Quantitative Data Analysis I. (YMH515)

syllabus

final version (26/2/14 with rev. 13/5/14)

Course requirements: homework, seminar paper demonstrating independent analytical work and written test.

Annotation

The course covers an introduction to the basic analysis of quantitative data from social surveys. Topics include simple descriptive statistics (central tendency and dispersion, frequency distributions, cross-tabulation, association/correlation), and elementary data manipulation; other topics (logic of elaboration, data standardization, introduction to inferential statistics) can be covered as time allows. Focus is on conceptual understanding and practical knowledge. Students will gain experience practicing their learning through various assignments using statistical software SPSS (or freeware replacement PSPP).

Course description

In this course, students will learn how to (a) create dataset (e.g. from their own survey) and assess the type and quality of data and potential problems (missing values, polarized responses, outliers, etc.) and transform variables (recoding); (b) use basic descriptive and explorative statistical methods to answer a simple research question (bivariate/trivariate data analysis), assess validity of simple hypotheses and graphically present the results; (d) control the basic functions in the statistical software SPSS respectively PSPP, e.g. elementary data transformation, descriptive statistics, and simple graphs.

Classes will be conducted using the statistical program SPSS (PSPP); additionally also MS Excel can be used. Previous grounding in statistics is not assumed nor practice using any statistical software. The course serves as a foundation for more advanced course Quantitative Data Analysis II. which extends the knowledge with basic principles of inferential statistics, i.e. statistical testing of hypotheses and multivariate analysis. Teaching materials are available at course webpage: **http://metodykv.wz.cz/**.

Outline of the seminar:

1. Introduction to quantitative data analysis, definition of statistics, possibilities and limits and typology of sources of data (level of data measurement)
2. Principles of data management: data file, data entry and inspection, types of variables, coding of missing values, data formats in SPSS/ PSPP, labels of variables and their values
3. Introduction into SPSS/ PSPP statistical software environment (basic functions and handling via menu).
4. Controlling the program SPSS/ PSPP using the command line (syntax).
5. Elementary data manipulation: recoding variables, converting between different types of variables; computing new–synthetic variables
6. Exploratory analysis: univariate data sorting, the distribution of variable values
7. Bivariate analysis of categorical data (crosstabulation): contingency table
8. Bivariate analysis of numerical data: central tendency and dispersion (mean, median, variance) in subgroups
9. Graphical visualization of the distribution of data and relationships (boxplot, histogram, barchart)

10. Introduction to multivariate analysis and principles of elaboration; coefficients of association/correlation for categorical data
11. Very basic introduction to statistical inference: estimation of parameters in a population based on random sample, standard error, confidence intervals (if time)
12. Principles of presenting findings: formulation of hypotheses, interpretation of relationships between variables and writing analytical text, formatting tables

Course requirements: (1) homework, (2) seminar work with applying methods of descriptive statistical analysis and the sociological interpretation of results summed in professional text, (3) written test.

Seminar work should include: definition of the research question (questions), hypotheses, basic data transformation (i.e. recoding, checking for missing values, inspection of variability, etc.), analysis of bivariate and partly trivariate relationships in crosstabulation (controlling for third factor) and a sociological interpretation of the results.

Basic course materials and readings

BABBIE, E. „Elementary analyses" Pp. 375–394 in *The Practice of social Research*. 7th Edition. Belmont: Wadsworth, 1995. (chapter 15).

BRYMAN, A. *Social research methods*. Oxford: Oxford University Press, 2008. chapters: 14. Quantitative data analysis (pp. 313–338) and 15. Using SPSS for Windows (pp. 339–362)

De VAUS, D. A. *Surveys in social research*. Fifth edition. London: Routledge. 2002. (chapters 10, 12 to 16)

IBM SPSS Statistics 20 Brief Guide. [online]. IBM Corporation 1989, 2011. Available at: ftp://public.dhe.ibm.com/software/analytics/spss/documentation/statistics/20.0/en/client/M anuals/IBM_SPSS_Statistics_Brief_Guide.pdf

IBM SPSS Statistics Base 20. [online]. IBM Corporation 1989, 2011. Available at: ftp://public.dhe.ibm.com/software/analytics/spss/documentation/statistics/20.0/en/client/M anuals/IBM_SPSS_Statistics_Base.pdf. (chapters 2, 3, 4, 5, 6, 7)

MILLER, J. E. *The Chicago guide to writing about numbers*. Chicago: University of Chicago Press, 2004. (selected chapters)

Texts and materials for the course http://metodykv.wz.cz

Recommended study materials and additional readings

ANTONIUS, R. *Interpreting Quantitative Data with SPSS*. London: Sage Publications, 2003.

STATSOFT, Inc. *Electronic Statistics Textbook*. Tulsa, OK: StatSoft, 2010. <http://www.statsoft.com/textbook>.

PSPP Manual. <http://www.gnu.org/software/pspp/documentation.html>.