Measuring Communication Competence in Global Aphasia

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The widely held belief that therapy for global or severe aphasic patients is ineffective has had a pervasive influence (Benson, 1979). While most neurologists would agree that aphasia therapy is psychotherapeutic, even aphasia therapists have difficulty in proving any direct language bene- fit from therapy. It is no wonder, then, that:

> Medicare and other third party payers resist payment for
> services delivered to global aphasic patients because of
> their poor prognosis and apparent lack of progress in
> language recovery over treatment sessions. (Towey and
> Pettit, 1980, p. 139)

However, two related factors have occurred to change this view. First, there has been an increasing awareness of the need to consider language within a broader perspective of total communication. Holland (1977) writes:

> ...we need to develop a sensitivity to the adequacy of
> non-verbal as well as verbal aspects of an aphasic's
> communicative patterns in order to capitalize more
> fruitfully on total communicative strength. (p. 173)

The second factor has been the creation of new and innovative aphasia treatment programs for the severe or globally aphasic patient (Aten, Cali- giuri and Holland, 1980; Gardner et al., 1976). Helm and Benson (1978) have reported on Visual Action Therapy (VAT) which initially requires the patient to imitate actions and is based on strong nonverbal cues and res- ponses. Helm and Barresi (1980) reported on an approach they call Voluntary Control of Involuntary Utterances (VCIU) which utilizes the patient's own verbal output, however meager it may be. Recently, Towey and Pettit (1980) outlined and discussed a treatment program for the globally aphasic patient which is based on a communication competence approach emphasizing the development of nonverbal responses in interactive communication situations.

With the advent of new programs for the severely aphasic patient, there is an ever-increasing need to develop more objective methods or procedures to evaluate the progress made by subjects in these programs. Unfortunately, there is no single test, measure or instrument which is appropriate for this task. As Darley (1979) has stated:

> Except for the Functional Communication Profile, which
> "attempted to quantify the communication behaviors which
> a patient actually uses in the course of interaction with
> others," test makers have not dealt with the matter of how
> test scores relate to one's functional communication in
> real-life situations. (p. 192)

Problems in using the FCP (Sarno, 1969) are compounded by the fact that no normative data have been provided and it is left to the clinician to determine ratings. It is also apparent that many of the items and expectations on the FCP are inappropriate for the global aphasic patient.

Although the CADL (Holland, 1980) was designed to measure the functional adequacy of a patient's communication in situations encountered in daily life, some of the simulated real-life behaviors sampled, such as keeping appointments and shopping, are not situations which the severe global aphasic patient would encounter in daily life. Marshall et al. (1979) suggested that most treatment methods and assessment methods for aphasia, and particularly severe aphasia, are niether appropriate nor functional. They implied that further research should investigate different treatment goals and procedures, and different ways to measure change, rather than continuing to emphasize language recovery.

PURPOSE

The purpose of this study was to examine the efficacy of a method for measuring the communication competence of global aphasic patients. A Communication Competence Evaluation Instrument (CCEI) was developed which combined elements of Sarno's (1969) FCP, Malone's (1978) Components of Communication Competence Scale (CCCS) and Bales' (1970) Interaction Process Analysis system (IPA).

The CCEI consists of 20 (10 expressive and 10 receptive) communication competency behaviors. There are five verbal and five nonverbal behaviors under each of the expressive and receptive categories. Thus, there are five verbal and five nonverbal expressive and five verbal and five nonverbal receptive behaviors that are evaluated (Figure 1). We have attempted to match verbal and nonverbal behaviors under each expressive and receptive category. For example, under the expressive communication category a patient can express a yes-no response verbally or nonverbally. Under the receptive communication category, a patient's responses include those based on spoken directions (verbal) and gestured directions (nonverbal).

Five-minute videotaped samples of a subject are made before and after each subject begins the treatment program. Each of the 20 behaviors is rated on a six-point scale. The number "1" is used to indicate that the behavior being rated was not observed in the videotaped communication interactions. Numbers "2" through "6" represent ratings of poor, fair, average, good, and excellent respectively. Judgments are based on both the number of a patient's behaviors and the strength of those behaviors in a given category.

Another example of how the behaviors are matched can be explained by describing scale 1 and scale 6 labelled "Demonstrates affect." Under Expressive Verbal, we define this as "attention to and awareness of self and others in the environment." Examples include such behaviors as greetings, appropriate use of intelligible words, such as "hi," "get out," and "stop that" in response to the immediate situation. Under Expressive Nonverbal, the definition is the same, but demonstration of this awareness is through waving, touching, smiling, frowning, etc.

Two sets of questions were examined in this study. The first series of questions dealt with inter- and intrajudge reliability for the CCEI. The second set of questions was concerned with the ability of the CCEI to measure changes in communication competence of globally aphasic subjects.

EXPRESSIVE	N/R	POOR	FAIR	AVE.	GOOD	EXC.	COMMENTS
VERBAL							
1. Demonstrates affect							
2. Indicates yes or no							
3. Uses verbal listener responses							
4. Initiates communicative interaction, uses words							
5. Indicates acceptance/rejection							
NONVERBAL							
6. Demonstrates affect							
7. Indicates yes or no							
8. Uses nonverbal listener responses							
9. Initiates communicative interaction, uses gestures							
10. Indicates acceptance/rejection							
RECEPTIVE							
VERBAL							
11. Responds to speech							
12. Responds to own name							
13. Responds to suprasegmental cues							
14. Listens, attends to speech							
15. Follows simple verbal directions/referrals							
NONVERBAL							
16. Responds to gross environmental sounds							
17. Responds to changing situations							
18. Responds to paraverbal cues							
19. Watches, attends to gestures, objects							
20. Follows gestured directions, referrals							

Figure 1.   The CCEI: Communication Competence Instrument.

METHODS

Subjects in this study were three female patients at the Camden Community Hospital and Health Care Center, who were diagnosed by a Speech Pathologist as having global aphasia. All three patients had suffered from cerebrovascular accidents and, at the time of the pretreatment video-taping, were at least two months post-onset of the aphasia.

All patients were treated with a communication competence-based therapy program, as described by Towey and Pettit (1980). This included workshops run by the Speech Pathology staff for the nursing staff respon-sible for the daily care of the patients. Communication treatment was then a part of the staff's daily interactions with the patients. Each patient was videotaped for five minutes both before and after treatment. The pre-treatment recording was made at least two months post onset of the aphasia. The posttreatment recording was done after one to three months of treatment had been administered.

The three pretreatment and three posttreatment videotapes were presented in random order to ten speech pathologists experienced in the treatment of adults and/or adult aphasia. A training session using the CCEI and the videotape of a subject not included in the major study preceded the rating of the six videotaped segments. Definitions and

descriptions of the categories were presented and discussed and the judges compared and discussed their ratings with each other. After the training session, the six videotaped segments were presented in random order to the judges. The average rating of the ten judges was used in examining communication changes before and after treatment of these three patients. The judges' individual scores were compared and analyzed using an analysis of variance to examine interjudge reliability (Winer, 1971). Three of the ten judges were asked to rate one of the videotaped segments again three months later to assess intrajudge reliability.

RESULTS

The interjudge reliability coefficient for overall communication competence (all 20 scales) was significant (r = .77, p < .01). It was also important to examine the four major dimensions (Expressive-Verbal, Expressive-Nonverbal, Receptive-Verbal, and Receptive-Nonverbal) separately to see if certain dimensions resulted in greater interjudge reliability than others. The reliability coefficients obtained for the nonverbal dimensions, both Expressive (r = .75) and Receptive Nonverbal (r = .71) were also significant (p < .05). The reliability coefficients obtained for the verbal dimensions of communication competence (Expressive Verbal, r = .62, and Receptive Verbal, r = .49) were not significant at the .05 level, although both indicated a strong trend toward reliability (p < .10). The three judges who participated in rating a videotaped segment three months later obtained reliability coefficients of .82, .82, and .87, which were found to be significant byeond the .01 level. It would appear from these results that the CEEI is a useful and reliable instrument in assessing communication competence behaviors in the globally aphasic patient.

We would like to present data for three globally aphasic patients in order to examine the changes that took place between the first and second videotaped samples.

Patient F.B. Figure 2 displays F.B.'s pre- and posttreatment mean scores on the CCEI for all 20 dimensions. The least amount of change was shown by Patient F.B.'s scores on the CCEI from the pretreatment videotaping to the posttreatment videotaping. Figure 3 shows the mean scores for F.B. in the four dimensions of communication competence. Overall change was positive, with the greatest degree of change occurring in the Expressive Verbal and the Receptive Nonverbal dimensions. The minimal positive change in the Expressive Nonverbal dimension would not appear to be significant for this patient. Because of the reliability of these ratings, the positive overall change and the Receptive Nonverbal change are the most important.

It is important to note that this patient took part in the communication competence-based therapy program at a different time than the other two patients, and that the posttreatment recording was completed after only one month of treatment, as opposed to three months for the other two patients. This shortened treatment time may have in part accounted for the lesser degree of change in CCEI ratings.

Patient M.W. Figure 4 shows M.W.'s pre- and posttreatment mean scores on the CCEI for all 20 dimensions. Patient M.W. also showed an overall positive change in CCEI ratings. Figure 5 shows M.W.'s mean scores in the four dimensions of communication competence. The greatest degree of change was observed in the Receptive Nonverbal dimension, followed by the
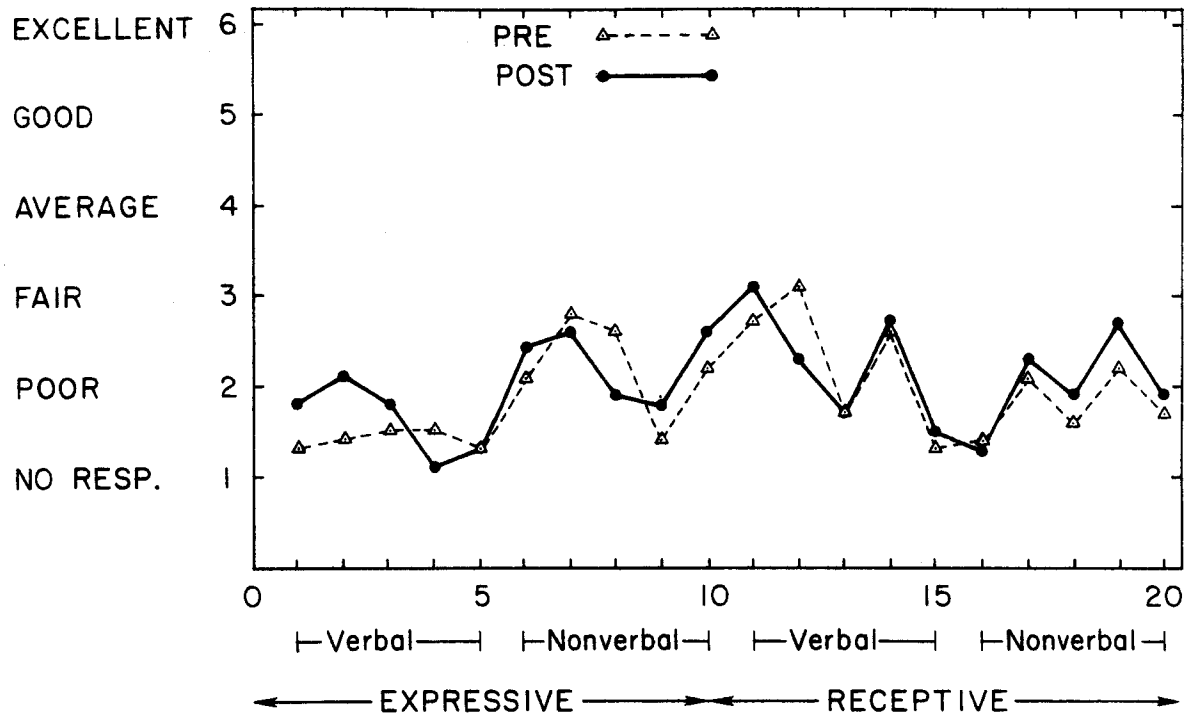
Figure 2. Pre- and post-therapy mean scores on the CCEI of F.B. for all 20 dimensions.
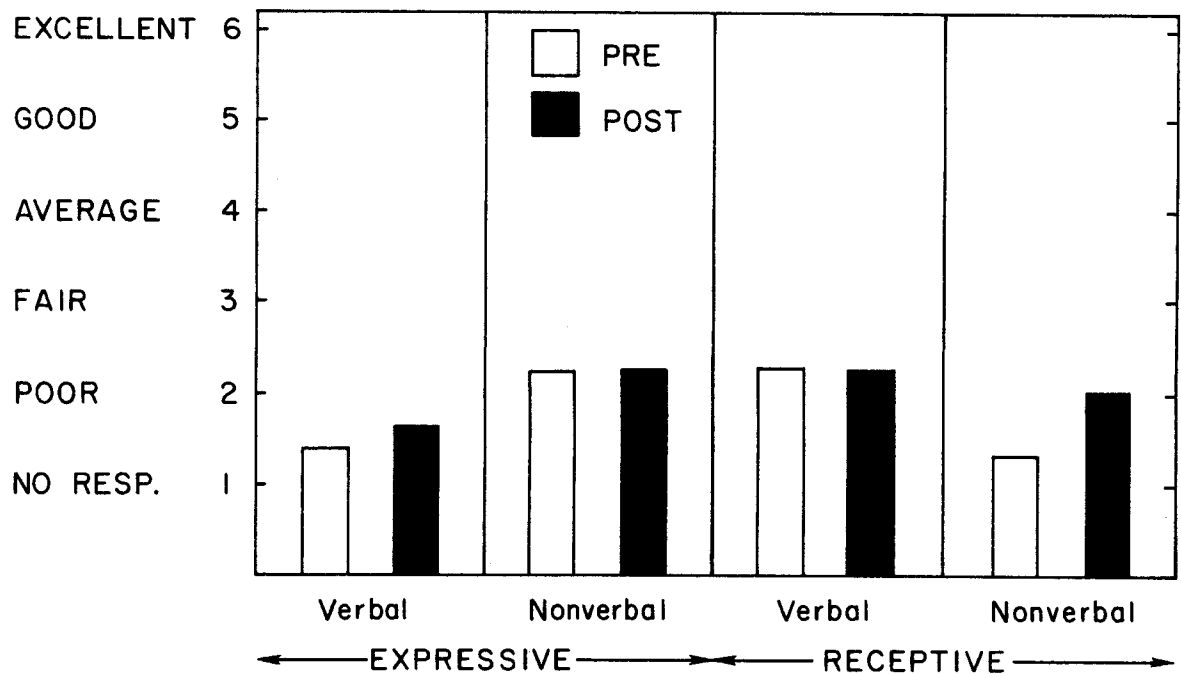

Figure 3. Pre-and post-treatment mean scores of F.B. on the CCEI for Expressive Verbal, Expressive Nonverbal, Receptive Verbal and Receptive Nonverbal dimensions.
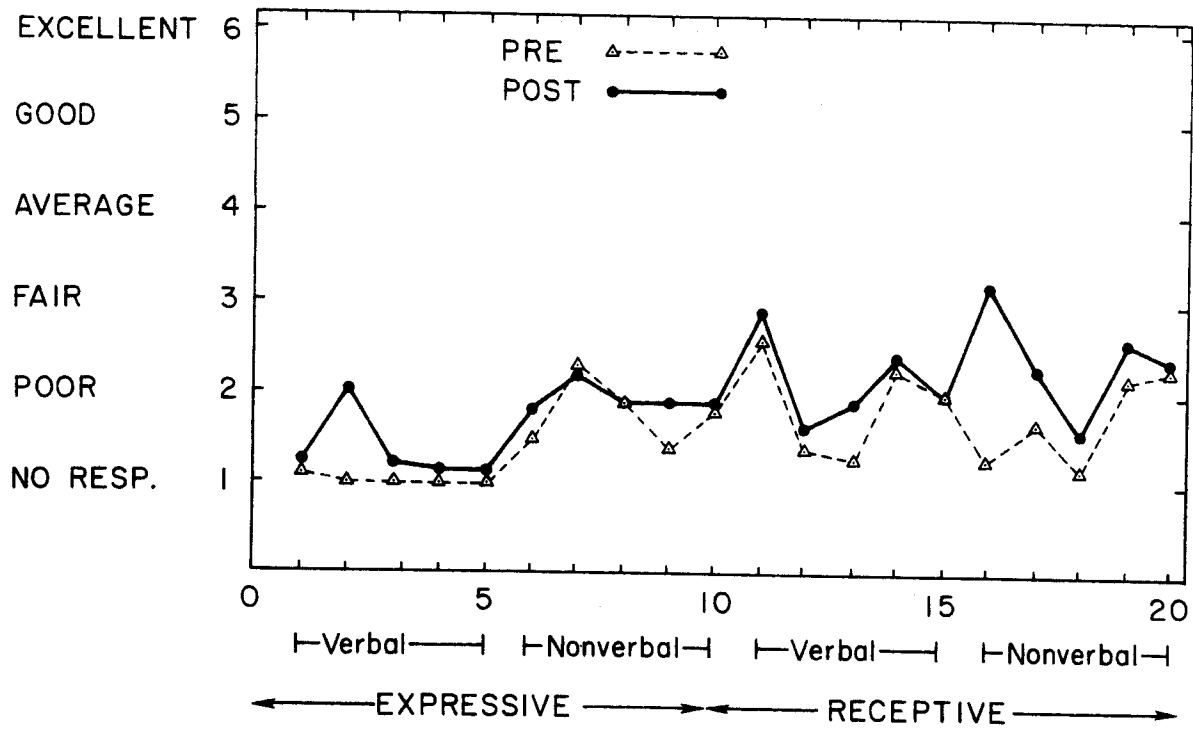
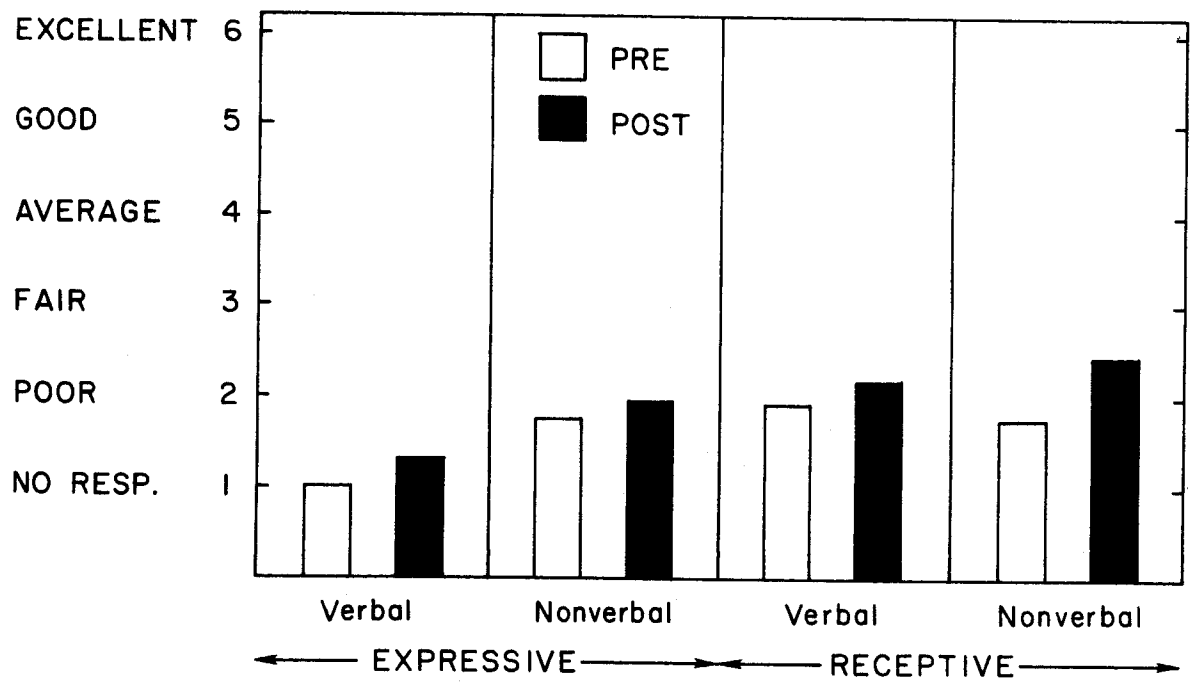Figure 4. Pre- and post-therapy mean scores on the CCEI of M.W. for all 20 dimensions.

Figure 5. Pre- and post-treatment mean scores of M.W. on the CCEI for Expressive Verbal, Expressive Nonverbal, Receptive Verbal and Receptive Nonverbal dimensions.

Expressive Verbal dimension, followed by the Receptive Verbal, and finally Expressive Nonverbal. Of all three patients, Patient M.W. received the lowest scores both pretreatment and posttreatment, except in her post-treatment score in the Receptive Nonverbal dimension, where she made her greatest positive gain. Because of their reliability, positive overall changes and positive changes in the Receptive Nonverbal and Expressive Nonverbal dimensions are most important.

Combining the results of this study for Patient F.B. and Patient M.W., it would be possible to project that a certain amount of positive change occurs in overall communication competence, as measured by the CCEI, following a program of communication competence-based therapy, and in particular in Receptive Nonverbal dimensions.

Subjective impressions of the Speech Pathologist, the staff conducting the treatment program, and the physicians responsible for referring patients for therapy indicate that there are positive changes in communication abilities following the initiation of a communication competence-based therapy program. In addition, the nursing staff reported that the patients were easier to care for, partly because they were more able to participate in and make decisions about their daily activities. However, no conclusive generalization can be drawn from this evidence, and further research is warranted to investigate these positive changes.

Patient J.H. Figure 6 shows the pre- and posttreatment mean scores for each dimension for J.H. The greatest degree of change in all dimensions was observed for the mean scores of Patient J.H. Unfortunately, these ratings also showed an across-the-board negative change from pretreatment to posttreatment videotapings. Figure 7 shows the pre- and posttreatment mean scores for J.H. in each of the four dimensions of communication competence. The greatest degree of change occurred in the Nonverbal dimension. Again, the Nonverbal dimensions are the most reliable.

A procedural problem in the videotaping may have in part accounted for the unexpected decrease in scores for this patient. During the pretreatment videotaping, the patient became upset over the Speech Pathologist's mis-placing of a photograph on the bureau at the far side of her bed. She pointed and vocalized and finally cried in an apaprent vain attempt to communicate the problem. Because he was unable to understand what she wanted, the Speech Pathologist wheeled her to the other side of the bed where she was able to point and reach and finally get the picture moved. Thus the stimuli used for this taped segment were different and conditions were not kept constant.

DISCUSSION

The reliability of a rating instrument is of primary importance in assessing the value of an instrument. The reliability which has been sug-gested for the nonverbal dimensions of the CCEI and for the overall instru-ment suggest that further refinements of the instrument may be appropriate. The validity of the concepts underlying this rating instrument can be examined by looking at the results in several ways. The results of the CCEI ratings for three patients with global aphasia suggest that expressive verbal communication abilities are the most impaired in global aphasia. Each patient in each treatment condition showed the greatest deficits in verbal expressive behaviors. This finding is expected, given the previous research concerning the parameters of global aphasia. The literature would
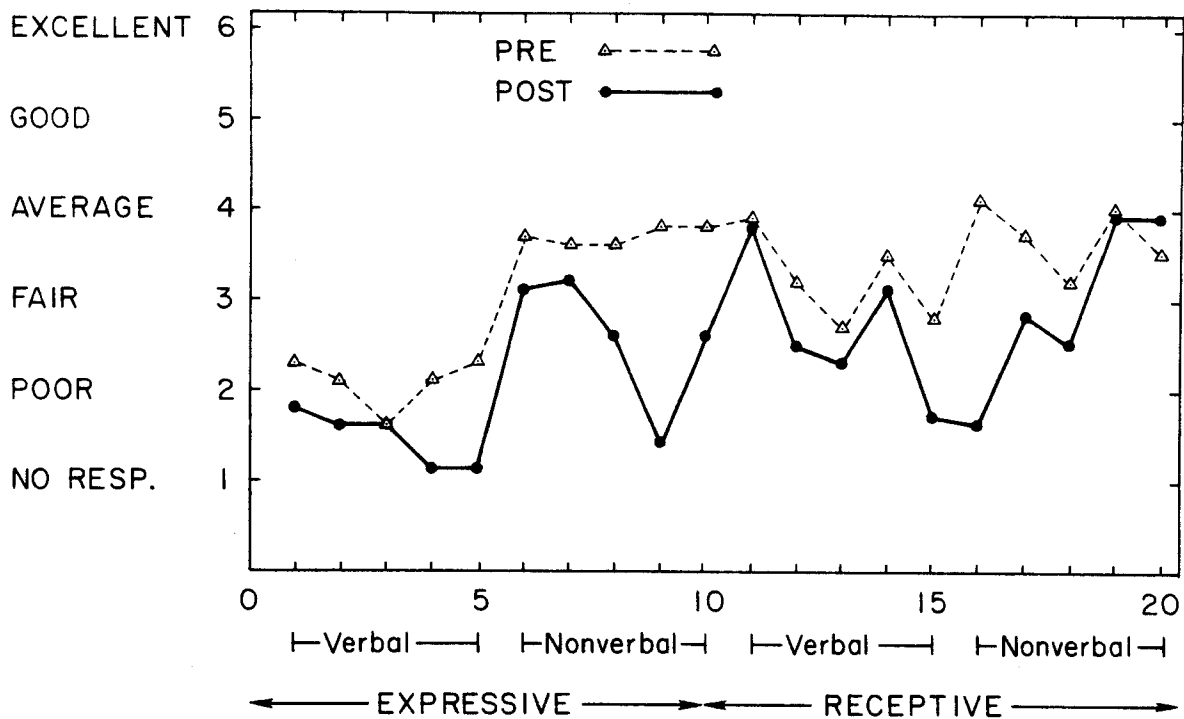
Figure 6. Pre- and post-therapy mean scores on the CCEI of J.H. for all 20 dimensions.
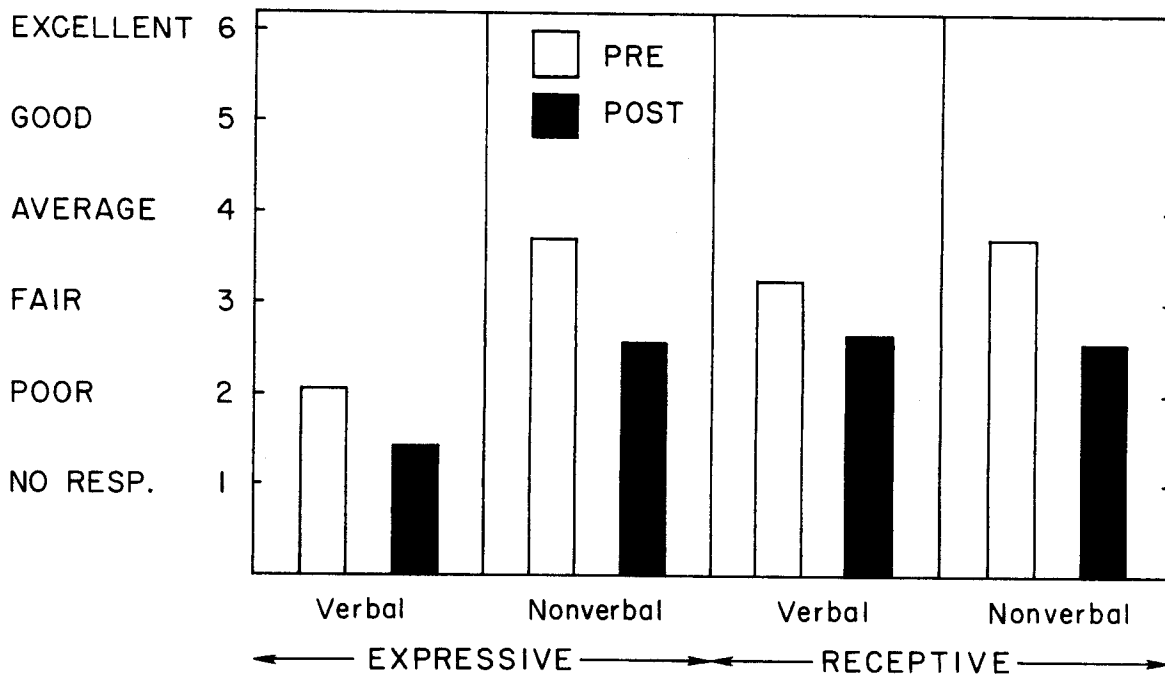

Figure 7. Pre- and post-treatment mean scores for J.H. on the CCEI for Expressive Verbal, Expressive Nonverbal, Receptive Verbal, and Receptive Nonverbal dimensions.

also suggest that global aphasic patients are severely impaired in all modalities, which is supported here.

Overall, the weighting of the judges' scores, for all patients, to the low end of the scales would support the contention that global aphasic patients have a severe impairment in communication competence. In all twenty categories on the CCEI, more than two-thirds of the combined scores for all three patients in both conditions fell at or below the "fair" rating. Despite this severe deficit, the behaviors rated by the CCEI indicate a residual level of communication abilities which is present in the patient with global aphasia. Some communication abilities are available to these patients, and some level of competence with communication can be objectively rated and assessed. Subjective evaluations of the physician and staff and the Speech Pathologist indicated a positive change in communication competence for these patients. This serves as evidence of the predictive validity of the ratings of communication competence.

To improve the reliability of the CCEI as used in this study, several methodological changes could be implemented. Some further refinements of the instructions to the judges, based on comments received from the judges, could be made. For example, distinctions between some of the categories could be made clearer (e.g., "Responds to speech" vs. "Attends to speech"). Some categories required highly interpretative ratings, which were difficult to make from the videotapes, since small facial changes were not visible (e.g., "Responds to suprasegmental or paraverbal cues"). More direct training should involve an opportunity for the judges to familiarize themselves with the instrument prior to judging sessions. The protocol for stimuli should be more consistent across patients and between treatment conditions.

In investigating the changes to be made in the CCEI, it would be advantageous to determine which of the scales might be retained by examining the reliability of each of the twenty categories. Some additional behaviors which were not specifically tapped by the CCEI, but which judges felt were important in assessing communication abilities, might be added to a revised CCEI (e.g., gestural skills, automatic receptive tasks).

CONCLUSION

Based on the results of this study, continued research in the area of communication competence as an approach to treatment would appear to be warranted. The results of this study would support the contention that it is possible for trained judges objectively and reliably to assess nonverbal receptive and expressive communication behaviors in patients with global aphasia. Continued research in this area, including further refinements of the CCEI and changes in some of the protocol and procedures used in this investigation, is warranted.

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DISCUSSION

Q: I'd like to know how you define global aphasia. I don't know what the
CCEI really does. Have you any other test data?

A: We used the Schuellian definition, total loss of functional language
abilities, and we used only patients who were at least two months post-
onset to be sure that the loss was "irreversible." One of the patients
had been tested with the PICA, with minimal results. The other patients
had been informally tested with subtests of the Boston, but neither
could complete the test. It became apparent within a few minutes that
they were not really testable. We gave them a zero score on the
severity rating scale.

Q: How does the CCEI relate to the treatment program? In other words, did you treat to the test?
A: No. There were only two items on the test which were included because they were important to the treatment program. They were in the receptive area. One was "responds to own name." Using the patient's name is important to the treatment procedure. The other one was "responds to changing situations," which we felt was important to the treatment program. We looked more at the area of communication competence itself, in order to see how it would apply to these patients.

Q: I wonder if we could go back to the reliability. My impression was that you used Pearson correlation coefficients, is that right?
A: For the intrajudge ratings, yes.

Q: What about interjudge reliability?
A: We used an analysis of variance. Winer has a procedure for looking at reliability through an analysis of variance procedure.

Comment: There's a problem with using any test of significance to measure reliability. An alpha level, $(p < .05)$ for example, says nothing about the reliability of the measures. It just says that there is a relationship, that the correlation is not zero. It doesn't say anything about the strength of the relationship. There are much more robust measures available.

Q: In looking at your data, when it's collapsed on the bar diagram, the differences between pre- and posttesting looked very small. It was hard to figure out what actually happened. Was there a bigger variety of responses in the posttreatment profile?
A: Yes, that did happen. That's why we were showing you the individual data across the twenty scales. You do see that there are some that are quite a bit different and there are some that are not.

Q: I don't feel comfortable, when we have data that appear to be ordinal at best, to apply parametric test procedures to them. I'd like for us to remember that, if we have nonparametric data, there are nonparametric tests that give us information about those data. I feel a little uncomfortable using notions like mean or analysis of variance when we have data that really don't meet the requirements for using those kinds of procedures.
A: I agree, and I think it's a continual problem using appropriate statistical measures when looking at small sample size data. However, we did have ten judges. That was another reason we wanted to have so many judges, so that we could have more judgments being made rather than only three of us making them.

Q: I like your basic concept of symmetry, and I was wondering if you might go back to the old standby of just looking at some of these behaviors in a little bit more structured situation where you might get more reliable results. I was also thinking of the idea of looking at verbal and nonverbal receptive and expressive abilities when the modalities are used in combination, as we most often deal with them. What if a patient says the first sound of something and then sort of provides the

shape of it, and the combination gets the idea across, where either one of those might have been inadequate?

A: That was one of the problems the judges had to deal with. I think one example is the area "indicates yes or no." One can say "yes" and also gesture, nod, and thus there are two kinds of stimuli for which the patient gets credit.

Q: I'm not sure that your use of the term competence does anything but add to the confusion over the use of this term. For example, you talk about receptive competence with your measures, and I'm not sure whether anybody can measure receptive competence at all, except by performance. In your case, it's looking at receptive competence through observational data, which seems problematic to me. I was wondering if you have thought about using another term, or if theoretically you believe you are dealing with receptive and expressive competence in this profile?

A: We considered inferential versus behavioral kinds of judgments. In order to assess competence behaviorally, we had to refine the category titles to make them behavioral. The question of competence versus performance has been around for quite awile, and I think this may confuse the concept of competence in a language sense. I don't feel these arguments are appropriate to the way we've used the terms here.

Q: Does the fact that the patients were only two months post onset concern you at all, given the inferences about the efficacy of your procedure, in concluding that improvement was based on treatment?

A: No. The patients varied from two months to more than twenty months postonset. Based on the extent of the deficit and the literature on spontaneous recovery, this was not a concern.

Q: Can you give us a feel for what the changes in communication abilities were, more specifically?

A: Clinically, I think the changes were exactly what we reported when we presented the treatment approach in 1980. We got a lot of feedback from other people, from nurses, physicians, relatives, etc., that communication was better. The globally aphasic patient and others were able to sit down and communicate with each other more effectively. The problem, as we saw it, was in finding out what those apsects of improved communication were. What's happened is that we have received a great deal of feedback supporting the changes in communication competence observed on the CCEI. For example, the improvement for "watches and attends to gestures and objects")(Scale 19) for F.B. and M.W. are clinically supported too. After treatment, both patients demonstrated an improvement in this aspect of communication. What we've found is that there is good solid clinical evidence for the communication changes in real-life situations that occur for several of the dimensions noted on the CCEI.