

## Introduction

- Anomia<sup>1</sup> is often assessed with confrontation picture naming tests (CNT's) which
  - are relatively efficient
  - are simple to administer and score
  - and observed behaviors can be analyzed to identify impaired word retrieval processes
- Professionals use CNT's
  - to determine the efficacy of experimental treatments,
  - assess impairment severity
  - quantify the improvement of patients
- An implicit assumption is that scores on CNTs lead to valid inferences regarding performance at the discourse level.
- However, there are significant differences in the nature of the processes involved in confrontation naming and discourse production<sup>2,3,4,5,6</sup>

## Study Aims

- Determine the magnitude of the relationship between performance in CNT's and the proportion of paraphasias in three different types of discourse when accounting for construct irrelevant variance (i.e. random noise and irrelevant systematic variance).
- To determine the relationship between observed scores in CNT's and paraphasias in discourse.

## Method

### Participants

- Data from 98 PWA retrieved from AphasiaBank<sup>7</sup>. *Criteria:* (i) chronic aphasia (min = 6 months post onset); (ii) left hemisphere stroke; (iii) aided or unaided normal hearing acuity; (iv) corrected or uncorrected normal visual acuity; (e) English as their primary language; and, (v) no reported history of psychiatric or neurodegenerative diagnosis.

Table 1  
*Aphasia WAB-R Type and Severity*

WAB-R Classification	
Anomic	33
Broca	22
Conduction	22
Wernicke	14
Global	4
Transcortical Motor	3
Duration (Yrs)	5.59 (6.23)
Mean WAB-RAQ	70.42 (17.03)

Note. SD's are shown in parentheses

## Procedures

### Elicitation of Language Sample & Estimation of Discourse Based Indices

- Stimuli.* Three discourse tasks form the AphasiaBank Protocol were used: (i) Free Speech, (ii) Picture Description, (iii) Cinderella Story (<http://talkbank.org/APhasiaBank/protocol/list.pdf>)
- Discourse Level Indices.* Content words were tagged in CLAN to indicate the different types of paraphasias
  - Paraphasia types included: semantic, formal/phonological, neologisms, and mixed.
  - The number of words for each type of discourse was estimated and proportions of paraphasias in each type of discourse were calculated

### Confrontation Naming Tests

- All PWA were administered the Western Aphasia Battery-Revised<sup>8</sup>, the Short Form of the Boston Naming Test<sup>9</sup>, and the Verb Naming Test<sup>10</sup>

### Statistical Analysis

- Data were analyzed using structural equation modeling in Mplus 6.1. Factor scores formed based on confrontation naming tests were used to predict the factor scores that were based on discourse production. The model was estimated using robust maximum likelihood to account for non-normality. Missing data (~2%) were accommodated using direct maximum likelihood.

## Results

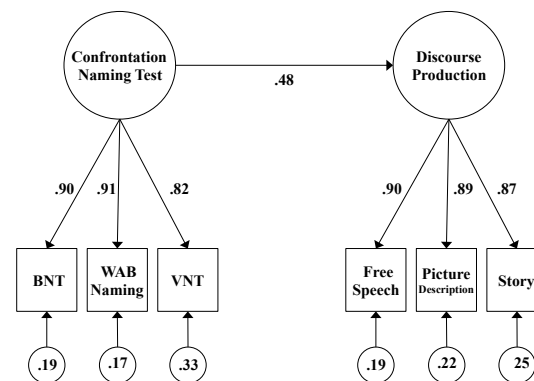


Figure 1. Fit and model parameters.  $\chi^2 = 15.34$ ,  $p = .053$ ; CFI = .986; RMSEA = .097; and, SRMR = .043. For each observed variable, the variance accounted for by the common factor,  $R^2 = (1 - \text{residual variance}) = \lambda^2$ . For all parameter estimates,  $p < .001$ .  $\Gamma$  is a standardized regression coefficient such that  $\Gamma^2 =$  variance shared between the two factors.

## Discussion

### Main Findings & Implications

- It is common in practice to refer to performance on CNTs to presume a patient's performance in discourse. This study explored the validity of the assumption that CNTs are valid indicators of rates of paraphasias in discourse.
- The relationship between the latent variables that determine performance in CNT's and discourse production with respect to the proportion of paraphasias produced was statistically significant and moderately strong ( $\Gamma = .48$ ):
  - While CNTs are informative about performance at the discourse level, there is a large proportion of unique variance.
  - These results do not support the common practice of reaching conclusions about rates of paraphasias in discourse based on performance on CNTs.
- Standard path analytic procedures<sup>11</sup> can provide estimates of the relationship between any two *observed* variables in the model.
  - E.g., the relationship between BNT and proportion of paraphasias in story telling is equal to the product ( $\lambda_1 * \Gamma * \lambda_6$ ) =  $.90 * .48 * .87 = .37$
  - In practice, for clinicians and researchers who do not have access to large samples and techniques such as SEM and rely on observed scores for a single individual at a time, inferences may be even less justified because they do not have the resources to partial noise from the observed scores.
- Professionals may gain additional information from assessing both the patient's ability to retrieve single words by way of CNTs and also assessing discourse by way of a language sample.
- Statistically significant, very strong loadings were observed in confrontation naming tests (.90 - .82) and discourse production (.90 - .87).
  - The magnitude of these results suggest that the observed indicators reflect the unitary underlying psychological constructs (i.e., single word retrieval).

### Caveats & Future Directions

- The analysis is restricted to paraphasias but excludes other instances of word finding difficulty at the discourse level (e.g., filled or unfilled hesitations, circumlocutions, comments, self corrections, deletions, overuse of indefinite terms; Mayer & Murray, 2003). Also, verbs and nouns are combined.
  - Employ a more detailed coding system for paraphasias.

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