Clinical Aphasiology, Vol. 22, 1994, pp. 135–144

The Effects of Setting Variables on Conversational Discourse in Normal and Aphasic Adults

Patrick J. Doyle, Cynthia K. Thompson, Karen Oleyar, Julie Wambaugh, and Amy Jackson

Ecologically valid outcome measures are crucial to thoroughly assess the efficacy of language intervention in aphasic adults. In this regard, clinical researchers are, with increasing frequency, sampling conversational discourse as a means to evaluate generalization effects of treatment.

Collecting language samples under conversational discourse conditions has several advantages. First, the contextual elements that compose such conditions, and the functional purpose and structure of the samples obtained, more closely approximate typical sociocommunicative interactions than do narrative, procedural, or expository forms of discourse. Second, certain pragmatic aspects of communication, such as the appropriate and successful use of speaking turns, topic shifts, and various communicative functions, may be observed only under conversational discourse conditions.

Nevertheless, there are a number of problems inherent to conversational discourse sampling, especially as it relates to the measurement of communicative functions. These include a lack of quantitative data from normal adults regarding the range and proportionate use of various communicative functions and a lack of information regarding the effects of a number of setting variables, including the number and familiarity of conversational partners, the physical environment in which conversations occur, and the manner in which discourse samples are elicited.

Therefore, the purpose of this investigation was to describe the proportionate distribution of communicative functions in the conversations of aphasic and normal adults and to examine the effects of familiarity of conversational partner (i.e., familiar vs. unfamiliar), sampling procedure (i.e., topic-open vs. topic-constrained), number of conversational partici-

pants (i.e., dyad vs. triad), and physical environment (i.e., subjects' homes vs. simulated home environments) on the dependent variables. These dependent variables included the communicative function categories of statements, requests, answers, and ambiguous communicative attempts.

METHOD

Participants

Subjects. Two groups of subjects, 12 normal and 13 aphasic adults, participated in the study. The aphasic group consisted of 12 males and 1 female who ranged from 18 to 180 months post onset of a single left hemisphere cerebrovascular accident (CVA). They obtained *Porch Index of Communicative Ability* (PICA) (Porch, 1971) overall percentile scores between 54 and 87 and estimated premorbid IQs (Wilson, Rosenbaum, & Brown, 1979) between 90 and 138. The mean age of the group was 60.6 years (*SD* = 5.88). Individual subject data, including Western Aphasia Battery (WAB) type (Kertesz, 1982), are presented in Table 1. The normal subject group consisted of 11 males and 1 female with a mean age of 58.8 years

Table 1. Aphasic Subject Data

Subject	*Age*	*Gender*	*Hand*[a]	*MPO*[b]	*EPIQ*[c]	*WAB Type*[d]	*PICA %ile*[e]
S1	66	M	R	120	114	Broca's	57
S2	62	M	R	48	112	Broca's	63
S3	62	M	R	79	107	Broca's	70
S4	69	M	L	71	116	Conduction	78
S5	60	M	R	25	138	Broca's	87
S6	50	M	R	101	122	Broca's	54
S7	59	M	R	86	132	Broca's	84
S8	68	M	R	65	119	Broca's	57
S9	59	F	R	54	109	Broca's	79
S10	50	M	R	18	110	Broca's	87
S11	62	M	R	180	120	Broca's	81
S12	64	M	R	32	90	Broca's	–
S13	57	M	R	46	102	Broca's	62
M	60.6						
SD	5.88						

[a]Handedness, [b]Months post onset. [c]Estimated premorbid IQ. [d]*Western Aphasia Battery* type. [e]*Porch Index of Communicative Ability.*

(SD = 58.8) and estimated premorbid IQs between 109 and 130. The subject groups did not differ significantly with respect to age [t (23) = .69, p = .499], estimated premorbid IQ [t (23) = –.97, p = .342], or years of formal education [t (23) = –.99, p = .331]. All subjects lived at home and identified 2 individuals with whom they were closely acquainted to serve as their familiar partners.

Conversational Partners. Two groups of volunteers, 50 familiar (i.e., 2 acquaintances of each aphasic and normal subject) and 25 unfamiliar (i.e., 1 hospital voluntary service worker for each subject) served as conversational partners. The familiar group consisted of 16 males and 34 females with a mean age of 53.0 years (SD = 16.5). The unfamiliar group consisted of 13 males and 12 females with a mean age of 54.6 years (SD = 10.5). The volunteer groups did not differ significantly with respect to age [t (73) = –.45, p = .652] or years of formal education [t (73) = –.187, p = .065].

All study participants were monolingual English-speaking individuals who passed a pure tone audiometric screening at 30dB HL in the better ear.

Data Collection

Six-minute samples of conversational discourse were obtained in a counterbalanced order across subjects within each group by holding number of conversational participants (dyads) and physical environment (simulated) constant while manipulating familiarity of conversational partner and topic-open versus topic-constrained sampling procedures. In topic-constrained sampling conditions, subjects viewed and then discussed one of five 4-minute videotaped news segments that were presented in a counterbalanced order across conditions. The video recordings were selected from a pool of 12 *ABC News*, "American Agenda" segments that were equated on a number of interest and complexity parameters by a separate group of 19 age-matched volunteers prior to data collection. In topic-open conditions, subjects were instructed to talk about anything they chose.

Samples were also obtained under conditions in which familiarity of conversational partner (familiar) and sampling procedure (topic-constrained) were held constant while the number of conversational participants and physical environment (i.e., subjects' homes vs. simulated home environments) were manipulated. Simulated home environments were located in the speech clinics of two research sites. These rooms were carpeted and contained comfortable furniture, draperies, wall hangings, TV monitors, and VCRs. All recording equipment was unobtrusive.

Data Analysis

A total of 175 conversations were conducted. Two were lost because of recording equipment failure; the remaining 173 samples were orthographically transcribed from audio recordings, segmented into utterances, and entered into a microcomputer by a trained research assistant. Utterance segmentation was determined on the basis of prosodic, syntactic, and semantic criteria according to transcription conventions adapted from those described by Campbell and Dollaghan (1987). Each subject utterance was subsequently coded by two speech pathologists according to the dependent measures defined in Appendix A.

Frequency data for individual communicative functions were converted to proportions of the total number of subjects' communicative functions in each sample. Proportional data were subsequently subjected to ARCSIN transformations to stabilize the variances.

Repeated measures analyses of variance were performed on each dependent measure to examine the effects of (a) group, familiarity, sampling procedure, and their interactions, and (b) group, number of participants, physical environment, and their interactions.

Reliability

Tests of the reliability of transcription and utterance segmentation were performed on all samples. To determine reliability, a second rater was provided with the original transcripts and corresponding audio recordings and instructed to indicate any disagreements with respect to utterance content or utterance segmentation on the original transcript. Disagreements were reviewed by a third rater and either resolved by consensus or omitted from the data analysis. Less than 2% of the utterances sampled were omitted because of a lack of consensus among the raters. A test of the reliability of communicative function scoring was performed on one randomly selected conversation for each subject. For this dimension, two raters independently coded all subject utterances, and point-to-point reliability was calculated. The percentage of interobserver agreement was determined by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. The mean percentage of agreement for the 25 transcripts sampled was 86%, with scores ranging from 79 to 100%.

RESULTS

Descriptive data are provided in the form of group means and standard deviations for the dependent measures within each setting condition

Table 2. Mean Values and Standard Deviations for Group, Familiarity, and Sampling Procedures

N = 13 *N* = 12	*Aphasic Normal*	*Group*	FAMILIARITY *Unfamiliar*	*Familiar*	SAMPLING PROCEDURE *Topic-Open*	*Topic-Con*
		M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Statements	A	.1855(.1287)	.1751(.1195)	.1958(.1379)	.1805(.1058)	.1904(.1516
	N	.5891(.1468)	.5438(.1520)	.6345(.1416)	.4971(.1400)	.6811(.1537
Requests	A	.0275(.0283)	.0173(.0197)	.0377(.0368)	.0342(.0331)	.0208(.0234
	N	.0728(.0588)	.0618(.0448)	.0838(.0726)	.0927(.0674)	.0530(.0502
Answers	A	.1844(.1092)	.1823(.0859)	.1869(.1326)	.2202(.1154)	.1489(.1030
	N	.0393(.0380)	.0386(.0249)	.0399(.0331)	.0628(.0876)	.0158(.0215
ACA	A	.1357(.0869)	.1496(.1215)	.1219(.0852)	.1209(.0685)	.1505(.1054
	N	.0562(.0401)	.0518(.0364)	.0607(.0483)	.0484(.0349)	.0641(.0453

(Tables 2 and 3). Inferential analyses are provided in the form of *F* values obtained from repeated measures analysis of variance procedures. Because of the number of analyses conducted on the same data set, a conservative significance level of .01 was employed for each inferential comparison.

Group, Familiarity, and Sampling Procedure Effects

Under conditions in which the number of conversational participants and environment were held constant while familiarity and sampling procedure were manipulated, aphasic subjects' conversations contained significantly lower proportions of statements [F (1, 22) = 92.33, $p < .01$] and requests [F (1, 22) = 14.88, $p < .01$] and significantly higher proportions of answers [F (1, 22) = 41.21, $p < .01$] and ambiguous communicative attempts [F (1, 22) = 12.74, $p < .01$], relative to normals.

Familiarity of conversational partner was found not to influence significantly subjects' use of the dependent measures [All F values (1, 22) < 6.75, $p > .01$].

In contrast, sampling procedure was found to affect performance, with subjects producing significantly greater proportions of statements under topic-constrained sampling conditions [F (1, 22) = 13.67, $p < .01$] and significantly greater proportions of requests [F (1, 22) = 10.26, $p < .01$] and answers [F (1, 22) = 19.19, $p < .01$] under topic-open sampling conditions.

However, for the communicative function category of statements, group membership significantly interacted with sampling procedure. That is, normal subjects produced more statements in the topic-constrained as compared to topic-open sampling condition [F (1, 22) = 11.00, $p < .01$],

Table 3. Mean Values and Standard Deviations for Group, Number, and Setting

N = 13 *N = 12*	*Aphasic* *Normal*	*Group*	NUMBER *Dyad*	*Triad*	SETTING *Home*	*Simulated*
		M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Statements	A	.2068(.1705)	.2085(.2104)	.2051(.1305)	.2103(.1943)	.2075(.2069)
	N	.6974(.1358)	.7087(.1320)	.6861(.1398)	.7107(.1351)	.6841(.1365)
Requests	A	.0227(.0298)	.0265(.1320)	.0188(.0266)	.0163(.0274)	.0290(.0321)
	N	.0655(.0516)	.0787(.0609)	.0524(.0422)	.0666(.0433)	.0645(.0598)
Answers	A	.1653(.1269)	.1589(.1341)	.1715(.1197)	.1754(.1382)	.1551(.1156)
	N	.0230(.0275)	.0212(.0220)	.0258(.0330)	.0226(.0234)	.0234(.0316)
ACA	A	.1342(.1071)	.1412(.1064)	.1271(.1079)	.1417(.1132)	.1265(.1012)
	N	.0852(.0619)	.0759(.0549)	.0930(.0572)	.0929(.0572)	.0774(.0656)

whereas the proportionate use of statements by aphasic subjects was not affected by differences in sampling contexts.

Group, Number, and Setting Effects

Under conditions in which the familiarity of conversational partner and sampling procedure were held constant while the number of conversational participants and physical environments were manipulated, the main effects for group were essentially replicated. That is, aphasic subjects produced significantly smaller proportions of statements [F (1, 23) = 94.83, $p < .01$] and requests [F (1, 23) = 24.28, $p < .01$] and significantly greater proportions of answers [F (1, 23) = 23.89, $p < .01$] relative to normals.

However, neither number of conversational participants nor physical settings significantly influenced subjects' use of the dependent measures [All F values (1, 23) < 5.01, $p > .01$].

In summary, our findings revealed that aphasic subjects used significantly lower proportions of statements and requests and greater proportions of answers during their conversations than did normals across all setting conditions. These behaviors were particularly sensitive to the manner in which conversational discourse was elicited (i.e., topic-open versus topic-constrained sampling procedures) but were not significantly influenced by the familiarity or number of conversational partners, or by the physical environments in which the conversations occurred.

DISCUSSION

One of the purposes of this investigation was to describe the proportionate distribution of communicative functions in the conversational discourse of people with aphasia and of normal adults. The results indicated that aphasic and normal subject groups differed significantly in their proportionate use of the communicative functions measured. Normal subjects' conversations primarily comprised utterances that asserted information that was neither obligated nor requested (i.e., statements). In contrast, aphasic subjects provided information in the form of answers to direct requests as frequently as they provided unsolicited information. Clearly, aphasic subjects were asked many more direct questions about themselves and the topics of conversation by their conversational partners than were normal subjects. This pattern of interaction may be accounted for by a number of factors, including (a) differences in conversational participants' perceived roles when conversing with aphasic subjects as compared to normal language users, (b) the reduced efficiency with which aphasic subjects were able to initiate substantive turns, (c) aphasic subjects' use of conversational regulators as an active strategy to shift the communicative burden to their conversational partner, or (d) interactions of all these factors, as well as other uncontrolled variables. However, what is evident is that the aphasic subjects studied in this investigation demonstrated the full range of communicative functions in their conversations, although they assumed a primarily passive communicative role relative to normals.

Another aspect of this study concerned the influence of extralinguistic contextual variables on the subjects' use of communicative functions. The results revealed that only the manner in which conversational discourse was elicited (i.e., topic-open versus topic-constrained sampling procedures) significantly influenced subject performance. These conditions actually differed on three relevant stimulus parameters (i.e., mode of presentation, degree of topic constraint, and degree of shared knowledge or reference). Specifically, the topic-constrained condition employed a *videotaped mode* of stimulus presentation in which *topic selection was constrained* and the extent of *shared topic reference was maximized* (i.e., subjects and partners viewed the videotape together). In contrast, the topic-open condition employed a *verbal instruction mode* of stimulus presentation in which *topic selection was unconstrained* and the degree of *shared topic knowledge varied* depending on the familiarity and conceptual knowledge of the participants. It is difficult to explain why the aphasic subjects' use of statements (unlike the normals') was not affected by differences in these eliciting conditions. It is possible that the provision of topic structure and the shared knowledge base operating in the topic-constrained condition

had a facilitative effect on the aphasic subjects' ability to assert information by minimizing the extent to which they were required to generate topics and by providing a mutually shared experience about which subjects could converse. This appears to be a plausible explanation for the significant differences observed in the normal subjects' use of statements across these conditions.

One possible explanation for the lack of observed differences in the aphasic group's use of statements across topic-open and -constrained sampling conditions may be related in part to the cognitive demands of the tasks. Topic-constrained conditions required subjects to retrieve auditory and visually presented information from short-term memory with essentially no opportunity for rehearsal. Although we attempted to control for task demands by selecting news segments that were rated low on complexity parameters and high on relevancy dimensions by age-matched volunteers, it may be that the memory demands of the task exceeded the potential facilitative properties of topic-structure and shared reference.

Both subject groups requested information and answered direct requests in greater proportions under topic-open conditions than in topic-constrained conditions, although careful examination of the group means for requests reveals that this communicative function category was used relatively infrequently by both aphasic and normal subjects. Given the limited frequency with which requests for information were observed regardless of subject group or elicitation condition, it is difficult to determine whether the differences observed under topic-open versus topic-constrained sampling conditions are clinically important. It may be that none of our sampling contexts provided sufficient obligatory contexts for requesting information.

Although the results of this investigation must be considered preliminary, there are several implications worth consideration with respect to the assessment and treatment of functional conversational skills in adults with aphasia. First, the lack of significant differences in subjects' performance across number and setting conditions suggests that all other factors being equal, one may observe a representative sample of conversational discourse in simulated natural environments that include one or two familiar conversational partners. Second, assessing requests for information under conversational discourse conditions may require specific instructions or the arrangement of obligatory contexts to provide sufficient opportunities to observe this particular communicative function. Third, although aphasic subjects' use of statements was not affected by the sampling procedures employed in this study, the facilitative effect observed in normal subjects under conditions in which topics were constrained and shared topic reference or knowledge was maximized should not be ignored. One may want to incorporate these contextual parameters into a sampling procedure that minimizes the cognitive demands placed

on the subject, thus providing a more facilitative context for assessing aphasic subjects' ability to assert new information.

With respect to treatment, applied generalization theory advises that one way to enhance transfer of treatment effects to more natural performance environments is to incorporate salient dimensions of the generalization context into the training context. Given the facilitative effect of topic structure and shared reference observed in our normal subjects' use of statements, it may be useful to incorporate such stimulus parameters in the context of a conversation-based therapy program whose terminal goal would be the functional assertion of information with familiar partners in nontherapeutic contexts.

In conclusion, much work needs to be done to determine which extralinguistic contextual variables do and do not affect the conversational discourse of aphasic individuals in important ways. The results of this investigation are a preliminary attempt to clarify the relationship between specific aspects of aphasic subjects' conversations and contextual variables that sample a range of natural contexts in which aphasic subjects need to communicate.

ACKNOWLEDGMENTS

This investigation was supported by the Department of Veterans Affairs Rehabilitation, Research, and Development Grant C330-3RA.

We gratefully acknowledge Tom Marshall, Linda McWilliams, Adele Pocavich, Brenda Peggs, and David DeAngelo for their assistance on various aspects of this project. Special thanks are extended to the Highland Drive VAMC volunteers who served as conversational participants in this study.

REFERENCES

Campbell, T. F., & Dollaghan, C. A. (1987). *Conventions for transcribing the spontaneous language samples of brain-injured children.* Unpublished manual. Language Analysis Laboratory, Department of Communication Disorders, Children's Hospital of Pittsburgh, Pittsburgh.

Kertesz, A. (1982). The Western Aphasia Battery. New York: Grune & Stratton.

Porch, B. E. (1971). The Porch Index of Communicative Ability, Vol. 1 (1st ed.). Palo Alto, CA: Consulting Psychologists Press.

Wilson, R. S., Rosenbaum, G., & Brown, G. (1979). The problem of premorbid intelligence in neuropsychological assessment. *Journal of Clinical Neuropsychology, 1,* 49–53.

APPENDIX A

Statements: utterances that were intelligible in context and communicated information relevant to the topic(s) of conversation that was not obligated or requested.

Requests: utterances that were intelligible in context and solicited information not previously provided and about the identity, location, or property of a person, object, or event.

Answers: utterances that were intelligible in context and provided information directly complementing a prior request.

Ambiguous Communicative Attempts: utterances containing intelligible words but whose meaning or intent was uninterpretable.