

Coping With Success: The Maintenance of  
Therapeutic Effect in Aphasia

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INTRODUCTION

In the Veterans Administration Cooperative Study on the treatment of aphasia (Wertz, Collins, Weiss, *et al.*, 1981), we compared individual treatment with group treatment for aphasic patients. All patients, regardless of group assignment, received eight hours of therapy each week for 44 weeks or until they dropped out of the study. We found that both groups made significant recovery of language abilities from baseline, four weeks postonset, regardless of treatment duration, and both groups continued to improve significantly beyond 26 weeks postonset. Our results suggest that individual treatment may be slightly superior to group treatment, but few of the differences between groups were significant.

These results, and those of others, make us feel a bit sanguine about the effects of treatment on aphasia. We know it works, whether we treat early or late, intensively or less so, and regardless of the instruments we use to assess change. We seem much less certain about when treatment ceases to be effective, when we might, in good conscience, spend that time with another patient, and what the long-term effects of our treatment are. We are aware of only one study which has examined, specifically, the maintenance of speech and language gains once formal treatment has ended, and that study was serendipitous (Holland, 1980a). The aphasic patients treated in the VA Cooperative Study provided us a unique opportunity to determine whether speech and language gains were maintained, whether type of treatment differentially effected maintenance of these gains, and whether continued treatment enabled patients to maintain their gains.

METHOD

We asked each patient who had completed 44 weeks of treatment in our original study to return for follow-up evaluation. Of those 34 patients, 23 responded. All were at least 18 months postonset. Of these 23 patients, 10 had received only individual treatment, Group A, and 13 had received only group treatment, Group B, during the study. All speech and language measures and a neurological examination were readministered, and we selected the Porch Index of Communicative Ability, (PICA) (Porch, 1967); the Token Test (DeRenzi and Vignolo, 1962); the Word Fluency Measure (Borkowski, Benton, and Spreen, 1967); the Coloured Progressive Matrices (Raven, 1962), and an Informant's Rating of functional language use adapted from Sarno (1969), for analysis.

Evaluations were scored and videotaped, and the first author again scored each response for each patient on the Porch Index of Communicative Ability. All subsequent PICA analyses were based on these reliability scores.

## RESULTS

PICA. As shown in Figure 1, overall PICA raw scores were not significantly different between groups at four weeks, 48 weeks, or at follow-up ( $p > .05$ ), but Group A patients were more severely impaired at 4 weeks postonset--a mean overall score of 9.52 compared with 10.58 for Group B. Despite these early differences, Group A improved more rapidly than Group B, and at 48 weeks postonset, outperformed Group B.

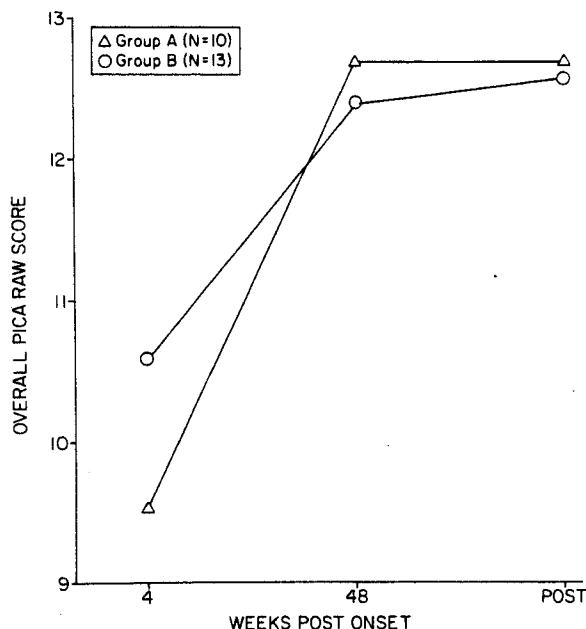


Figure 1. Group mean performance on PICA overall score at entry (four weeks postonset), end of Cooperative study (48 weeks postonset), and at reevaluation.

Comparisons of 48 week and follow-up scores revealed no significant differences between groups. One surprising finding, however, is that only 30 percent of Group A patients continued to improve, while 54 percent of Group B patients continued to improve. These differences may be related to an expected "sag" in the effects of individual treatment at termination. Very fragile support for this supposition is provided by an analysis of scores for those patients who continued to receive treatment and those who did not.

In Group A, six patients received varying amounts of treatment after 48 weeks postonset. When their 48 week and follow-up PICA scores were compared, however, the mean change score was zero. For the five Group B patients who received treatment beyond termination, however, the mean PICA change score was +.26. For those patients who received no treatment after termination, mean change scores were negative: -.22 for Group A and -.02 for Group B. Correlations between PICA change scores and hours of continued treatment were nonsignificant for Group A ( $r = -.56$ ) and significant for Group B ( $r = +.74$ ) ( $p < .01$ ).

Token Test. As shown in Figure 2, four week postonset Token Test results favored Group B, 29.15 to 20.6, and the Group B advantage continued through 48 weeks postonset. None of the differences were significant. At follow-up,

however, although the total score still favored Group B, 40 to 36, Group A had improved slightly after 48 weeks and Group B fell three points. No significant correlations ( $r = +.28$  for Group A,  $r = +.35$  for Group B) for Token Test change scores and hours of continued treatment were detected.

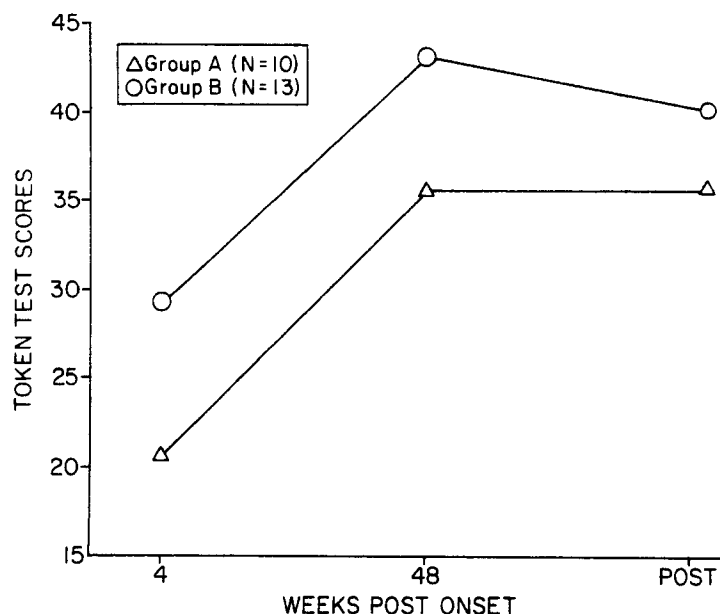


Figure 2. Group mean performance on Token Test total score at entry, (four weeks postonset), end of Cooperative study (48 weeks postonset), and at reevaluation.

Word Fluency Measure. As shown in Figure 3, total word fluency measure scores favored Group B at 4 weeks, 48 weeks, and follow-up. At no point were differences significant, however, and although scores dropped off slightly from 48 weeks to follow-up, 24.38 to 23.77 for Group B and 17.2 to 16.9 for Group A, these changes were not significant. Correlations between word fluency measure change scores and hours of continued treatment were significant for Group A ( $r = +.69$ ) ( $p < .05$ ) and nonsignificant for Group B ( $r = +.24$ ).

Informant's Rating Scale. As shown in Figure 4, no significant difference between groups were obtained on the Informant's Rating Scale at any of the three points. Again, initial scores favored Group B, but by follow-up, they favored Group A very slightly. No significant changes took place between 48 weeks and the follow-up evaluation, and no significant correlations ( $r = +.56$  for Group A  $r = -.42$  for Group B) between the Informant's Rating change scores and hours of continued treatment were obtained.

Coloured Progressive Matrices. As shown in Figure 5, no significant differences were found between groups on the Coloured Progressive Matrices at any of the three points. In fact, scores were nearly identical and changed least of all measures across time. There was a very slight decrement in performance at follow-up, 24.4 to 24.3 for Group A and 24.85 to 23.62 for Group B. Correlations between CPM change scores and hours of continued treatment were significant for Group A ( $r = +.64$ ) ( $p < .05$ ) and nonsignificant for Group B ( $r = -.08$ ).

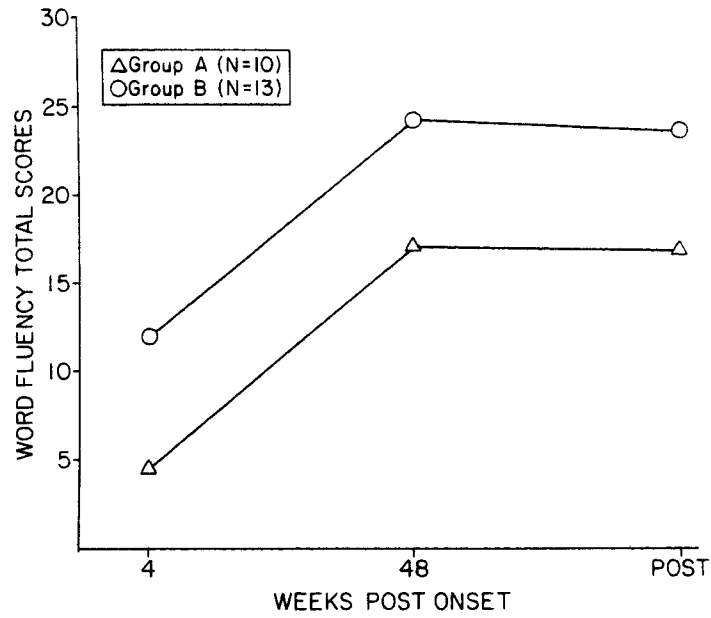


Figure 3. Group mean performance on Word Fluency Measure Total score at entry (four weeks postonset), end of Cooperative Study (48 weeks postonset), and at reevaluation.

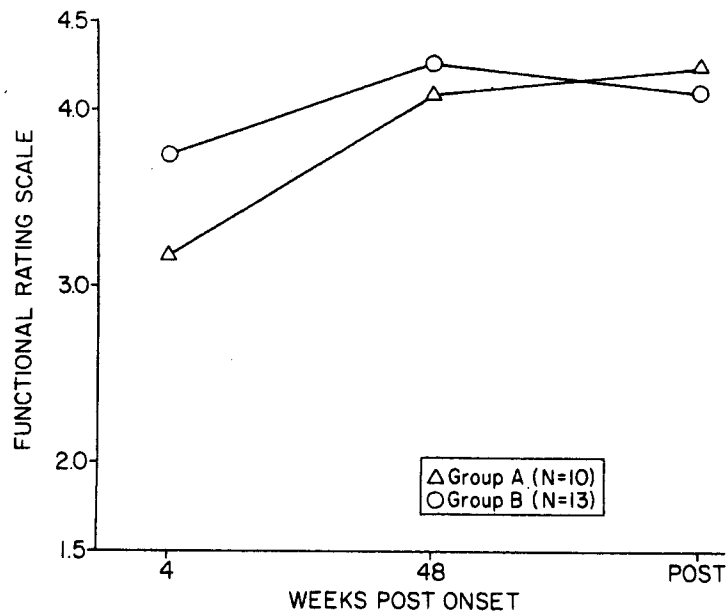


Figure 4. Group mean performance on Informant's Rating Scale at entry (four weeks postonset), at end of Cooperative Study (48 weeks postonset), and at reevaluation.

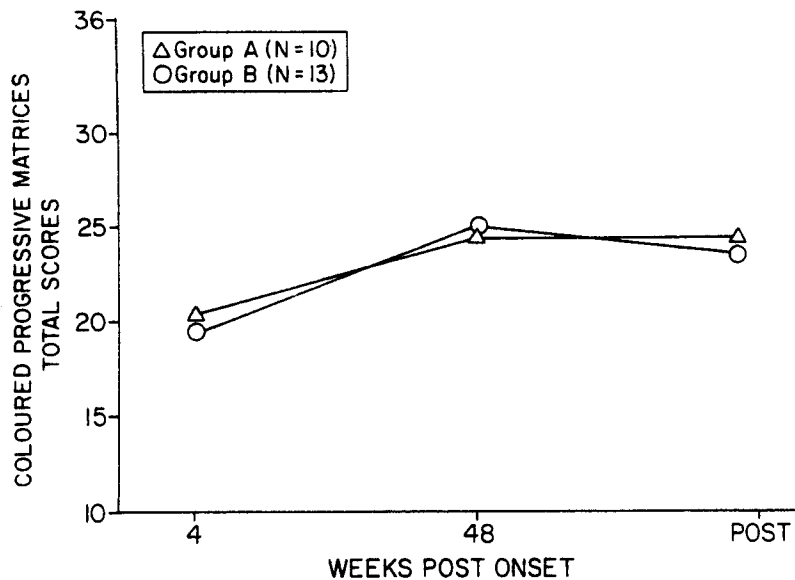


Figure 5. Group mean performance on Coloured Progressive Matrices total score at entry (four weeks postonset), at end of Cooperative Study (48 weeks postonset), and at reevaluation.

#### SUMMARY AND CONCLUSIONS

Summary. When we ranked patients by hours of continued treatment, as shown in Table 1, we found that for Group A, there was a superficial relationship between improvement and hours of continued treatment. Of the four patients receiving the most treatment, PICA scores improved for three, and functional ratings improved for all four. However, functional ratings also improved for two of the four patients receiving no continued treatment.

When the same comparisons were made for Group B, we found that PICA scores improved for three of the five patients who received continued treatment, but functional ratings improved for none of them.

Thus, ten of 23 patients continued to improve from termination of the Cooperative Study to follow-up, although this improvement was not statistically significant ( $p > .05$ ). The remaining patients did not maintain their gains and, in fact, performance had diminished by follow-up, although not significantly so. A greater percentage of Group B patients (54 percent) continued to improve beyond 48 weeks postonset than did Group A patients (30 percent). Type of early treatment apparently had a differential effect on maintenance of improvement, but for most patients, a continuation of treatment after 48 weeks had little or no effect on maintenance or improvement in communicative ability. Ratings of functional communication ability improved in 70 percent of Group A patients and only 23 percent of Group B patients from 48 weeks to follow-up. These changes were not systematically related to hours of continued treatment. Significant correlations between test performance and hours of continued treatment emerged for Group A on the Word Fluency Measure and the Coloured Progressive matrices and for Group B on the PICA Overall score.

Table 1. Patient descriptive data showing hours of continued treatment, PICA change scores, and Informant's Rating change scores.

GROUP	PATIENT	MPO*	HOURS OF TREATMENT	PICA CHANGE SCORE	INFORMANT'S RATING CHANGE SCORE
A	02-14	24	208	-.48	+.58
A	04-10	18	168	+.82	+.02
A	05-06	20	140	+.12	+.44
A	04-08	30	104	+.07	+.64
A	02-16	18	52	-.45	-.30
A	04-17	18	38	-.08	+.06
A	02-01	36	0	-.34	-.12
A	02-06	30	0	-.20	+.24
A	04-05	30	0	-.24	+.12
A	05-01	42	0	-.09	.00
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B	02-02	36	88	+.90	-.72
B	05-05	18	52	-.25	-.24
B	02-13	24	32	+.20	-.04
B	04-01	42	20	+.67	-.24
B	04-11	18	4	-.24	.00
B	01-01	42	0	+.22	+.56
B	01-05	27	0	-.40	-1.36
B	01-06	18	0	+.10	-.14
B	02-07	30	0	-.13	-.38
B	02-15	18	0	+.50	+.22
B	02-18	18	0	+.37	-.12
B	03-02	24	0	-.54	-.08
B	05-03	36	0	-.28	+.64

\*Months postonset at final reevaluation.

Conclusions. Our results appear to support the following conclusions. All patients, regardless of group assignment, made significant gains in communicative ability through 48 weeks of treatment. Generally, these gains were maintained until follow-up despite the fact that the majority of patients received no treatment after the study was terminated. Continued treatment beyond one year made little difference in communicative ability. Mean change scores were negligible for those patients receiving continued treatment.

These results force us to resort to supposition and conjecture. We cannot convincingly account for the superiority of Group B in maintaining gains. Fewer patients in the group received continued treatment, 38 percent as opposed to 60 percent in Group A, and mean hours of continued treatment was much greater for Group A, 118 compared with 39 for Group B. It may be that early, intensive, and prolonged individual treatment enabled Group A patients to realize maximal performance more quickly. If this is true, it is convincing testimony about the value of early, intensive, individual treatment, but it does little to support the notion that treatment for chronic aphasia can have a positive influence once formal, intensive treatment has ended. If early treatment is restricted to group treatment, we might surmise that a patient's maximum performance has not been reached, and potential for improvement remains.

The only study extant which is remotely comparable to ours is Holland's (1980a). In her validating study for the Communicative Abilities in Daily Living Measure (CADL) (Holland, 1980b), she retested 28 patients on 68 items common to the original and the revised CADL, approximately eight months after initial testing. All 28 patients were at least four months postonset at initial test, group mean was 21 months postonset, and at least eight months elapsed until the second test.

Holland found that 12 of the 13 patients receiving at least six months of treatment improved significantly ( $p < .05$ ) from first to second test. Only five of the 15 patients who discontinued treatment improved significantly. She did not indicate, specifically, which patients--by months postonset, initial severity, or handedness--improved most. We are told, however, that the "discontinued treatment" group was older, by five years; much further postonset, by more than one year; and more severe, six points on the BDAE auditory comprehension subtest and almost four percentile units on the PICA overall. One attractive guess about Holland's data is that the five "improvers" in the discontinued treatment group were those who were closer to onset or more severe. But, Holland tells us that two of those patients were furthest from onset, had the lowest PICA's, and were the oldest. Communicative ability had obviously not been maximized.

We fear we have implied, with our limited data, that there is an arbitrary ceiling on language ability imposed by cortical damage resulting in aphasia, and, despite our best efforts, if we treat intensively for one year, we reach asymptote, and further treatment will have little effect. This may well be true. Our data certainly suggest it. A more optimistic view, however, is that our treatment methods and the ways we measure change require refinement. For example, Aten et al. (1982) demonstrated group treatment that emphasized functional communication in chronic aphasic patients resulted in significant improvement on the CADL but not on the PICA. With refinement, perhaps, we can continue to expand the aphasic patient's communicative horizons.

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#### ACKNOWLEDGMENTS

This research was supported by funds provided by the Veterans Administration Cooperative Studies Program. Its successful conclusion was the result of efforts provided by the following participants: R.H. Brookshire, T. Friden, J.F. Kurtzke, James Pierce, David Weiss, B.E. Porch, L. Davis, D.J. Hubbard, V. Matovitch, D. Kushner-Vogel, G. Morley, P. Holtzapple, J. West, E. Resurreccion, and J. Klett.

#### DISCUSSION

- Q: What was the nature of the continuing treatment? How many patients received individual treatment, how many received group treatment, how many received both?
- A: Most of the treatment was individual, however a few patients also received group treatment.
- Q: I was struck by the absence of a relationship between time in treatment and test results. One of the problems is that the significance of a correlation coefficient does not say anything about the strength of a relationship between two variables. It would be useful to know what the correlations were.
- A: Good point. We will provide these in the paper that will be printed in the Proceedings.
- Q: I do not think your results are too surprising. There are data from other disciplines that suggest unless you do something structured after treatment, gains are not maintained.
- A: I hope we did not give the impression gains were not maintained. The greatest drop was approximately .50 in one patient's PICA overall score. So, most of the improvement patients experienced during the Cooperative Study treatment trial, four to 48 weeks postonset, was maintained at follow-up.
- Q: Certain PICA subtests have a ceiling built into them. Patients reach a maximum score and have no place to go to show improvement. Have you considered looking at individual subtests to see if patients may have improved, but the improvement was not evident in the overall score?
- A: No, but we should.