The Relationship between Discourse Performance and Life Participation in Persons with Aphasia

Jessica D. Richardson, Whitney M. Saunders, Sarah G. Hudspeth, Adam Jacks, Maura Silverman, Katarina Haley
Neuroscience of Rehabilitation Laboratory, Department of Communication Sciences and Disorders
University of South Carolina, USA

Introduction

- Life participation, as defined by the WHO-ICF, is the nature and extent of a person's involvement in life situations.
- There is limited understanding of the predictors of the participation of persons with aphasia (PWAs) in community, civic and social life.
- Language difficulties experienced by PWAs often prevent their participation in a variety of life roles that require communication (work, community engagement, relationships, etc.).[1,2]
- Measurement of communicative ability during conversation and/or structured discourse has been demonstrated to reliably predict real-world conversational abilities, listener perceptions, social integration and quality of life.[3-5]
  - Research demonstrates that even those with mild aphasia produce discourse samples that, though well-structured, are characterized by reduced complexity, content, length, coherence and lexical diversity.[6]
- Discourse abilities may therefore have a strong and positive relationship with life participation. This relationship has not been explored, and the discourse measures best suited for exploring this relationship need to be established.
  - For example, what combination of word-level, cohesion/coherence, "gist", correctness, and efficiency measures would best predict life participation?
- **Research Question: Is there a relationship between discourse performance and life participation?**
  - A. Is there a relationship between lexical diversity during discourse and life participation?
  - B. Is there a relationship between the ability to express essential concepts during discourse and life participation?

Methods

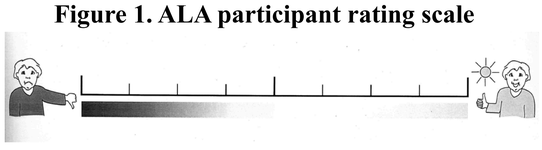
Participants

- A total of 39 individuals with stroke-induced aphasia participated in this study.
  - 7 PWAs were excluded: 5 did not complete all 3 narratives; 2 had insufficient number of tokens for the VOCD analysis.
- Our final sample included 32 PWAs (13 female)
  - Age: Mean 61.9 years (SD 11.5), range 39 – 80 years
  - Race: 23 Caucasians, 8 African Americans, 1 American Indian
  - WAB-R AQ: Mean 79.4 (SD 12.4), range 49.7 to 97.4

Life Participation

- The Assessment for Living with Aphasia's (ALA) Life Participation subscales relate to the PWA's actual participation in everyday life roles and situations. Sample questions include:
  - Do you get out to where you want to go?
  - Are you doing what you want with learning and education?
  - Do you join in simple conversations? Complex conversations?
- Responses to questions are given using rating scales.

Figure 1. ALA participant rating scale



Discourse Production

- PWAs were asked to produce monologic narratives following standardized administration techniques.[7]
- Three narratives assessed: Broken Window picture sequence description (see **Figure 2**), Cinderella story retell (see **Figure 3**), and procedural explanation of making a PBJ.

Figure 2. Broken Window

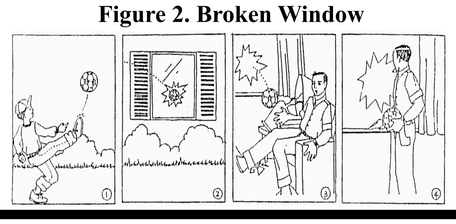


Figure 3. Cinderella

Methods con't

Discourse Production (cont.)

- ***1 – Main Concept Analysis***
  - A measure of narrative adequacy, or how well one conveys the main "gist" of a picture, story, etc.
  - PWA transcripts for each narrative were scored using a list of MCs, which were identified by previous research as MCs produced by 50% of controls.[8]
  - A multi-level coding system[8] was used to determine the accuracy and completeness of main concepts.
    - **0 - Absent (AB)**: The participant did not produce any portion of the MC.
    - **1 - Inaccurate/Incomplete (II)**: The participant attempted to produce a portion of the MC, but it was missing at least one essential element and another essential element was incorrect.
    - **2 - Inaccurate/Complete (IC)**: The participant produced a complete MC, but at least one essential element was inaccurate.
    - **2 - Accurate/Incomplete (AI)**: The participant produced an accurate MC, but at least one essential element was missing.
    - **3 - Accurate/Complete (AC)**: The participant correctly produced all essential elements.
  - Scores for each MC were summed to yield the MC overall score.
- ***2 - VOCD-D***[9]
  - A metric of lexical diversity that overcomes the varying sample size limitations of the Type-Token Ratio (TTR) by mathematically modeling how new words are introduced into larger language samples.
  - There is a minimum of 50 tokens-per-sample requirement.
  - Each narrative was transcribed using AphasiaBank's CHAT format, which is integrated into CLAN.
  - The transcripts of the three narratives for each PWA were combined for analysis.

Data Analysis

- Descriptive statistics (Figure 4 – 6) and statistical analyses (Table 1, Figure 7-8) for our continuous data were completed using SPSS 22 (IBM SPSS, Inc.).
- Data were first screened to ensure assumptions of planned correlation analysis (Pearson's product-moment correlation coefficient [r] or Spearman's rank-order correlation coefficient [r_s]) were not violated. Screening included evaluation of normality (skewness, kurtosis, Q-Q plots, Shapiro-Wilk normality tests), and linearity and monotonicity (visual inspection). Our variables were normally distributed and linearly related, thus Pearson's r was determined to be appropriate for use.
- For **Question A**, a one-tailed, Pearson's r was calculated between the ALA - Life Participation subtest and the VOCD-D.
- For **Question B**, a one-tailed, Pearson's r was calculated between the ALA - Life Participation subtest and the overall Main Concept score.

Results

- There are strong, positive correlations between life participation and both discourse measures, lexical diversity and main concepts.
  - Therefore, PWAs with greater lexical diversity (a larger VOCD-D) reported higher life participation scores.
  - PWAs who produced a greater number of main concepts reported higher life participation scores.
- Strong correlations of both discourse measures with the life participation measure may suggest that one may be predictive of the other.

References

1. Ross, K.B. & Wertz, R.T. (1999). Comparison of impairment and disability measures for assessing severity of, and improvement in, aphasia. *Aphasiology, 13*(2), 113-124.
2. Dalemans, R.J.P., DeWitte, L.P., Wade, D.T., & Van den Heuvel, W.J.A. (2008). A description of social participation in working-age persons with aphasia: A review of the literature. *Aphasiology, 22*(10), 1071-1091.
3. Cruice, M., Worrall, L., & Hickson, L. (2003). Finding a focus for quality of life with aphasia: Social and emotional health, and psychological well-being. *Aphasiology, 17*(4), 333-353.
4. Doyle, P.J., Goda, A.J., & Spencer, K.A. (1995). The communicative informativeness and efficiency of connected discourse by adults with aphasia under structured and conversational sampling conditions. *American Journal of Speech-Language Pathology, 4*(4), 130-134.
5. Nicholas, L.E., Brookshire, R.H. (1995). Presence, completeness, and accuracy of main concepts in the connected speech of non-brain-damaged adults and adults with aphasia. *Journal of Speech, Language, and Hearing Research, 38*, 145-156.
6. Andreetta, S., Cantagallo, A., & Marini, A. (2012). Narrative discourse in anomic aphasia. *Neuropsychologia, 50*(8), 1787-1793.
7. Aphasiabank. (n.d.) Aphasiabank protocol description. Retrieved from http://www.talkbank.org/aphasiabank/protocol/description.pdf
8. Richardson, J.D. & Hudspeth, S.G. (Accepted but pending). Main concepts for three different discourse tasks in a large non-clinical sample. *Aphasiology*.
9. Aphasiabank. (n.d.) The CLAN program. Retrieved from http://www.talkbank.org/aphasiabank/

Figure 4. Average scores of ALA Life Participation subscales

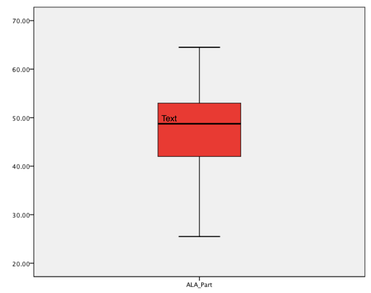


Figure 5. Average MC scores

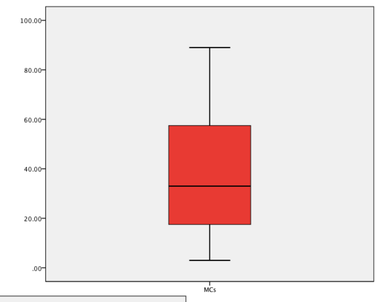


Figure 6. Average VOCD-D scores

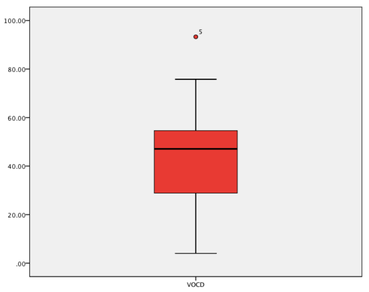


Table 1. Correlation between Life Participation and VOCD-D and MC

	Pearson r*	Significance
VOCD-D	0.529	0.001
MC	0.561	0.000

**one-tailed test*

Figure 7. Correlation between Life Participation and Main Concepts

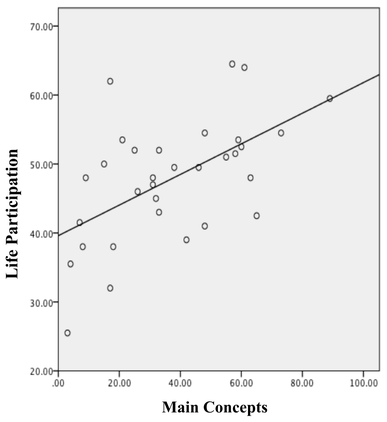
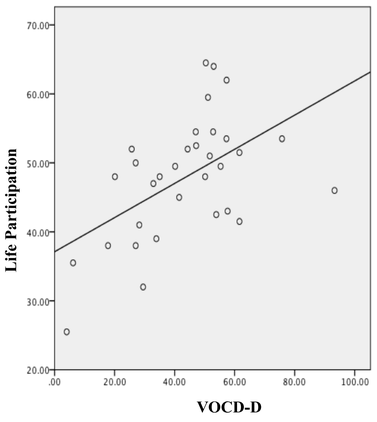


Figure 8. Correlation between Life Participation and Lexical Diversity



Discussion

- Both discourse measures investigated in this study were significantly correlated with life participation scores, with large effect sizes (>.50).
- Our findings are consistent with previous research demonstrating that discourse abilities were related to social integration and quality of life in persons with aphasia.[1]
- These findings support the need to continue to develop and refine therapy methods that focus on discourse and conversational abilities rather than the more commonly addressed discrete language deficits.
- These findings provide further support for the need for clinician-friendly discourse measures, which may actually galvanize the speech-language community into incorporating functional discourse tasks into treatment.
- With such tools, clinicians and clinical researchers could increasingly target narrative discourse during treatment of PWAs.
- It is hoped that an increased emphasis on discourse in assessment and treatment would result in greater life participation and quality of life for PWAs.
- Limitations and Future Directions:
  - Discourse measures were limited to verbal output and, therefore, did not include non-verbal aspects of communication, such as facial expressions and physical gestures, which are often used by PWAs in place of linguistic information. Allowing a gesture to serve as an essential element in a main concept would have increased the main concept scores for many of our participants.