The national psychological/personality profile of Romanians: An in depth analysis of the regional national psychological/personality profile of Romanians

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Abstract

In this article we perform an in depth analysis of the national psychological/personality profile of Romanians. Following recent developments in the field (see Rentfrow et al., 2013; 2015), we study the regional national psychological/personality profile of Romanians, based on the Big Five model (i.e., NEO PI/R). Using a representative sample (N1 = 1000), we performed a cluster analysis and identified two bipolar personality profiles in the population: cluster 1, called "Factor X-", characterized by high neuroticism and low levels of extraversion, openness, agreeableness, and conscientiousness, and cluster 2, called "Factor X+", characterized by the opposite configuration in personality traits, low neuroticism and high levels of extraversion, openness, agreeableness, and conscientiousness. The same two cluster pattern/solution emerged in other samples (N = 2200), with other Big Five-based instruments, and by using various methods of data (e.g., direct vs. reversed item score, controlling for item desirability) and cluster (i.e., with and without "running means") analyses. These two profiles are quite evenly distributed in the overall population, but also across all geographical regions. Moreover, comparing the distribution of the five personality traits, we found just few small differences between the eight geographical divisions that we used for our analysis. These results suggest that the regional national psychological/personality profile of Romania is quite homogenous. Directions for harnessing the potential of both personality profiles are presented to the reader. Other implications based on the bipolar and fractal structure of the personality profile are discussed from an interdisciplinary perspective.

Keywords: National psychological/personality profile, Regional analyses, Cluster analysis, Romania.

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The scientific context

The publication of the monograph The psychology of the Romanian people. The psychological profile of Romanian from a cognitive-experimental perspective, by Daniel David (2015a), attracted a lot of interest from both professionals and general public. Following international literature (e.g., Bond, 2000; Peabody, 1985/2011; Rentfrow et al., 2013; 2015; Terracciano et al., 2005), we have conceptualized the psychology of a country/nation (see David, 2015a) as the psychological characteristics of the population/the citizens of a given country, measured with rigorous instruments, following the logic of the crosscultural research paradigm in order to find a reference point/frame.

Once we understand the global national psychological profile (e.g., see Terracciano et al., 2005 for global national personality profiles in 49 cultures/47 counties), the next logical step is to move to regional national psychological profiles (see Rentfrow et al., 2013; 2015, for U.S. and Great Britain regional national personality profiles).

Understanding the psychological profiles of different countries/nations or regions is of great interest for modern societies (e.g., Hofstede et al., 2010; Peabody, 1985/2011; Rentfrow, 2013; 2015; Terracciano et al., 2005). First, in today's globalized world, interactions between countries/cultures are more and more frequent, and the knowledge related to the psychological profile of each partner in the interaction is fundamental for facilitating cooperation. Second, a vivid example is the massive population migration taking place nowadays. Understanding our own psychological global and regional profiles could help us to integrate immigrants coming from one or more cultural backgrounds. We could facilitate our understanding of such groups and individuals by comparing their psychological and cultural profile with the one of the native (in this case, Romanian) population, from the

specific area where the efforts for integration is being carried out. Such a comparison could take into account criteria of both similarity and complementarity (David, 2015b). Third, we have to take into account that different psychological profiles are related differently to cultural, social and economic indicators, and therefore knowing how these two categories interact with each other in both ways can help us in shaping better evidence-based public policies. Finally, such psychological profiles might work as a bridge between individual level indicators (e.g., specific behaviors) and macro level indicators (e.g., economical/social indicators) (for details see Rentfrow et al., 2013; 2015).

Global national psychological profile

Comparing different countries in terms of psychological characteristics and shaping their individual profiles has been fostered by the development and the adaptation of valid psychological instruments across the world during the past decades. When the focus is on individuals, personality is regarded as the main pillar for drawing a psychological description, or profile. This idea has been easily translated in research focused on the psychological profile of different countries, instead of different individuals. The Personality Profiles of Cultures Project (McCrae et al., 2005a; 2005b; Terraciano et al., 2005) offered one of the first large data sets that allowed the analysis and comparison of personality profiles of a large pool of cultures and countries from six continents (but see also Allik & McCrae, 2004). This project was based on the NEO PI-R (Costa & McCrae, 1992), a widely used and well researched psychological instrument, in order to assess the five basic traits of the Big Five model of personality.

The five traits and the 30 facets assessed by this instrument are:

1) Neuroticism: anxiety, hostility, depression, selfconsciousness/shyness, impulsiveness, and vulnerability to stress;

2) Extraversion: warmth, gregariousness, assertiveness, activity, excitement seeking, and positive emotion;

3) Openness to experience in the following domains: fantasy, aesthetics, feelings, actions, ideas, and values;

4) Agreeableness: trust, straightforwardness/honesty, altruism, compliance, modesty, and tenderness;

5) Conscientiousness: competence, order, dutifulness/ honor, achievement striving, self discipline, and deliberation.

The results based on this data showed that the structure of the Big Five model in general and of the NEO PI-R specifically can be replicated across a large number of cultures (McCrae et al., 2005a; Schmitt et al., 2007) and that country-level personality traits, computed as aggregated scores for all the members of that country, are correlated with other country variables already established in the literature (McCrae et al., 2005b). For example, extraversion, openness and agreeableness are negatively correlated with power distance, and positively correlated with individualism from Hofstede's model of cultural dimensions (2001), while Neuroticism is negatively correlated with uncertainty avoidance. Openness and agreeableness were also positively correlated with affective and intellectual autonomy, as well as egalitarian commitment, and negatively correlated with conservatism from Schwartz's model of universal values (1994). These are just some of the available examples (see McCrae et al., 2005b) pointing to the fact that country/culture-level psychological characteristics (including personality traits) can be efficiently used to understand cross-cultural variations and results show that the associations at this level of analysis follow theoretical predictions rooted at the individual level.

In a seminal article published in Science, Terraciano et al. (2005) used the data from 49 cultures and 47 countries to investigate if there is a match between how the citizens of a

given country see themselves (assessed with the National Character Survey) and how they really are (assessed with the other-report version of the NEO PI-R). The data from both measures were aggregated in one score for each country and culture, for each of the five traits from the Big Five model. The authors found, with very few exceptions, that there is no correlation between perceived (i.e., projected national character) and real (i.e., actual national character) personality characteristics. This suggests that we cannot rely on the general beliefs of a country's citizens when drawing the national personality profile for that country. We continued this work on the discrepancy between perceived and real personality traits and found that a higher discrepancy at country-level is negatively associated with several social indicators: life satisfaction, autonomy, human development, and peacefulness (David et al., submitted manuscript).

Starting from the data of Terracciano et al. (2005), we have presented in the monograph about the psychology of Romanians (David, 2015a) a detailed analysis of the global national psychological/personality profile of Romania. Figure 1 presents this profile contrasted with the one for the United States (U.S.) and England [i.e., the reference point was the score of the 50 cultures (49+Romania)/48 countries (47+Romania)]. These profiles show that, when compared to the reference point, Romanians have average levels of neuroticism and agreeableness and levels above the mean for extraversion, openness and conscientiousness (values in Figure 1 have been standardized based on the cross-cultural data from McCrae et al., 2005b, and Terraciano et al., 2005). The U.S. have a lower level of neuroticism, a higher level of extraversion, while openness, agreeableness and conscientiousness are close to the average. England has higher levels of extraversion and openness, a lower level of conscientiousness, and average levels of neuroticism and agreeableness. As pointed out, each personality trait for any country is interpreted

contextually, in comparison with others countries (in this case the average level for 50 cultures and 48 countries).

-- Insert Figure 1 here --

Regional national psychological profile

The interest for studying the psychological profile of large human communities has extended recently form country-level to different regions within a country. Rentfrow et al. (2013) identified four personality clusters that are found in the U.S. population, and these clusters have different geographical distributions. The first cluster, called the "Friendly and Conventional" has high level of extraversion, agreeableness and conscientiousness, and low levels of neuroticisms and openness. This cluster is mainly present in the North-Central and South-East regions of the U.S. The second cluster is characterized by low extraversion and agreeableness, very low neuroticism, high openness, and average conscientiousness, and has been called the "Relaxed and Creative" cluster. It is mainly distributed in the west of the country and a few regions on the Atlantic coast. The last cluster that was identified was called the "Temperamental and Uninhibited", and it comprises individuals with low extraversion, very low agreeableness and conscientiousness, very high neuroticism and moderately high openness. This cluster is prevalent in Northern states of the Atlantic coast and South-Central states (see Rentfrow et al., 2013 for a geographical representation). The results also showed that these clusters had different associations with several political, economic, social and health indicators. For example, cluster 2 ("Relaxed and Creative") had the stronger ties with economic variables (human capital, wealth, and innovation), followed by cluster 3 ("Temperamental and Uninhibited"), while cluster 1 ("Friendly and Conventional") was negatively associated with the same indicators. Cluster 2 was also positively associated with health related variables (well-being and health behaviors). Also, the three clusters seemed to have different political and ideological orientations.

Another exploration of the regional distribution of personality characteristics, led by the same author (Rentfrow et al., 2015), was conducted for Great Britain (G.B.). This time the authors looked at how each trait (instead of a configuration of traits under a profile) is distributed in G.B. To offer some examples (see for a geographical representation Rentfrow et al. 2015), the highest levels of agreeableness (meaning high levels of trust, honesty, altruism, compliance, modesty and tenderness) are present in Scotland, the Northern, SouthWestern and some of the Eastern regions of England, while less friendly regions (meaning lower levels of the same trait present in the local population) are London and some other Eastern regions of England. Similar to the results obtained for the U.S. clusters, higher vs. lower levels of a personality trait present in a region were associated with a series of demographic, economic, social, health and political indicators. To give some examples, both extraversion and openness are associated with higher income, better socio-economic status, and education. Also, the presence of these traits is associated with a better assimilation of immigrants. The prevalence of neuroticism is associated with poorer health and economic outcomes while the prevalence of conscientiousness is associated with better health outcomes. Although some associations also emerged for the distribution of agreeableness, most of them disappeared after controlling for demographic and socio-economic differences (e.g., income, age, and gender distribution).

Overview of the present study

The brief overview of the literature presented so far shows that the personality profile of a country and the personality profiles of different regions within a country are of great interest for the scientific community both for theory development and for their practical implications.

From a theoretical point of view such analyses might be a bridge from individual behavior to macro-level social and economic indicators, covering the existing gap between

these levels of analysis and thus spurring on more multi-, inter- and trans disciplinary research (see Rentfrow, et al., 2013; 2015). From a practical point of view, the personality profile of a given population might shed new light in our understanding of its current status and perhaps its future evolution, and could offer fresh input for policy development. In fact, these results open a new door for psychological research to extend its contribution in solving some of the greatest societal challenges in today's globalized world (e.g., social inequalities, immigrants), by adopting a new perspective (country/region-level) on these issues. As stated earlier, a detailed analysis of the global national psychological and personality profile for Romania has already been presented by David (2015a). Yet, a detailed analysis of the psychological profiles of the different regions in the country is lacking.

The goal of the current article is to investigate the regional differences in the distribution of personality traits and to identify if there are any personality clusters that emerge in this population, and whether such clusters are geographically distributed. In order to do so, we applied the methodology described by Rentfrow et al. (2013; 2015) to the vailable NEO PI-R data from the validation study of the questionnaire on the Romanian population (Costa et al., 2008). The geographical distribution of personality traits and clusters was compared across the official eight developmental regions of Romania (that overlap at least partially with historical regions that had different time courses): region 1 – North-East (Bacău, Botoşani, Iaşi, Neamţ, Suceava, and Vaslui counties), region 2 – SouthEast (Brăila, Buzău, Constanţa, Galaţi, Tulcea, and Vrancea counties), region 3 – South (Argeş, Călăraşi, Dâmboviţa, Giurgiu, Ialomiţa, Prahova, and Teleorman counties), region 4 – South-West (Dolj, Gorj, Mehedinţi, Olt, and Vâlcea counties), region 5 - West (Arad, CaraşSeverin, Hunedoara, and Timiş counties), region 6 – NorthWest (Bihor, Bistriţa-Năsăud, Cluj, Maramureş, Satu-Mare, and Sălaj counties), region 7 – Center (Alba, Braşov, Covasna, Harghita, Mureş, and Sibiu counties), and region 8 (Bucureşti and Ilfov county).

Method

Participants

The main sample of the study (N_1) comprised 1000 participants, with a mean age of 43.93 years, 514 females, randomly extracted from the normative sample used for the translation and adaptation of NEO PI-R instrument on the Romanian population (N_2 = 2200 participants; Costa et al., 2008). The normative sample was built to be representative for the population structure based on the 2002 census. The sample selected for this study was matched to the new census conducted in 2011, and thus reflect the new population structure, on the following criteria: the proportion of the population in the 8 developmental regions (described above), gender ratio, the ratio of individual coming from rural vs. urban settings, and age distribution (following six categories: 14-19, 20-29, 30-39, 40-49, 50-59 and over 60 years).

We also used the full normative sample for a secondary analysis, to verify if results are replicable from one sample to another. This sample consists of 1100 men and 1100 women, has a mean age of 30.30 years, and approximated the population structure identified by the 2002 census, with some small differences: urban settings, higher education, ethnical minorities, ages between 18 and 20 years, and region 8 are slightly overrepresented in the sample, while ages over 51 years and region 1 are slightly underrepresented.

Measures

We used the adapted version of the NEO PI-R (selfreport) for the Romanian population (Costa et al., 2008). This is probably the most widely used instrument for assessing personality, and is based on the Big Five model of personality. It assesses the five basic traits of this model (i.e., neuroticism, extraversion, openness, agreeableness and conscientiousness), each with six facets (described above). Each facet is measure trough 8 items, totaling 240 items for the full questionnaire. The Romanian version of the instrument

has good psychometric properties, with Cronbach α coefficients ranging between .86 and .90 for the five traits, while test-retest reliability coefficients range between .73 and .83 (Ispas et al., 2014). Also, the factor structure of the Romanian version closely follows the one for the U.S. population (Costa et al., 2008), replicated across many other cultures and countries (McCrae et al., 2005a).

Results

Cluster analysis

The first analysis we have performed followed the general method of Rentfrow et al. (2013). Thus, rather than using a top-down approach and looking for a model, which was already established on various samples (e.g., see Asendorph et al., 2001; Robins et al., 1996), we used a bottom-up approach (from data to theory development). More precisely, we used a K-means cluster analysis, testing models with 2 and up to 8 clusters (as we had eight regions), allowing for a maximum of 10 iterations (without "running means").

Convergence was reached after 10 iterations, ending with 2 clusters, with opposite configurations on the five traits (see Figure 2). Cluster 1 (named Factor X-, "The Dragon") is characterized by a high level of neuroticism, and low levels of extraversion, openness, agreeableness, and conscientiousness. Cluster 2 (named Factor X+, "The Prince Charming") is characterized by a low level of neuroticism, and high levels of extraversion, openness, agreeableness, and conscientiousness.

In order to check the stability of this two cluster pattern/solution and run out some potential statistical artifacts, we did the following supplementary analyses (more details are available from the principal author):

1) In the study sample (N = 1000), the two cluster pattern remained stable, when we varied the method of cluster analysis (e.g., with and without "running means") and the type of items (i.e., direct vs. reversed score item).

2) The pattern was also found in the full normative sample of the NEO PI-R for the Romanian population (N2 = 2200). Additionally, in this larger sample a pattern with three clusters reached convergence. However, when we varied the method of cluster analysis (e.g., with and without "running means"), only the two cluster pattern remained convergent with a maximum of 10 iterations.

3) The two cluster pattern was also identified in another Romanian sample (N3 = 2100), using another Big Fivebased psychological tests, namely the Big Five Questionnaire (Caprara et al, 2005), based on the data of Caprara et al. (2008). Only the two and three cluster patterns reached convergence using a maximum of 10 iteration (with "running means") and the two cluster pattern reached convergence after 13 iterations (without "running means"), while the three cluster pattern reached convergence after 19 iterations (without "running means").

4) In order to rule out the role of desirability we reanalyzed the data of Albu (2008). We were able to identify the two cluster pattern (15 iterations without "running means" and 11 iteration with "running means") – along with other patterns -, even when we controlled for social desirability in the scores. The two cluster pattern is one of the best solutions (but not the only one in this data set), considering the convergence indicator based on different methods of analysis (i.e., with and without "running means").

5) Finally, given that we had access to the NEO PI-R other-report data from the Profiles of Cultures Project (McCrae et al., 2005a, 2005b; Terraciano et al., 2005), we tested if the same two cluster pattern would emerge in the 51 cultures comprised by this data set (N4 = 12156; an average of 238 participants per country). If individuals in all countries/cultures can be grouped in these two clusters, it is then possible that the results we observed are statistical artifacts or are due to a general characteristic of the instrument, for example due to the negative correlation that emerges between the facets of neuroticism, and

those of extraversion, agreeableness, and conscientiousness (Costa et al., 2008), rather than a genuine psychological effect. Therefore, we tested if a solution with two clusters would emerge for a maximum of 10 iterations (the same constrains as for the Romanian data). For U.S., Russia, Belgium, Poland, Germany, Chile, Burkina Faso, and Kuwait, convergence was not reached. Moreover, for the German-speaking Swiss population, for Malta, New Zeeland and Austria, the two cluster pattern that emerged were not similar to the ones that we found in Romania. For the other countries, the two clusters were bipolar, with neuroticism on one side of the axis and the rest of the traits on the other side. However, there was much variation in the exact configuration of the five personality traits. For these countries is also possible that other solutions (with a different number of clusters) might be more suitable; however, it was beyond of our scope to test for that. What can be inferred from this analysis is that the two bipolar clusters seen in the Romanian population are not universal, but they might appear in several populations.

-- Insert Figure 2 here –

To have a clearer picture of the characteristics of each of these clusters, we point out here those facets that have the strongest correlations with each factor ($r = .70$ or higher). The most representative facets for neuroticism are: depression ($r = .72$), anxiety ($r = .73$), hostility ($r = .72$), vulnerability to stress ($r = .83$) and self-consciousness (shyness; $r = .70$). For extraversion, the most representative facets are: warmth ($r = .71$) and gregariousness ($r = .70$). For openness, the best correlated facets are openness to esthetics ($r = .71$) and feelings ($r = .74$). For agreeableness the most representative facets are: honesty ($r = .77$) and altruism ($r = .76$). Finally, the most relevant facets for conscientiousness are: duty ($r = .83$), self discipline ($r = .84$), competence ($r = .78$), order ($r = .74$), and whish for achievement ($r = .75$). Thus, the psychological characteristics of each cluster will be most likely shaped by these facets.

Geographical distribution and association with demographic variables for clusters and personality traits

After identifying the two clusters, we set out to investigate if there are any variations in their distribution in the general population and across the 8 geographical regions of Romania we have delineated above (see Figure 3). In the overall analysis, compared to a probabilistic distribution (50% for each), cluster 1, "Factor X-", appears more frequent than it would be expected due to chance (54.3%) and cluster 2, "Factor X+", less frequent (45.7%), $\chi^2(1) = 7.396$, $p = .007$. Translated into a measure of effect size, this difference in frequency is lower than the threshold for a small effect (d = .17). Indeed, repeating the same analysis for each geographical region with Bonferroni adjustment for multiple comparisons, no significant differences in the frequency of the two clusters emerges in any of the 8 regions (all ps were not significant). Thus, we can conclude that the two clusters are similarly distributed in the population and across different geographical regions.

-- Insert Figure 3 here --

We also tested if there is any association between the frequency of the two clusters and main demographic variables, such as gender, age, urban vs. rural settings, education, and ethnicity (see below a detailed description of the categories of demographic variables). We found an association between the cluster type and gender, $\chi^2(1) = 4.077$, $p = .044$, with cluster 1 being more frequent among females (57.4%) and cluster 2 less frequent (42.6%). For males, the clusters were more equally distributed (51.0% for cluster 1 and 49.0% for cluster 2). We also found a significant association with age, $\chi^2(5) = 152.16$, $p < .001$, with cluster 1 being more frequent among individuals between 14 to 19 years (74.3%) and individuals 60 years old or above (82.6%). Cluster 2 was more frequent than expected among individual with ages between 30-39 years (66.7%), 40-49 years (61.1%) and 50-59 years (54.1%). We also found an association with education, $\chi^2(5) = 54.421$, $p < .001$. Cluster 1

was more frequent among those that did not specify the type of education they graduated (62.7%), and those that graduated only secondary education (69.4%), while cluster 2 was more frequent among those who graduated a form of post-tertiary education (67.0%) and those who graduated a form of higher education (60.1%). The association with type of setting (urban vs. rural) and ethnicity did not reach statistical significance (ps > .05). The effect size was irrelevant for the association with gender, small to medium for the association with education, and large for the association with age. The cluster pattern and its distribution among geographical and demographic variables were stable, indifferent to weather running means procedure was used or not for clusters' center estimation.

Next, we investigated if there are regional differences for each of the five traits from the Big Five model. We used a top-down approach similar to the one used by that of Rentfrow et al. (2015) for studying personality differences in G.B. To do so, we performed two sequential univariate analyses of variance in which the dependent variable was each of the five personality traits (neuroticism, extraversion, openness, agreeableness, and conscientiousness). In the first step we introduced as independent variable the geographical region. If significant differences emerged between geographical regions, we then tested if such an effect is still present after controlling for differences in demographic variables (see Goldberg et al., 1998). Thus, in the second step, we introduced as independent variables the geographical regions together with the available demographics: gender (male vs. female), age (6 categories: 14-19, 20-29, 30-39, 40-49, 50-59, and 60 or more years), setting (urban vs. rural), education (6 categories: gymnasium, vocational education, high school, post-secondary education, higher education, and unspecified), and ethnicity (Romanian, Hungarian, German, and other). We did not have any a priori hypotheses related to interaction effects, and thus we excluded them from the model. We computed overall effect

sizes based on the η^2 and planned to perform pairwise comparisons using the Bonferroni correction.

In the first step of the analysis we found significant effects of region for neuroticism, $F(7, 992) = 2.094$, $p = .042$, $\eta^2 = .015$, and agreeableness, $F(7, 992) = 2.891$, $p = .005$, $\eta^2 = .020$. The η^2 values show that both effects are in the small range. For neuroticism, one significant difference emerged when looking at the pair-wise comparisons, region 8 having significantly lower scores than region 2 ($p = .040$). For agreeableness, region 1 had significantly lower scores than region 5 ($p = .028$) and region 7 ($p = .038$). Running the same comparisons using neuroticism and agreeableness facets as dependent variables showed that the effect on neuroticism was due to a difference between the same regions 2 and 8 on vulnerability to stress ($p = .002$). For agreeableness, despite that overall significant differences emerged for both trust and altruism, on Bonferroni adjusted post-hoc tests the only significant differences were found on altruism, with region 1 having significantly lower scores than region 5 ($p = .010$), and region 7 ($p = .037$). For these two traits, we computed the second model, following the logic described above. In the case of neuroticism, we found significant overall effects for age, $F(5, 977) = 5.50$, $p < 0.001$, $\eta^2 = .025$, gender, $F(1, 977) = 53.42$, $p < .001$, $\eta^2 = .049$, ethnicity, $F(3, 977) = 5.22$, $p = .001$, $\eta^2 = .014$, and region, $F(7, 977) = 2.45$, $p = .017$, $\eta^2 = .016$. For agreeableness, significant effects emerged for age, $F(5, 977) = 30.61$, $p < .001$, $\eta^2 = .131$, level of education, $F(5, 977) = 4.05$, $p = .001$, $\eta^2 = .017$, and region, $F(7, 977) = 2.66$, $p = .010$, $\eta^2 = .016$. All other effects were not significant (ps > .05). The magnitude of the observed significant effects, with the exceptions of age for agreeableness which had a medium effect size, was in the small range. The main variable of interest, geographical region, explained only 1.6% in the variance of each of the two personality traits. Pair-wise comparison on significant main effects for neuroticism showed

that adolescents and young adults (14-19 years old) had higher scores than all other age categories (all ps < .05).

For gender, female participants had higher scores than male participants ($p < 0.001$), while for ethnicity, German ethnics had lower scores than both Romanian ($p = .005$) and Hungarian ethnics ($p = .001$). For geographical region, the same difference as in step 1 emerged, region 2 had significantly higher neuroticism scores than region 8 ($p = .019$). In the case of agreeableness, the effect of age followed an inversed U-shaped distribution, with third and fourth categories (30-39 years old and 40-49 years old) showing similar and significantly higher levels of this trait as compared to all other categories (all ps < .001). Category 2 (20-29 years old) had significantly higher scores ($p = .014$) than category 1 (14-19 years old) but was similar ($p > .05$) to category 6 (60 years old or above). Category 5 (50-59 years old) had significantly higher scores than category 1, 2, and 6 (all ps < .001). Finally, categories 1 and 6 were similar on this trait ($p > .05$). The effect of education on agreeableness was due to a higher score for those that finalized gymnasium as compared to those that did not specify their level of education ($p = .002$) and those that graduated a form of higher education ($p = .010$). Finally, the same pattern as in step 1 emerged for geographical region, with lower scores for region 1 as compared to region 5 ($p = .021$) and region 7 ($p = .048$).

Despite the fact that we identified a few differences that were significant, the effect of region was in general small, both before and after controlling for the effect of demographic variables. Thus, we can state that the distribution of personality traits across geographical regions in Romania is relatively similar (see Figure 4).

-- Insert Figure 4 here --

Sensitivity analysis

In order to see if there are any relevant differences, which we were not able to detect due to low statistical power, thus reducing the strength of our conclusion, we performed a

sensitivity analysis to identify the rage of effect sizes that we were able to detect. Given a statistical power of 0.80, and standard type I error rate, for nonparametric tests (χ^2 for differences in proportions) we were able to identify effect size larger than w = .123, which is close to the lower limit of the small range of effect sizes (for comparisons with df = 1, even after applying adjustment to the type I error rate, the largest detectable effect size was w = .11). Also, for parametric omnibus statistics (analysis of variance), we were able to detect effect sizes smaller than Cohen f = .140, also close to the lower end of a small effect size interval, which in the case of a two groups comparison would be equivalent of a Cohen d smaller than .030. Thus, we were able to identify any relevant effect in the overall analysis for the distribution of personality traits across the 8 regions.

However, for pair-wise comparisons between regions, there were variation in the sample sizes (with smaller numbers of participants in some of the regions) and we used a conservative correction for multiple comparisons (Bonferroni correction). We took this approach given that for each trait that proved to be significant in the omnibus analysis there were 28 post hoc or pair-wise comparisons that we computed. The risk of type I error, i.e., concluding that here differences between different regions, when in reality such differences are not present, was very high and we also deemed this error as having important social and cultural consequences. Thus, we took a more sceptical approach, giving credit only to larger effect sizes that are more likely to reflect relevant differences in psychological traits. For the adjusted type I error rate, two tailed pairwise comparison, and the standard for statistical power (.80), the minimum detectable effect size ranged between Cohen d = .44 and .57, depending on the sample size of the two groups being compared, with an average of d = .51. Thus, we are able to detect effects in the upper side of the small effect size interval or at least those in the lower interval of the medium effect size interval. We also computed the effect size based on the observed means to see if any of the geographical differences (for

neuroticism and agreeableness, where main effects proved to be significant) were in the range of relevant effects, but we were not able to detect them. The absolute value of the effect sizes for both traits ranged between d=.01 and 0.43, with an average of .17. Practically, we were able to detect with adequate statistical power any of the observed raw differences between geographical regions. Just three effect sizes crossed the threshold of .40, and the highest value of .43 was for the difference between region 1 and region 5 for agreeableness, which emerged as significant in our analysis.

Discussion

The results presented in this article, together with those from the monograph on the psychology of Romanians (David 2015a), offer a preliminary picture of this country's national psychological/personality profile, both globally (contrasted with the profile of other countries) and regionally.

At a global level, as compared to 50 cultures (48 countries) (i.e., Terracciano et al., 2005), Romanians are characterized by an average level of neuroticism and agreeableness, and by higher levels of extraversion, openness, and conscientiousness. As compared to the Americans (see David, 2015a), Romanians have higher level of neuroticism and extraversion and lower levels of openness, agreeability, and conscientiousness. These variations emphasize the importance of the reference point/framework in establishing the psychological profile, an approach that is incompatible to the psychological essentialism.

A more in-depth look at how these traits are configured in the population trough cluster analysis identified two bipolar profiles. The first profile (called "Factor X-", or metaphorically "The Dragon") is characterized by high neuroticism and low levels of extraversion, openness, agreeableness, and conscientiousness. The second profile (called "Factor X+", or metaphorically "The Prince Charming") is characterized by low neuroticism, and higher levels of extraversion, openness, agreeableness, and conscientiousness. These

profiles are not universal, but they can be found in other countries/cultures, as we have shown previously. However, we did not investigate if a different structure would be more appropriate for those countries. Future research should clarify which are the exact countries that can be best described by the two bipolar clusters. Given that large geographical distribution of the countries for which the two clusters pattern emerged, explanations based on cultural, economic, and measure-related factors are all possible.

The classical approach based on the Big Five model identified three clusters of personality profiles (see Asendorph et al., 2001; Robins et al., 1996): (1) resilient (i.e., low neuroticism and often above-average scores on the other dimensions); (2) overcontrolled (i.e., high neuroticism, low extraversion and often average scores of the other dimensions) and (3) undercontrolled (i.e., low conscientiousness, low agreeability, and sometimes high neuroticism). While the resilient type is related to egoresiliency, the other two types are related to ego-control (see Block & Block, 1980), so that the undercontrolled type is related to expressing impulses (i.e., externalizing problems), and the overcontrolled type is related to containing impulses (i.e., internalizing problems). However, this model is not universal; indeed, for example, Rentfrow et al. (2013) found a four cluster pattern for the U.S.

While our Factor X+ nicely fits the resilient type, the Factor X- seems to be generally related to ego-control and here the profile fits more the undercontrolled type. Indeed, it could be consistent with David (2015a), which argued, based on secondary data analyses, that as compared to Americans, Romanians has a higher level of rule-breaking behaviors. Moreover, potentially combining the overcontrolled and undercontrolled types in a global “control deficiency” type might not be unusual, as it has been a long-standing standard in clinical assessment (e.g. ASEBA; Achenbach & Rescorla, 2009) to compute a total score of problems, which results from combing the scores of externalizing (more related to undercontrolled type) and internalizing (more related to overcontrolled type) problems.

Sava and Popa (2011) also investigated the global national personality profile in Romania. They tested in a nationally representative sample, using a Big Five-based psychological test developed in Romania (see Sava & Popa, 2011), from 2 to 8 cluster patterns. Even if they also identified the two cluster pattern we found here, they did not further test it, choosing in the end, based on some external validity analyses, a five cluster pattern (also different than the three cluster pattern suggested by Asendorph et al., 2001; Robins et al., 1996). Taking into account the stability of the two cluster pattern we found here, it is important in future research to investigate the external validity of the two versus five cluster patterns, taking into account the fact that the measures used in the two studies, although both based on a Big Five model of personality, are nevertheless different.

The two clusters are quite evenly distributed in the global population and across all major regions in Romania. Not only that these two profiles are evenly distributed across geographical regions, but personality traits have also similar distributions. We found only a few statistically significant differences for neuroticism and agreeableness between the eight regions, but they were related to just one of the facets comprising each of the broader traits. These differences remained significant after controlling for demographic variables; however, the effects were close to the lower limit of the interval for a small effect size (explaining less than 2% of the variance of each trait). This indicates a lack of practical relevance. These conclusions are in concordance with those of David (2015a) related to the homogeneity of the Romanian psychological and cultural environment, possibly due to historical population movements inside the country. The results presented here also support the idea that the polarization of psychological and cultural attributes is a common characteristic of the Romanian population.

Implications

A personality profile is not good or bad. It just describes a combination of various psychological characteristics that could be more or less useful depending on the context. The personality profile Factor X+ represents a positive psychological potential but one which requires modern social and cultural institutions in order to express itself contextually in specific productive behaviors; otherwise, it might remain just an unused potential. For example, a high level of openness in a repressive working environment might not help the individuals to function efficiently. At this moment, Factor X+ profile is better represented in more educated individuals, with ages between 30 and 50 years. Factor X- profile is a psychological potential that could express itself in a more or less adaptive manner, depending on the constraints that are imposed by social and cultural institutions. Under modern institutions, this profile could be associated with adaptive behaviors in some contexts (e.g., a low level of agreeability might be associated to assertiveness), while under archaic institutions it could lead to problematic behaviors (e.g., a low level of agreeability might be associated to aggression and anger). At this point in time, Factor X- is better represented in individuals with lower education, among adolescents and young adults with ages between 14 to 19 years, and among older individuals, 60 years or above. Robins and his collaborators (Robins et al., 2005) showed that higher education could increase scores on openness, agreeableness and conscientiousness, while decreasing those on neuroticism. Yet, such changes in personality profiles are not dramatic. In our case, we found only a small effect of education for agreeableness, obtained by comparing groups with different level of education. Also, we found a small to medium effect for cluster distribution between different education categories, with cluster Factor X+ being more frequent among those with more education (post-tertiary and higher education). Robins et al. (2005) investigated this effect as a within group change (pre- to post-test), and thus there might be other confounded variables that should be investigated in order to clarify this link.

We suggest that modern social and cultural institutions can activate and use in a productive manner both types of potentials and education might sometimes ameliorate, if necessary, the characteristics of the Factor X- profile. According to this conclusion, in order to use in a productive and optimal manner the national personality of Romanians, we need modern social and cultural institutions and large scale education. Given that the link between social institutions and education on one hand, and personality on the other hand is bidirectional, any intervention for improvement will be self-sustainable, leading to a growth spiral: modern social and cultural institutions could have a positive impact on the national personality profile, which in turn could allow the development of complex educational environments and modern social and cultural institutions.

Some possible interdisciplinary approaches and extensions to the personality profile of Romania

At the end of this article, we would like to suggest some interdisciplinary perspectives that could help to generate some insights in understanding the personality profile of Romania. We showed that its structure is bipolar (meaning two opposed structures, in our case the two cluster pattern) and evenly distributed across the general population, but also across all major geographical regions. This suggests that its structure is not only bipolar, but also equilibrated and fractal in its nature, meaning that the global structure is kept at smaller levels of analysis (i.e., country level vs. the eight regions). Having this in mind, we could use speculatively different perspectives, from other disciplines (such as physics and mathematics) to understand the properties that emerge from such structures. This approach could offer new insights on the formation of this personality structure or its possible evolution.

Mate et al. (2015) showed that physical systems that are bipolar and equilibrated structures are more stable and inert to the action of external factors. Extrapolating this idea to Romanian’s personality, we could speculatively say that the two opposed clusters (Factor X-

and Factor X+) could explain today Romanian traditionalism and its resistance to change. Also, a fractal structure ensures that the identity of a system is kept even when the system is broken or divided. Speculatively, this could be a possible explanation for why Romanians kept their national identity (i.e., personality profile) despite historical division. Having made these hypotheses, we emphasize that parts of this discussion are based on the speculative assumption that the regional national personality profile we found here was similar in the time of historical divisions. Therefore, such a hypothesis should be further rigorously investigated in a historical context.

Limitations and new directions

The limitations of the research reported here are relatively low and specific to any scientific endeavor in the field.

The normative sample of the NEO PI-R in Romania (N2=2200 participants) is a probability sample obtained through a stratified sampling procedure, the strata being built on the eight geographically distinct regions in Romania, from both rural and urban areas, with each stratum sampled as an independent sub-population (random sampling). The basic sample of this study (N1=1000 participants) was built through probabilityproportional to-size sampling from this larger sample and not collected separately. While both the initial and the resampling procedure are accepted probability sampling methods, they have significant overlap. The fact that the sample we used was representative for the population and the results were replicable from one sample to the other (from N1 to N2) offers better generalizability of our conclusions. Also the instrument that we used, the NEO PIR, was validated on the Romanian population and has good psychometric properties, and thus our measurement error was low (e.g., the internal consistency of the self-report scale varies between 0.83 and 0.91. Moreover, the two cluster pattern was replicated in different samples, with different data analysis methods, and by using different Big Five-based instruments.

The fact that the two clusters and their traits are quite evenly distributed in the global population and across all 8 major regions in Romania makes it less important to explore the relationship between these psychological profiles and various socio-economic indicators of the eight official regions of Romania, as Rentfrow et al. (2013; 2015) did. However, such a study might be of interest if one will examine the regional national personality profile at more detailed levels (e.g., counties rather than regions). Indeed, while some socio-economic indicators seem to vary among the 8 regions of Romanian, there seems to be a very large variability among the counties. However, a larger sample is necessary for such a study, so that we can have a good statistical power for such analyses.

In the end, for a final decision regarding the stability of the two cluster pattern, future studies should focus on analyzing this bipolar profile (i.e., the two cluster pattern) vs. other cluster patterns, in relation with various constructs and indicators with theoretical and practical relevance, for a better understanding of its conceptual and external validity.

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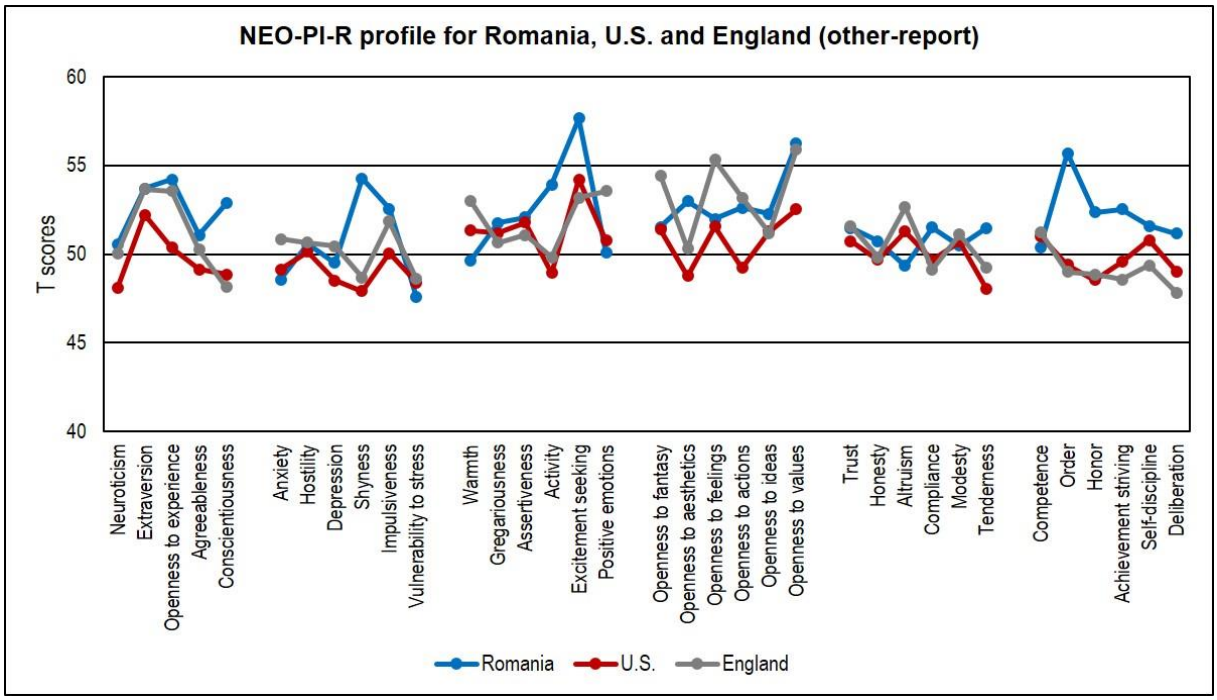

Figure 1. National profile for Romania, U.S. and England. Values in the figure are standardized *T* scores (M = 50), based on the data from McCrae et al. (2005), Terraciano et al. (2005), and Costa et al. (2008) (in 50 cultures/48 countries).

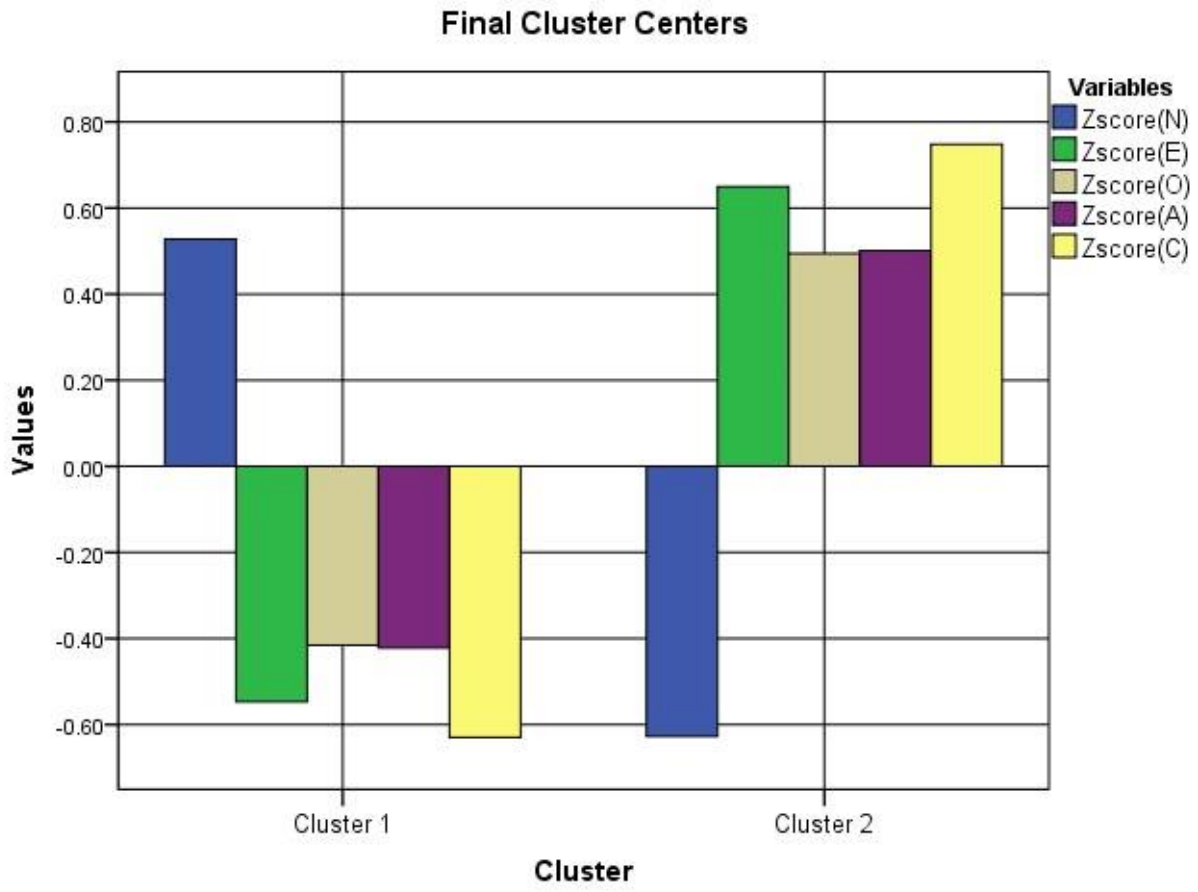

Figure 2. Psychological profile of Romanians generated from cluster analysis. Values in the figure are standardized *z* scores. N = neuroticism; E = extraversion; O = openness; A = agreeableness; C = conscientiousness.

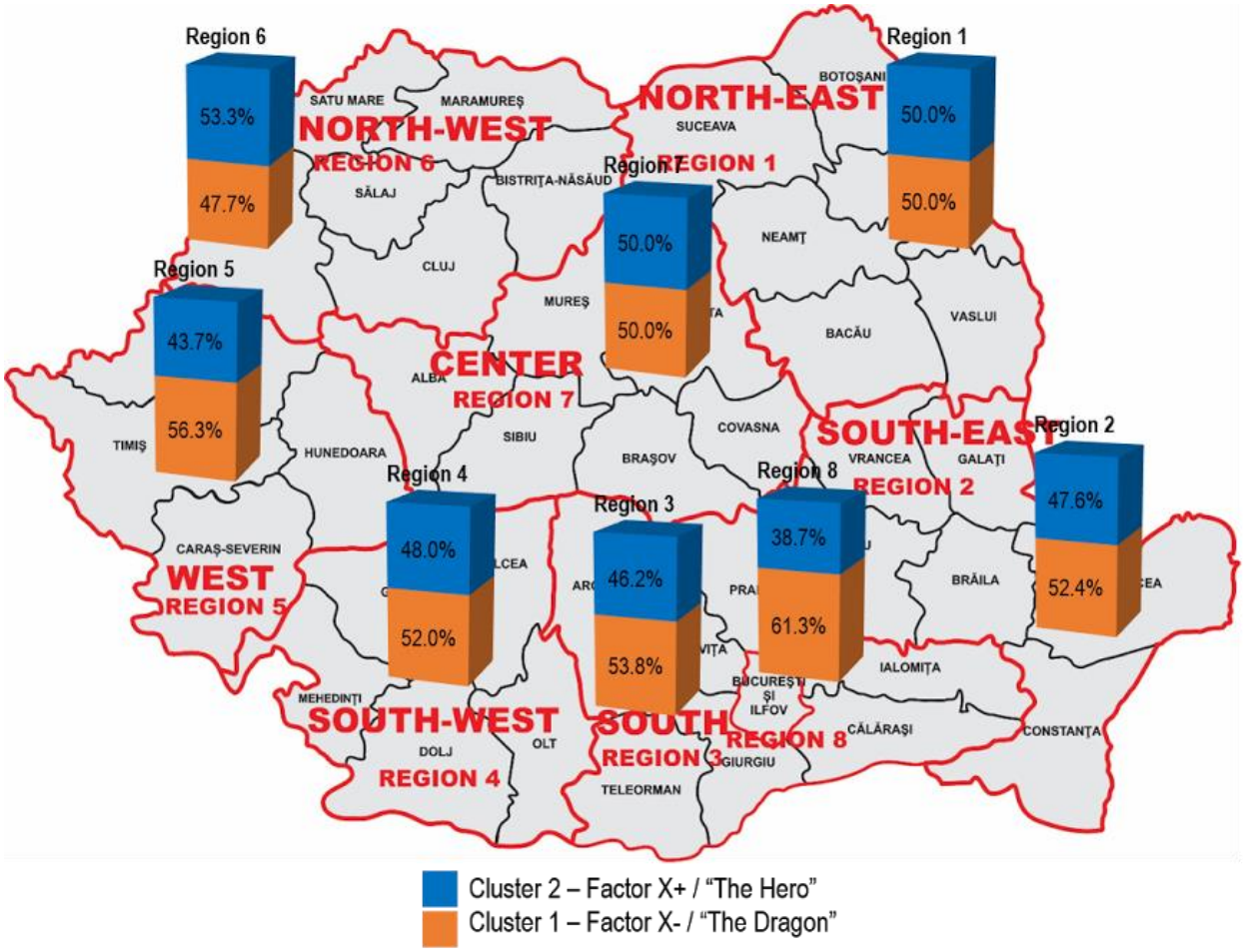

Figure 3. Regional distribution of the two personality profiles of Romanians resulted from cluster analysis.

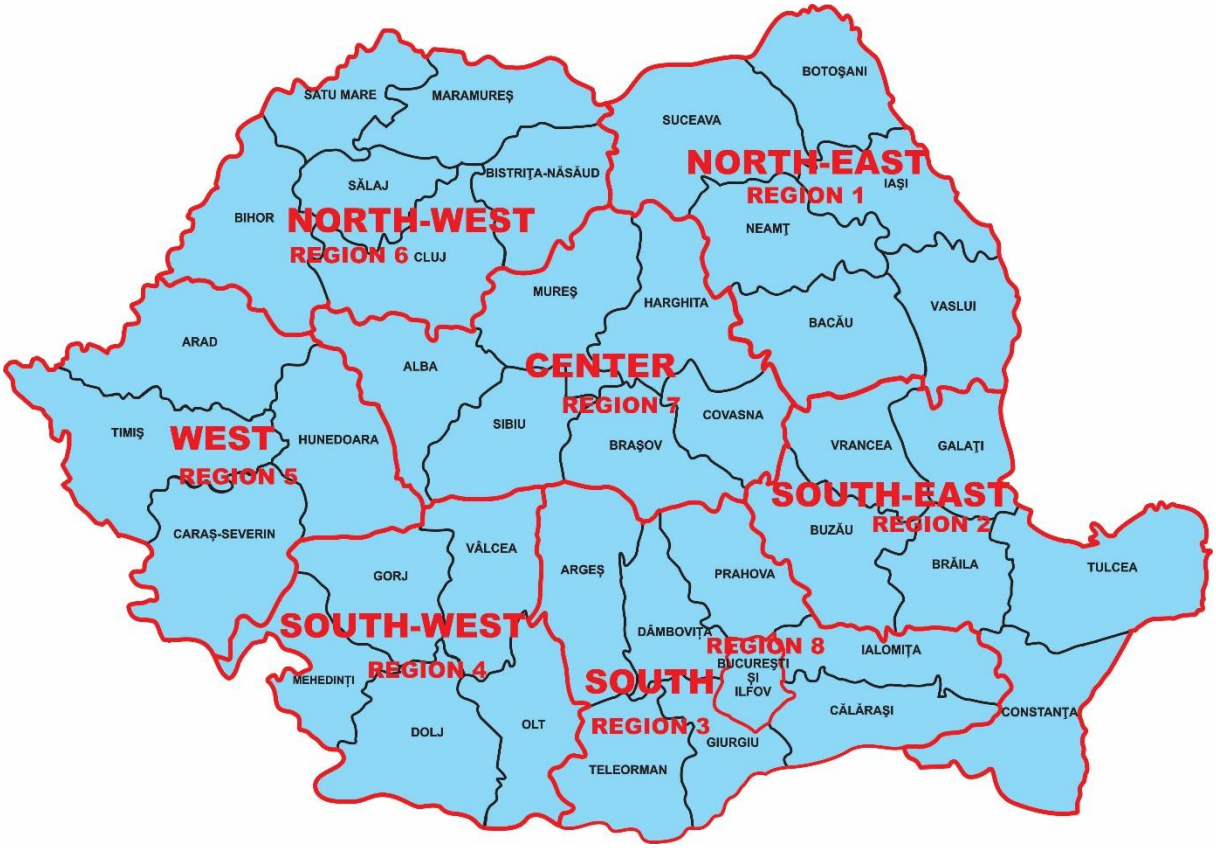

Figure 4. Psychological profile of Romanians resulted from multifactorial analysis of variance. Neuroticism, extraversion, openness, agreeableness, and conscientiousness are equally distributed among geographical regions, with small differences.