

INTENSIVE GROUP THERAPY PROGRAM FOR STUTTERERS

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ABSTRACT

Twenty-one adult stutterers were each enrolled in one of four intensive three-week summer group therapy programs over a two year period. Prolongation was used to gain initial fluency in the program which combined behavior modification techniques with selected procedures from traditional therapy. An arrangement of counters and timers provided each stutterer with immediate, individualized feedback of performance data within the group setting. Pre and post video samples of conversational speech indicated that the mean percentage of stuttered syllables for all four groups decreased from 21% to 1.3%.

In the past decade operant procedures have been applied to the experimental manipulation of stuttering (Goldiamond, 1965; Haroldson, Martin and Starr, 1968; Curlee and Perkins, 1969; Ingham and Andrews, 1971). The data from these and similar studies suggest that systematic application of operant principles will produce substantial modifications in the measured frequency of stuttering in an experimental setting. It has been pointed out that ". . .there is little reliable evidence to support the use of response contingent treatment procedures in stuttering therapy" (Martin and Ingham, 1973). Other authors (Ryan, 1974; Ryan and Kirk, 1974) report that the experimental procedures can be applied to treatment programs.

Ingham and Andrews (1971) described an intensive program in which adult stutterers were hospitalized. Their stuttering was then decreased through the use of a token economy and the systematic application of either syllable-timed speech, prolonged speech or delayed auditory feedback.

The purpose of this paper is to describe an intensive clinical program combining elements of the Ingham and Andrews program with traditional techniques of prolongation and cancellation. The three major goals of this program were to produce a rapid decrease in stuttering frequency, to transfer fluency to a variety of situations and to maintain fluency in a follow-up program.

METHOD

Patients

Twenty-one stutterers completed the program during the summers of 1973 and 1974. The 15 males and 6 females ranged in age from 17 to 44 with a mean age of 27.1. They represented a wide cross section of educational and occupational levels. Seventeen of the patients reported previous therapy experiences in another setting.

Clinicians

Twelve undergraduate student clinicians worked with the four groups. The students were trained to use the equipment, count stuttered and fluent syllables, administer the program and collect data.

Equipment

The equipment used in this project was designed by Diversified Electronics, Ltd. of Edmonton to provide individual and immediate feedback to each stutterer in the group. The block diagram in Figure 1 illustrates the physical arrangement of patients, student clinician, Behavior Counters and Master Control Unit. On the Behavior Counter in front of him each patient could read: the total number of syllables spoken in each session (Behavior I); the total number of syllables stuttered in each session (Behavior II); and the total speaking time in seconds for each session. The component parts of the Master Control Unit and the Behavior Counter are diagrammed in Figures 2 and 3.

Whenever a patient indicated readiness to speak, the student clinician would activate the clock on his Counter by pushing the appropriate channel selector. She would then monitor his speech by depressing the appropriate micro switch to indicate the occurrence of stuttered or non-stuttered syllables. The switch depressions were registered on the electronic display panels in front of each patient as Behavior I or Behavior II. This process continued until each patient had spoken a minimum of 300 seconds.

FIGURE 1. Block diagram showing physical arrangement used in the clinical room.

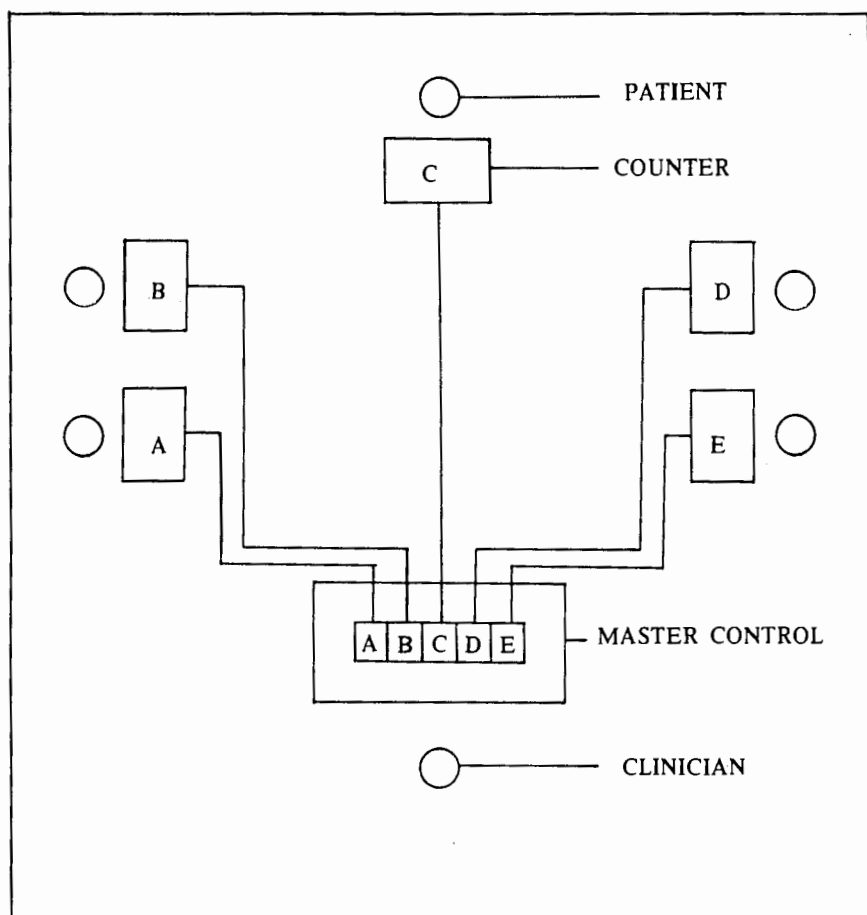


FIGURE 2. Diagram showing components of Master Control Unit.

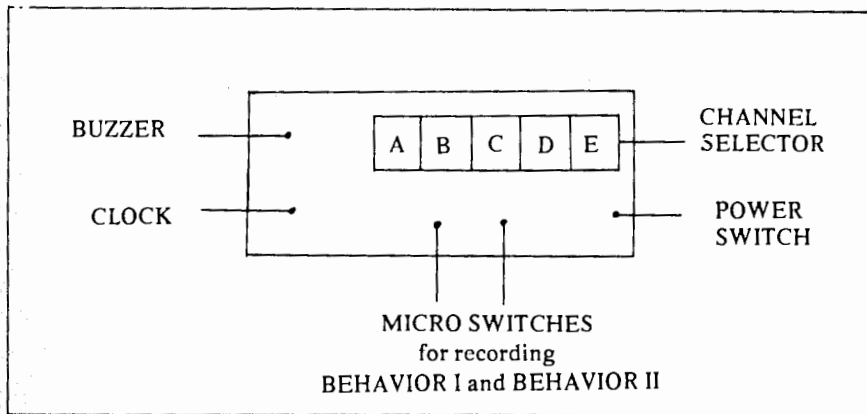
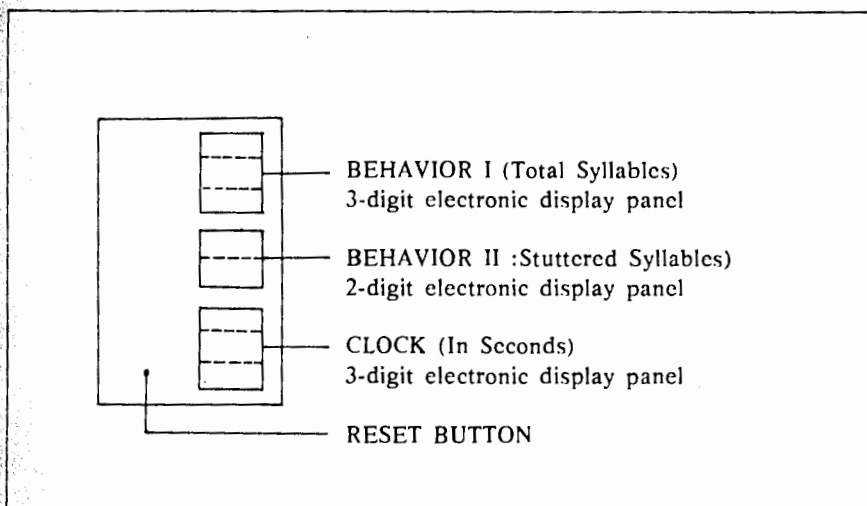


FIGURE 3. Diagram showing components of individual Behavior Counters.



Design of Program

The patients met in groups of five or six in four separate summer programs. Each program ran for approximately seven hours per day for three weeks. The patients lived in University Residence halls for the duration of the program.

Table 1 shows the design of the Disfluency Modification Program. Money payments were used in the first three phases and in the maintenance program. From a \$30.00 deposit made by each subject on the first day, each patient received a \$1.00 payment upon successful completion of each of the first 15 sessions. The balance was paid during the maintenance program. Failure to achieve the goal of any particular session resulted in forfeiture of the money for that session. A session was defined as a minimum of 300 seconds of speaking time for each member of the group.

Once criterion was reached in one phase, the patients moved to the next program phase.

32

Table 1. DESIGN FOR INTENSIVE STUTTERING THERAPY PROGRAM

PRELIMINARY PROBE	DISFLUENCY MODIFICATION PROGRAM					POST PROBE	MAINTENANCE PROGRAM
Conversation Counting Reading Telephone Video	PHASE I	PHASE II	PHASE III	PHASE IV	PHASE V	Conversation Counting Reading Telephone Video	Daily-Speech Situations Record Keeping Clinic Visits Phone Calls Audio and Video Samples
	BASELINE	CLINICAL TREATMENT			TRANSFER		
	Pre-treatment rate	Prolongation	Increased Rate	Increased Rate	Normal Rate		
	Payments	Payments	Payments Cancellation Buzzer	Cancellation Self-Monitoring	Cancellation Self-Monitoring		

Measurement Procedures

Stuttered and fluent syllables were counted throughout the pre and post probes as well as during Phases I - III. In Phases IV and V, fluent syllables were not counted except for an occasional probe to measure syllable rate per minute. These data permitted the computation of percentage of syllables stuttered (%SS), syllables stuttered per minute (SS/M) and total syllables per minute (TS/M). The collection of both the percentage of stuttering and the syllable rate per minute provided a two-dimensional measure of stuttering behavior.

In order to avoid subjective judgments as to whether a particular disfluency was normal or deviant, all disfluencies were counted in the pre and post probes. For example, if the patient said, "My favorite activities are skiing, skating and . . . ah . . . curling," the "ah" might possibly be considered to be a normal disfluency if it was not accompanied by struggle behavior. Nevertheless, it was counted as an instance of stuttering.

During the week preceding Phase I and following completion of Phase V, the following pre and post measurements were made:

- a. A video recording of a 3-minute sample of conversation and a 3-minute sample of reading. A beep tone was superimposed on the tape at one-minute segments. In order to minimize the possibility of generalization effects from the program, these samples were recorded in an Audio Visual Studio in another building with an interviewer who was not associated with the program in any way.
- b. A Disfluency Evaluation. This consisted of 30 minutes of talking in the following nine situations: 1) Five minutes of conversation with the interviewer; 2) One minute of counting; 3) One minute of reading single words; 4) Two minutes of reading sentences; 5) Five minutes of reading textual material; 6) Two minutes of telephone conversations with commercial establishments; 7) Four minutes of conversation with an adult stranger outside of the examination area; 8) Final five minutes of reading textual material; 9) Final five minutes of conversation with interviewer. All of these speech samples were recorded on audio tape. A beep tone was superimposed on the recording at one-minute intervals in all of the speech samples, except for items 6 and 7.

Reliability of Measurements

The syllable was the basic unit of measurement. It was identified as either stuttered or non-stuttered. Each stuttered syllable was counted only once, even though it might have contained more than one instance of stuttering, e.g., the sentence "I w-w-will go home t-t-t...(silent block)....tonight," contains two stuttered and four non-stuttered syllables.

To determine the reliability of judgments of the occurrence of stuttered and non-stuttered syllables, an interobserver agreement procedure was used. The assigned therapist and a second therapist listened to a three-minute sample of conversational speech taken from either the video sample or the disfluency evaluation form of the preliminary probe. Independently, they counted stuttered and non-stuttered syllables. These counts were used to compute a percentage of agreement employing the method described by Ryan (1974).

Therapist A's Count X 100
Therapist B's Count

The percentage of agreement on counted stuttered syllables ranged from 67.2% to 100% with a mean of 93.8%. On counted non-stuttered syllables the percentage of agreement ranged from 79.5% to 100% with a mean of 94.2%. The considerable range obtained reflects the frequently observed differences in the difficulty of counting instances of stuttering in different individuals. The low score of 67.2% mentioned above was obtained on a patient who is dysarthric. Both of the observers reported difficulty in discriminating between the stuttering behaviors and other facial movements related to the dysarthric condition.

To determine whether the judgments of stuttering occurrence were reliable in the post probe measures, an independent observer counted the instances of stuttering in the first two minutes of the video sample using the first two patients from each of the four groups. The counts made by Observer 2, following the clinics, were compared with the original counts made by Observer 1 and are presented in Table 2. The counts are presented as raw data rather than in percentage form because of the low frequencies of occurrence.

TABLE 2. The total number of stutters in two minutes of the post probe video sample in eight patients comparing the original counts of Observer 1 with subsequent counts made by Observer 2.

Patient	Observer 1	Observer 2
T.K.	0	0
M.W.	4	4
B.W.	3	5
D.H.	1	1
R.C.	11	11
W.C.	0	0
H.W.	8	7

Description of the Program Phases

Phase I - The purpose in this phase was to establish a base line of stuttering frequency in the group setting. Patients were asked to start talking and continue for five minutes. At the end of each session the %SS, SS/M and TS/M were computed and entered on the daily record sheets. Baseline sessions continued until the following stability criterion was achieved:

If the mean %SS of the first 3 sessions is between 0 and 9, then the mean of session #4 must not vary by more than $\pm 2\%$ SS. If the mean is between 10 and 19, then the mean of #4 must not vary by more than $\pm 3\%$ SS, etc.

The display panels in front of each patient were covered during this phase so that the patient could not watch the appearance of numbers on the panel. Money payments were presented upon completion of each five-minute session.

Phase II - In this phase, the criterion for receipt of payment was a 10% reduction in the %SS from the mean of the three previous sessions. The clinician described and demonstrated a prolonged speech rate of approximately 60 syllables/minute and suggested that such prolongation was one method of gradually reducing the struggle behavior. For purposes of calculating the %SS during the treatment phases, controlled, struggle-free prolongations were not counted; all other struggle behaviors, including effortful repetitions of sounds or syllables, blocks, interjections or any effortful emission of syllables, were counted as instances of stuttering. At the

end of each session, the patients calculated their scores from the figures on the counters and received payment as well as social reinforcement if they had met their target. Each patient's score was also recorded on the blackboard. Patients continued in this phase until they had done three successive sessions with a stuttering rate of 2% or less.

Phase III - Cancellation was described to the patients as a punishing event which was to replace the opportunity to finish the sentence (an event which we assumed to be reinforcing). The patients were told that they must stop immediately if they began to struggle and must repeat the stuttered word until they produced it fluently. A buzzer on the master control was connected so that each switch depression, identifying stuttering behaviors, was accompanied by a loud buzz. The use of prolongation was continued. At the outset of this phase, the patients were instructed to increase their speech rate gradually as they felt able to do so. They were further instructed to return to a slower rate at the first reappearance of struggle behavior. Payments were contingent upon completion of a session with less than 2%SS but were discontinued after the fifteenth session, which occurred in Phase III. Patients continued in this phase until they obtained five consecutive sessions with a stuttering rate of 2% or less.

Phase IV

Patients were provided with wrist counters and taught to self-monitor. The student clinician kept an independent tally to check on the accuracy of the self-monitoring. The patients were instructed to continue increasing their speaking rate until it fell between 140 and 200 syllables/minute. An occasional rate probe was made by using the syllable counter to determine the syllable rate per minute. Cancellation procedures were continued. The patients continued in this phase until they obtained five consecutive sessions at a rate between 140 and 200 syllables/minute with a stuttering rate of 2% or less. A further criterion was that the patient's self-monitoring and the clinician's monitoring of stuttering frequency must not vary by more than ± 2 for the five-minute session.

Phase V

In order to permit patients as much freedom as possible to select speech situations relevant to their needs, it was decided to arrange the transfer situations in a relatively unstructured manner. Three steps were arranged, from Step 1 where the clinician accompanied the patient to Step 3 wherein the patient went alone into situations of his own choosing. Although the groups initially started with Step 1 before moving to subsequent steps, they later shifted from one step to another. Consequently, there was no attempt to designate criteria for movement from one step to the next, that is, the steps were not necessarily considered to be in a pre-requisite arrangement.

1. The student clinician accompanied one or two patients into outside situations, starting with listeners in the clinic building, then moving on to telephone calls and other speech situations in stores and on the street. Occasional tape recordings were made for subsequent analysis. In all transfer situations, the patients were instructed to record all instances of stuttering on their wrist counters and continue the cancellation procedures. The patients entered successive speech situations until they had accumulated the five minutes of talking time needed to complete one session.
2. The patients went together in groups of two or three, suggested transfer situations to each other, and checked monitoring accuracy. They continued to record total stutters in the five-minute sessions.

3. In the "Maiden Voyage" the patient went alone into a variety of situations, kept his own records and reported back to the group. An example of one of the more difficult situations that they were encouraged to enter at this stage was to arrange for and conduct a job interview.

It was not feasible to engage in transfer activities more than 3-4 hours per day. The remaining time was spent in the clinic in Phase IV in which the patients would describe and discuss transfer experiences and plan future activities.

The clinic visitor program should be mentioned at this point. Beginning in Phase II, the patients were encouraged to invite friends and relatives to attend sessions and participate in discussions. Evening sessions were often held in auditorium-classrooms where the patients presented five-minute speeches to the group and their visitors.

During the maintenance program, the patients were requested to complete a number of transfer situations every day, record the data and make periodic visits and phone calls to the clinic. Each patient received \$1.00 contingent on a clinic visit plus an additional \$2.00 if he had completed the maintenance activity and recorded the data satisfactorily. A covert assessment procedure is done during maintenance which will be described in a subsequent paper.

RESULTS OF THE PROGRAM

Individual data are presented for each of the four groups in Tables 3-6. The means for each group are provided at the bottom of each column.

Reduction in measured stuttering rate from pre to post can best be appreciated by focusing upon individual scores. For instance, in Table 3, M.W. showed a substantial decrement in stuttering; from 93% in the video reading pre-test to .3% in the video reading post-test. Another indication of the change in M.W.'s speech pattern is the increase in total syllables spoken during the 30 minutes of the disfluency evaluation; from 595 or 19.8 syllables/minute in the pre-test to 5,423 or 174.2 syllables/minute in the post-test.

Table 7 presents the mean percentage of stuttering from all four groups. It may be noted that the stuttering rates in the preliminary probes are substantially higher in the video sample than in the Disfluency Evaluation Measure. This difference may be accounted for partially by the presence of video cameras and technicians, which may have added to the pressure of the speaking situation. Another factor is the inclusion, in the Disfluency Evaluation, of speech tasks such as counting and reading single words. Most of the patients demonstrated very low stuttering rates on these tasks compared to conversation and continuous reading.

Another factor that can be examined is the actual number of minutes required for the patients to reach the initial stage of fluency. Each patient talked 5 minutes per session. The average number of sessions required to meet the criterion for Phase II (three successive sessions with less than 2% stuttering) was 8.75 with a range of 3 to 21. That is, the average time required for a patient to gain initial fluency, at a prolonged speech rate, was approximately 44 minutes of actual talking time.

TABLE 3. Pre and post measures for patients in the June, 1973 Intensive Group. The table provides the percentage of stuttering in the Video Sample and the Disfluency Evaluation and the total stutters and syllables in the Disfluency Evaluation.

Name	Age and Sex	VIDEO SAMPLE (6 min)				DISFLUENCY EVALUATION (30 min)					
		Conversation		Reading		9 Combined Measures					
		% Syllables Stuttered		% Syllables Stuttered		Total Stutters		Total Syllables		% Syllables Stuttered	
		PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
T.K.	23/M	29	0.0	30	0.0	466	2	1931	5664	24.1	0.0
M.W.	24/F	85	0.3	93	0.3	235	21	595	5423	39.5	0.4
R.M.	34/M	9.7	7.1	20.5	3.5	213	76	2150	2203	9.9	3.5
F.L.	25/M	5.5	1.2	3.5	0.9	443	37	5512	6050	8.0	0.6
T.F.	34/M	22.1	0.2	49.2	0.3	480	46	3650	4361	13.2	1.1
\bar{X}		29.1%	1.8%	39.2%	1.0%	367.4	36.4	2767.6	4740.2	18.9%	1.1%

TABLE 4. Pre and post measures for patients in the August, 1973 Intensive Group. The table provides the percentage of stuttering in the Video Sample and the Disfluency Evaluation and the total stutters and syllables in the Disfluency Evaluation.

Name	Age and Sex	VIDEO SAMPLE (6 min)				DISFLUENCY EVALUATION (30 min)					
		Conversation		Reading		9 Combined Measures					
		% Syllables Stuttered		% Syllables Stuttered		Total Stutters		Total Syllables		% Syllables Stuttered	
		PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
B.W.	27/M	55.9	1.1	40	0.0	515	23	1422	4156	36.2	0.6
D.H.	31/M	5.2	0.4	3.2	0.4	143	14	3753	4920	3.8	0.3
M.S.	27/F	9.8	0.8	4.2	0.5	267	87	4726	4473	5.7	1.9
G.F.	22/M	10.8	2.5	20.5	3.0	376	87	2851	3481	13.2	2.5
D.B.	25/F	3.6	0.0	1.0	0.0	65	4	5049	7225	1.3	0.1
\bar{X}		17.1%	1.0%	13.8%	0.8%	273.2	43.0	3560.2	4851	12.0%	1.1%

TABLE 5. Pre and post measures for patients in the May, 1974 Intensive Group. The table provides the percentage of stuttering in the Video Sample and the Disfluency Evaluation and the total stutters and syllables in the Disfluency Evaluation.

Name	Age and Sex	VIDEO SAMPLE (6 min)				DISFLUENCY EVALUATION (30 min)					
		Conversation		Reading		9 Combined Measures					
		% Syllables Stuttered		% Syllables Stuttered		Total Stutters		Total Syllables		% Syllables Stuttered	
		PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
R.C.	32/M	28.4	4.1	34.2	1.0	443	72	1694	4052	26.2	1.8
L.M.	25/F	25.0	0.2	23.5	0.0	586	25	3489	4880	16.8	0.5
G.J.	18/M	28.9	0.0	10.0	0.1	400	18	3798	4988	10.5	0.4
J.S.	30/M	4.0	0.0	4.1	0.0	137	17	4333	4288	3.2	0.4
S.H.	32/F	25.0	1.4	17.5	1.4	284	34	2257	3869	12.9	0.9
B.M.	44/M	19.9	0.4	8.7	0.3	536	15	5015	4417	10.7	0.3
\bar{X}		21.9%	1.0%	16.3%	0.5%	397.7	30.2	3431.0	4415.7	13.4%	0.7%

TABLE 6. Pre and post measures for patients in the July, 1974 Intensive Group. The table provides the percentage of stuttering in the Video Sample and the Disfluency Evaluation and the total stutters and syllables in the Disfluency Evaluation.

Name	Age and Sex	VIDEO SAMPLE (6 min)				DISFLUENCY EVALUATION (30 min)					
		Conversation		Reading		9 Combined Measures					
		% Syllables Stuttered		% Syllables Stuttered		Total Stutters		Total Syllables		% Syllables Stuttered	
		PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
W.C.	27/M	25.1	0.0	33.5	0.3	722	25	3075	4646	23.5	0.5
H.W.	30/M	14.7	3.3	27.8	1.8	532	73	3045	4320	17.5	1.7
C.R.	22/F	21.8	0.3	14.2	0.7	105	17	3441	3697	3.1	0.5
R.M.	21/M	8.8	0.9	9.0	0.2	432	65	5589	5700	7.7	1.1
C.G.	17/M	9.7	2.4	28.2	4.5	276	121	1432	3039	19.3	4.0
\bar{X}		16.0%	1.38%	22.5%	1.5%	413.4	60.2	3316.4	4280.4	14.2%	1.6%

DISCUSSION OF THE PROGRAM

The program described above is a complex of several different procedures. Because of the clinical nature of the program it was not possible to isolate the effects of the individual variables. The following discussion of the relative merits of various procedures is based on clinical observations, in the hope that it may be helpful to someone attempting to design a fluency program.

The immediate feedback of performance data to the individual talking within the group setting, provided by the Behavior Counters, appeared to be a critical component of the program. During Phases II and III, when fluency was being established, the frequency of stuttering rose rapidly whenever the Counter was turned off at the end of a session. As the program progressed, the patients appeared to become more and more attentive to the panels displaying the counted behaviors. Although other variables, associated with the end of a session, might also be involved, it would appear reasonable to speculate that the appearance of numbers on the Counter, signalling the occurrence of stutterings, acted as contingent punishing stimuli and thus exercised some control over the frequency of stuttering. Another interpretation might be that the numbers on the Counters served to call attention to stuttering and that this in combination with instructions and other procedures served to reduce the frequency of stuttering.

Although there was no attempt at an experimental demonstration, other program procedures might also have had punishing and reinforcing effects. On the basis of earlier punishment studies reported by Martin (1968), one might assume that the contingent buzzer, introduced in Phase III, operated as a punishing stimulus. Whatever other effects the cancellation procedure might have had, it, too, appeared to operate as a punishing consequence: perhaps not being permitted to finish the sentence until the disfluent word had been fluently produced had an effect similar to the time-out procedure used by Haroldson, Martin and Starr (1968). This speculation is supported by the fact that many of the patients expressed annoyance at having to stop and repeat a word. Sheehan, in an early article (1951), also reported a decrease in stuttering when the stutterers were required to repeat a stuttered word until they could produce it fluently, before they were permitted to complete the sentence.

The money payments used in the early phases were probably useful in a minor way. When questioned after the program, most of the patients reported that the payments had helped sustain interest initially but were no longer necessary when fluency gains were realized. It is possible that a payment system might be more useful with a younger group or if the deposit and money payments were substantially larger.

Ingham and Andrews (1973) advocated continuous monitoring of speech behavior in any fluency program. This suggestion was incorporated into our program. After each session patients recorded the numbers from the Counters, calculated their scores, entered the figures in their own records and then onto a blackboard. From many remarks made during the program it is my impression that patients benefited greatly from the continual recording indicating progress across sessions. The public display of the figures on the blackboard, in particular, allowed opportunities for group members to provide supportive comments to each other. The constant monitoring permitted each patient to compare his performance with other group members and his own previous performance.

TABLE 7. The mean percentage of stuttering for the four groups in pre and post measures in the Video Samples and Disfluency Evaluation Forms.

Video Sample				Disfluency Evaluation	
Conversation		Reading		9 different measures	
PRE	POST	PRE	POST	PRE	POST
21.0%	1.3%	23.0%	1.0%	14.6%	1.1%

The group setting offered both advantages and disadvantages. One of the advantages was the provision of a forum for discussing topics which are dealt with more directly in other therapeutic approaches (Van Riper, 1973). The patients spontaneously introduced subjects such as avoidances, fears and social anxieties. Although these areas were never worked on directly, the student clinician encouraged open discussion and supplied pertinent information about the speech process and characteristics of stuttering. It is my subjective impression that the patients benefited from these discussions, particularly from the opportunity of hearing how other stutterers attempted to cope with difficult situations. Systematic programming of such discussions would be difficult. It might, however, be possible to develop guidelines to ensure that certain topics would be covered and in a particular sequence. This is an area where we might profitably investigate a closer merging of behavior modification and traditional procedures. For example, could fluency maintenance be enhanced by systematically introducing, into a behavior modification program, those traditional procedures directed at reducing avoidance and changing attitudes?

A second advantage of the group was that it provided a ready source of social reinforcement. Group members displayed what might be referred to as spontaneous enthusiasm and excitement whenever other members demonstrated progress. Group comments seem to have had as great or greater effect than a similar expression from the student clinician. The group members extended their support beyond the clinic since they spent considerable time together during non-clinic hours.

Another possible advantage of a group as compared to a one-to-one situation was that it more closely resembled a "real-life" situation. Not only did these groups provide a relatively natural setting for conversation but group members also reported that they experienced, many of them for the first time, the joys and difficulties (in non-scientific terminology) of participating in a group discussion. They were required to present ideas, support them and develop tolerance for opposing ideas.

Furthermore, the group interaction seemed to facilitate transfer in Phase V of the program. I was repeatedly impressed with the ease with which the patients moved from the clinic to conversing with strangers on the street and in stores. The patients did many of their transfers in groups of two or three. This arrangement not only reduced clinician time but established a pattern of working together to solve mutual problems, a practice that carried over into the maintenance program.

The major disadvantage of the group setting was that it required more time. Participating in therapy along with four other people obviously reduces the amount of talking time available to any single patient. Ryan (1974) recommends "individual training or at least a combination of individual and group training because the critical event in training appears to be the number of monitored responses a client can make or hours of monitored practice a client can collect." Whether or not the advantages of a group setting for fluency programs outweigh the disadvantages is an important question and should be investigated systematically.

A final comment about the program procedures concerns the relative ease most of the patients experienced in reducing the amount of struggle through the use of prolongation. I had considered using DAF or a metronome to assist in the establishment of initial fluency. It soon became apparent, in a pilot study, that such procedures were not necessary, so we eliminated them in the interest of simplifying the equipment needs of the program. Prolongation appeared to be an easily administered and effective procedure when used within a carefully structured program.

Maintenance data will be presented in a subsequent article along with a discussion of problems encountered in maintaining fluency in a natural environment.

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