

Effects of Picture Stimuli on Discourse Production by Aphasic Patients

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Spontaneous speech is almost always impaired in aphasic persons. Consequently, evaluation of spoken discourse is an important component of any assessment battery for aphasia. A variety of discourse elicitation procedures are used by clinicians and researchers. These procedures include conversation, interview, story telling, description of common procedures, and description of pictures.

Discourse produced in response to pictures may be easier to analyze than discourse elicited in conversation or interviews because the extralinguistic context (picture) may help the clinician determine the syntactic, semantic, and phonological intent and accuracy of speakers' responses. Most standardized tests of verbal expression for aphasic patients include stimulus pictures to elicit spontaneous speech. Although speech pathologists use these pictures to stimulate spontaneous speech in aphasic patients, it is not known whether the pictures from the various tests elicit similar spontaneous speech samples.

Correia (1986) compared the accuracy, efficiency, and amount of enumeration in aphasic persons' descriptions of the pictures from the Minnesota Test for Differential Diagnosis of Aphasia (MTDDA) (Schuell, 1973); The Boston Diagnostic Aphasia Examination (BDAE) (Goodglass and Kaplan, 1983); and the Western Aphasia Battery (WAB) (Kertesz, 1982). She found that the BDAE (Cookie Theft) picture consistently elicited the most accurate, the most efficient, and the least enumerative descriptions. The WAB consistently elicited the least accurate, the least efficient, and the most enumerative descriptions. Correia suggested that the Cookie Theft picture contains less detail, a higher degree of context dependency, and more action than the other two test pictures. However, since it consists of a single picture, it does not present an ongoing story with a beginning, middle, and end in which all the events are related to one another. A series of pictures that presents an ongoing story with connections between the events in the pictures may elicit more accurate and efficient, and less enumerative descriptions than those elicited by a single picture.

The purpose of this study was to determine whether discourse samples elicited from aphasic adults by a single picture (The Cookie Theft picture) differed in terms of efficiency in producing accurate information and amount of enumeration from samples elicited by a series of pictures representing an ongoing story.

METHOD

Subjects. Subjects were 10 aphasic adults who were at least one month post onset of a single left hemisphere thromboembolic brain lesion. Diagnosis of aphasia was based on the results of standard aphasia tests. Classification of subjects by aphasia type and estimation of aphasia severity with the rating scale from the BDAE were done independently by two speech-language pathologists. These judgments were based on analysis of audiotaped conversation and picture description together with standard test results. Only subjects for

whom the two judges independently agreed on type and severity of aphasia were included in the study. Five subjects were nonfluent and five were fluent-mixed (fluent with literal paraphasias and word retrieval problems) (Table 1).

Table 1. Descriptive information for aphasic subjects.

SUBJECTS	AGE	EDUCATION	BDAE Severity	MPO
Nonfluent				
1	53	14	3	130
2	53	12	3	105
3	47	16	3	31
4	66	12	3	29
5	60	12	4	164
Fluent-Mixed				
1	65	13	4	79
2	62	14	4	16
3	67	16	5	58
4	61	14	5	37
5	63	12	3	65

Note. BDAE severity = Boston Diagnostic Aphasia Examination Aphasia Severity Rating Scale, 0 = most impaired and 5 = least impaired. MPO = months post onset of aphasia.

Materials. Stimulus materials included the Cookie Theft picture from the BDAE and six sequenced pictures that describe a complete story from the wordless picture book "Frog Goes To Dinner" (Mayer, 1985).

Procedure. Subjects were tested individually in a quiet room. Each subject was seated at a table with the investigator seated beside him. As the pictures were presented, the subjects were told to "Tell me everything you see happening in this (these) pictures."

Half the subjects saw and described the Cookie Theft picture first and the other half saw and described the Mercer Mayer pictures first. Subjects' narratives were audiotaped. All speech samples were transcribed verbatim by one of the investigators. A second investigator independently transcribed one transcript for each of the ten subjects. Average transcription reliability was 99%. The following measures were obtained for each sample: (1) total number of intelligible whole words; (2) number of correct information units (CIUs) (words that were informative, accurate in relation to picture content, and correctly articulated); and (3) number of enumerative information units (EIUs)--(CIUs that were nouns, personal or possessive pronouns, or adjectives).

Scoring reliability was established on the same ten transcripts used to determine transcript reliability. Total percentage agreement for number of words was 100%. Overall point-to-point agreement for CIUs was 91% and for EIUs

was 97%. These reliability measures for correct information units and enumeration units are well above the level of agreement to be expected on the basis of chance.

The foregoing measures were used to calculate two proportions for each description: (1) CIUs/words = a measure of efficiency in producing accurate information; (2) EIUs/CIUs = a measure of enumeration.

RESULTS

The subjects produced more words in response to the Mercer Mayer pictures than the Cookie Theft pictures. The mean efficiency score for producing accurate information (CIUs/words) was .53 for the Cookie Theft descriptions and .51 for the Mercer Mayer descriptions. The mean enumeration score (EIUs/CIUs) was .54 for the Cookie Theft descriptions and .52 for the Mercer Mayer descriptions (Table 2).

Table 2. Total words, CIUs/words, and EIUs/CIUs for aphasic subjects.

Subjects	Total Words		CIUs/words		EIUs/words	
	CT	MM	CT	MM	CT	MM
Nonfluent						
1	26	104	.58	.59	.60	.52
2	38	79	.58	.49	.55	.41
3	36	135	.61	.52	.45	.56
4	44	318	.55	.50	.42	.52
5	28	53	.50	.45	.79	.75
\bar{X}	34.4	137.8	.56	.51	.56	.55
Fluent-mixed						
1	43	218	.49	.53	.52	.56
2	50	93	.60	.62	.47	.43
3	77	160	.56	.68	.47	.46
4	11	89	.36	.27	.75	.58
5	240	128	.50	.47	.42	.44
\bar{X}	84.2	137.6	.50	.51	.53	.49
All subjects						
\bar{X}	59.3	137.7	.53	.51	.54	.52

Note. CIUs = correct information units. EIUs = enumerative information units.

Two 3-way analyses of variance tested the effects of Groups (nonfluent, fluent-mixed aphasic) by Picture Type (Cookie Theft, Mercer Mayer) by Measure (CIUs/words, EIUs/CIUs). The results revealed that for CIUs/words, there were no significant main effects for Group ($F(1,8)=0.25, p > .05$) or Picture Type ($F(1,8)=1.12, p > .05$), and there was no significant interaction ($F(1,8)=2.78, p > .05$). For EIUs/CIUs there were no significant main effects for

Group ($F(1,8)=0.45, p > .05$) or Picture Type ($F(1,8)=0.46, p > .05$), and there was no significant interaction ($F(1,8)=0.13, p > .05$).

DISCUSSION

Aphasic subjects' verbal descriptions of the Mercer Mayer picture sequence contained more words than their descriptions of the Cookie Theft picture. This is not surprising since the Mercer Mayer sequence contained six pictures and the BDAE Cookie Theft stimulus consisted of a single picture. Although the Mercer Mayer pictures elicited longer discourse samples from aphasic subjects than the Cookie Theft Picture did, the discourse samples elicited by the two did not differ significantly either in efficiency in producing accurate information or in amount of enumeration. These results suggest that longer speech samples elicited by a sequence of pictures do not necessarily provide different information than shorter speech samples elicited by a single picture. These findings are consistent with those of Cherepski and Drummond (1987). They compared five nonfluent aphasic patients' spontaneous speech produced in response to the Cookie Theft picture and two cartoon strips (Dennis the Menace and Tank McNamara). They analyzed neologistic and phonemic paraphasias, syntactic errors and syntactic complexity and word finding problems. They found no significant differences between the pictures for any of these measures.

These data suggest that for estimating an aphasic speaker's efficiency in producing accurate information, and the amount of enumeration they might produce, clinicians would be most efficient if they elicited short speech samples with a single picture rather than longer speech samples with a sequence of pictures. However, use of picture sequences to elicit speech samples from aphasic adults may be warranted when characteristics such as cohesion and grammatical complexity are of interest.

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DISCUSSION

- Q: In enumeration units you have nouns, pronouns, and adjectives. Why are adjectives, but not verbs, considered to be enumeration units?
- A: Enumeration units are considered to refer to labeling or the description of labels rather than to actions or descriptions of the events taking place. Therefore adjectives were considered enumeration units since they modify a label rather than provide information about the action.

- Q: Didn't you lose a lot of information when you left out words that were not correctly articulated from correct information units?
- A: We did not lose that much information since few words were omitted due to inaccurate articulation. However, if there were a lot of misarticulated words that were still intelligible, we probably would lose information. That is a good point.