



Structural Equation Modelling in Sustainable Human Settlement Research

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Abstract

Structural Equation Modelling (SEM) is a technique that effectively incorporates a whole range of standard multivariate analysis methods, including regression, factor analysis and analysis of variance. Using SEM, researchers can specify confirmatory factor analysis models. While being a sophisticated theoretical tool, and certainly not easy to implement, SEM underlies much of what sustainable human settlement (SHS) researchers do on a daily basis. That is, on the basis of things we can measure, and the attempt to make predictions of things we cannot measure. For SHS research, SEM provides an opportunity to hypothesise models of human behaviour, and to test or confirm these models statistically. The aim of this paper is to present how Structural Equation Modelling technique can be used to study and to understand issues encircling SHS issues with a specific emphasis on housing satisfaction in South Africa low-income housing. Research materials within and outside the field of the built environment were reviewed, and the researcher found that SEM using EQation modeling software (EQS) was the most appropriate technique for sustainable human settlement research studies. Because of the numerous benefits and advantages of the analysis produced by SEM through the EQS platform, such as the model estimation, and model fit attributes amongst others. The study further recommended the use of the process because of the Satorra-Bentler scaled statistics ($S - B\chi^2$), use of appropriate cut-off values for the generated model analysis / fit Indices for various required goodness-of-fit tests of SEM model as applicable.

Keywords: Structural Equation Modelling, EQS, Sustainable Human Settlement, Housing satisfaction

1 Introduction

Structural Equation Modelling (SEM) is currently the most inclusive statistical procedure in social and scientific research catering for all operations of the General Linear Modeling (GLM) group of statistics such as Analysis of Variance (ANOVA); Multivariate Analysis of Variance (MANOVA) and multiple regression (Kline, 2005). Though there are many ways to describe SEM, it is most commonly thought of as a hybrid between some form of analysis of variance (ANOVA) / regression and some form of factor analysis. In general, it can

be remarked that SEM allows researchers to perform multilevel regression/ANOVA on factors. SEM is conceptually used to answer any research question involving the indirect or direct observation of one or more independent variables or one or more dependent variables. However, the primary goal of SEM is to determine and validate a proposed causal process and/or model. In the current study, SEM was used to validate a conceptualized holistically integrated residential satisfaction model for public housing occupants in South Africa. Also, SEM takes a confirmatory approach to the analysis of a structural theory