Cohesion in Narratives of Aphasic Adults

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INTRODUCTION AND PROBLEM

Change and new direction are inevitable and have become a given in clinical aphasiology. As new areas of linguistics develop, new constructs become available for describing aphasic language. The last decade witnessed the development of discourse grammar as a reaction against the preoccupation with minimal units in linguistic theory and against the context-free abstractness of linguistic methods (Ulatowska, 1981). Discourse analysis, a new construct from linguistics, provided a method for analyzing aphasic performance in connected communication. In the early 1980 researchers (Berko-Gleason, Goodglass, Green, Obler, Hyde, Weintraub, 1980; Ulatowska, Macalusco-Haynes, North, 1980; Ulatowska, North, Macalusco-Haynes, 1981; Ulatowska, Freedman-Stern, Weiss-Doyel, Macalusco-Haynes, North, 1983) began to study discourse in aphasic adults.

Initial research on discourse in aphasic adults has focused on the quantity of information produced (Berko-Gleason et al., 1980) and on discourse grammar (Ulatowska et al., 1980, 1981, 1983). While aphasic adults produce shorter and less complex narratives than normal speakers, they appear to produce well-structured narratives, preserving the essential elements of setting, complicating actions and resolutions, with selective reduction of information (Ulatowska et al., 1983). To date, little is known about the proficiency of aphasic adults in using cohesive connectives -- linguistic devices which link connected discourse in a meaningful way.

In 1983, Ulatowska and Bond noted that precise and well-defined methodologies for evaluating discourse are not yet available. The present pilot study attempted to evaluate narrative discourse in aphasic adults with specific emphasis on cohesion. The purposes of the study were: (1) to evaluate the usefulness of a series of tasks for eliciting narrative discourse from mildly impaired aphasic adults; (2) to evaluate the effect of visual stimuli with varying degrees of structure on aphasic adult oral stories; and (3) to evaluate the effectiveness of cohesive tie (Halliday and Hasan, 1976; Hedberg and Stoel-Gammon, 1983) and narrative level (Hunt, 1970) discourse analysis on narratives produced by aphasic adults.

METHOD

Subjects. Ten aphasic adults (nine male, one female), between the ages of 36 and 71, with a mean age of 57 years, served as subjects. Educational status ranged from 9 years to 16 years, with a mean of 13.6 years. The etiology of aphasia was a single cerebrovascular accident in the left hemisphere for all subjects. Months post onset of aphasia ranged from two months to 96 months, with an average of 30.2 months. Based on standardized language testing, all aphasic subjects but one, were mildly impaired (PICA Overall scores between 12-14). The remaining subject was moderately impaired

(PICA Overall score 10-12). Subjects were obtained from speech and language pathology services at the Denver Veterans Administration Medical Center and at two local university clinics in Denver. A summary of subject description is in Table 1.

Table 1. Subject description.

Sex	Age[1]	Educ.[1]	M.P.O.	PICA-OA	PICA-OA%ile
M	47	16	23	13.56	85
M	53	18	96	12.43	74
M	36	16	31	13.50	85
M	51	12	25	13.04	80
M	66	12	7	12.81	76
F	60	12	34	13.56	85
M	70	9	20	10.65	50
M	48	12	36	14.87	99
M	71	16	2	13.83	90
M	68	13	28	13.42	85
Mean	57.00	13.60	30.20	13.17	80.90
S.D.	11.79	2.76	25.60	1.20	12.93

[1] In years

Data Collection. Subjects were shown a series of visual stimuli, in a fixed order of increasing structure, to elicit three different oral stories. Subjects were asked to construct oral narratives from (1) a set of toy dolls representing a family, (2) a Norman Rockwell print Looking Out to Sea, and (3) an ordered sequence of pictures illustrating a picnic scenario. Each story was tape recorded and transcribed. Four linguistic analyses were carried out on the aphasic narratives: productivity, syntax level, cohesion, and narrative level.

Productivity. The first analysis concerned productivity -- the length of the narratives (measured by number of words and number of T-units). A T-unit is a grammatical structure, considered to be a thought unit, and defined by Hunt (1970) as one main clause and all subordinate clausal and nonclausal elements attached to or embedded in it.

Syntax. The second analysis related to syntactic level. The average number of words per T-unit was used as an index of syntactic maturity, or syntactic level (Hunt, 1970).

Cohesion. The third analysis, cohesion, assessed the semantic aspects of language. Cohesion is created in discourse through the mutual connection of linguistic components in the surface structure of a text. Cohesive connections relate linguistic items and allow for the interpretation of certain items according to their dependencies on other items. Cohesion, expressed partly through grammar and partly through vocabulary at the surface level, is an important contributor to coherence at the deep level in discourse.

The most familiar work in the area of cohesion is that of Halliday and Hasan (1976), who first described cohesive tie analysis. They identified five types of cohesive relations or cohesive techniques; reference, lexical

redundancy, conjunction, substitution and ellipsis. Briefly, reference items include pronouns, definite articles, demonstratives and comparatives that make reference to something else, either within or outside the text, for their interpretation. Lexical redundancy refers to the selection of related vocabulary which may include reiteration of the same word, a synonym or near synonym, or a word representing a superordinate category. Conjunction refers to the connecting of surface structures, such as phrases, clauses and sentences, with conjunctions. Substitution and ellipsis are similar cohesive processes. Substitution involves the replacement of one item with another, while ellipsis involves the omission of an item which can be presupposed from the previous text.

A procedure for coding cohesive ties that connect T-units has been devised by Hedberg and Stoel-Gammon (1983). The total number of words in cohesive ties is divided by the total number of words in the story to determine the percent of total words in cohesive ties. This measure, representing a global measure of cohesion, was used in this study.

Narrative Level. The final analysis, narrative level, was developed by Applebee in 1978. Applebee discussed two aspects of narrative organization; chaining and centering. In chaining, story elements are linked on the basis of similarity of attributes, such as repeated mention of a character or an action. In centering, the elements are linked to one special aspect which is held constant -- an object or an event that assumes importance in the story. In the construction of well-formed stories both centering and chaining are integrated. Narrative level relates to the degree of chaining, or how story elements and events are linked on the basis of similarity; and to centering, or how certain aspects of the story are held constant. Applebee has identified six basic types of organizational structure in narratives which reflect developmental stages -- heaps, sequences, primitive narrative, unfocused chain, focused chain, and narrative.

The first stage is called heaps, in which the subject deals with each event that comes to his attention separately. There are few links between sentences. Thus, many characters and actions may be mentioned but not linked in the narrative. Sequences occur when events are linked on the basis of a shared attribute that is central to the story. The shared attribute might be a major character or a kind of action. The primitive narrative, the third developmental level, is organized around a concrete core, with events related to that core. The fourth level is the unfocused chain, in which events lead directly from one to another but attributes that link them -- character, setting, or actions -- shift. For example, settings, characters and activities change in the course of the story. Level five, focused chain, usually has a center or a main character who goes through a series of events that are linked, as in the unfocused chain, on a concrete, perceptual level. The sixth and highest level of a story is the narrative, in which the center develops over the course of the story. Each incident develops out of the previous one and simultaneously elaborates a new aspect of the theme. Causal relationships, which may rely on either concrete or abstract bonds, result in a consistent forward movement toward the ending which was entailed within the initial situation. There is usually a climax. Each aphasic adult story was assigned a number according to its narrative level based on Applebee (1978).

RESULTS

The analyses of the data were based on seven dependent variables. These variables were total words, total T-units, words per T-unit, unweighted cohesive ties, weighted cohesive ties attempts, and narrative level. A series of seven one-way Analyses of Variance (ANOVA) for repeated measures were computed. Means, ranges, standard deviations and results of analysis of variance for each variable are presented in Table 2.

Stimulus structure did not have a significant effect on words per T-unit ($F = 0.061$), percent unweighted cohesive ties ($F = 0.095$), percent weighted cohesive ties ($F = 0.471$), and percent attempts, or cohesive errors ($F = 1.073$). The syntax level and use of cohesion were similar across the series of stimuli used to elicit narratives from the aphasic sample.

Structure of stimuli yielded a significant F-ratio for total words ($F = 5.836$, $p < .05$), total T-units ($F = 4.938$, $p < .05$), and narrative level ($F = 4.846$, $p < .05$). The amount of structure in the stimulus affected productivity, as measured by total words or total T-units, and the narrative level. The trend for both productivity and narrative level was highest for the picture sequence, and lowest for the toy dolls. Specific means, ranges, and standard deviations for total words, total T-units, and narrative level across stimuli are presented in Table 2.

SUMMARY

In summary, our study investigated the effect of visual stimuli with varying degrees of structure on the productivity, syntax level, global cohesion, and narrative level of oral stories produced by mildly impaired aphasic adults.

The results of our study indicate that mildly impaired aphasic adults, given a series of visual stimuli with varying degrees of structure, produce oral narrative which could be analyzed for productivity, syntax level, global cohesion, and narrative level. The stimulus structure affected productivity, as measured by both total words and total T-units, and the narrative level of narratives elicited from aphasic subjects. The trend for both productivity and narrative level was highest for the picture sequence with the most structure and lowest for the sequence with the least structure. The amount of structure in the stimuli did not affect the syntax level or use of cohesion in oral narratives produced by mildly aphasic adults. The use of global cohesion was similar across the series of stimuli, as was syntax level.

We are currently in the process of gathering data on a normal control group and anticipate that these data will further elucidate our findings. Additionally, we plan to do analysis of cohesive tie types across stimuli and reconsider dysnomic behaviors and their effect on cohesion.

Because discourse is the natural unit of language and entails an interaction of linguistic and cognitive components, discourse analysis, including narratives, warrants further consideration from aphasiologists. Further study of cohesion in aphasic narratives appears to be worthwhile, given the role of cohesion in coherent communication.

Table 2. Means, ranges, standard deviations (SD), and results of analysis of variance for each variable are presented for the stimulus series.

Variable	Stimuli	Mean	Range	SD	ANOVA Summary (df 9, 20)
Total Words	Dolls	83.5	27 -207	56.5	F = 5.836
	Sea	104.2	38 -180	58.8	p < .05*
	Picnic	168.7	42 -373	109.1	
Total T-Units	Dolls	12.2	4 - 22	5.7	F = 4.938
	Sea	14.9	5 - 31	8.4	p < .05*
	Picnic	23.5	8 -47	12.4	
Total Words/ T-Units	Dolls	6.7	4.00- 9.10	1.8	F = 0.061
	Sea	6.9	3.80- 9.06	1.6	NS
	Picnic	6.9	3.23- 8.88	1.8	
Percent Word Unwt. Cohesive Ties	Dolls	15.8 %	4.54- 32.78 %	7.6 %	F = 0.095
	Sea	14.4 %	5.26- 27.14 %	8.6 %	NS
	Picnic	14.5 %	6.52- 20.64 %	4.6 %	
Percent Word Wt. Cohesive Ties	Dolls	23.20 %	4.54- 50.81 %	12.10 %	F = 0.471
	Sea	20.66 %	5.26- 35.71 %	9.38 %	NS
	Picnic	19.06 %	6.52- 24.90 %	6.81 %	
Attempts	Dolls	2.00	0 - 7	2.05	F = 1.073
	Sea	2.60	0 - 5	1.78	NS
	Picnic	3.50	0 - 8	2.80	
Narrative Level	Dolls	2.4	1 - 4	0.97	F = 4.846
	Sea	2.9	1 - 4	1.20	p < .05*
	Picnic	3.9	1 - 6	1.60	

*Significant at the criterion .05 level
NS = Non-significant at the criterion .05 level

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DISCUSSION

Q: When you got the discourse sample from your patients, were they providing information that was shared with the conversational partner (examiner) or not?

A: Yes, it was a shared corpus always. The stimuli were in view of the examiner and the subject.

Q: What do you suppose might have happened to cohesion had the patients done this behind some sort of screen where they were giving a narration of information that wasn't known to the examiner?

A: I would anticipate the cohesion might have been greater. The use of cohesion across the series of stimuli was low in comparison to other pilot data that we have.

If the examiner didn't know what was going on, it would be taxing to the subject. There were many references by the aphasic adults to, for example, "when you see that thing there," "well its uh, la de da de da." If the recording person had not been there, they would never have given "that thing there, that thing." So, I agree it probably would have changed the cohesion quite a bit.

Q: Did you define how it was that your stimuli differed in structure? How some are more structured than others?

A: Structure decisions were made before the study and they were more on clinical intuition than anything else. The sequence pictures obviously have the most structure as they -- the pictures -- were sequenced for the patient. For the dolls, there was no structure. The subject was given all of the dolls at once including a mother, father, boy, girl, grandmother, grandfather, baby, dog and cat, which were not named for the subject. The subject was then asked to tell a story about them. The dolls were the least structured stimuli.

Q: You said the dolls task was the least structured condition. Do you feel that the discourse elicited from the dolls was representative of how your subjects would converse in unstructured conversations? Do you feel that what you got was representative of what might go on naturally?

A: I think its hard to extrapolate at this point from our data to answer that question adequately. We're in the pilot stage of this.

Q: Is words per T-unit a way to get at syntactic complexity? We're trying to find a way to analyze some stories in terms of syntactic complexity. Is that something you found useful?

A: Hunt (1970) would suggest words per T-unit to look at both syntax level and degree of development of syntax.

Q: I'm not familiar with that 1983 reference about the method for looking at cohesion, but I am familiar with Halliday and Hasan and it seems to me that when a person who is producing discourse makes a reference to something that is in the external environment that you call that exophoric reference? So wouldn't that be a form of cohesion?

A: Yes.

Q: I would think that the examiner seeing the picture would influence the type of cohesion but not the amount.

A: Well, each of the subjects was asked to develop a story -- to tell a story about the picture. A story should have a beginning, a middle and an end and each subject should have developed the story throughout. A lot of times they started out with things like: "He's standing there on the mountain or standing on the cliff looking at it." If you compare that with what you expect a normal subject to do if the instructions had been "tell me a story about this picture," you wouldn't have assumed that your listener knew what it was. So those are kinds of references that were scored as attempts because there was no clear evidence on the part of the aphasic subjects of what "it" was. They never did tell us that.

Q: What exactly were your instructions to the patients when you presented this visual stimuli?

A: The stories were elicited by graduate students and they said, "I want you to tell me a story about these dolls," or, "I want you to tell me a story about these pictures." And the sequence pictures were put in the right sequence.

Q: When you ask them to tell a story, did you see much in the way of tangential remarks, or irrelevant intrusion?
A: Yes. We had lots of those occurring and it's all in the raw data. But a lot of things like, "I used to have a dog like that too," occurred. Many times the eliciting clinician went back and said, "Can you tell me more in the story," trying to get the subject back on task.

Q: I'm not familiar with the Applebee narrative level. Was it developed for children?
A: No, it would be applicable to any age.

Q: Did he apply it to children?
A: Yes.

Q: What is your feeling about narrative level? Maybe one task like the Norman Rockwell picture would achieve a lower level than the sequence picture -- did they tend to get a higher level in the task?
A: The sequence pictures did get a higher narrative level, and we infer that was because of the structure of the stimuli. With Applebee's narrative levels, most children by age 5 produce narratives at levels 4, 5, or 6. Many of our aphasic subjects didn't do as well as normal three- and four-year-olds do.

Q: The aphasic adult is very selective in terms of getting the most important information. Do you feel that the narrative level evaluation gets at the sort of selected reduction that aphasic people do?
A: I don't know.