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Reanalysis of the Structure of the Greek Personality Lexicon

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We investigated the structure of the Greek personality lexicon, based on a reanalysis of the data reported by Saucier, Georgiades, Tsaousis, and Goldberg. To facilitate comparisons with previous lexical studies of personality structure, our factor analyses were based on ipsatized (i.e., within-subject standardized) ratings on the Greek adjective variable set, after the removal of "negative valence" (or low base rate) adjectives. Results showed a six-factor solution that was very similar to those obtained in a diverse array of other languages, and thus suggest that this six-dimensional structure of personality variation does generalize to the Greek culture.

Keywords: *personality structure; lexical study; HEXACO model; Big Five*

In a recent article, Saucier, Georgiades, Tsaousis, and Goldberg (2005) reported findings regarding the structure of the Greek personality lexicon. The Greek lexical factor solutions obtained by Saucier et al. (2005) were interpretable, yet those structures did not correspond closely to some cross-culturally replicated structures, such as the Big Five (e.g., Goldberg, 1990) or a more recent six-dimensional framework (e.g., Ashton, Lee, Perugini, et al., 2004). However, the methods of the Saucier et al. (2005) study differed in some ways from those used in previous investigations conducted in other languages, and it is possible that such differences could have obscured similarities between the structure of the Greek personality lexicon and the structures observed cross-culturally.

The purpose of the present report is to reexamine the structure of the Greek personality lexicon as derived from the data set of Saucier et al. (2005), but using analytic procedures that are similar to those applied in previous lexical studies of personality structure. Briefly, these procedures involve (a) the use of ipsatized (i.e., within-subject standardized) ratings on the adjective variable set and (b) the exclusion of "negative valence" (or low base rate) adjectives from the variable set. Below, we give a brief summary of the findings of previous lexical studies that have employed these procedures, before describing the results of our reanalysis of the Greek data.

Many researchers have attempted to uncover the structure of human personality variation by analyzing a comprehensive list of a given language's personality descriptors.

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According to the logic of the lexical hypothesis (Goldberg, 1990), the domain of human personality variation can be sampled representatively by selecting words (generally adjectives) that describe individuals in terms of their personality characteristics—that is, their dispositions to behave, think, or feel in a given way. On the basis of this logic, most lexically based investigations of personality structure have been conducted using variable sets that include personality-descriptive adjectives but that exclude other categories of adjectives. For example, terms that describe an individual's physical characteristics, social status, social roles, or effects on others have generally all been excluded, as have terms that serve chiefly to evaluate, insult, or praise an individual rather than to describe his or her personality dispositions.

Although there have been some minor differences among traditional lexical studies in the details of their variable selection guidelines, the solutions obtained in these investigations have shown some consistency. Particularly, a six-dimensional structure has been widely replicated from many languages, including Croatian, Dutch, English, Filipino, French, German, Hungarian, Italian, Korean, Polish, and Turkish (see Ashton & Lee, 2007; Ashton, Lee, Perugini, et al., 2004), and the similarities of these solutions have recently been assessed (Lee & Ashton, 2008). This set of six cross-language factors (see detailed descriptions in Ashton, Lee, Perugini, et al., 2004) includes extraversion, conscientiousness, and intellect/imagination/unconventionality dimensions similar to those of the Big Five. It also includes agreeableness and emotionality factors, which correspond roughly to rotated variants of Big Five emotional stability and agreeableness, as well as an honesty–humility factor, which is typically defined by sincerity, fairness, and modesty versus hypocrisy, slyness, greed, and pretentiousness. In contrast, no solution involving seven or more factors has been replicated across the majority of lexical studies conducted to date.

As noted above, most lexical studies of personality structure have been based on broadly similar guidelines for variable selection. During the 1980s, however, there emerged an alternative—and markedly different—perspective on this issue (Tellegen & Waller, 1987). Specifically, Tellegen and Waller proposed that lexical studies of personality structure should include purely evaluative adjectives within their variable sets, because an individual's self-ratings on those adjectives (e.g., *awful, horrible, good-for-nothing*, *wonderful,* and *excellent*) allow inferences about the individual's level of self-esteem. Although such inferences may well be accurate, Ashton and Lee (2001) have explained that the inclusion of adjectives as signs rather than as descriptors of personality traits is incompatible with the logic of the lexical hypothesis.

When lexical studies have been conducted using variable sets that include substantial numbers of these purely evaluative terms, a factor interpretable as "negative valence" has usually appeared within solutions of five or more factors (e.g., Church, Reyes, Katigbak, & Grimm, 1997; Tellegen & Waller, 1987). Negative valence is defined almost exclusively by the most rarely endorsed terms in the analysis; these adjectives are among those generally classified as "purely evaluative" terms, and as such these terms have generally been excluded from traditional lexical investigations. But in these nontraditional lexical studies, the emergence of the negative valence has thus prevented the Big Five structure and the cross-language six-factor structure from emerging within five- or six-factor solutions.

The Greek Personality Lexicon

The main analyses of Saucier et al. (2005) involved self-ratings of 991 respondents on the most frequently used 400 Greek personality terms. The authors reported summaries of analyses on both ipsatized and original (i.e., nonipsatized) data, but focused mainly on the nonipsatized responses. However, because almost all other lexical studies of personality structure have been based on ipsatized data, we will focus exclusively on the results obtained from the ipsatized responses (see ten Berge, 1999, for a discussion on principal components analysis of ipsatized data).

As noted in the previous section, another feature of the investigation by Saucier et al. (2005) was its use of a variable set that included primarily evaluative terms (*abject*, *unpleasant*, *loser*, *barbarian*, *inhuman*, *disgusting*, and *useless*). As would be expected, these terms defined a negative valence factor, which emerged in each of the reported solutions containing three or more factors. This factor was defined exclusively by terms with low mean responses: Of the 20 highest-loading terms on negative valence, all had response means below 1.35 on the 1 to 5 response scale; conversely, of the 20 terms with the lowest response means, all loaded at least .30 on negative valence and less than .30 on all other factors.

Given the emergence of a negative valence factor in solutions involving three or more factors, the five- and six-factor solutions noted by Saucier et al. did not correspond to the Big Five and cross-language six-factor structures, respectively. Saucier et al. (2005) also investigated whether the Big Five would be recovered within the six-factor solution (i.e., after discounting the negative valence factor), and whether the cross-language six factors would be recovered within the seven-factor solution (again after discounting negative valence). They reported that these solutions did not recover the full set either of the Big Five or of the cross-language six factors, as revealed by the correlations of the obtained factors with adjective marker scales representing the dimensions of those hypothesized structures. These findings might be interpreted to suggest that the Greek personality lexicon structure is unique and therefore that a personality taxonomy that is specific to the Greek culture ought to be developed. On the other hand, it is possible that the negative valence factor would absorb some small amounts of variance from the factors of those adjectives, and thereby reduce the size or influence the rotational positions of those factors.

To overcome the above problem, we planned to reanalyze the Greek adjective data set of Saucier et al. (2005) after excluding the negative valence terms—that is, we intended to conduct an analysis whose procedures are similar to those of traditional lexical studies of personality structure. We predicted that this analysis would produce a set of six factors that would correspond very closely to the six-dimensional structure as observed in many other languages. Below, we report the results of that analysis.

Reanalysis of the Structure of the Greek Personality Lexicon

Our reanalysis was based on the full sample of 991 respondents (751 women; mean age = 23.6 years) who had provided self-ratings on the set of 400 frequently used Greek adjectives in Saucier et al. (2005). To be consistent with the procedures of previous lexical studies, we ipsatized the responses by standardizing across variables within respondents

prior to performing factor analyses. Also for the sake of consistency with previous lexical studies, we excluded the Greek adjectives that represented negative valence by removing the 40 adjectives that loaded .30 or above on the negative valence factor in Saucier et al.'s ipsatized seven-factor solution. We factor analyzed the self-ratings of all 991 respondents on the remaining set of 360 adjectives by the method of principal components.

Six-Factor Solution

Table 1 shows the loadings of the highest-loading Greek adjectives, in English translation, on each dimension of the varimax-rotated six-factor solution. With regard to interpretation of these dimensions, the first factor corresponded fairly closely to Extraversion, being defined by such content as sociability and cheerfulness versus their opposites. The second factor represented Conscientiousness, being defined by terms describing organization and industriousness versus their opposites. The third factor resembled the cross-language variant of agreeableness, being defined by content suggesting patience and politeness versus irritability and stubbornness. (Note that such content does not typically define the *Big Five variant* of agreeableness, which tends to be dominated by terms describing generosity and sympathy. As discussed elsewhere, the cross-language agreeableness factor absorbs some content associated with Big Five emotional stability; see, e.g., Ashton, Lee, Perugini, et al., 2004.)

The fourth factor resembled the cross-language emotionality factor, being defined by content suggesting vulnerability, (hyper)sensitivity, and fearfulness versus their opposites. Note that although the content of the first and fourth factors was consistent with the interpretations of these dimensions as extraversion and emotionality, respectively, inspection of the defining terms and their loading patterns suggested that these two dimensions were rotated slightly from their typical cross-language locations. We noticed that if the first and fourth varimax-rotated factors were rerotated by 15 degrees (i.e., maintaining the orthogonality of the two factors), the interpretation of the emotionality factor would become even clearer, as terms such as *emotional* and *sensitive* would be among the highest loading terms. The defining adjectives of the rerotated extraversion and emotionality factors, as produced by this 15-degree rerotation, are shown at the end of Table 1 (see Caprara & Perugini, 1994, for a similar example of orthogonal hand rotation in aligning indigenous factors with external prototypes of the factors).

The fifth factor resembles honesty–humility, being defined by adjectives relevant to the various aspects of that factor, including fairness and modesty versus insincerity and greed. Finally, the sixth factor can be interpreted as an intellect/imagination dimension, being defined by terms such as *talented, inventive*, and *ingenious*.[1] This factor is relatively small compared with the other five factors, but its defining content is broadly similar to that of the intellect/iImagination/unconventionality factor observed across languages, except for the absence of content related to unconventionality or philosophicalness in the Greek version of the factor. Overall, the content of the six factors suggests that this solution is very similar to the common six-factor structure observed across other languages.[2]

As a means of checking our interpretations, we calculated the correlations between factor scores on the above factors and scores on the adjective scales that were constructed by Saucier et al. (2005) as markers of the cross-language six factors. As seen in Table 2, the

Table 1
English Translations of Highest-Loading Adjectives on Dimensions of Six-Factor Solution From Ipsatized Self-Ratings on 360 Greek Personality-Descriptive Adjectives

Varimax-Rotated Factors												15-Degree Rotated Variants of F1 and F4			
F1 (5.16%), Extraversion		F2 (4.33%), Conscientiousness		F3 (4.22%), Agreeableness		F4 (4.16%), Emotionality		F5 (3.60%), Honesty–Humility		F6 (2.34%), Intellect/Imagination		F1′ (5.97%), Extraversion		F4′ (3.35%), Emotionality	
Amusing	.57	Disorganised	−.58	Calm	.57	Insecure	.57	Unscrupulous	−.50	Talented	.55	Amusing	.57	Hypersensitive	.55
Demonstrative	.56	Hard working	.57	Short-tempered	−.56	Fearful	.56	Scrupulous/ Conscientious	.47	Multitalented	.53	Sociable	.57	Insecure$_{-1'}$	.51
Sociable	.54	Organized	.57	Aggressive	−.51	Hypersensitive	.53	Honorable	.45	Genius	.53	Cheerful	.57	Fearful$_{-1'}$	.50
Cheerful	.53	Industrious	.54	Touchy	−.50	Hesitant	−.52	Decent	.45	Inventive	.51	Demonstrative	.55	Vulnerable	.49
Cheerful	.53	Workaholic	.54	Abrupt	−.50	Courageous	−.52	Profiteer	−.43	Ingenious$_{+4}$	.44	Withdrawn	−.54	Hesitant$_{-1'}$	.45
Withdrawn	−.53	Neglectful	−.54	Nervous	−.49	Vulnerable	.49	Modest	.42	Genius	.43	Taciturn	−.54	Courageous$_{+1'}$	.44
Taciturn	−.52	Untidy	−.54	Reactive	−.46	Coward	.49	Reticent	.41	Popular	.43	Cheerful	.54	Complainer	.43
Openhearted	.51	Unsystematic	−.54	Mild	.46	Optimistic	−.48	Grandiose	−.41	Pioneer$_{+4}$	.42	Silent	−.52	Coward$_{-1'}$	.42
Cute	.51	Responsible	.53	Patient	.45	Dynamic$_{+2}$	−.47	Ethical	.41	Remarkable	.39	Loner	−.51	Determinative	−.41
Warm	.51	Lazy	−.52	Fretful$_{+4}$	−.44	Determinative	−.46	Exhibitionist	−.40	Inventive	.39	Cute	.50	Independent	−.41
Cheerful	.49	Inconsistent	−.52	Quiet	.42	Complainer	.45	Reliable	.40	Eclectic	.38	Openhearted	.50	Optimistic$_{+1'}$	−.41
Silent	−.49	Consistent	.51	Neurotic	−.42	Pessimistic	.45	Unbiased	.40	Sharp	.38	Moody	−.50	Autonomous	−.40
Lovable	.48	Irresponsible	−.51	Demanding	−.42	Melancholic	.45	Sly	−.39	Enviable	.36	Pleasant	.50	Sensitive	.40
Antisocial	−.47	Unstable	−.51	Brawler$_{-5}$	−.41	Bold, daring	−.45	Considerate	.38	Successful$_{+4}$	.36	Monotonous	−.49	Easy to convince	.39
Pleasant	.47	Absentminded	−.47	Pushy	−.41	Depressive$_{-1}$	.44	Provocative	−.38	Excellent	.36	Comfortable$_{-4'}$	.49	Emotional	.39
Loner	−.47	Unstable	−.46	Strong-minded	−.41	Comfortable$_{+1}$	−.44	Prudent	.38	Charismatic	.34	Sad$_{+4'}$	−.49	Dynamic$_{+1'+2}$	−.38
Silent	−.47	Disobedient	−.45	Compliant	.41	Brave	−.43	Trustworthy	.38	Laudable$_{+2}$	.31	Cheerful	.49	Pessimistic$_{-1'}$	.38
Extroverted	.47	Stable	.44	Oppressive	−.41	Self-conscious	.42	Objective	.38	Selective	.31	Extroverted	.48	Neurotic	.38
Smileless	−.46	Perfectionist	.42	Capricious	−.40	Sad$_{-1}$	.42	Vengeful	−.37			Silent	−.48	Anxious	.37
Friendly	.45	Incorrigible	−.41	Impatient	−.39	Independent	−.42	Cunning	−.37			Lively, vivid	.48	Brave$_{+1'}$	−.36
Monotonous	−.45	Superficial	−.41	Polite	.39	Anxious	.41	Dangerous	−.36			Introvert	−.47	Self-conscious$_{-1'}$	.36
Introvert	−.45	Methodical	.41	Clement	.39	Melodramatic	.40	Arrogant	−.36			Lovable	.47	Romantic	.35

Note: $N = 991$. F1 = Factor 1, F2 = Factor 2, and so on. The original Greek adjectives are available from the authors. Some English adjectives (e.g., cheerful, unstable) were assigned to more than one Greek term in cases when those Greek terms are synonyms. Terms having a secondary loading whose absolute value exceeds .30 are noted with a subscript that indicates the factor and the direction of the loading. For example, "Fretful$_{+4}$" indicates that *fretful* had a negative secondary loading of at least .30 on Factor 4. Values in parentheses are percentages of item variance accounted for by the rotated factors.

Table 2
Correlations Between Saucier et al.'s (2005) Adjective Marker Scales of the Six Cross-Language Factors and Factor Scores From the Greek Six-Factor Solution

	Varimax-Rotated Factors						15-Degree Rerotated Factors 1 and 4	
Adjective Marker Scales	1	2	3	4	5	6	1′	4′
Extraversion	**.67**	.05	–.15	**–.41**	.03	.10	**.75**	–.23
Conscientiousness	.16	**.72**	.01	–.02	.11	.26	.16	.02
Agreeableness	–.05	.15	**.74**	.00	.26	.06	–.05	–.01
Emotionality	.01	.04	.03	**.80**	.09	–.19	–.20	**.78**
Honesty–humility	.04	.25	.17	.03	**.61**	–.01	.04	.04
Intellect/imagination/ unconventionality	.17	–.03	–.20	–.36	–.08	**.45**	.26	–.31

Note: $N = 991$. Correlations with absolute values of .40 or greater are given in boldface.

pattern of correlations generally supported these interpretations. For example, even the lowest convergent correlation ($r = .45$ for intellect/imagination/unconventionality) was substantially higher than any discriminant correlations involving that lexical factor.

Five-Factor Solution

In the varimax-rotated five-factor solution, four of the five dimensions were nearly identical to the dimensions interpreted as extraversion, conscientiousness, agreeableness, and honesty–humility factors within the varimax-rotated six-factor solution, with factor score correlations of .98 or above. The remaining dimension of the five-factor solution was mainly defined by emotionality-related terms (particularly those involving fearfulness and insecurity), but also contained some intellect/imagination-related terms at its opposite pole. Factor scores on this dimension correlated .86 and –.48 with factor scores on the dimensions interpreted as emotionality and intellect/imagination, respectively, within the six-factor solution.

Seven-Factor Solution

In the varimax-rotated seven-factor solution, five of the dimensions showed factor-score correlations of .90 or above with dimensions of the varimax-rotated six-factor solution (all except the dimension interpreted as honesty–humility). The two remaining dimensions of the seven-factor solution both showed their highest factor-score correlations (.84 and .53, respectively) with the honesty–humility dimension of the six-factor solution, and thus could be considered divisions of that factor.

Summary, Implications, and Conclusions

The present reanalyses of data from the Greek lexical study of personality structure (Saucier et al., 2005) show that the Greek personality lexicon does produce a six-factor

structure similar to that observed in diverse other languages. That is, when the Greek data are analyzed using procedures that correspond to those of other lexical investigations—that is, using ipsatized responses on adjective variable sets that exclude "negative valence" terms—those data yield a six-factor solution that corresponds to those of lexical investigations of other languages.

Therefore, the results described here indicate that the Greek language can now be added to the list of languages in which a similar set of six dimensions has been recovered from the indigenous personality lexicon. This result is important for personality theory because it supports the notion that the structure of personality variation shows some substantial degree of cross-cultural generality. This generality in turn has important implications for personality measurement in applied contexts, such as clinical or organizational settings, because it suggests that the same set of major dimensions can be assessed across diverse cultures.

Notes

1. Some of the adjectives defining the intellect/imagination factor—especially *popular*, *remarkable*, *enviable*, *successful*, *excellent*, and *laudable/worthy*—are more readily interpreted as "positive valence" terms than as personality descriptors per se. When we reanalyzed the data after excluding these six adjectives, the six factors derived from the resulting 354 adjectives were virtually identical to those reported in Table 1. Even for the intellect/imagination factor, the correlation between factor scores from the two analyses was .94, and the content of that factor remained essentially unchanged except (of course) for the absence of those positive valence terms.

2. A reviewer questioned the legitimacy of using ipsatized responses, which is a standard data-analytic practice in lexical studies of personality structure. Ipsatization is applied because the original ratings on adjectives are influenced by individual differences in the overall elevation of responses, which distorts factor analytic results by producing unipolar factors (e.g., an *A* factor and a *not-A* factor) rather than a meaningful bipolar factor (an *A* vs. *not-A* factor). Ipsatization can effectively eliminate this response style variance. As Lee and Ashton (2007) and ten Berge (1999) have pointed out, however, ipsatization should be used only when the variable set being analyzed is at least roughly balanced in representing the opposite poles of traits, which has been known to be the case in the variable sets in lexical studies (e.g., Ashton, Lee, & Goldberg, 2004).

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