

Long-Term Results of an Intensive Treatment Program for Adults and Adolescents Who Stutter

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In order to determine the long-term effects of an intensive treatment program, 17 adult and 25 adolescent stutterers were tested 2 or 3 times during a 12- to 24-month post-intensive treatment phase. The results of this study are intended to augment and supplement the growing body of evidence about the effects of intensive treatment programs on adult and adolescent stutterers. Follow-up measures included surprise phone calls to clients at home/work and a self-administered Speech Performance Questionnaire. Careful training of speech raters was undertaken to ensure high reliability of speech measures. Results from the phone call samples indicated that about 69% of the subjects maintained a satisfactory level of post-treatment fluency, with an additional 7% maintaining a level that was judged to be marginally satisfactory. On the self-administered Questionnaire, 80% of the subjects rated their speech fluency as good or fair 12 to 24 months after treatment.

KEY WORDS: stuttering treatment, intensive treatment, long-term results, Comprehensive Stuttering Program (CSP), maintenance of fluency

Obtaining long-term and reliable outcome measures after treatment is difficult. Shames (1986) observed that most clinicians approach the issues of outcome measures and relapse much as they approach an appointment with their dentist: expecting pain and discomfort and wanting to deny that a problem exists. Nevertheless, post-treatment relapse is a fact of life for many stutterers and clinicians. Indeed, one of the 12 criteria Bloodstein (1987) established for evaluating the effectiveness of treatment is that the stability of results must be demonstrated by long-term investigations.

One measure of the reluctance to deal with treatment outcome is the number of studies that report results of treatment programs but provide no data or reports of any kind on post-treatment outcomes. In the several editions of his comprehensive *Handbook*, Bloodstein (1975, 1981, 1987) provides a table summarizing the results of clinical studies that used at least five subjects. In the 1975 edition only 31% of 58 studies reported any follow-up results; in 1981 it was 39% of 117 studies, and in 1987 49% of 148 studies reported follow-up results. Although this upward trend is encouraging, Bloodstein (1987) commented that the studies he surveyed varied widely in scientific rigor and sophistication. He also pointedly observed that the terms used to indicate significant improvement are likely to have different meanings for different clinicians. Most studies did not specify the conditions in which speech performance was measured, what measures were used, or how the speech raters were trained.

During the early 1980s attention was focused on post-treatment outcome by the first Banff International Conference on Stuttering (Boberg, 1981) and by several writers who began to address the urgent need to collect outcome data in a systematic manner (Andrews & Craig, 1982; Howie et al., 1981, 1982; Ingham, 1980, 1982,

1984, 1985; Kamhi, 1982). Boberg (1986) reviewed the progress on this front and concluded that, although many difficulties still existed and much research had yet to be done, there did appear to be some evidence of progress.

Closely related to the lack of long-term outcome measures is the issue of reliability of the measures used in stuttering treatment and research. Kully and Boberg (1988) found a startling lack of interclinic agreement in the identification of fluent and stuttered syllables when experienced clinicians in nine centers rated speech samples that were recorded on an audiotape. There were also major disagreements when the same clinicians rated the severity of the stuttering samples on a 7-point rating scale. Ingham has written extensively about the urgent need to develop valid and reliable measures of stuttering (1984, 1985, 1993). He has also argued that further developments in research and treatment will remain stalled until this fundamental problem is solved. As an interim arrangement Ingham suggests that measures of stuttering events in any research program should be made by judges/raters who, at the very least, display satisfactory intrajudge agreement. This suggestion is bolstered by the recent findings of Ingham, Cordes, and Gow (1993), who reported that judges who display high intrajudge agreement have a much higher probability of showing satisfactory interjudge agreement when measuring stuttering in typical clinical/research settings.

The purpose of this paper is to report on an investigation of the long-term effects of an intensive group program for adult and adolescent stutterers that combined fluency shaping strategies with techniques to promote attitude change, avoidance reduction, and social skill development. The specific purpose was to determine if the improvements achieved during the intensive program were maintained in the post-treatment environment. An additional purpose was to obtain information about the subjects' perceptions of their speech behavior and/or attitudes toward their speech after completing this treatment.

Procedures

Subjects

A total of 49 stutterers enrolled in six 3-week intensive clinics. All of the subjects completed the course. To be included in this study a subject had to be available for pre- and post-clinic testing and on at least two occasions during the follow-up period. Two of the 49 potential subjects were not available for post-clinic testing, four could not be contacted two or more times during the follow-up period, and one had a medical condition that made him unsuitable for this study. Thus 42 subjects were available for this study.

Subjects were divided into two groups: 14 males and 3 females in the adult group had a mean age of 24.59 years, with a range of 18–36; 20 males and 5 females in the adolescent group had a mean age of 14.28 years, with a range of 11–17. At the time of this study two broad subject groups were available: those who had completed their intensive clinics about 24 months earlier and those who had completed their clinics about 12 months earlier.

Clinical Program

All of the subjects completed the 3-week intensive Comprehensive Stuttering Program (Boberg & Kully, 1985) where clients meet for 7 hours a day each weekday. During the first 2 weeks the subjects lived in a student residence; during the third week they could choose to live at home, stay with friends, or remain in residence.

The program uses behavioral strategies to teach the fluency skills of prolongation, easy onset, soft contacts, appropriate phrasing, and continuous airflow/blending. Syllable rate is gradually increased from a slow prolongation rate of about 40 syllables per minute (spm) to a near-normal rate of 190 ± 40 spm at the end of the establishment phase. Subjects are also trained to self-monitor and to modify errors in preparation for the transfer phase where they use their controlled speech outside the clinic in situations of graduated difficulty.

Along with the systematic training in motor skills, strategies were employed to help the subjects identify and reduce their fears and avoidances, discuss their stuttering with family and friends, and seek opportunities to expand their social skills.

During the final week of treatment each subject was asked to develop a home maintenance program that would fit his schedule and objectives. The program was to be based on suggestions made by the clinicians and typically included a daily fluency skill practice period (5 to 10 minutes), some transfer activities, and discussions of speech goals with family, friends, and colleagues. Each subject presented the proposed program to the clinician for discussion and final approval. Subjects were also encouraged to arrange occasional sessions with a local speech-language pathologist, to join a self-help group, and to attend a refresher clinic at the Institute. Weekend and 5-day refresher clinics were available to clients. Since the costs for a weekend refresher clinic are included in the basic fee for the 3-week intensive clinic we anticipated that many clients would attend at least one such weekend.

Pre- and Post-Treatment Speech Measures

A variety of audio- and videotaped speech samples is routinely obtained for pre- and post-clinic assessment sessions for this treatment program. For the purpose of this study, however, only one type of speech sample was used—telephone calls. This sample was chosen for two principal reasons. The first stemmed from a concern to select a follow-up measure that would, as much as possible, reflect the subject's speech performance in "real life." This measure avoided the problems of the subject's reactivity to the clinician and/or clinic building; both can acquire stimulus control properties that may cause post-treatment reductions in stuttering and an inflated measure of improvement (Boberg & Sawyer, 1977; Bloodstein, 1987). Some form of covert assessment may have provided a more valid measure of speech performance, but such assessments are very difficult to arrange, particularly for repeated trials and when subjects live as far as 3,000 miles from the clinic. As a compromise, an unexpected or surprise telephone call to the subject was chosen as an assessment that would be relatively free of clinic cues. It also made it possible to obtain repeated speech samples from the largest possible number of subjects. An-

draws and Craig (1982) found that speech samples obtained through unexpected telephone calls from the clinic were not significantly different from samples obtained through other covert non-clinic measures.

A second reason for choosing a telephone assessment was that there is reason to believe that it may be one of the most stringent measures of outcome (Boberg & Sawyer, 1977). Stuttering severity varies considerably across situations, but almost all stutterers report, during clinical assessments, that the telephone is probably the most difficult speaking situation. Arguably, a telephone assessment is likely to be very sensitive to the presence of residual stutterings in the post-treatment speech.

Telephone Call Procedure

Immediately before and after treatment, subjects were audio-recorded while they made telephone calls to business establishments from the clinic. Each sample included at least 2 minutes of the client's speech, excluding formulative pauses. In the follow-up assessments subjects were telephoned unexpectedly at their home or workplace by research assistants who had never met them. During the intensive clinic, the subjects had been told that someone might phone them during the coming year. They had given their permission in writing for those phone calls to be made and recorded.

The research assistants called the subjects at 4, 12, and 24 months post-clinic. They stated that they were calling on behalf of the Institute (a procedural requirement of the Research Ethics Committee) and then engaged the subject in conversation until 2 minutes of client talk time had been obtained. The samples were recorded on audiotape directly from the telephone line using a duplex adaptor and an Archer telephone recording control.

Analysis of Speech Samples

Stuttering was assessed through frequency counts and expressed as a percentage of syllables stuttered using the following formula:

$$\frac{\text{total syllables stuttered}}{\text{total syllables}} \times 100 = \% \text{ Syllables Stuttered (\%SS)}$$

It was initially planned to obtain speech rate scores as well as %SS scores, but that plan was abandoned because of the short utterances and frequent pauses that characterized many of the telephone conversations, particularly with the adolescent subjects.

Telephone speech samples were collected on five occasions. They provided the following data collection points: (a) pre-treatment, (b) immediately post-treatment, (c) 4 months post, (d) 12 months post, and (e) 24 months post.

Training Program for Raters

In view of the current concerns about the reliability of stuttering treatment measures, efforts were made to ensure

satisfactory inter- and intra-rater reliability. This was achieved by systematically training the raters in the use of a set of counting guidelines developed at the Institute for Stuttering Treatment and Research.

Two undergraduate students in speech pathology served as raters. Neither student had been involved in the clinics or had met the subjects. The raters were given 6 hours of training in the identification and measurement of stuttered and fluent syllables. This involved careful study of the counting guidelines and tutored analysis of several practice tapes containing stuttered and fluent speech samples. Both students were required to establish 90% agreement in counts of stuttered and fluent syllables with one of the investigators (DK) before they were permitted to analyze the telephone samples.

Since perceptions of stuttering events may shift across time, additional procedures were employed to control for observer drift, once the analysis began:

1. Raters were required to begin each session by analyzing a training tape that contained several samples of stuttered speech. They were instructed to begin rating the experimental samples only after they had demonstrated at least 90% agreement with the training tape.

2. Raters were instructed to take a short (5 min) break from counting every 20-30 minutes.

3. Raters were informed that the investigator would periodically select a random sample, rate it, and then discuss any pronounced discrepancies with the rater.

All syllable counts were made on electronic button-press event recorders (Boberg & Kully, 1985).

Pre- and Post-Treatment Nonspeech Measures

Bloodstein (1987) has indicated that another criterion for evaluating the effectiveness of treatment is that it must remove not only stuttering but also the fears and the person's self-concept as a stutterer. Bloodstein's recommendation has been echoed by a number of other investigators who are concerned about the clinical validity of treatment evaluation based solely on speech performance measures rather than a combination of speech and nonspeech performance data (e.g., Cooper, 1986, 1990; Ingham, 1990; Perkins, 1983). Hence, in addition to the speech measures, a number of tests and questionnaires are routinely given to clients in the program used in this study. These include the S24 scale (Andrews & Cutler, 1974), the Perceptions of Stuttering Inventory (Woolf, 1967), and the Locus of Control of Behavior (Craig et al., 1984).

For the purpose of this study, a slightly shortened version of the Speech Performance Questionnaire (SPQ), developed by Perkins (1981), was used to assess the subjects' perceptions of their post-clinic speech performance. The revised version of this questionnaire retained most of the same questions and categories. The questionnaire was mailed to the subjects at the end of the project, 12 or 24 months after they had completed the intensive program.

Reliability

Inter-observer reliability for counting syllables was assessed by comparing the two raters' independent counts of

TABLE 1. Summary of the intra- and inter-rater reliability of syllables stuttered (SS), total syllables spoken (TSS), and percent syllables stuttered (%SS).

	Intra-rater reliability		Inter-rater reliability
	Rater 1	Rater 2	
SS	.966	.962	.987
TSS	.995	.997	.992
%SS	.952	.992	.973
Mean reliability	.971	.984	.984

stuttered and nonstuttered syllables in 26 samples from six subjects, selected at random from the total number of subjects. To evaluate intra-observer reliability, each rater reanalyzed 10 samples selected at random from the set of samples originally assigned to the rater.

Reliability was determined using the Pearson product-moment correlation test. As indicated in Table 1, both intra- and inter-observer reliability were very high, averaging .971, .984, and .984, respectively.

Although the Pearson test is commonly used to assess reliability because it indicates the degree to which sets of counts correlate it does not provide information on the extent to which the raters agreed on the total amount of stuttering in any one speech sample. Therefore, we have provided additional information on intra- and inter-rater agreement. Table 2 contains the original counts and re-counts of %SS obtained by each rater in 20 randomly selected samples. Table 3 contains the %SS obtained by the two raters for 26 samples from six randomly selected subjects.

Results

Telephone Speech Samples

Telephone speech samples were obtained pre- and post-treatment and on two or more occasions during the follow-up period. At the time of this investigation it was possible to collect data on three occasions from a group of subjects who had completed the intensive clinic 24 months earlier, and on two occasions from the remaining subjects who had com-

TABLE 2. Intra-rater reliability: Original counts and re-counts of %SS obtained by the two raters in 20 randomly selected samples.

Rater 1			Rater 2		
Sample	Original count	Recount	Sample	Original count	Recount
1	14.33	13.11	11	39.53	37.5
2	13.9	15.8	12	6.98	7.45
3	13.5	12.3	13	7.5	8.02
4	41.57	40.47	14	4.16	4.22
5	11.94	12.72	15	2.33	6.12
6	9.5	14.63	16	18.96	15.81
7	17.3	19.58	17	0	0
8	14.18	17.39	18	.32	.33
9	28.42	23.58	19	.95	.62
10	21.47	17.22	20	0	.23

TABLE 3. Inter-rater reliability: A comparison of counts of %SS by Raters 1 and 2 for 26 samples from six randomly selected subjects.

Sample	Rater 1	Rater 2
1	13.79	11.3
2	.16	0
3	3.08	2.88
4	7.9	7.59
5	6.8	4.16
6	2.46	3.67
7	4.5	3.8
8	.22	.7
9	1.8	1.36
10	8.49	6.81
11	0	0
12	.98	.49
13	1.68	1.45
14	2.17	1.5
15	7.04	8
16	.24	0
17	.28	1.12
18	.36	.74
19	.38	.36
20	11.94	12.65
21	3.3	3.16
22	18.16	17.09
23	13.53	17.27
24	.5	.18
25	.26	.25
26	.16	.45

pleted the clinic 12 months earlier. Tables 4 and 5 present the data on 17 adult and 25 adolescent subjects.

The results in Tables 4 and 5 reveal that both groups experienced a dramatic decrease in %SS from the pre- to the post-treatment test period. The mean %SS for the 17 adults decreased from 19.59 to 1.29, whereas the mean %SS for the 25 adolescents decreased from 14.32 to 1.75.

The speech samples obtained in the follow-up period reveal that the mean %SS for the 17 adults increased from 1.29 to a mean of 4.27 at the 4-month test period, with a further increase to 6.03 at 12 months. However, there was a decline to 2.03 %SS for the seven subjects who were followed for 24 months. The adolescent subjects showed a similar but smaller mean increase in %SS; from 1.75 to 3.65 and 3.89 at the 4- and 12-month test periods respectively. However, there was also a pronounced increase in the mean %SS score (to 7.3 %SS) for these eight subjects at the 24-month test period. Two of the adolescent subjects showed unusual patterns: Subject 3 showed a sharp increase in %SS at the 4-month test period but then decreased in the two following test periods; Subject 8 did not show the usual decrease in %SS immediately post-treatment.

An inspection of the data in Tables 4 and 5 reveals that the increases in %SS during the follow-up periods were largely due to the performance of 10 of the 42 subjects. Because we were interested in determining if there might be an identifiable subgroup in the subject population, the mean %SS for the 17 adult subjects listed in Table 4 was recalculated deleting the data for Subjects 3, 8, 10, and 16. Similarly, in Table 5 the mean %SS for the 25 adolescent clients was recalculated deleting Subjects 2, 4, 7, 10, 13, and 18. The

TABLE 4. Percentage of stuttering in telephone samples from 17 adult clients pre-treatment; immediately post-treatment; and 4, 12, and 24 months post-treatment.

Client	Age/Sex	Pre	Post	4 mos.	12 mos.	24 mos.
1	26/M	4.85	1.48	2.4	1.84	1.4
2	18/F	11.41	0.0	.7	.72	.97
3	19/M	53.73	2.2	4.4	21.76	8.5
4	28/M	8.49	0.0	.98	1.47	2.2
5	18/M	7.0	.24	.28	.36	.38
6	30/M	15.8	.43	.89	1.26	.6
7	27/M	20.4	.49	0.0	0.0	.19
8	30/M	35.3	12.0	26.3	27.9	—
9	23/M	23.9	.64	1.3	.15	—
10	27/F	9.5	1.6	4.2	9.4	—
11	19/M	58.08	0.0	.2	5.7	—
12	20/M	10.63	0.0	.8	.9	—
13	33/M	5.4	.3	.2	.6	—
14	22/F	12.44	.95	.68	2.7	—
15	36/M	5.03	.61	.5	0	—
16	18/M	42.0	.75	28.0	26.1	—
17	19/M	9.0	.18	.75	1.58	—
\bar{X} ($N = 17$)	24.29	19.59	1.29	4.27	6.03	
\bar{X} ($N = 7$)						2.03
\bar{X} ($N = 13$)		*14.80	.62	.74	1.33	
\bar{X} ($N = 6$)						.96

*Recalculation of mean percentage scores deleting results from Clients 3, 8, 10, and 16.

mean %SS of the remaining 13 adults and 19 adolescents remained low in all the follow-up measures.

In an attempt to categorize the subjects' post-treatment performance as satisfactory or unsatisfactory we have developed arbitrary categories of post-treatment results. In Table 6 we have indicated the number of adult and adolescent subjects who fall into three arbitrary categories of post-treatment outcome, 12 months after treatment. According to this arbitrary categorization, 29 of the 42 subjects, or about 69%, showed a satisfactory outcome; three subjects, or about 7%, were marginally satisfactory; and 10 subjects, or about 24%, had unsatisfactory results.

It is difficult to develop meaningful categories that accurately reflect post-treatment outcomes. Subject 11 in the adult group (Table 4) illustrates such difficulties. This subject had the highest pre-treatment %SS of the 42 subjects, had achieved a 100% improvement by the end of treatment, and maintained most of that improvement 4 months post-treatment. However, he then showed some relapse at the 12-month period, placing him into the marginal category even though his improvement at that point, relative to his pre-treatment %SS, was still approximately 90%. It should be noted that all 15 of the subjects for whom we were able to obtain 24-month measures remained in the same categories of treatment outcome as they were at the 12-month measure.

Speech Performance Questionnaire (SPQ)

The SPQ was mailed to the 42 subjects approximately 12 or 24 months after treatment. Sixteen of the 17 adults returned completed SPQs, but only 14 of the 25 adolescents returned the form. Table 7 contains a summary of the responses to this questionnaire. The table shows the number of adults and adolescents responding to each option in each

question. The right column shows the percentage of subjects (both adults and adolescents) ($N = 30$) responding to each option for each question.

Some responses to specific questionnaire items should be noted. Immediately after treatment 93% of subjects indicated that they were satisfied or very satisfied with their speech. Twelve and 24 months later about 80% described their speech as fair or good, and 20% described their speech as poor or terrible. The difference between these two ratings points to some decline in satisfaction level during the post-treatment period. However, it is interesting to note that between 83% and 90% maintained that they still had the necessary skills to control their speech or to sound normal with controlled speech; 50% reported that they were almost always able to speak normally without thinking about controlling speech. A surprising 40% reported that they always or almost always felt like a normal speaker, whereas 77% reported that their fluency skills, learned in the clinic, were effective most or all of the time. Eighty-three percent of the subjects reported that they felt better about speaking after treatment, whereas 93% reported that the treatment was moderately or very helpful. Perhaps the most surprising result was that 23% reported that they no longer considered themselves to be stutterers; it might be significant that five of the seven who formed this group were adolescents.

Discussion

In order to determine the long-term effects of an intensive treatment program, 42 adult and adolescent subjects were tested two or three times during the follow-up period, after they had completed the 3-week Comprehensive Stuttering Program. The follow-up measures included surprise phone calls made to subjects at their home or work, plus a ques-

TABLE 5. Percentage of stuttering in telephone samples from 25 adolescent clients pre-treatment; immediately post-treatment; and 4, 12, and 24 months post-treatment.

Client	Age/Sex	Pre	Post	4 mos.	12 mos.	24 mos.
1	17/M	11/5	.46	.37	.44	.53
2	13/F	18.96	6.61	14.97	18.91	18.99
3	13/M	7.5	0.0	11.0	.85	1.68
4	15/F	*45.45	1.17	13.0		20.0
5	15/M	2.33	1.01	.5	1.22	1.38
6	13/M	6.98	0.0	0.0	1.6	1.36
7	15/M	39.53	2.16	—	17.47	13.11
8	16/F	4.16	3.67	3.8	.7	1.36
9	15/M	14.33	3.1	4.2	0.0	—
10	15/M	12.0	3.3	—	17.7	—
11	15/F	21.5	1.8	.15	.52	—
12	15/F	14.2	3.66	3.4	2.0	—
13	16/M	13.9	6.43	15.0	10.7	—
14	15/M	17.3	.66	.62	.15	—
15	16/M	13.5	.5	.26	.16	—
16	12/M	10.0	1.05	.98	4.25	—
17	11/M	*22.48	1.92	.25	.84	—
18	17/M	11.3	0.0	2.88	7.6	—
19	12/M	16.0	.59	4.5	0.0	—
20	16/M	17.22	1.94	1.74	1.97	—
21	13/M	4.06	0.0	.7	.67	—
22	11/M	13.04	.18	0.0	.22	—
23	12/M	16.0	3.23	5.2	4.13	—
24	12/M	.7	0.0	0.0	0.0	—
25	17/M	4.03	.42	.48	1.3	—
\bar{X} (N = 25)		14.28	1.75			
(N = 23)				3.65	3.89	
(N = 8)						7.3
\bar{X} (N = 19)		**11.41	**1.27	**2.03	*1.11	
(N = 5)						*1.26

*Samples were of videotaped conversation rather than telephone calls because the latter were unavailable or poorly recorded.

**Recalculation of mean percentage scores deleting results for Clients 2, 4, 7, 10, 13, and 18.

tionnaire that asked them to rate their speech performance and attitudes.

Telephone samples were chosen as the assessment condition because they provided a stringent measure of post-treatment performance, were relatively free of treatment stimulus cues, and permitted the collection of speech samples from the largest number of subjects regardless of where they lived. The surprise telephone calls were audio-recorded directly from the telephone line and then analyzed by two trained undergraduate students who served as raters.

An analysis of the speech samples obtained from the phone calls (pre- and post-treatment and on two or three occasions in the follow-up period) revealed a sharp decrease in mean %SS scores from the pre- to post-treatment recordings, but with some increase in the mean %SS scores during the follow-up period. Both the adult and the adolescent groups showed a similar pattern.

TABLE 6. The number of adult and adolescent subjects who fall into three arbitrary categories of post-treatment outcome (satisfactory, marginal, unsatisfactory) 12 months after treatment.

	%SS	Adults	Adolescents
Satisfactory	0-3.0	12	17
Marginal	3.1-6.0	1	2
Unsatisfactory	>6	4	6

A close inspection of the results revealed that the increase in %SS scores during the post-treatment period was largely due to a small group of subjects: 4 of the 17 adults and 6 of the 25 adolescents. When their results were deleted from the calculation of the mean %SS in the follow-up periods (Tables 4 and 5), the remaining 32 subjects showed little evidence of relapse: About 69% were judged to have a satisfactory outcome, and an additional 7% were considered to be marginally satisfactory. Hence, the post-treatment relapse, suggested by the increased mean %SS, was largely limited to 10 subjects, or 23.8% of the 42 subjects in the study, suggesting the possibility of a subgroup with limited capacity to respond to treatment.

As another measure of treatment outcome, subjects were asked to rate their own post-treatment performance on a Speech Performance Questionnaire (SPQ) that was mailed to them 12 or 24 months after the completion of the intensive clinic. Approximately 80% of the subjects rated their speech as good or fair at the time they were completing the questionnaire. This represents a decline from the 93% who indicated that they were satisfied with their speech immediately after the clinic. It is interesting to note that the proportion of subjects who rated their speech as good or fair 12 months after treatment (80%) is almost the same as the proportion (76%) who were categorized by the investigators as satisfactory or marginally satisfactory 12 months after treatment.

TABLE 7. Summary of 30 clients' responses to the Speech Performance Questionnaire 12-24 months after intensive treatment

Response	Number responding		% Response combined
	Adults	Adolescents	
Satisfaction with speech immediately after treatment:			
Very satisfied	15	10	83.3
Satisfied	0	3	10.0
Dissatisfied	1	1	6.6
Very dissatisfied	0	0	0
Current rating of speech fluency:			
Terrific	0	0	0
Good	8	8	53.3
Fair	6	2	26.6
Poor	1	3	13.3
Terrible	1	1	6.6
Now have necessary skills to <i>control</i> speech:			
Yes	14	13	90.0
No	2	1	10.0
Now have necessary skills to <i>sound fluent</i> :			
Yes	14	12	86.6
No	2	2	13.3
Now able to <i>sound normal</i> with controlled speech:			
Yes	14	11	83.3
No	2	3	16.6
Now able to speak normally without thinking about controlling speech:			
Always	0	0	0
Almost always	11	4	50.0
Sometimes	4	10	46.6
Never	1	0	3.3
Now feel like a normal speaker:			
Always	0	1	3.3
Almost always	8	3	36.7
Sometimes	6	10	53.3
Never	2	0	6.7
Reported effectiveness of fluency skills:			
All of the time	3	1	13.3
Most of the time	10	9	63.3
Occasionally	2	4	20.0
Never	1	0	3.3
Present degree of stuttering compared to before treatment:			
More severe	0	0	0
Less severe	14	13	90.0
The same	2	1	10.0
Present feelings about speaking, compared to before treatment:			
Better	14	11	83.3
The same	2	3	16.6
Worse	0	0	0
Reported benefit of stuttering program:			
Very helpful	13	11	80.0
Moderately helpful	3	1	13.3
Slightly helpful	0	1	3.3
Of no help	0	0	0
Extent to which stuttering is currently a problem, compared to pre-treatment:			
More	0	0	0
Less	14	11	83.3
Same	2	3	16.6
Prefer stuttering over controlled speech:			
No	14	12	86.6
Sometimes	2	2	13.3
Yes	0	0	0
Presently consider self a stutterer:			
Yes	14	9	76.6
No	2	5	23.3
Attribute speech improvements to:			
Treatment at ISTAR	16	14	100.0
Factors other than treatment	0	0	0

A surprisingly high percentage of subjects, 85–90%, indicated via the SPQ (Table 7) that they now possessed the fluency skills to control speech or sound fluent. An even higher percentage, over 96%, reported that they were sometimes or almost always able to speak normally without thinking about controlling speech. These responses raise an important question: If almost 90% of such subjects believe they possess the requisite fluency skills to control speech or sound fluent, why do they not use these skills at all times? Is it that they choose to stutter on occasion? Can they not be bothered with using the controls at times? Are the social pressures so great in some situations that they simply lose control? Are they self-conscious about the quality of their controlled speech patterns, or are their responses on the questionnaire less than accurate? We could speculate that any combination of these factors might operate for a given subject. These questions invite investigation.

It was also noted that 23% of subjects reported that they no longer considered themselves to be stutterers. This response was unexpected as subjects are repeatedly advised throughout the intensive clinic that there is no “cure” for stuttering, that their goal is to acquire effective control over their speech, that they will probably need to deal with residual stuttering and all the attendant anxieties and avoidance tendencies for several years, if not for life.

It would have been interesting to attempt to match the SPQ responses with the subjects’ speech performance in the telephone sample, particularly for the 23% who no longer considered themselves to be stutterers. However, subjects’ response patterns introduced difficulties. Although the SPQ mailouts were coordinated with the telephone speech probes, there were considerable variations in the return time. Some subjects delayed as long as 6 months before they returned the completed SPQ. To make a meaningful comparison the telephone speech sample and the subjects’ self-evaluation of post-treatment speech performance should be made within a short time of each other.

The results obtained in this study compare favorably with other published investigations of long-term results. Martin (1981) reviewed a number of long-term studies and concluded that only one third of all subjects achieved and maintained satisfactory results, another third achieved fluency during treatment but were unable to maintain a satisfactory level of fluency during the post-treatment period, whereas the remaining third dropped out of treatment or were unavailable for follow-up assessment.

Howie et al. (1981) reported that when their subjects were tested 12–18 months after treatment, they were still significantly improved and their attitudes toward speaking were significantly more positive than before treatment. However, signs of relapse were also present in 30–60% of their subjects, depending on which criterion was used to determine relapse. In the present study about 24% showed signs of relapse ranging from moderate to severe. Another factor that can be compared is the low drop-out rate in the current study: 49 subjects enrolled in the intensive programs, and all completed the course. Of that total, 42 or 86% were available for at least two follow-up surprise phone calls. This contrasts with Martin’s observation (1981) that one third of subjects fail to complete treatment programs or are unavailable for fol-

low-up testing. Ryan (1974), for example, was able to obtain follow-up measures on only 25 of his original 58 subjects.

Since this and other investigations indicate that a proportion of clients will experience some degree of relapse after treatment, it is interesting to speculate on why this might happen. The following speculations are offered:

1. The average adult stutterer will have experienced thousands of speech situations where he was embarrassed, humiliated, and frustrated by his stuttering and the audience reaction. Such repeated experiences will likely have had and will continue to exercise a profound effect on the individual’s feelings of self-worth as well as his willingness and ability to adopt new attitudes and behaviors.

2. The cyclical nature of many human disorders is also evident in stuttering (Sheehan, 1970). Individuals may experience wide swings in severity and in their ability to monitor and effectively manage their speech.

3. The stresses, anxieties, and crises experienced by many people are likely to increase the severity of the disorder and/or reduce an individual’s capacity to control the speech system.

4. Monitoring a new, controlled speech pattern requires constant attention. The requisite effort may be similar to the struggle to maintain a strict diet over many years. An enormous amount of energy, determination, and self-discipline is necessary to maintain new behaviors, attitudes and lifestyles, month after month, in the post-treatment environment. Stutterers, like other individuals in similar circumstances, occasionally give up, express frustration with the need for constant monitoring, and take a vacation from vigilance.

5. The underlying neuropsychological/neurophysiological deficit, which we assume exists in the stutterer (Moore & Boberg, 1987; Boberg & Webster, 1990), may or may not continue to operate to some degree after treatment and may continue to hamper the efficient operation of the speech mechanism. The need for compensatory control may vary widely among stutterers and may be related to such factors as severity, age at time of treatment, and the severity of the underlying deficit. If such subgroups exist we might anticipate that clients in one group will achieve normal-sounding speech relatively quickly, whereas clients in another group, with greater deficits, will need to exercise continual monitoring to achieve even a minimal level of control. The identification of client subgroups, in terms of their response to treatment, is another area that invites research.

Martin (1981) and Cooper (1986) have speculated that within any large group of stutterers 15% to 65% will be unable to benefit from treatment or unable to maintain clinical gains in the post-treatment environment. Cooper has referred to these individuals as “chronic stutterers”; their stuttering will persist despite all therapeutic efforts.

A limitation of the present study is that no consideration was given to the possible effects of clinical contacts that subjects may have had after the intensive clinics. Our informal reports indicate a wide range of experiences: some subjects had no contacts with a speech-language pathologist or with self-help groups; others had implemented a home practice program; others reported that they had attended self-help groups; others had arranged occasional sessions

with a local speech-language pathologist. It was not possible to track all these post-treatment experiences, but we did record the subjects' attendance at Institute refresher clinics:

- 5 adults and 8 teens had no contact with the Institute
- 7 adults and 6 teens attended one weekend refresher
- 3 adults and 4 teens attended two weekend refreshers
- 2 adults and 5 teens attended one 5-day refresher
- 2 teens received about 35 hours of maintenance treatment at the Institute

The investigators were unable to detect any systematic relationships between attendance at refresher clinics and long-term outcome. Since several subjects were engaging in some type of maintenance activities the results in this study should be viewed as reflecting speech performance at various points in the post-clinic period rather than the final post-treatment outcome.

Another limitation of the study is that only one speaking situation in the subjects' speaking environment was sampled—a surprise telephone call. It should not be assumed that this condition represents the subjects' speech performance in all post-clinic situations. However, extensive clinical observation and some experimental evidence suggests that telephone conversations, especially surprise calls, tend to be among the most difficult speaking situations for stutterers. They are certainly not regarded as situations that elicit improved speech performance. A final limitation is the absence of syllable rate data or speech naturalness measures in this study. It is not possible, therefore, to reach data-based conclusions about the quality of the subjects' post-clinic speech.

Further study is needed to determine the effects of post-treatment maintenance activities on long-term outcomes. Additional study is also needed to determine relationships between clients' self-evaluations of their speech performance and objective speech measures. Of particular interest would be subjects who report that they no longer consider themselves to be stutterers after completing an intensive treatment program.

Summary and Conclusions

Results from an investigation of long-term outcome following an intensive treatment program can be summarized, and the following tentative conclusions can be drawn:

1. Over 90% of subjects who completed the intensive Comprehensive Stuttering Program experienced dramatic gains at the end of the program, in terms of reduced %SS scores and their responses on a questionnaire. Speech performance during the 12- to 24-month follow-up period was measured by analyzing speech samples obtained from surprise phone calls to the client. The results revealed that approximately 69% of subjects were able to maintain their clinic gains at a satisfactory level, with an additional 7% at a marginally satisfactory level. On the Speech Performance Questionnaire about 80% rated their 12-24 month post-treatment speech as fair or good and claimed still to have the fluency skills needed to control their speech, and 23% reported that they no longer considered themselves to be stutterers. Because approximately 24% of the clients expe-

rienced some degree of post-treatment relapse it was suggested that these individuals might constitute a distinctive subgroup.

2. Student raters were carefully trained to count stuttered and nonstuttered syllables and demonstrated high inter- and intra-rater reliability. This suggests that careful and extensive training in syllable counting may help persons who rate stuttering to achieve satisfactory levels of agreement within a particular clinic. However, these results cannot be generalized to address the difficult problem of interclinic disagreements on syllable counting.

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