Quantitative Methods: Report Requirements

I. Objectives
Main task of the paper is to demonstrate student’s skills in:
1) Operating with elementary inferential statistics tools while investigating public opinion
2) Using SPSS package in:
   • Accessing and management of data stored in international sociological data bases,
   • Data transformation
3) Applying basic statistical measures and inference concepts in:
   • Describing and comparing populations,
   • Assessing significance of differences between them.

II. Data

1. Data base
   From CSS survey data bank (kept in COMMON folder) select database and select two countries from it. Data bases available in COMMON folder are the following:
   - Central and Eastern Eurobarometer: 8 data sets, surveys conducted from 1990 to 1997,
   - Eurobarometer 2000: 1 data set, survey conducted in April 2000, 15 UE countries, 16078 cases,
   - International Social Survey Program: 16 data sets surveys conducted from 1985 to 1999,
   - Polish General Social Survey PGSS1992-1999 (six editions also containing ISSP modules data from 1991 to 1999),
   - Polish Surveys CBOS data base containing responses for two questions on social perception of actors of Polish political scene in 1985-1997 (13 surveys),
   - World Values Surveys 1981 - 1990 - 1995, (R. Inglehart et al, Institute for Social Research, University of Michigan; USA), cumulative file for the first three waves,: 168482 cases,: 251 variables, 70 countries.
   - Social Stratification in Eastern Europe 1994, (Ivan Szelenyi, Donald J. Treiman., Dept. of Sociology, UCLA), 6 countries, 30462 cases.

2. Variables
   a) Indicators of the attitude
   Select several variables, your candidates for scale construction, at least 7. They do not have to be close to each other in questionnaire, but should be (in your opinion) indicators of the same phenomenon i.e. attitude towards something, social orientation, aspect of personality, disposition etc.
   Select indicators in such a way, as to be able to formulate hypotheses on their relations with stratification properties of respondent, as age, gender, education level, and place of residence. Include theses variables together with country identifier in your SPSS data file.
   Control coding of your responses in your indicators set and the meaning of responses values in regard to the scale assumed. Check (for example) whether “strongly agree” and “definitely disagree” reactions mean the same for all indicators under study or not?
b) **Set of potential components of the model of attitude formation**

You must have at least 5 independent, explanatory variables (raw variables present in original data set or new variables created by you) coming from the following blocks:

1. **characteristic of respondent's family background** (education of mother, father, place of residence in a childhood),

2. **social position of respondent in educational dimension**, 

3. **position of respondent in occupational structure** (employed-unemployed-not labour force, industrial sector of employment, public-private sector of employment, supervising, self employment),

4. **social position of respondent in “welfare” dimension** (earnings, possession, family income, family income per member etc.),

5. **indicator of respondents value system or social orientation** (e.g. political self description on left-right scale, voting behaviour, party affiliation, religious involvement) expected to be subjective explaining factor of attitude under study.

**III. Report Part A: Scaling Attitude With a Help of Exploratory Factor Analysis**

Your task is to build unidimensional scale representing intensity of attitude with the use of factor analysis as an exploratory tool. Task can be decomposed on following 7 steps:

I. Initial exploration of item set - item selection

II. Solving dimensionality problem

III. Factor scoring

IV. Factor-justified index construction

V. Investigation of factor scores and index properties.

VI. Comparison of two countries selected for analysis in regard to all previous steps.

1. **Initial factor analysis: item selection**

   Include all indicators selected to factor analysis with criteria factors 1, 2 and 3 (you can apply Kaiser criteria with eigenvalue over 1 as well). Check whether in final solution all of your indicators have communalities over 0,10. If some of them do not, you have a right to exclude them as not significantly connected with any of underlying dimensions present in factor solutions.

2. **Looking for single dimension**

   Repeat factor run for reduced set of indicators (if happened) and find such a factor solution, in which at least 4-5 variables have high factor loadings (over 0,30) with one of the factors and low (close to 0,10) loadings with every other factor present in final solution. They will form your unidimensional scale. Your factors do not have to be orthogonal, so as to find out how they are related to each other you should check results of factor OBLIMIN rotations.

3. **Factor scores**

   Add to the working SPSS file factor score for dimension identified in previous step. Use default (regression) method of score assessment. Do not forget to save new version of a file!

4. **Factor inspired and justified indexing**

   Recode indicators used in previous step to 0-1 variables. Take into account their distribution (margins) in both countries and find common way of recoding. Controlling the meaning of 1-s (see point I.2 above) sum them and construct simple additive index, rough version of factors determined previously.

5. **Factor score and index - comparison of properties**

   Check out linear correlation between:
   - index and factor score,
   - factor score and age, gender, education and place of residence (size of),
   - index and age, gender, education and place of residence (size of).

   Do relations between both representations of attitude have something in common? How similar do they behave in relation to four socio-demographic characteristics of respondents?
Instead of original factor scores (which are standardised variables) you can use ordering variable derived from scores e.g. by ranking percentiles, deciles etc.

6. Scaling in two countries: differences and similarities

Repeat steps I-VI separately for each country and present their results parallel (one next to another) answering following questions:
1) How similar is set of indicators selected in step II in both countries,
2) How similar are factor solutions obtained in step III? How close to each other are sets of indicators involved in single dimension selected? How big amount of common variance is connected with this dimension in each country?
3) How similar are statistical dependencies between factor scores and indexes based on them in both countries?
4) How scores and indexes correlate with socio-demographic variables in both countries?
5) What is your general answer on the question of scalability of attitude you had had in mind at the beginning of your report? Is the task equally feasible in both cultures? Do indicators used have similar indicating properties in both countries?

IV. Report Part B: Modeling attitude formation process with a help of path model


Describe social process of attitude formation in causal terms and present its diagram. Justify components selection and events order with the help of sociological theories from which they can be derived. Formulate theory of the process in a form of theoretical hypotheses.

2. Operationalisation: Indicators selection

Propose full set of indicators for each event in a theoretical model of a process. From the set of variables available in a database select available indicators of events satisfying requirement 2.b) in section “Data” above. Translate hypotheses formulated earlier to the statistical properties of path model build with a help of constrained set of events’ indicators.

3. Identification of model’s parameters

Identify separately for each country path model of a process and present it in two forms:
• with a table containing all path coefficients and R-square values for each step of a process
• with a diagram representing model objects (events, their indicators, path coefficients, R-square coefficients) and their numerical attributes.

4. Conclusions

Compare models determined for two countries in regard to:
• Goodness of fit of the model,
• Set of R-square coefficients describing each step of a process.
• Decomposition of the goodness of fit measure of a model between steps of a process
• Set of paths coefficients values (and signs) significantly different from zero
• Degree of confirmation of the theory of a process: which of hypotheses were supported by the model parameters, which were rejected.