Research Plan - Beyond Correct Responses: Test-Reetest Reliability of Additional Verbal Fluency Measures

Yumeng Lyu, Kevin Riggs & Shane Lindsay

Background

- **Verbal fluency Test (VFT)** is a widely used, easily administered psychological assessment (Villalobos et al., 2022):
  - Task is to generate as many words as possible in 60s, either:
    - Within a specific category (semantic fluency, e.g. “animal”)
    - Or starting with a particular letter (phonemic fluency, e.g. “F”)
  - Typically performance on the VFT is based on number of correct responses, however additional measures have potential theoretical such as error types, response latency, clustering, switching, and lexical properties (Amunts et al., 2021; Ayers et al., 2022; Patra et al., 2020).
  - However, the test-retest reliability of these additional measures remain unexplored.

Methods

A two-session study design, with sessions separated by a one-week interval.

In each session, participants (n = 60) will complete online versions of both semantic and phonemic VFT tasks.

Session 1

- F, A, S, B
- C, L, P, D

Session 1

- F, A, S, B
- O, T, M, N

Clustering and Switching

- Clustering: groups of successively generated words semantically related or share common features
- Switching: shifting between clusters

Additional measures

- Repeated words
- Non-repeated words

Clustering and Switching

- Fruits
- Clusters
- Apple
- Banana
- Tangerine
- Orange
- Grapefruit
- Strawberry
- Blueberry
- Kiwi
- Peach
- Pear

- Citrus Fruits
- Berries Fruit

- Fruits
- Switches
- Apple
- Switch
- Banana
- Switch
- Tangerine
- Orange
- Grapefruit
- Switch
- Strawberry
- Blueberry
- Switch
- Kiwi
- Switch
- Peach
- Pear

Lexical properties

The characteristics or attributes of individual words or lexical items.

- Age of acquisition rating
- Brown verbal frequency
- Word class
- Concreteness rating
- Familiarity rating
- Imagibility rating

Errors

Any responses that do not meet the criteria for correctness.

- Repetition
- Variations
- Unclear or Non-existent Words
- Non-member Words
- Meta-comments: comments related to the testing process but not actual responses

Response latency

For each test per participant

- First reaction time
- Sub reaction time

For each item test

- Initiation parameter and Slope
- correct responses will be divided into 5-second bins within each 60-second trial based on timestamps
- compute the average correct responses within each bin
- plot the line graphs (x variable, bins; y variable, mean correct responses)

Results

- Test-retest reliability of VFT, semantic fluency test, and phonetic fluency test
- For correct responses and the four additional measures, we will explore the Pearson’s correlation and the Intraclass Correlation Coefficient, followed by the classification of poor (r < 0.5), moderate (0.5 ≤ r < 0.75), good (0.75 ≤ r < 0.9), and excellent (r ≥ 0.9) reliability between session 1 and session 2.

- Test-retest reliability of repeated and non-repeated items
  - We will explore the impact of items by comparing the test-retest reliability of repeated items and non-repeated items in correct responses and additional measures.

References