

STA 3180 Statistical Modelling: Structural Equation Modeling

1. What is the difference between a path diagram and a structural equation model?

Answer: A path diagram is a graphical representation of a structural equation model, which is a mathematical model that describes the relationships between variables. Path diagrams show the direction of the relationships between variables, while structural equation models provide equations that quantify the strength of the relationships.

2. What is the purpose of a latent variable in a structural equation model?

Answer: A latent variable is an unobserved variable that is used to explain the relationships between observed variables. Latent variables are used to capture the underlying structure of a system and to explain the relationships between observed variables that cannot be explained by direct measurement.

3. What is the difference between a confirmatory factor analysis and a structural equation model?

Answer: Confirmatory factor analysis is a type of structural equation model that is used to test the relationships between observed variables and latent variables. In a confirmatory factor analysis, the researcher specifies the relationships between the observed and latent variables before the analysis is conducted. In contrast, a structural equation model is a more general type of model that can be used to test the relationships between observed and latent variables without specifying the relationships beforehand.

4. What is the difference between a path coefficient and a regression coefficient?

Answer: A path coefficient is a measure of the strength of the relationship between two variables in a structural equation model. Path coefficients are estimated using maximum likelihood estimation. A regression coefficient is a measure of the strength of the relationship between two variables in a linear regression model. Regression coefficients are estimated using ordinary least squares.

5. What is the difference between a direct effect and an indirect effect in a structural equation model?

Answer: A direct effect is a relationship between two variables that is not mediated by any other variables. An indirect effect is a relationship between two variables that is mediated by one or more other variables. In a structural equation model, direct effects are represented by paths between the two variables, while indirect effects are represented by paths between the two variables that pass through one or more other variables.