Ψ

S.E.M.

Lab 1: Introduction & Lead-in

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S.E.M. Software:

- Each software has its advantages / disadvantage
- It is always good to know more than one
  (Just as is the case with stat. software)
- Read up on some of the features in each package
- Some available software:
  - AMOS (*SPSS*)   - Proc Calis (*SAS*)
  - EQS   - MPlus
  - SEM (*R*)   - SEPath (*Statistica*)
  - RAMONA (*Systat*) - HYBALL/CEFA*
  - TETRAD   - **LISREL (!)**

LISREL:

- http://www.ssicentral.com/lisrel/student.html
- The student edition is limited by the number of variables you can include in the path model
- Limited in the type of programs you can import data from
- Not limited by sample size
- LISREL has a great help menu
- PRELIS is part of the software package

S.E.M. Terminology:

- Exogenous Variable:
  Independent variable (predicts others, arrow points away from)
- Endogenous Variable:
  Dependent variable (is predicted, arrow points towards it)
- Direct Effect:
  Regression coefficients of direct prediction
- Indirect Effect:
  Regression coefficients through another variable

S.E.M. Terminology Cont.:

- Observed Variable:
  Measurable physically and numerically, usually regress upon latent, can be exogenous (X) or endogenous (Y)

- Latent Variable:
  Hypothetical or theoretical variable which cannot be measured or observed directly (i.e. intelligence, social support), can be exogenous (ξ) or endogenous (η)

S.E.M. Terminology Cont.:

- Dependency
  (Predicting, one-way arrow, unidirectional)
- Covariance/correlation
  (Two-way arrows)
- Variance component
  (As used by Kline)
- Measurement Error:
  - Observed variable
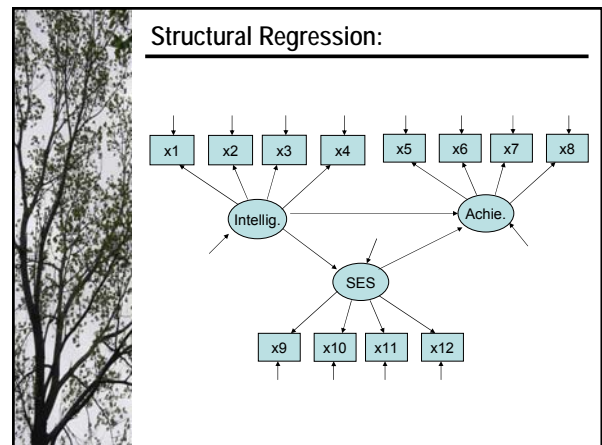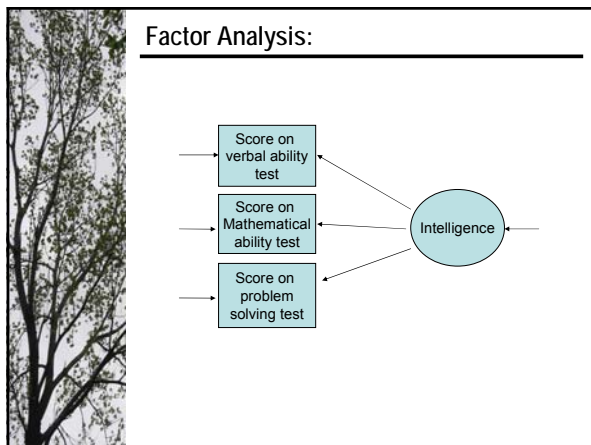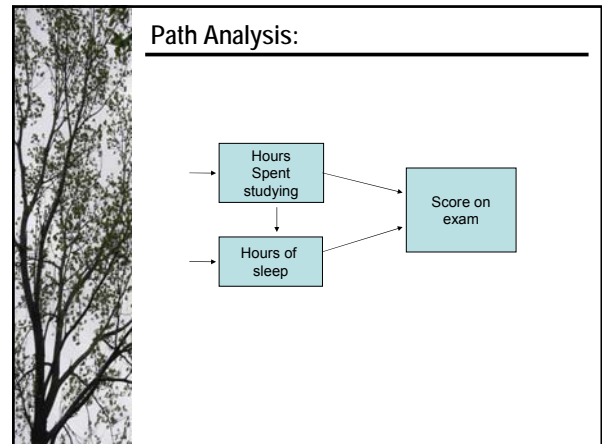   *(Error, ε, δ)*
  - Latent variable
    (Disturbance, ζ)

S.E.M. Models:

- **Path Analysis**:
  Interrelationship among observed variables only

- **Factor Analysis**:
  - Exploratory Factor Analysis
  - Confirmatory Factor Analysis
  Regressive structure includes latent variables, whereby observed variables are regressed unto the latent variables

- **Structural Regression**:
  Mix between path analysis and factor analysis where latent constructs can be regressed on other latent constructs

Path Analysis:

Factor Analysis:

Structural Regression:

LISREL Cont.:

- Let us look at the LISREL software:
  - Software options
  - Menus
  - Help and help files

- PRELIS:
  - Reading in data / defining variables
  - Saving data / file organization
  - Data screening
  - Simple statistical analyses

- LISREL:
  - Path diagrams
  - Syntax generation