

The Relationship between Discourse Performance with and without Gesture Use and Life Participation in Persons with Aphasia



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Introduction

- Language difficulties experienced by PWAs can prevent their participation in a variety of life roles that require communication.^{1,2}
- Measurement of communicative ability during conversation and/or structured discourse reliably predicts real-world conversational abilities, listener perceptions, social integration and quality of life.³⁻⁵
- Discourse abilities may 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?
- In addition, PWAs use gestures more, and with greater variety, than typical speakers,⁶ and the use of gesture may "contribute to the communication of meaning" in PWAs.⁷
- Specific Aims**
 - To characterize the relationship between life participation and discourse performance as measured by lexical diversity and main concept production.
 - To characterize the relationship between life participation and discourse performance as assessed by two verbal plus gestural discourse measures.

Methods

Participants

- A total of 28 individuals (11 female) with stroke-induced aphasia participated in this study.
 - Age: Mean 63 years (SD 11.5), range 39 – 80 years.
 - Race: 20 Caucasians, 7 African Americans, 1 Asian American.
 - WAB-R AQ: Mean 82.2 (SD 9.67), range 57.3 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.

Discourse Production

- PWAs were asked to produce monologic narratives following standardized administration techniques.⁸
- Three narratives were assessed: Broken Window picture sequence description, Cinderella story retell, and procedural explanation of making a peanut butter and jelly sandwich.
 - 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.
- 1 - VOCD-D⁹**
 - 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.
 - Minimum 50 tokens/sample requirement.
- 2 - Main Concept Analysis (MCA)**
 - 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 33% of controls.¹⁰

Methods (cont.)

- 2 - Main Concept Analysis (cont.)**
- A multi-level coding system¹⁰ 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.

Gesture Scoring

- Gestures that conveyed linguistic information within the discourse task were coded as above for MCA, and were labeled with the word or phrase represented by the gesture for inclusion in VOCD calculations.

Data Analysis

- Descriptive statistics (Table 1) and statistical analyses (Table 2, Figure 1) for our continuous data were completed using SPSS 22 (IBM SPSS, Inc.).
- Our variables were normally distributed and linearly related, thus Pearson's *r* was determined to be appropriate for use.
- For **Aim 1**, a one-tailed, Pearson's *r* was calculated between the ALA - Life Participation subtest and the VOCD-D and overall MC scores.
- For **Aim 2**, a two-tailed, Pearson's *r* was calculated between the ALA - Life Participation subtest and the verbal plus gestural scores.

Results

- There are significant positive correlations between life participation and both verbal only discourse measures, lexical diversity and main concepts.
 - PWAs with greater lexical diversity and greater production of main concepts reported higher life participation scores.
- Correlations of both verbal only discourse measures with the life participation measure may suggest that one may be predictive of the other.
- Correlations remained significant but decreased in strength when gestural productions were included.

Table 1. Descriptive statistics for the ALA - Life Participation subtest, Main Concepts, VOCD, and the verbal plus gestural discourse measures.

		No Gesture		Gesture	
	ALA Participation	MC	VOCD	MC	VOCD
Mean	48.69	40.32	46.36	44.00	47.11
S.D.	8.95	21.93	17.85	21.54	17.48
Minimum	25.5	7	4	9	4.03
Maximum	64.5	89	93.29	89	92.97

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Results (cont.)

Figure 1. Correlations between Life Participation and Main Concepts and VOCD scores with (A, B) and without (C, D) gestures included.

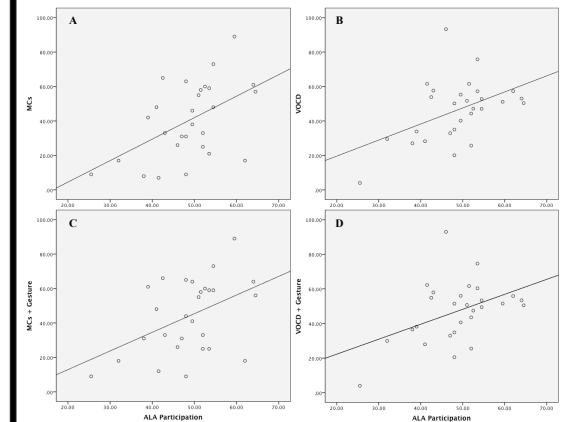


Table 2. Correlations between Life Participation and VOCD and MC scores with and without inclusion of gesture production.

	No Gesture ^a		Gesture ^b	
	MC	VOCD	MC	VOCD
Pearson's <i>r</i>	0.509	0.467	0.450	0.443
Significance	0.003	0.006	0.016	0.018

^aone-tailed test; ^btwo-tailed test

Discussion

- Discourse measures were significantly correlated with life participation scores, with large correlation coefficient effect sizes for verbal only MC and moderate effect sizes for verbal only VOCD and the verbal plus gestural discourse measures.
- This is consistent with previous research that discourse abilities are related to social integration and quality of life in persons with aphasia.¹
- These findings support the continued development of assessment and rehabilitation techniques focusing on discourse and conversational abilities.
- The slightly weaker correlations between life participation and the verbal plus gestural discourse measures suggest that verbal output alone may be a stronger predictor of life participation than the combination of verbal plus gestural output, despite the frequent use of gestures by PWAs.
 - The goal of PWAs is to return to their pre-morbid baseline, which for most means verbal only communication. It is possible that PWAs who rely on gesture plus verbal output for successful communication will be less likely to engage with the community at large, thereby reducing life participation.
 - Additionally, unfamiliar communication partners might be less willing to engage PWAs who use gestures to support communication, making these attempts to engage the community more difficult and less successful.
- Future investigations should be conducted to determine if other discourse measures, or a different combination of discourse and gesture information, will strengthen our ability to predict life participation.