



University of Michigan
Aphasia Program

Mapping New Directions

PROGRAM OUTCOMES FOR INTENSIVE APHASIA INTERVENTION

The University of Michigan Aphasia Program (UMAP) is one of a small number of clinical service programs around the country that offers state-of-the-art language therapy to adults with chronic aphasia on an intensive intervention schedule. Founded 60 years ago, UMAP emphasizes total functional communication, with expressive language being one of the integral components. Adults typically enroll for one or more sessions in the UMAP. Sessions are 6 weeks in duration, and therapy is provided 5 days a week for a total of 138 hours. Therapy includes individual, small group, and computer laboratory sessions, with supplementary art and music therapy, and recreational activities. This paper provides program accountability data to inform potential clients and the public at large.

Background

Past research has analyzed the relationship between intensive therapy for adults with aphasia and improvement in their communication outcomes. This research has asked the following question: Does aphasia intervention work? And, the answer is clearly yes (Bhogal, Teasell, Speechley, & Albert, 2003; Holland, Fromm, DeRuyter, & Stein, 1996; Robey, 1998). However, when therapy schedules are non-intensive, for example offering appointments for only one or two hours per week, outcomes are very mixed, ranging from no progress to only very limited improvements in communication (Bhogal et al., 2003; Hinckley & Craig, 1998; Robey, 1998). Unfortunately, this lack of progress on non-intensive schedules has been misinterpreted by some individuals to mean that aphasia therapy is not effective. Instead, the research is best interpreted as providing strong evidence that therapy is not effective in the treatment of chronic aphasia unless the schedule is intensive.

The past decade has produced a number of important research studies focused on improving understanding of intensive therapy for chronic aphasia. The more intensive the schedule, the greater the improvements in communication (Bhogal et al., 2003; Denes, Perazzolo, Piani, & Piccione, 1996; Robey, 1998). It was the intensity of therapy, not the amount that was associated with the positive outcomes (Hinckley & Craig, 1998; Meinzer, Djundja, Barthel, Elbert,

& Rockstroh, 2005; Pulvermüller, Neining, Elbert, Mohr, Rockstroh, Koebbel, et al., 2001).

It has long been assumed that regaining language loss from aphasia was possible only during the earliest phases of spontaneous recovery, typically in the first approximately six months from the time of the brain injury, with little hope for improvement when aphasia was chronic. However, the research shows that positive benefits from intensive therapy for chronic aphasia occur regardless of whether recovery is in the acute, post-acute, or chronic stage (Holland et al., 1996; Poeck, Huber, & Willmes, 1989). The benefits of intensive aphasia therapy are apparent even for adults with the more severe forms of chronic aphasia (Poeck, et al., 1989; Robey, 1998).

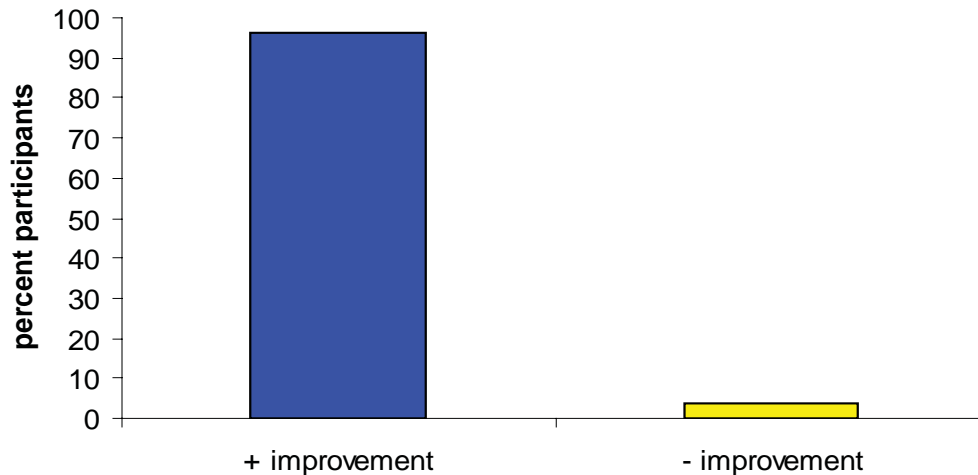
Analytic Strategy

For our current purposes, we analyzed retrospectively the clinical records of 128 adults with chronic aphasia who attended a 6-week session at the UMAP and received at least 120 hours of therapy. Clients were enrolled for their first session at the UMAP between the years 1999 and 2006. The clients were diagnosed with predominantly expressive aphasia. A summary of their characteristics is presented in Table 1 below.

Table 1. Selected demographic characteristics of the client pool.

Characteristic		
Gender	% Male	67
	% Female	33
Highest Educational Level Attained	% High school	37
	% College	29
	% Graduate Degree	34
Chronological Age	Mean	53 years
	Range (years; months)	16;9 – 84;6
Etiology	% Left-CVA	83
	% Closed Head Injury	4
	% AV Malformation	2
	% Other	11
Time Post Onset	Mean	16 months
	Range (years; months)	0;0 – 5;10

Figure 1. Percent participants showing improvement



Two measures, the Boston Naming Test (BNT, Kaplan, Goodglass, & Weintraub, 1983) and the Analysis of Utterance: Content Units task (CU, Yorkston & Beukelman, 1980), are routinely collected pre- and post-test for all participants in the UMAP during Week 1 and Week 6 of the program. Performances on these two measures at these two points in time served as the basis for our program accountability analysis. The BNT measures an individual’s ability to name pictured objects, and the CU measures the number of meaningful content units expressed in a picture description task.

Accountability Data

In analyzing our accountability data we asked a number of questions, as follows.

1. Do clients benefit from the intensive therapy program at the UMAP?

This question was answered in two ways. First, we performed pairwise *t*-test statistical analyses on the pre- and post-test results for the BNT and the CU. Table 2 provides mean performance scores at pre- and post-testing on the two measures.

Table 2. Means and standard deviations (*SD*) on the BNT and CU at pre- and post-testing for the 128 clients.

Measure		Pre-testing	Post-testing
BNT	Mean	20.5	28.4
	(<i>SD</i>)	(17.3)	(18.4)
CU	Mean	6.9	11.7
	(<i>SD</i>)	(6.5)	(8.5)

This change in naming skills from pre- to post-testing was statistically significant¹. The increase in the number of

¹ Pairwise $t(128) = -12.276, p = .000, \text{Cohen's } d = 1.08$

meaningful content units between pre- and post-testing was statistically significant as well². These treatment effects were strong (Cohen’s *d*, Cohen, 1965) for both measures.

A second way of answering this question was to examine how many clients were represented by the statistical improvements. Of the 128 clients, 123 (96%) made progress on at least one of the two measures after the 6-week program. These relationships are displayed in Figure 1.

2. How much improvement occurred on average at the end of the 6-week program?

The mean BNT score increased by 7.9 points, representing a gain of approximately 38%. The mean CU score increased by 4.8 points, or by approximately 69%.

3. Are there client characteristics that influenced the amount of change between pre- and post-testing?

There was no evidence that age, gender, or level of education affected the amount of improvement that clients experienced. There was no evidence that time post-onset related systematically to the gains made on the BNT³. However, time post-onset was somewhat related to the growth in CU at the end of the program⁴. There was a tendency for clients who enrolled with longer post-onset times to have greater gains in their content units.

Five individuals did not demonstrate measurable gains on the BNT and the CU. Their clinical files were reviewed to determine why change was not evidenced. At the time of the pre-test, two clients were already performing well on these two measures, suggesting that there may have been

² Pairwise $t(128) = -8.495, p = .000, \text{Cohen's } d = .75$

³ Pearson $r = -.123, p = .167$

⁴ Pearson $r = .170, p = .055$

little margin for further improvement on these tasks. In both cases, however, gains were made in other language areas (e.g., memory, reading, and writing), which were not a part of the skill set analyzed for this report. The other three clients were nonverbal at program entry and remained nonverbal at program completion. Their gains were made in the use of alternative communication systems which were not tapped by these two measures.

Next we analyzed the outcomes data for 80 of the clients who attended more than one UMAP session between 1999 and fall 2006. We asked the following questions about clients who returned for additional UMAP sessions:

4. Do clients benefit from attending more than one session at the UMAP?

We looked at this in two ways. For the group of people who received approximately the same amount of therapy in their first and second sessions ($n = 45$), we compared the scores at the end of session 1 to the scores at the end of session 2. Although the CU scores did not change overall, the BNT⁵ scores at the end of session 2 were significantly higher than the scores at the end of session 1. BNT scores at the end of session 2 were about 25% higher than they were at the end of session 1.

Another way to look at this question is to examine the amount of change that was made in each session. We found that for the CU⁶, the gains made in session 1 were statistically larger than the gains that were made in session 2. In other words, during the second enrollment clients continued to improve the meaningful length of their spoken phrases and sentences, but the rate of growth was not as great as during the first enrollment. For the BNT, clients made improvements during their second session just as rapidly as they did during their first enrollment.

5. If a client wants to attend another UMAP session, is it important that these be scheduled consecutively?

Overall, no. The benefits of attending an additional UMAP session are the same, regardless of whether the client completes the sessions consecutively or returns to the UMAP at a later time. Gains were found to be the same for the BNT⁷ no matter if the client attended UMAP in consecutive or nonconsecutive sessions. There was a marginally significant greater gain in CU⁸ production if the sessions were nonconsecutive.

⁵ Pairwise $t(31) = -3.281, p = .001$, Cohen's $d = .67$

⁶ Pairwise $t(30) = 2.131, p = .041$, Cohen's $d = .38$

⁷ Independent $t(54) = .220, p = .827$

⁸ Independent $t(60) = -1.943, p = .057$

At the completion of each UMAP session, clients (and/or their caregivers as appropriate) are asked to complete and return a brief survey about their experiences in the UMAP. The following question is based on approximately 100 clients who have returned completed surveys in the last 3 years.

6. How do clients evaluate their enrollment in the UMAP?

Their evaluations have been overwhelmingly positive. When asked whether overall they were satisfied with their experience in the UMAP, 97% agreed or strongly agreed, and additionally said that they would recommend the UMAP to others.

More specifically, 96% of respondents agreed or strongly agreed that the speech-language pathologists were competent and knowledgeable in their area of expertise. The business office staff was rated as friendly and helpful by 99% of clients, and 89% agreed or strongly agreed that the recreational activities offered outside of therapy time were interesting and fun. In addition, nearby accommodations were rated as comfortable by most clients, 85%.

Summary and Interpretation

Our accountability data show that clients with aphasia who attended our intensive University of Michigan Aphasia Program demonstrated significant gains in their expressive abilities in the areas of word naming and production of meaningful messages. In this analysis, most clients (96%) demonstrated improved expressive language skills post-treatment. Gains were seen both in their ability to use specific word names, and in the amount of information they could say about specific pictured topics. Changes like these can have a dramatic impact on the individual's quality of life and the ability to express his or her thoughts to others in the environment.

Our accountability data revealed no significant barriers in terms of age, gender, educational background, or time post-onset to benefiting from the UMAP's intensive therapy program. It is clear that our clients significantly improved their ability to engage in meaningful conversation months and years after their brain injury. Our findings from clients who have enrolled in multiple UMAP sessions show that clients continued to make gains on subsequent visits. It was found that it did not matter whether the clients enrolled in consecutive sessions or they took a break in between sessions.

Overall, the literature reveals that communication skills can improve with intensive therapy. This report of UMAP outcomes is consistent with the research literature, and offers hope to the many adults with chronic aphasia.

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