LA-Aging Summary Measures from Cognitive Assessment Battery
April 11, 2023

Global Cognitive Function Domain

GC1. General Cognitive Function

- Test: TICSm
- Variable: totalscore from TICS
- Approach
    - Create z-score by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide standard deviation
    - Ignore any missing data

Memory Domain

MEM1. Word List Delayed Memory

- Test: TICSm
- Approach
    - Create z-score by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide standard deviation
    - Ignore any missing data

MEM2. Story Memory Immediate

- Test: Story Recall
- Variable: totscore from storyrecall1; story packet
- Approach
    - Separately, for scores from each packet, create z-scores by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide standard deviation
    - Take mean of immediate recall scores for each participant
    - Renormalize mean to have standard deviation 1
    - Ignore any missing data

MEM3. Story Memory Delayed

- Test: Story Recall
- Variables: totscore from storyrecall2; story packet
- Approach
    - Separately, for scores from each packet, create z-scores by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide standard deviation
    - Take mean of delayed recall scores for each participant
    - Renormalize mean to have standard deviation 1
    - Ignore any missing data

Executive Function Domain

EF1. Set shifting

- Test: OTMT-B
- Variables: time_comp_b
- Approach

- Transform score by using a log transformation
- Create z-score by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide standard deviation
- Re-order z-scores so that positive scores reflect better performance by subtracting each from 0
- Ignore any missing data

EF2. Category Verbal Fluency

- Tests: Category and Letter Fluency
- Variables: animalcorrect; vegecorrect
- Approach for Category Verbal Fluency
  - Sum animal and verbal fluency scores (requires both to be non-missing)
  - Create z-score by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide standard deviation

EF3. Letter Verbal Fluency

- Variables: lcorrect; fcorrect
- Approach for Letter Fluency
  - Sum "l" and "f" scores (requires both to be non-missing)
  - Create z-score by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide standard deviation

EF4. Attention/Working Memory 1

- Test: Number Span Forward and Backward
- Variables: dst_forwardtot; dst_backwardTot
- Approach
  - Sum digit forward and backwards scores (requires both to be non-missing)
  - Create z-scores by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide standard deviation

Composite Scores

General Cognitive Function

- Equal to GC1

Global Episodic Memory

- Average MEM1-MEM3, ignoring any missing data
- Create z-score by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide baseline standard deviation

Global Executive Function

- Average EF1-EF4, ignoring any missing data
- Create z-score by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide baseline standard deviation

Global Cognitive Composite

- Average z-scores from the following individual tests (note that this differs from averaging the three domain-specific z-scores and includes TICSm (Long) and Oral Trails A, which don't contribute to any of these):
  - TICSm total score
  - TICSm-Long to assess delayed memory
  - Story recall (immediate)
  - Story recall (delayed)

    - Oral trails A (based on log transformation
    - Oral trails B (based on log transformation)
    - Verbal fluency
    - Category fluency
    - Number span test (total of forward and backward)
- Create z-score by dividing the difference between individual scores and the raw cohort-wide baseline mean by the raw cohort-wide standard deviation

In the primary analyses, to follow intention-to-treat and use all available data to compare changes from baseline, we will include all cognitive assessments (baseline through Year 3) as dependent variables in general linear models (including data from participants with incomplete follow-up) and use linear contrasts to compare the average changes from baseline across follow-up between intervention groups: the difference between the average means at years 1, 2, and 3 and the baseline mean.