Modeling change: A gentle introduction to cross-lagged and latent growth curve approach: course materials

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A quick overview of longitudinal assessment

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Why bother?

- Insights about change (e.g., does the effect of drug X last?)
- Insights about factors associated with change (e.g., does intervention X work?)
- Insights about directionality
- Better assessment of potential mediators
- More robust input for theory building

Requirements

- How many waves are the minimum for TRUE LONGITUDINAL?
  - Is it waves or how many times you repeated a measure/indicator?
  - Why 3 and not 2
    - Time from 1 to 2 is linear by default
    - True change and measurement error are confounded
    - Lower reliability
- Same participants (panel sample) vs. repeated cross-sectional studies (WVS, EVS, EES, ISSP, GSS…)
- Longitudinal vs. time-series („hyper-longitudinal studies”)
- Familiarity with statistical methods used to analyze longitudinal data (most frequently MLM and SEM); *longitudinal data is non-independent*

NOT TO BE FORGOTTEN: The importance of conceptualizing (expected) change, as well as what kind of changes will be associated with what kind of changes

Longitudinal studies and causality?

Unavoidable problems in longitudinal research

- PROBLEM 1: **Spacing** of repeated measurements (how much time needed for X to change?)
  - Looking for conceptual clues
  - Striking a balance between logistics and intuition
  - Should be kept in mind when interpreting findings

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- PROBLEM 2: **Attrition** and how to minimize it…
  - Planning for attrition (sample size considerations)
  - Planning how to minimize attrition
    - Symbolic and material tokens of appreciation; minimizing required participation time & efforts; planned missingness strategy, etc.
  - Minimizing attrition bias: analyze potential biases by exploring differences between those who stayed and those who left

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- PROBLEM 3: **Missing information** (and how to deal with them)
  - Attrition-related missing information
  - Explore patterns of missings
  - Analyze potential biases by exploring differences between those with missings and the completers
  - Think about the nature of missings
  - Apply, when feasible, state-of-the-art methods for dealing with missing information
    - FIML (full information maximum likelihood)
    - Multiple imputation

Ultimate benefits of longitudinal research…

- Exciting
- Great for personal learning
- Easier to establish collaboration
- Easier to publish your findings
- Bring you closer to—if not answers, then—the right questions