

# RECENT ADVANCES IN MODEL EVALUATION

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Model Evaluation Workgroup  
CRMDA, University of Kansas

# Introduction

- Model is something that represents or simulates a real world phenomenon.
- In Structural Equation Modeling (SEM), model represents how the relationships among variables of interest happening.
- Good model is a ***parsimonious*** substantively ***meaningful*** model that ***fits*** observed data adequately well (MacCallum & Austin, 2000)
  - Fit observed data
  - Parsimonious
  - Meaningful

# Model Fit Definition

- Absolute Model Fit
  - **Exact Fit** → Hypothesized model explain **everything** why there are relationships within variables of interest
  - **Approximate Fit** → Hypothesized model show only **meaningful** reasons why there are relationships within variables of interest
- Model Comparison
  - Fit observed data
  - Parsimonious
  - Meaningful

# Evolution in Absolute Model Fit Method

Past

Present

Future

Chi-square

- Test of exact fit
- Related to sample size

Fit Indices

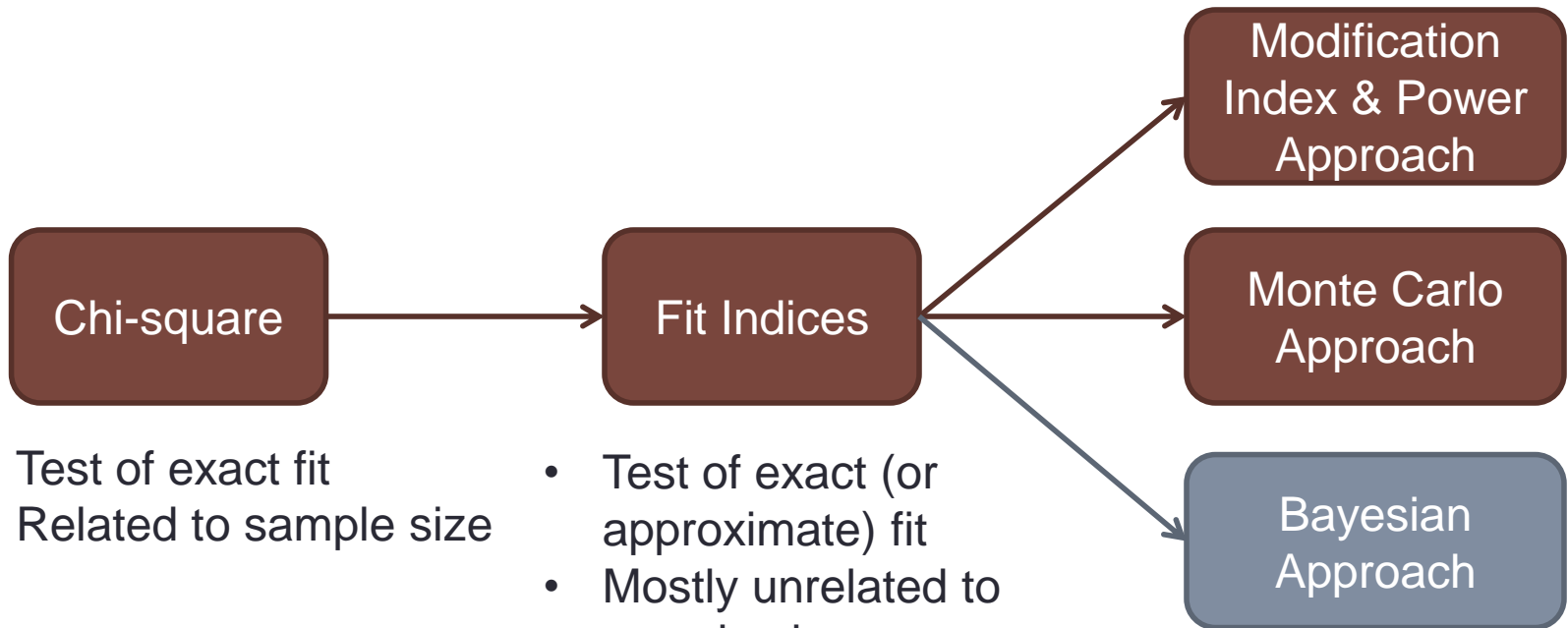
- Test of exact (or approximate) fit
- Mostly unrelated to sample size
- Have multiple values for investigation
- Have unclear cutoffs

Modification Index & Power Approach

Monte Carlo Approach

Bayesian Approach

- Test of approximate fit
- Need more research



# Presentation 1: Bayesian Approach

- Terry Jorgensen will present a method called Posterior Predictive P-value (PPP) that uses Bayesian data analysis.
- He will present his simulation study examining the PPP in confirmatory factor analysis

# Presentation 2: Bayesian Approach

- Mauricio Garnier-Villarreal will extend the PPP simulation study to confirmatory factor analysis with categorical variables.

# Evolution in Model Comparison

Present

Future

Chi-square  
Difference  
Test

Comparison  
of fit Indices

Quantify Model  
Parsimony

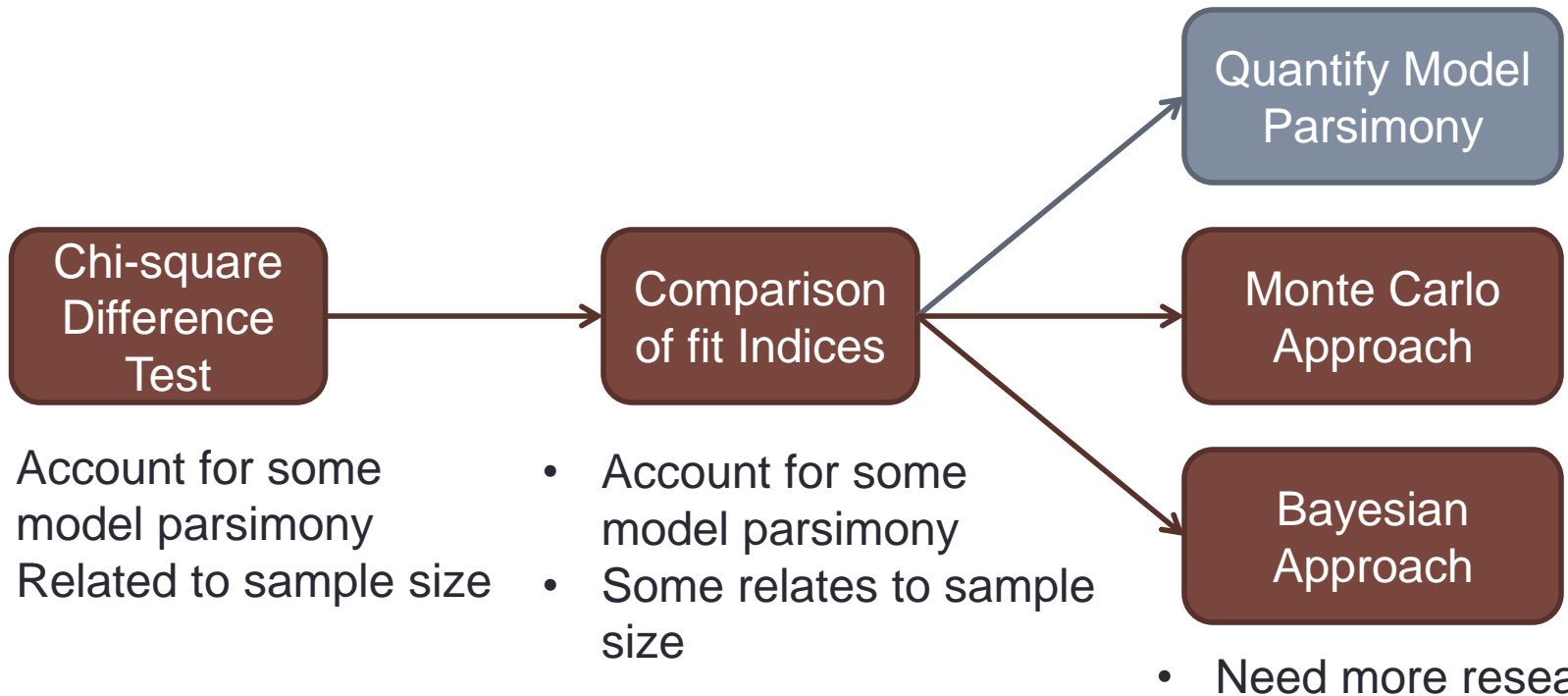
Monte Carlo  
Approach

Bayesian  
Approach

- Account for some model parsimony
- Related to sample size

- Account for some model parsimony
- Some relates to sample size

- Need more research



# Presentation 3: Model Parsimony

- Aaron Boulton will discuss the meaning of model parsimony in SEM context.
- He will propose fit indices designed to better penalize model complexity (encourage model parsimony) and present a small simulation study.



TO BE CONTINUED ...

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