

Effect of Story Content on Narrative Discourse of Aphasic Adults

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Visual stimuli have been used in countless research, assessment and treatment tasks to elicit single-word or phrase-length responses from aphasic adults. The effect of the visual stimuli on labeling and word retrieval tasks was investigated by a number of researchers (Benton, Smith and Lang, 1972; Bisiach, 1966; Whitehouse and Caramazza, 1978) in the 1960s and 1970s with the results indicating that color, size and redundancy of the visual stimuli have some effect for some subjects on the responses obtained, but that, as a whole, aphasic subjects generally produce the targeted response with varying efficiency regardless of the stimulus format.

Narrative discourse of aphasic adults has also been elicited using a variety of stimulus formats including: 1) toy dolls (Bottenberg et al., 1985; Lemme et al., 1984), 2) single pictures (Bond et al., 1983; Bottenberg et al., 1985; Lemme et al., 1984; Yorkston and Buekelman, 1978, 1980), and 3) sets of sequence pictures (Bond et al., 1983; Bottenberg et al., 1985; Lemme et al., 1984, Ulatowska et al., 1981, 1983). For example, Berko-Gleason et al. (1980) and Ulatowska et al. (1981, 1983) used a series of cartoon-like pictures as stimuli during story retelling tasks. Yorkston and Buekelman (1978, 1980) used the Cookie Theft picture from the Boston Diagnostic Aphasia Examination (BDAE) (Goodglass and Kaplan, 1972) while Bottenberg et al., (1985) and Lemme et al. (1984) used a Norman Rockwell print -- Looking Out to Sea. Other sequence picture stimuli include colored drawings of a picnic scenario (Bottenberg et al., 1985; Lemme et al., 1984).

Additionally, traditional aphasia assessment procedures typically use single picture stimuli to elicit spontaneous language samples from aphasic adults (Goodglass and Kaplan, 1972; Kertesz, 1972; Schuell, 1972). Unfortunately, the authors of these investigations and the developers of the aphasia examinations provided little rationale for the selections of stimuli used to elicit narrative discourse. An investigation related to the effect of stimuli on discourse productions was completed by Lemme et al. (1984). They compared narratives produced from three sets of stimuli which differed in structure, including a set of toy dolls, a single picture (Rockwell print) and a set of sequence pictures (Picnic scenario) and found that the sequence pictures resulted in longer, more complete narratives. Additionally, Bottenberg (1987) examined narrative produced from two sets of sequence pictures and found no difference in total words or story organization but did find a difference in the percentage of words in lexical ties. Given stimuli with a like amount of structure, the production of lexical items differed significantly for the two stories. Little is known however, about the effect, if any, of using picture stimuli which differ in content, familiarity or emotional impact on narrative discourse production. Thus, this study was designed to address the effect of story content on narratives of aphasic adults.

METHOD

Subjects. Twelve aphasic adults were selected for this study using the following criteria: 1) a single sided left thromboembolic cerebral vascular accident; 2) no history of psychiatric disorders, alcoholism or drug abuse; 3) right handed; 4) aged 65 years or less; 5) Caucasian; 6) monolingual English; 7) three or more months post cerebral vascular accident; and 8) aphasia severity in the mild-to-moderately impaired group.

Inquiries were made to speech and language pathologists at university speech and hearing clinics, hospitals and rehabilitation centers soliciting referrals of aphasic adults who met the criteria and who were willing to participate in the study. Subjects referred to the experimenter for inclusion in the study were screened to assure that they met the selection criteria. If the subjects met initial inclusion criteria, the experimenter administered the Porch Index of Communicative Ability (PICA) (Porch, 1967) to each subject to obtain an overall aphasia severity score. Subject characteristics include a mean age of 50.58 years, mean years of education of 13.91 and a mean post onset of 71.91 months. The mean overall PICA score was 12.84 with a mean percentile of 74.58 (Table 1).

Table 1. Subject characteristics.

Subject Number	Gender	Age (Years)	Education (Years)	Months Post Onset	PICA Overall	PICA Percentile
1	M	60	11	43	11.33	55
2	M	65	16	153	13.01	76
3	M	41	14	60	12.88	74
4	M	54	11	67	13.88	88
5	M	41	20	71	13.94	88
6	F	41	14	25	13.46	82
7	F	55	14	282	11.54	58
8	F	50	12	3	12.89	75
9	M	45	10	73	13.59	84
10	M	38	20	33	11.84	61
11	F	60	12	41	12.95	80
12	F	57	13	12	12.84	74
Mean		50.58	13.91	71.91	12.84	74.58
S.D.		9.16	3.28	76.70	.87	11.19
Range		38-65	11-20	3-282	11.33-13.88	55-88

Narrative Tasks. Three sets of pictures were selected for the narrative tasks. The single black-and-white picture was the Cookie Theft picture from the Boston Diagnostic Aphasia Examination (Goodglass and Kaplan, 1972). The other stimuli were colored sequenced pictures depicting a fire scenario and the Kennedy assassination. The Cookie Theft picture (which is familiar to most aphasiologists) depicts characteristics involved in a somewhat silly set of events, the fire scenario depicts a more serious set of activities that is well understood but not necessarily something all subjects have had direct

experience with, and the Kennedy sequence involves the most remembered historical event in the lives of most adult Americans.

Data Collection. Subjects were seen for data collection in a speech-language pathology clinic or in the subject's home. All subjects were given identical instructions: "Look at all the picture(s) and tell me the best story you can." While the subjects told each story, the examiner provided minimal feedback with an occasional "hmm" or head nod. When the subject indicated verbally or nonverbally that the narrative was completed, the task was discontinued. If a pause greater than 20 seconds occurred, the subjects were prompted with, "Can you tell me more?" or "Is that all?" All narratives were audiotape recorded.

Data Preparation. Thirty-six stories were generated by the 12 subjects. The tape recorded narratives were transcribed, with unintelligible words written phonetically, if possible, or recorded as an "unintelligible." The audiotaped narratives were compared with the written narrative by the primary experimenter to verify the transcriptions and to divide the narratives into T-units (Hedberg and Stoel-Gammon, 1985; Hunt, 1970). Additionally, the experimenter bracketed all revisions or self corrections, false starts, perseverations, stereotypic comments and asides according to the rules specified by Hedberg and Stoel-Gammon (1985).

Total Word Counts. All words except those in brackets were included in the total word counts. The total number of words was used as an overall measure of productivity.

Cohesive Tie Analysis. T-Units, as described by Hunt (1970) and Hedberg and Stoel-Gammon (1985), served as the units for cohesive tie analysis. The cohesive tie analysis procedure originally described by Halliday and Hasan (1976) and modified by Hedberg and Stoel-Gammon (1985) was used to analyze surface level cohesive strategies used in each narrative. The cohesive tie analysis procedure addresses five types of cohesion, including reference, lexical, conjunction, substitution, and ellipsis and considered total percentage of words in cohesive ties as well as a weighted percentage of words in cohesive ties.

Story Grammar Analysis. Story grammar analysis as described by Stein and Glenn (1979) and modified by Hedberg and Stoel-Gammon (1986) was used to describe the overall organization or suprastructure of the narratives. Story grammar consists of eight levels of organization: 0) unrelated statements, 1) descriptive sequences, 2) action sequences, 3) reactive sequences, 4) abbreviated episodes, 5) completed episodes, 6) compound or complex episode, and 7) interactive episode. The levels represent a developmental sequence of narrative abilities (McCabe and Peterson, 1979).

RESULTS

A multivariate one factor analysis of variance (MANOVA) with repeated measures for the three stories was completed. The multivariate analysis considered four dependent variables; 1) total words; 2) percentage of words in cohesion, unweighted; 3) percentage of words in cohesion, weighted; and 4) story grammar level.

The results of this study revealed a multivariate F value of 1.998 and a p of <.058 for story (Table 2). Subsequent univariate analyses were completed for the four dependent variables. A significant univariate F was found for total words (Table 3), but was not obtained for the other three dependent variables.

Table 2. Results of statistical analyses for differences among stories and effects of dependent variables.

Multivariate Analysis of Variance for Story

Test	Value	Approx. F	Hypoth df	Error df	Signif.
<u>Pillais</u>	.41360	2.02	8	62	.058

Univariate F-Tests for Dependent Variables

	Hypoth SS	Error SS	Hypoth MS	Error MS	F	Signif.
Total Words	7881.06	39313.92	3940.53	1191.33	3.31	.049*
Unweighted cohesion	171.38	1648.79	85.69	49.96	1.72	.196
Weighted cohesion	153.70	2770.25	76.85	83.95	.92	.410
Story grammer	1.50	55.25	.75	1.67	.45	.643

* p. < .05

The Post hoc analyses (Tukey) of the differences in means (Table 3) revealed a significant difference between the mean number of words produced for the Cookie Theft story and the Kennedy assassination sequence but no difference between the Cookie Theft story and the fire scenario and the fire scenario and the Kennedy assassination sequence. The percentages of words in weighted and unweighted cohesion were approximately the same for all three stories (Table 3). Additionally, the story grammar levels reflecting narrative organizational abilities were not different for the three stories (Table 3).

The results of the study indicate that given the three sets of visual stimuli -- one single picture and two 6-picture sequences -- mild-to-moderately impaired aphasic adults produced stories which differed in length -- the Cookie Theft picture generated the shortest stories and the Kennedy sequence the longest. These results are, at least in part, consistent with those of Lemme *et al.* (1984) who also demonstrated that sequence pictures elicited longer samples of language.

The second set of analyses dealt with cohesion, which is related to surface level semantic relationships between thought, or T-units, the unit of analysis selected for this study. The percentage of total words used in cohesive ties was not different across the three stories nor was the weighted percentage of words. These results are consistent with findings reported by Lemme *et al.* (1984) and Bottenberg (1987) using other narrative stimuli. Further, Bottenberg found a difference in the percentage of lexical items in two stories elicited from sequence pictures but similar results were not found for these three stories.

Finally, each story was analyzed relative to global narrative organization. The organization across the stories as measured by story grammar analysis (Stein and Glenn, 1979) was not statistically different. However, examination of the data in Table 3 reveal a trend that the story grammar levels for the Cookie Theft picture were lower than for the fire scenario, which were lower than for the Kennedy sequence. Although statistically not

significant, the trend suggests that story topic may affect narrative organization and that further investigation may be warranted. Furthermore, most but not all of the subjects in this study produced a complete story with a setting, initiating event, attempt (action) and a resolution regardless of the stimuli. These results are consistent with Lemme *et al.* (1984) and Ulatowska *et al.* (1981, 1983), suggesting that most mild-to-moderately impaired subjects can produce complete narratives, given a variety of visual stimulus formats.

Table 3. Lexical, cohesion, and story grammar mean scores, standard deviations (SD), and ranges for the Cookie Theft picture, fire scenario, and Kennedy assassination picture sequence. Standard deviations are given in parentheses.

	Cookie Theft			Fire Scenario			Kennedy Assassination		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
TOTAL WORDS	63.00	27.58	20-92	71.75	31.66	31-112	97.83	42.56	10-173
UNWEIGHTED COHESION	13.22	6.75	0-23	18.06	7.01	10-35	13.68	7.35	0-26
WEIGHTED COHESION	18.69	9.37	0-34	22.75	7.85	13-38	18.14	10.12	0-35
STORY GRAMMAR LEVEL	4.0	1.38	1-6	4.25	1.22	2-6	4.5	1.31	2-6

Although differences for the three stories were not found when all 12 subjects were considered, the topic content appeared to have a greater content effect on some individual subjects. Three subjects had markedly different output and story grammar scores when the Cookie Theft scenario was compared to the Kennedy assassination. It seemed the events not stimulus related to the Kennedy sequence and long term memory or experience with the picture stimuli facilitated their verbal production. This pattern was the anticipated outcome, at least by this investigator, for all subjects in the study, not just three of them.

DISCUSSION

Spontaneous language production or discourse is a meaningful context in which to assess language abilities of aphasic adults. Systematic organized structures for such analyses have not been suggested but are evolving. As we work toward a systematic methodology, the choice of stimuli is only one of many important issues. These preliminary results suggest that format (single picture versus sequence) and emotional content of story stimuli have an effect on productivity, and for some subjects (not necessarily all) may affect the quality of their verbal output.

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DISCUSSION

- Q: I mentioned a study yesterday that suggests that the Boston Diagnostic Aphasia Exam Cookie Theft is the best of the single pictures. So, probably a caution here that all single pictures aren't going to be as good as a sequence of pictures for eliciting speech. The Cookie Theft

Picture was significantly better than either the Minnesota Picture or the Western Aphasia Battery Picture at eliciting information. The Western Aphasia Battery Picture elicited a lot of labeling, yet gave us less information from subjects.

A: I agree with what you are saying. We have to decide what it is we want to look at and then choose stimuli appropriately.

Q: Had these subjects described the Cookie Theft Picture in any kind of prior assessment or evaluation, so that it was not the first time they had seen it?

A: Right.

Q: Do you think also that with the Kennedy assassination, did these people really stick with the pictures or, in fact, did they bring in some of their own experiences?

A: I think that's probably true. Ulatowska et al. used a memorable event and reported that they obtain a much more representative spontaneous speech sample from it. I understand that, but part of the problem using a memorable event across a number of subjects is you can't control for all the variables you'd like to, such as potential familiarity. I chose Kennedy because I felt that it could be represented in sequence pictures and provide some structure, but I was also hoping they would use long-term memory. I selected it because nearly every person in this room knows exactly where they were and what they were doing at that moment. We really predicted when we set the study up that we would get a strong effect from Kennedy and did not. It was real effective for three subjects. But on the whole, the group did not respond that way and I would not have predicted it.

Q: Is the hidden message that perhaps this stuff is pretty individual and maybe we should present various conditions to individual patients and then see how they perform?

A: I agree. I think it's unrealistic to present one set of stimuli to any subject and expect that to be a representative sample. Unfortunately, clinically that is often done. That's a good point and we shouldn't forget it.

Q: As a follow-up to that comment, I'll comment on some work we did. In a referential communication task in which we had nonaphasic and aphasic people participate, we found that our nonaphasic people were more variable than our aphasic people -- to the degree that we could not include them in the same analysis of variance. So I caution you not to expect that the variability will be greater for an aphasic group, it may not be.

Q: Your statement that practically everyone in this room can remember where they were when Kennedy was assassinated probably is no longer true.

A: For the subjects I used that statement is, in fact, true. The youngest subject was 38.

C: I want to comment on variability. In my dissertation I did normals and compared them to the aphasic group. The variability in every measure I did on the normals was at least as great and sometimes greater than it was in the aphasic population. When I asked the normals to do this kind of task, I found a lot of reticence on their part that it was a silly,

nonsensical kind of task. Aphasic patients took it much more seriously, I think, because they had been through treatment and felt this was an appropriate and an okay thing to do. I had a lot of normals say, "This is silly" or "I can't do this" or "I don't want to do this, but I will because I'm here and you've already got me in the room." So that when we make direct comparisons between normal and aphasic subjects, there are problems with the normal subjects.

A: We've been concerned about what we call the pragmatic validity of the tasks we use and I think your point is a good one. It may be more important for the nonaphasic people than for the aphasic people, because we've conditioned aphasic people to accept pragmatic invalidity. Nonaphasic people haven't been conditioned by us.

Q: Could you comment on what kind of stories you got from the Cookie Theft picture, because maybe it elicits as much language as a narrative, but it still doesn't get us narrative structure.

A: If you have three elements -- something is going to happen, something happens and something happened, you get a level four in story grammar. Cookie Theft was probably less set up to get that, but in most cases we still got it. One subject gave a setting, "this is in the kitchen" some kind of initiating event -- "the children are trying to get a cookie" or "the boy is trying to get the cookie;" that really meets the essence of what the description system said you had to have. There's no doubt in my mind that qualitatively those story components are different in the two groups. But I think that's the shortcoming of the analysis procedures that we need to look not at quantity -- we can count elements, we need to go back and look at quality. We're just getting started with this, and I think we need to do that.