Part Three: Path Analysis and Structural Equation Models

In parentheses are indicated the pages in your textbook that roughly correspond with the lectures.

I. Preliminaries
   A. Discussion of Exam II
   B. Overview of Part Three
      1. Purpose
      2. History

II. Path Analysis: Recursive Causal Models with Standardized Variables (pp. 452-467)
   A. Assumptions
      1. Theory
      2. Measurement
   B. Model Specification
      1. Simple Single-Equation Model:
         a. Specifying the Causal Process
            i. Structural Equation
            ii. Path Diagram
         b. Estimating the Structural Parameters
            i. Path Coefficients for Causal Effects
            ii. Path Coefficients for Residual Effects
      2. Complex Multiple-Equation Models
         a. Specifying the Causal Process
            i. Structural Equations
            ii. Path Diagram
         b. Estimating the Structural Parameters
            i. Path Coefficients for Causal Effects
            ii. Path Coefficients for Residual Effects
   C. Model Implications
         a. Structural Equations: The Basic Theorem
         b. Path Diagram: The Tracing Rule
   D. Model Testing
      1. Correlation Decomposition and Reconstruction
      2. Hierarchical Regression: Restricted versus Unrestricted Models
         a. Causal Misspecifications
            i. "Arrow Errors of Commission"
            ii. "Arrow Errors of Omission"
         b. "Theory Trimming"
   E. Interpretation
      1. Features
         a. Direct, Indirect, and Total Effects
         b. Spurious and Non-Causal Relations
         c. Supression Effects
         d. Residual Influences
      2. Precautions (pp. 475-477)
         a. Philosophical: Failure to disconfirm versus positive proof
         b. Statistical: Specification Errors
            i. Omitted Variables: "Umpteenth Variable Problem"
            ii. Measurement Error: Reliabilities < 1.0
            iii. Misspecified Causal Ordering: Insufficient Criteria
   F. Extensions and Elaborations
      1. Categorical and Ordinal Measures
      2. Unstandardized Numerical Measures
         a. Structural Equations
         b. Covariance Algebra

III. Advanced Topics
    A. Introduction
        1. Relaxing Simplifying Assumptions
            a. Measurement Error
            b. Correlated Disturbances
            c. Reciprocal Causality
        2. A Specific Case: Correlated Disturbances
    B. Identification Problem
        1. Necessary Criteria
        2. Illustrations
    C. Covariance Structure Analysis and Latent-Variable Modeling
        1. Model Specification
            a. Structural Model
            b. Measurement Model
        2. Model Testing and Parameter Estimation
            a. Estimation Algorithms: LS, GLS, and ML
            b. Fit Indices: Inferential and Descriptive
            c. Model Modification
        3. Special Issues
        4. Computer Programs
        5. Examples

IV. Review and Exam III