

# Analysis of Oral Narratives of Normal and Aphasic Adults

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## INTRODUCTION AND PURPOSE

Analysis of connected discourse is a relatively new way to assess communication problems of aphasic adults. Early research related to discourse in adults focused on the quantity of information produced (Berko-Gleason *et al.*, 1980) and on aspects of discourse grammar (Ulatowska *et al.*, 1980, 1981, 1983). More recently, Piehler and Holland (1984) investigated cohesion of conversational language samples of two aphasic adults and Lemme *et al.* (1984) investigated the influence of stimulus structure on cohesion and on narrative levels of stories produced by aphasic adults.

No information is available concerning logical connective use (Warren, Nicholas and Trabasso, 1979) and cohesive harmony (Hasan, 1980) by aphasic adults. There also is little research comparing the performance of normal adults with that of aphasic adults on discourse tasks. The purpose of this study was to describe and compare narrative levels (Applebee, 1978), logical connective use (Warren, Nicholas and Trabasso, 1979), and cohesive harmony (Hasan, 1980) of oral stories produced by normal and aphasic adults in three story conditions.

## METHOD

**Subjects.** Ten aphasic adults and ten normal adults served as subjects. Aphasic subjects ranged in age from 36 to 71 years with a mean age of 57 years. Their education ranged from nine to 18 years with a mean of 13.6 years of education. Each aphasic subject had a history of one left hemisphere cerebrovascular accident with post onset time of from 2 to 96 months with an average of 30.2 months (Table 1). Each aphasic subject was evaluated using the Porch Index of Communicative Ability (Porch, 1967). Nine subjects were mildly impaired and one subject was moderately impaired. Aphasic subjects were obtained from clients seen at a Veterans Administration hospital and two university clinics.

The ten normal adults were selected to be of comparable age range and educational level. These subjects ranged in age from 37 to 74 years with a mean age of 61 years. The education of the normal subjects ranged from ten to 17 years with a mean of 12.7 years of education (Table 1).

**Data Collection.** Subjects were asked to construct oral narratives from three sets of stimuli: a set of toy dolls; a Norman Rockwell print--Looking Out to Sea; and an ordered set of pictures illustrating a family picnic. Subjects were instructed to "tell me a story about \_\_\_\_\_." The three story conditions were chosen because they presumably differed in the degree of structure provided. Each story was tape recorded and later transcribed for analysis.

Table 1. Subject characteristics.

Normal Subjects			Aphasic Subjects						
Gender	Age	Education	Gender	Age	Education	Etiology	MPO	PICA OA	OAZile
M	68	12	M	47	16	LCVA	23	13.56	85
M	64	12	M	53	18	LCVA	96	12.43	74
M	65	12	M	36	16	LCVA	31	13.50	85
M	74	12	M	51	12	LCVA	25	13.04	80
M	67	13	M	66	12	LCVA	7	12.81	76
F	58	14	F	60	12	LCVA	34	13.56	85
F	58	14	M	70	9	LCVA	20	10.65	50
F	37	13	M	48	12	LCVA	36	14.87	99
M	71	10	M	71	16	LCVA	2	13.83	90
M	48	17	M	68	13	LCVA	28	13.42	85
Mean	61.00	12.70		57.00	13.60		30.20	13.17	80.90
SD	11.26	1.82		11.79	2.76		25.60	1.20	12.93

Methods of Analysis. Each narrative was analyzed and described from three analytic perspectives--narrative level, use of logical connectives and cohesive harmony.

Applebee (1978) developed narrative level analysis to describe the degree of chaining and centering that occurs in narratives of preschool children. Chaining relates to how story elements are linked on the basis of similarity of attributes, such as repeated mention of a character or an action. Centering occurs when elements of the narrative are linked to a core that is held constant throughout the story. Narrative level analysis involves analysis of deep structures of stories to determine the degree of coherence present. Applebee identified six levels of narrative organization. The lower levels reflect random sets of events with few links between characters and actions. As story organization evolves, central events or series of events with either concrete or abstract bonds are presented. At the highest level, a true narrative is observed, with a central theme, a forward momentum, and a climax. Each story produced by aphasic adults and normal subjects was assigned a ranking from 1 to 6 according to the structure of the narrative.

Cohesive harmony (Hasan, 1980) is a measure of those grammatical and lexical components of narratives that contribute to the cohesiveness of a text. Cohesive harmony analysis involves identifying the lexical items in a text and then determining relationships among the items in terms of chain interactions. Each narrative was reduced to lexical tokens. The number of tokens included in identity or similarity chains was determined and compared with the number of lexical items to obtain a percentage score. The percentage score is a direct reflection of the amount of chain interaction. Below is a brief example of the cohesive harmony analysis procedure.

### Text

1. Once there was a little boy named Bill who had a red bike.
2. And he had lots of fun with his red bike.
3. And one day he ride on it and had a broken leg.

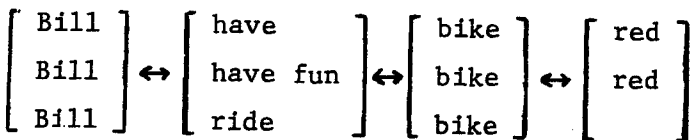
### Lexical Rendering

1. be little boy Bill Bill have red bike
  2. Bill have lots fun Bill ride bike
  3. Bill ride bike Bill break leg
- (21 lexical tokens)

### Chain Formation

1. Identify chains: Bill (6), red (2), bike (3)
2. Similarity chains: have, have fun, ride

### Chain Interaction



(12 central tokens)

Cohesive Harmony Index = 12 central tokens ÷ 21 lexical tokens = 57%

Logical connectives (Warren, Nicholas and Trabasso, 1979) describe logical relations in narratives. The stories were analyzed using four types of connectives. Three types of connectives - motivation, psychological, and physical cause - represent cause-effect relations while the fourth type - enablement - is a weaker connective form that frequently occurs in narrative.

Motivational Inferences occur when a character's voluntary thoughts, actions or goals have been motivated. For example, "Mary was tired. She went to bed." Psychological Cause inferences occur when involuntary behaviors, either internal or external, have a psychological cause. For example, "The boy was disappointed. He started to cry." Physical Cause inferences involve physical or mechanical causality between objects, between people, or between objects and people. Only external occurrences have physical causality. For example, "The weather turned cool. The leaves fell off the tree." Enablement inferences link a state or occurrence which is necessary but not sufficient to cause another. For example, "The dog got loose from her. He ran away."

## RESULTS

The data were analyzed using a series of two-way analyses of variance with repeated measures. Statistically significant between-group differences for narrative level, for logical connective use, and for cohesive harmony were obtained. These group results are summarized in Table 2. Aphasic adults produced stories with narrative levels ranging from 1 to 6 with only one of the 30 stories ranked 6, the highest rank, and 5 of the 30 stories ranked 5. Normal subjects generated narrative levels ranging from 3 to 6 with 17 of the 30 stories ranked 5 or 6. The normal subjects demonstrated more complete stories with much less variability in narrative level rankings than the aphasic adults.

Table 2. Summary of two way analysis of variance--ANOVA.

Source	SS	df	MS	F	Probability
NARRATIVE LEVEL					
Group (Normal/ Aphasic)	38.40	1	38.40	20.94	p < .05
Treatment (Story Condition)	31.60	2	15.80	29.65	p < .05
GXT	5.19	2	2.59	4.87	p < .05
SS <sub>W</sub>	19.2	36	.53		
LOGICAL CONNECTIVES					
Group	7831.15	1	7831.15	16.12	p < .05
Treatment	548.54	2	274.27	1.01	NS
GXT	773.41	2	386.70	1.43	NS
SS <sub>W</sub>	9713.01	36	269.80		
COHESIVE HARMONY					
Group	1945.98	1	1945.98	4.78	p < .05
Treatment	1100.35	2	550.17	4.55	p < .05
GXT	376.90	2	188.45	1.55	NS
SS <sub>W</sub>	4352.11	36	120.89		

For logical connectives, in addition to the significant between-group differences, greater variability was observed in the aphasic group than the normal group. Aphasic adults used fewer logical relations, ranging from no connectives to 50% of the T-units having logical relations with another T-unit. Eleven of the 30 stories produced by aphasic adults had no logical connectives, while all stories produced by the normal adults had at least one logical connective.

For cohesive harmony, variability was greater in the aphasic group than in the normal group. Aphasic adults produced fewer chain interactions than the normal group, with 7 of 30 stories produced by aphasic adults having no chain interactions, while only one story produced by normal adults had no chain interactions. Means, ranges and standard deviations are reported in Table 3.

A second set of questions were related to the effect of stimuli or story condition on the stories produced by normal and aphasic adults. Significant differences for the three story conditions--dolls, Rockwell print and sequence pictures--were found for narrative level and cohesive harmony but not for the logical connectives (Table 2).

Table 3. Means, ranges and standard deviations for narrative, cohesive harmony, and connectives.

Variable	Story	Subjects	Mean	Range	SD
<u>Narrative</u>	Dolls	N	4.80	4 - 6	.91
		A	2.40	1 - 4	.96
	Rockwell	N	3.70	3 - 5	.82
		A	2.70	1 - 4	1.05
	Sequence Pictures	N	5.70	5 - 6	.48
		A	4.20	1 - 6	1.39
<u>Cohesive Harmony</u>	Dolls	N	28.21	13.33 - 36.66	7.18
		A	9.86	0 - 33.33	10.84
	Rockwell	N	29.88	0 - 43.24	12.57
		A	20.81	0 - 66.66	22.76
	Sequence Pictures	N	32.82	21.81 - 55.42	12.75
		A	26.08	0 - 59.26	17.00
<u>Connectives</u>	Dolls	N	36.21	5.88 - 100.00	32.00
		A	4.95	0 - 42.85	13.47
	Rockwell	N	23.24	10.00 - 50.00	12.00
		A	12.39	0 - 50.00	14.15
	Sequence Pictures	N	38.00	16.21 - 66.66	17.12
		A	14.45	0 - 37.50	9.30

N: Normal  
A: Aphasic

Narrative level yielded the only group by treatment interaction. Figure 1 provides a graphic representation of the means. The interaction indicates that normal subjects did not produce more complete stories than aphasic subjects did across the three story conditions. Within the same story condition (for example sequence pictures) normal subjects consistently produced stories superior to those of aphasic subjects. Among the story conditions, however, normal subjects were not consistently superior to aphasic subjects. Narrative level means for normal subjects for the Rockwell print story condition were lower than the narrative level means for aphasic subjects for the sequence picture condition.

In summary, this study described and compared narrative level, logical connective use and cohesive harmony in stories produced by normal and aphasic adults. Cohesive harmony is a measure of surface structure aspects of discourse, while narrative level and logical connectives reflect deep structure of the stories. Normal adults produced more complete, coherent stories (as reflected by narrative level), produced more chain interactions (as reflected in greater cohesive harmony scores), and provided more inferences (as seen in the logical connective scores) than aphasic adults did. Aphasic subjects' stories demonstrated more variability than those of normal subjects for narrative level, logical connective use, and cohesive harmony.

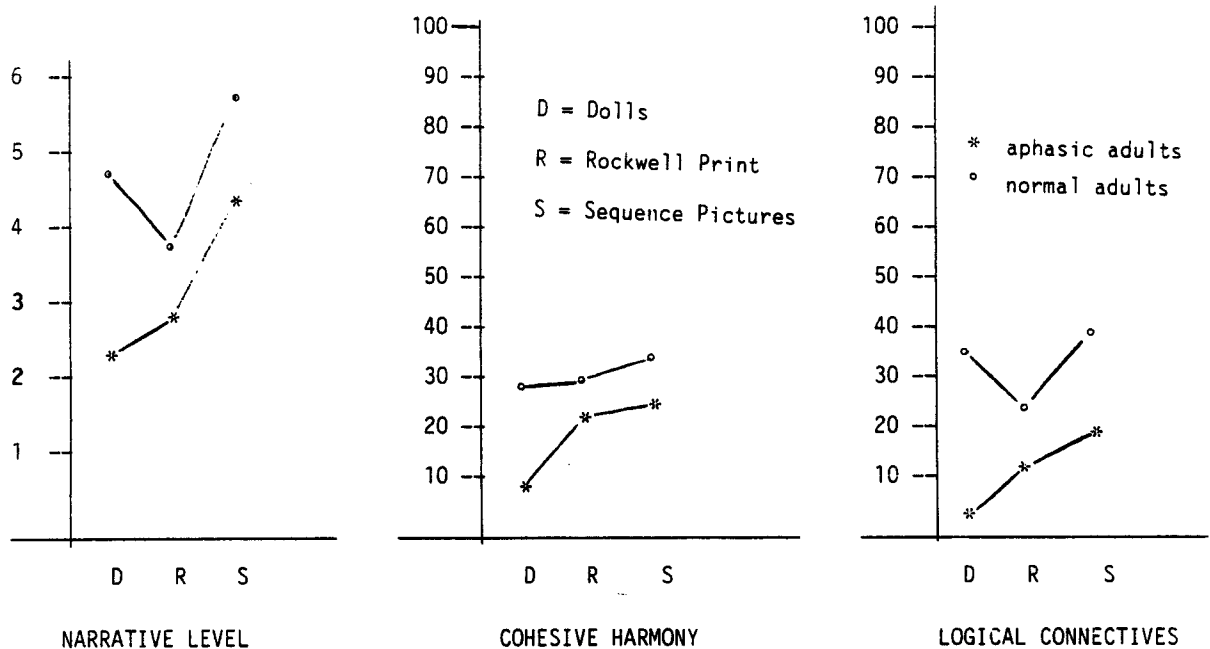


Figure 1. Interaction of group by story for each variable.

The stimuli for the three story conditions differed in format, number of characters and familiarity of the material to subjects. The stimuli affected the narratives produced. Normal subjects did better within each story condition than aphasic subjects. It is plausible that normal subjects would produce consistent stories regardless of the stimuli. We also assumed that the structure provided by the stimuli would be greatest for sequence pictures, least for the dolls, and the Rockwell print between the other two. Normal subjects did less well than expected in the Rockwell story condition for both narrative level and cohesive harmony. We anticipated larger differences between dolls and the Rockwell print story conditions for aphasic subjects. The data did not support our initial assumption about differences in structure of each story condition.

What are the clinical implications? We would like to suggest three. (1) We need to look closely at stimuli used to elicit expressive language in assessment as well as treatment of aphasic adults. The stimuli which logically might appear to provide more or less structure may be deceiving, as we found in this study. (2) Assessing spontaneous production using at least two story conditions, not just one, may reveal differences in both quantity and quality in expressive language productions for some patients. We should use a continuum of stimuli and conditions. (3) Single word assessment, including word retrieval and naming, are common aphasia assessment tasks, although these tasks seem to have little direct relationship to conversational competence. Conversation and overall communication competence are key issues in aphasia treatment. Although narrative production and spontaneous conversation are not equivalent language tasks, story production may reveal some important information about the adequacy of conversation. Story telling may be helpful in making clinical predictions about conversational discourse in real life

situations. The analysis of discourse in aphasic adults is worth pursuing. It is clear that descriptive and quantitative information about discourse by aphasic adults will facilitate more accurate and meaningful assessment and enhance therapeutic management of aphasic patients.

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