

An Analysis of a Cross-Cultural Personality Inventory: The IPIP Big-Five Factor Markers in Croatia

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In this article, we describe the factor structure in both self-reports and peer ratings of the items in a cross-cultural Big-Five inventory in Croatia. Using 2 versions of an inventory developed from the International Personality Item Pool (IPIP; Goldberg, 1999), this is one of the first cross-national analyses of these IPIP measures. A large sample of university students ($N = 519$) used the translated Croatian version of the 100-item IPIP Big Five inventory to describe themselves, and they were also described by 515 of their acquaintances on the same instrument. In separate analyses of both self-reports and peer ratings, the 100-item and 50-item versions of these IPIP measures showed clear Five-factor orthogonal structures that were nearly identical to the American structure. These factors were strongly related on a one-to-one basis with those derived from a Croatian translation of Goldberg's (1992) bipolar rating scales.

The International Personality Item Pool (IPIP) was proposed by Goldberg (1999) as a scientific collaboratory for the development of advanced measures of personality traits and other individual differences. Over the years, the IPIP Web site (<http://ipip.ori.org/>) has provided an ever increasing set of measures, all in the public domain, available to scientists worldwide. Also included at the IPIP Web site is an ever increasing set of items (now numbering well over 2,000), each consisting of a short verbal phrase (e.g., "Act as I please," "Blend into the crowd," "Can keep a secret," "Dislike changes"). One rationale for the use of this common item format is that these short behavior-descriptive phrases should be much easier than single trait-descriptive adjectives to translate into the diverse languages of the modern world (Hendriks, Hofstee, & De Raad, 1998).

Although the IPIP item pool has been used to develop public-domain equivalents of the constructs in a variety of popular commercial personality inventories (Goldberg et al., 2006), among the most popular IPIP measures have been those targeted at constructs that are already in the public domain, especially the adjective-based markers of the Big-Five factor structure developed by Goldberg (1992). Trans-

lations of the IPIP version of the Big-Five markers are now available in (at least) Arabic, Bulgarian, Chinese, Croatian, German, Hungarian, Korean, Norwegian, Persian, Polish, Russian, Spanish, Swedish, and Welsh (Goldberg, 2005). Interestingly, however, we know of no published scientific reports on the characteristics of these translations, and thus we have no evidence about the utility of these measures in other languages and cultures. In this article, we report findings from the first study of such a translation. We analyze a Croatian version of both the 100-item and the 50-item versions of the IPIP Big-Five markers using both self-reports and peer ratings in large samples of research participants, and we compare these new findings from Croatian samples with the earlier results from an American community sample. Our primary aim was to verify the Five-factor structure of IPIP Big-Five factor markers in Croatian, both in self-reports and peer ratings, and to compare the resulting factor structures. An additional aim was to investigate the relations between the Croatian IPIP measures and a Croatian translation of Goldberg's (1992) bipolar markers of the Big-Five factors. This study was a part of a larger research project that aims to develop a comprehensive taxonomy of

Croatian personality-descriptive terms (Mlačić & Ostendorf, 2005).

METHOD

Research Participants

We recruited two samples of participants in Croatia, one for self-reports and the other for descriptions of these targets by their close acquaintances; for convenience, we refer to the latter as peer ratings. The self-reports were provided by 519 students from the University of Zagreb (426 females and 93 males); their ages ranged from 18 to 50 years, with a mean of 19.5 and a standard deviation of 1.9. The peer ratings were provided by 515 close acquaintances of the participants from the self-report sample (364 females, 149 males, and 2 who did not report their genders); their ages ranged from 15 to 76 years, with a mean of 24.9 years and a standard deviation of 10.4 years. The majority of the acquaintances were described by the participants as their closest friends (50.4%), followed by their mothers (14.4%), sisters (12%), boyfriends (11.4%), brothers (3.1%), cousins (3.1%), fathers (2.5%), girlfriends (2.5%), and husbands, grandmothers, and friends of the family (0.2%, respectively). The reason for the diversity in the peer-rating sample lies in the fact that the participants from the self-report sample were free to choose the type of acquaintance to describe them, using only the criterion that the selected person “knows them best.” From the 521 potential target persons, 2 did not complete the self-descriptions, and therefore, the self-report sample consisted of 519 participants; 6 acquaintances did not complete the peer descriptions, and therefore, the peer-rating sample consisted of 515 participants. Altogether, there were 513 matched pairs of ratings (a self-description paired with a peer description). Each peer rated only one target person, and the mean period of target-peer acquaintanceship was 10 years.

Instruments

The IPIP instrument used in this study was targeted to measure the Big-Five domains with 100 items (long form). We administered the IPIP items with a 5-point, Likert-type scale ranging from 1 (*very inaccurate*) to 5 (*very accurate*) as in the original instrument (Goldberg, 1999). In the American community sample used to develop the English-language version of the IPIP instrument (Goldberg, 2005), the internal consistency reliability estimates (coefficient alpha) of the long form for each of the five domains were .91 (Factor I: Extraversion), .88 (Factor II: Agreeableness), .88 (Factor III: Conscientiousness), .91 (Factor IV: Emotional stability), and .90 (Factor V: Intellect/Imagination). The number of items per pole by factor number (i.e., the number of items keyed in the positive and negative directions for each construct measured by the

IPIP instrument) was I+ (10), I- (10); II+ (14), II- (6); III+ (11), III- (9); IV+ (5), IV- (15); and V+ (13), V- (7).

Because all of the items in the 50-item version (short form) of the IPIP instrument are included in the 100-item version, it is possible to analyze both versions from a single administration of the 100 items. However, it is important to note that the 50-item version does not consist of the first 50 items from the 100-item version. The items included in the long and the short form self-report forms are listed in Appendixes 1 and 2, respectively. In the original American sample, the coefficient alpha values for the short version by factor number were .87 (1), .82 (2), .79 (3), .86 (4), and .84 (5). The number of items per pole by factor number was I+ (5), I- (5); II+ (6), II- (4); III+ (6), III- (4); IV+ (2), IV- (8); and V+ (7), V- (3).

The other instrument we used in this study was Goldberg's (1992) 50 transparent Bipolar Rating Scales (50-BRS), developed as markers of the Big-Five factor structure. The 50-BRS included 50 bipolar adjective-anchored rating scales, 10 for each domain of the Big-Five. We administered the bipolar scales with a 9-step rating scale ranging from 1 (*very*) Trait A through 5 (*neither*) Trait A (*nor*) Trait B to 9 (*very*) Trait B as in the original instrument (Goldberg, 1992). In the English-language version of the 50-BRS (Goldberg, 1992), the internal consistency reliability estimates (coefficient alpha) for the five domains (by factor number) were .87 (I), .87 (II), .84 (III), .88 (IV), and .76 (V).

In previous research with the 50-BRS in Croatia (Mlačić & Knezović, 2000), the 50-BRS items were translated and applied in an opaque format (Mlačić & Knezović, 1997); all 100 adjectives were translated by B. Mlačić. A sample of 140 participants (82 males, 58 females) rated the familiarity of those translations using a three-step scale (with 1 = *not familiar with the adjective*, 2 = *somewhat familiar with the adjective*, and 3 = *totally familiar with the adjective*), and 85% of the sample claimed to be totally familiar with the translations of all 100 adjectives. Subsequent research (Mlačić & Knezović, 1997) confirmed the Five-factor structure of the 50-BRS items when administered in an opaque format. The coefficient alpha reliability estimates of this Croatian version by factor number were .82 (I), .84 (II), .89 (III), .82 (IV), and .77 (V).

Procedure

The 100 English IPIP items were independently translated into Croatian by two personality psychologists (including B. Mlačić, and their translations were then back translated into English by an English-Croatian bilingual. Using these item texts, the translated items were further refined in Croatian by a professional language editor. The refined version was then adapted for self-ratings (first-person format) and for peer ratings (third-person format). All four versions of the Croatian IPIP measures (long and short scales for

the self-reports and the peer ratings) are available from B. Mlačić.

The translation of the 100 English IPIP items into Croatian proved to be an easy task. The two independent translations were nearly identical in over 90% of the cases, with differences between the two translations reflecting just different word orders. In the remaining cases (less than 10%), differences in the item translations reflected only different stylistical expressions by the two translators, with the exact same meaning in all cases. Naturally, the back translations were also all nearly perfect. A final item refinement was provided by a language editor, which is a standard practice before publishing tests in Croatia.

We approached the participants in the self-report sample at the beginning of the academic year and asked them to participate in the study. We instructed them to describe themselves as accurately as possible using the inventories we described previously. We also instructed these participants to select the person who “knows them best.” Those acquaintances were asked to describe the target person using the same measures, which we then adapted for peer ratings (third person).

RESULTS

Factor Structure of the 100 IPIP Items

Self-reports. When we extracted principal components from the correlations among the 100 IPIP items in the self-report data set, there was a clear discontinuity in the sizes of the eigenvalues between the fifth and the sixth factors. Figure 1 presents a plot of the first 15 eigenvalues. The factor loadings from a varimax rotation of these self-reports are provided in Appendix 1. The five factors explained 41.6% of the total variance. Of the 100 items, 94 (94%) loaded

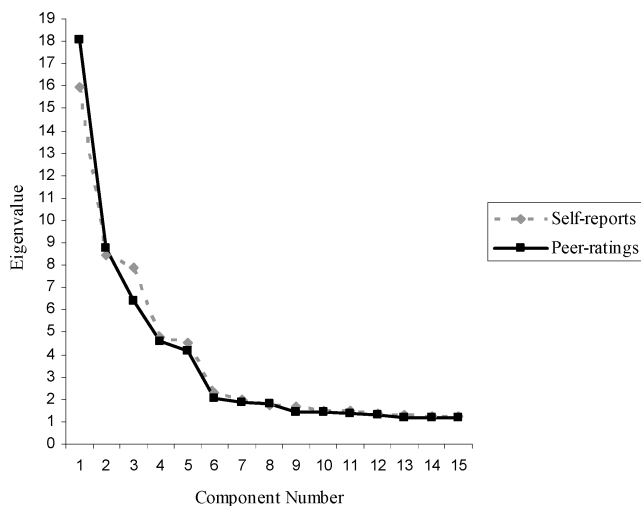


FIGURE 1. Plot of the eigenvalues in the four data sets: Self-reports and peer ratings on 100 items.

as expected based on the original findings in an American community sample (Goldberg, 2005).

Of the 20 items defining the Extraversion factor, all loaded most highly on the same factor. For the factors of Emotional Instability and Intellect, 19 items loaded most highly on the same factor. For the factors of Agreeableness and Conscientiousness, 18 loaded as expected. In total, only 6 items departed from the intended structure, 1 of which had no substantial loadings on any of the factors (“Am always prepared,” which was intended to measure the positive pole of Conscientiousness). The item “Am interested in people,” which was intended as a measure of the positive pole of Agreeableness, loaded most highly on the positive pole of Extraversion. The item “Am hard to get to know,” intended as a measure of the negative pole of Agreeableness, loaded most highly on the negative pole of Extraversion. The item “Pay attention to details,” intended as a measure of the positive pole of Conscientiousness, loaded most highly on the positive pole of Intellect. The item “Get overwhelmed by emotions,” intended as a measure of the negative pole of Emotional Stability, loaded most highly on the positive pole of Agreeableness. Finally, the item “Avoid difficult reading material,” intended as a measure of the negative pole of Intellect, loaded most highly on the negative pole of Conscientiousness with almost the same size of loading as on the intended factor. Because the majority of the items for the domain of Emotional Stability are oriented toward the negative pole (75% for the long form and 80% for the short form), the resulting factor from the analysis was also oriented toward the negative pole. Therefore, we labeled it as ES-, or Emotional Instability.

Peer ratings. When we extracted principal components from the correlations among the 100 IPIP items in the peer-rating data set, again there was a clear discontinuity in the sizes of the eigenvalues between the fifth and the sixth factors, which is also shown in Figure 1. The factor loadings from a varimax rotation of these peer-rating data are also included in Appendix 1. The five factors explained 42.0% of the total variance. Once again, of the 100 items, 94 (94%) loaded as expected.

All 20 of their intended items defined the factors of Extraversion and Intellect, whereas 18 of the intended items loaded most highly on the factors of Agreeableness, Conscientiousness, and Emotional Instability. There were only a few differences from the self-rating solution: (a) The item “Avoids difficult reading material,” intended as a measure of the negative pole of Intellect, now loaded as expected; (b) the item “Is always prepared,” intended as a measure of the positive pole of Conscientiousness, loaded most highly on the positive pole of Extraversion; and finally (c), the item “Is relaxed most of the time,” intended as a measure of the positive pole of Emotional Stability, also loaded most highly on the positive pole of Extraversion.

Factor Structure of the 50 IPIP Items

Self-reports. Because all of the items in the short version of the IPIP instrument are included in the long version, it is possible to analyze the two forms from a single administration of the 100 items. Also, because the short version has some practical advantages (being easier and faster for applied purposes), it is useful to compare its properties with those of the longer instrument. Therefore, we used the same analytical procedures to examine the factor structure of the 50-item version.

When we extracted principal components from the correlations among the 50 IPIP items in the self-report data set, there was again a clear discontinuity in the sizes of the eigenvalues between the fifth and the sixth factors. These values are shown in Figure 2. The factor loadings from a varimax rotation of the 50 items are provided in Appendix 2. These five factors explained 45.2% of the total variance. Of the 50 items, 46 (92%) loaded as expected. All 10 of the intended items defined the factors of Extraversion, Emotional Instability, and Intellect, whereas 8 of the 10 intended items loaded most highly on the factors of Agreeableness and Conscientiousness.

Only 4 items departed from the intended structure: The item “Am always prepared,” intended as a measure of the positive pole of Conscientiousness, had no substantial loadings on any of the factors, the same as in the analyses of the self-reports with the 100 items. The item “Am interested in people,” which was intended as a measure of the positive pole of Agreeableness, loaded most highly on the positive pole of Extraversion just as it did in the analyses of the self-reports and the peer ratings of the 100 items. The item “Pay attention to details,” which was intended as a measure of the positive pole of Conscientiousness, loaded most highly on the positive pole of Intellect just as it did in the analyses

of the self-reports and the peer ratings with the 100 items. Finally, the item “Insult people,” which was intended as a measure of the negative pole of Agreeableness, loaded most highly on the negative pole of Emotional Stability.

Peer ratings. When we extracted principal components from the correlations among the 50 IPIP items in the peer-rating data set, again there was a clear discontinuity in the sizes of the eigenvalues between the fifth and sixth factors. Figure 2 presents a plot of the first 15 eigenvalues from these data. The five factors explained 44.9% of the total variance. The factor loadings from a varimax rotation of these factors are presented in Appendix 2. Of the 50 items, 47 (94%) loaded as expected. All 10 of the intended items defined the factors of Extraversion, Emotional Instability, and Intellect, and 9 of the intended items defined the factor of Agreeableness. Of the 10 items intended as measures of Conscientiousness, 8 loaded most highly on that factor. There was only one difference from the self-rating solution: The item “Is interested in people” now loaded most highly on its intended positive pole of Agreeableness.

Reliabilities of the Long and the Short Scales in the Self-Reports and the Peer Ratings

Table 1 presents the internal consistency reliability estimates (coefficient alpha) for each of the Big-Five domains in all four analyses (self-reports and peer ratings of the long and short forms). All 20 alpha coefficients were high, ranging from .79 to .93. Although the average values of alpha coefficients are necessarily higher for the long forms (.91 for the peer-ratings and .90 for the self-ratings) than for the short forms, nevertheless, the average values for the shorter forms were also substantial (.83 in both the self-ratings and peer ratings). Both sets of values are quite comparable to those reported by Goldberg (2005) in an American community sample. The corresponding U.S. alpha coefficients are given in parentheses in Table 1.

Correspondence between the factors from the self-reports and the peer ratings. To evaluate the similarity between the corresponding factors across different types of judges (self vs. peers), we calculated the congruence coefficients (Tucker, 1951) between the factors derived in the self-report and the peer-rating data separately for both the 100-item and the 50-item instruments. These values are reported in Table 2. All of the corresponding congruence coefficients were high, ranging from .95 to .98, and averaging .97. These results attest to the robustness of the Five-factor structures across the self-ratings and the peer ratings, both for the long and the short scales of the IPIP instrument.

To evaluate the convergent and the discriminant validity of the five IPIP factors for each of the two different types of judges, we calculated correlations between the factor scores derived from both the 100-item and the 50-item instruments

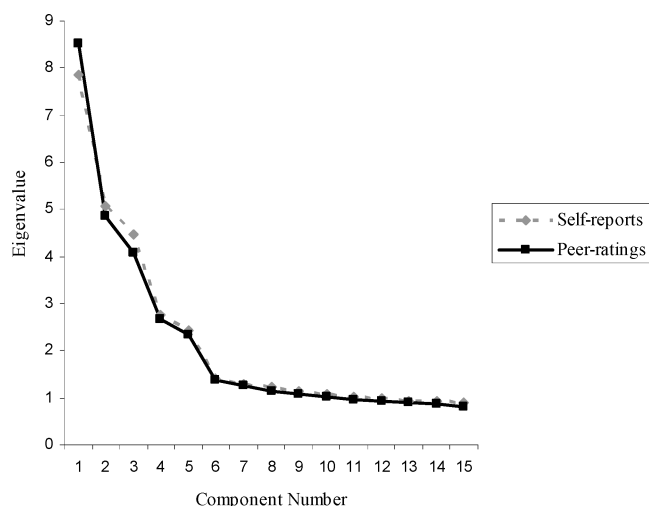


FIGURE 2. Plot of the eigenvalues in the four data sets: Self-reports and peer ratings on 50 items.

in the self-report and the peer-rating data. These correlations are provided in Table 3.

The convergent validity (or monotrait-heteromethod) coefficients (Campbell & Fiske, 1959) of the five factors are listed in the main diagonals of the correlation matrices. A comparison of these coefficients with the heterotrait-heteromethod correlations shows that all convergent validity coefficients exceeded the relevant heterotrait correlations, thus satisfying the first criterion of discriminant validity proposed by Campbell and Fiske (1959). All convergent validity coefficients were significantly different from zero. The mean

TABLE 1
Internal Consistency Reliability Estimates
(Coefficient Alpha) for the Croatian 100-Item
and 50-Item IPIP Scales in Self-Reports^a and
Peer Ratings^b

Scale	100-Item		50-Item	
	Self-Reports	Peer Ratings	Self-Reports	Peer Ratings
Extraversion	.93 (.91)	.92	.87 (.87)	.85
Agreeableness	.87 (.88)	.91	.79 (.82)	.83
Conscientiousness	.92 (.88)	.93	.81 (.79)	.83
Emotional Instability	.92 (.91)	.90	.88 (.86)	.84
Intellect	.87 (.90)	.88	.79 (.84)	.80

Note. IPIP = International Personality Item Pool; The corresponding values from a U.S. community sample are listed in parentheses.

^a*N* = 519. ^b*N* = 515.

TABLE 2
Congruence Coefficients Between the
Corresponding Factors in the Self-Reports
and the Peer Ratings

Factor	100 Items	50 Items
Extraversion	.98	.97
Agreeableness	.96	.95
Conscientiousness	.98	.98
Emotional Instability	.97	.98
Intellect	.96	.96

convergent validity of the factors across the two types of judges was .55 for the long form and .50 for the short form.

Table 3 reveals that the convergent validity coefficients for the factors of Extraversion and Conscientiousness were generally higher than the others and averaged .66 in the long and .62 in the short form. The convergent validities for the factors of Agreeableness, Emotional Stability, and Intellect averaged .47 in the long and .42 in the short form. Using Funder and Colvin's (1997) four categories of potential moderators of self-peer agreement (good judge, good target, good trait, and good information), our findings suggest that the factors of Extraversion and Conscientiousness represented good traits, ones that elicited higher amounts of self-peer agreement. This finding is similar to that found in Croatian emic personality dimensions in a study by Mlačić and Ostendorf (2005).

None of the heterotrait correlations even approximated the size of the convergent validity coefficients reported in Table 3, and none reached the $p < .01$ significance level; only a few of the heterotrait correlations were as high as .09 or .10 and thus were significant at the $p < .05$ level. Therefore, the findings from this study provide strong evidence for the convergent and the discriminant validity of the five IPIP factors across the two types of judges. (The correlations between the self-reports and the peer ratings at the item level are available from B. Mlačić.)

Comparing the IPIP factors with another measure of the Big-Five. The 50-BRS items (Goldberg, 1992) in the self-report and the peer-rating data sets were submitted to separate principal components analyses; and in both analyses, there was a clear discontinuity in the sizes of the eigenvalues between the fifth and sixth factors. The 50-BRS in the Croatian sample showed a high factorial stability across the self-report and the peer-rating data sets and a close correspondence to the factor structure in the original American samples (Mlačić, 2002). To evaluate the convergent and discriminant validity of the five factors from the long and the short IPIP scales, we calculated the correlations between the factor scores derived from the varimax-rotated principal

TABLE 3
Self- and Peer-Convergent Peer Convergent and Discriminant Correlations for the IPIP Factors

Self Reports	Peer Ratings									
	100 Items					50 Items				
	E	A	C	ES-	I	E	A	C	ES-	I
E	<u>.65**</u>	-.06	-.01	.07	-.09*	<u>.62**</u>	-.10*	.01	.02	-.04
A	.03	<u>.47**</u>	.05	.05	.00	.04	<u>.39**</u>	.09*	.09*	-.03
C	.04	.02	<u>.67**</u>	.02	-.04	-.00	-.03	<u>.61**</u>	.03	-.06
ES-	-.09*	-.02	.07	<u>.49**</u>	.00	-.10*	-.04	.04	<u>.47**</u>	.02
I	.05	-.09*	-.08	.08	<u>.45**</u>	.01	-.04	-.10*	.06	<u>.41**</u>

Note. The highest correlation for each factor is underlined. IPIP = International Personality Item Pool; E = Extraversion; A = Agreeableness; C = Conscientiousness; ES- = Emotional Instability; I = Intellect.

* $p < .05$. ** $p < .01$, two-tailed.

components of the 50-BRS factors and the varimax-rotated principal components in the 100-item and in the 50-item pools for both self-reports and peer ratings. These correlations are summarized in Table 4.

As the table indicates, there were clear one-to-one relations between all five corresponding factors in all four cases (short and long versions in self-reports and peer ratings). In the self-report data, the correlations between the corresponding factors from the 50-BRS and the IPIP long form averaged .68, whereas all of the correlations between noncorresponding factors were much lower (the highest was $-.19$). The correlations between the corresponding factors from the 50-BRS and the IPIP short form averaged .65, with all correlations between noncorresponding factors again being much lower (the highest was $-.25$). In the peer-rating data set, the correlations between the corresponding factors from the 50-BRS and the IPIP long form averaged .67, with the highest correlation between noncorresponding factors being only .14. Finally, the correlations between the corresponding factors from the 50-BRS and the IPIP short form averaged .63, and the highest noncorresponding correlation was only $-.21$. The convergent correlations between the IPIP factors and the 50-BRS factors were very similar to those between the IPIP Big-Five markers and Goldberg's (1992) unipolar Big-Five markers obtained in the U.S. sample (Saucier & Goldberg, 2002). Thus, the pattern of correlations between the IPIP and the 50-BRS factors further serve to confirm the convergent and the discriminant validity of the five IPIP factors.

DISCUSSION

This study provides substantial support for the generalizability of the Five-factor IPIP structure in a Croatian context.

Our findings reflect a substantial match between the American and the Croatian IPIP Five-factor structure, both in self-reports and in peer ratings, and for both the long and the short IPIP scales. Almost all the items loaded as expected in all four analyses. The reliabilities of the five factors were high in all four data sets, as were the factor congruence coefficients between the self-reports and the peer ratings. The convergent correlations of the five factors across the two types of judges were reasonably high, especially for the dimensions of Extraversion and Conscientiousness, and yielded evidence of the robustness of the Five-factor structures between self-reports and peer-ratings. The relations between 50-BRS factors and IPIP factors revealed unequivocally clear one-to-one relations between all five corresponding factors in all four data sets. These results suggest that the IPIP instruments provide an excellent starting point for cross-national comparisons of individual differences (e.g., Gow, Whiteman, Pattie, & Deary, 2005). The items that may need to be refined in specific cultures seem to be relatively rare, and they do not compromise the overall factor structure.

In general, then, this first attempt to validate the IPIP Big-Five markers in another language and culture was remarkably successful. As a next step, it would be useful to compare these findings from Croatia, a Westernized culture with an Indo-European language, with those from one or more Asian or African cultural settings where translation problems may not be so easily solved. In addition, it would be useful to compare the usefulness of this cross-cultural instrument with other types of IPIP inventories such as the IPIP inventory measuring constructs similar to those in the Revised NEO Personality Inventory (e.g., Buchanan, Johnson, & Goldberg, 2005) and with other types of personality inventories more generally. Finally, future cross-cultural studies ought to compare the characteristics of these measures in easily available

TABLE 4
Correlations Between Goldberg's Bipolar Markers and the IPIP Factors in the Self-Reports and the Peer Ratings

50-BRS	100 Items					50 Items				
	<i>E</i>	<i>A</i>	<i>C</i>	<i>ES-</i>	<i>I</i>	<i>E</i>	<i>A</i>	<i>C</i>	<i>ES-</i>	<i>I</i>
Self-reports										
<i>E</i>	<u>.77**</u>	.00	.07	$-.19^{**}$	.12**	<u>.74**</u>	.02	.04	$-.25^{**}$	.07
<i>A</i>	.07	<u>.63**</u>	.08	.01	$-.11^*$	.03	<u>.56**</u>	.12**	.00	$-.08$
<i>C</i>	$-.10^*$	$-.02$	<u>.72**</u>	$-.01$	.08	$-.09^*$	$-.01$	<u>.69**</u>	$-.03$	.01
<i>ES-</i>	$-.07$	.03	.08	<u>$-.70^{**}$</u>	$-.02$	$-.12^{**}$	$-.01$	.08	<u>$-.67^{**}$</u>	.02
<i>I</i>	.08	.05	$-.02$	.02	<u>.60**</u>	.11*	.03	.03	.01	<u>.58**</u>
Peer-ratings										
<i>E</i>	<u>.79**</u>	$-.07$	.02	$-.13^{**}$	.09*	<u>.73**</u>	$-.07$	.01	$-.21^{**}$	.11*
<i>A</i>	.06	<u>.67**</u>	.08	$-.09^*$	.01	.06	<u>.63**</u>	.12**	$-.03$	.01
<i>C</i>	$-.05$	$-.05$	<u>.69**</u>	$-.04$	.14**	$-.07$	.01	<u>.62**</u>	$-.05$	.07
<i>ES-</i>	$-.08$	.01	.06	<u>$-.63^{**}$</u>	$-.01$	$-.13^{**}$	.00	.08	<u>$-.59^{**}$</u>	$-.02$
<i>I</i>	.02	.08	$-.04$	.09	<u>.57**</u>	.03	.06	.00	.09*	<u>.57**</u>

Note. The highest correlation for each factor is underlined. IPIP = International Personality Item Pool; *E* = Extraversion; *A* = Agreeableness; *C* = Conscientiousness; *ES-* = Emotional Instability; *I* = Intellect; 50-BRS = 50 transparent Bipolar Rating scales.

* $p < .05$. ** $p < .01$, two-tailed.

highly educated samples (i.e., university students) with more representative samples from the total population under study.

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APPENDIX 1

Five-Factor Varimax-Rotated Loadings of the 100 IPIP Items in the Croatian Self-Reports (S)^a and Peer Ratings (P)^b

Item	E		A		C		ES-		I	
	S	P	S	P	S	P	S	P	S	P
1. Am the life of the party.	.60*	.63*	.05	.10	.06	.06	-.13	-.11	.15	.14
6. Often feel uncomfortable around others.	-.62*	-.65*	-.02	-.05	-.12	-.09	.27	.19	-.04	-.08
11. Feel comfortable around people.	.60*	.64*	.25	.14	.07	.02	-.18	-.14	.02	.06
16. Keep in the background.	-.73*	-.64*	-.08	-.12	-.04	-.01	.13	.09	-.07	-.07
21. Start conversations.	.59*	.65*	.11	.17	.02	.03	-.02	-.02	.22	.16
26. Have little to say.	-.51*	-.41*	-.09	-.23	.00	-.04	.10	.03	-.36	-.32
31. Talk to a lot of different people at parties.	.67*	.74*	.11	.12	.01	-.05	-.08	-.08	.21	.09
36. Don't like to draw attention to myself.	-.46*	-.48*	.14	.25	.06	.13	-.07	-.17	-.23	.00
41. Don't mind being the center of attention.	.57*	.49*	-.11	-.16	.03	-.05	-.09	.01	.29	.07
46. Am quiet around strangers.	-.69*	-.64*	-.12	-.12	-.02	.03	.05	.04	-.08	.00
51. Make friends easily.	.70*	.66*	.21	.23	.06	.03	-.07	-.13	.08	.07
56. Find it difficult to approach others.	-.80*	-.72*	-.11	-.16	-.05	-.02	.09	.10	-.10	-.07
61. Take charge.	.62*	.61*	-.07	.01	.08	.12	.00	.01	.31	.21
66. Don't talk a lot.	-.73*	-.70*	-.03	-.07	.04	.13	-.05	-.02	-.16	-.04

(Continued on next page)

APPENDIX 1
Five-Factor Varimax-Rotated Loadings of the 100 IPIP Items in the Croatian Self-Reports (S)^a and Peer Ratings (P)^b (Continued)

Item	E		A		C		ES-		I	
	S	P	S	P	S	P	S	P	S	P
71. Know how to captivate people.	.59*	.54*	.09	.25	.04	.01	-.12	-.10	.25	.17
76. Bottle up my feelings.	-.39*	-.32*	-.17	-.18	-.03	-.10	.03	.01	.14	.12
81. Feel at ease with people.	.67*	.70*	.19	.19	.08	.07	-.19	-.26	.11	.10
86. Am a very private person.	-.77*	-.75*	-.05	-.05	.00	.06	.13	.12	-.11	-.08
91. Wait for others to lead the way.	-.48*	-.50*	.10	.07	-.11	-.11	.02	-.02	-.27	-.24
96. Am skilled in handling social situations.	.68*	.68*	.14	.14	.08	.09	-.16	-.07	.33	.28
2. Insult people.	.04	.03	-.36*	-.45*	-.25	-.29	.31	.25	.07	-.03
7. Am interested in people.	.44*	.45*	.39	.27	-.04	-.06	.01	-.01	.16	.16
12. Am not interested in other people's problems.	-.07	-.09	-.54*	-.52*	.03	.04	-.09	.00	.02	.01
17. Sympathize with other's feelings.	.06	.11	.69*	.73*	.07	.19	.02	-.04	.08	.11
22. Feel little concern for others.	-.13	-.17	-.71*	-.69*	-.15	-.10	.02	.07	.02	-.16
27. Have a soft heart.	-.02	-.01	.53*	.65*	.12	.09	.17	.06	-.02	.10
32. Am not really interested in others.	-.28	-.34	-.47*	-.38*	-.02	.07	.04	.13	-.11	-.16
37. Take time out for others.	.20	.28	.59*	.56*	.00	.07	-.03	-.06	.15	.17
42. Am hard to get to know.	-.37*	-.36*	-.21	-.28	-.05	-.05	.08	.20	.27	.09
47. Feel others' emotions.	-.12	.00	.66*	.64*	-.03	.15	.18	.03	.06	.13
52. Am indifferent to the feelings of others.	-.07	-.12	-.68*	-.63*	-.16	-.07	.02	.12	-.11	-.15
57. Make people feel at ease.	.05	.22	.43*	.56*	.09	.24	.03	-.12	.16	.15
62. Inquire about others' well-being.	.11	.19	.71*	.68*	.14	.23	.00	.00	.19	.22
67. Know how to comfort others.	.26	.24	.48*	.52*	.04	.17	-.01	-.12	.26	.29
72. Love children.	.08	.19	.42*	.46*	.26	.17	-.08	-.03	-.08	.05
77. Am on good terms with nearly everyone.	.19	.30	.32*	.35*	.10	.02	-.21	-.25	.03	.17
82. Have a good word for everyone.	.22	.19	.47*	.55*	.20	.31	-.15	-.17	.13	.10
87. Show my gratitude.	.12	.08	.45*	.50*	.19	.23	-.11	-.12	.10	.17
92. Think of others first.	-.28	-.12	.53*	.59*	.03	.19	.00	-.03	-.04	.03
97. Love to help others.	.15	.25	.69*	.66*	.21	.25	-.04	-.09	.10	.10
3. Am always prepared.	.22	.35*	.04	.05	.28	.29	-.20	-.15	.13	.19
8. Leave my belongings around.	.01	.07	-.14	-.07	-.68*	-.70*	.06	.08	.12	.06
13. Pay attention to details.	.05	.00	.13	.10	.13	.20	.08	.10	.35*	.42*
18. Make a mess of things.	.04	.10	-.05	-.27	-.60*	-.54*	.12	.21	.07	.04
23. Get chores done right away.	.02	.03	.16	.20	.63*	.61*	.02	-.02	-.12	-.05
28. Often forget to put things back in their proper place.	-.07	.05	-.07	-.09	-.64*	-.69*	.07	.06	.05	.01
33. Like order.	-.01	.02	.14	.18	.72*	.71*	.08	.01	-.04	-.01
38. Shirk my duties.	-.04	.00	-.15	-.22	-.65*	-.61*	.10	.06	-.12	-.07
43. Follow a schedule.	-.04	.10	-.03	-.09	.58*	.57*	-.01	-.07	.21	.18
48. Neglect my duties.	-.08	-.04	-.08	-.22	-.75*	-.68*	.13	.17	-.03	-.15
53. Am exacting in my work.	.09	.04	.08	.07	.70*	.69*	-.05	-.14	.20	.22
58. Waste my time.	-.20	-.13	-.07	-.24	-.56*	-.50*	.29	.24	-.03	-.19
63. Do things according to plan.	.02	.05	.01	.04	.69*	.73*	.03	-.11	.14	.25
68. Do things in a half-way manner.	-.03	-.01	.00	-.15	-.68*	-.69*	.16	.16	-.16	-.20
73. Continue until everything is perfect.	.04	.03	.12	.05	.60*	.64*	.08	-.03	.19	.24
78. Find it difficult to get down to work.	-.12	-.04	-.12	-.15	-.56*	-.66*	.17	.18	-.06	-.17
83. Make plans and stick to them.	.07	.13	.00	-.01	.62*	.66*	-.04	-.08	.22	.23
88. Leave a mess in my room.	-.03	.06	-.11	-.12	-.71*	-.70*	.05	.04	.10	.07
93. Love order and regularity.	.02	-.02	.09	.12	.72*	.78*	.11	-.03	.02	.04
98. Like to tidy up.	-.05	.00	.19	.29	.59*	.63*	.03	-.05	-.10	-.08
4. Get stressed out easily.	-.12	-.16	.15	.12	-.04	-.10	.69*	.64*	.02	-.01
9. Am relaxed most of the time.	.37	.45*	.08	-.01	-.02	-.03	-.54*	-.42	.07	.05
14. Worry about things.	-.30	-.24	.15	.19	.04	.11	.63*	.55*	.08	.04
19. Seldom feel blue.	.31	.25	-.12	-.15	.00	.00	-.49*	-.38*	-.11	-.01
24. Am easily disturbed.	-.13	-.17	.00	.03	-.12	-.14	.48*	.44*	-.15	-.10
29. Am not easily bothered by things.	.03	-.03	-.03	.04	-.03	-.02	-.74*	-.67*	.12	-.05
34. Get upset easily.	.01	.04	.08	-.05	-.04	-.06	.80*	.70*	-.14	-.06
39. Rarely get irritated.	-.03	-.02	-.01	.10	-.02	.10	-.65*	-.46*	.03	.09
44. Change my mood a lot.	-.13	-.06	-.04	-.07	-.12	-.15	.67*	.68*	.06	.03
49. Seldom get mad.	-.12	-.05	.05	.12	-.03	.02	-.62*	-.60*	.08	.05
54. Have frequent mood swings.	-.08	-.06	.01	-.07	-.12	-.20	.71*	.72*	.05	.00
59. Get irritated easily.	.01	.03	-.02	-.11	-.12	-.12	.80*	.73*	-.08	-.13
64. Often feel blue.	-.41	-.35	.12	.06	-.10	-.08	.60*	.59*	.09	-.02

(Continued on next page)

APPENDIX 1
Five-Factor Varimax-Rotated Loadings of the 100 IPIP Items in the Croatian Self-Reports (S)^a and Peer Ratings (P)^b (Continued)

Item	E		A		C		ES-		I	
	S	P	S	P	S	P	S	P	S	P
69. Get angry easily.	.07	.09	-.09	-.12	-.07	-.11	<u>.74*</u>	<u>.78*</u>	-.14	-.12
74. Panic easily.	-.20	-.18	.07	.03	-.09	-.11	<u>.60*</u>	<u>.55*</u>	-.14	-.13
79. Feel threatened easily.	<u>-.37</u>	<u>-.30</u>	-.02	-.01	-.18	-.16	<u>.53*</u>	<u>.53*</u>	-.01	-.10
84. Get overwhelmed by emotions.	-.03	.07	<u>.45*</u>	<u>.51*</u>	.00	.07	<u>.33</u>	.28	.14	.15
89. Take offense easily.	-.04	-.09	-.05	-.15	-.05	-.17	<u>.69*</u>	<u>.63*</u>	-.07	-.08
94. Get caught up in my problems.	-.21	-.12	-.09	-.17	.12	.01	<u>.47*</u>	<u>.35*</u>	.01	.00
99. Grumble about things.	.03	.01	-.12	-.27	-.20	-.16	<u>.44*</u>	<u>.49*</u>	-.02	-.04
5. Have a rich vocabulary.	.18	.13	.03	.03	.10	.11	-.04	.03	<u>.57*</u>	<u>.59*</u>
10. Have difficulty understanding abstract ideas.	-.03	-.07	-.04	-.15	.12	.04	.14	.20	<u>-.54*</u>	<u>-.48*</u>
15. Have a vivid imagination.	.07	.21	.16	.07	<u>-.31</u>	-.23	.08	.13	<u>.46*</u>	<u>.43*</u>
20. Am not interested in abstract ideas.	.00	-.09	-.05	-.17	.14	.15	.06	.07	<u>-.48*</u>	<u>-.47*</u>
25. Have excellent ideas.	.14	.17	-.01	.10	.03	.03	-.02	-.06	<u>.61*</u>	<u>.64*</u>
30. Do not have a good imagination.	-.17	-.22	-.18	-.21	.14	.08	.01	.06	<u>-.57*</u>	<u>-.55*</u>
35. Am quick to understand things.	.18	.12	.05	.04	.03	.04	-.11	-.16	<u>.58*</u>	<u>.58*</u>
40. Try to avoid complex people.	-.16	-.04	-.12	-.07	-.12	-.05	.09	.16	<u>-.42*</u>	<u>-.36*</u>
45. Use difficult words.	.15	.04	-.04	-.10	.12	.19	.05	.05	<u>.44*</u>	<u>.51*</u>
50. Have difficulty imagining things.	-.15	-.15	-.07	-.18	.05	-.02	.21	.27	<u>-.43*</u>	<u>-.40*</u>
55. Spend time reflecting on things.	-.20	-.15	.13	.11	-.06	-.05	<u>.32</u>	.26	<u>.39*</u>	<u>.41*</u>
60. Avoid difficult reading material.	-.05	-.01	-.06	-.09	<u>-.31*</u>	<u>-.32</u>	.14	.04	<u>-.30</u>	<u>-.45*</u>
65. Am full of ideas.	.24	.26	.06	.11	-.06	.00	-.02	-.10	<u>.63*</u>	<u>.65*</u>
70. Will not probe deeply into a subject.	.05	.01	-.17	-.14	-.17	-.23	.08	.08	<u>-.40*</u>	<u>-.51*</u>
75. Carry the conversation to a higher level.	.17	.08	.11	.07	-.04	.05	.08	.02	<u>.60*</u>	<u>.59*</u>
80. Catch on to things quickly.	.22	.14	.06	.09	.08	.10	-.22	-.15	<u>.53*</u>	<u>.60*</u>
85. Can handle a lot of information.	.12	.09	.08	.05	.17	.17	.04	.00	<u>.59*</u>	<u>.65*</u>
90. Am good at many things.	.17	.11	-.02	.13	.20	.16	-.03	-.09	<u>.56*</u>	<u>.63*</u>
95. Love to read challenging material.	.03	.01	.06	-.01	.14	.18	.03	.00	<u>.52*</u>	<u>.56*</u>
100. Love to think new ways of doing things.	.16	.20	-.01	.19	.10	.09	-.06	-.02	<u>.49*</u>	<u>.49*</u>

Note. Loadings over .30 are underlined. The highest factor loading for each variable is indicated with an asterisk (*). IPIP = International Personality Item Pool; E = Extraversion; A = Agreeableness; C = Conscientiousness; ES- = Emotional Instability; I = Intellect. The order of the items in the table reflects their order on the IPIP Web site (Goldberg, 2005).

^aN = 519. ^bN = 515.

APPENDIX 2
Five-Factor Varimax-Rotated Loadings of the 50 IPIP Items in the Croatian Self-Reports (S)^a and Peer Ratings (P)^b

Item	E		A		C		ES-		I	
	S	P	S	P	S	P	S	P	S	P
1. Am the life of the party	<u>.62*</u>	<u>.61*</u>	.00	.05	.09	.09	-.16	-.16	.13	.19
6. Don't talk a lot.	<u>-.74*</u>	<u>-.72*</u>	-.06	-.10	.06	.09	.01	.04	-.12	-.07
11. Feel comfortable around people.	<u>.58*</u>	<u>.62*</u>	.27	.18	.10	.03	-.21	-.19	.00	.10
16. Keep in the background.	<u>-.72*</u>	<u>-.64*</u>	-.12	-.13	-.03	-.03	.19	.14	-.03	-.09
21. Start conversations.	<u>.64*</u>	<u>.66*</u>	.13	.18	.04	.06	-.05	-.05	.16	.15
26. Have little to say.	<u>-.52*</u>	<u>-.44*</u>	-.12	-.26	-.01	-.08	.13	.05	<u>-.33</u>	<u>-.33</u>
31. Talk to a lot of different people at parties.	<u>.68*</u>	<u>.74*</u>	.15	.16	.02	-.04	-.11	-.13	.15	.09
36. Don't like to draw attention to myself.	<u>-.53*</u>	<u>-.54*</u>	.14	.23	.04	.11	-.05	-.15	-.23	.00
41. Don't mind being the center of attention.	<u>.62*</u>	<u>.52*</u>	-.13	-.17	.05	-.04	-.11	-.01	.27	.10
46. Am quiet around strangers.	<u>-.68*</u>	<u>-.66*</u>	-.13	-.14	-.02	.01	.10	.05	-.06	.02
2. Feel little concern for others.	-.12	-.17	<u>-.74*</u>	<u>-.73*</u>	-.17	-.13	.04	.03	.00	-.15
7. Am interested in people.	<u>.48*</u>	<u>.49*</u>	<u>.46</u>	<u>.36</u>	-.03	-.04	-.02	-.02	.11	.12
12. Insult people.	.13	.09	<u>-.32</u>	<u>-.48*</u>	<u>-.30</u>	<u>-.30</u>	<u>.33*</u>	.20	.02	.00
17. Sympathize with others' feelings.	.03	.07	<u>.72*</u>	<u>.76*</u>	.08	.19	.01	-.02	.09	.11
22. Am not interested in other people's problems.	-.09	-.12	<u>-.63*</u>	<u>-.59*</u>	.04	.04	-.08	-.02	.04	.00
27. Have a soft heart.	-.04	-.03	<u>.50*</u>	<u>.63*</u>	.15	.09	.15	.10	-.02	.11
32. Am not really interested in others.	<u>-.30</u>	<u>-.34</u>	<u>-.56*</u>	<u>-.49*</u>	-.05	.08	.07	.12	-.11	-.14
37. Take time out for others.	.21	.29	<u>.61*</u>	<u>.58*</u>	.03	.11	-.03	-.04	.16	.18

(Continued on next page)

APPENDIX 2
Five-Factor Varimax-Rotated Loadings of the 50 IPIP Items in the Croatian Self-Reports (S)^a and Peer Ratings (P)^b (Continued)

Item	E		A		C		ES-		I	
	S	P	S	P	S	P	S	P	S	P
42. Feel others' emotions.	-.12	-.01	<u>.67*</u>	<u>.64*</u>	-.01	.16	.19	.05	.06	.11
47. Make people feel at ease.	.06	.18	<u>.40*</u>	<u>.56*</u>	.17	.28	.06	-.10	.14	.16
3. Am always prepared.	.23	<u>.33*</u>	.05	.04	.26	<u>.30</u>	-.24	-.18	.09	.21
8. Leave my belongings around.	.03	.07	-.12	-.03	<u>-.75*</u>	<u>-.77*</u>	.07	.08	.11	.02
13. Pay attention to details.	.11	.00	.16	.06	.16	.26	.09	.12	<u>.34*</u>	<u>.47*</u>
18. Make a mess of things.	.05	.14	.00	-.27	<u>-.69*</u>	<u>-.61*</u>	.09	.18	.05	.04
23. Get chores done right away.	.02	.05	.14	.14	<u>.63*</u>	<u>.66*</u>	.01	.01	-.14	-.03
28. Often forget to put things back in their proper place.	-.07	.06	-.05	-.05	<u>-.70*</u>	<u>-.75*</u>	.09	.05	.04	-.02
33. Like order.	.01	.01	.10	.16	<u>.77*</u>	<u>.76*</u>	.07	.01	-.05	.02
38. Shirk my duties.	-.03	.02	-.17	-.27	<u>-.61*</u>	<u>-.61*</u>	.12	.07	-.07	-.04
43. Follow a schedule.	-.01	.08	-.04	-.06	<u>.55*</u>	<u>.53*</u>	-.02	-.10	.16	.11
48. Am exacting in my work.	.14	.01	.06	.08	<u>.70*</u>	<u>.69*</u>	-.06	-.14	.11	.18
4. Get stressed out easily.	-.06	-.09	.15	.07	-.04	-.06	<u>.72*</u>	<u>.72*</u>	-.02	-.03
9. Am relaxed most of the time.	<u>.32</u>	<u>.42</u>	.09	-.02	-.05	.00	<u>-.60*</u>	<u>-.45*</u>	.08	.08
14. Worry about things.	-.23	-.21	.13	.14	.10	.14	<u>.70*</u>	<u>.64*</u>	.06	.05
19. Seldom feel blue.	<u>.31</u>	.26	-.12	-.13	-.06	.01	<u>-.54*</u>	<u>-.43*</u>	-.16	.01
24. Am easily disturbed.	-.08	-.12	.00	.01	-.13	-.18	<u>.48*</u>	<u>.48*</u>	-.20	-.14
29. Get upset easily.	.04	.10	.09	-.10	-.06	-.05	<u>.77*</u>	<u>.70*</u>	-.17	-.07
34. Change my mood a lot.	-.04	.00	-.06	-.13	-.08	-.14	<u>.75*</u>	<u>.72*</u>	.05	.07
39. Have frequent mood swings.	-.01	.00	.00	-.14	-.10	-.19	<u>.78*</u>	<u>.75*</u>	.03	.03
44. Get irritated easily.	.05	.09	.02	-.17	-.14	-.11	<u>.77*</u>	<u>.68*</u>	-.10	-.11
49. Often feel blue.	<u>-.38</u>	-.29	.11	.01	-.05	-.05	<u>.66*</u>	<u>.65*</u>	.12	-.04
5. Have a rich vocabulary.	.24	.13	.00	.07	.14	.13	-.03	.00	<u>.54*</u>	<u>.53*</u>
10. Have difficulty understanding abstract ideas.	-.01	-.03	-.04	-.16	.08	.01	.12	.18	<u>-.62*</u>	<u>-.55*</u>
15. Have a vivid imagination.	.07	.20	.16	.03	-.29	-.20	.07	.12	<u>.57*</u>	<u>.56*</u>
20. Am not interested in abstract ideas.	.00	-.08	-.07	-.19	.10	.12	.03	.05	<u>-.55*</u>	<u>-.56*</u>
25. Have excellent ideas.	.19	.15	-.05	.07	.08	.09	-.04	-.06	<u>.63*</u>	<u>.71*</u>
30. Do not have a good imagination.	-.15	-.19	-.19	-.20	.12	.03	.04	.07	<u>-.67*</u>	<u>-.64*</u>
35. Am quick to understand things.	.19	.07	.05	.09	.07	.05	-.10	-.18	<u>.57*</u>	<u>.59*</u>
40. Use difficult words.	.21	.03	-.11	-.11	.19	.19	.09	.04	<u>.42*</u>	<u>.45*</u>
45. Spend time reflecting on things.	-.16	-.13	.11	.08	.00	-.01	<u>.37</u>	.29	<u>.40*</u>	<u>.42*</u>
50. Am full of ideas.	.25	.23	.02	.08	-.02	.03	-.04	-.13	<u>.66*</u>	<u>.71*</u>

Note. Loadings over .30 are underlined. The highest factor loading for each variable is indicated with an asterisk (*). IPIP = International Personality Item Pool; E = Extraversion; A = Agreeableness; C = Conscientiousness; ES- = Emotional Instability; I = Intellect. The order of the items in the table reflects their order on the IPIP Web site (Goldberg, 2005).

^aN = 519. ^bN = 515.

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