# Communicative Effectiveness in Treated Aphasic Adults During the First Post Onset Year

Jan A. Roberts and Robert T. Wertz

Language performance in aphasic individuals generally improves over time with treatment (Basso, Capitani, & Vignolo, 1979; Hagan, 1973; Hartman & Landau, 1987; Ludlow, 1977; Shewan & Kertesz, 1984; Vignolo, 1964; Wertz et al., 1981, 1986). While most improvement occurs within the first 3 months after a stroke (Ludlow, 1977; Wertz et al., 1981), improvement can continue over time (Aten, Caligiuri, & Holland, 1982; Sands, Sarno, & Shankweiler, 1969; Wertz et al., 1981).

Standardized tests dominate as outcome measures for evaluating treatment efficacy. The sole use of standardized tests has been questioned because of the dissociation between performance on tests and conversational interactions outside of the clinic (Beele, Davies, & Muller, 1984; Foldi, Cicone, & Gardner, 1983; Sarno, 1991; Taylor, 1965; Ulatowska, Haynes, Hildebrand, & Richardson, 1977). This dissociation may result from standardized tests' emphasis on lexical, syntactic, and semantic skills and their failure to measure overall communicative effectiveness (Aten et al., 1982; Drake, 1986; Sarno & Levita, 1971).

Investigations of communicative effectiveness in aphasic patients have focused on descriptions of chronic patients, and they indicate that aphasic people exhibit some communicative impairments (Bates, Hamby, & Zurif, 1983; Bond, Ulatowska, Macaluso-Haynes, & May, 1983; Busch & Brookshire, 1985; Early & Van Demark, 1985; Gurland, Chwat, & Wollner, 1984; Lemme, Hedberg, & Bottenberg, 1984; Newhoff & Apel, 1990; Penn, 1985; Prutting & Kirchner, 1987). However, one study assessed informal conversations of two aphasic patients during the acute phase of recovery and found that communicative effectiveness improved over time (Piehler & Holland, 1984).

Researchers and clinicians are beginning to expand assessment of aphasic language performance to include overall communicative effectiveness

in conversational contexts (Newhoff & Apel, 1990). However, little is known about changes in communicative effectiveness that may occur during treatment across acute and chronic stages of recovery. The purpose of this study was to examine whether communicative effectiveness changed over time in treated aphasic patients during the first year post onset.

# METHOD

This investigation was retrospective. The data came from videotaped conversational language samples of patients who participated in the first Veterans Administration Cooperative study on aphasia (Wertz et al., 1981). All subjects had sustained a single, left cerebral vascular accident and performed between the 15th and 75th overall percentiles on the Porch Index of Communicative Ability (Porch, 1967) at four weeks post onset.

Twenty subjects who were videotaped at 1, 3, 6, 9, and 12 months post onset were selected from the pool of 34 subjects who had completed 1 year of treatment. Descriptive data for these subjects are summarized in Table 1.

Communicative effectiveness was assessed with a pragmatic protocol (Prutting & Kirchner, 1983, 1987). It screened verbal, paralinguistic, and nonverbal aspects of language use and provided an overall description of communicative abilities.

The pragmatic protocol was completed after viewing an unstructured, spontaneous conversational interaction between the patient and the communication partner. Each of 29 pragmatic behaviors were scored as appropriate or inappropriate. Appropriate ratings were defined as behaviors that facilitated the communicative interaction or were neutral, and inappropriate ratings were behaviors that detracted from the communicative exchange and penalized the individual (Prutting & Kirchner, 1983, 1987).

## Procedures

Prior to the pragmatic ratings, 100 subject videotapes, 5 for each of the 20 subjects, were randomized and coded by number to control for any bias from knowing the time post onset. Performance on the pragmatic protocol was scored either during or after viewing the conversation on videotape. Viewing was repeated if necessary.

## Statistical analysis

The data were analyzed by analyses of variance at 1 and 3 months post onset. Analyses of covariance were conducted for the remaining time periods. Language scores at 1 month post onset served as the covariant.

TABLE 1. APHASIC SUBJECT DESCRIPTIVE DATA AT 1 MONTH POST ONSET FOR AGE, EDUCATION, AND LANGUAGE SEVERITY FOR EACH SUBJECT (PICA, PORCH, 1967)

| *Subject* | *Age (years)* | *Education (years)* | *PICA Overall (Percentile Score)* |
|---|---|---|---|
| 1 | 73 | 16 | 43 |
| 2 | 63 | 9 | 72 |
| 3 | 58 | 6 | 50 |
| 4 | 65 | 8 | 42 |
| 5 | 45 | 12 | 15 |
| 6 | 57 | 12.5 | 16 |
| 7 | 63 | 8 | 60 |
| 8 | 78 | 8 | 66 |
| 9 | 41 | 12 | 73 |
| 10 | 51 | 12 | 44 |
| 11 | 68 | 10 | 49 |
| 12 | 65 | 8 | 55 |
| 13 | 62 | 9 | 58 |
| 14 | 50 | 12 | 49 |
| 15 | 64 | 6 | 35 |
| 16 | 55 | 7 | 39 |
| 17 | 78 | 3 | 26 |
| 18 | 52 | 13 | 47 |
| 19 | 52 | 12 | 15 |
| 20 | 61 | 12 | 19 |

## Reliability

Ten percent of the conversational samples were re-scored to determine point-to-point pragmatic rating reliability. Interjudge reliability for the pragmatic ratings was 94%. Intrajudge reliability was 96%.

## RESULTS

Communicative effectiveness, measured by a pragmatic protocol (Prutting and Kirchner, 1983, 1987), improved over time. Mean appropriate pragmatic performance was 87.5% at 1 month, 91.2% at 3 months, 91.4% at 6 months, 92.3% at 9 months, and 92.9% at 12 months (Table 2). Most of the total improvement (the .01 alpha level) (68%) occurred by 3 months. This was significant. An additional 4% improvement occurred by 6 months, 16% by 9 months, and 12% by 12 months.

**TABLE 2. MEANS, STANDARD DEVIATIONS, AND RANGE FOR PRAGMATIC APPROPRIATENESS (PRUTTING AND KIRCHNER, 1983, 1987) OVER TIME FOR APHASIC SUBJECTS**

| *Source* | *Mean* | *Standard Deviation* | *Range* |
|---|---|---|---|
| 1 month | 87.45 | 5.93 | 79–97 |
| 3 months | 91.15 | 5.95 | 77–97 |
| 6 months | 91.35 | 5.16 | 79–97 |
| 9 months | 92.25 | 5.66 | 79–100 |
| 12 months | 92.90 | 5.59 | 83–100 |

**TABLE 3. TOTAL NUMBER OF APHASIC SUBJECT INAPPROPRIATE VERBAL, PARALINGUISTIC, AND NONVERBAL BEHAVIORS OVER TIME**

| | *Months Post onset* | | | | |
|---|---|---|---|---|---|
| | *1* | *3* | *6* | *9* | *12* |
| Verbal[a] | 53 | 32 | 30 | 32 | 28 |
| Paralinguistic[b] | 18 | 18 | 18 | 12 | 12 |
| Nonverbal[c] | 2 | 2 | 2 | 2 | 2 |
| Total[d] | 73 | 52 | 50 | 46 | 42 |

[a]Maximum inappropriate ratings = 340
[b]Maximum inappropriate ratings = 100
[c]Maximum inappropriate ratings = 140
[d]Maximum total inappropriate ratings = 580

Table 3 shows the number of inappropriate verbal, paralinguistic, and nonverbal behavior for all 20 subjects from 1 to 12 months. Verbal aspects of pragmatic performance improved between 1 and 3 months, and remained stable between 3 and 9 months. They improved between 9 and 12 months. Paralinguistic aspects of performance showed no improvement until 9 and 12 months post onset. Nonverbal aspects of performance remained stable over time from 1 to 12 months post onset.

Nine pragmatic behaviors were appropriate at all points in time. These included the ability of the aphasic patients to respond both as listeners and speakers; to provide feedback, such as "yeah" or head nods; and to take their speaking turn. There were no instances of distracting phonation or resonance problems. Facial expressions and body posturing were consistently appropriate.

Eight inappropriate pragmatic behaviors (Table 4) occurred in a large percentage of the aphasic patients. Improvement generally occurred in all

**TABLE 4. SPECIFIC VERBAL, PARALINGUISTIC, AND NONVERBAL BEHAVIORS THAT RECEIVED A HIGH PERCENTAGE OF INAPPROPRIATE PRAGMATIC RATINGS FOR APHASIC SUBJECTS ACROSS MONTHS POST ONSET**

| | *Months Post onset* | | | | |
|---|---|---|---|---|---|
| | *1* | *3* | *6* | *9* | *12* |
| VERBAL ASPECTS | | | | | |
| Topic Maintenance | 20% | | 5% | | 5% |
| Turntaking initiation | 25% | 15% | 25% | 5% | 20% |
| Turntaking contingency | 30% | 25% | 35% | 30% | 20% |
| Turntaking quantity | 25% | 10% | | 15% | |
| Specificity/accuracy | 90% | 80% | 70% | 75% | 50% |
| Cohesion | 30% | 20% | 10% | 15% | 30% |
| PARALINGUISTIC ASPECTS | | | | | |
| Intelligibility | 45% | 45% | 40% | 20% | 30% |
| Fluency | 30% | 35% | 30% | 30% | 20% |

of these behaviors over time, particularly in the ability to maintain a topic, to contribute information, and to be more accurate in overall lexical skills. Performance on cohesion or the overall connectedness of the conversation fluctuated over time.

Eleven inappropriate pragmatic behaviors (Table 5) were identified. They occurred infrequently from one month to 12 months post onset. A few individuals had difficulty introducing a topic or repairing communicative breakdowns. Other difficulties included speaking too softly or with reduced intonation, maintaining poor eye contact, using distracting hand and foot movements, and/or interrupting the speaker.

## DISCUSSION

Using a pragmatic protocol (Prutting & Kirchner, 1983, 1987), our results indicated that overall communicative effectiveness improved significantly within the first 3 months after a stroke. The majority of this improvement occurred in the verbal aspects of pragmatic skills. No measurable changes occurred in paralinguistic or nonverbal aspects during this same period.

Our data also indicated that improvement in communicative effectiveness continued after 3 months post onset. For example, on average, specificity and accuracy of lexical word choice improved 20% between 1 and 6 months post onset improved an additional 20% between 6 and 12 months post onset.

**TABLE 5. SPECIFIC VERBAL, PARALINGUISTIC, AND NONVERBAL BEHAVIORS THAT RECEIVED A LOW PERCENTAGE OF INAPPROPRIATE PRAGMATIC RATINGS FOR APHASIC SUBJECTS ACROSS MONTHS POST ONSET**

| | *Months Post onset* | | | | |
|---|---|---|---|---|---|
| | *1* | *3* | *6* | *9* | *12* |
| VERBAL ASPECTS | | | | | |
| Variety of speech acts | 10% | | | | |
| Topic selection | 5% | | | 5% | |
| Topic introduction | 5% | | | 5% | |
| Turntaking repair/revision | 5% | | | 5% | |
| Turntaking pause time | 5% | 5% | | | 5% |
| Turntaking interruption | 15% | | 5% | 5% | 5% |
| PARALINGUISTIC ASPECTS | | | | | |
| Vocal intensity | 5% | 5% | 10% | 5% | 5% |
| Prosody | 10% | 5% | 10% | 5% | 5% |
| NONVERBAL ASPECTS | | | | | |
| Foot/leg movements | | 5% | | 5% | 5% |
| Gestures | 5% | 5% | 5% | | 5% |
| Eye contact | 5% | | 5% | 5% | |

Specific patterns of communicative effectiveness were also evident. Some pragmatic behaviors were appropriate across time periods, and others were inappropriate in only a few patients. The remaining behaviors affected fourth or more of our patients. Some of these inappropriate behaviors resolved over time; e.g., topic maintenance and turntaking were almost normal by 1 year post onset. Impaired behaviors at 12 months post onset included specificity/accuracy, cohesion, intelligibility, turntaking initiation, and turntaking contingency.

Our retrospective binding indicated that aphasic patients display pragmatic communicative assets and liabilities throughout the first year post onset. These early pragmatic deficits require clinical attention. They can be documented with a pragmatic protocol (Prutting & Kirchner, 1983, 1987) and discussed with the patient, family, and rehabilitation team. Traditional aphasia assessment that evaluates only lexical, syntactic, and semantic skills in convergent tasks does not adequately describe how aphasia affects a patient's communicative abilities in conversational settings.

Our results on 20 aphasic subjects indicate that pragmatic communicative effectiveness does improve throughout the first year following a stroke. These pragmatic changes can be documented; and it may therefore be possible to determine whether they respond to specific treatments.

## REFERENCES


Aten, J. L., Caligiuri, M. P., & Holland, A. L. (1982). The efficacy of functional communication therapy for chronic aphasic patients. *Journal of Speech and Hearing Disorders, 47,* 93–96.

Basso, A., Capitani, E., & Vignolo, L. A. (1979). Influence of rehabilitation on language skills in aphasic patients. *Archives of Neurology, 36,* 190–196.

Bates, E., Hamby, S., & Zurif, E., (1983). The effects of focal brain damage on pragmatic expression. *Canadian Journal of Psychology, 37,* 59–84.

Beele, K. A., Davies, E., & Muller, D. J. (1984). Therapists' views on the clinical usefulness of four aphasia tests. *British Journal of Disorders of Communication, 19,* 169–178.

Bond, S. L., Ulatowska, H. K., Macaluso-Haynes, S., & May, E. B. (1983). Discourse production in aphasia: Relationship to severity of impairment. In R. H. Brookshire (Ed.), *Clinical Aphasiology Conference Proceedings* (Vol. 13, pp. 202–210). Minneapolis MN: BRK Publishers.

Busch, C. R. & Brookshire, R. H. (1985). Referential communication abilities of aphasic speakers. In R. H. Brookshire (Ed.), *Clinical Aphasiology Conference Proceedings* (Vol. 15, pp. 255–261). Minneapolis, MN: BRK Publishers.

Drake, K. L. (1986). *The assessment of pragmatics in aphasia.* Unpublished master's thesis, University of California, Santa Barbara.

Early, E. A. & Van Demark, A. A. (1985). Aphasic speakers use of definite and indefinite articles to mark given and new information in discourse. In R. H. Brookshire (Ed.), *Clinical Aphasiology Conference Proceedings* (Vol. 15, pp. 248–254). Minneapolis, MN: BRK Publishers.

Foldi, N. S., Cicone, M., & Gardner, H. (1983). Pragmatic aspects of communication in brain-damaged patients. In S. J. Segalowitz (Ed.), *Language functions and brain organization.* New York: Academic Press.

Gurland, G. B., Chwat, S. E., & Wollner, S. G. (May 1984). Establishing a communication profile in adult aphasia: Analysis of communicative acts and conversational sequences. Paper presented at Conference on Clinical Aphasiology, Seabrook Island, SC.

Hagan, C. (1973). Communication abilities in hemiplegia: Effects of speech therapy. *Archives of Physical Medicine and Rehabilitation, 54,* 454–465.

Hartman, J. & Landau, W. M. (1987). Comparison of formal language therapy with supportive counseling for aphasia due to acute vascular accident. *Archives of Neurology, 44,* 646–649.

Lemme, M. L., Hedberg, N. L., & Bottenberg, D. E. (1984). Cohesion in narratives of aphasic adults. In R. H. Brookshire (Ed.), *Clinical Aphasiology Conference Proceedings* (Vol. 14, pp. 215–222). Minneapolis, MN: BRK Publishers.

Ludlow, C. L. (1977). Recovery from aphasia: A foundation for treatment. In M. Sullivan and M. S. Kommers (Eds.), *Rationale for adult aphasia therapy.* University of Nebraska Medical Center.

Newhoff, M. & Apel, K. (1990). Impairments in pragmatics. In L. L. LaPointe (Ed.), *Aphasia and related neurogenic language disorders.* New York: Thieme Medical Publishers, Inc.

Penn, C. (1985). The profile of communicative appropriateness: A clinical tool for the assessment of pragmatics. *The South African Journal of Communicative Disorders, 32,* 18–23.

Piehler, M. F. & Holland, A. L. (1984). Cohesion in aphasic language. In R. H. Brookshire (Ed.), *Clinical Aphasiology Conference Proceedings* (Vol. 14, pp. 208–214). Minneapolis, MN: BRK Publishers.

Porch, B. E. (1967). *Porch Index of Communicative Ability.* Palo Alto, California: Consulting Psychologists Press.

Prutting, C. A. & Kirchner, D. M. (1983). Applied pragmatics. In T. M. Gallagher and C. A. Prutting (Eds.), *Pragmatic assessment and intervention issues in language.* San Diego, CA: College-Hill Press.

Prutting, C. A. & Kirchner, D. M. (1987). A clinical appraisal of the pragmatic aspects of language. *Journal of Speech and Hearing Disorders, 52,* 105–119.

Sands, E., Sarno, M. T., & Shankweiler, D. (1969). Long-term assessment of language function in aphasia due to stroke. *Archives of Physical Medicine and Rehabilitation, 50,* 203–207.

Sarno, M. T. (1991). Recovery and rehabilitation in aphasia. In M. T. Sarno (Ed.), *Acquired aphasia* (2nd ed.). New York: Academic Press.

Sarno, M. T. & Levita, E. (1971). Natural course of recovery in severe aphasia. *Archives of Physical Medicine and Rehabilitation, 52,* 175–179.

Shewan, C. M. & Kertesz, A. (1984). Effects of speech and language treatment on recovery from aphasia. *Brain and Language, 23,* 272–299.

Taylor, M. L. (1965). A measurement of functional communication in aphasia. *Archives of Physical Medicine and Rehabilitation, 46,* 101–107.

Ulatowska, H. K., Haynes, S. M., Hildebrand, B. H., & Richardson, S. M. (1977). The aphasic individual: A speaker and a listener, not a patient. In R. H. Brookshire (Ed.), *Clinical Aphasiology Conference Proceedings* (Vol. 7, pp. 198–213). Minneapolis MN: BRK Publishers.

Vignolo, L. A. (1964). Evolution of aphasia and language rehabilitation: A retrospective exploratory study. *Cortex, 1,* 344–367.

Wertz, R. T., Collins, M. J., Weiss, D., Kurtzke, J. F., Friden, T., Brookshire, R. H., Peirce, J., Holtzapple, P., Hubbard, D. J., Porch, B. E., West, J. A., Davis, L., Matovitch, V., Morley, G. K., & Resurreccion, E. (1981). Veterans Administration cooperative study on aphasia: A comparison of individual and group treatment. *Journal of Speech and Hearing Research, 24,* 580–594.

Wertz, R. T., LaPointe, L. L., Weiss, D. G., Holland, A. L., Brookshire, R. H., Aten, J. L., Kurtzke, J. F., Garcia-Bunuel, L., Milianti, F. J., Brannegan, R., Greenbaum, H., Marshall, R. C., Vogel, D., Carter, J. E., Barnes, N. S., & Goodman, R. (1986). Veterans Administration cooperative study on aphasia: Comparison of clinic, home, and deferred treatment. *Archives of Neurology, 43,* 653–658.