

Analyzing the Macrolinguistic Features of Oral Discourse produced by People with Acquired Communication Disorders

Stephanie Eaton, B.S., Anthony Pak Hin Kong, PhD, Lauren Bislick-Wilson, PhD, CCC-SLP, John Ryalls, PhD



Macrolinguistic Analysis of Spoken Discourse by People with Post-Stroke Aphasia, Individuals with Cognitive Impairment, and Survivors of Traumatic Brain Injury

Stephanie Eaton, B.S., Anthony Pak Hin Kong, PhD, Lauren Bislick-Wilson, PhD, CCC-SLP, John Ryalls, PhD



Background

Conducting discourse analysis can define strengths and weaknesses of verbal output of people with acquired communication disorders. People with fluent aphasia, survivors of traumatic brain injury, and individuals with mild cognitive impairment, present with differences in discourse production across features of informativeness, local coherence, and global cohesion. The literature provides a “lack of unified theoretical base” in studying discourse analysis (Linnik et al., 2015;p.766). Other forms of standardized assessment can provide information regarding a person’s linguistic, cognitive, and functional communication abilities. Discourse production can be elicited through various means including single-picture description, sequential picture description, and story telling tasks

Objectives

To investigate differences in macrolinguistic impairments across neurologic groups (Q1) and differences in macrolinguistic impairments across narrative tasks (Q2). To examine the correlation between standardized scores and differences of macrolinguistic impairments across groups and across genres of discourse tasks (Q3).

Methods

Six participants with acquired communication disorders were recruited UCF Aphasia House, Central Florida Brain Injury Support Group, and Brain Fitness Club. Six normal control participants’ discourse samples were downloaded from AphasiaBank (MacWhinney et al., 2011). Standardized assessment scores on the Western Aphasia Battery-Revised, Oxford Cognitive Screen, Communication for Activities of Daily Living-Three, and Main Concept Analysis were collected from each disordered participant. Participants performed a single-picture description task, sequential picture description task, and story telling task. Narratives were recorded and orthographically transcribed. Features of analysis were selected based upon Quantitative Production Analysis indices, percent local cohesion (Andreeta et al., 2012), average global coherence score (Wright et al., 2013), main concept score, and accurate and correct concept per minute. Several indices were analyzed on CLAN, a system developed for the Child Language Data Exchange System (MacWhinney, 2003) while others were manually calculated.

Discussion

Disordered participants were combined into a larger clinical group for statistical analysis. Control participants performed better across all three discourse tasks than disordered speakers (Q1). A larger degree of difference was found for story telling task compared to picture description tasks (Q2). The MCA yielded the strongest correlation to features of macrolinguistic analysis compared to other standardized assessment scores.

Acknowledgments

The authors would like to extend their thanks to Dr. Amy Engelhoven of the UCF Aphasia House, Peggy Bargmann of Brain Fitness Club and Dr. Diane Robinson of the Central Florida Brain Injury Support Group for their efforts in participant recruitment

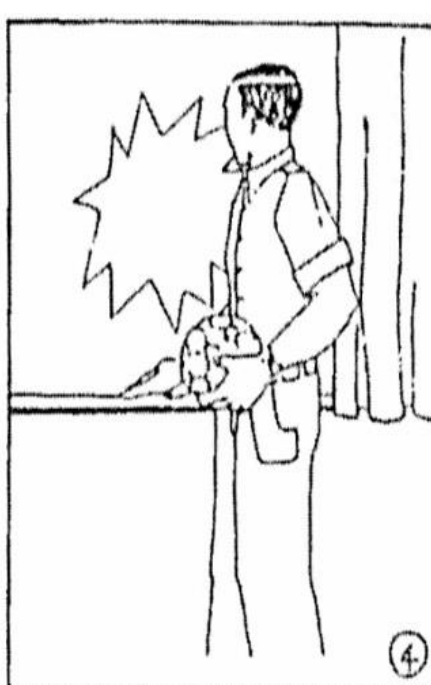
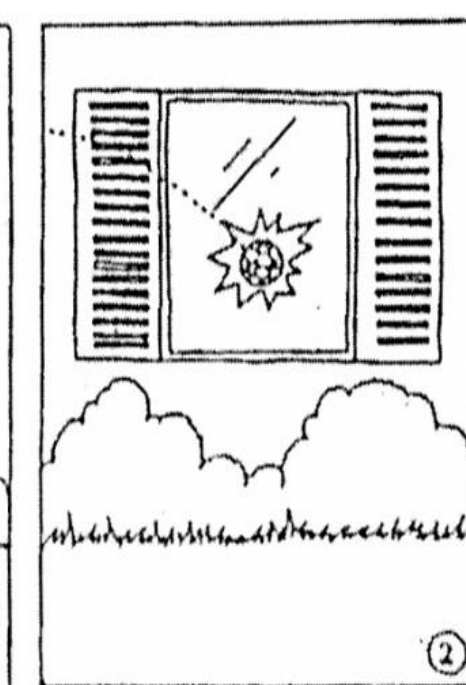
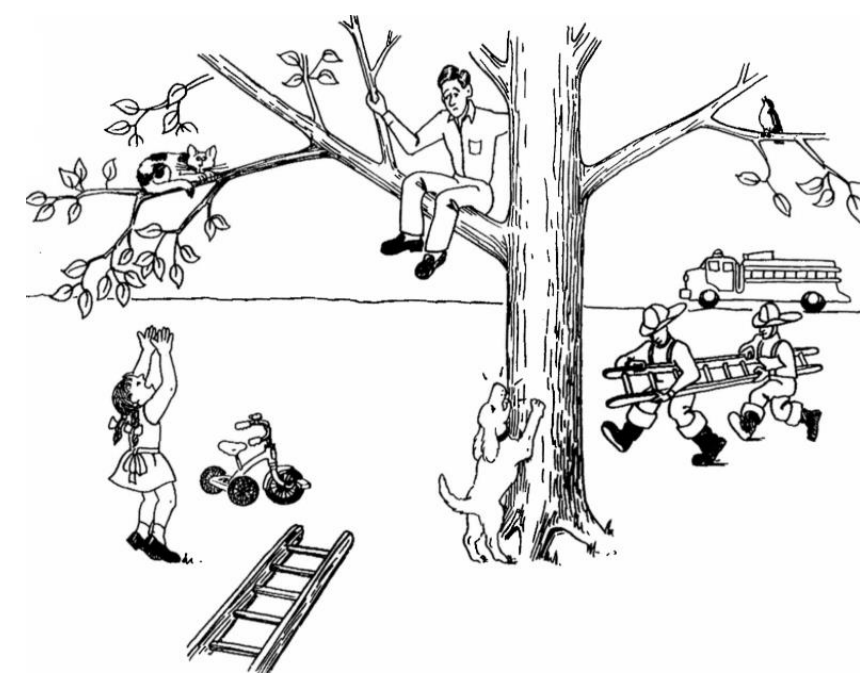
Key References

- 1) Rochon, E., Saffran, E.M., Berndt, R.S., & Schwartz, M.F. (2000). Quantitative analysis of aphasic sentence production. Further development and new data. *Brain and Language*, 72, 193-218.
- 2) Andreetta, S., Cantagallo, A., & Marini, A. (2012). Narrative discourse in anomic aphasia. *Neuropsychologica*, 50, 1787-1793.
- 3) Wright, H. H., & Capilouto, G.J., & Koutsoftas, A. (2013). Evaluating measures of global coherence ability in stories in adults. *International Journal of Language and Communication Disorders*, 48(3), 249-256
- 4) Kong, A.P.H. (2009). The use of main concept analysis to measure discourse production in Cantonese-speaking persons with aphasia: A preliminary report. *Journal of Communication Disorders*, 42(6), 442-464.
- 5) Dalton, S.G.H., & Richardson, J.D. (2018). A large-scale comparison of main concept production between persons with aphasia and persons without brain injury. *American Journal of Speech-Language Pathology*, 47, 1-26.
- 6) Fleming, V.B., (2014). Early detection of cognitive-linguistic change associated with mild cognitive impairment. *Communication Disorders Quarterly*, 35(3), 146-157.
- 7) Linnik, A., Bastiaanse, R., & Höhle, B., (2015). Discourse production in aphasia: A current review of theoretical and methodological challenges. *Aphasiology*, 30 (7), 765-800.
- 8) MacWhinney, B., Fromm, D., Forbes, M. & Holland, A. (2011). AphasiaBank: Methods for studying discourse. *Aphasiology* 25(11), 1286-1307.
- 9) Marini, A., Zettin, M., Bencich, E., Bosco, F.M., & Galetto, V. (2017). Severity effects on discourse production after TBI. *Journal of Neurolinguistics*, 44, 91-106.

Discourse Analysis Procedures

The following analytic measures and/or procedures adopted from previous studies were implemented with each discourse sample

Total number of words ^[1]	Number of narrative words ^[1]	Number of open class words ^[1]	Number of closed class words ^[1]
Number of nouns ^[1]	Number of pronouns ^[1]	Number of verbs ^[1]	Lexical efficiency measure ^[1]
Type Token Ratio ^[1]	Number of utterances ^[1]	Total Narrative time in minutes ^[1]	Time efficiency measure ^[1]
Number of C-Units ^[1]	Percent local cohesion errors ^[2]	Average global coherence score ^[3]	Main Concept Score ^[4]
Number of accurate and complete main concepts per minute ^[4]			



Statistical Analysis

Mann Whitney U tests were conducted to determine group and genre effects for Q1 and Q2. Spearman’s rho correlation coefficients were calculated to evaluate the relationship between macrolinguistic features of analysis and performance on standardized assessments. Intra- and inter-rater reliability measures with 33% of data

Results

Disordered participants were combined into a larger clinical group for statistical analysis. Control participants performed better across all three discourse tasks than disordered speakers (Q1). A larger degree of difference was found for story telling task compared to picture description tasks (Q2). The MCA yielded the strongest correlation to features of macrolinguistic analysis compared to other standardized assessment scores.

Limitations and Future Direction

A very small sample size resulted in the combination of the three disordered groups into one larger clinical group. This prevented the systematic comparison of discourse performance among the three disorder groups. Additionally, participants were not matched based on factors such as age and education. Future studies should involve the inclusion of other genres of discourse including procedural discourse and personal narratives when conducting macrolinguistic analyses.