

Abstract: Analytical methods for measurement error estimation in survey data

This dissertation aims at the domain of measurement error in social science survey data. To conceptualize and estimate measurement errors it employs the analytical and theoretical framework that stems from the analytical method of structural equation modeling (SEM) and Classical Test Theory (CTT), extended with the component of the systematic measurement error. This thesis has two goals that may contribute to development and extension of Czech social science methodology. The first goal is to illustrate methods of measurement error estimation, which has not been used for analysis of Czech data yet, and to point out to some problematical aspects of these methods. The second goal is to employ presented methods to obtain new findings regarding the quality of data from Czech surveys. The dissertation presents three empirical studies, each of which uses one of the methods defined within the presented theoretical and analytical framework. First study presents an analysis of reliability of measurement with the Quasi Simplex Model (QSM). It illustrates how to use the model and brings optimistic results regarding the reliability of the Czech EU SILC panel data. In the second study the confirmatory factor analysis model, operationally called CF-RS model, is applied. This model specifies a systematic measurement error that emerges as a consequence of the acquiescent response style (ARS). The analysis revealed that the Czech acquiescent response style is obviously different from the ARS identified in data from Western European countries. The CF-RS model did not confirm a theoretically expected correlation between the ARS and age, resp. education in Czech data. Since this correlation has been previously reported in Western Europe, the lack of such correlation in the Czech data is considered a Czech cultural specificity. The third study aims at the experimental design called 2 split – ballot MTMM, repeatedly used in the European Social Survey (ESS), and analysis of this data in the True Score MTMM model. Scholars involved in the ESS methodological research specified this experimental design and the model as an analytical tool to estimate the reliability and the systematic measurement error that originates as a consequence of a measurement method. In the analysis it is shown that such data are uneasily analyzed and that it is very hard to obtain estimates of the quality of data. The text aims at the problematical aspects of the analysis and explains why the problems emerge. The following chapter illustrates how to employ estimates of reliability and systematic measurement error in the substantial analysis. The text encourages survey data analysts to be concerned in reliability and validity of measurement and to aspire to employ survey items of known and high quality. Concluding chapter of the thesis considers the future of surveys in the era of Big Data and the

internet and evaluates the present situation, when Big data has not pervaded the academic research yet. The chapter also calls attention to different errors and bias in different kinds of Big data and data from non – representative internet polls and opt – in panels.

Keywords: survey, methodology, measurement error, validity, reliability, the quasi simplex model, acquiescent response style, multitrait – multimethod, Big data