

Pragmatic and Syntactic Improvement in Fluent and Nonfluent Aphasia

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Some suggest that aphasic patients communicate better than they talk (Holland, 1977). However, traditional appraisal of oral expressive language in aphasia has focused on patients' performance given standardized aphasia tests which emphasize syntax and semantics and give little attention to pragmatics or detailed linguistic analysis. Recent evidence suggests that pragmatic behaviors in aphasic patients are less disrupted than performance on standardized tests implies, and that detailed linguistic analysis provides information not sampled by conventional scoring (Penn, 1983; Penn and Behrmann, 1986). But these efforts are few and there have been no serious attempts to document change in pragmatic and linguistic behaviors over time or to document relationships between the two.

The purpose of this paper is to describe changes in traditional test performance, pragmatic behaviors, and syntactic behaviors in two groups of aphasic patients, one fluent and one nonfluent, during the first year postonset; to compare performance between groups; and to examine the relationships among behaviors.

METHOD

Six aphasic patients, three fluent and three nonfluent, participated in the study (Table 1). Each patient suffered a single, left hemisphere thromboembolic infarct and all received 6 to 8 hours of treatment each week for 44 weeks between 1 and 12 months postonset. Fluency was determined by the methods employed in the Boston Diagnostic Aphasia Examination (Goodglass and Kaplan, 1972) and the Western Aphasia Battery (Kertesz, 1982).

Table 1. Patient descriptive data.

Variable	Groups					
	Fluent Patients			Nonfluent Patients		
	1	2	3	1	2	3
Age (in years)	63	50	41	73	65	64
Education (in years)	8	12	12	16	8	6
PICA OA %ile at One Month Postonset	60th	49th	73rd	43rd	42nd	35th
PICA OA %ile at 12 Months Postonset	82nd	92nd	95th	60th	85th	63rd

Note. PICA OA = Porch Index of Communicative Ability Overall.

The patients were evaluated with the Porch Index of Communicative Ability (PICA; Porch, 1967), and a conversational sample at 1, 3, 6, 9, and 12 months postonset. The conversations were between each patient and a clinician. All evaluations were videotaped and analyzed later with a pragmatic protocol and linguistic analysis.

Prutting and Kirchner's (1983, 1987) pragmatic protocol was used to analyze each patient's conversations. The pragmatic protocol assesses the appropriateness of verbal, paralinguistic, and nonverbal communicative behaviors. Appropriate behaviors are neutral or facilitate the communicative interaction. Behaviors that detract from the interaction or penalize the individual are considered inappropriate.

The T-unit, developed by Hunt (1970), is a measure of syntactic complexity. It is defined as one main clause plus any subordinate clause or nonclausal structure attached to or embedded in the main clause. Two measures were used -- words per T-unit and clauses per T-unit. A T-unit analysis was done on all conversations and PICA Subtest I for all evaluations.

Reliability measures were obtained from 20% of the data. Interjudge reliability for the pragmatic ratings was 93% and intrajudge reliability was 96%. Interjudge reliability for the T-unit analysis was 91% and intrajudge reliability was 97%.

RESULTS

Both groups of patients made significant change in the PICA Overall percentile between the first and twelfth months postonset. Mean change in the fluent group was 28 percentile units, and mean change in the nonfluent group was 29 percentile units.

Pragmatic behaviors changed over time in both groups. Table 2 shows the percentage of inappropriate behaviors for the 17 verbal, 5 paralinguistic, 7 nonverbal, and 33 total pragmatic items. Inappropriate verbal behaviors reduced from 12% at 1 month postonset to 2% inappropriate at 12 months postonset in the fluent group and from 14% to 8% in the nonfluent group. Inappropriate paralinguistic behaviors were inconsistent for the fluent group, with no behaviors rated inappropriate at 1, 9, or 12 months postonset and a slight increase in behaviors rated inappropriate at 3 and 6 months postonset. In the nonfluent group the inappropriate paralinguistic behaviors generally decreased between 1 and 12 months postonset with the lowest ratings at 6 and 9 months postonset. The fluent and nonfluent groups had no inappropriate nonverbal behaviors at any time. Total inappropriate behaviors reduced from 7% at 1 month postonset to 1% at 12 months postonset in the fluent group, and from 14% to 8% in the nonfluent group.

The T-unit analysis showed differences between groups and differences between measures over time (Table 3). In PICA Subtest I responses, the fluent group produced more complex syntax, indicated by a greater number of clauses in each T-unit, than the nonfluent group at 1, 3, and 6 months postonset. Syntactic complexity was similar for both groups at 9 and 12 months postonset. Both groups showed a slight increase in syntactic complexity over time. The fluent group produced longer utterances than the nonfluent group at all time periods as measured by number of words in each T-unit. The number of words in each T-unit increased slightly for the fluent group, but the nonfluent group almost doubled the number of words in each T-unit. In the conversations, the fluent group produced more complex

Table 2. Percent of inappropriate pragmatic behaviors for the fluent (F) and nonfluent (NF) groups.

MONTHS POSTONSET	PERCENT OF INAPPROPRIATE BEHAVIORS							
	Verbal		Paralinguistic		Nonverbal		Total	
	F	NF	F	NF	F	NF	F	NF
1	12	14	0	33	0	0	7	14
3	6	10	7	27	0	0	5	10
6	6	8	7	13	0	0	5	7
9	2	2	0	13	0	0	1	5
12	2	8	0	20	0	0	1	8

syntax than the nonfluent group at all time periods. Both groups showed a slight increase in syntactic complexity over time. The fluent group produced longer utterances than the nonfluent group at 1, 3, 6, and 9 months postonset. By 12 months postonset, utterance length was similar for both groups. The number of words in each T-unit decreased slightly for the fluent group by 12 months postonset while the number of words in each T-unit almost doubled for the nonfluent group.

Table 3. Analysis of the number of clauses in each T-unit (CT) and the number of words in each T-unit (WT) for the fluent (F) and nonfluent (NF) groups.

MONTHS POSTONSET	PICA SUBTEST I					CONVERSATION				
	CT		WT		F	CT		WT		
	F	NF	F	NF		NF	F	NF		
1	1.34	1.17	7.13	3.56	1.28	1.00	6.77	3.66		
3	1.32	1.13	5.52	4.44	1.46	1.17	8.38	5.70		
6	1.42	1.31	7.58	5.78	1.31	1.16	7.68	6.13		
9	1.21	1.24	7.08	5.39	1.78	1.14	7.93	5.71		
12	1.56	1.53	7.89	6.25	1.54	1.16	6.38	6.49		

A comparison of performance from 1 to 12 months postonset shows differences among measures, differences between groups, and differences among and between measures and groups over time (Table 4). Both groups improved on most measures. However they improved differently on different measures at different points in time during the first year postonset. For example, on the PICA, the fluent group changed from the 61st to the 89th percentile over the 12 month period achieving 89% of their total improvement by 3 months postonset. Conversely, the nonfluent group obtained only 55% of

their total improvement by 3 months postonset. On the Pragmatic protocol, the fluent group achieved approximately 33% of their total reduction in inappropriate behaviors by 3 months postonset, while the nonfluent group achieved 66% of their total reduction in inappropriate pragmatic behaviors by 3 months postonset. In the T-unit analysis of conversations, clauses in each T-unit increased about 18% for both groups by 12 months postonset. Performance by the fluent group fluctuated over time. However, the nonfluent group achieved 100% of their increase in clauses in each T-unit by 3 months postonset.

Table 4. Comparison among measures for the fluent (F) and nonfluent (NF) groups.

MONTHS POSTONSET	PICA OVERALL PERCENTILE		% INAPPROPRIATE PRAGMATIC		CLAUSES PER T-UNIT CONVERSATION	
	F	NF	F	NF	F	NF
1	61	40	7	14	1.28	1.00
3	86	56	5	10	1.46	1.17
6	83	63	5	7	1.31	1.16
9	86	69	1	5	1.78	1.14
12	89	69	1	8	1.54	1.16

DISCUSSION

The purposes of this paper were to describe changes in traditional test performance, pragmatic behaviors, and linguistic behaviors in two aphasic groups, one fluent and one nonfluent, during the first year postonset, to compare performance between groups, and to examine the relationships among behaviors.

Our results suggest that both groups made marked improvement on most measures. The PICA Overall percentile increased, inappropriate pragmatic behaviors decreased, and syntactic complexity in PICA Subtest I and conversation increased.

The patients differed on when change occurred depending on the measure employed. For example, most of the fluent group's improvement on the PICA occurred by 3 months postonset, but change was distributed over time on the pragmatic protocol and the T-unit analysis. In the nonfluent group, improvement was distributed over time on both the PICA and the pragmatic protocol, but all of the increase in syntactic complexity in conversations occurred by 3 months postonset.

The purposes of appraisal of aphasic persons are to determine severity, to permit a diagnosis, to indicate a prognosis, to focus treatment if treatment is appropriate, and to measure change over time. Our results with a small number of fluent and nonfluent aphasic patients suggest that no single measure would have met all of these purposes for each patient at each evaluation during the first year postonset. If these results are replicated with larger samples, they would suggest that we need a battery of traditional, pragmatic, and syntactic measures for evaluating aphasic persons.

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DISCUSSION

- Q: Were these patients treated and, if so, how much treatment did they receive?
- A: They were treated from 6 to 8 hours a week for 44 weeks.
- Q: What was the initial severity level of the two groups?
- A: The fluent group was superior.
- Q: Is that a problem for you?
- A: Not really. If I looked at total improvement over time, I think it would be a critical factor. I was looking at rate of change and that differed between the two groups.
- Q: I think your fluent subjects went from the 61st percentile to the 91st. Do you think they're representative or do you think they're a little on the mild side? If so, is that a problem for you or at least something worth considering?
- A: I don't think anyone went up to the 91st percentile initially. They were pretty representative of fluent aphasic patients, but none were typed as Wernicke's aphasic patients.

- Q: There seemed to be at least a couple of behaviors where the fluent subjects' performance was best at 6 and 9 months and seemed to deteriorate at 12 months. Do you think there is anything significant about that?
- A: The words per T-unit tended to go down slightly over time and I think what was happening is that they were able to say more with less. The complexity increased slightly and I think they were able to embed more and to be more specific.
- Q: Then you would say that it actually reflects an improvement in their ability to communicate?
- A: That was the general trend.
- Q: If it's in fact an improvement in their ability to communicate, would you want to have assessment tools that show improvement, rather than scores that, at least on the slides you have, seem best at 6 and 9 months and then deteriorated at 12 months?
- A: I think with a sample of only 3 fluent patients and especially in conversation where you don't have a lot of control, you're going to see those types of fluctuations. I'm not sure without running more patients if I can answer you directly.
- Q: Did both the fluent and nonfluent subjects receive the same kind of treatment? Could you expand a little on the type of treatment?
- A: They all received a stimulus-response type of treatment.
- Q: Was there anything specific to pragmatics or syntax?
- A: No. It was tailored to the individual patient.
- Q: Do you think the changes you saw could be attributed to the treatment you gave?
- A: Yes, probably so.
- Q: As I remember the T-unit is used with narrative writing. Did you find it hard to use that unit with aphasic speech? You had high reliability.
- A: I made sure that clauses were very well defined and modified the scoring for conversations. You can have clausal units that can extend across one conversational turn. For example, the clinician might say "Are you coming to the party this weekend?" and the patient says "I'll come" and the clinician says "uhuh" followed by the patient saying "if my wife is not sick," so you have the continuation of a T-unit past one turn. So I made that type of modification to reflect the type of complexity that the patient was able to express. The reliability is good which is nice, because conversation is so difficult to analyze.