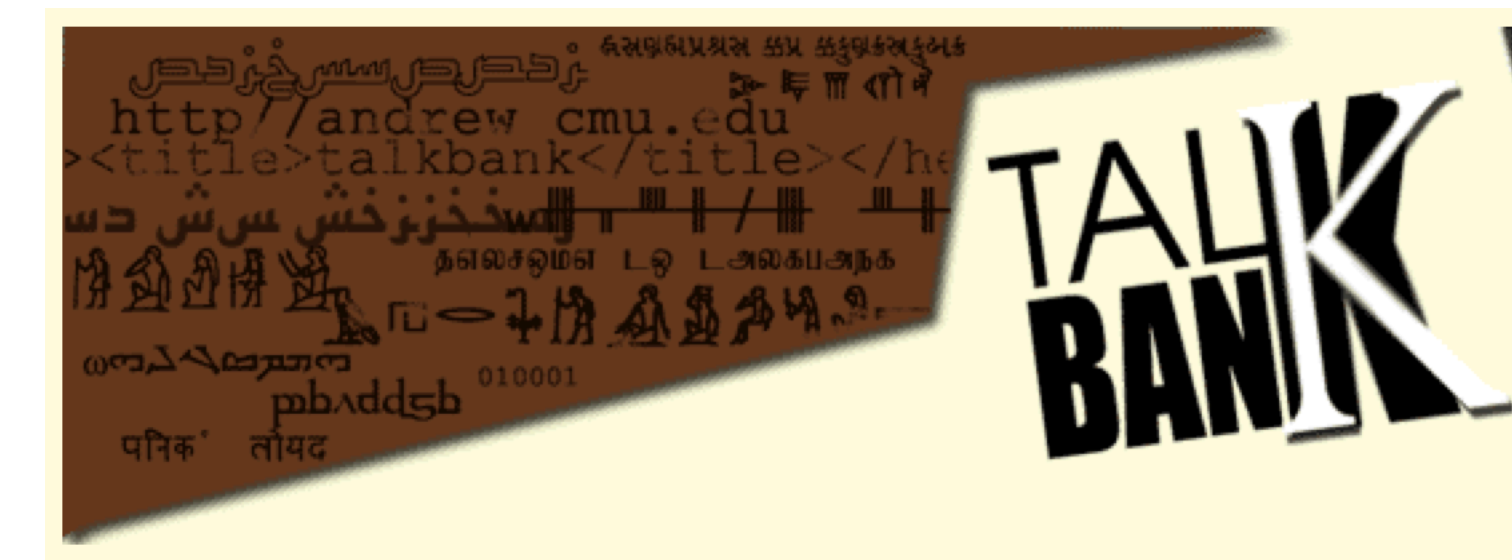




The Relationship between Discourse and Naming in Persons with Aphasia

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Introduction

- Anomia is the primary diagnostic feature of all aphasia subtypes.
- Individuals with aphasia also demonstrate impaired discourse ability and a resultant decline in functional communication.¹⁻³
- Picture naming assessments may be useful for estimating the potential impact of anomia in connected speech.
- The relationship between naming abilities and discourse is unclear, with significant correlations between object and action naming and discourse production for some variables but not others.⁴⁻⁷
 - Studies used a variety of discourse measures such as: type-token ratio of verbs only, type token ratio of nouns only, number of verbs, number of nouns, proportion of nouns per speech turn, and percent word retrieval, among others.
- All of the above are microlinguistic (word-level) measures and may have less relation to gist production or coherence.
 - There is little information about the relationship between lexical retrieval and gist production, and the predictive nature of the relationship is unknown.
- **Specific Aim 1:** Determine the relationship between A) performance on the BNT short form and gist production as measured by main concept analysis (MCA); and B) performance on the VNT and gist production.
- **Specific Aim 2:** Determine if these relationships vary by aphasia subtype.

Methods

Participants

- Transcripts from 258 individuals with stroke-induced aphasia were used in this study.
 - PWAs were excluded if they: 1) did not complete all 3 narratives; 2) did not have scores for the BNT short form; or 3) did not have scores for the VNT.
 - Our sample includes transcripts from 110 female and 148 male participants.
 - Age: Mean 61.8 years (SD 12.7), range 25.6 – 90.7 years
 - Race: 221 Caucasians, 23 African Americans, 8 Hispanic/Latino, 3 Asian, 1 American Indian, 1 Mixed, 1 unknown
 - WAB-R AQ: Mean 70.8 (SD 19.4), range 10.8 to 99.6
 - BNT: Mean 7.3 (SD 4.6), range 0 to 15
 - VNT: Mean 14.5 (SD 25.1), range 0 to 22

Discourse Production

- PWAs were asked to complete several discourse tasks that do not require a conversational partner using standardized administration techniques.⁸
- Three narratives were assessed: Broken Window picture sequence description, Cinderella story retell, and procedural explanation of making a PBJ.

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. Andreetta, S., Cantagallo, A., & Marini, A. (2012). Narrative discourse in anomic aphasia. *Neuropsychologia*, 50(8), 1787-1793.
3. Dimpleby, R. & Burton, G. (1998). *More than words: An introduction to communication* (3rd Ed.). New York, NY: Routledge.
4. Mayer, J., & Murray, L. (2003). Functional measures of naming in aphasia: Word retrieval in confrontation naming versus connected speech. *Aphasiology*, 17(5), 481-497.
5. Bastiaanse, R., & Jonkers, R. (1998). Verb retrieval in action naming and spontaneous speech in agrammatic and anomic aphasia. *Aphasiology*, 12(11), 951-969.
6. Herbert, R., Hickin, J., Howard, D., Osborne, F., & Best, W. (2008). Do picture-naming tests provide a valid assessment of lexical retrieval in conversation in aphasia? *Aphasiology*, 22(2), 184-203.
7. Kambanaros, M. (2010). Action and object naming versus verb and noun retrieval in connected speech: Comparisons in late bilingual Greek-English anomic speakers. *Aphasiology*, 24(2), 210-230.
8. Aphasiabank. (n.d.) Aphasiabank protocol description. Retrieved from <http://www.talkbank.org/aphasiabank/protocol/description.pdf>
9. 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.
10. Richardson, J.D. & Dalton, S.G. (2015). Main concepts for three different discourse tasks in a large non-clinical sample. *Aphasiology*, 1-29.

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.⁹
 - A main concept by definition must have a main verb, and can include clauses.
- 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
- A multi-dimensional coding system¹⁰ was used to determine the accuracy and completeness of main concepts.
 - **0 - Absent (AB):** Did not produce any portion of the MC.
 - **1 - Inaccurate/Incomplete (II):** Attempted to produce a portion of the MC, missing at least one essential element and another essential element incorrect.
 - **2 - Inaccurate/Complete (IC):** Produced a complete MC, at least one essential element inaccurate.
 - **2 - Accurate/Incomplete (AI):** Produced an accurate MC, at least one essential element missing.
 - **3 - Accurate/Complete (AC):** Correctly produced all essential elements.
- Scores for each MC (**0-3**) were summed to yield the MC Composite score for all three stories.

Data Analysis

- Data were first screened to ensure assumptions of planned correlation analysis were not violated. Screening included evaluation of normality (skewness, kurtosis), linearity, and monotonicity (visual inspection). Our variables were linear and monotonic, but since MC composite is not a true continuous variable, Spearman’s *rho* was used. One extreme outlier was removed.
- For **Specific Aims 1 and 2**, two-tailed correlations using Spearman’s *rho* were calculated between the MC Composite scores and the VNT scores as well as between the MC Composite Scores and the BNT scores.
- For **Specific Aim 2**, only aphasia subtypes with samples greater than 10 were included (see Table 1).

Results

- There are strong, positive correlations between MC Composite scores and both naming ability measures for all subtypes except those not aphasic according to WAB score (NABW) (see Table 1).
- The strength of the correlations varied by aphasia subtype (see Figures 1 and 2).
- Strong correlations of both naming measures with the discourse measure may suggest that one may be predictive of the other.

Discussion

- Previous research has often failed to find a relationship between verb naming ability and discourse production, while relationships between noun naming ability and discourse production have been observed more frequently.
- Here we found that both noun and verb naming ability were significantly correlated with discourse production as measured by a hybrid micro/macrolinguistic gist measure.
- While there are many discourse measures available to clinicians, these results highlight the importance of choosing the most appropriate measure given the expected changes.
 - It appears that a measure such as MCA might relate well to both naming abilities and language use.

Table 1. Correlations between BNT and VNT Scores and MC Composite Scores

		Boston Naming Test	Verb Naming Test
		<i>rho</i> = .673, <i>p</i> < .001	<i>rho</i> = .700, <i>p</i> < .001
MC Composite	All		
	Anomic	<i>rho</i> = .352, <i>p</i> < .001	<i>rho</i> = .378, <i>p</i> < .001
	Broca’s	<i>rho</i> = .693, <i>p</i> < .001	<i>rho</i> = .733, <i>p</i> < .001
	Conduction	<i>rho</i> = .337, <i>p</i> = .011	<i>rho</i> = .421, <i>p</i> = .002
	NABW	<i>rho</i> = .013, <i>p</i> = .475	<i>rho</i> = .272, <i>p</i> = .1
	Wernicke’s	<i>rho</i> = .834, <i>p</i> < .001	<i>rho</i> = .835, <i>p</i> < .001

Figure 1. Correlation between MC Composite Scores and VNT Scores

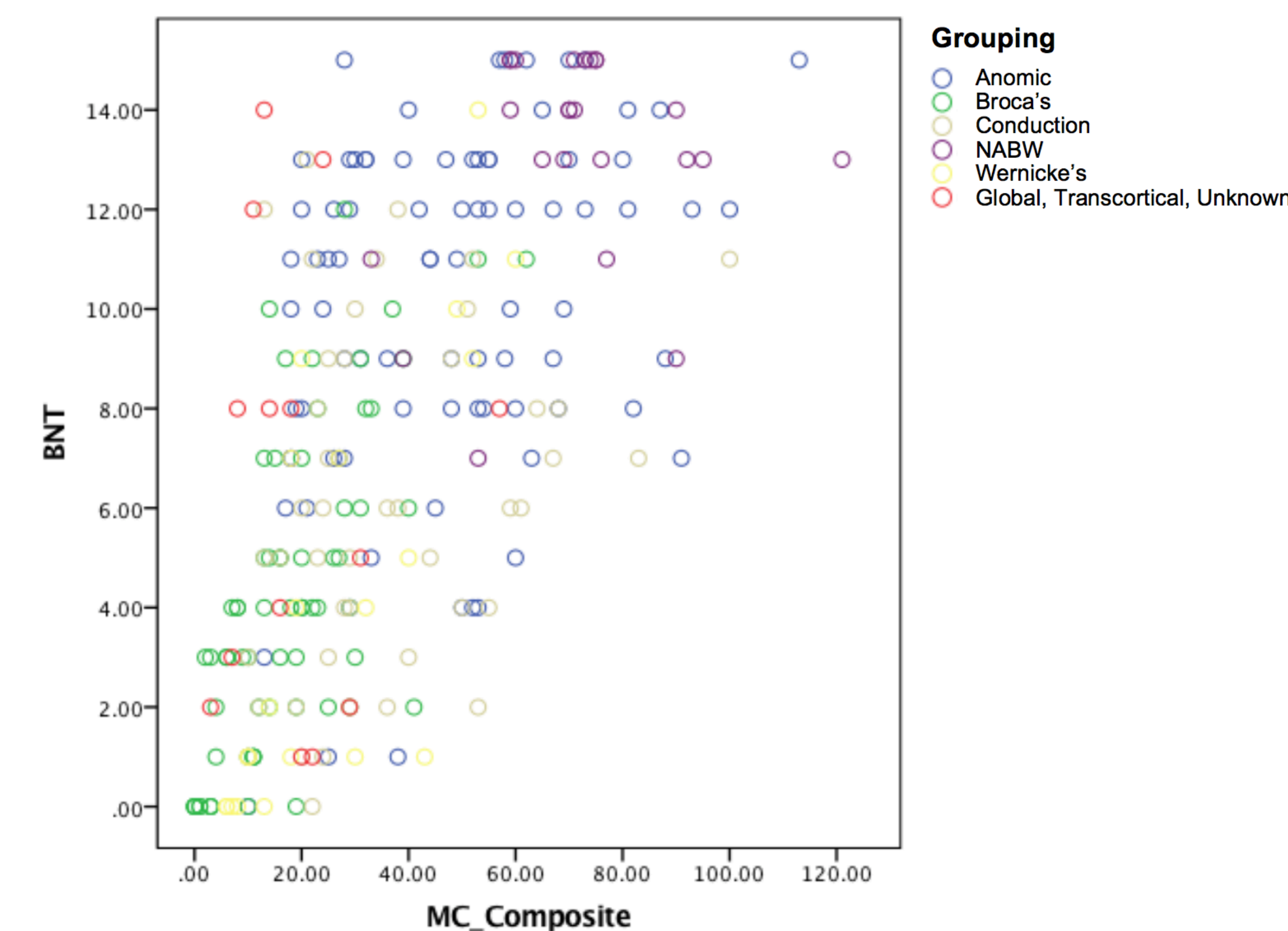
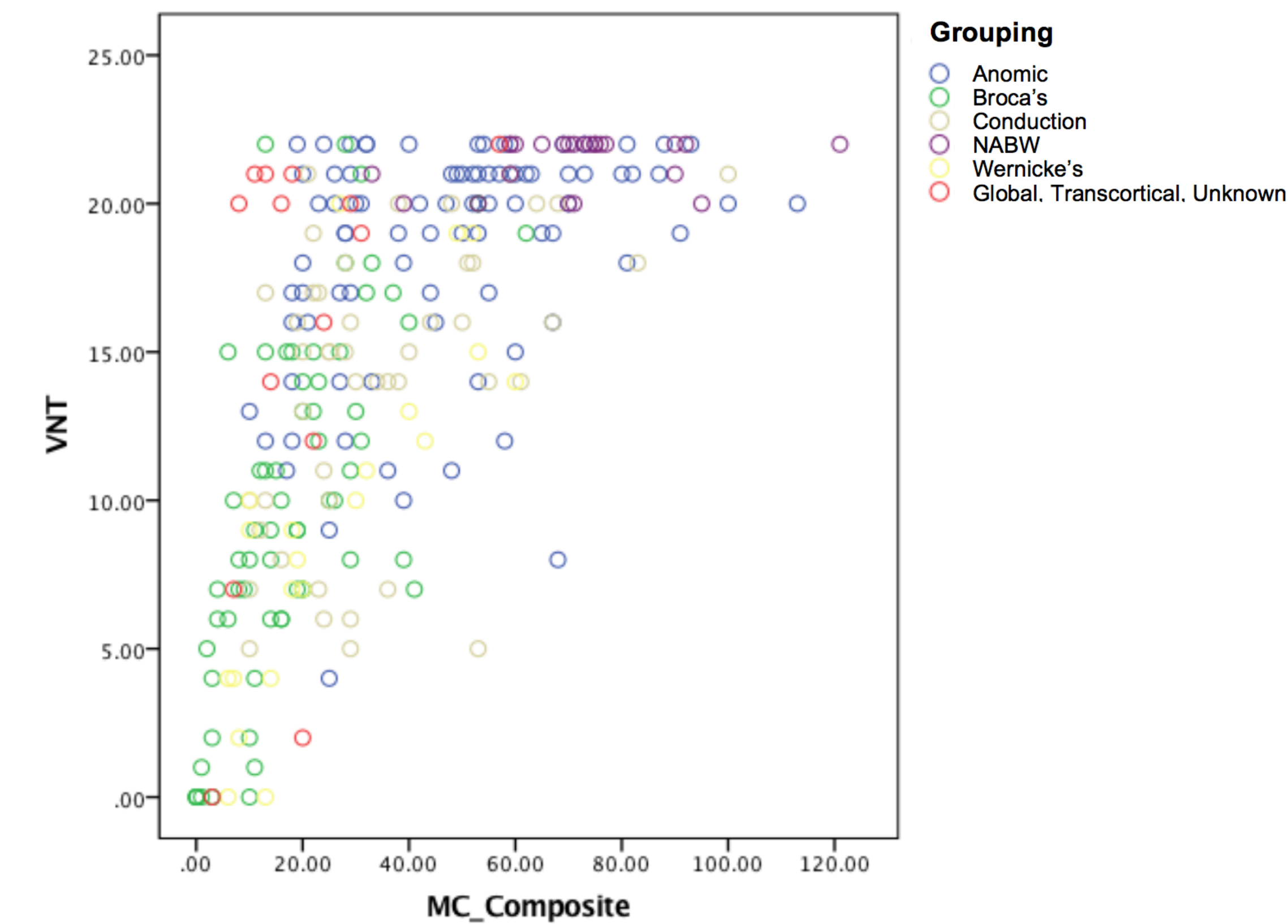


Figure 2. Correlation between MC Composite Scores and BNT Scores



Discussion (Continued)

- Aphasia severity seems to affect the relationship between lexical retrieval and gist production.
 - Correlations were strong for individuals with Broca’s and Wernicke’s aphasia, moderate for those with Conduction and Anomic aphasia, and non-significant for individuals NABW.
 - Lexical retrieval may be an accurate predictor of discourse performance for more severe aphasia subtypes.
 - For others, a multidimensional assessment may be more appropriate.
- Further research should determine what other factors may be playing a role.