

Effects on reliability and validity of egocentered network measurements

Tina Kogovšek*, Anuška Ferligoj

*Faculty of Social Sciences, University of Ljubljana, Kardeljeva pl. 5,
1000 Ljubljana, Slovenia*

Abstract

This paper examines the reliability and validity of egocentered networks. Reliability and validity are estimated by the multitrait-multimethod (MTMM) approach. A split ballot MTMM design [Saris, W.E., 1999. Forced choice or agree/disagree questions? An evaluation by the split ballot MTMM experiment. In: *Proceeding of the Meeting of the IRMCS*, pp. 122–146; Kogovšek, T., Ferligoj, A., Coenders, G. Saris, W. E., 2002. Estimating the reliability and validity of personal support measures: full information ml estimation with planned incomplete data. *Social Networks* 24, 1–20] is used, in which separate groups of respondents received different combinations of two methods. The effect of factors such as the methods used and the personal characteristics of respondents that can affect the quality of data was estimated by a meta analysis.

Measurement method, type of question, network size, age, gender, extraversion and emotional stability all had statistically significant effects on the validity of measurement. After the list of alters is obtained with name generators, name interpreter questions can be asked in two ways. One way (“by alters”) is to take each alter individually and to ask all the questions about him/her, going alter by alter until the end of the list of alters. The other way (“by questions”) is to take the question and ask this question for all alters on the list, going question by question until the end of the list of name interpreter questions. Telephone interviewing (both by alters and by questions) gave more valid measurements than face-to-face interviews.

Behavioral questions were more valid than questions with emotional content. The characteristics of ties were more validly measured in smaller networks. With reference to respondents’ personal characteristics younger respondents, men, extraverted and emotionally stable respondents all had more valid measurements. Reliability was significantly affected by the measurement method, the type of question and age. The telephone/by alters method was the most reliable measurement method.

* Corresponding author. Tel.: +386 1 58 05 285; fax: +386 1 58 05 101.

E-mail address: Tina.Kogovsek@guest.arnes.si (T. Kogovšek).

Behavioral questions were more reliable than questions with emotional content. Measurements among younger respondents were also more reliable.

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1. Introduction

Social network analysis has become very important in many research fields (e.g., sociology, political science, economics, anthropology, organizational sciences, and medicine). One of the most important fields where social network analysis is used is social support, where it has been reported to influence physical and mental health, as well as general well-being (e.g., Hirsch, 1981; House, 1981; Gottlieb, 1983; Berkman, 1985; Wenger, 1994; Latkin et al., 1995; Samuelsson, 1997).

Studying the measurement quality of social network measurement instruments is important because it has the potential to provide information relating to the factors that influence the reproducibility of results and the validity of the underlying concepts. This is perhaps even more important for egocentered network data, since data about the network and its characteristics and the characteristics of network members are usually given by the respondent (ego).

In substantive research on social networks, different network characteristics (such as network size, structure and composition) and characteristics of network members (such as gender, closeness, importance, frequency of contact) are studied. Within this paper, the aim is to estimate the reliability and validity of frequently used name interpreters. Further, since data about the characteristics of ties are important explanatory variables in social support research and are, moreover, usually reported by the ego, it is very important to know the extent to which the measures are reliable and valid. However, as the intended unit of analysis is egocentered network as a whole and not individual ego-alter ties, the variables are defined as averages of name interpreters for each egocentered network. The use of averages is further justified by the fact that averages of these variables are often used in the substantive research on social support. Therefore, the reliability and validity of the averages for these variables were studied.

2. Quality of measurement

The main purpose of scientific research is the discovery of laws on the basis of which interpretation and prediction of phenomena are possible. In this endeavor the quality of the measurement instruments (their reliability and validity) with which we obtain empirical data for the attainment of this purpose, is of crucial importance. In general, reliability of data can be defined as the ability to obtain the same (or at least very similar) scores at repeated measurements on the same units, on the assumption that the true scores have remained the

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