**PANTEION UNIVERSITY OF SOCIAL AND POLITICAL SCIENCES**

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POSTGRADUATE DEGREE COURSE
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# Investigating the dimensionality of the Schwartz scale of human values: Evidence from the European Social Survey of 2002 for Greece and Slovenia

MASTER THESIS

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## ABBREVIATIONS

AGFI: Adjusted Goodness-of-fit Index

AIC: Akaike Information Criterion

CAIC: Consistent Akaike Information Criterion

CC: Corrected Item-total Correlation

CFA: Confirmatory Factor Analysis

CFI: Comparative Fit Index

CI: Confidence Interval

*df*: Degrees of Freedom

ECVI: Expected Cross-validation Index

EFA: Exploratory Factor Analysis

ESS: European Social Survey

IPUMS: Integrated Public Use Microdata Series

KMO: Kaiser-Meyer-Olkin Measure of Sampling Adequacy

MAR: Missing at random

NA: No Answer

NFI: Normed Fit Index

PAF: Principal Axis Factoring

PCA: Principal Component Analysis

PVQ: Portrait Value Questionnaire

RMSEA: Root-mean-square Error of Approximation

SD: Standard Deviation

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## ABSTRACT

*Purpose:* To investigate the dimensionality, reliability and construct (factorial) validity of the Short Form of the Human Values Scale as proposed by Schwartz (1992).

*Method:* The Greek and the Slovenian European Social Survey data of 2002 (Round 1) were used. First, the samples of both countries were split randomly into two halves. For the data of the first split-half sample in both cases, item analysis was carried out to examine the distributional properties of the scale and decide on the items to be included in the analysis. For the construct validity of the scales, Exploratory Factor Analysis (principal axis factoring with promax rotation) was adopted. The structure was validated in both cases by carrying out Confirmatory Factor Analysis (maximum likelihood) on the data of the second split-half sample.

*Results*: In both cases, the Exploratory Factor Analysis resulted in a three-factor solution. Three subscales were constructed based on the defining items of the respective factors. Reliability coefficients and internal consistencies of the three subscales showed that the third subscale was not reliable. Confirmatory Factor Analysis indicated poor fit for three of the models considered but better fit for the model defined by the following two first-order correlated factors based on 14 and 12 items for Greece and Slovenia, respectively: Openness to change/Self-enhancement and Self-transcendence/Conservation. This solution provided two subscales that were both reliable and valid.

*Conclusions*: Our results indicated that a two factor solution was both reliable and valid. This finding does not confirm the dimensionality of the Schwartz Human Values Scale as proposed in the literature. The implications of our results suggest that further research and analysis is necessary for each country and each round of the European Social Survey.



*Keywords*: Schwartz's human values scale (PVQ-21); Reliability; Validity; Exploratory Factor Analysis; Confirmatory Factor Analysis

# INTRODUCTION

Schwartz (1992) developed the theory of basic human values which has been widely used by social and cross-cultural psychologists in order to study differences in values among individuals (European Social Survey, n.d.). This theory includes ten motivationally distinct basic values (Self-direction, Universalism, Benevolence, Tradition, Conformity, Security, Power, Achievement, Hedonism, Stimulation), which encompass the major value orientations recognized cross-culturally (Davidov, Schmidt, & Schwartz, 2008; Datler, Jagodzinski, & Schmidt, 2013). Schwartz derived these values from three universal requirements of the human condition: needs of individuals as biological organisms, requisites of coordinated social interaction and requirement for the survival and welfare needs of group (Davidov et al., 2008; Datler et al., 2013; Knoppen & Saris, 2009).

Schwartz presented the ten basic values in a circular structure based on the relations of conflict and congruity among the types of values (Figure 1). More similar value types are close to each other in either direction around the circle and consequently have more similar underlying motivations. On the other hand, conflicting value types appear on opposite sides of the circle and have more antagonistic underlying motivations (Davidov et al., 2008; European Social Survey, n.d.). Moreover, the circular structure also summarizes two dimensions of relations between these values: the self-enhancement versus self-transcendence dimension opposes power and achievement values to universalism and benevolence values, and the openness to change versus conservation dimension opposes self-direction and stimulation values to security, conformity and traditional value; hedonism shares elements of both openness to change and self-enhancement and it appears around dashed lines (Davidov et al., 2008; European Social Survey, n.d.).

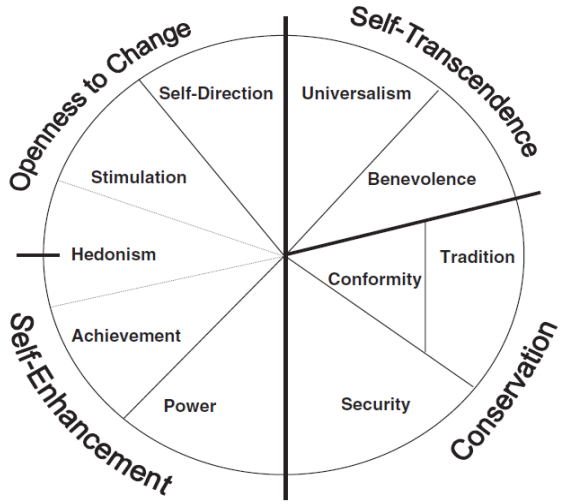


Figure 1. Structural Relations Among the Ten Values and the Two Dimensions. Reproduced from "Bringing Values Back in: the Adequacy of the European Social Survey to Measure Values in 20 Countries," by E. Davidov, P. Schmidt and Sh.H. Schwartz, 2008, *Public Opinion Quarterly*, 72 (3), p. 425. Copyright 2008 by Oxford Journals.

Lilleoja and Saris (2014) pointed out that Schwartz first used a 57-item questionnaire in his survey (Schwartz's value survey, SVS) for data collection, which was later replaced by the 40-item Portrait Value Questionnaire (PVQ). The European Social Survey (ESS) human values scale was derived from the earlier 40-item PVQ, but because of space limitations, the ESS reduced the number of items (Davidov et al., 2008) and used a short form of the Portrait Value Questionnaire consisting of 21 items (PVQ-21). According to Knoppen and Saris (2009), ESS selected Schwartz's value scale because it is considered as one of the most comprehensive models that has been also widely validated across the cultures.

The ESS PVQ-21 questionnaire is worded according to the respondent's gender (Appendix I) and is administered as a self-completion questionnaire after the end of the interview. Each item represents one of the above mentioned ten values of the Schwartz scale and verbal portraits of 21 different people are provided. Each portrait describes a person's goals, aspirations or wishes that show implicitly the importance of a value (Davidov et al., 2008). Each value is represented by two items, apart from the Universalism value, which is expressed by three items (Table 1).

There are six possible response categories which are defined as follows: 1 (very much like me), 2 (like me), 3 (somewhat like me), 4 (a little like me), 5 (not like me) and 6 (not like me at all). The total score for each respondent is calculated by averaging his or her responses on the items defining each value, i.e. subscales are

constructed by computing the mean of items that measure each one (Davidov et al., 2008). The scale was first included in Round 1 of the ESS conducted in 2002.

Table 1

*The Short Form of Schwartz's Portrait Value Questionnaire (PVQ-21) – ESS Round 1*

| Item | Value | Label |
|---|---|---|
| 1. Thinking up new ideas and being creative is important to him. He likes to do things in his own original way. | Self-Direction (SD) | SD1 |
| 11. Thinking up new ideas and being creative is important to him. He likes to do things in his own original way. | | SD11 |
| 3. He thinks it is important that every person in the word should be treated equally. He believes everyone should have equal opportunities in life. | Universalism (UN) | UN3 |
| 8. It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them. | | UN8 |
| 19. He strongly believes that people should care for nature. Looking after the environment is important to him. | | UN19 |
| 12. It's very important to him to help the people around him. He wants to care for their well-being. | Benevolence (BE) | BE12 |
| 18. It is important to him to be loyal to his friends. He wants to devote himself to people close to him. | | BE18 |
| 9. It is important to him to be humble and modest. He tries not to draw attention to himself. | Tradition (TR) | TR9 |
| 20. Tradition is important to him. He tries to follow the customs handed down by his religion or his family. | | TR20 |
| 7. He believes that people should do what they're told. He thinks people should follow rules at all time, even when no-one is watching. | Conformity (CO) | CO7 |
| 16. It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong. | | CO16 |
| 5. It is important to him to live in secure surroundings. He avoids anything that might endanger his safety. | Security (SEC) | SEC5 |
| 14. It is important to him that the government ensures his safety against all threats. He wants the state to be strong so it can defend its citizens. | | SEC14 |
| 2. It is important to him to be rich. He wants to have a lot of money and expensive things. | Power (PO) | PO2 |
| 17. It is important to him to get respect from others. He wants people to do what he says. | | PO17 |
| 4. It's important to him to show his abilities. He wants people to admire what he does. | Achievement (AC) | AC4 |
| 13. Being very successful is important to him. He hopes people will recognize his achievements. | | AC13 |
| 10. Having a good time is important to him. He likes to "spoil" himself. | Hedonism (HE) | HE10 |
| 21. He seeks every chance he can to have fun. It is important to him to do things that give him pleasure. | | HE21 |
| 6. He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life. | Stimulation (ST) | ST6 |
| 15. He looks for adventure and likes to take risks. He wants to have an exciting life. | | ST15 |

Adapted from "Bringing Values Back in: the Adequacy of the European Social Survey to Measure Values in 20 Countries" by Davidov, E., Schmidt P. & Schwartz Sh. H. (2008), *Public Opinion Quarterly*, 72 ( 3), pp.427-428.

Davidov, Schmidt and Schwartz (2008, pp. 440-441) showed that "the scale failed to exhibit scalar invariance across the 20 countries. Hence, one should not compare the mean importance of the values across all 20 countries simultaneously. However, as illustrated for Denmark and Spain, one can compare means for values across subsets of countries where scalar invariance or partial scalar invariance are

found." In each country, they found that there were at least two pairs of values which were dependent on each other that could not be separated. In order to solve the problem of non-positive definite covariance matrices of the constructs, Davidov, Schmidt and Schwartz (2008, pp. 430-432) unified in pairs the strongly associated values. Their results, presented in Table 2, showed that there were between five and eight distinct values in the different countries. They found that 69 out of 71 pairs of unified values across the 20 countries were adjacent in the circular structure of the Schwartz theory of values. As shown, for Greece, their analysis resulted in the following five unified values: POAC, COTR, UNBE, HEST, STSD.

Table 2

*Number of Values Found in Each Country After Unifying Values to Solve the Problem of Non-Positive Definite Matrices of the Constructs in Single-Country CFAs*

| Country | Number of values | Unified values[a] |
|---|---|---|
| Austria | 8 | POAC, COTR |
| Belgium | 6 | POAC, CORT, UNBE, STSD |
| Czech Republic | 7 | POAC, UNBE, COTR |
| Denmark | 8 | COTR, POAC |
| Germany | 7 | POAC,UNBE,COTR |
| Finland | 8 | COTR, POAC |
| France | 7 | COTR, POAC, UNBE |
| Great Britain | 8 | COTR, POAC |
| Greece | 5 | POAC, COTR, UNBE, HEST, STSD |
| Hungary | 5 | UNBE, COTR, POAC, SECUN, HESD |
| Ireland | 6 | POAC, COTR, UNBE, HEST |
| Israel | 7 | UNBE, POAC, STSD |
| Netherlands | 8 | COTR, POAC |
| Norway | 8 | POAC, COTR |
| Poland | 6 | UNBE, COTR, HEST, POAC |
| Portugal | 7 | COTR, UNBE, HEST |
| Slovenia | 5 | COTR, UNBE, HEST, POAC, STSD |
| Spain | 8 | COTR, POAC |
| Sweden | 8 | COTR, POAC |
| Switzerland | 7 | COTR, POAC, UNBE |

[a]For abbreviations of values, see Table 1. Reproduced from "Bringing Values Back in: the Adequacy of the European Social Survey to Measure Values in 20 Countries," by E. Davidov, P. Schmidt and Sh.H. Schwartz, 2008, *Public Opinion Quarterly*, 72 (3), p. 425. Copyright 2008 by Oxford Journals.

Davidov, Schmidt and Schwartz (2008) showed that a similar structure of values to that of Greece was present in the case of Slovenia. The purpose of this thesis is to investigate the dimensionality of the Schwartz scale for these two cases by applying both Exploratory and Confirmatory Factor Analysis and indicate how the values should be treated in country-level analyses.

# CHAPTER 2 Method

## 2.1 The Greek and Slovenian samples

The statistical analysis was based on the Greek and Slovenian ESS data of 2002 (Round 1). According to the sampling specification of the ESS, only probability samples were allowed. For the implementation of the design, the following requirements had to be met: common definitions of the target population and full coverage; high response rates (at least 70%); substitution was prohibited; same minimum effective sample sizes for participating countries ($N_{eff}$ = 1,500 or 800 where population is smaller than 2 million residents) and minimum net sample size of $N_{net}$ = 2,000 (European Social Survey, 2002).

In every round of the ESS, the target population is defined as all persons aged 15 or older, who inhabit private households, regardless of nationality, citizenship, language or legal status (European Social Survey, 2002). As these are probability samples, each member of the population under study has a non-zero chance of being selected in the sample. After the target population has been defined for the implementation of any type of probability sampling, an essential requirement is the availability of a sampling frame for sample selection. This frame is a list of all the members of the population. The quality of the frames, however, differs from country to country.

The selection of the sample becomes more complicated when a list of residents is not available. In this case, a two-stage design is drawn, in which the first stage covers the selection of municipalities and the second the selection of households within these municipalities. Because sampling frames are not available, the selection of the households is a crucial procedure and there are two ways to handle it: a) by the creation of lists which contain all the addresses within a certain area of the selected communities and the selection of the target households from these lists or b) by the application of random route elements. The first type of the design was applied in Greece and the second in Slovenia (European Social Survey, 2002). The Greek and Slovenian sample sizes were 2,566 and 1,519, respectively.

More specifically, for the Greek survey, the survey population was defined as all persons aged 15 and over, who live in private households, excluding the Cyclades and Dodecanese islands, apart from Rhodes. The homeless and institutionalized

population was also excluded. The Greek Census of 2001 was used as sampling frame (European Social Survey, 2002). A stratified three-stage area sample was drawn. In the first stage, area units (Primary Sampling Units, PSUs) were classified into 101 strata. Athens was divided into 31 geographical strata, Salonica into 9 and the rest of Greece into 61, defined by degree of urbanization and region. Sample size was distributed across strata in proportion to the number of households and was sorted into PSUs, based on 6, 7 or 8 sample households per PSU. Within each stratum, PSUs was selected with *pps* (probability proportionate to size) and the total number of PSUs was 438. At the second stage, within each selected area unit in cities and towns (83% of PSUs), interviewers constructed the sampling frame for the selection of households based on maps of census tracts. In rural areas, field supervisors created a rough map and a description of the boundaries. Subsequently, field supervisors applied systematic sampling for the selection of households based on the complete updated lists. At the final stage, in the selected households, one resident aged over 15 was selected at random using Kish's (1949) method (European Social Survey, 2002).

In total, the Greek sample comprised of 2,566 respondents (Table 3) of which 1,132 (44.1%) were men and 1,434 (55.9%) women. The participants belonged mainly to the age group of 45-64 (30%) and almost half of them were under 45 years old (46.6%). Moreover, the majority was married (66.6%) and 86.6% had completed upper secondary education.

In the case of Slovenia, the survey population was defined as all persons aged 15 and over, who live in private households, regardless of their nationality, citizenship, language or legal status. The Central Register of Population (CRP) was used as sampling frame; this includes all residents with permanent addresses, citizens and non-citizens. A stratified two-stage probability sample was drawn. Slovenia was divided into 9,000 Clusters of Enumeration Areas (CEA), which were first stratified according to 12 regions. In the first stage, 150 PSUs were selected and at the second stage, 15 SSUs per PSU were selected (European Social Survey, 2002).

In total, the Slovenian sample consisted of 1,519 respondents (Table 3) of which 723 (47.6%) were men and 795 (52.4%) were women. The participants belonged mainly to the age group of 45-64 (30.4%) and over half of them were under 45 years old (52.6%). Furthermore, the majority was married (53.9%) and over half of the sample (55.0%) had completed upper secondary education.

Table 3

*The Socio-demographic Characteristics of ESS 2002 Greek (N = 2,566) and Slovenian (N = 1,519) Respondents Compared to Their Respective General Population (IPUMS-International)*

| | Greece | | Slovenia | |
|---|---|---|---|---|
| Variable | ESS 2002 % | Census 2001 % | ESS 2002 % | Census 2002 % |
| Gender | | | | |
| Male | 44.1 | 48.8 | 47.6 | 48.3 |
| Female | 55.9 | 51.2 | 52.4 | 51.6 |
| Age | | | | |
| 15-29 | 19.7 | 24.9 | 26.3 | 25.0 |
| 30-44 | 26.9 | 26.1 | 26.3 | 26.3 |
| 45-64 | 30.0 | 28.8 | 30.4 | 30.1 |
| 65+ | 23.3 | 20.3 | 17.0 | 18.6 |
| Marital status | | | | |
| Married | 66.6 | 60.7 | 53.9 | 53.8 |
| Separated | 0.6 | 0.7 | 0.7 | 0.6 |
| Divorced | 1.6 | 2.5 | 3.7 | 3.7 |
| Widowed | 7.6 | 8.2 | 9.0 | 7.4 |
| Never married | 23.6 | 27.9 | 32.6 | 34.5 |
| Education (Highest level) | | | | |
| Less than lower secondary education | 38.8 | 42.0 | 5.2 | 6.7 |
| Lower secondary education completed | 19.0 | 42.6 | 25.0 | 25.9 |
| Upper secondary education completed | 28.8 | 14.5 | 55.0 | 59.6 |
| Tertiary education completed | 13.3 | 0.9 | 14.8 | 7.8 |

*Source*: Minnesota Population Center. *Integrated Public Use Microdata Series, International: Version 6.2* [Machine-readable database]. Minneapolis: University of Minnesota, 2013.

## 2.2 Level of measurement

The items of Schwartz's scale of human values use six response categories and are Likert-type, therefore their level of measurement is ordinal. In applications where the number of response categories used for each item is at least five, the ordinal categories can be understood as being interval and one may perform statistical analyses using these pseudo-interval variables (Bartholomew, Steele, Moustaki, & Galbraith, 2008).

## 2.3 Construct validity and reliability assessment

First, the sample was randomly split into two halves. For the data of the first split-half sample, item analysis was carried out to examine their distributional properties and decide on the items to be included in the analysis. For the construct validity of the scale, Exploratory Factor Analysis was adopted. The structure was validated by carrying out Confirmatory Factor Analysis on the second split-half sample.

### 2.3.1 Exploratory Factor Analysis (EFA)

The size of the first split-half samples for Greece ($N$ = 1,267) and Slovenia ($N$ = 751) was considered adequate for factor analysis (KMO = 0.901 for Greece and KMO=0.831 for Slovenia; see also Tabachnick and Fidell, 2007). First, Principal Components Analysis (PCA) and Exploratory Factor Analysis (EFA) were performed to define components or factors as subscales and component or factor loadings were reported (Fabrigar, Wegener, MacCallum, & Strahan, 2009). In performing PCA or EFA, the following sequence of decisions was required (Tabachnick, & Fidell, 2007; Thompson, 2005; Cabrera-Nguyen, 2010):

1. Initially, univariate statistics were computed for each item and their distributional properties were inspected (testing for normality) to decide on the appropriateness of the methods to be used. Also, corrected item-total correlations were computed and items meeting the criteria of correlations greater than .30 and extraction communalities greater than .40 were included in the analysis (Nunnally & Bernstein, 1994; see also Michalopoulou & Symeonaki, 2014; Symeonaki, Michalopoulou, & Kazani, 2014). Also, missing data analysis was carried out, and because the number of missing values was negligible they were deleted pairwise, as suggested by Davidov and Schwartz (2008).

2. Component or factor extraction method: both PCA and EFA were performed and their results were compared (Bartholomew et al., 2008; Fabrigar et al., 1999).

3. The decision on the number of components or factors to be extracted was based on the eigenvalue greater than 1.0 rule, scree test, parallel analysis and interpretability (Hayton, Allen, & Scarpello, 2004; see also Michalopoulou & Symeonaki, 2014; Symeonaki et al., 2014). Parallel analysis (Schmitt, 2011; O'Connor, 2000; see also Ledesma, & Valero-Mora, 2007) was performed for both PCA and EFA using the parallel analysis engine provided by Patil, Singh, Mishra and Donavan (2007); a utility developed as part of Patil, Singh, Mishra and Donavan (2008).

4. Component or factor rotation method: both varimax (orthogonal) and promax (oblique) rotations were applied (Fabrigar et al., 1999). The choice between them was based on the correlations among components or factors and the simple structure criterion (Fabrigar et al., 1999; Reise, Waller, & Comrey, 2000). The

meaning of each dimension was inferred from the items that had their highest loading on the respective factor (Nunnally & Bernstein, 1994). The items with loadings greater than .30 on one factor and with loadings greater than .22 on another factor (Stevens 2002; see also Anagnostopoulos, Yfantopoulos, Moustaki, & Niakas, 2013) were considered as "cross-loading" items, i.e. items that loaded on multiple factors.

5. Subscales were computed by averaging their defining items based on their factor loadings. Average inter-item correlations in the recommended range of .15-.5 that clustered near the mean value were used as an indication for the unidimensionality of the subscales (Clark & Watson, 1995). To demonstrate whether subscales were warranted or not, the condition of average correlation between subscale items "significantly greater than zero but substantially less than the average within-subscale values (say, .20)" (Clark & Watson, 1995, p. 318) was used for justifying subscales. As Clark and Watson (1995) point out, "if this condition cannot be met, then the subscales should be abandoned in favor of a single overall score" (p. 318).

PCA and EFA were performed using IBM SPSS Statistics Version 20.

### 2.3.2 Confirmatory Factor Analysis (CFA)

The size of the second split-half samples for Greece ($N$ = 1,267) and Slovenia ($N$ = 751) was considered adequate for factor analysis (Tabachnick & Fidell, 2007).

CFA was performed using IBM SPSS AMOS Version 21. In performing CFA, the following sequence of decisions was required (Brown, 2006; Thompson, 2005; Cabrera-Nguyen, 2010; Gillapsy, Jackson, & Purc-Stephenson, 2009):

1. The decision on the items to be included in the analysis was based on the item analysis results carried out before performing EFA. First, we tried pairwise deletion of missing values but because for AMOS complete data sets are required, missing data was replaced by the mean or median values (which in most cases coincided). In the case of Greece, data screening for unengaged responses (standard deviation = .000) in the Greek and Slovenian data sets resulted in only six and four cases-respondents, respectively, and it was decided not to reject them from analysis. Data screening for outliers was based on the following background variables: gender (dichotomy), age (ratio), education (pseudo-interval). In the case of Greece, only four outlying cases with Higher Education degree were detected and it was decided not to

reject them from analysis (Figure A1). In the case of Slovenia, outliers were not detected (Figure A2).

2. CFA was performed using the covariance matrix of associations and using maximum likelihood for estimation.

3. Rival models: It was decided to consider the following models: one first-order factor (model 1); two first-order correlated factors employing all items (model 2a); two first-order correlated factors based on the solution obtained from EFA with consideration of the subscales' reliability (model 2b); three first-order correlated factors based on the EFA results (model 3); and the five first-order correlated factors model based on Davidov and Schwartz's (2008) results (model 4).

Lilleoja and Saris (2014, p. 157) point out that "Schwartz has criticized CFA approach, because it contradicts the view of values as arrayed on a continuum, as it seeks to confirm relatively pure factors and each item ideally loads on only one factor. (Schwartz 2011). The latter remark is not true because cross loadings are in principle allowed in CFA, but in that case they have to be specified in the model. If they are ignored, the misspecification leads to improper estimates, like correlations larger than 1.0." Therefore, the presentation of cross-loadings in CFA is required and models 2, 3 and 4 were run again by considering the respective "cross-loadings" resulting from EFA. Where necessary, error variances were correlated.

4. Model Fit statistics: In CFA, model fit was considered adequate when $\chi^2/df$ was lower than 3; the Comparative Fit Index (CFI) and the Adjusted Goodness-of-Fit Index (AGFI) were greater than 0.95, the Normed Fit Index (NNFI) was greater than 0.95 and the Root-Mean-Square Error Approximation (RMSEA) was lower than 0.06 (Brown, 2006; Thompson, 2004; see also Schmitt, 2011).

5. Model misspecification searches: searches for modification indices (Brown, 2006; Thompson, 2004).

### 2.3.3 Constructing and testing the subscales

Subscales were constructed for the total sample and step 5 of the EFA sequence of decisions was repeated.

# CHAPTER 3 Results

## 3.1 EFA-based analyses results

### 3.1.1 Greece

The majority of the responses were clustered at the lower end of the scale in the first two response categories (Table 4). Lower mean responses were found for items defining Security (SEC5, SE14), Conformity (CO16), Universalism (UN3, UN8) and Benevolence (BE12, BE18). Higher mean responses were found for items defining Stimulation (ST15), Power (PO2), Achievement (AC13) and Hedonism (HE10).

As shown in Table 4, the proportion of missing values for all the items was negligible, ranging from 0.3 to 0.7% and pairwise deletion was adopted. Non-normality was not severe for any item (skewness>2; kurtosis>7). Based on the criteria of corrected item-total correlations and extraction communalities, the following four items were rejected from analysis: TR9 (It is important to him to be humble and modest. He tries not to draw attention to himself); TR20 (Tradition is important to him. He tries to follow the customs handed down by his religion or his family); CO7 (He believes that people should do what they are told. He thinks people should follow rules at all time, even when no-one is watching); and PO2 (It is important to him to be rich. He wants to have a lot of money and expensive things).

Table 4

*Item Analysis of Schwartz Scale Values For ESS – 2002: Greece*

| Item | Mean (SD)* | 95% CI* | Frequency percent of response categories** | | | | | | | Skew* | Kurt.* | CC* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | NA | | | |
| SD1 | 2.28 (1.017) | 2.23-2.34 | 20.4 | 46.3 | 22.3 | 6.3 | 3.8 | 0.5 | 0.5 | 0.96 | 1.01 | 0.483 |
| SD11 | 2.06 (1.008) | 2.00-2.11 | 30.1 | 45.3 | 16.8 | 3.5 | 2.8 | 0.9 | 0.6 | 1.31 | 2.25 | 0.509 |
| UN3 | 1.81 (0.882) | 1.76-1.86 | 41.3 | 42.2 | 11.7 | 3.0 | 1.1 | 0.5 | 0.3 | 1.40 | 2.92 | 0.364 |
| UN8 | 2.16 (0.887) | 2.10-2.21 | 23.2 | 48.4 | 20.3 | 5.0 | 2.0 | 0.6 | 0.6 | 1.04 | 1.68 | 0.495 |
| UN19 | 1.82 (0.857) | 1.77-1.87 | 39.2 | 44.7 | 11.5 | 2.8 | 1.2 | 0.2 | 0.4 | 1.30 | 2.55 | 0.446 |
| BE12 | 2.01 (0.869) | 1.96-2.05 | 29.4 | 45.7 | 20.2 | 3.2 | 0.7 | 0.4 | 0.5 | 0.92 | 1.64 | 0.392 |
| BE18 | 1.80 (0.814) | 1.75-1.84 | 38.6 | 46.2 | 11.5 | 2.0 | 0.7 | 0.4 | 0.6 | 1.32 | 3.31 | 0.397 |
| TR9 | 2.34 (1.071) | 2.28-2.40 | 22.0 | 40.2 | 24.3 | 8.6 | 3.7 | 0.8 | 0.3 | 0.81 | 0.55 | 0.091 |
| TR20 | 1.72 (0.867) | 1.67-1.77 | 48.7 | 36.0 | 11.1 | 2.8 | 0.9 | 0.3 | 0.3 | 1.40 | 2.45 | 0.212 |
| CO7 | 2.54 (1.275) | 2.47-2.61 | 19.7 | 38.4 | 21.5 | 9.5 | 7.0 | 3.4 | 0.5 | 0.91 | 0.31 | 0.235 |
| CO16 | 2.10 (0.945) | 2.05-2.15 | 24.8 | 49.8 | 17.2 | 4.8 | 1.9 | 0.9 | 0.7 | 1.23 | 2.40 | 0.366 |
| SEC5 | 1.70 (0.899) | 1.65-1.75 | 51.1 | 33.9 | 9.8 | 3.6 | 0.8 | 0.5 | 0.4 | 1.57 | 3.06 | 0.395 |
| SEC14 | 1.72 (0.930) | 1.67-1.77 | 49.8 | 35.2 | 9.4 | 3.0 | 1.9 | 0.4 | 0.3 | 1.63 | 3.13 | 0.424 |
| PO2 | 3.53 (1.322) | 3.46-3.60 | 5.0 | 14.4 | 37.5 | 16.8 | 15.9 | 9.9 | 0.4 | 0.25 | -0.60 | 0.289 |
| PO17 | 2.45 (1.205) | 2.38-2.52 | 23.1 | 34.6 | 24.6 | 8.7 | 7.1 | 1.2 | 0.7 | 0.76 | 0.05 | 0.394 |
| AC4 | 2.70 (1.290) | 2.63-2.77 | 17.4 | 33.0 | 25.2 | 13.2 | 7.3 | 3.4 | 0.5 | 0.66 | -0.14 | 0.520 |
| AC13 | 2.84 (1.273) | 2.77-2.91 | 13.0 | 31.9 | 28.1 | 13.0 | 10.4 | 2.9 | 0.8 | 0.55 | -0.35 | 0.531 |
| HE10 | 2.91 (1.384) | 2.84-2.99 | 14.7 | 28.4 | 28.0 | 12.5 | 10.3 | 5.6 | 0.5 | 0.56 | -0.42 | 0.450 |
| HE21 | 2.49 (1.265) | 2.42-2.56 | 23.6 | 33.4 | 23.9 | 10.8 | 4.7 | 3.1 | 0.5 | 0.83 | 0.28 | 0.511 |
| ST6 | 2.74 (1.325) | 2.66-2.81 | 17.5 | 32.2 | 24.9 | 12.8 | 8.7 | 3.5 | 0.4 | 0.63 | -0.29 | 0.527 |
| ST15 | 3.70 (1.539) | 3.62-3.79 | 8.4 | 16.9 | 20.4 | 18.8 | 19.9 | 15.1 | 0.6 | -0.09 | -1.10 | 0.349 |

*Notes*: SD = standard deviation; CI = confidence interval; NA = no answer (missing values); Kurt. = kurtosis; CC = corrected item-total correlation. Items were assigned the following response categories: 1 (very much like me), 2 (like me), 3 (somewhat like me), 4 (a little like me), 5 (not like me) and 6 (not like me at all). Standard errors for skewness and kurtosis were 0.069 and 0.137, respectively.
**N* = 1,266. ***N* =1,296.

The eigenvalue rule >1 and scree test suggested the retention of a three-factor solution that best explained the variance when eigenvalues from the target data set were compared to the average and the 95$^{th}$ percentile of the random data sets. Parallel analysis confirmed this result as actual eigenvalues (4.919, 2.414, 1.303) were greater than the randomly generated ones for both the average (1.200, 1.161, 1.131) and the 95$^{th}$ percentile (1.237, 1.188, 1.156) eigenvalue criteria.

PCA and PAF (Table A1) resulted in a quite similar structure and interpretability, with PAF providing a simpler structure than PCA (Table 5).

Table 5

*Factor Loadings of Exploratory Factor Analysis (Principal Axis Factoring) With Promax Rotation (3 Factors): Greece*

| Variables | Principal axis factor analysis | | | Unique variance |
|---|---|---|---|---|
| | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation | Factor III Self-enhancement | |
| SD1 | **0.596** | 0.127 | -0.060 | 0.612 |
| SD11 | **0.502** | 0.204 | 0.070 | 0.602 |
| UN3 | 0.066 | **0.593** | -0.084 | 0.648 |
| UN8 | **0.306** | **0.448** | -0.061 | 0.650 |
| UN19 | 0.138 | **0.623** | -0.112 | 0.582 |
| BE12 | 0.108 | **0.555** | -0.094 | 0.675 |
| BE18 | 0.030 | **0.588** | -0.003 | 0.644 |
| CO16 | **-0.220** | **0.496** | **0.302** | 0.645 |
| SEC5 | -0.166 | **0.589** | **0.220** | 0.589 |
| SEC14 | -0.073 | **0.594** | 0.125 | 0.616 |
| PO17 | -0.032 | 0.098 | **0.588** | 0.627 |
| AC4 | **0.448** | -0.011 | **0.343** | 0.563 |
| AC13 | **0.416** | -0.068 | **0.464** | 0.487 |
| HE10 | **0.303** | -0.099 | **0.459** | 0.621 |
| HE21 | **0.616** | 0.053 | 0.046 | 0.571 |
| ST6 | **0.751** | 0.087 | -0.101 | 0.445 |
| ST15 | **0.664** | **-0.255** | 0.070 | 0.565 |
| | Correlations between factors | | | |
| Openness to change/Self-enhancement | — | | | |
| Self-transcendence/ Conservation | 0.303 | — | | |
| Self-enhancement | 0.403 | 0.299 | — | |

*Note*: Factor loadings >.22 are in boldface.

The first factor was defined by the Self-Direction, Stimulation and one item of Achievement and Hedonism values. Therefore, it refers mostly to Openness to change with elements of Self-enhancement. The second factor was defined by the Universalism, Benevolence, Conformity and Security values which express both Self-transcendence and Conservation. The third factor was defined by Self-enhancement as it consisted of one item from the Power, Achievement and Hedonism values. These three factors explain 28.934, 14.202 and 7.662% of the variance, respectively.

Moreover, the three-factor solution on the 17 items indicated that almost all items demonstrated strong factor loadings ≥0.45 on at least one factor.

Subscales were constructed by averaging the defining items of each factor. As shown in Table 6, Cronbach's alpha reliability coefficients for the subscales Openness to change/Self-enhancement, Self-transcendence/Conservation and Self-enhancement were 0.788, 0.799 and 0.632, respectively, indicating that the third factor was not reliable. Split-half reliabilities were 0.748, 0.762 and 0.584, respectively. Average

inter-item correlations were 0.392, 0.333 and 0.365 within subscales and 0.252, 0.345 and 0.250 between subscales, indicating that the values were within the recommended range.

Table 6

*Descriptive Statistics, Reliability Coefficients and Internal Consistencies of the Subscales: Greece*

| | Subscale | | |
|---|---|---|---|
| | Openness to change/Self-enhancement | Self-transcendence/ Conservation | Self-enhancement |
| Range (number of items) | 1-6 (6) | 1-6 (8) | 1-6 (3) |
| Mean (standard error) | 2.66 (0.025) | 1.89 (0.016) | 2.74 (0.028) |
| 95% Confidence interval | 2.61-2.71 | 1.86-1.92 | 2.68-2.79 |
| Standard deviation | 0.874 | 0.574 | 0.981 |
| Skewness (standard error) | 0.651 (0.069) | 1.350 (0.069) | 0.553 (0.069) |
| Kurtosis (standard error) | 0.177 (0.137) | 4.182 (0.137) | 0.201 (0.137) |
| Cronbach's alpha reliability coefficient | 0.788 | 0.799 | 0.632 |
| Split-half reliability coefficient | 0.748 | 0.762 | 0.584 |
| Average inter-item correlations | 0.392 | 0.333 | 0.365 |
| Minimum-maximum correlations | 0.298-0.497 | 0.258-0.505 | 0.331-0.401 |
| Range of correlations | 0.199 | 0.248 | 0.069 |
| | Average inter-item correlations between subscales | | |
| Openness to change/Self-enhancement | — | | |
| Self-transcendence/Conservation | 0.252 | — | |
| Self-enhancement | 0.345 | 0.250 | — |

*Notes*: *N* = 1,267 (split-half sample). Missing values are deleted pairwise.

### 3.1.2 Slovenia

The majority of the responses were clustered at the lower end of the scale in the first two response categories (Table 7). Lower mean responses were found for items defining Security (SEC5, SE14), Self-direction (SD11), Universalism (UN3, UN8, UN19) and Benevolence (BE12, BE18). Higher mean responses were found for items defining Stimulation (ST15), Power (PO2, PO17), Achievement (AC4, AC13) and Hedonism (HE10).

As shown in Table 7, the proportion of missing values for all the items was not so negligible as for Greece, ranging from 1.6 to 2.4%. Non-normality was not severe for any item (skewness>2; kurtosis>7). Based on the criteria of corrected item-total correlations and extraction communalities, the following six items were rejected from analysis: UN8 (It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them); TR9 (It is important to him to be humble and modest. He tries not to draw attention to himself);

TR20 (Tradition is important to him. He tries to follow the customs handed down by his religion or his family); CO7 (He believes that people should do what they are told. He thinks people should follow rules at all time, even when no-one is watching); PO2 (It is important to him to be rich. He wants to have a lot of money and expensive things); and ST15 (He looks for adventure and likes to take risks. He wants to have an exciting life).

Table 7

*Item Analysis of Schwartz Scale Values For ESS – 2002: Slovenia*

| Item | Mean (SD)* | 95% CI* | Frequency percent of response categories** | | | | | | | Skew* | Kurt.* | CC* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | NA | | | |
| SD1 | 2.56 (1.143) | 2.48-2.64 | 14.6 | 40.0 | 27.0 | 8.1 | 6.9 | 1.5 | 1.9 | 0.86 | 0.50 | 0.363 |
| SD11 | 2.09 (1.044) | 2.02-2.17 | 28.8 | 46.4 | 13.6 | 5.3 | 3.2 | 0.9 | 1.8 | 1.30 | 1.91 | 0.413 |
| UN3 | 1.97 (0.931) | 1.90-2.03 | 29.8 | 50.4 | 11.7 | 2.5 | 2.5 | 0.8 | 2.3 | 1.52 | 3.38 | 0.349 |
| UN8 | 2.40 (1.037) | 2.33-2.48 | 14.5 | 48.7 | 22.6 | 6.7 | 4.6 | 1.1 | 1.8 | 1.09 | 1.38 | 0.290 |
| UN19 | 2.07 (0.935) | 2.01-2.14 | 26.9 | 46.2 | 18.7 | 4.7 | 1.1 | 0.6 | 1.8 | 1.06 | 1.82 | 0.379 |
| BE12 | 2.30 (0.940) | 2.23-2.37 | 17.6 | 45.8 | 25.8 | 6.6 | 2.0 | 0.4 | 1.8 | 0.78 | 0.91 | 0.405 |
| BE18 | 2.37 (1.069) | 2.30-2.45 | 16.4 | 48.7 | 19.2 | 8.2 | 4.1 | 1.4 | 2.0 | 1.11 | 1.30 | 0.437 |
| TR9 | 2.32 (1.078) | 2.24-2.39 | 21.3 | 44.4 | 18.4 | 9.5 | 4.1 | 0.5 | 1.8 | 0.89 | 0.47 | 0.250 |
| TR20 | 2.62 (1.224) | 2.53-2.71 | 14.3 | 41.1 | 22.3 | 10.3 | 7.4 | 2.7 | 1.9 | 0.86 | 0.22 | 0.177 |
| CO7 | 3.10 (1.391) | 3.00-3.20 | 9.5 | 31.6 | 23.2 | 14.0 | 14.1 | 5.8 | 1.8 | 0.46 | -0.74 | 0.213 |
| CO16 | 2.54 (1.173) | 2.45-2.62 | 14.7 | 44.4 | 21.8 | 7.9 | 7.2 | 2.0 | 1.9 | 0.98 | 0.59 | 0.386 |
| SEC5 | 2.20 (1.060) | 2.12-2.27 | 23.6 | 48.5 | 14.6 | 6.3 | 3.8 | 1.1 | 2.0 | 1.21 | 1.51 | 0.354 |
| SEC14 | 2.18 (1.067) | 2.11-2.26 | 26.0 | 45.3 | 16.1 | 6.1 | 3.8 | 0.8 | 1.9 | 1.14 | 1.27 | 0.431 |
| PO2 | 4.18 (1.287) | 4.08-4.27 | 2.5 | 10.0 | 18.9 | 17.5 | 36.5 | 12.7 | 1.8 | -0.50 | -0.63 | 0.205 |
| PO17 | 2.86 (1.204) | 2.77-2.94 | 8.6 | 36.2 | 29.1 | 11.3 | 10.8 | 2.2 | 1.9 | 0.66 | -0.17 | 0.426 |
| AC4 | 2.89 (1.277) | 2.80-2.98 | 9.8 | 36.5 | 25.1 | 11.0 | 13.3 | 2.4 | 1.8 | 0.60 | -0.48 | 0.469 |
| AC13 | 2.72 (1.181) | 2.64-2.80 | 10.8 | 40.2 | 25.8 | 11.3 | 8.6 | 1.6 | 1.6 | 0.74 | -0.01 | 0.541 |
| HE10 | 3.00 (1.306) | 2.90-3.10 | 8.9 | 33.2 | 26.5 | 12.2 | 13.7 | 3.6 | 1.9 | 0.52 | -0.58 | 0.392 |
| HE21 | 2.70 (1.362) | 2.60-2.79 | 19.9 | 32.4 | 20.6 | 12.8 | 9.4 | 3.2 | 1.8 | 0.63 | -0.43 | 0.389 |
| ST6 | 2.56 (1.230) | 2.48-2.65 | 17.0 | 41.2 | 19.8 | 10.0 | 8.8 | 1.4 | 1.8 | 0.78 | -0.10 | 0.474 |
| ST15 | 3.86 (1.472) | 3.75-3.97 | 6.3 | 14.3 | 20.3 | 14.8 | 29.1 | 12.7 | 2.4 | -0.28 | -1.00 | 0.223 |

*Notes*: SD = standard deviation; CI = confidence interval; NA = no answer (missing values); Kurt. = kurtosis; CC = corrected item-total correlation. Items were assigned the following response categories: 1 (very much like me), 2 (like me), 3 (somewhat like me), 4 (a little like me), 5 (not like me) and 6 (not like me at all). Standard errors for skewness and kurtosis were 0.089 and 0.178, respectively.
*$N$ = 751. **$N$ = 788.

The eigenvalue rule >1 and scree test suggested the retention of a three-factor solution that best explained the variance when eigenvalues from the target data set were compared to the average and the 95$^{th}$ percentile of the random data sets. Parallel analysis confirmed this result as actual eigenvalues (4.019, 1.949, 1.217) were greater than the randomly generated ones for both the average (1.240, 1.188, 1.148) and the 95$^{th}$ percentile (1.287, 1.223, 1.177) eigenvalue criteria.

PCA and PAF (Table A2) resulted in a quite similar structure and interpretability, with PAF providing a simpler structure than PCA (Table 8).

Table 8

*Factor Loadings of Exploratory Factor Analysis (Principal Axis Factoring) With Promax Rotation (3 Factors): Slovenia*

| Variables | Principal axes factor analysis | | | Unique variance |
|---|---|---|---|---|
| | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation | Factor III Self-enhancement | |
| SD1 | **0.392** | 0.154 | 0.015 | 0.785 |
| SD11 | **0.539** | **0.283** | -0.166 | 0.623 |
| UN3 | 0.187 | **0.453** | -0.112 | 0.758 |
| UN19 | 0.122 | **0.546** | -0.116 | 0.700 |
| BE12 | 0.079 | **0.536** | -0.026 | 0.697 |
| BE18 | 0.191 | **0.424** | -0.007 | 0.745 |
| CO16 | **-0.273** | **0.505** | **0.308** | 0.582 |
| SEC5 | -0.146 | **0.500** | 0.178 | 0.682 |
| SEC14 | -0.046 | **0.540** | 0.130 | 0.650 |
| PO17 | 0.025 | 0.076 | **0.504** | 0.698 |
| AC4 | **0.297** | -0.058 | **0.537** | 0.542 |
| AC13 | **0.369** | 0.001 | **0.480** | 0.508 |
| HE10 | **0.570** | -0.084 | 0.116 | 0.641 |
| HE21 | **0.677** | -0.137 | 0.108 | 0.520 |
| ST15 | **0.582** | 0.084 | 0.089 | 0.578 |
| | Correlations between factors | | | |
| Openness to change/Self-enhancement | — | | | |
| Self-transcendence/ Conservation | 0.260 | — | | |
| Self-enhancement | 0.352 | 0.400 | — | |

*Note*: Factor loadings >.22 are in boldface.

The first factor was defined by the Self-Direction, Hedonism and one item of Stimulation values. Therefore, it refers mostly to Openness to change with elements of Self-enhancement. The second factor was defined by the Universalism, Benevolence, Conformity and Security values, which express both Self-transcendence and Conservation. The third factor was defined by Self-enhancement as it consists of Achievement and one item from the Power values. These three factors explain 26.791, 12.992 and 8.116% of the variance, respectively.

Moreover, the three-factor solution on the 15 items indicated that almost all items demonstrated strong factor loadings ≥0.45 on at least one factor.

As shown in Table 9, Cronbach's alpha reliability coefficients for the subscales Openness to change/Self-enhancement, Self-transcendence/Conservation and Self-enhancement were 0.714, 0.726 and 0.658, respectively, indicating that the

third factor was not reliable. Split-half reliabilities were 0.739, 0.648 and 0.613, respectively. Average inter-item correlations within subscales were 0.333, 0.276 and 0.392 and between subscales 0.209, 0.299 και 0.235, indicating that the values were within the recommended range.

Table 9

*Descriptive Statistics, Reliability Coefficients and Internal Consistencies of the Subscales: Slovenia*

| | Subscale | | |
|---|---|---|---|
| | Openness to change/Self-enhancement | Self-transcendence/ Conservation | Self-enhancement |
| Range (number of items) | 1-6 (5) | 1-5 (7) | 1-6 (3) |
| Mean (standard error) | 2.58 (0.030) | 2.24 (0.023) | 2.82 (0.034) |
| 95% Confidence interval | 2.52-2.64 | 2.19-2.28 | 2.75-2.89 |
| Standard deviation | 0.835 | 0.636 | 0.939 |
| Skewness (standard error) | 0.626 (0.089) | 0.506 (0.089) | 0.525 (0.089) |
| Kurtosis (standard error) | 0.349 (0.178) | 0.843 (0.178) | 0.004 (0.178) |
| Cronbach's alpha reliability coefficient | 0.714 | 0.726 | 0.658 |
| Split-half reliability coefficient | 0.739 | 0.648 | 0.613 |
| Average inter-item correlations | 0.333 | 0.276 | 0.392 |
| Minimum-maximum correlations | 0.268-0.494 | 0.202-0.398 | 0.341-0.479 |
| Range of correlations | 0.326 | 0.196 | 0.138 |
| | Average inter-item correlations between subscales | | |
| Openness to change/Self-enhancement | — | | |
| Self-transcendence/Conservation | 0.209 | — | |
| Self-enhancement | 0.299 | 0.235 | — |

*Notes*: *N* = 756 (split-half sample). Missing values are deleted pairwise.

### 3.2 CFA-based analyses results

#### 3.2.1 Greece

Using CFA, four different models were tested: the first model of one first-order uncorrelated factor was based on the 17 observed variables (Figure 2); model 2a was based on the 17 observed variables with the limitation of two factors (Figure 3); model 2b of two first-order correlated factors was based on the 14 observed variables as indicated by the subscale reliability analysis results (Figure 4); model 3 of three first-order correlated factors was based on the EFA results (Figure 5); and model 4 of five-order correlated factors of unified values (Figure 6) as indicated by Davidov et al. (2008).

For the justification of the models 2a and 2b PCA and PAF were performed (Table A3 and Table A4). Both resulted in a quite similar structure and interpretability, with PAF providing a simpler structure than PCA (Table A5 and

Table 10). The two factors of model 2a explained 28.847 and 14.190% of the variance, respectively. Parallel analysis confirmed this result as actual eigenvalues (4.909, 2.412) were greater than the randomly generated ones for both the average (1.200, 1.161) and the 95$^{th}$ percentile (1.237, 1.188) eigenvalue criteria. The two factors of model 2b explained 35.045 and 14.543% of the variance, respectively. Parallel analysis confirmed this result as actual eigenvalues (4.906, 2.036) were greater than the randomly generated ones for both the average (1.179, 1.138) and the 95$^{th}$ percentile (1.217, 1.164) eigenvalue criteria.

Table 10

*Factor Loadings of Exploratory Factor Analysis (Principal Axis Factoring) With Promax Rotation (2 Factors-14 Items): Greece*

| Variables | Principal axis factor analysis (factors) | | Unique variance |
|---|---|---|---|
| | Factor I Self-transcendence/ Conservation | Factor II Openness to change/Self-enhancement | |
| SD1 | 0.089 | **0.594** | 0.589 |
| SD11 | 0.178 | **0.553** | 0.569 |
| UN3 | **0.600** | 0.026 | 0.624 |
| UN8 | **0.448** | **0.308** | 0.574 |
| UN19 | **0.587** | 0.128 | 0.568 |
| BE12 | **0.605** | 0.018 | 0.624 |
| BE18 | **0.651** | 0.042 | 0.548 |
| CO16 | **0.603** | -0.115 | 0.689 |
| SEC5 | **0.690** | -0.097 | 0.578 |
| SEC14 | **0.708** | -0.066 | 0.539 |
| AC4 | 0.101 | **0.509** | 0.682 |
| HE21 | -0.011 | **0.668** | 0.561 |
| ST6 | 0.023 | **0.681** | 0.521 |
| ST15 | **-0.332** | **0.757** | 0.554 |
| | Correlations between factors | | |
| Self-transcendence/ Conservation | — | | |
| Openness to change/Self-enhancement | 0.474 | — | |

*Note*: Component and factor loadings >.22 are in boldface.

As shown in Table 11, the fit of model 1 was not adequate (NFI = 0.788, CFI = 0.800, RMSEA = 0.099, $\chi^2/df$ = 13.49); model 2a had a better fit but also not adequate (NFI = 0.917, CFI = 0.931, RMSEA = 0.058, $\chi^2/df$ = 5.31); model 2b presented a good fit (NFI = 0.951, CFI = 0.964, RMSEA = 0.046, $\chi^2/df$ = 3.70); model 3 had also a better fit than model 1 but still not adequate (NFI = 0.927, CFI = 0.941,

RMSEA = 0.055, $\chi^2/df$ = 4.79); model 4 resulted in using a non-positive definite matrix. Therefore, model 2b provided a better fit to the data than all other models.

Table 11

*Confirmatory Factor Analysis (Maximum Likelihood), Goodness-of-fit Indices of Four Models: Greece*

| Models tested | Factor structure | $\chi^2$ | *df* | NFI[a] | CFI[a] | AGFI[a] | RMSEA[b] (95 % CI) | ECVI[b] | AIC[b] | CAIC[b] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 first-order uncorrelated factor | 1443.80 | 107 | 0.788 | 0.800 | 0.789 | 0.099 (0.095-0.104) | 1.217 | 1535.80 | 1818.30 |
| 2a | 2 first-order correlated factors (17 items) | 568.07 | 107 | 0.917 | 0.931 | 0.925 | 0.058 (0.054-0.063) | 0.523 | 660.07 | 942.57 |
| 2b | 2 first-order correlated factors (14 items) | 258.94 | 70 | 0.951 | 0.964 | 0.957 | 0.046 (0.040-0.052) | 0.261 | 328.94 | 543.89 |
| 3 | 3 first-order correlated factors | 497.90 | 104 | 0.927 | 0.941 | 0.935 | 0.055 (0.050-0.060) | 0.472 | 595.90 | 896.82 |
| 4 | 5 first-order correlated factors of unified values | — | — | 0.854 | 0.870 | 0.888 | 0.072 (0.068-0.076) | 0.915 | 1155.08 | 1449.86 |

*Notes*: df degrees of freedom; CI confidence interval; NFI normed fit index; CFI comparative fit index; AGFI adjusted goodness-of-fit index; RMSEA root-mean-square error of approximation; ECVI expected cross-validation index; AIC Akaike information criterion; CAIC consistent Akaike information criterion. The covariance matrix of the 5 first-order correlated factors of unified values was not positive definite.
a Higher values indicate better model fit
b Lower values indicate better model fit

As shown in Table 12, the results confirmed that the third factor was not reliable, this time for the full sample. Cronbach's alpha reliability coefficients for the subscales Openness to change/Self-enhancement, Self-transcendence/Conservation and Self-enhancement were 0.794, 0.814 and 0.617, respectively. Split-half reliabilities were 0.748, 0.778 and 0.580, respectively. Average inter-item correlations within subscales were 0.402, 0.356 and 0.350 and between subscales 0.267, 0.352 and 0.268, indicating that the values were within the recommended range.

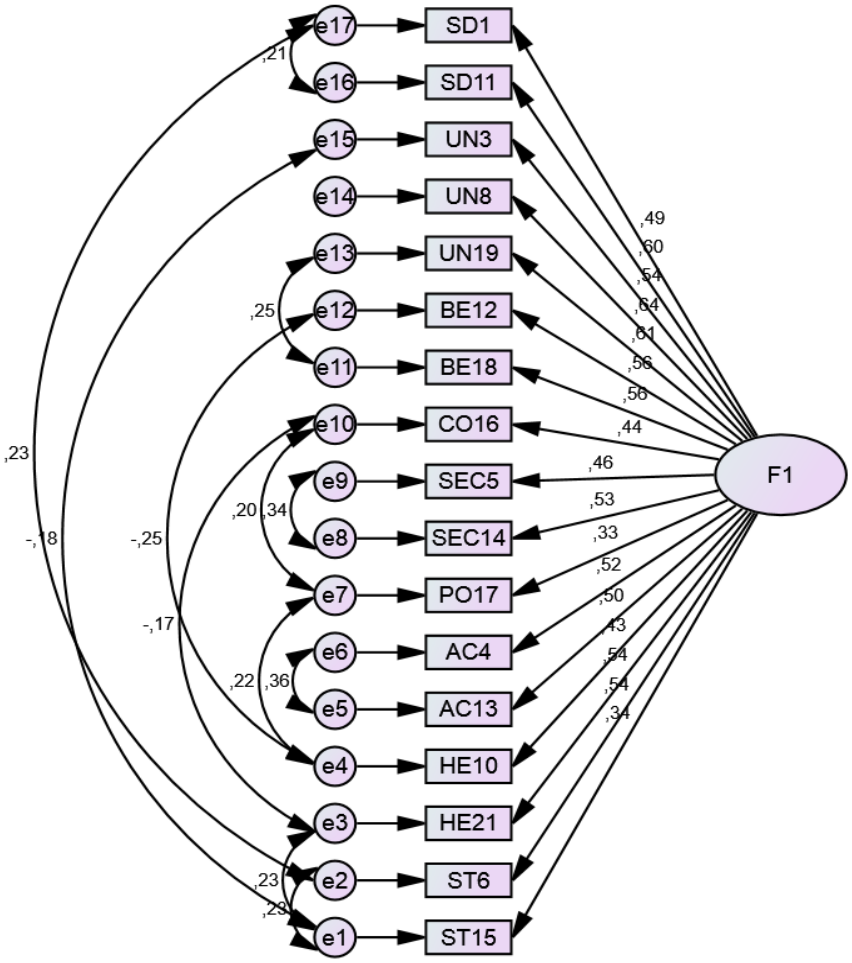


Figure 2. Standardized solution for the 1 first-order uncorrelated factor (model 1) based on CFA analysis ($N$ = 1,263). Observed variables are represented by rectangles and latent variables are enclosed in ellipses: Greece.

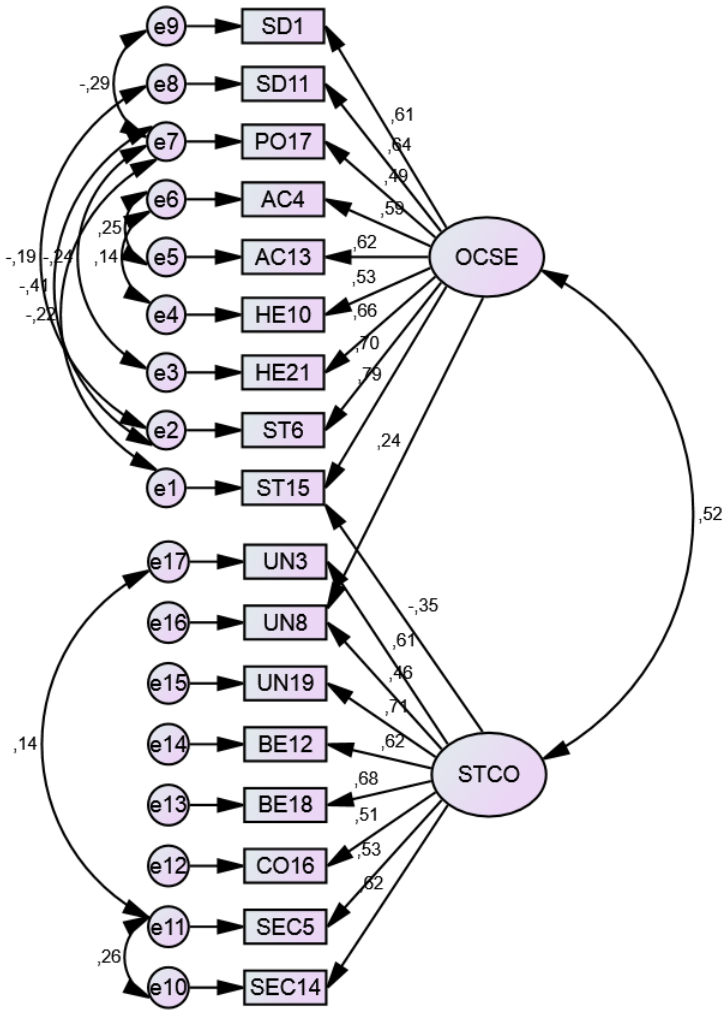


Figure 3. Standardized solution for the 2 first-order correlated factors (model 2a; 17 items) based on CFA analysis ($N$ = 1,263). Observed variables are represented by rectangles and latent variables are enclosed in ellipses: Greece.

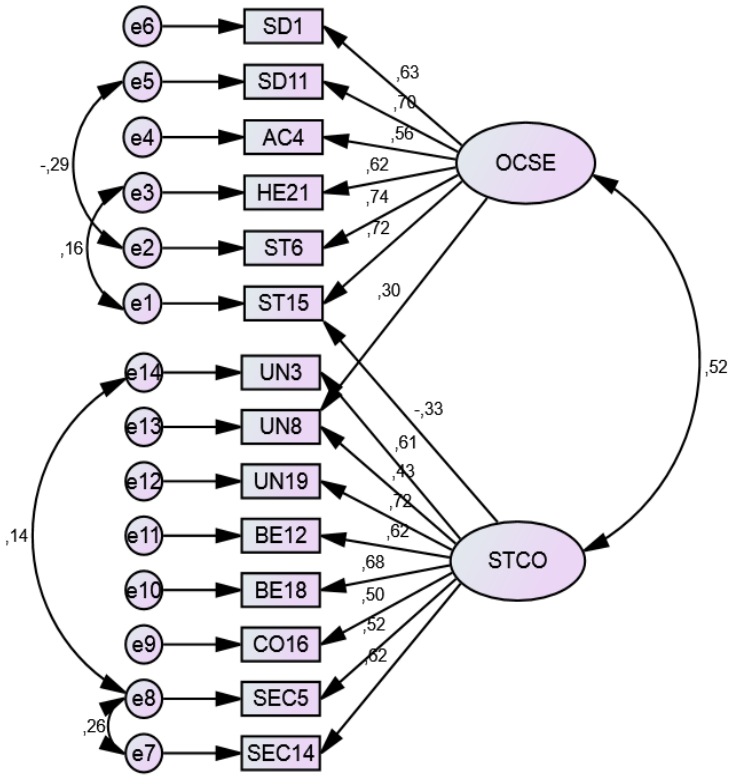


Figure 4. Standardized solution for the 2 first-order correlated factors (model 2b; 14 items) based on CFA analysis ($N$ = 1,263). Observed variables are represented by rectangles and latent variables are enclosed in ellipses: Greece.

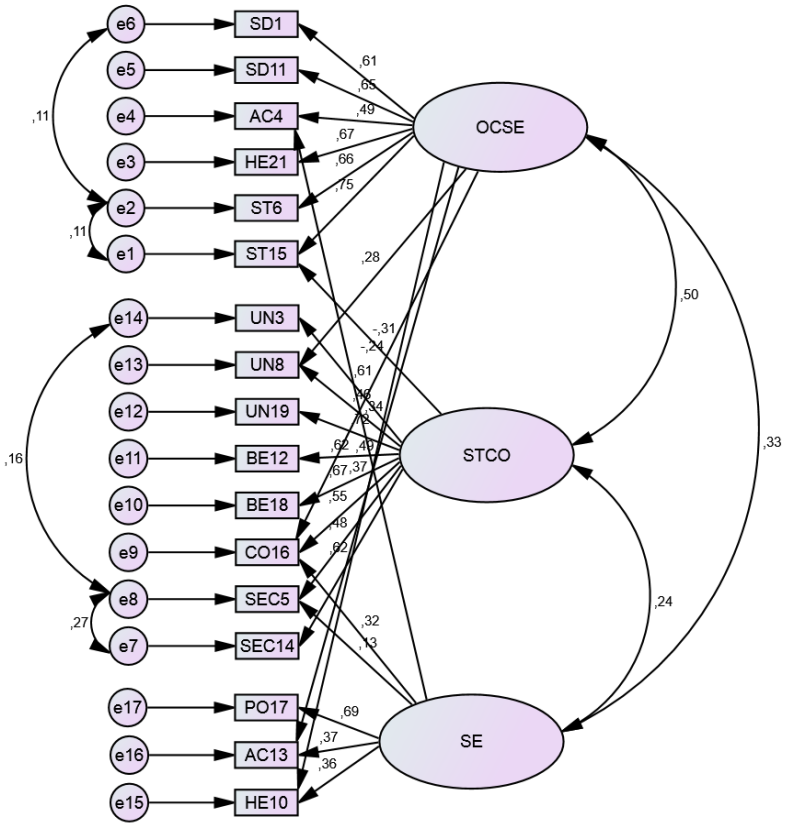


Figure 5. Standardized solution for the 3 first-order correlated factors (model 3) based on CFA analysis ($N$ = 1,263). Observed variables are represented by rectangles and latent variables are enclosed in ellipses: Gre

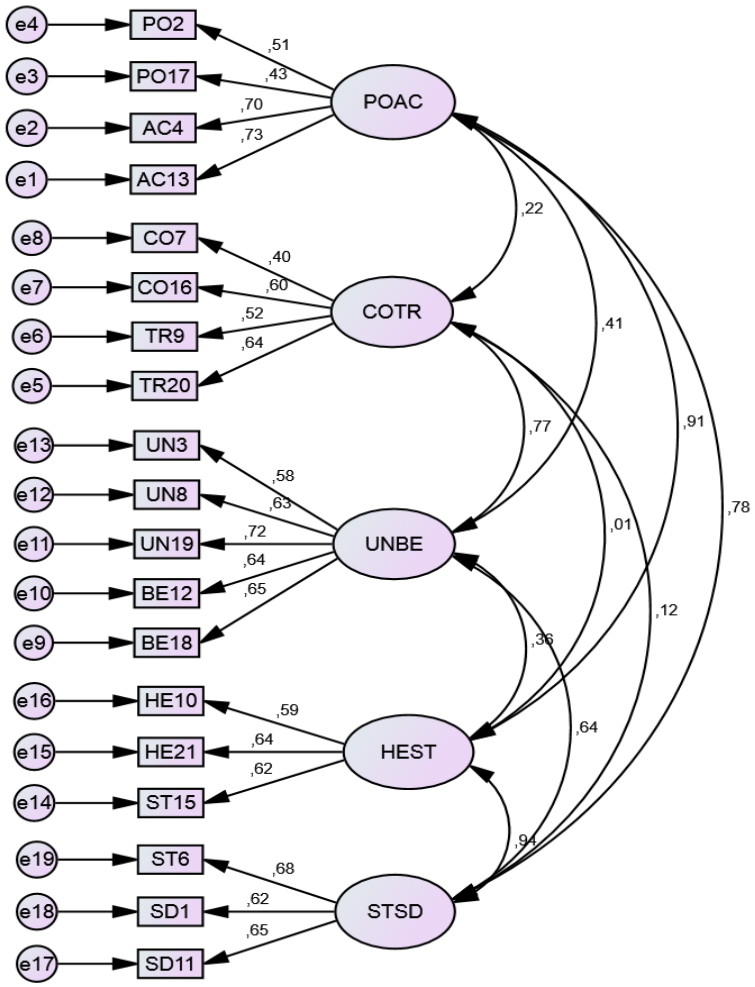


Figure 6. Standardized solution for the 5 first-order correlated factors of unified values (model 4) based on CFA analysis ($N$ = 1,263). Observed variables are represented by rectangles and latent variables are enclosed in ellipses: Greece.

Table 12

*Descriptive Statistics, Reliability Coefficients and Internal Consistencies of the Subscales (Full Sample): Greece*

| | Subscale | | |
|---|---|---|---|
| | Openness to change/Self-enhancement | Self-transcendence/ Conservation | Self-enhancement |
| Range (number of items) | 1-6 (6) | 1-6 (8) | 1-6 (3) |
| Mean (standard error) | 2.67 (0.018) | 1.90 (0.012) | 2.72 (0.019) |
| 95% Confidence interval | 2.63-2.70 | 1.88-1.92 | 2.68-2.76 |
| Standard deviation | 0.888 | 0.599 | 0.972 |
| Skewness (standard error) | 0.602 (0.049) | 1.459 (0.049) | 0.497 (0.049) |
| Kurtosis (standard error) | 0.158 (0.098) | 5.165 (0.098) | 0.117 (0.098) |
| Cronbach's alpha reliability coefficient | 0.794 | 0.814 | 0.617 |
| Split-half reliability coefficient | 0.748 | 0.778 | 0.580 |
| Average inter-item correlations | 0.402 | 0.356 | 0.350 |
| Minimum-maximum correlations | 0.319-0.504 | 0.287-0.525 | 0.316-0.400 |
| Range of correlations | 0.186 | 0.238 | 0.084 |
| | Average inter-item correlations between subscales | | |
| Openness to change/Self-enhancement | — | | |
| Self-transcendence/Conservation | 0.267 | — | |
| Self-enhancement | 0.352 | 0.268 | — |

*Notes*: $N$ = 2,518. Missing values are deleted pairwise.

### 3.2.2 Slovenia

Using CFA, three different models were tested: the first model of one first-order uncorrelated factor was based on the 15 observed variables (Figure 7); model 2a was based on the 15 observed variables with the limitation of two factors (Figure 8); model 2b of two first-order correlated factors was based on the 12 observed variables as indicated by the subscale reliability analysis results (Figure 9); model 3 of three first-order correlated factors was based on the EFA results (Figure 10); and model 4 of five-order correlated factors of unified values (Figure 11) as indicated by Davidov et al. (2008)

For the justification of the second model PCA and PAF were performed (Table A8 and Table A9). Both resulted in a quite similar structure and interpretability, with PAF providing a simpler structure than PCA (Table A10 and Table 13). The two factors of model 2a explain 26.376 and 12.879% of the variance, respectively. Parallel analysis confirmed this result as actual eigenvalues (3.956, 1.932) were greater than the randomly generated ones for both the average (1.240, 1.188) and the 95$^{th}$ percentile (1.287, 1.223) eigenvalue criteria.

The two factors of model 2b explain 27.796 and 14.444% of the variance, respectively. Parallel analysis confirmed this result as actual eigenvalues (3.336, 1.733) were greater than the randomly generated ones for both the average (1.212, 1.158) and the 95$^{th}$ percentile (1.259, 1.198) eigenvalue criteria.

Table 13

*Factor Loadings of Exploratory Factor Analysis (Principal Axis Factoring) With Promax Rotation (2 Factors-12 Items): Slovenia*

| Variables | Principal axes factor analysis (factors) | | Unique variance |
|---|---|---|---|
| | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation | |
| SD1 | **0.484** | 0.033 | 0.750 |
| SD11 | **0.514** | 0.139 | 0.655 |
| UN3 | 0.207 | **0.324** | 0.795 |
| UN19 | 0.177 | **0.476** | 0.669 |
| BE12 | 0.051 | **0.552** | 0.668 |
| BE18 | **0.241** | **0.404** | 0.694 |
| CO16 | -0.161 | **0.568** | 0.731 |
| SEC5 | -0.119 | **0.553** | 0.737 |
| SEC14 | -0.077 | **0.582** | 0.694 |
| HE10 | **0.559** | -0.081 | 0.720 |
| HE21 | **0.681** | -0.158 | 0.605 |
| ST6 | **0.661** | -0.022 | 0.575 |
| Correlations between factors | | | |
| Openness to change/Self-enhancement | — | | |
| Self-transcendence/ Conservation | 0.434 | — | |

*Note*: Factor loadings >.22 are in boldface.

As shown in Table 14, the fit of the first model was not adequate (NFI = 0.817, CFI = 0.844, RMSEA = 0.078, $\chi^2/df$ = 5.43). Model 2a was also not adequate (NFI = 0.824, CFI = 0.854, RMSEA = 0.073, $\chi^2/df$ = 4.90). Model 2b presented a better fit (NFI = 0.893, CFI = 0.921, RMSEA = 0.058, $\chi^2/df$ = 3.44). The third model had also a poor fit (NFI = 0.843, CFI = 0.873, RMSEA = 0.068, $\chi^2/df$ = 4.43). The fourth model resulted in using a non-positive definite matrix. Therefore, model 2b provided a better fit to the data than all other models.

Table 14

*Confirmatory Factor Analysis (Maximum Likelihood), Goodness-of-fit indices of Four Models: Slovenia*

| Models tested | Factor structure | $\chi^2$ | *df* | NFI[a] | CFI[a] | AGFI[a] | RMSEA[b] (95 % CI) | ECVI[b] | AIC[b] | CAIC[b] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 first-order uncorrelated factor | 434.24 | 80 | 0.817 | 0.844 | 0.884 | 0.078 (0.070-0.085) | 0.698 | 514.24 | 738.40 |
| 2a | 2 first-order correlated factors (15 items) | 416.93 | 85 | 0.824 | 0.854 | 0.896 | 0.073 (0.066-0.080) | 0.661 | 486.93 | 683.07 |
| 2b | 2 first-order correlated factors (12 items) | 308.97 | 48 | 0.925 | 0.935 | 0.936 | 0.066 (0.059-0.073) | 0.292 | 368.97 | 553.21 |
| 3 | 3 first-order correlated factors | 518.20 | 79 | 0.908 | 0.921 | 0.918 | 0.066 (0.061-0.072) | 0.476 | 600.20 | 851.99 |
| 4 | 5 first-order correlated factors of unified values | — | — | 0.800 | 0.835 | 0.884 | 0.070 (0.065-0.076) | 1.020 | 751.829 | 1020.82 |

*Notes*: df degrees of freedom; CI confidence interval; NFI normed fit index; CFI comparative fit index; AGFI adjusted goodness-of-fit index; RMSEA root-mean-square error of approximation; ECVI expected cross-validation index; AIC Akaike information criterion; CAIC consistent Akaike information criterion. The covariance matrix of the 5 first-order correlated factors of unified values was not positive definite.
a Higher values indicate better model fit
b Lower values indicate better model fit

As shown in Table 15, the results confirmed that the third factor was not reliable, this time for the full sample. Cronbach's alpha reliability coefficients for the subscales Openness to change/Self-enhancement, Self-transcendence/ Conservation and Self-enhancement were 0.714, 0.726 and 0.683 respectively. Split-half reliability coefficients were 0.739, 0.641 and 0.642 respectively. The average inter-item correlations within subscales were 0.334, 0.275 and 0.419 and between subscales 0.214, 0.311 and 0.241, indicated that the values were within the recommended range.

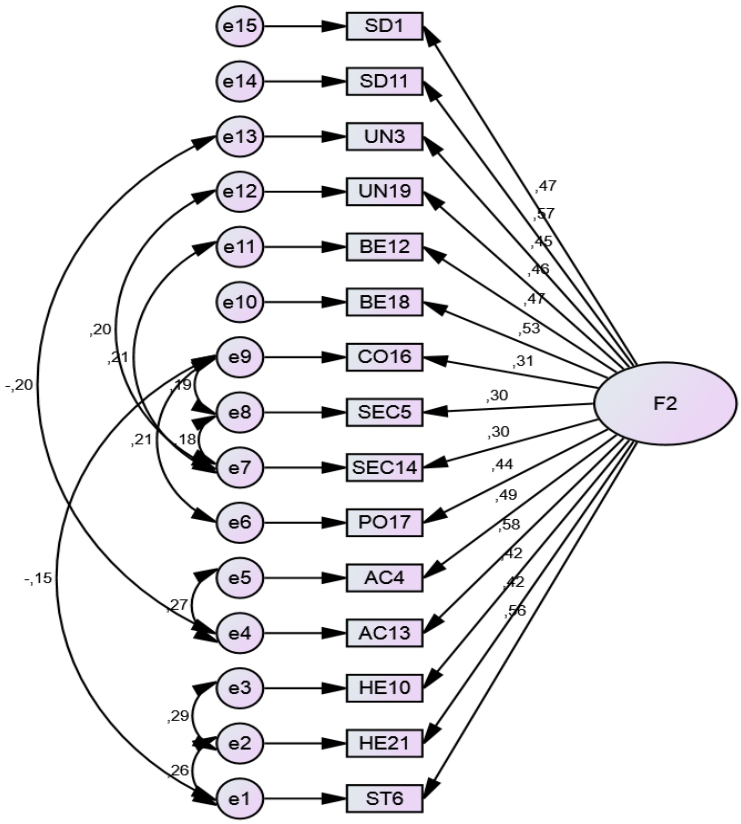


Figure 7. Standardized solution for the 1 first-order uncorrelated factor (model 1) based on CFA analysis ($N$ = 738). Observed variables are represented by rectangles and latent variables are enclosed in ellipses: Slovenia.

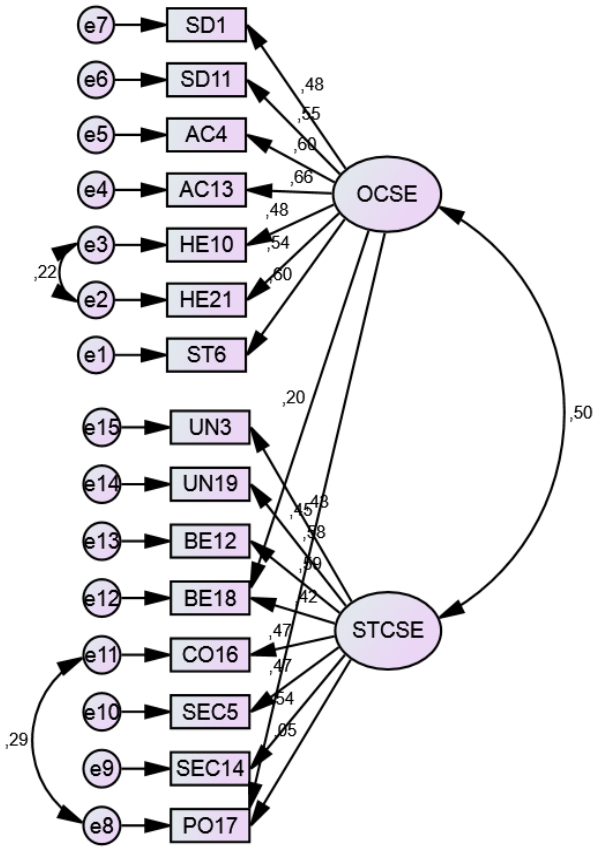


Figure 8. Standardized solution for the 2 first-order correlated factors (model 2a; 15 items) based on CFA analysis (*N* = 738). Observed variables are represented by rectangles and latent variables are enclosed in ellipses: Slovenia.

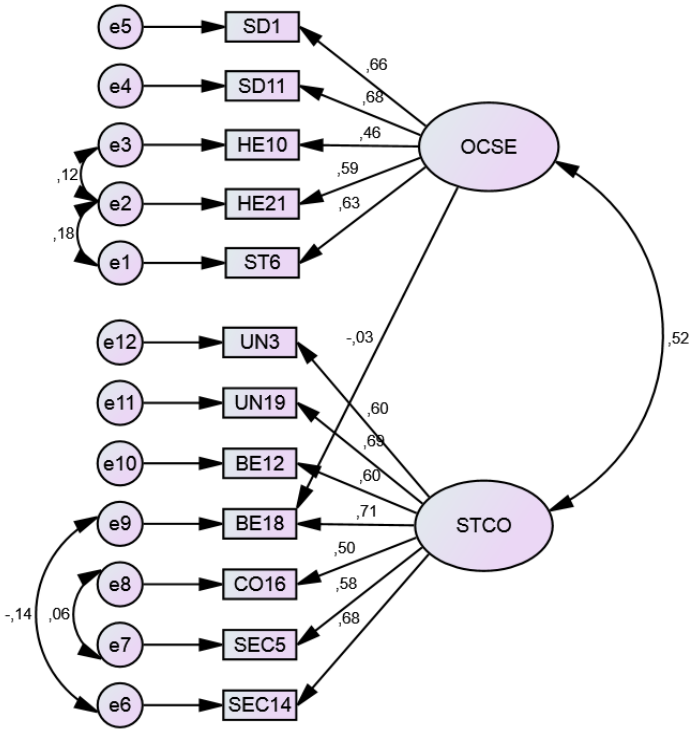


Figure 9. Standardized solution for the 2 first-order correlated factors (model 2b; 12 items) based on CFA analysis (*N* = 738). Observed variables are represented by rectangles and latent variables are enclosed in ellipses: Slovenia.

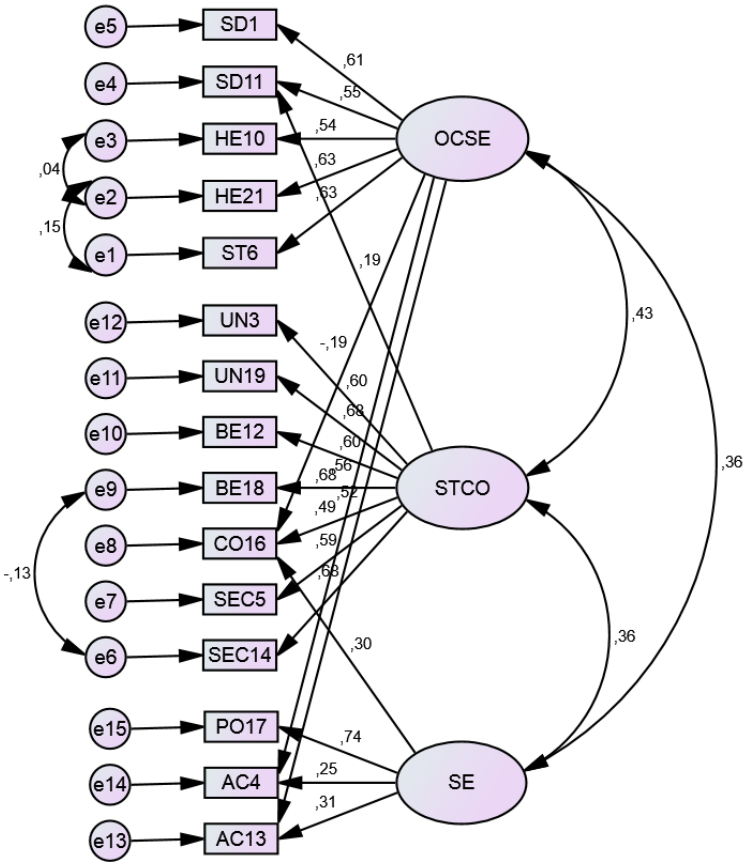


Figure 10. Standardized solution for the 3 first-order correlated factors (model 3) based on CFA analysis ($N$ = 738). Observed variables are represented by rectangles and latent variables are enclosed in ellipses: Slovenia.

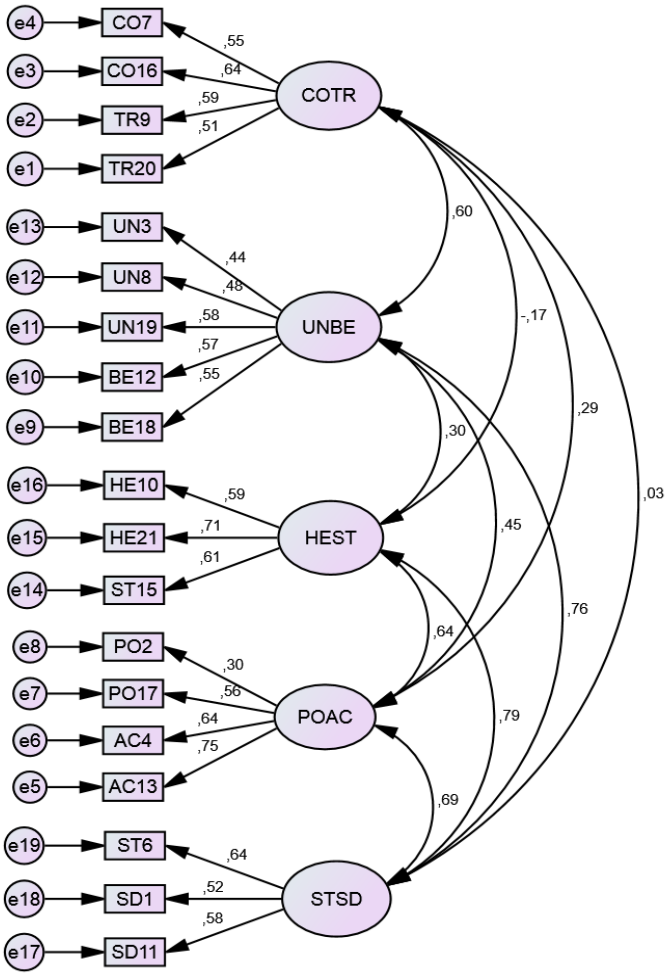


Figure 11. Standardized solution for the 5 first-order correlated factors of unified values (model 4) based on CFA analysis ($N$ = 738). Observed variables are represented by rectangles and latent variables are enclosed in ellipses: Slovenia.

Table 15

*Descriptive Statistics, Reliability Coefficients and Internal Consistencies of the Subscales (Full Sample): Slovenia*

| | Subscale | | |
|---|---|---|---|
| | Openness to change/Self-enhancement | Self-transcendence/ Conservation | Self-enhancement |
| Range (number of items) | 1-6 (5) | 1-5 (7) | 1-6 (3) |
| Mean (standard error) | 2.57 (0.022) | 2.25 (0.017) | 2.80 (0.025) |
| 95% Confidence interval | 2.53-2.61 | 2.22-2.28 | 2.75-2.84 |
| Standard deviation | 0.831 | 0.631 | 0.953 |
| Skewness (standard error) | 0.598 (0.064) | 0.505 (0.064) | 0.531 (0.064) |
| Kurtosis (standard error) | 0.288 (0.128) | 0.846 (0.128) | 0.032 (0.128) |
| Cronbach's alpha reliability coefficient | 0.714 | 0.726 | 0.683 |
| Split-half reliability coefficient | 0.739 | 0.641 | 0.642 |
| Average inter-item correlations | 0.334 | 0.275 | 0.419 |
| Minimum-maximum correlations | 0.219-0.468 | 0.187-0.378 | 0.357-0.502 |
| Range of correlations | 0.249 | 0.192 | 0.146 |
| | Average inter-item correlations between subscales | | |
| Openness to change/Self-enhancement | — | | |
| Self-transcendence/Conservation | 0.214 | — | |
| Self-enhancement | 0.311 | 0.241 | — |

*Notes*: $N$ = 1,449. Missing values are deleted pairwise.

## DISCUSSION AND CONCLUSIONS

In this study, the investigation of the dimensionality of the ESS Schwartz values scale by applying the traditional approaches of EFA and CFA to randomly split half-samples indicated a different structure from the five unified values that had been proposed by Davidov et al. (2008) for Greece and Slovenia in order to solve the problem of non-positive definite matrices of the constructs in single-country CFAs. In both cases, when the proposed solution was tested on the second split-half samples, the CFAs showed that this problem was still present. Item analyses carried out on the first split-half samples indicated that a number of items had first to be excluded from further analysis. In both cases, four models were tested. The models with two first-order correlated factors based on 14 and 12 items in Greece and Slovenia, respectively, and the results of the respective EFAs and the reliabilities of the subscales, provided a better fit to the data. The fit was improved by considering cross-loadings as suggested by Lilleoja and Saris (2014). Based on these results, in both countries, the resulting two underlying dimensions were defined as Openness to change/Self-enhancement and Self-transcendence/Conservation values, respectively. This solution provided reliable subscales for further analyses.

Certainly, many aspects of the analyses conducted should be tested further. For instance, missing values were treated as missing at random (MAR) and in carrying out EFA they were deleted pairwise as proposed by Davidov et al. (2008). But in carrying out CFA, they were replaced by their respective mean values. In this respect, multiple imputations is another option to be considered for both types of analyses. Although item analysis showed in both cases that non-normality was not severe for any item (skewness>2; kurtosis>7), justifying the methods used, unweighted least squares factoring is another method to be considered and the results of both methods should be compared. Although the items were Likert-type with six response categories and therefore were treated as pseudo-interval, an analysis considering them as ordinal should be conducted – basing the CFA on the polychoric correlation matrix (Anagnostopoulos et al., 2013) – and the results of these two methods should be compared.

The ESS has included Schwartz's Short Form of the Human Values Scale in all its rounds and therefore this work could be extended to cover all participating

countries in every round. In this way, researchers would be provided with valid and reliable subscales for their analyses.

**REFERENCES**


Anagnostopoulos, F., Yfantopoulos, J., Moustaki, I., & Niakas, D. (2013). Psychometric and factor analytic evaluation of the 15D health-related quality of life instrument: the case of Greece. *Quality of Life Research,* 22, 1973-1986. doi: 10.1007/s11136-013-0348-2

Bartholomew, D. J., Steele, F, Moustaki, I., & Galbraith, J. (2008). *Analysis of multivariate social science data*. London: Chapman & Hall/CRC.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research.* New York: The Guilford Press.

Cabrera-Nguyen, P. (2010). Author guidelines for reporting scale development and validation results. *Journals of the Society for Social Work and Research*, 1, 99-103.

Clark, L. A., & Watson, D. (1995, September). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, 7(3), 309-319.

Datler, G., Jagodzinski, W., & Schmidt, P. (2013). Two theories on the test bench: Internal and external validity of the theories of Ronald Inglehart and Shalom Schwartz. *Social Science Research*, 42, 906-925. doi: 10.1016/j.ssresearch.2012.12.009

Davidov, E., Schmidt, P., & Schwartz, S. H. (2008). Bringing values back in the adequacy of the European Social Survey to measure values in 20 countries. *Public Opinion Quarterly*, 72(3), 420-445.

European Social Survey (2002). *Final report: sampling for the European Social Survey*. Retrieved from the European Social Survey website http://www.europeansocialsurvey.org/docs/round1/methods/ESS1_sampling_report.pdf

European Social Survey (n.d.). *Core Questionnaire*. Retrieved from http://www.europeansocialsurvey.org/docs/methodology/core_ess_questionnaire/ESS_core_questionnaire_human_ values. pdf

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4, 272-299.

Gillapsy Jr., J. A., Jackson, D. L., & Purc-Stephenson, R. (2009). Reporting practices in confirmatory factor analysis: An overview and some recommendations. *Psychological Methods*, 14(1), 6-23.

Hayton, J. C., Allen, D. G, & Scarpello, V. (2004). Factor retention decisions in exploratory factor analysis: A tutorial on parallel analysis. *Organizational Research Methods,* 7, 191-205. doi: 10.1177/1094428104263675

Knoppen, D., & Saris, W. (2009). Do we have to combine values in the Schwartz' human values scale? A comment on the Davidov studies. *Survey Research Methods*, 3(2), 91-103.

Ledesma, R. D., & Valero-Mora, P. (2007, February). Determining the number of factors to retain in EFA: an easy-to-use computer program for carrying out parallel analysis. *Practical Assessment, Research & Evaluation*, 12(2), 1-11.

Lilleoja, L., & Saris, W. E. (2014). Testing a new operationalization of the basic values on Estonian-and Russian-speaking subpopulations in Estonia. *Social Indicators Research*, 116, 153-172. doi: 10.1007/s11205-013-0272-4

Michalopoulou, C., & Symeonaki, M. (2014). Transforming Likert scale raw scores with k-means clustering: an empirical study. Manuscript in preparation.

Minnesota Population Center. *Integrated Public Use Microdata Series, International: Version 6.2* [Machine-readable database]. Minneapolis: University of Minnesota, 2013.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. New York: McGraw-Hill.

O'Connor, Br. P. (2000). SPSS and SAS programs for determing the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instruments & Computers*, 32(3), 396-402.

Patil, V. H., Singh, S. N., Mishra, S., & Donavan T. (2007). *Parallel analysis engine to aid determining number of factors to retain* [Computer software]. Available from Instruction and Research Server, University of Kansas website: http://ires.ku.edu/~smishra/parallelengine.htm.

Patil, V. H., Singh, S. N., Mishra, S., & Donavan T. (2008). Efficient theory development and factor retention criteria: A case for abandoning the "eigenvalue greater than one" criterion. *Journal of Business Research*, 61, 162-170.

Reise, S. P., Waller, N., & Comrey, A. (2000). Factor analysis and scale revision. *Psychological Assessment*, 12(3), 287-297. doi: 10.1037//1040-3590.12.3.287

Schmitt, T. A. (2011). Current methodological considerations in exploratory and confirmatory factor analysis. *Journal of Psychoeducational Assessment*, 29, 304-322. doi: 10.1177/0734282911406653

Schwartz, S. H. (2001). A proposal for measuring value orientations across nations. *In European Social Survey core questionnaire* (pp. 259-319). Retrieved from http://www.europeansocialsurvey.org/docs/methodology/core_ess_questionnaire/ESS_core_questionnaire_human_ values. pdf

Schwartz, S. H. (2011). Studying values: Personal adventure, future directions. *Journal of Cross-Cultural Psychology*, 42, 307-319. doi: 10.1177/0022022110396925

Stevens, J. (2002). *Applied multivariate statistics for the social sciences*. New Jersey: Lawrence Erlbaum Associates.

Symeonaki, M., Michalopoulou, C., & Kazani, A. (2014). A fuzzy set theory solution to combining Likert items into a single overall scale (or subscales). *Quality & Quantity*. doi: 10.1007/s11135-014-0021-z.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Pearson International Edition.

Thompson, Br. (2005). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. Washington DC: American Psychological Association.

# APPENDIX I

**The ESS short form of Portrait Value Questionnaire (PVQ-21) developed by Schwartz**

RESPONDENT: IF YOU ARE MALE, ANSWER GS1. IF YOU ARE FEMALE, ANSWER GS2

## GS1 MALE RESPONDENTS

**Here we briefly describe some people. Please read each description tick the box on each line that shows how much each person is or is not like you.**

| | | Very much like me | Like me | Some-what like me | A little like me | Not like me | Not like me at all |
|---|---|---|---|---|---|---|---|
| A | Thinking up new ideas[1] and being creative is important to him. He likes to do things in his own original way. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| B | It is important to him to be rich. He wants to have a lot of money and expensive[2] things. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| C | He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| D | It's important to him to show[3] his abilities. He wants people to admire[4] what he does. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| E | It is important to him to live in secure[5] surroundings. He avoids anything that might endanger his safety. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| F | He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life[6]. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| G | He believes that people should do what they're told[7]. He thinks people should follow rules[8] at all times, even when no-one is watching. | ☐ 1 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 6 |
| H | It is important to him to listen to people who are different[9] from him. Even when he disagrees with them, he still wants to understand them. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| I | It is important to him to be humble and modest. He tries not to draw attention to himself. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| J | Having a good time is important to him. He likes to "spoil"[10] himself. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |

| | | Very much like me | Like me | Some-what like me | A little like me | Not like me | Not like me at all |
|---|---|---|---|---|---|---|---|
| K | It is important to him to make his own decisions about what he does. He likes to be free and not depend[11] on others. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| L | It's very important to him to help the people around him. He wants to care for[12] their well-being. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| M | Being very successful is important to him. He hopes people will recognise his achievements. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| N | It is important to him that the government ensures[13] his safety against all threats. He wants the state to be strong so it can defend its citizens. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| O | He looks for adventures and likes to take risks. He wants to have an exciting[14] life. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| P | It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| Q | It is important to him to get[15] respect from others. He wants people to do what he says. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| R | It is important to him to be loyal to his friends. He wants to devote[16] himself to people close to him. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| S | He strongly believes that people should care for[17] nature. Looking after the environment is important to him. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| R | Tradition is important to him. He tries to follow the customs handed down by his religion or his family. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| U | He seeks every chance[18] he can to have fun. It is important to him to do things that give him pleasure. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |

## GS2 FEMALE RESPONDENTS[19]

**Here we briefly describe some people. Please read each description tick the box on each line that shows how much each person is or is not like you.**

| | | Very much like me | Like me | Some-what like me | A little like me | Not like me | Not like me at all |
|---|---|---|---|---|---|---|---|
| A | Thinking up new ideas and being creative is important to her. She likes to do things in her own original way. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| B | It is important to her to be rich. She wants to have a lot of money and expensive things. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| C | She thinks it is important that every person in the world should be treated equally. She believes everyone should have equal opportunities in life. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| D | It's important to her to show her abilities. She wants people to admire what she does. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| E | It is important to her to live in secure surroundings. She avoids anything that might endanger her safety. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| F | She likes surprises and is always looking for new things to do. She thinks it is important to do lots of different things in life. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| G | She believes that people should do what they're told. She thinks people should follow rules at all times, even when no-one is watching. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| H | It is important to her to listen to people who are different from her. Even when she disagrees with them, she still wants to understand them. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| I | It is important to her to be humble and modest. She tries not to draw attention to herself. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| J | Having a good time is important to her. She likes to "spoil" herself. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |

| | | Very much like me | Like me | Some-what like me | A little like me | Not like me | Not like me at all |
|---|---|---|---|---|---|---|---|
| **K** | It is important to her to make her own decisions about what she does. She likes to be free and not depend on others. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| **L** | It's very important to her to help the people around her. She wants to care for their well-being. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| **M** | Being very successful is important to her. She hopes people will recognise her achievements. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| **N** | It is important to her that the government ensures her safety against all threats. She wants the state to be strong so it can defend its citizens. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| O | She looks for adventures and likes to take risks. She wants to have an exciting life. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| **P** | It is important to her always to behave properly. She wants to avoid doing anything people would say is wrong. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| Q | It is important to her to get respect from others. She wants people to do what she says. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| R | It is important to her to be loyal to her friends. She wants to devote herself to people close to her. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| **S** | She strongly believes that people should care for nature. Looking after the environment is important to her. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| T | Tradition is important to her. She tries to follow the customs handed down by her religion or her family. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |
| U | She seeks every chance she can to have fun. It is important to her to do things that give her pleasure. | ☐ 01 | ☐ 02 | ☐ 03 | ☐ 04 | ☐ 05 | ☐ 06 |

# APPENDIX II

**Box-plots, PCA, EFA and covariance matrices**

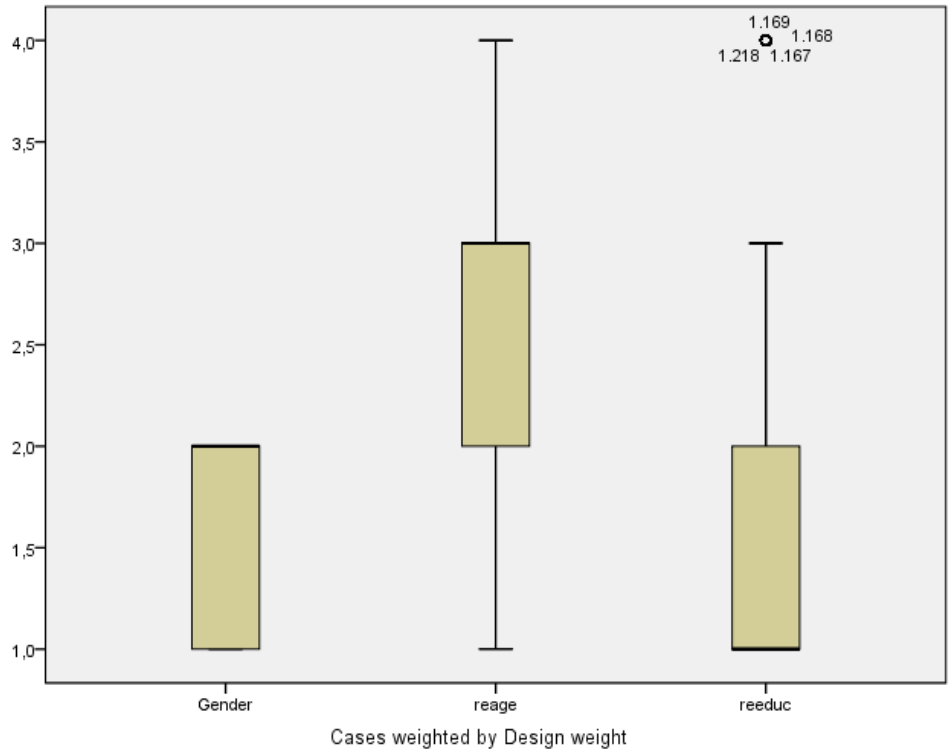


Figure A1. Box-plot of gender, age and education: Greece

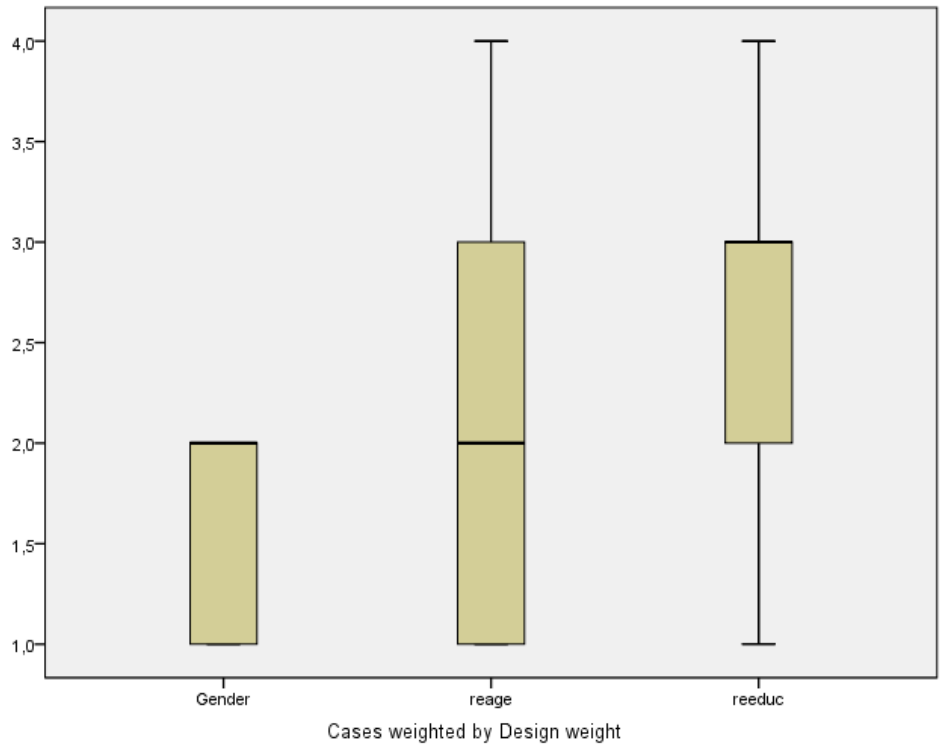


Figure A2. Box-plot of gender, age and education: Slovenia

Table A1

*Loadings for Principal Components and Common Factors Using Varimax and Promax Rotations: Greece*

| Rotation | Principal components analysis (components) | | | Principal axis factor analysis (factors) | | |
|---|---|---|---|---|---|---|
| | Factor I Openness to change/Self-enhancement | FactorII Self-transcendence/ Conservation | Factor III Self-enhancement | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation | Factor III Self-enhancement |
| Varimax | | | | | | |
| SD1 | **0.670** | 0.211 | 0.004 | **0.586** | 0.206 | 0.043 |
| SD11 | **0.597** | **0.294** | 0.163 | **0.537** | **0.289** | 0.162 |
| UN3 | 0.132 | **0.657** | -0.031 | 0.127 | **0.580** | -0.004 |
| UN8 | **0.392** | **0.531** | 0.004 | **0.347** | **0.478** | 0.037 |
| UN19 | 0.208 | **0.679** | -0.039 | 0.195 | **0.616** | -0.016 |
| BE12 | 0.177 | **0.630** | -0.058 | 0.160 | **0.547** | -0.012 |
| BE18 | 0.101 | **0.653** | 0.076 | 0.111 | **0.582** | 0.068 |
| CO16 | -0.145 | **0.546** | **0.434** | -0.071 | **0.502** | **0.313** |
| SEC5 | -0.070 | **0.634** | **0.324** | -0.025 | **0.589** | **0.253** |
| SEC14 | 0.014 | **0.650** | 0.220 | 0.043 | **0.593** | 0.176 |
| PO17 | 0.070 | 0.155 | **0.761** | 0.128 | 0.184 | **0.569** |
| AC4 | **0.554** | 0.083 | **0.454** | **0.521** | 0.111 | **0.392** |
| AC13 | **0.528** | 0.041 | **0.555** | **0.512** | 0.070 | **0.496** |
| HE10 | **0.403** | -0.029 | **0.604** | **0.395** | 0.022 | **0.471** |
| HE21 | **0.687** | 0.143 | 0.140 | **0.621** | 0.154 | 0.139 |
| ST6 | **0.764** | 0.181 | 0.022 | **0.721** | 0.184 | 0.021 |
| ST15 | **0.703** | -0.177 | 0.133 | **0.631** | -0.138 | 0.133 |
| Promax | | | | | | |
| SD1 | **0.676** | 0.157 | -0.087 | **0.596** | 0.127 | -0.060 |
| SD11 | **0.566** | **0.229** | 0.081 | **0.502** | 0.204 | 0.070 |
| UN3 | 0.085 | **0.672** | -0.112 | 0.066 | **0.593** | -0.084 |
| UN8 | **0.360** | **0.513** | -0.090 | **0.306** | **0.448** | -0.061 |
| UN19 | 0.164 | **0.688** | -0.131 | 0.138 | **0.623** | -0.112 |
| BE12 | 0.139 | **0.643** | -0.143 | 0.108 | **0.555** | -0.094 |
| BE18 | 0.035 | **0.656** | 0.005 | 0.030 | **0.588** | -0.003 |
| CO16 | **-0.271** | **0.520** | **0.419** | **-0.220** | **0.496** | **0.302** |
| SEC5 | -0.183 | **0.619** | **0.287** | -0.166 | **0.589** | **0.220** |
| SEC14 | -0.079 | **0.641** | 0.166 | -0.073 | **0.594** | 0.125 |
| PO17 | -0.070 | 0.054 | **0.782** | -0.032 | 0.098 | **0.588** |
| AC4 | **0.491** | -0.024 | **0.414** | **0.448** | -0.011 | **0.343** |
| AC13 | **0.451** | -0.078 | **0.528** | **0.416** | -0.068 | **0.464** |
| HE10 | **0.318** | -0.146 | **0.599** | **0.303** | -0.099 | **0.459** |
| HE21 | **0.677** | 0.067 | 0.062 | **0.616** | 0.053 | 0.046 |
| ST6 | **0.773** | 0.115 | -0.075 | **0.751** | 0.087 | -0.101 |
| ST15 | **0.723** | **-0.264** | 0.085 | **0.664** | **-0.255** | 0.070 |
| | Correlations between components or factors | | | | | |
| Openness to change/Self-enhancement | — | | | — | | |
| Self-transcendence/ Conservation | 0.208 | — | | 0.303 | — | |
| Self-enhancement | 0.287 | 0.256 | — | 0.403 | 0.299 | — |

*Note*: Component and factor loadings >.22 are in boldface.

Table A2

*Loadings for Principal Components and Common Factors Using Varimax and Promax Rotations: Slovenia*

| Rotation | Principal components analysis (components) | | | Principal axis factor analysis (factors) | | |
|---|---|---|---|---|---|---|
| | Factor I Openness to change/Self-enhancement | FactorII Self-transcendence/ Conservation | Factor III Self-enhancement | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation | Factor III Self-enhancement |
| Varimax | | | | | | |
| SD1 | **0.520** | **0.243** | 0.006 | **0.409** | 0.200 | 0.086 |
| SD11 | **0.605** | **0.356** | -0.112 | **0.532** | **0.303** | -0.048 |
| UN3 | **0.246** | **0.568** | -0.098 | 0.218 | **0.440** | -0.011 |
| UN19 | 0.156 | **0.640** | -0.045 | 0.165 | **0.523** | -0.007 |
| BE12 | 0.122 | **0.628** | 0.071 | 0.141 | **0.527** | 0.072 |
| BE18 | **0.247** | **0.518** | 0.099 | **0.241** | **0.435** | 0.085 |
| CO16 | -0.209 | **0.545** | **0.473** | -0.137 | **0.531** | **0.343** |
| SEC5 | -0.113 | **0.571** | **0.337** | -0.041 | **0.512** | **0.234** |
| SEC14 | 0.000 | **0.613** | **0.288** | 0.052 | **0.552** | 0.206 |
| PO17 | 0.116 | 0.116 | **0.727** | 0.144 | 0.190 | **0.495** |
| AC4 | **0.438** | 0.046 | **0.619** | **0.402** | 0.098 | **0.536** |
| AC13 | **0.505** | 0.111 | **0.562** | **0.468** | 0.151 | **0.500** |
| HE10 | **0.666** | -0.028 | 0.187 | **0.577** | 0.010 | 0.164 |
| HE21 | **0.741** | -0.053 | 0.161 | **0.673** | -0.031 | 0.160 |
| ST6 | **0.682** | 0.173 | 0.153 | **0.604** | 0.170 | 0.167 |
| Promax | | | | | | |
| SD1 | **0.508** | 0.218 | -0.053 | **0.392** | 0.154 | 0.015 |
| SD11 | **0.598** | **0.349** | -0.196 | **0.539** | **0.283** | -0.166 |
| UN8 | 0.216 | **0.590** | -0.193 | 0.187 | **0.453** | -0.112 |
| UN19 | 0.113 | **0.663** | -0.143 | 0.122 | **0.546** | -0.116 |
| BE12 | 0.068 | **0.634** | -0.017 | 0.079 | **0.536** | -0.026 |
| BE18 | 0.200 | **0.507** | 0.021 | 0.191 | **0.424** | -0.007 |
| CO16 | -0.302 | **0.505** | **0.431** | **-0.273** | **0.505** | **0.308** |
| SEC5 | -0.193 | **0.548** | **0.281** | -0.146 | **0.500** | 0.178 |
| SEC14 | -0.077 | **0.592** | 0.217 | -0.046 | **0.540** | 0.130 |
| PO17 | 0.036 | -0.003 | **0.739** | 0.025 | 0.076 | **0.504** |
| AC4 | **0.379** | -0.080 | **0.620** | **0.297** | -0.058 | **0.537** |
| AC13 | **0.448** | -0.007 | **0.548** | **0.369** | 0.001 | **0.480** |
| HE10 | **0.659** | -0.103 | 0.167 | **0.570** | -0.084 | 0.116 |
| HE21 | **0.740** | -0.129 | 0.140 | **0.677** | -0.137 | 0.108 |
| ST6 | **0.663** | 0.111 | 0.130 | **0.582** | 0.084 | 0.089 |
| | Correlations between components or factors | | | | | |
| Openness to change/Self-enhancement | — | | | — | | |
| Self-transcendence/ Conservation | 0.166 | — | | 0.260 | — | |
| Self-enhancement | 0.175 | 0.297 | — | 0.352 | 0.400 | — |

*Note*: Component and factor loadings >.22 are in boldface.

Table A3

*Loadings for Principal Components and Common Factors Using Varimax and Promax Rotations (17 Items): Greece*

| Rotation | Principal components analysis (components) | | Principal axis factor analysis (factors) | |
|---|---|---|---|---|
| | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation |
| Varimax | | | | |
| SD1 | **0.613** | 0.183 | **0.553** | 0.192 |
| SD11 | **0.606** | 0.292 | **0.556** | **0.291** |
| UN3 | 0.096 | **0.640** | 0.107 | **0.569** |
| UN8 | **0.350** | **0.510** | **0.328** | **0.465** |
| UN19 | 0.162 | **0.657** | 0.166 | **0.598** |
| BE12 | 0.127 | **0.607** | 0.136 | **0.534** |
| BE18 | 0.108 | **0.653** | 0.118 | **0.584** |
| CO16 | 0.024 | **0.608** | 0.044 | **0.524** |
| SEC5 | 0.048 | **0.677** | 0.061 | **0.611** |
| SEC14 | 0.085 | **0.674** | 0.094 | **0.611** |
| PO17 | **0.356** | **0.261** | **0.309** | **0.238** |
| AC4 | **0.683** | 0.126 | **0.624** | 0.143 |
| AC13 | **0.700** | 0.100 | **0.643** | 0.119 |
| HE10 | **0.606** | 0.044 | **0.527** | 0.073 |
| HE21 | **0.684** | 0.134 | **0.629** | 0.150 |
| ST6 | **0.708** | 0.152 | **0.661** | 0.165 |
| ST15 | **0.703** | -0.183 | **0.643** | -0.142 |
| Promax | | | | |
| SD1 | **0.607** | 0.086 | **0.546** | 0.085 |
| SD11 | **0.581** | 0.200 | **0.528** | 0.189 |
| UN3 | -0.013 | **0.651** | -0.011 | **0.583** |
| UN8 | **0.276** | **0.471** | **0.247** | **0.425** |
| UN19 | 0.053 | **0.658** | 0.046 | **0.601** |
| BE12 | 0.025 | **0.612** | 0.028 | **0.539** |
| BE18 | -0.002 | **0.662** | -0.002 | **0.597** |
| CO16 | -0.082 | **0.630** | -0.067 | **0.549** |
| SEC5 | -0.069 | **0.698** | -0.069 | **0.638** |
| SEC14 | -0.030 | **0.688** | -0.033 | **0.631** |
| PO17 | **0.326** | 0.210 | **0.276** | 0.187 |
| AC4 | **0.690** | 0.014 | **0.633** | 0.018 |
| AC13 | **0.713** | -0.016 | **0.659** | -0.012 |
| HE10 | **0.624** | -0.058 | **0.545** | -0.036 |
| HE21 | **0.690** | 0.022 | **0.637** | 0.024 |
| ST6 | **0.711** | 0.036 | **0.668** | 0.032 |
| ST15 | **0.765** | **-0.312** | **0.716** | **-0.290** |
| | Correlations between components or factors | | | |
| Openness to change/Self enhancement | — | | — | |
| Self-transcendence/ Conservation | 0.325 | — | 0.392 | — |

*Note*: Component and factor loadings >.22 are in boldface.

Table A4

*Loadings for Principal Components and Common Factors Using Varimax and Promax Rotations (14 Items): Greece*

| Rotation | Principal components analysis (components) | | Principal axis factor analysis (factors) | |
|---|---|---|---|---|
| | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation |
| Varimax | | | | |
| SD1 | 0.215 | **0.672** | **0.230** | **0.598** |
| SD11 | **0.301** | **0.645** | **0.580** | **0.291** |
| UN3 | **0.652** | 0.165 | **0.588** | 0.173 |
| UN8 | **0.537** | **0.439** | **0.509** | **0.409** |
| UN19 | **0.646** | **0.274** | **0.600** | **0.268** |
| BE12 | **0.656** | 0.156 | **0.590** | 0.166 |
| BE18 | **0.692** | 0.198 | **0.641** | 0.202 |
| CO16 | **0.644** | -0.001 | **0.557** | 0.037 |
| SEC5 | **0.710** | 0.056 | **0.646** | 0.076 |
| SEC14 | **0.724** | 0.098 | **0.670** | 0.111 |
| AC4 | 0.206 | **0.606** | **0.221** | **0.519** |
| HE21 | 0.127 | **0.720** | 0.151 | **0.645** |
| ST6 | 0.170 | **0.728** | 0.187 | **0.666** |
| ST15 | -0.189 | **0.738** | -0.138 | **0.653** |
| Promax | | | | |
| SD1 | 0.085 | **0.668** | 0.089 | **0.594** |
| SD11 | 0.183 | **0.619** | 0.178 | **0.553** |
| UN3 | **0.660** | 0.030 | **0.600** | 0.026 |
| UN8 | **0.479** | **0.348** | **0.448** | **0.308** |
| UN19 | **0.631** | 0.148 | **0.587** | 0.128 |
| BE12 | **0.666** | 0.020 | **0.605** | 0.018 |
| BE18 | **0.696** | 0.056 | **0.651** | 0.042 |
| CO16 | **0.687** | -0.145 | **0.603** | -0.115 |
| SEC5 | **0.745** | -0.098 | **0.690** | -0.097 |
| SEC14 | **0.752** | -0.057 | **0.708** | -0.066 |
| AC4 | 0.090 | **0.599** | 0.101 | **0.509** |
| HE21 | -0.019 | **0.738** | -0.011 | **0.668** |
| ST6 | 0.026 | **0.737** | 0.023 | **0.681** |
| ST15 | **-0.360** | **0.828** | **-0.332** | **0.757** |
| | Correlations between components or factors | | | |
| Openness to change/Self enhancement | — | | — | |
| Self-transcendence/ Conservation | 0.394 | — | 0.474 | — |

*Note*: Component and factor loadings >.22 are in boldface.

Table A5

*Promax Rotated Principal Axis Factor Analysis (17 Items): Greece*

| Variables | Principal axis factor analysis (factors) | | Unique variance |
|---|---|---|---|
| | Factor I Self-transcendence/ Conservation | Factor II Openness to change/Self-enhancement | |
| SD1 | 0.546 | **0.085** | 0.658 |
| SD11 | 0.528 | **0.189** | 0.651 |
| UN3 | **-0.011** | 0.583 | 0.665 |
| UN8 | **0.247** | **0.425** | 0.676 |
| UN19 | **0.046** | 0.601 | 0.614 |
| BE12 | **0.028** | 0.539 | 0.696 |
| BE18 | **-0.002** | 0.597 | 0.645 |
| CO16 | **-0.067** | 0.549 | 0.723 |
| SEC5 | **-0.069** | 0.638 | 0.622 |
| SEC14 | **-0.033** | 0.631 | 0.618 |
| PO17 | **0.276** | 0.187 | 0.848 |
| AC4 | 0.633 | **0.018** | 0.590 |
| AC13 | 0.659 | **-0.012** | 0.572 |
| HE10 | 0.545 | **-0.036** | 0.717 |
| HE21 | 0.637 | **0.024** | 0.582 |
| ST6 | 0.668 | **0.032** | 0.536 |
| ST15 | **0.716** | **-0.290** | 0.567 |
| | Correlations between factors | | |
| Self-transcendence/ Conservation | — | | |
| Openness to change/Self-enhancement | 0.392 | — | |

*Note*: Component and factor loadings >.22 are in boldface.

Table A6

*Covariance Matrix of 5 First-order Correlated Factors of Unified Values: Greece*

| | STSD | HEST | UNBE | COTR | POAC |
|---|---|---|---|---|---|
| STSD | 0.424 | | | | |
| HEST | 0.583 | 0.913 | | | |
| UNBE | 0.231 | 0.191 | 0.303 | | |
| COTR | 0.046 | 0.004 | 0.249 | 0.345 | |
| POAC | 0.461 | 0.796 | 0.207 | 0.118 | 0.832 |

*Note*: the matrix is not positive definite.

Table A7

*Loadings for Principal Components and Common Factors Using Varimax and Promax Rotations (15 items): Slovenia*

| Rotation | Principal components analysis (components) | | Principal axis factor analysis (factors) | |
|---|---|---|---|---|
| | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation |
| Varimax | | | | |
| SD1 | **0.569** | 0.044 | **0.474** | 0.076 |
| SD11 | **0.597** | **0.220** | **0.529** | 0.219 |
| UN3 | **0.240** | **0.418** | **0.224** | **0.343** |
| UN19 | 0.132 | **0.567** | 0.147 | **0.466** |
| BE12 | 0.067 | **0.625** | 0.091 | **0.525** |
| BE18 | **0.343** | **0.453** | **0.316** | **0.390** |
| CO16 | -0.041 | **0.675** | -0.002 | **0.576** |
| SEC5 | 0.020 | **0.652** | 0.051 | **0.553** |
| SEC14 | 0.065 | **0.652** | 0.090 | **0.558** |
| PO14 | **0.326** | **0.368** | **0.289** | **0.318** |
| AC4 | **0.603** | 0.194 | **0.528** | 0.204 |
| AC13 | **0.649** | **0.231** | **0.589** | **0.238** |
| HE10 | **0.645** | 0.013 | **0.557** | 0.048 |
| HE21 | **0.740** | -0.040 | **0.684** | -0.013 |
| ST6 | **0.683** | 0.080 | **0.611** | 0.102 |
| Promax | | | | |
| SD1 | **0.586** | -0.054 | **0.491** | -0.028 |
| SD11 | **0.586** | 0.124 | **0.518** | 0.112 |
| UN3 | 0.182 | **0.393** | 0.164 | **0.315** |
| UN19 | 0.045 | **0.566** | 0.054 | **0.464** |
| BE12 | -0.033 | **0.638** | -0.018 | **0.540** |
| BE18 | **0.284** | **0.411** | **0.252** | **0.344** |
| CO16 | -0.153 | **0.710** | -0.130 | **0.616** |
| SEC5 | -0.086 | **0.674** | -0.068 | **0.579** |
| SEC14 | -0.039 | **0.666** | -0.027 | **0.575** |
| PO17 | **0.280** | **0.325** | **0.240** | **0.272** |
| AC4 | **0.596** | 0.096 | **0.521** | 0.095 |
| AC13 | **0.639** | 0.126 | **0.579** | 0.118 |
| HE10 | **0.669** | -0.100 | **0.586** | -0.078 |
| HE21 | **0.778** | -0.172 | **0.735** | -0.173 |
| ST6 | **0.698** | -0.037 | **0.632** | -0.033 |
| | Correlations between components or factors | | | |
| Openness to change/Self-enhancement | — | | — | |
| Self-transcendence/ Conservation | 0.318 | — | 0.405 | — |

*Note*: Component and factor loadings >.22 are in boldface.

Table A8

*Loadings for Principal Components and Common Factors Using Varimax and Promax Rotations (12 items): Slovenia*

| Rotation | Principal components analysis (components) | | Principal axis factor analysis (factors) | |
|---|---|---|---|---|
| | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation |
| Varimax | | | | |
| SD1 | **0.594** | 0.118 | **0.481** | 0.136 |
| SD11 | **0.619** | **0.249** | **0.534** | **0.245** |
| UN3 | **0.317** | **0.427** | **0.276** | **0.359** |
| UN19 | **0.299** | **0.573** | **0.282** | **0.501** |
| BE12 | 0.170 | **0.635** | 0.177 | **0.548** |
| BE18 | **0.363** | **0.507** | **0.329** | **0.445** |
| CO16 | -0.089 | **0.647** | -0.026 | **0.518** |
| SEC5 | -0.043 | **0.638** | 0.011 | **0.512** |
| SEC14 | 0.024 | **0.658** | 0.059 | **0.550** |
| HE10 | **0.649** | 0.000 | **0.527** | 0.041 |
| HE21 | **0.721** | -0.040 | **0.629** | -0.008 |
| ST6 | **0.717** | 0.107 | **0.640** | 0.120 |
| Promax | | | | |
| SD1 | **0.597** | 0.025 | **0.484** | 0.033 |
| SD11 | **0.601** | 0.156 | **0.514** | 0.139 |
| UN3 | **0.256** | **0.393** | 0.207 | **0.324** |
| UN19 | 0.211 | **0.547** | 0.177 | **0.476** |
| BE12 | 0.066 | **0.633** | 0.051 | **0.552** |
| BE18 | **0.290** | **0.468** | 0.241 | **0.404** |
| CO16 | -0.205 | **0.689** | -0.161 | **0.568** |
| SEC5 | -0.155 | **0.672** | -0.119 | **0.553** |
| SEC14 | -0.090 | **0.681** | -0.077 | **0.582** |
| HE10 | **0.675** | -0.107 | **0.559** | -0.081 |
| HE21 | **0.757** | -0.162 | **0.681** | -0.158 |
| ST6 | **0.727** | -0.008 | **0.661** | -0.022 |
| | Correlations between components or factors | | | |
| Openness to change/Self-enhancement | — | | — | |
| Self-transcendence/ Conservation | 0.318 | — | 0.434 | — |

*Note*: Component and factor loadings >.22 are in boldface.

Table A9

*Factor Loadings of Exploratory Factor Analysis (Principal Axis Factoring) With Promax Rotation (2 Factors-15 Items): Slovenia*

| Variables | Principal axis factor analysis (factors) | | Unique variance |
|---|---|---|---|
| | Factor I Openness to change/Self-enhancement | Factor II Self-transcendence/ Conservation | |
| SD1 | **0.491** | -0.028 | 0.770 |
| SD11 | **0.518** | 0.112 | 0.672 |
| UN3 | 0.164 | **0.315** | 0.832 |
| UN19 | 0.054 | **0.464** | 0.761 |
| BE12 | -0.018 | **0.540** | 0.716 |
| BE18 | **0.252** | **0.344** | 0.748 |
| CO16 | -0.130 | **0.616** | 0.669 |
| SEC5 | -0.068 | **0.579** | 0.692 |
| SEC14 | -0.027 | **0.575** | 0.681 |
| PO17 | **0.240** | **0.272** | 0.815 |
| AC4 | **0.521** | 0.095 | 0.679 |
| AC13 | **0.579** | 0.118 | 0.596 |
| HE10 | **0.586** | -0.078 | 0.687 |
| HE21 | **0.735** | -0.173 | 0.532 |
| ST6 | **0.632** | -0.033 | 0.616 |
| | Correlations between factors | | |
| Openness to change/Self-enhancement | — | | |
| Self-transcendence/ Conservation | 0.405 | — | |

*Note*: Component and factor loadings >.22 are in boldface.

Table A10

*Covariance Matrix of 5 First-order Correlated Factors of Unified Factors: Slovenia*

| | STSD | HEST | UNBE | POAC | COTR |
|---|---|---|---|---|---|
| STSD | 0.316 | | | | |
| HEST | 0.381 | 0.734 | | | |
| UNBE | 0.232 | 0.140 | 0.293 | | |
| POAC | 0.340 | 0.480 | 0.214 | 0.746 | |
| COTR | 0.011 | -0.090 | 0.199 | 0.156 | 0.382 |

*Note*: the matrix is not positive definite.

**Διερεύνηση του διαστατού της κλίμακας ανθρωπίνων αξιών του Schwartz: Δεδομένα από την Ευρωπαϊκή Κοινωνική Έρευνα του 2002 για την Ελλάδα και τη Σλοβενία**

## ΠΕΡΙΛΗΨΗ

*Σκοπός:* Να διερευνηθεί το διαστατό και η (παραγοντική) εγκυρότητα κατασκευής της εννοίας της σύντομης μορφής της κλίμακας ανθρωπίνων αξιών, όπως προτάθηκε από τον Schwartz (1992).

*Μέθοδος:* Χρησιμοποιήθηκαν τα δεδομένα της Ευρωπαϊκής Κοινωνικής Έρευνας του 2002 για την Ελλάδα και τη Σλοβενία (1$^{ο}$ Γύρος). Αρχικά, τα δείγματα και των δύο χωρών διχοτομήθηκαν τυχαία σε δύο μισά. Για τα δεδομένα του πρώτου διχοτομημένου δείγματος και των δύο περιπτώσεων, διενεργήθηκε ανάλυση των ερωτήσεων-μονάδων για να εξεταστούν οι ιδιότητες των κατανομών τους και να αποφασιστεί ποιες ερωτήσεις-μονάδες θα συμπεριληφθούν στην ανάλυση. Για την διερεύνηση της εγκυρότητας της κατασκευής της εννοίας των κλιμάκων, υιοθετήθηκε Διερευνητική Παραγοντική Ανάλυση (principal axis factoring με περιστροφή promax). Η δομή ελέγχθηκε και στις δύο περιπτώσεις με την εφαρμογή Επιβεβαιωτικής Παραγοντικής Ανάλυσης (maximum likelihood) στο δεύτερο διχοτομημένο δείγμα.

*Αποτελέσματα*: Και στις δύο περιπτώσεις, η Διερευνητική Παραγοντική Ανάλυση οδήγησε καταρχήν σε μια λύση τριών παραγόντων. Κατασκευάστηκαν τρεις υπο-κλίμακες που βασίστηκαν στις ερωτήσεις-μονάδες που προσδιορίστηκαν από τους αντίστοιχους παράγοντες. Οι συντελεστές αξιοπιστίας και η εσωτερική συνοχή των τριών υπό-κλιμάκων έδειξαν πως η τρίτη υπό-κλίμακα δεν ήταν αξιόπιστη. Η Επιβεβαιωτική Παραγοντική Ανάλυση υπέδειξε ανεπαρκή προσαρμογή για τρία υποδείγματα και καλή προσαρμογή για αυτό το οποίο προσδιορίστηκε από τους εξής δύο πρώτης-τάξης συσχετιζόμενους παράγοντες, που βασίζονται σε 14 και 12 ερωτήσεις-μονάδες για την Ελλάδα και τη Σλοβενία, αντίστοιχα: Ευρύτητα αντιλήψεων σε αλλαγές/Αυτό-εξύψωση, Αυτό-υπέρβαση/Συντήρηση. Η λύση αυτή οδήγησε στην κατασκευή δύο υπό-κλιμάκων οι οποίες είναι και αξιόπιστες και έγκυρες.

*Συμπεράσματα*: Τα αποτελέσματά μας υπέδειξαν ότι η λύση των δύο παραγόντων είναι και αξιόπιστη και έγκυρη. Το αποτέλεσμα αυτό δεν επιβεβαιώνει το διαστατό της κλίμακας ανθρωπίνων αξιών του Schwartz, όπως προτάθηκε στη βιβλιογραφία.

Κρίνεται απαραίτητη η περαιτέρω διερεύνηση και ανάλυση για όλες τις χώρες και όλους τους γύρους της Ευρωπαϊκής Κοινωνικής Έρευνας.

*Λέξεις-κλειδιά*: Κλίμακα ανθρωπίνων αξιών του Schwartz (PVQ-21) · Αξιοπιστία · Εγκυρότητα · Διερευνητική Παραγοντική Ανάλυση · Επιβεβαιωτική Παραγοντική Ανάλυση