

Efficacy of Aphasia Rehabilitation:  
Preliminary Results

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This report is not intended to be a definitive statement as to the efficacy of aphasia rehabilitation. It is the report of one clinic's experience and we do not extend our results to the general population of aphasic patients.

No massive review of literature is included, as many of the relevant articles are reprinted in Sarno's book of readings (Sarno, 1972) and Darley (1972, 1975, and 1977) has rather extensively reviewed the literature and enumerated many of the problems and variables to consider in treatment studies. We do want to mention some of the Italian work (Basso, Faglioni, and Vignolo, 1975; Vignolo, 1964) as well as the report by Kertesz and McCabe (1977) and the preliminary results of the Veterans Administration cooperative study (Wertz, et al., 1978). The Italian reports are often cited as positive evidence for treatment and Kertesz and McCabe are often cited, at least by our neurologists, as negative evidence for treatment.

The Italian studies indicate quite clearly that treatment is effective if it is initiated early and continues for some time. Vignolo stated that "Re-education has a significant effect provided it lasts more than six months (p. 30). Basso, Faglioni, and Vignolo reached essentially the same conclusion and both studies stressed the importance of time postonset in prognosis. The VA cooperative study supports these findings, and it is of interest to note that a treatment effect seemed to be apparent for those patients whose treatment continued after 6 months postonset.

Kertesz and McCabe rebutt the Italian data by pointing out that the untreated group of patients was not treated for socioeconomic reasons and therefore it is a biased group which may negate the positive results for the treated group. They proceed to their conclusion that "although some cases recovered exceptionally well while under therapy, there was no significant difference between treated and untreated groups, where such a comparison was possible (p. 17)." They reached that conclusion even though they clearly stated that they were studying recovery and not treatment and the number of treated patients was exceptionally small compared to the untreated patients. We seem to be in the same situation we have always been in -- some say treatment is effective and some say it isn't.

This paper was prompted by pressure to look at our own section and attempt to answer the question "Do patients who are treated improve more than patients who are not treated?" We were aware that patients change if we don't treat them (see Culton, 1969, for example), so we decided to look at the clinical data available to us to determine whether we could answer the question in terms of patients who had been followed by the Speech Pathology Section at VA Hospital, Martinez. We were interested in the following questions:

1. Do treated patients improve more than untreated patients?
2. Does time postonset affect results?
3. Does age seem to be a factor?

## Description of Study

### Patients

The data reported were compiled from the files of the Speech Pathology Section, Veterans Administration Hospital, Martinez, California. The period covered was from 1971 to March, 1978. All the data are from veterans who met the following criteria:

1. Each patient had suffered a left hemisphere cerebrovascular accident (CVA).
2. Each patient had suffered only one CVA.
3. Patients had been followed by the Speech Pathology Section for testing.
4. Patients in the treatment groups (Groups 1-4) received at least 24 therapy visits over at least a two month interval. (approximately three visits per week)

All of the patients were males and none of the patients were in occupations such as medicine, law, banking, etc. We found it unrewarding to study occupations or education, as some patients were unable to specify occupation or education, and not all patients had family to supply missing data. It was difficult to categorize and compare occupational data because we could not equate positions such as "laborer in Navy Yard" and "warehouseman". We have not considered occupation or education in our data analysis.

A total of 21 of the 55 patients were seen and followed prior to 1975. The remainder of the patients (34) were followed between January, 1975, and March, 1978. The patients were divided into five groups on the basis of when they were initially evaluated and treated -- or not treated. Patients were not randomly assigned to groups, as the groups were formed from the characteristics of the patients.

The 17 patients in Group 1 were evaluated and treatment was initiated during the first month postonset. Tables 1 and 6 provide descriptive data for these patients. Note in table 1 that patients 7 and 13 were seen prior to 1975 and the total number of treatments was not completely tabulated. We were unable to determine the final totals for these two patients. We do know that they each received in excess of 40 treatment visits.

TABLE 1  
Age, PICA Scores, Change Score, and Number of Visits for Each Patient in Group 1.

| Pt. No. | Age | Init. PICA |      | Final PICA   |      | Change |      | Visits |
|---------|-----|------------|------|--------------|------|--------|------|--------|
|         |     | OA         | %ile | OA           | %ile | OA     | %ile |        |
| 1       | 58  | 5.81       | 10   | 11.45        | 60   | 5.64   | 50   | 143    |
| 2       | 54  | 9.43       | 39   | 12.68        | 77   | 3.25   | 38   | 254    |
| 3*      | 54  | 10.03      | 44   | 12.93        | 80   | 2.90   | 36   | 70     |
| 4       | 53  | 4.00       | 4    | 11.16        | 56   | 7.16   | 52   | 110    |
| 5       | 64  | 12.45      | 74   | 13.89        | 91   | 1.42   | 17   | 41     |
| 6       | 50  | 9.17       | 37   | 12.75        | 77   | 3.58   | 40   | 75     |
| 7*      | 55  | 11.18      | 56   | 13.88(7 mos) | 91   | 2.70   | 35   | **     |
| 8       | 36  | 5.03       | 6    | 8.69(6 mos)  | 33   | 3.66   | 27   | 30     |
| 9       | 53  | 10.01      | 44   | 12.89(3 mos) | 79   | 2.88   | 35   | 27     |
| 10*     | 54  | 9.69       | 41   | 13.66        | 89   | 3.97   | 48   | 131    |
| 11*     | 65  | 10.04      | 44   | 12.69        | 77   | 2.65   | 33   | 40     |
| 12      | 55  | 9.23       | 38   | 9.74         | 42   | 0.51   | 4    | 73     |
| 13*     | 61  | 11.17      | 56   | 12.63(3 mos) | 76   | 1.46   | 20   | **     |
| 14      | 51  | 11.76      | 65   | 13.80        | 90   | 2.04   | 25   | 82     |
| 15      | 52  | 6.20       | 13   | 12.74(6 mos) | 77   | 6.54   | 64   | 90     |
| 16      | 58  | 10.62      | 50   | 13.90(9 mos) | 91   | 3.29   | 41   | 146    |
| 17*     | 60  | 9.48       | 40   | 13.32        | 85   | 3.84   | 45   | 204    |

\*These patients were seen prior to 1975.

\*\* Total number of visits was not available

The nine patients in Group 2 were evaluated and treatment was begun during the second month postonset. Tables 2 and 6 provide the descriptive data for these patients. These patients were initially hospitalized in facilities not having speech pathology services and the patients had no therapy prior to the initial PICA.

TABLE 2  
Age, PICA Scores, Change Score, and Number of Visits for Each Patient in Group 2.

| Pt No. | Age | Initial PICA |      | Final PICA  |      | Change |      | Visits |
|--------|-----|--------------|------|-------------|------|--------|------|--------|
|        |     | OA           | %ile | OA          | %ile | OA     | %ile |        |
| 1*     | 57  | 7.89         | 25   | 10.69       | 51   | 2.80   | 26   | 92     |
| 2*     | 48  | 7.57         | 15   | 9.23(5 mos) | 37   | 1.66   | 22   | 113    |
| 3      | 69  | 10.36        | 47   | 14.23       | 95   | 3.87   | 48   | 45     |
| 4*     | 75  | 8.32         | 30   | 10.87       | 51   | 2.55   | 21   | 143    |
| 5*     | 46  | 8.86         | 34   | 13.01       | 81   | 4.15   | 47   | 90     |
| 6      | 49  | 8.26         | 29   | 11.97       | 67   | 3.71   | 38   | 79     |
| 7      | 62  | 9.92         | 43   | 12.63       | 76   | 2.71   | 33   | 95     |
| 8      | 62  | 8.28         | 29   | 9.78(6 mos) | 42   | 1.50   | 13   | 106    |
| 9*     | 43  | 8.43         | 36   | 11.45       | 60   | 3.20   | 24   | 89     |

\*These patients were seen prior to 1975.

The nine patients in Group 3 were first evaluated and treatment was initiated during the third month postonset. The patients had no treatment prior to coming to the VA. They were either transferred to the VA as inpatients or had been discharged home and subsequently were seen as inpatients or had been discharged home and subsequently were seen as outpatients of the VA Hospital. None of the patients received speech pathology services during the interim. Descriptive data for these patients are located in Tables 3 and 6.

TABLE 3  
Age, PICA Scores, Change Score, and Number of Visits for Each Patient in Group 3.

| Pt No. | Age | Initial PICA |      | Final PICA   |      | Change |      | Visits |
|--------|-----|--------------|------|--------------|------|--------|------|--------|
|        |     | OA           | %ile | OA           | %ile | OA     | %ile |        |
| 1      | 42  | 12.37        | 73   | 13.28(6 mos) | 84   | 0.91   | 11   | 84     |
| 2*     | 57  | 6.10         | 12   | 9.47         | 40   | 3.37   | 28   | 88     |
| 3      | 66  | 7.00         | 18   | 10.39        | 48   | 3.39   | 30   | 146    |
| 4*     | 59  | 8.12         | 28   | 10.84        | 52   | 2.72   | 24   | 27     |
| 5      | 47  | 9.84         | 43   | 14.07        | 93   | 4.23   | 50   | 78     |
| 6      | 48  | 9.53         | 40   | 11.31(6 mos) | 58   | 1.79   | 18   | 73     |
| 7      | 48  | 8.60         | 32   | 11.78(9 mos) | 65   | 3.18   | 33   | 90     |
| 8      | 55  | 8.37         | 30   | 11.79        | 65   | 3.42   | 35   | 85     |
| 9*     | 67  | 6.01         | 11   | 8.45         | 31   | 2.44   | 20   | 103    |

\*These patients were seen prior to 1975.

The ten patients in Group 4 were first evaluated and treatment was initiated during the fourth, fifth, sixth, or seventh months postonset. These patients had histories similar to Group 3 patients. They were initially hospitalized in non-VA facilities and received no speech pathology services, according to their histories, prior to coming to the VA. Tables 4 and 6 provide the descriptive data for these patients.

| Pt No.           | Age | Initial PICA |      | Final PICA   |      | Change |      | Visits |
|------------------|-----|--------------|------|--------------|------|--------|------|--------|
|                  |     | OA           | %ile | OA           | %ile | OA     | %ile |        |
| 1 <sup>1,2</sup> | 49  | 11.37        | 59   | 13.66        | 89   | 2.99   | 30   | 139    |
| 2 <sup>3</sup>   | 51  | 9.75         | 42   | 10.45        | 48   | 0.70   | 6    | 187    |
| 3 <sup>3</sup>   | 65  | 10.47        | 48   | 11.17        | 56   | 0.70   | 8    | 87     |
| 4 <sup>1,3</sup> | 57  | 6.72         | 16   | 8.17(7 mos)  | 28   | 1.45   | 12   | 118    |
| 5 <sup>1,4</sup> | 52  | 11.39        | 59   | 12.22        | 71   | 0.83   | 12   | 153    |
| 6 <sup>4</sup>   | 64  | 7.66         | 23   | 10.39        | 48   | 2.73   | 25   | 31     |
| 7 <sup>5</sup>   | 74  | 10.53        | 49   | 11.14        | 55   | 0.61   | 6    | 27     |
| 8 <sup>1,5</sup> | 58  | 13.32        | 85   | 14.42        | 97   | 1.10   | 12   | 30     |
| 9 <sup>2</sup>   | 56  | 7.25         | 20   | 10.11(6 mos) | 45   | 2.86   | 25   | 85     |
| 10 <sup>5</sup>  | 62  | 11.13        | 55   | 13.71        | 89   | 2.58   | 34   | 81     |

<sup>1</sup>These patients were seen prior to 1975.

<sup>2</sup>These patients were seen at four months post onset.

<sup>3</sup>These patients were seen at five months post onset.

<sup>4</sup>These patients were seen at six months post onset.

<sup>5</sup>These patients were seen at seven months post onset.

The ten patients in Group 5 served as our "control" group. These patients were initially evaluated during the first month of onset but were not treated. The typical Group 5 patient was evaluated, but then discharged to a facility or an area where no speech pathology services were available. We were able to re-evaluate these patients at intervals but were not able to offer them services and they did not receive speech therapy from any other source. These patients, to the degree we could determine, were no different from the treated patients. The only reason they did not receive therapy was because it was not available to them. Tables 5 and 6 provide the descriptive data for these patients.

TABLE 5  
Age, PICA Scores, and Change Score for Each Patient in Group 5.

| Pt No. | Age | Initial PICA |      | Final PICA |      | Change |      |
|--------|-----|--------------|------|------------|------|--------|------|
|        |     | OA           | %ile | OA         | %ile | OA     | %ile |
| 1      | 63  | 10.71        | 51   | 11.72      | 64   | 1.01   | 13   |
| 2*     | 51  | 10.18        | 46   | 11.37      | 59   | 1.19   | 13   |
| 3      | 54  | 5.50         | 9    | 7.67       | 24   | 2.17   | 15   |
| 4*     | 78  | 11.18        | 10   | 12.27      | 24   | 1.09   | 14   |
| 5      | 50  | 10.53        | 49   | 11.14      | 55   | 0.61   | 6    |
| 6      | 58  | 5.66         | 10   | 7.75       | 24   | 2.09   | 14   |
| 7*     | 69  | 8.12         | 28   | 10.84      | 52   | 2.72   | 24   |
| 8      | 46  | 7.26         | 20   | 7.60       | 23   | 0.34   | 3    |
| 9      | 41  | 8.90         | 35   | 9.53       | 40   | 0.63   | 5    |
| 10     | 54  | 12.88        | 79   | 14.02      | 93   | 1.14   | 14   |

\*These patients were seen prior to 1975.

## Data Analysis

The initial PICA score and the final or 12-month-post-onset PICA score was collected for each patient. Not all patients in Groups 1-4 were followed to the twelfth month postonset, and those patients, 13 in all, are identified in the tables. Table 6 summarizes the data which were analyzed for each group.

Several analyses were utilized. First, between-group t tests were computed for the initial PICA mean differences among the five groups. Second, between-group t tests were computed for the mean differences among the final PICA means of each group. Third, t tests for the within-group mean differences were computed. Finally, the initial to final PICA change scores were determined and t tests were used to detect any differences among the five groups.

The specific questions we asked were

1. Are the initial PICA scores for each of the groups significantly different from each other?
2. Are the final PICA scores for each group significantly different from each other?
3. Are the within group differences significant?
4. Are the "change" scores significantly different among the five groups?
5. Do age and change correlate?

## Results

### Initial PICA Scores

Table 7 indicates the lack of significant differences among the five groups. As may be noted, none of the differences reached significance at the .05 level of confidence. The answer to the first question was negative--the initial PICA scores were not significantly different.

TABLE 7  
The Mean Differences Among the Initial PICA Means.\*

|         | Group 1 | Group 2 | Group 3 | Group 4 | Group 5 |
|---------|---------|---------|---------|---------|---------|
| Group 1 | ----    | .48     | .69     | -.83    | .04     |
| Group 2 |         | ----    | .21     | -1.31   | -.44    |
| Group 3 |         |         | ---     | -1.52   | -.65    |
| Group 4 |         |         |         | ----    | .87     |
| Group 5 |         |         |         |         | ----    |

\*None of the mean differences are significantly different from each other.

### Final PICA Scores

Table 8 provides the results of testing for differences among the final PICA scores. As may be noted, only the difference between Group 1 and Group 5 reaches significance at the .05 level of confidence. With respect to the question of whether the groups had significantly different final PICA scores, the answer was affirmative for Groups 1 and 5. No other significant differences were noted.

TABLE 6  
Descriptive Statistics for Groups 1 - 5.

|                     | Group 1<br>N = 17 | Group 2<br>N = 9 | Group 3<br>N = 9 | Group 4<br>N = 10 | Group 5<br>N = 10 |
|---------------------|-------------------|------------------|------------------|-------------------|-------------------|
| Mean Age            | 54.8              | 56.7             | 54.3             | 58.8              | 56.4              |
| Range               | 36 - 67           | 46 - 69          | 47 - 67          | 49 - 74           | 46 - 78           |
| S.D.                | 6.53              | 11.04            | 8.75             | 7.61              | 11.05             |
| Mean Visits         | 101*              | 94.7             | 86.0             | 93.8              | --                |
| Range               | 27 - 254          | 45 - 192         | 27 - 146         | 27 - 187          | --                |
| S.D.                | 65.21             | 26.40            | 30.88            | 55.36             | --                |
| Mean Initial PICA   | 9.13              | 8.65             | 8.44             | 9.96              | 9.09              |
| Range               | 4.00 - 12.47      | 7.57 - 10.36     | 6.10 - 12.37     | 6.72 - 13.32      | 5.50 - 12.88      |
| S.D.                | 2.43              | .92              | 2.01             | 2.12              | 2.44              |
| Mean Final PICA     | 12.36             | 11.54            | 11.27            | 11.54             | 10.39             |
| Range               | 8.69 - 13.90      | 9.23 - 14.23     | 8.45 - 14.07     | 8.17 - 14.42      | 7.60 - 14.02      |
| S.D.                | 1.48              | 1.60             | 1.75             | 1.95              | 2.19              |
| Mean Change Score   | 3.36              | 2.89             | 2.83             | 1.58              | 1.30              |
| Range               | .51 - 7.16        | 1.50 - 4.15      | .91 - 4.23       | .61 - 2.86        | .34 - 2.72        |
| S.D.                | 1.75              | .93              | .99              | .93               | .78               |
| No. Above 50th %ile |                   |                  |                  |                   |                   |
| Initial             | 4 (24%)           | 0 (0%)           | 1 (11%)          | 3 (30%)           | 3 (30%)           |
| Final               | 15 (88%)          | 7 (78%)          | 6 (67%)          | 6 (60%)           | 6 (60%)           |

\*N = 15.

TABLE 8

## Mean Differences Among the Final PICA Means

|         | Group 1 | Group 2 | Group 3 | Group 4 | Group 5 |
|---------|---------|---------|---------|---------|---------|
| Group 1 | ---     | .98     | 1.25    | .98     | 2.13*   |
| Group 2 |         | ---     | .27     | .00     | 1.15    |
| Group 3 |         |         | ---     | -.27    | .88     |
| Group 4 |         |         |         | ---     | 1.15    |
| Group 5 |         |         |         |         | ---     |

\*Significant at the .05 level of confidence.

Within Group PICA Scores

Table 9 provides the data for the within group comparisons. Note that all comparisons were significant. The final PICA scores were significantly higher than the initial PICA scores within each group.

TABLE 9

Means, Mean Differences, Standard Deviation of the Difference Score, and t-Ratio for the Within Group Comparisons

|         | Init. PICA Mean | Final PICA Mean | Difference | S.D. | t*   |
|---------|-----------------|-----------------|------------|------|------|
| Group 1 | 9.14            | 12.52           | 3.38       | 1.75 | 7.97 |
| Group 2 | 8.65            | 11.54           | 2.89       | .93  | 9.36 |
| Group 3 | 8.44            | 11.27           | 2.83       | .99  | 8.50 |
| Group 4 | 9.96            | 11.54           | 1.59       | .93  | 8.50 |
| Group 5 | 9.09            | 10.39           | 1.30       | .78  | 5.30 |

\*All t-ratios are significant beyond the .05 level of confidence.

Change Scores

The mean change scores for each group are reported in Table 10. As may be noted:

1. Group 1 had significantly larger change scores than either Group 4 or Group 5, but there were no significant differences when compared to Group 2 or Group 3.
2. Group 2 had significantly larger change scores than either Group 4 or Group 5, but there was no significant difference when compared to Group 3.
3. Group 3 had significantly larger change scores than either Group 4 or Group 5.
4. The change scores for Group 4 did not differ significantly from those of Group 5.

TABLE 10  
Mean Differences Among the Change Scores for the Five Groups

|         | Group 1 | Group 2 | Group 3 | Group 4 | Group 5 |
|---------|---------|---------|---------|---------|---------|
| Group 1 | ---     | .47     | .53     | 1.78*   | 2.06*   |
| Group 2 |         | ---     | .06     | 1.31*   | 1.59*   |
| Group 3 |         |         | ---     | 1.25*   | 1.53*   |
| Group 4 |         |         |         | ----    | .28     |
| Group 5 |         |         |         |         | ----    |

\*Differences significant at the .05 level of confidence.

### "Functional Communication"

Note in Table 6 that a higher percentage of patients in Groups 1, 2, and 3 achieved "functional communication" than in Groups 4 and 5. "Functional communication" was defined as a PICA overall score at the 50th percentile or higher. The differences in percentages are especially apparent for Groups 1 and 2.

### Age and "Change"

Correlation coefficients between age and change in overall PICA scores were computed for each group. None of the correlation coefficients were significant. As Groups 1, 2, and 3 were not significantly different from each other in terms of initial, final and change scores, we divided those 35 patients into a group under age 55 (N=17) and a group over age 55 (N=18). Using the same reasoning, we divided the 20 patients in groups 4 and 5 into a group under 55 (N=9) and a group over 55 (N=11). The difference between means was not significant for either comparison.

Further, Figure 1 illustrates a breakdown of average change scores for patients in group 1 - 3 versus patients in groups 4 - 5 by age group. As may be seen in the figure, age did not seem to be a factor. Finally, this figure rather dramatically illustrates the differences between early treated patients and late and untreated patients. This difference is especially apparent for patients between the ages of 50 and 59, an age range encompassing almost half of the early treated patients and exactly half of the late and untreated patients.

### Discussion

We are well aware of the weaknesses and limitations of this report. The patients were not randomly assigned to treatment groups or to the untreated group. The groups were not large and it was possible to match patients only in terms of age and when treatment was or was not initiated. We could not control for length of treatment nor could we control for the total number of treatments. No site of lesion data are available. The sample does not represent the population of aphasic patients. Given these problems, and others which might be added, we nevertheless believe that we have at least begun to answer the questions posed earlier.

Do treated patients improve more than untreated patients?  
Does time postonset affect results?



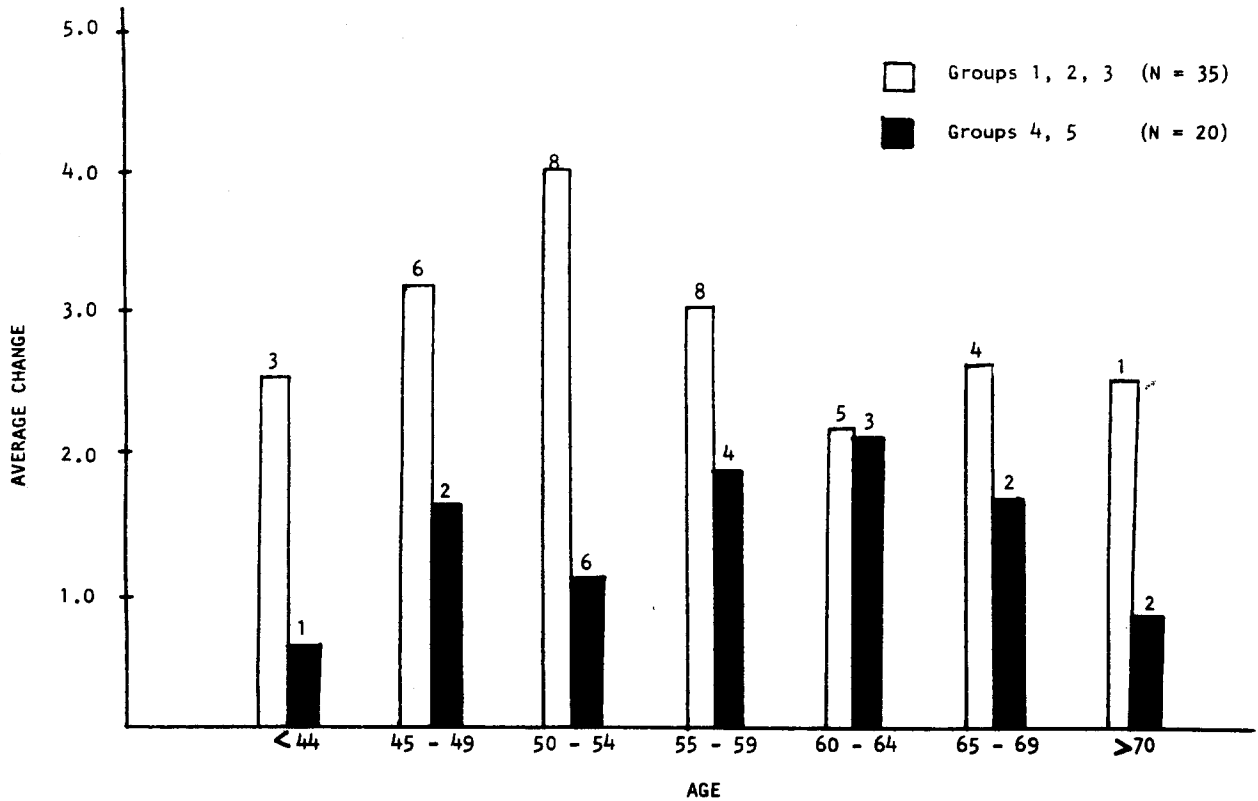


Figure 1. Average change in PICA overall scores comparing the early treatment patients (Groups 1, 2, 3) and the late and no treatment patients (Groups 4 and 5).

These questions, according to our data, cannot be separated. The patients who were treated early, during the first three months postonset, did change more than the untreated patients. These patients also changed more than the patients treated late, between the fourth to seventh months postonset. It is important to note that all patients demonstrate positive changes over time, even the untreated patients. Further, within each group, the final PICA overall scores were significantly higher than the initial PICA overall scores. It is in terms of the change scores, or the differences between initial and final PICA overall scores, that we begin to see what we consider to be treatment effects. If treatment had no effect, we would not expect to note change scores which were different. Since the early treated groups had higher change scores, we feel justified in concluding that treatment was a factor.

Time postonset does indeed seem to influence the results of treatment. The late treatment group was not significantly different from the untreated group. One way of interpreting this finding is to conclude that treatment is not effective for this group. Although that is the conclusion which may be correct, it is also possible that if we had interim measures on the untreated group (so that we could make a direct comparison to the late treated group) we might have seen that treatment was indeed effective, especially if treatment had been continued for a longer period - a conclusion the VA study seems to support.

Our data are similar to the data of the Italians in that we also seem to be showing that treatment is effective if patients are treated early and for some time. Our results are in direct disagreement with the conclusions of Kertesz and McCabe.

We made the assumption that an overall score above the 50th percentile represented functional communication, because it is a relatively standard clinical assumption. The 50th percentile, then, provided us with a means to assess the meaningfulness of the changes made by the patients. As was shown earlier, the early treated groups contained a higher percentage of patients achieving functional communication than the late treated or untreated group. We feel this gives added support to the contention that treatment is effective.

#### Does age seem to be a factor?

Our answer is negative. Age, at least for the patients we are reporting, was not a factor in improvement. There was no correlation between age and amount of change and dividing the patients into groups under 55 and over 55 produced no significant differences between the two. This held for the early treated groups and for the late and no treatment groups.

There may be other factors which might contribute to make age a factor, but, if so, those factors were not apparent to us. It might be expected that younger patients, those with families, and pressing financial concerns, etc., would make more progress than older patients who did not have the motivation to change. We could not really address these other factors which might involve the age of the patients.

Although it is tempting to generalize beyond our sample to the entire population of aphasic patients, we have already stated that our methodology does not allow us to do so. We can draw the following conclusions about patients at our clinic and can hope that our findings may be applicable to your patients as well. Based on our data we drew the following conclusions:

1. Treatment is effective if it is initiated early -- within the first three months.
2. Treatment after the third month postonset was not shown to be more effective than no treatment.
3. Patients treated early seem to have a better chance of attaining functional communication than patients treated after the third month or patients not treated at all.
4. Age alone, without considering any other variable, was not shown to be a factor in the recovery process.

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Leslie A. Deal is presently employed in private practice in San Mateo, California. During the period the data were being compiled, she was in the Speech Pathology Training Program of the Audiology and Speech Pathology Service, VA Hospital, Martinez, California.

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Q: How are you factoring out spontaneous recovery?

A: By comparing to the control group. When we compared our patients who were treated at one month to the patients who were seen at one month but not treated, there was a difference. There was a difference in final PICA scores and there was a difference in change scores. In the other groups, we noted that the patients who were treated at two months postonset and at three months postonset and the untreated patients did not have significantly different initial PICA scores, but the change scores for those two groups were significantly greater than the change scores for the untreated group. The patients who were treated early changed more than the patients who were not treated at all.

Q: The patients who were not treated, did they go home, did they go to nursing homes, where did they go?

A: They went to a number of places and that is obviously another problem. Some went home, some went to nursing homes, and there were those who had no family and yet went off and lived alone -- such as in a transient hotel. So, it's not the best kind of control group.

Q: This was essentially an administrative process with a specific objective and which obviously took you some time to complete. Did it help you convince the neurologists?

A: The answer is basically no...at least we still have one neurologist who still believes Kertesz and McCabe and he would rather believe them than us...but if you have read that article, you know that there are some real questions about the study.

Q: I'd just like to make a comment relative to the previous question. In three places where I have been a consultant the Kertesz and McCabe study has come up and we found in these three places that the neurologists were very surprised that we were not impressed with the study. We would start off "Well, as you know, there are serious difficulties with that study". At the end, not one of them has brought up that study again. I think that as a field we really are just not assertive enough in saying "you're full of it". I think that what I am saying is that it is not just a question of our going out and doing more studies, it is a question of they have to prove their point, not just that we have to prove ours.

Q: Could you give as a quick rundown on the weaknesses of the Kertesz and McCabe study?

A: Well, from my point of view, I can't interpret their data, because what they say in the article is often not reflected in the tables they provide. I can't find the data they are talking about. They show some very major changes although with a very small N. There was a change in the Broca's aphasic subjects, who had a change of something like 16 points in the Aphasia Quotient, as compared to something like 3 points in the Aphasia Quotient for those who were untreated. That is a huge, change, although they claimed it was not a significant change. Also it was not at all controlled, it was not a study of treatment, it was a study of recovery and they made some haphazard comments on those patients who were treated. Patients dropped out all along the way.

Q: Just a comment...they recognize the weaknesses of the study. The biggest one, of course, is that they are measuring over time without knowing anything about the stability of the measure. He's trying to collect those data now and he's probably going to replicate the study some day with all those criticisms in mind.

I just want to make another comment about your study and using the PICA overall scores as a measure of change. I think that's a relevant one, but the more measures of change you have, the better your chances of finding something significant. When you watch a patient over time who comes up on PICA overall scores and plateaus, if you're looking just at overall score... even if you're looking at high/low gap and he looks terrible in terms of possible prognosis...if you're looking at effects of treatment at that point his overall scores might not change at all but other measures might. What we're looking at now is we're hypothesizing that the greater the variability of scores, the greater the prognosis for change within subtests. The intra-subtest variability indices are one measure of change. So we've taken some of these patients who are chronic, long term postonset patients and treated. They hadn't had treatment in years and we got baseline measures and treated and then measured again one month later - now this is 2-3 hours per day per month -- and they go up like 1 or 2 per cent and it doesn't look like a very significant change. But, if you look at intersubtest variability for the whole PICA battery, it starts out quite high, around 600 or so for the total battery, and then drops down and plateaus. If it drops below 200 the prognosis for change is poor, but if they don't go below the 200 level and you start treating even though the overall score only changes 2 per cent over the month, Peak Mean Difference scores have this fantastic acceleration if the patient has the potential for change. The overall score lags behind that and when the Peak Mean Difference drops down again and the overall score stays high our treatment is effective. So if you don't look at some other indices besides the overall score, you might be deluded into thinking there was no difference between groups or that the patients hadn't changed when in fact you had produced a tremendous potential effect that you weren't measuring.