ABSTRACT

There has been a significant increase in the usage of structural equation modeling (SEM) as the prime analysis technique in the last few decades. To synthesize the studies for SEM, researchers usually employ meta-analytic procedures with Hunter-Schmidt (H-S) approach (Hunter & Schmidt, 1990), Hedges-Olkin (H-O) approach (Hedges & Olkin, 1985) or generalized least squares (GLS) approach (Becker, 1992) on correlation matrices. The synthesized correlation matrix is subjected to the analysis of SEM. Hunter-Schmidt and Hedges-Olkin approaches have several potential problems: (a) the resultant correlation matrix is nonpositive definite because of the pairwise aggregation of correlation coefficients in the presence of missing data; (b) the arbitrary choice of sample size (median, total, arithmetic or geometric means) in fitting SEM makes the chi-square statistics and standard errors incorrect; (c) treating correlation matrix as covariance matrix makes the statistical inferences questionable. In response to these problems, a framework on conducting meta-analytic structural equation modeling was proposed. In the first part, a two-stage structural equation modeling (TSSEM) approach based on the multiple-group and correlation analyses was proposed as the analysis technique. The empirical performance of TSSEM against H-S, H-O and GLS were assessed by simulation studies. Results revealed that H-S, H-O and TSSEM performed very well in testing the homogeneity of correlation matrices and estimating the pooled correlation matrix when the rejection counts and parameter estimates of GLS were over-estimated. When fitting SEM, however, the chi-square test statistics of H-S, H-O and GLS approaches were over-estimated while their standard errors were under-estimated. The TSSEM worked well in most conditions. In the second part, cluster analytic procedures were proposed to group correlation matrices into homogenous groups

when the correlation matrices were heterogeneous. Simulation studies showed that the Euclidian distance as the proximity matrix and Ward's minimum variance method as the clustering method performed the best. A real example was used to illustrate how to apply these procedures on real data set. Future directions for research have also been discussed.