A comprehensive approach to the analysis of narrative discourse production by Greek speakers with aphasia

P. Foka-Kavalieraki[1], M. Kakavoulia[2], A. Economou[1], S. Varlokosta[3], C. Routsis[1], D. Kasselimis[4], C. Potagas[1], I. Evdokimidis[1], A. Protopapas[5]

[1]University of Athens; [2]Panteion University; [3]University of the Aegean; [4]University of Crete; [5]Institute for Language & Speech Processing, Greece

Background

Narrative discourse as a form of connected speech has received extensive attention in aphasia research. Studies of narrative production of speakers with aphasia (SWA) have reported disruption at a microlinguistic (intrasentential) level, relative preservation of skills at a macrolinguistic (suprasentential) level in terms of producing sequences of events and actions (e.g., Glosser & Desser, 1990), and a reduction of language complexity at both the sentence and the discourse level (Ulatowska et al., 1983, Armstrong, 2000).

Assessment of narrative discourse is important for SWA, because production of narratives is necessary for relaying the relationships between events and characters in everyday life, and because SWA are impaired in narrative discourse.

Interrelations between sentence-level and discourse-level phenomena in the narrative production of SWA have received insufficient attention and are poorly understood.

Aims

To integrate the microlinguistic and macrolinguistic levels of analysis in narrative production and to place narrative analysis in the context of cognitive and linguistic evaluation, we propose a comprehensive approach to the analysis of narrative discourse production in aphasia.

Materials and procedures

A battery of 4 narrative tasks was designed to include a combination of elicitation techniques (McNeil et al., 2007; Menn et al., 1994), providing different degrees and types of support:

(a) unaided self-generation of a personal narrative ("**stroke story**");
(b) novel story production based on a 6-picture sequence ("**the party**");
(c) story retelling after presentation of a 5-picture sequence with concurrent listening to a matching original story ("**the ring**"); and
(d) retelling (after listening) of a familiar Aesop's fable ("**hare and tortoise**")

Macro- and micro-linguistic measures

Macrolinguistic-level analyses include
(a) structural and propositional analyses, such as number of story propositions and main ideas related;
(b) coverage of primary (orientation-action-resolution) and secondary (abstract-evaluation-coda) narrative elements;
(c) analyses of selective linguistic devices of evaluation (direct speech, adjectives, psych verbs and nouns), based on Labov (1972).

Microlinguistic-level measures include
(a) verbal productivity, such as total number of completed words, words per minute, number of utterances;
(b) syntactic complexity (proportion well formed sentences, independent and embedded clauses, conjunctions);
(c) verbal disruption (abandoned sentences, mazes).

Pilot testing – participants

The elicitation tasks were administered to 3 men 54–61 years old, who had suffered left CVAs 5–19 months earlier and were diagnosed with mild to moderate nonfluent aphasia, and to 4 native Greek speakers (1 female) without aphasia, of similar age and education (12–17 years).

Preliminary data

		Stroke story			Party			Ring			Hare & tortoise		
Speakers with Aphasia:		**A1**	**A2**	**A3**	**A1**	**A2**	**A3**	**A1**	**A2**	**A3**	**A1**	**A2**	**A3**
Verbal productivity	N utterances	44	66	67	16	25	23	29	43	31	42	41	56
	Words per minute	65.7	40.1	70.0	65.6	33.7	44.3	68.1	36.9	73.9	65.3	48.4	56.9
	N words	253	209	267	70	78	51	118	161	149	161	195	165
Grammatical well-formedness & Syntactic complexity	Conjunctions	30	28	9	6	13	4	25	25	13	17	26	14
	N clauses	66	44	55	21	18	10	42	34	22	25	40	23
	% correct clauses	86.3	86.3	94.5	100.	55.5	60.0	97.6	88.2	72.7	96.0	87.5	69.5
	% independent clauses	71.9	89.4	98.0	76.1	90.0	83.3	58.5	66.6	100.	91.6	71.4	100.
	% embedded clauses	28.0	10.5	1.9	23.0	10.0	16.6	41.4	33.3	0.0	8.3	28.5	0.0
Verbal disruptions	N mazes	9	9	4	1	6	5	3	6	13	3	5	14
Narrative structure elements	Narrative elements*	OARC	OARC	OAR	OAR	OAR	OAR	OARC	OAR	OAR	bOAR	OAR	bARC
	N propositions	65	50	55	21	16	10	25	34	22	42	40	23
	Main events	10	9	8	7	7	5	8	10	7	9	10	5
	Evaluation: Direct speech	4	0	2	1	0	0	1	2	1	2	2	0
	Evaluation: Adjectives	1	1	0	1	1	0	1	0	4	0	2	0
	Evaluation: Psych verbs	3	1	1	3	1	2	2	3	5	2	2	2

		Party		Ring		Hare & tortoise	
Speakers without Aphasia:		**N3**	**N4**	**N1**	**N2**	**N3**	**N4**
Verbal productivity	N utterances	29	27	28	30	37	48
	Words per minute	117.0	148.4	136.8	134.5	120.4	134.1
	N words	158	136	244	213	277	286
Grammatical well-formedness & Syntactic complexity	Conjunctions	25	12	24	36	38	28
	Number of clauses	38	31	50	41	58	69
	% correct clauses	100.	100.	100.	100.	100.	100.
	% independent clauses	52.6	61.2	68.0	58.5	58.6	63.7
	% embedded clauses	47.3	38.7	32.0	41.4	41.3	36.2
Verbal disruptions	N mazes	0	0	0	0	0	0
Narrative structure elements	Narrative elements*	OAR	OAR	bOARC	bOARC	bOARC	bOARC
	N propositions	38	31	50	41	58	69
	Main events	7	7	10	9	9	9
	Evaluation: Direct speech	1	1	2	1	6	7
	Evaluation: Adjectives	3	2	6	3	2	5
	Evaluation: Psych verbs	2	3	2	2	7	3

** b: Abstract, O: Orientation, A: Action, R: Resolution, C: Coda*

Conclusions

The SWA were able to produce the main events and obligatory story structure elements (orientation-action-resolution) at the macrolinguistic level, despite mild impairment at the microlinguistic level, such as reduced syntactic complexity (fewer embedded clauses). Of the evaluative devices measured, SWA used mainly verbs and emotion words, whereas speakers without aphasia also used adjectives.

The proposed set of tasks for the elicitation of narrative discourse production is sensitive to various levels of analysis, allowing evaluation of interrelations between and within speakers. Speakers without aphasia respond to the elicitation requirements and produce grammatically and structurally well formed narratives, supporting the validity of the proposed battery. Preliminary testing of three SWA showed impairment on the microlinguistic level and relative preservation of narrative superstructure elements on the macrolinguistic level, in agreement with previous studies.

Thus, this set of tasks complements a comprehensive research battery for the evaluation of aphasic performance in Greek also including neuropsychological, linguistic, and functional measures.

References

Armstrong, E. (2000). Aphasic discourse analysis: The story so far. *Aphasiology*, 14, 875–892.
Doyle, P. J., McNeil, M. R., Spencer, K. A., Goda, A. J., Cottrell, K., & Lustig, A. P. (1998). The effects of concurrent picture presentations on retelling of orally presented stories by adults with aphasia. *Aphasiology, 12*, 561–574.
Glosser, G. & Deser, T. (1990). Patterns of discourse production among neurological patients with fluent language disorders. *Brain and Language, 40*, 67–88.
Labov, W. (1972). *Language in the inner city: Studies in the Black English Vernacular*. Philadelphia: University of Pennsylvania Press.
MacNeil, M. R., Sung, J. E., Yang, D., Pratt, S. R., Fossett, T. R. D., Doyle, P. J., & Pavelko, S. (2007). Comparing connected language elicitation procedures in persons with aphasia: Concurrent validation of the Story Retell Procedure. *Aphasiology, 21*, 775–790.
Menn, L., Ramsberger, G., Helm-Estarbrooks, N. (1994). A linguistic communication measure for aphasic narratives. *Aphasiology, 8*, 343–359.
Ulatowska, H. K., Freedman-Stern, R., Doyel, A. W., et al. (1983). Production of narrative discourse in aphasia. *Brain and Language, 19*, 317–334.

Contact: mariakakavoulia@gmail.com