- Rush MAP study
  - Began in 1997, rolling enrollment
  - Northeastern Illinois, residents of continuous care communities
  - Up to 17 waves of data, few people actually have this number
  - Decision about how many waves to include

Participants

Follow up year		
	Women	Men
0	961	336
1	850	280
2	724	234
3	598	196
4	486	166
5	386	126
6	338	109
7	283	88
8	233	77
9	180	54
10	121	39
11	63	19
12	32	5
13	23	2
14	17	2
15	13	2
16	1	0

Question

- Do the number of waves included in the growth model impact the conclusions?

- Examine cognitive and physical outcomes with increasing numbers of waves included

Plots

- KB_profiles (https://goo.gl/photos/yRLCNLmwJcmGGKrj8)
- Left column: Intercepts (baseline)
- Right column: Slope (rate of change)
- Vertical facet: Gender
- Horizontal facet: Outcome measures
- X-axis: Numerical value
- Y-axis: Waves included in analysis
- Labels: `Estimate|S.E.|Est./S.E. |P-Value`

Intercepts

- Intercepts show little change over the number of waves used in the analysis.
- Across all outcome pairs this remains true
- Intercepts are the baseline levels of the outcome measure
- Fluctuations over the number of waves might indicate model misspecification

Grip-Category Fluency

- Slope column, physical facet
- Regardless of the number of waves analyzed we see a steady decline in grip strength for both sexes.
- Women: The straight vertical purple line suggests a consistent rate of decline regardless of waves count included.
- Men: The curvature of the line between wave count 4 and 8 hints at an accelerated rate of decline between those time points.

Grip-Category Fluency

- Slope column, significance row, cognitive facet
- Slopes become significant once at least 9-10 waves are included
- If we analyze fewer than 9 waves of data we fail to detect a significant decline in category fluency test performance.
- Men require fewer waves (9) of data in the analysis to detect a significant decline than women (10).

Grip-Number Comparison

- Kb_fans (https://goo.gl/photos/vYX4k8K4bb3nUTmf6)
- Slope column, significance, cognitive facet
- Men: We can detect a significant decline in number comparison task performance once at least 7 waves are included.
- Women: Both positive (wave 5) and negative slopes (wave 9+) reached significance.

Grip-Number Comparison

- Zoom on top right cell, slope column, point estimate row.
- Facets: cognitive, women.
- Changing signs of the slope suggests non-linearity in the observed data.
- We explore the observed and modeled data in the next series of dynamic plots.

Kb Fans: grip-NUMBERCOMP

- Red lines: trajectories of individuals across time.
- Y-axis: performance on the number comparison task
- X-axis: time metric
- Top row: time in study*
- Bottom row: biological age
- Blue lines: smooth average

Kb Fans: grip-NUMBERCOMP

- Left column: observed trajectories
- Middle column: predicted trajectories reconstructed from the fixed effects (.out files) estimated by Mplus.
- Right column: trajectories reconstructed from factor scores (gh5. file) created during model estimation in Mplus.

Kb Fans: grip-NUMBERCOMP

- Left, age
- The curvilinear shape of the trajectory is evident
- Supports our hypothesis from Kb profile graph
- Small increase in performance between ages and 60 and 65 likely represent practice effects
- Decline begins ~67 yrs
- Accelerates ~82 yrs

Kb Fans: grip-NUMBERCOMP

- Middle, age
- The blue line (smoothed average) becomes steeper as more waves are included in the analysis.
- It appears that women show a practice effect but decline sooner (~67)
- Men do not show a practice effect but decline later (~80)
- There are fewer men than women

Kb Fans: grip-NUMBERCOMP

- Right
- Trajectories reconstructed from the estimated factor scores (Mplus .gh5 file)

Questions/Discussion

Q1: What exactly do factor scores reconstruct?

Q2: At what wave count do trajectories become unreliable?