

Tangential, egocentric, verbose language: Is it right brain damage or normal aging?

## INTRODUCTION

The stereotypical picture of an individual with RHD includes “abnormal” discourse production. Various features have been identified as deviant, including a reduced amount of content, the inclusion of tangential or overpersonalized information, fewer cohesive ties, and poor organization of thoughts or ideas. Quantity of discourse also often is abnormal, described as either verbose or extremely curt (paucity of speech) (e.g., Brownell et al., 1986; Myers, 1995; Tompkins, 1995).

Descriptions of discourse production by healthy older adults (HOAs) are similar to those of RHD in many ways. General findings suggest that older adults may evidence verbosity, reduced use of cohesive ties or clear referents, and possibly irrelevant, tangential information that reduces topic maintenance. Additionally, older adults have been reported to be less efficient at conveying content in picture description tasks (e.g., Cooper, 1990; Glosser, 1993; Glosser & Deser, 1992; Shewan & Henderson, 1988)

Given the similarities of discourse production in these two groups, it is not surprising that some research studies have failed to report differences in some characteristics of discourse production when comparing individuals with RHD to healthy aging adults (e.g., Bloom 1996; Mackenzie, Begg, & Brady, 1997; Brady, Mackenzie & Armstrong, 2003). The similarities between HOA and RHD groups lead one to question whether “deviant” discourse production can really be considered a hallmark of RHD. The purpose of this study was to test whether specific discourse characteristics typically attributed to RHD could actually distinguish this population from healthy older adults.

## METHODS

### Participants and Stimuli

Verbal transcripts were obtained from individuals with RHD and healthy older adults as part of a separate research study. The task was a Thinking Out Loud (TOL) task. Participants were asked to read stories out loud, and after each sentence, to talk about their thoughts about the story, particularly any predictions they had about what might happen. In the larger study, participants completed several sets of stories over three testing sessions. For the current purposes, two of those stories were selected. Sample stories and responses are provided in the appendix.

Demographic and select clinical data for the participants are provided in Table 1. Transcripts from the eight individuals with RHD were used in the current study. Eight individuals from the larger NBD group were selected for this study based on age and education background that was similar to the RHD group. Participant groups did not differ in terms of age, education, receptive vocabulary, discourse comprehension, or working memory (all  $t < 1.9$ ; all  $p > .05$ ).

Twenty speech-language pathologists (SLPs) with at least five years experience working with neurological communication disorders in older adults were recruited to rate the verbal transcripts. Raters worked in a variety of settings, and had a range of experience with adults with RHD (see Table 2). All reported they were at least “somewhat familiar” with deficits associated with RHD.

### Procedures.

Raters were blind to group inclusion (i.e., whether a sample was from an individual with RHD or a HOA). Raters read discourse samples from each participant and rated them in terms of tangentiality/off-topic content, egocentrism, and amount of speech produced (paucity vs. verbosity of speech). These three features were selected because they are commonly reported as being deviant characteristics of discourse produced by adults with RHD. Due to the nature of the elicitation task, the authors felt that organization and cohesion would be difficult to rate, as would pragmatic factors. Results from the larger study (including this same RHD group and a larger HOA group) suggested no differences in inference generation between groups; thus, inferencing was not rated here. Age, gender, and level of education have been suggested to influence discourse production in older adults (e.g., Mackenzie, 2000); hence, these data were provided on each of the transcripts.

The SLPs independently completed the rating task in the following way: Each rater read one transcript from one participant and rated it in terms of tangentiality, egocentrism and amount of speech (see rating scales in Table 3). The rater then read the second sample from the same participant and made judgments on the same variables. After reading and rating the two samples, the rater then classified the participant as either a healthy older adult or an adult with RHD, and indicated how confident s/he was with the classification. Finally, the rater indicated whether the participant's age, level of education, or sex influenced his/her decision. Raters also were given the opportunity to write comments for each story.

### RESULTS

Overall, the raters accurately classified 73% of the participants (range 54 – 88%). They were (statistically) equally accurate at classifying samples as from a HOA (M=68%; range 38-88%) or an individual with RHD (M=77%; range 50-100%;  $t(19)= 1.7$ ;  $p=.10$ ). Accuracy was not meaningfully related to number of years in the profession, the number of years working with neurogenic communication disorders, or with self-reported familiarity with RHD disorders (all Spearman's Rho  $< .3$ ;  $p>.05$ ).

Raters indicated a range of certainty of classifications (M=3.3; range 1.94 – 4.6). Certainty was not meaningfully correlated to accuracy, although it was related to the raters' self-reported level of familiarity with RHD (Spearman's Rho=.60;  $p=.003$ )

Transcripts from the individuals with RHD were rated significantly more tangential (M=3.63) and egocentric (M=3.64) than those from HOAs (tangentiality: M=4.44; egocentrism: M=4.48; both  $t > 10.0$ ;  $p<.05$ ). The average ratings for quantity of speech were the same for both groups (M=3.44).

The raters indicated that age, education and gender biased their classifications and ratings in less than 20% of cases. Reported bias of these three demographic variables was not related to classification accuracy or to ratings of tangentiality, egocentrism, or quantity of speech (all Rho  $< .3$ ;  $p>.10$ )

### DISCUSSION

SLPs experienced in the diagnosis and treatment of adults with RHD were able to accurately classify approximately three-fourths of participants as either RHD or HOA based on specific discourse characteristics. Their reported certainty of classification was not related to their accuracy, although individuals who reported more familiarity with RHD deficits were typically more certain of their classifications.

Ratings of tangentiality and egocentrism differentiated adults with RHD from HOAs, but quantity of speech did not. Despite the significant differences between groups, raters' comments indicated that, the variables selected (tangentiality, egocentrism and quantity of speech) did not always capture the essence of the discourse. Some classifications were based more on the quality of responses (e.g., bizarre; not reflective of the character's motives; related only to the previous sentence and not the theme of the story) more than the presence of tangential or egocentric comments.

Despite the similarities in discourse characteristics reported for adults with RHD and HOAs, experienced speech-language pathologists were able to distinguish verbal transcripts from these two groups with relatively high accuracy. While the three selected features did not always capture the "abnormal" quality that led to a classification of RHD, responses produced by individuals with brain damage were rated as containing more tangential and egocentric comments than those produced by healthy older adults. The results lend credibility to the "stereotypical" description of discourse associated with right hemisphere brain damage.

Table 1: Characteristics of two groups of participants.

	Right hemisphere brain damage	Healthy older adults
sex	3 female; 5 male	6 female; 2 male
age		
Mean (S.D.)	69.4 (6.5)	69.3 (8.1)
Range	57-76	55-78
education		
Mean (S.D.)	14.3 (2.9)	14.0 (2.8)
Range	12-20	12-20
Discourse Comprehension Test error score <sup>1</sup>		
Mean (S.D.)	4.88 (4.3)	4.37 (2.6)
Range	0-12	0-9
(max = 32)		
Receptive vocabulary <sup>2</sup>		
Mean (S.D.)	184.1 (11.6)	192.4 (5.8)
Range	167-200	185-201
(max=204)		
working memory recall & true/false errors <sup>3</sup>		
Mean (S.D.)	13.7 (5.6)	12.0 (4.5)
Range	7-21	2-16
(max = 42)		
Mini Mental State Exam <sup>4</sup>	--	29.0 (1.2)
Mean (S.D.)		27-30
Range		
(max=30)		
Months post onset		--
Mean (S.D.)	60.4 (36.3)	
Range	10-119	
lesion site <sup>5</sup>	1 primarily anterior 2 primarily posterior 1 anterior + posterior 1 subcortical only 3 normal CT <sup>6</sup>	--

<sup>1</sup> *Discourse Comprehension Test* (Brookshire & Nicholas, 1993)<sup>2</sup> *Peabody Picture Vocabulary Test, Third Edition*, raw score (Dunn & Dunn, 2000)<sup>3</sup> Auditory working memory task (Tompkins et al., 1994; Lehman & Tompkins, 1998)<sup>4</sup> *Mini Mental State Exam* (Folstein, Folstein, & McHugh, 1975)<sup>5</sup> Anterior/posterior to the central sulcus (sulcus of Rolando)<sup>6</sup> Diagnosis of RH CVA based on physical deficits (i.e., left-sided hemiparesis)

Table 2. Characteristics of the raters

Number of years as an SLP Mean (S.D.) Range	18.0 (8.9) 6-34
Number of years working in neurogenics Mean (S.D.) Range	15.1 (7.0) 3-28
Number of RHD patients seen per month Mean (S.D.) Range	1.85 (2.3) 0-8
Level of familiarity with RHD communication disorders (1 = slightly; 5 = very familiar) Mean (S.D.) Range	4.45 (.69) 3-5
Work setting	1 – acute care & rehabilitation 2 – acute care hospital 2 – research center 4 – rehabilitation (in/outpatient/long-term care) 5 – university clinic 6 – university faculty

Table 3. Rating scales and mean ratings for two groups.

<b>Tangentiality*</b>						
1	2	3	3.6 RHD	4	4.4 HOA	5
very tangential; excessive off- topic information		somewhat tangential		not tangential; all information was on-topic		

  

<b>Egocentrism*</b>						
1	2	3	3.6 RHD	4	4.5 HOA	5
extremely egocentric; excessive overpersonalization		somewhat egocentric		not egocentric; no references to personal experience		

  

<b>Verbosity/Paucity</b>						
1	2	3	3.4 RHD 3.4 HOA	4	5	
verbose; excessively long responses		appropriate length of response		paucity of speech; very few – or very short responses given		

\* RHD/HOA significantly different ( $p < .05$ ).

## REFERENCES

- Bloom, R.L., Borod, J.C., & Santschi-Haywood, C. (1996) Left and right hemispheric contributions to discourse coherence and cohesion. *International Journal of Neuroscience*, 88, 125-140.
- Brady, M., Mackenzie, C., & Armstrong, L. (2003). Topic use following right hemisphere brain damage during three semi-structured conversational discourse samples. *Aphasiology*, 17, 881-904.
- Brookshire, R.H. & Nicholas, L.E. (1993). *Discourse Comprehension Test*. Tucson: Communication Skill Builders.
- Cooper, P.V. (1990). Discourse production and normal aging: Performance on oral picture description tasks. *Journals of Gerontology*, 45, P210-P214.
- Dunn, L.M., & Dunn, L.M. (2000). Peabody Picture Vocabulary Test III. Circle Pines, MN: American Guidance Service.
- Folstein, M.F., Folstein, S.E., & McHugh, P.R. (1975). Mini Mental State. *Journal of Psychiatric Research*, 12, 189-198.
- Glosser, G. (1993) Discourse patterns in neurologically impaired and aged populations. In H.H. Brownell and Y. Joanette (Eds). *Narrative discourse in neurologically impaired and normal aging adults*. (pp. 191 – 212). San Diego: Singular.
- Glosser, G., & Deser, T (1992) Aging changes in microlinguistic and macrolinguistic aspects of discourse production. *Journal of Gerontology: Psychological Sciences*, 47, 266-272.
- Lehman, M.T. & Tompkins, C.A. (1998). Reliability and validity of an auditory working memory measure: data from elderly and right-hemisphere damaged adults. *Aphasiology*, 12, 771-785.
- Mackenzie, C. (2000). Adult spoken discourse: The influences of age and education. *International Journal of Language & Communication Disorders*, 35, 269-285.
- Mackenzie, C., Begg, T., & Brady, M.(1997). The effects on verbal communication skills of right hemisphere stroke in middle age. *Aphasiology*, 11, 929-945.
- Myers, P.S. (1999). *Right hemisphere disorder: Disorders of communication and cognition*. San Diego: Singular.
- Shewan, C. M., & Henderson, V.L. (1988) Analysis of spontaneous language in the older normal population. *Journal of Communication Disorders*, 21, 139-154.

Tompkins, C.A. (1995). *Right hemisphere communication disorders: Theory and management*. SanDiego: Singular.

Tompkins, C.A., Bloise, C.G.R., Timko, M.L., & Baumgaertner, A. (1994). Working memory and inference revision in brain-damaged and normally aging adults. *Journal of Speech and Hearing Research*, 37, 896-912.