Miscellaneous Topics in SEM

SDS 390 Structural Equation Modeling

Monday Apr 17, 2019

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Addressing Open Challenges in Genomics and Data Science Education

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Thursday, April 18 • 6 p.m.

Seelye Hall, Room 106

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Agenda

- Multigroup Structural Equation Modeling
  - Measurement invariance
- Latent Growth Curve Modeling
- Project time!

Multigroup SEM

Multigroup SEM

- We use Multigroup SEM when we want to compare estimates for a model between two groups.
  - Does a scale that measures feminist identity work the same between people identifying as men and people identifying as women?
  - Can we measure positive emotion and negative emotion with the same words (translated) across countries?
  - Does being objectified lead to cognitive impairments because of increases in self-objectification similarly between men and women?

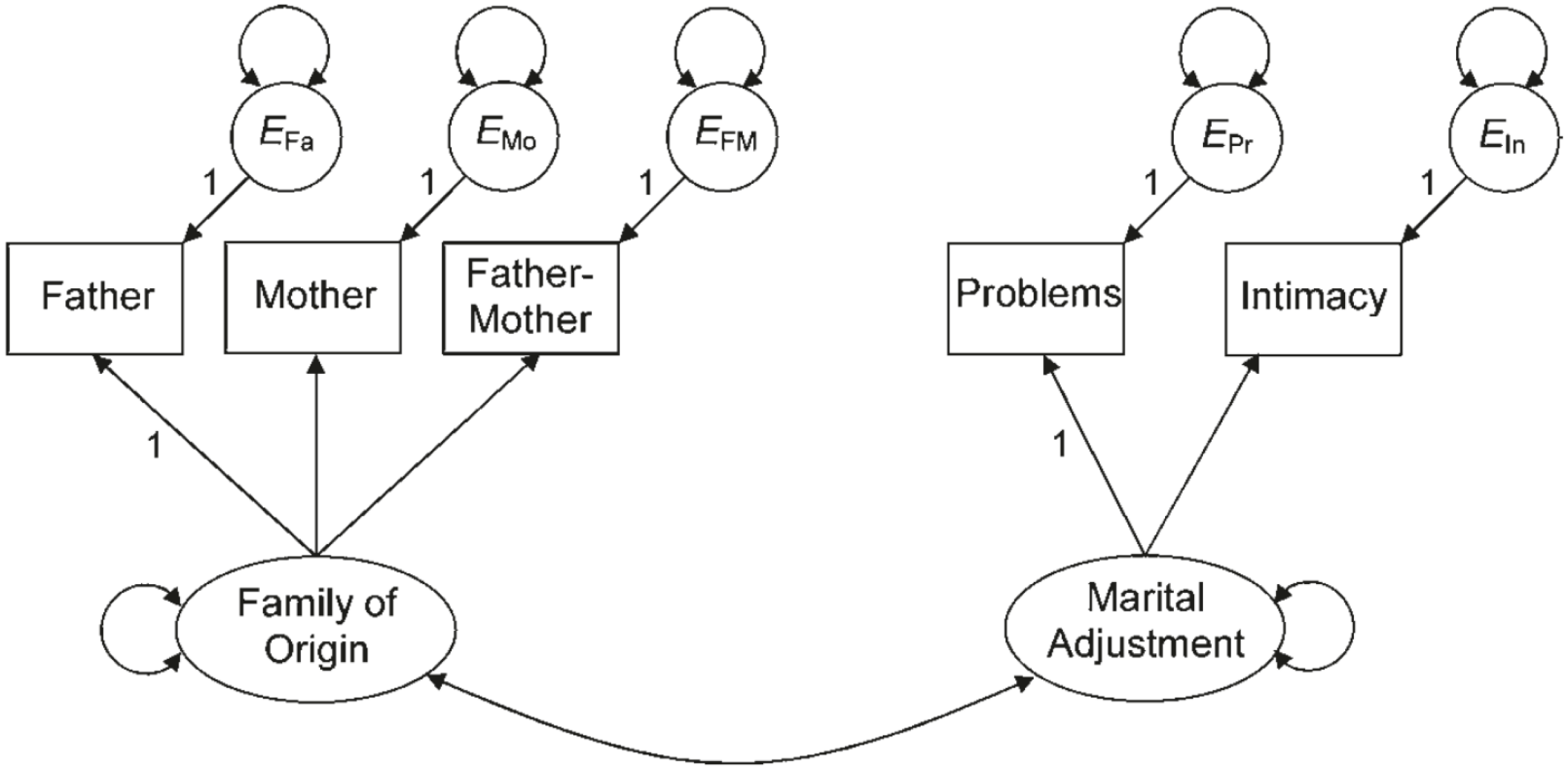
Multigroup SEM

- Two uses of multigroup SEM:

1. Measurement invariance testing
   - We do a multigroup CFA to make sure that our latent variables "work the same" across the groups.
   - Our latent variables need to be apples and apples, not apples and oranges, before we can hope to compare the structural parts of the model.
2. Moderation testing
   - Seeing if there are differences in causal paths across groups
   - Similar to including interaction terms in your model (moderation)

Measurement Invariance

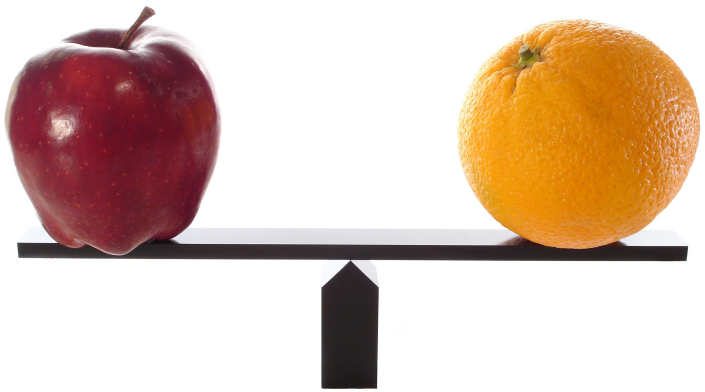
- Page 251 in your textbook…chapter 9



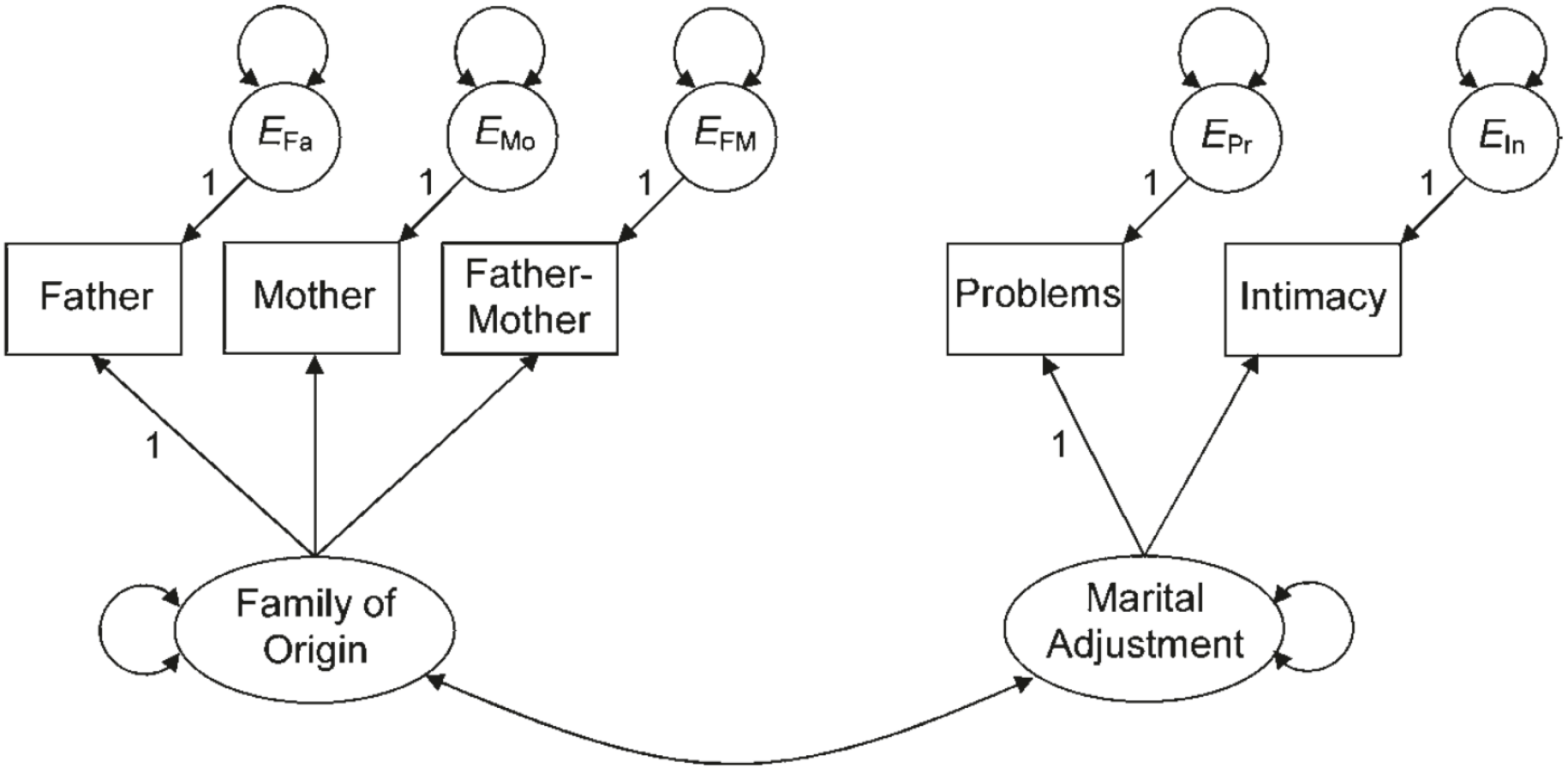
Measurement Invariance

Things we need to test:

1. Configural invariance – same latent variables and indicator variables
2. Factor loading invariance – same factor loadings
3. Intercept invariance – same item intercepts
4. Residual invariance – same residual error variances
5. Variance and covariance invariance – the interesting stuff



Measurement Invariance



Latent Growth Curve Modeling

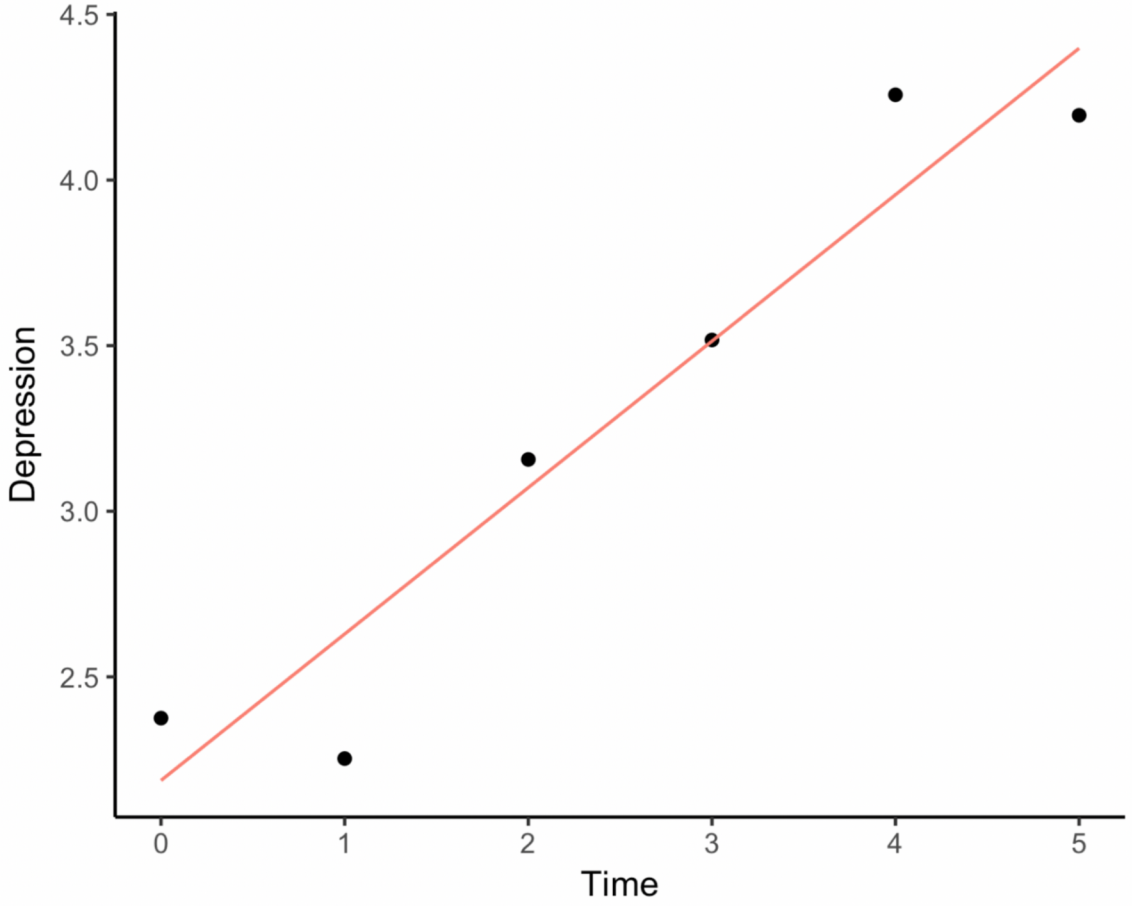
Latent Growth Curve Modeling

Growth Curve Modeling

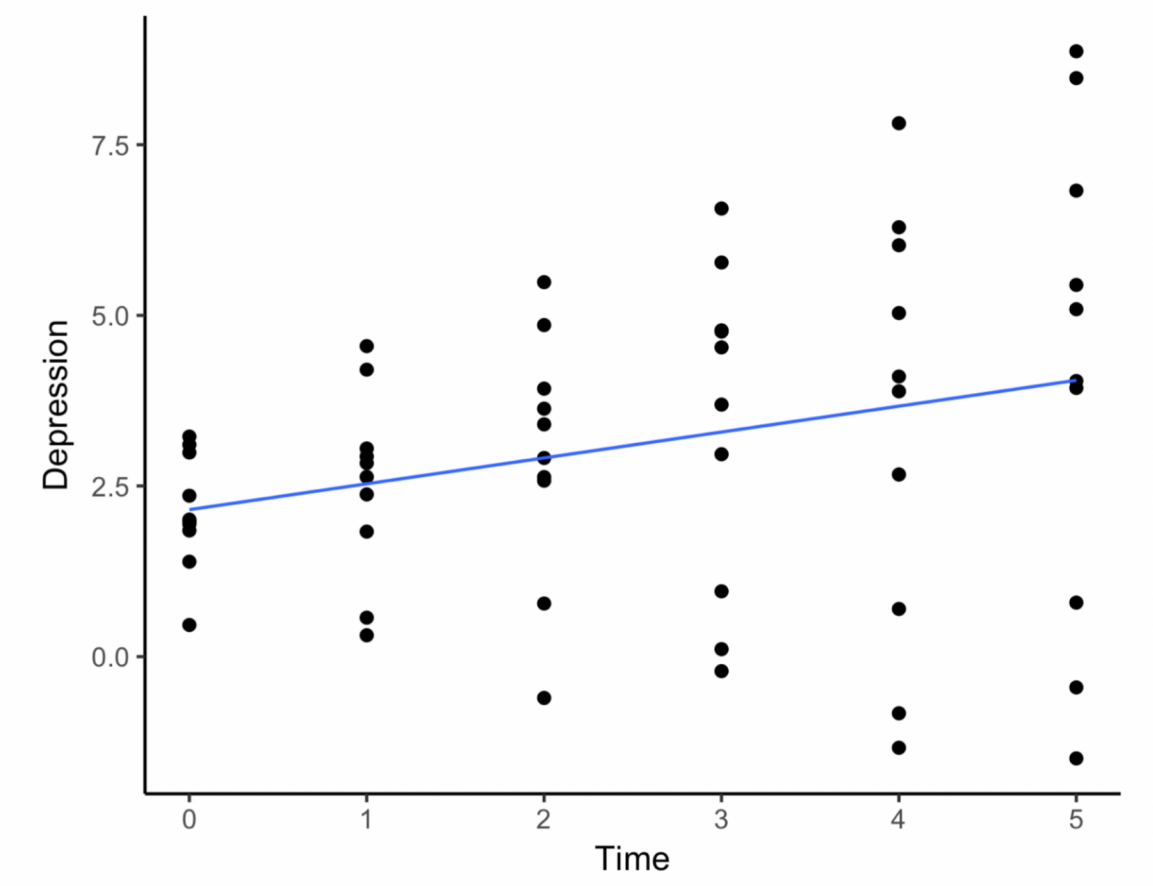
- The object of growth curve modeling is to model the trajectory of some construct over time.
- For example
  - Studying change in depression and anxiety for adolescents during the transition from junior high to high school (Barber & Olsen, 2004)
  - Young women's body image disturbances predict their change in depression during adolescents (Stice & Bearman, 2001)
- To answer these research questions, we would use time as a key predictor in the model.

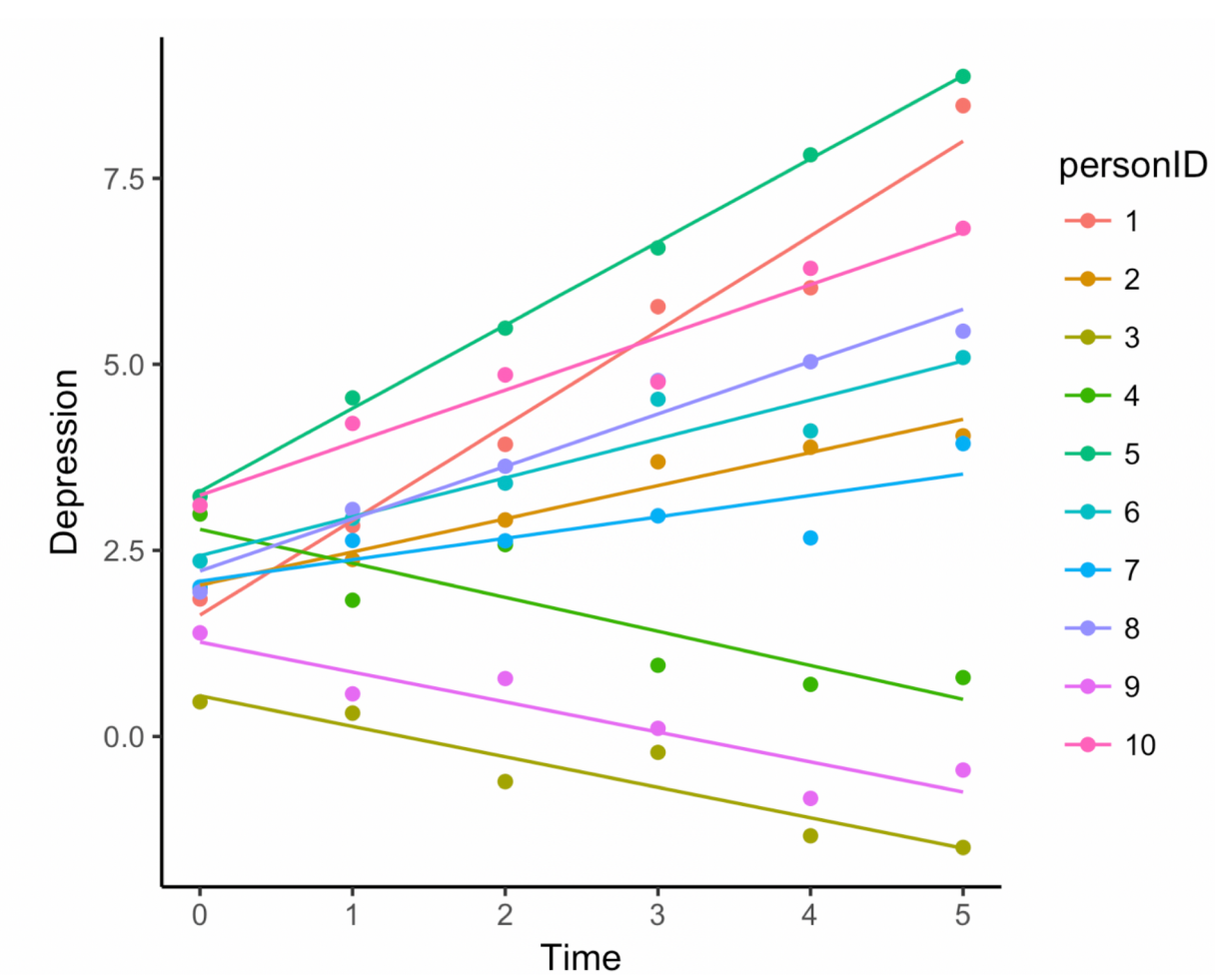
Growth Curve Modeling

- Time as a predictor, depression as response
- The interpretation of the time coefficient: for every 1 time point increase we would predict that much of an increase in depression.



Growth Curve Modeling

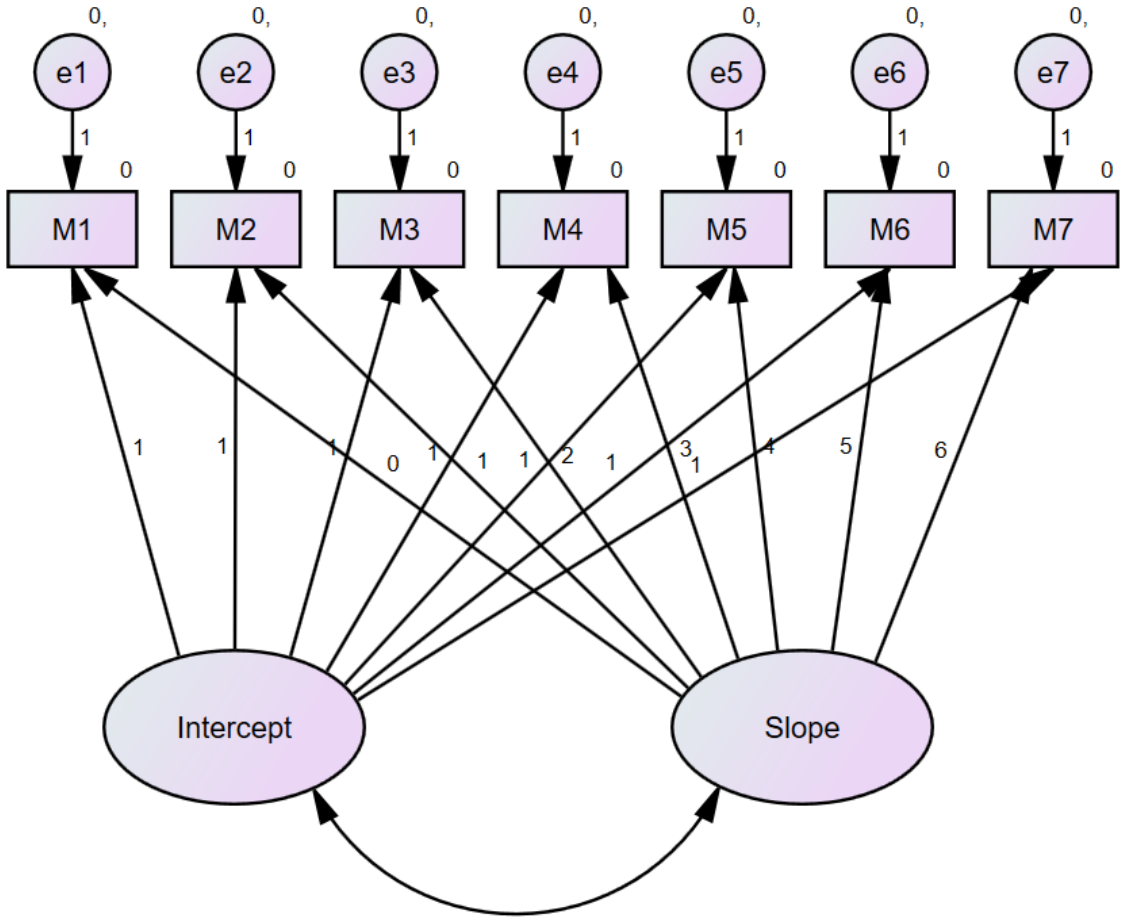




Latent Growth Curve Modeling

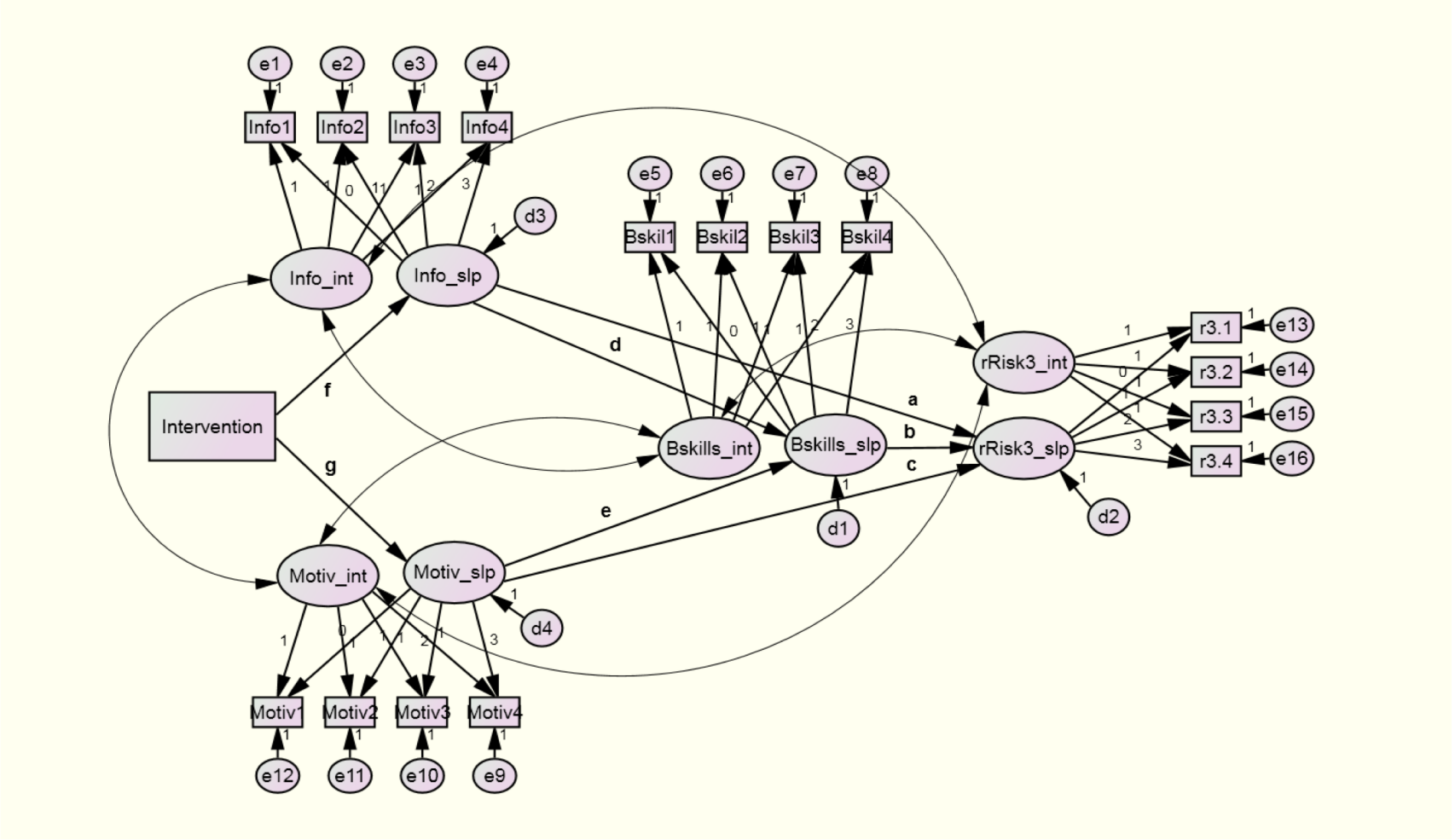
- We can specify the basic Growth Curve Model with SEM
- Then this is called "latent growth curve modeling"
  - The intercept and slope are latent variables
- We need a different (wide) data structure

Basic Latent Growth Model



Why is this helpful?

- Because now the slopes can be predictors of stuff!



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