

CLINICAL STUDIES

Using a Computerized Stuttering Treatment Program to Supplement Fluency Shaping Therapy

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Fluency-shaping procedures for stuttering have been accepted as effective and reliable strategies for enhancing the distorted speech patterns of individuals who stutter. It has been well documented that therapeutic techniques incorporating rate reduction, respiratory control, gentle voice onsets, as well as proper articulatory postures are effective forms of treatment for stuttering when applied in a systematic and comprehensive program. Inherent in fluency shaping programs are principles of learning that include reduced response variability and immediate instructional feedback as the client progresses through the various steps of the treatment approach.

Recently, one of the authors (Kroll) has been involved in the development of a computer program that presents speech therapy techniques to the client using speech recognition and analysis. The program, known as Dr. Fluency, was first introduced to Canada at the Clarke Institute of Psychiatry and continues to be tested at the Stuttering Centre of the Speech Foundation of Ontario. Clients are introduced to the various units of the program as they proceed through intensive treatment. They are then asked to provide feedback as to the effectiveness of using the computer as compared to completing their speech exercises without computer assistance.

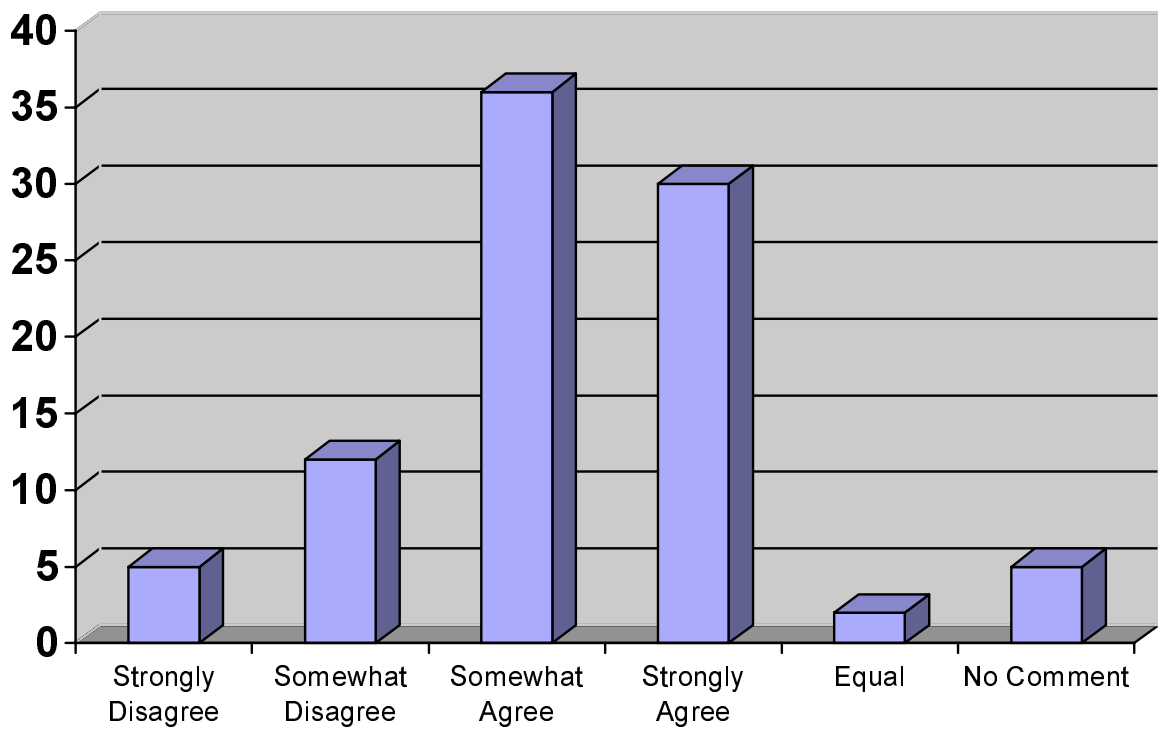
The study surveyed 29 individuals who stutter as they participated in the intensive behavioural treatment program. All subjects were male and ranged in age from 14 to 50 years. Stuttering severity ranged from mild to severe. The 29 subjects represented a total of five treatment groups. A 19-item questionnaire utilizing a five point rating scale was developed by the authors. This questionnaire asked subjects to rate their opinions regarding computers in general as well as the Dr. Fluency Program specifically (see attached). The questionnaire was completed on the last day of the fluency shaping treatment program.

This paper will highlight some of the major findings of the survey. Results will be discussed with reference to subjects' ratings of visual learning, computer feedback, and overall satisfaction level with computerized training.

- 69% of the subjects indicated that they learn better through visual demonstration than through verbal explanation
- 90% of the subjects indicated that the Dr. Fluency demonstrations preceding each unit are helpful
- 86% of subjects indicated that the computer's on-line easy onset curves were more effective than traditional biofeedback devices (e.g., voice monitor)
- 86% of the subjects indicated that their accuracy in achieving specific speech targets such as prolonged syllables was facilitated by utilizing Dr. Fluency
- 86% of the subjects indicated that all feedback provided by the Dr. Fluency program was generally useful

The data from this study indicate that the Dr. Fluency stuttering treatment program provides a powerful tool for facilitating fluency-shaping training. Subjects expressed a high level of satisfaction with both the demonstration and trailing aspects of the program. It has been reported by clients in the past that fluency-shaping exercises are not generally highly interesting. It is felt that the Dr. Fluency program serves to better motivate clients as they progress through treatment and as they are provided with a complete and accurate indication of their progress. The authors hope to incorporate more aspects of the program within training sessions and eventually to replace existing conventional hardware.

Percentage of Clients Who Believe They Learn Better Through Visual Demonstration than through Verbal Explanation



Dr. Fluency™ Computerized Stuttering Treatment Program is essential to Kasseler Stuttering Therapy

The data after one year

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1. SUMMARY

Since the beginning of 1996 a three year evaluation study has been conducted at the University Gesamthochschule Kassel using the Kasseler Stuttering Therapy. Dr. Alexander Wolff von Gudenberg is responsible for the therapy and the collection of data, and Prof. Harald A. Euler, Ph.D. is the academic adviser.

The Kasseler Stuttering Therapy is a computerized biofeedback therapy for the treatment of teenage and adult stutterers. The effectiveness and efficiency of this therapy is demonstrated by the results of the first clients out of therapy for at least one year.

The study incorporated a waiting control group of ten clients and a randomly sampled raters agreement testing. Up until now 33 clients have completed the intensive program, of these 21 has also completed at least a one year maintenance phase. At four different times in the therapy the disfluencies in 4 every day speech situations are counted and the self-evaluation of the speech behavior is recorded using established questionnaires. In an evaluation of their data 71% of the clients demonstrated after one year less than 25% of their pretherapeutic disfluencies and less than 3 syllables-percentages. With 24% of the clients the disfluencies decreased to between 38% and 61% of their pretherapeutic values, that means the improvements were not so pronounced. One client did not profit from the therapy at all.

During the period of research the clients' self-evaluation of their speech behavior showed a marked improvement.

The data show that with this therapy approach, which uses an elaborated computer program also in the maintenance phase on a regular basis, the relapse-rate can be reduced significantly. Because in Germany very few stuttering therapies systematically evaluate their results at all one can hardly compare them with the Kasseler Therapy.

2. THE STRUCTURE OF THE THERAPY

The Kasseler Stuttering Therapy is based on the principles of fluency-shaping therapies like PFSP into which elements from non-avoidance methods and other therapy approaches (e.g. PMR of Jacobson) have been integrated. The therapy consists of diagnostic procedures, a 24 day intensive program and a structured maintenance phase for at least one year.

Diagnostic procedures: After a consideration of the client's case history the therapy concept is explained in an in-depth preliminary discussion in order to assess the client's aptitude and motivation for, and expectations of the therapy. Additionally at this meeting speech samples in four different speaking situations are taken on audio and video-tapes and questionnaires are completed to evaluate the client's communicative and speech abilities and the score of avoidance behaviors. The speaking situations include a standard-interview with people on the street and telephoning with strangers in order to get a more realistic view of the disfluencies in real life situations. They provide more accurate information about the client's actual speaking difficulties than reading texts or an interview with the clinician.

Intensive program: The intensive course consists of three phases: modification, deepening and transfer.

During the *modification phase* the client learns the new speech pattern of gentle speaking, which is marked by stretching the syllables, good diaphragmatic breathing and gentle onsets. These behavioral targets are learned with a very prolonged syllable duration. In the first days of the intensive course, for example, every syllable is made to last for two seconds.

In the next phase the speech pattern of gentle speaking is further *deepened*.

Now the syllable duration is gradually decreased to one and then to half a second for every syllable. This intensive speech training is complemented by different therapeutic measures above all at first getting used to the still consciously exaggerated speech technique (desensitizing).

In the *transfer phase* of the intensive course there is a further increase in the syllable duration up to a normal, but still slow way of speaking. In this retarded normal tempo the clients practice first of all telephoning. Then they take part in a big number of speech situations outside of the therapy rooms in shopping malls and on the streets of Kassel in order to make a habit of the pattern of speech which they have learned. The manifold transfer activities are complemented by role plays and group discussions to make the use of the new speech patterns more natural.

Maintenance: It involves regular practice with a computer with decreasing intensity until the end of the first year, and two months after the intensive course a three day refresher course in which the whole therapy program is repeated. A second refresher is part of the therapy package and further refresher courses are offered regularly. The daily exercises with the computer can be saved on a floppy disk and sent to a therapist for evaluation. This information allows the therapist to get a detailed overview in quality and quantity of the exercises which the client has been doing. So the therapeutical frame is maintained beyond the intensive-course, which fulfills the needs of most clients.

3. THE IMPORTANCE OF THE COMPUTER

During the intensive therapy a computer program leads the client through the units of the exercises. The client speaks the given words or sentences into a microphone and sees his voice curve on the computer screen.

After most exercises there is an obligatory self-evaluation of the speech sample by the client. The following objective evaluation by the computer program takes into account among other things the gentle onset, the correct stretching of the syllables as well as the continuous phonation with words of more than one syllable. The precise presentation of each individual exercise in the form of a voice curve makes it possible to correct one's own speech immediately and to quickly approach the behavioral target which is to be learned. The therapist can explain and show his client –quite literally- the required behavioral aims of the therapy. Both for the client and the therapist it is equally of value to have the possibility to be able to focus on certain exercises and levels of difficulty according to individual needs and problems.

The great importance of a computer program is not only that the speech patterns of gentle speaking can be learned more precisely during the intensive course. Even more important is its use in the maintenance phase by long term exercising at home, which allows the client to retain the new speech motor patterns better, than was previously possible without such an elaborated software.

4. RESULTS

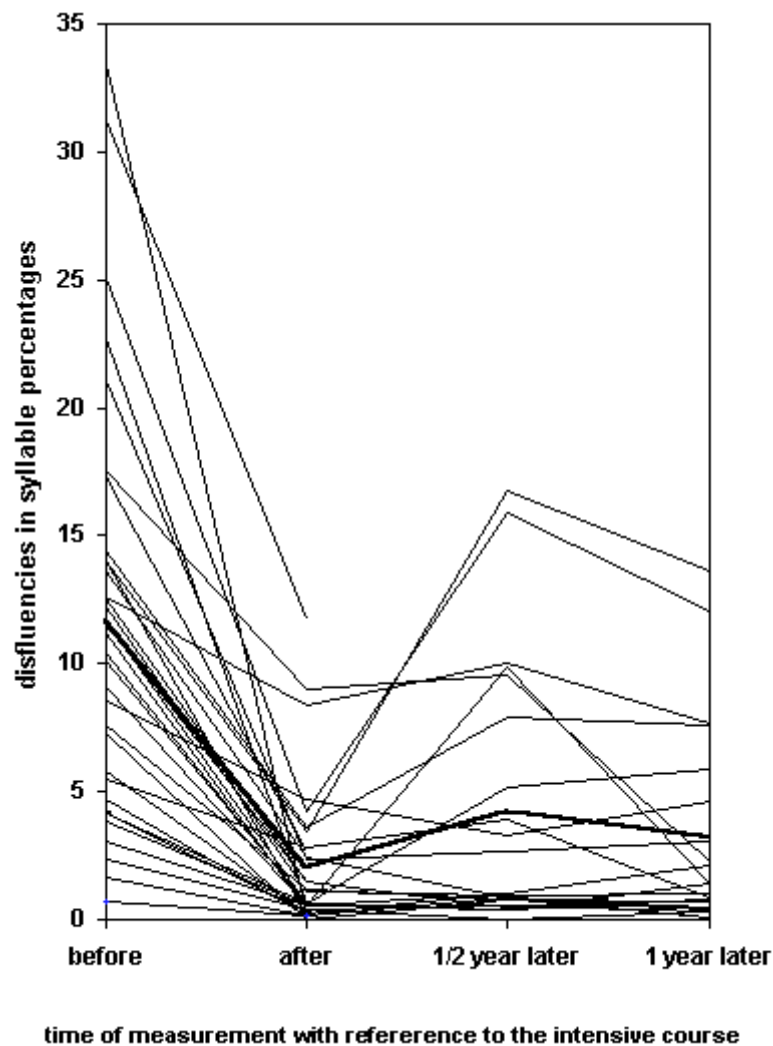
The study examines the effectiveness of the Kasseler Stuttering Therapy on a statistically sufficient number of clients. Because of the well known fact that there is a high number of relapses among stutterers after therapy, the maintenance data has been recorded for at least one year up until now and will be continued for another year at least.

Together 33 clients (27 male, 6 female) in 5 different therapy groups have been treated up until now. From 21 clients the one year results from four different points in time (before and after the intensive program, six months and 1 year after) are available. The effect of the therapy has been recorded objectively with the percentage of disfluent syllables in four different speech situations (Conversation with a therapist, reading, telephoning with an unknown person, interviewing people in the street). The rater agreement is high (overall agreement $r=.9985$ and place to place agreement 78.8%). The variations from the data of the client group to the of the waiting control group are all within the range of random.

Objective measurements

The following graph presents the reduction of the disfluencies as the mean value of four speaking situations for every client. The massive improvement in speech fluency is easily recognizable with nearly all the clients, only a few hardly profit from the program at all.

If one considers the mean average for the four speech situations for the whole group of the clients, (bold type), then the slight relapse after half a year has been further diminished by the their fluency at a high level on a long-term basis.

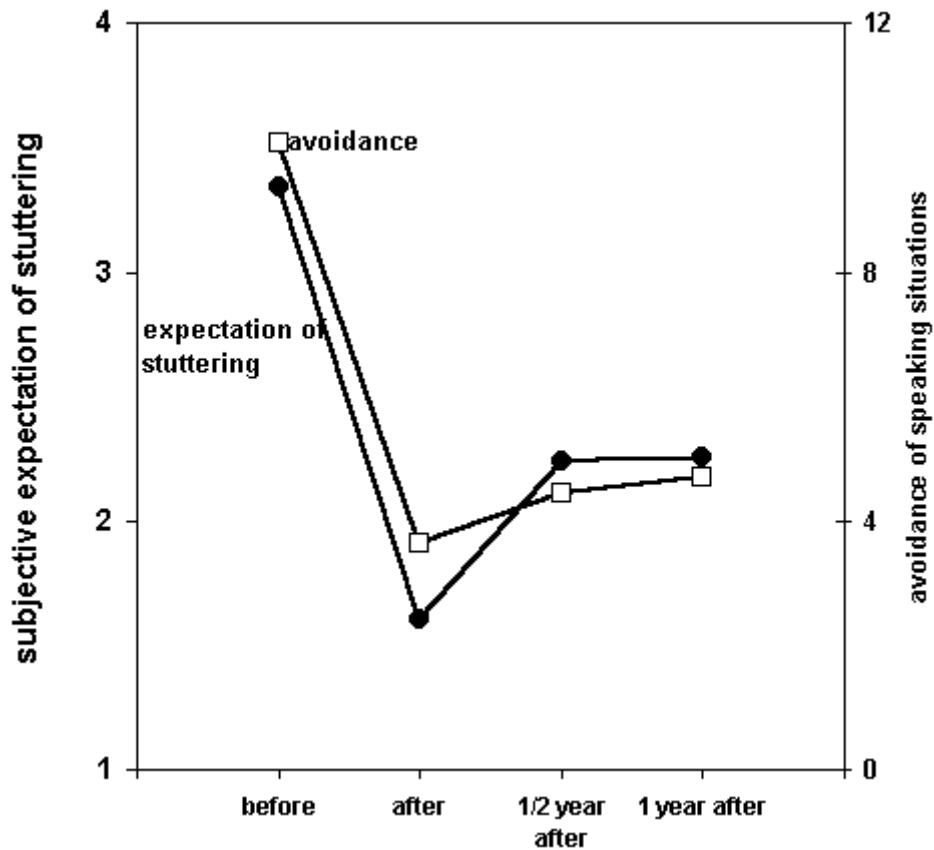


Graph 1: Disfluencies in syllable-percentages as mean of four speaking situations for every client before the intensive course ("before", N = 33), immediately after ("after", N = 33), 1/2 year (N = 22) and at least 1 year later (N = 21); bold type: mean of all clients (in 10 clients of the last intensive course the half year data will be recorded in November 1998).

Subjective measurements

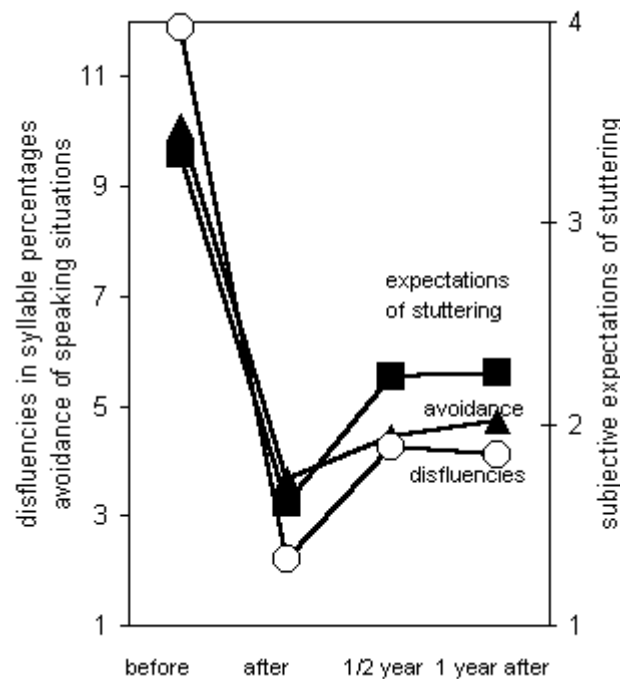
The expected degree of severity in stuttering in 51 different speaking situations (*e.g.* to give directions, to be misunderstood, to give an improvised talk) was evaluated with a questionnaire (1 = no stutter, 5 = very bad stutter) to assess the degree of expected stuttering of the client in different speaking situations.

With the "Perceptions of Stuttering Inventory" (PSI) the avoidance of speaking and of speaking situations is asked about with 18 items (for example, "I don't like to speak in front of too many people, and I try to avoid such situations whenever possible"), with only the possibility to answer dichotomically ("is true / is not true"). The questionnaire results in values between 0 and 18. The second graph shows the results.



Graph 2: Subjective expectations of stuttering (1 = no stuttering, 5 = very bad stuttering; average of all clients in 51 different speaking situations) and avoidance of speaking situations (average of all clients), before the intensive course ("before", N = 33), immediately after ("after", N = 33), ½ year (N = 22) and at least 1 year later (N = 21), (in 10 clients of the last intensive course the half year data will be recorded in November 1998).

Objective stuttering measurements and subjective stuttering measurements agree to a great extent in the form of their curves and corroborate each other's validity (graph 3).



Graph 3: Subjective expectations of stuttering (1 = no stuttering, 5 = very bad stuttering), avoiding of speaking situations and objective disfluencies in syllable percentage, before the intensive course ("before", N = 33), immediately after ("after", N = 33), ½ year (N = 22) and at least 1 year later (N = 21), (average of all clients) (in 10 clients of the last intensive course the half year data will be recorded in November 1998).

Self-evaluation of the therapy effects

The positive therapeutic effects which have been presented are also reflected in the clients own evaluation of their speech. Table 1 shows that the degree of satisfaction with their own speaking behavior after the intensive course is very high, after half a year it goes down, but at the end of the year it is good again.

self-evaluation of the client's speaking behavior	time of evaluation			
	before therapy	immediate after	1/2 year later	1 year later
very good	0	5	0	0
good	1	19	11	13
average	9	8	8	7
imperfect	17	0	3	0
horrible	5	0	0	1

Table 1: Self-evaluation of the client's speaking behavior, a retrospective assessment. (Number of clients)

5. CONCLUSION

The results available up until now and those presented in this paper show that the Kasseler Stuttering Therapy not only has very good short-term effects but also good long-term ones. The comparatively short length of the Kasseler program approximately 200 hours (the intensive program approximately 150 hours, two refreshers 50 hours), the possibility of group treatment and a possible therapist to client ratio of 2 to 10 increase the efficiency of the Kasseler Stuttering Therapy.

The use of the computer program in the maintenance phase, and also the regularly held refresher courses contribute to the fact that the rate of relapses in the clients of the Kasseler Stuttering Therapy is low, also among those clients who have already taken a number of other therapies unsuccessfully. On a long-term basis this form of maintenance also puts clients who have had a temporary relapse in a position to reacquire a high level of speech fluency again and to maintain it without further therapy. This view tends to be supported by the better one year data compared to the half yearly data, just like the clients improving satisfaction with their own speech fluency again in the course of time (Table 1).

It can also be shown using the data acquired in the courses of the Kasseler Stuttering Therapy that the extent of the maintenance activities and the long-term success of the therapy are interconnected. Both, the extent of the practice at home on the computer and the frequency of participation in refresher courses correlate clearly with the success of the therapy after one year. The data also clearly indicates – in contrast to what some other stuttering literature says – that the clients with the highest avoidance scores in the PSI questionnaire profit most from this fluency shaping approach. It is interesting to note that the clients, who attribute their stuttering to physical causes have better long term results than the clients who attribute their stuttering to psychological causes.

Chapter 8.3

THE SWEDISH COMPREHENSIVE STUTTERING TREATMENT PROGRAM: A PILOT STUDY*H. Forne-Wästlund**Orebro, Sweden**SUMMARY*

During last decade there has been increased requests to create possibilities for different treatments for stutterers. It resulted in a two-year project financially supported by the Swedish Ministry of Social affairs, Allmänna Arvsfonden, in collaboration with the Swedish Handicap Institute, for an evaluation of a computerized speech training treatment according to PFSP. The results of this study shows intense speech training with the PFSP, combined with a comprehensive approach of treatment, to be very beneficial for people that stutters. The outcome of treatment for the first nine stutterers are discussed in terms of social benefits and clinical research.

INTRODUCTION

Since the beginning of the 1970s, Stuttering Modification Therapy and Psychotherapy have been the only kinds of treatments available for people who stutter in Sweden. Over the last eight years, there has been a reaction among members of the Swedish Stammerers Association for a change in order to make other kind of treatments available, as well; especially for a method that copes with their need for intense speech-training. The Comprehensive Stuttering Treatment Program given by Robert Kroll, PhD at the Stuttering Centre, Speech Foundation of Ontario, Canada served as a model for this project—a structured, comprehensive treatment that deals with both speech behaviour and the socio-psychological problems of the individual who stutters. Being aware of a strong resistance among colleagues in Speech Pathology, reports of a general lack of interest among therapists to study findings in neuropsychological and/or linguistic research (Andrews et al., 1983; Stromsta, 1986), resistance among Speech Pathologists in Scandinavia (Sederholm, 1992) and other countries (Andrews et al, 1983; Franken, 1997) to new approaches in the treatment of stuttering—and speech training in particular—for people who stutter (Stromsta, 1986), I decided to try to find the easiest way to introduce this new method to Sweden so it could gain acceptance as an alternative, or complement, to those two already existing therapies. As there is a big interest in new technology, a computerized system (Fetterman, 1997) was found to be the easiest way for moving forward. This idea was supported by Mats Hansson and Catharina Brun, Department of research and development, Swedish Handicap Institute and the Swedish ministry of Social Affairs, Allmänna Arvsfonden. During the first year of project, the Dr. Fluency Computerized system was translated into Swedish by me in collaboration with Mr. Eli Fetterman, Israel, the creator of the methodology and educational part, including exercises of the English version of Dr. Fluency.

Design of the project.

At first, the intention was to make the evaluation as a matched control study, comparing the outcome of treatment of stutterers following this project with stutterers following the intense stuttering modification therapy organized by Sahlgrenska University Hospital, Göteborg, so the outcome of treatment in both groups could be evaluated by the same procedure. Unfortunately, due to rejection for this proposal by the Speech Pathology staff running the stuttering modification therapy (the AIS-group), this idea could not be realized. The design was then changed to a pilot study of 10 stutterers, including outcome of treatment and follow-up. The first ten stutterers interested in participating in this project were approved. No selections according to age, sex, severity of stuttering or other criterion were made. This decision was made for ethical, as well as methodological reasons: I wanted to examine this new kind of treatment with open eyes, not being limited by a, perhaps, false and, certainly, insecure way at looking at things, concerning the individual results of treatment. It turned out to be a group of ten participants between 20 and 54 years old, including eight males and two females. According to the amount and severity of dysfluency, they were in a range between very mild to very severe stuttering.

Description of training

The participants were divided into two groups of five persons each. Each group went through 15 days of intense training, according to the outlines of program of intense training developed by the Webster Institute (Webster & Stoeckel, 1987) and the Speech foundation of Ontario. Daily sessions consisting of lessons in phonetics and Precision Fluency Shaping were combined with discussions of covert practise and strategies, individual training (in this project entirely with the Dr. Fluency program), and group sessions dealing with voice training and reinforcement of the techniques outside of the computer transfer sessions. The last four days comprised transfer sessions in which the participants - with their new way of talking - asked for information and did shopping outside of Clinic. After the course, there was a maintenance training program with the home-version of Dr. Fluency combined with follow-ups.

EVALUATION

The procedure of evaluation given for each individual before and after intense treatment, and at 5 month and one year intervals after treatment, consisted of the following: Videotapes of interviews, phone calls, descriptions (for judgments of spontaneous speech), and oral reading were analyzed with Stuttering Severity Instrument (SSI; Riley, 1994). The videotapes before and after treatment were analyzed by a listener group of Speech Pathologists. The procedure was judgment of each person based on before- and after-treatment interviews and oral reading, according to the SSI parameters (i.e. judgment of frequency, duration, physical concomitants that should give a total overall rating of stuttering severity). Two minutes of each speech sample from the interview and oral reading were presented for an interval of 30 seconds, a sufficient amount of time for the listeners to complete their scores.

As the follow-ups of the first results needed to be completed with more data, the speech samples of all ten persons before and after treatment, 5 months after treatment, and at the one year follow-up, were presented to a group of naive listeners in random order. The same instructions were given to each group of listeners. The following scales were given before and after intense treatment, after 5 months, and after one year for analyzing their own judgments of difficulty/ease of communication and other factors:

1. the Perception of Stuttering Inventory (PSI, Wolf, 1964), Erickson S-24
2. the Locus of Control Battery (LCB).

Five months after the intense therapy, a questionnaire about the personal outcome of treatment was given. Also, another questionnaire was given for evaluation of the Dr. Fluency Computerized system. These two questionnaires were administered by a third person, Elisabeth Jørgensen, a professional in the field of psychology and social sciences from the University of Örebro. This was done in order to give the opportunity for each individual to answer as freely and candidly as possible.

RESULTS

The results will be presented as a case- study, where each individual's outcome of treatment is evaluated through this arsenal of objective and subjective tests and questionnaires. At the end, some data of the whole group will be presented. Although this study has a small number of subjects (N=9, completed data, as one dropped out at a very early stage) it gives some implications for further studies of a larger population. For reasons of secrecy the names of the persons participating in this study are fictive.

Anton, 21 years

Previous history: Onset of stuttering at the age of two or three; heredity from father's side. Previously Anton attended breathing therapy 25 times with a Speech Pathologist. Anton describes the outcome of that treatment as worthless. Clinical observations during treatment: works efficiently and with great patience on the computer; enjoys the voice-and transfer sessions in group; trying his speech targets even outside the therapy room; feels comfortable during the outdoor transfers sessions. Attitude: "I am improving my speech while training, and it works!"

SSI-score: Before treatment: Severe. After treatment: Normal dysfluencies, no stuttering. Follow-up 5 months after: very mild. Follow-up one year after: mild.

Bertil, 54 years

Previous history: Onset of stuttering during childhood; no information about heredity. Bertil has attended about 100 treatment sessions, including mainly voice therapy, acupuncture, but had a poor outcome due to bad continuity. Clinical observations during treatment: Has some difficulty feeling comfortable monitoring speech on the computer; enjoys a lot more the voice and transfer sessions in group, but hesitant to try his speech targets outside the therapy room; has difficulty using his speech targets during the outdoor transfers sessions. Attitude: "Slowing down my speech makes me impatient."

SSI-score: Before treatment: Very severe. After treatment: Mild. Follow-up 5 months after: severe. Follow-up 1 year after: moderate

Calle, 43 years

Previous history: Onset of stuttering at the age of three or four; no records of heredity. Previous therapy included mainly intense stuttering modification therapy and speech training with Stutter - free speech. In all, Calle had more than 100 sessions of treatment, resulting in a temporary help. Clinical observations during treatment: Works efficiently and with great interest and patience on the computer; enjoys the voice-and transfer sessions in group; trying his speech targets even outside the therapy room; feels comfortable during the outdoor transfers sessions. Attitude: "I feel comfortable with what I am doing, due to increased motor speech control."

SSI-score: Before treatment: Mild. After treatment: Normal dysfluencies, no stuttering. Follow-up 5 months after: normal dysfluencies, no stuttering. Follow-up 1 year after: normal dysfluencies, no stuttering.

David, 42 years

Previous history: Onset of stuttering during childhood; heredity for stuttering. Previous treatment: non-avoidance treatment for about 30-40 visits, a treatment that gave poor outcome at that time. Clinical observations during treatment: Very pleased by the computer training at the 2-seconds timing; has severe difficulty when increasing the speech rate; refuses for the first two days of intense training participating in the voice-and transfer group sessions due to anxiety; overcame it partly, mainly because of direct individual voice training and advice from the speech pathologist, but still hesitant in transfer situations during remaining intense treatment; has severe difficulty using his speech targets during the outdoor transfer sessions, mainly due to anxiety and intermediate aphonic periods within syllables. Attitude: "This is the best training I've ever had. Though not helping me to 100%, the computer lessons by 2-seconds rate gives me the possibility of feeling fluency while doing exercises, and, at least hope for the future for reducing my anxiety by gaining more fluent speech."

SSI-score: Before treatment: Severe . After treatment: Severe. Follow-up 5 months after: severe. Follow-up 1 year after: moderate

Erik, 49 years

Previous history: As far as he can remember, has always been stuttering; No records of heredity. Previous treatment was mainly voice training, which helped a little but was not followed up. Clinical observations during treatment: Works efficiently and with great interest and patience on the computer; enjoys the voice-and transfer sessions in group; monitoring his speech targets even outside the therapy room; feels comfortable during the outdoor transfer sessions. Attitude: "I am improving. I can feel the harmony of fluent speech."

SSI-score: Before treatment: Very mild. After treatment: Normal dysfluencies, no stuttering. Follow-up 5 months after: Very mild. Follow-up 1 year after: Normal dysfluencies, no stuttering.

Filippa, 48 years

Previous history: Onset of stuttering at the age of six, after a traumatic experience and a troublesome situation in general; no records of heredity. During a period of 15 years, Filippa has been to treatment 75 times with a variety of Speech Pathologists, including mainly non-avoidance and speech training. At the moment she is in psychotherapy. Previous treatment has mainly been beneficial. Clinical observations during treatment: has some difficulty feeling comfortable monitoring speech on the computer; enjoys a little bit more the voice-and transfer sessions in group; calls speech training in question, due to doubtfulness that it could be beneficial for reducing her overall anxiety, especially in different speech situations; monitors her speech targets quite well outside the therapy room; uses her speech targets well during the outdoor transfers sessions. Attitude: "Are you really sure that you are capable giving me any help?"

SSI-score: Before treatment: Moderate to severe . After treatment: Very mild. Follow-up 5 months after: Normal dysfluencies, no stuttering. Follow-up 1 year after: Normal dysfluencies, no stuttering.

Gustav, 27 years

Previous history: Onset of stuttering at the age of six; no records of heredity. Previous treatment was mainly non-avoidance and stutter-free-speech, in all about 25 times. Did not report any long-lasting results. Clinical observations during treatment: Works efficiently and with great patience on the computer; enjoys the voice-and transfer sessions in group; has difficulty trying his speech targets outside the therapy room, due to discomfort while doing something that feels new and unnatural; has difficulty using his speech targets during the outdoor transfers sessions; calls speech training in question, due to doubtfulness that he could succeed in monitoring his speech targets in different speech situations well enough to reduce his overall anxiety.

Attitude: "It feels so unnatural speaking in this manner. How can I be able making it work outside clinic?"

SSI-score: Before treatment: Moderate . After treatment: Very mild. Follow-up 5 months after: Mild Follow-up 1 year after: Very mild.

Ingrid, 54 years

Previous history: As far as she can remember, she has always been stuttering; heredity is probably present, with three brothers who stutter. Previous treatment: has attended between 75-100 times, including mainly speech training, non-avoidance, and hypnosis, but could never reconcile herself to non-avoidance therapy. Clinical observations during treatment: Works efficiently and with great interest on the computer; enjoys the voice-and transfer sessions in group; is using her speech targets even outside the therapy room; feels comfortable during the outdoor transfers sessions. Attitude: "I can feel control. A very interesting experience to see if it works or not."

SSI-score: Before treatment: Very mild. After treatment: Normal dysfluencies, no stuttering. Follow-up 5 months after: Normal dysfluencies, no stuttering. Follow-up 1 year after: Normal dysfluencies, no stuttering.

Johan, 25 years

Previous history: Onset of stuttering at the age of three; no records of heredity. Previous treatment was mainly non-avoidance, stutter-free-speech and psychotherapy; in all about 50 times. Clinical observations during treatment: Works efficiently, but somewhat impatiently by the computer; enjoys the voice-and transfer sessions in group, as the voice training improves his fluency tremendously; has difficulty trying his speech targets outside the therapy room, due to discomfort while doing something that feels new and unnatural; has difficulty using his speech targets during the outdoor transfers sessions; is somewhat doubtful and pessimistic about his future success in monitoring his speech targets in different speech situations well enough to reduce his overall anxiety. Attitude: "It feels so unnatural while speaking in this manner. What will people think about me?"

SSI-score: Before treatment: Moderate . After treatment: Mild. Follow-up 5 months after: Mild. Follow-up 1 year after: Moderate.

The Perception of Stuttering Inventory. (G. Woolf)

For 8 out of 9 participants in this study, the outcome of reduced amount of struggle, avoidance and expectancy behaviours, seems over the year to be closely linked to the amount of gain and maintenance of fluency. Particularly considering the amount of struggle and avoidance behaviour. Concerning some of the statements related to expectancy, there seems to be a tendency among the participants toward a positive interpretation of target behaviours, such as self-correction and pauses. This matter needs to be further investigated.

Erickson S24-scale

For 4 out of 9 participants in this study, a slight improvement of communication attitude communication over the year is shown by a lower total score. For 4 participants, no differences are shown. For 1 participant, an increase of score is shown that should, according to Erickson, indicate a poorer communication attitude; however, this individual showed improvement in all other scales, such as SSI, listeners' judgments after one year as a normal speaker, and PSI. Thus, the suggestions by Erickson of only total score judgments, and not item by item as a validity tool, is put into question. When analyzing the material separating the 12 items that are positively related to communication from the other 12 items that are negatively related to communication, the picture of this individual, and the main scores of the whole group, reveals an increase of positive scores during the year (before treatment main score 2.9, after 1 year 5.2), and a decrease of negative scores

(before treatment main score 10.2, after 1 year 6.4). This item-by-item evaluation could indicate a general improvement for the group towards a positive attitude to communication. However, because the subject numbers are small (N=9), and because attitudinal scales in general are highly correlated to the society (the Erickson S24-scale was developed from measurements of male college students in the United States), more research is needed for the validity of the scale in Swedish society.

The Locus of Control Battery (LCB)

The analysis by total score, where a higher score should indicate a greater amount of external locus of control, does not reveal any pattern among either the individuals or the whole group, with 7 participants indicating an internal locus of control and the remaining 10 indicating external locus of control. Still, looking at the scores of each item, results indicate a decrease in externality over the year (main score before treatment 18.3 and 1 year after 13.7). No significant change were noticed in internality (main score before treatment 26.11 and 1 year after 26.33). Results may indicate a decrease of amount of externality not shown by total score procedure. An item-by-item analysis is suggested here, as well, for more stable qualitative analysis of outcome of treatment.

Listeners judgments: Ratings accordingly to parameters given in Stuttering Severity Instrument (SSI)

After analysis of the deviation between judged total impression of severity of stuttering and the main score of the judgments of frequency, duration, and physical concomitants, the group of naive listeners were judged as more reliable than the group of speech pathologists (main deviance of 0.08 for naive listeners and 0.44 for speech pathologists). Also, their evaluation was closely related to the counted SSI scores. These results could indicate that the group of speech pathologists judged based on other criteria, as well. These results could also be related to procedure: the use of a random order of presentation with the group of naive listeners seems to be a more reliable tool for preventing listeners from making other personal judgments of the advantages or disadvantages of treatment. One year after treatment, Calle, Erik, Filippa and Ingrid were judged as non stutterers with normal dysfluencies; Gustav was judged as a very mild stutterer; Anton was judged as mild stutterer; and David, Johan, and Bertil were judged as moderate stutterers.

Individual questionnaire to each participant

The questionnaire given 5 months after intense treatment shows that 8 out of 9 participants were pleased or very pleased with the Comprehensive treatment being given. The same individuals were also pleased with the Dr. Fluency computerized training program, especially during the intense period, and also for the home training (though some expressed reservations due to technical problems when the program was installed on home computers). The program is advised only to be provided for clinical use and home training to clients when preinstalled and technically checked in 3- to 4-year-old computers.

DISCUSSION

The results of this study show intense speech training with the Precision Fluency Shaping Program, combined with problem solving (coping) strategies, such as positive covert practice as outlined in the Comprehensive approach of treatment, to be very beneficial for people who stutter. The importance of giving people who suffer from stuttering an opportunity to receive an efficient treatment that helps them achieve more fluent speech, cannot be overestimated for the development of our society. The resistance among Swedish Speech Pathologists working in the field of stuttering to new approaches and new knowledge is not fully understood. The Swedish version of the program is judged as giving a cost effective treatment and a reliable basis of results for further clinical research and development. The diagnostic tools, including both objective data (SSI), combined with subjective evaluations from each individual (PSI, Ericsson S-24, LCB, and questionnaires) is something new to Swedish Speech Pathology, and could, in combination with recent development in neurophysiology and Stuttering (Kroll & De Nil, 1998), provide a foundation for development of clinical research in the field of stuttering even in Sweden. Hopefully, within a couple of years we will see an increased curiosity regarding this approach to treatment and clinical research among Speech Pathologists. Meanwhile, this treatment should be given the respect it deserves, as an alternative to the regular non-avoidance approach. The respect of the individual's rights to choose the kind of treatment he wants should be one of the fundamental rights in an open democratic country (UN declaration of Human Rights). Through this project, supported by the Swedish Ministry of Social Affairs, Allmänna Arvsfonden, and the Swedish Handicap Institute and Swedish Stammerers Association, we are moving in the right direction.

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Doctor Fluency: A Computerized System for Precision Fluency Shaping

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Julie Masterson: What is the main use for the Dr. Fluency software?

Klaas Bakker: Dr. Fluency was designed to be a computerized system for the treatment of stuttering. It was particularly designed with precision fluency shaping therapy in mind.

JM: Can you give a brief description of precision fluency therapy?

KB: Fluency Shaping (e.g., Webster, 1980) is one of the most frequently followed stuttering treatment methods of today. Unfortunately, because of its particular structure this treatment is difficult when implemented in traditional SLP settings. It requires that therapy is administered in an intensive format (several weeks; at least 6 hours daily), and clinician feedback tends to be notoriously laboured intensive and subjective. Needless to say, this therapy is feasible and affordable only when implemented with computerized feedback methods. Until now, the feedback specific to the Precision Fluency Shaping method was available only to clinicians who were connected with a number of specialized stuttering treatment centers (for example, the Hollins College program) that have specialized equipment for conducting this type of therapy. This situation appears to have changed with the arrival of Dr. Fluency.

JM: How does Dr. Fluency help?

Teresa Kuntz: The manual of Dr. Fluency states that its purpose is to help make fluency shaping therapy accessible to clients and their clinicians. As such, it was designed to (1) reduce the time demands on therapist and client, (2) reduce cost to the client, (3) maximize the effectiveness of the approach, while (4) providing assistance with post treatment fluency maintenance therapies.

JM: Who will benefit most from the use of Dr. Fluency?

TK: The populations targeted by Dr. Fluency are (1) stutterers, with whom at least part of their therapy is conducted at home (by using the client version of Dr. Fluency), (2) clients who have already acquired the targeted fluency shaping skills and are attempting to maintain and generalise the acquired fluency skills in their home environment, and (3) clinicians (clinician version of Dr. Fluency), who may find the system beneficial in that it saves costly clinician therapy time, while providing specific and objective feedback for the targeted behavioural skills.

JM: What types of feedback are provided?

KB: Dr Fluency includes five feedback tools: (1) a computerized stopwatch, (2) digitized tape-recording, (3) an oscilloscope feedback screen, (4) a breathing 1 speech coordination monitor (with separate feedback concerning thoracic and abdominal breathing), and (5) interactive speech analysis dialogues.

These tools facilitate effective training of the following techniques: (1) prolonged syllables, (2) correct breathing, (3) gentle onsets, (4) gentle transitions, (5) reduced air pressure, (6) reduced articulatory pressure, (7) correct voice curve patterns, and (8) volume control.

JM: How have you used Dr. Fluency in treatment?

TK: As beta testers for Dr. Fluency, we were in a position to experience how it can be applied in clinical situations. Although Dr. Fluency was specifically designed for precision fluency training, some components are clearly helpful as feedback tools in related therapies (e.g., gentle voice onset training, coordination of breathing patterns). Dr. Fluency is appealing and user-friendly for both the client and the clinician. Immediate, objective feedback allows the client to do self-evaluation and aids the clinician in providing strategies for improvement.

It is important that the Dr. Fluency be used as a clinical tool and not as a complete treatment program. Dr. Fluency provides instructions for correct productions, but does not provide remedial measures if the client is unsuccessful. Because the techniques targeted in fluency therapy (e.g., prolonged syllables, gentle voice onset) are often difficult for clients to master, clinician support is crucial to prevent clients from becoming discouraged. Once techniques are learned, however, Dr. Fluency could be used as a tool to allow the client to practice outside of therapy time.

JM: Are there any other benefits of using Dr. Fluency in treatment?

TK: Dr. Fluency is also very useful in guiding a clinician in the progression of skills that need to be taught as part of a fluency shaping program.

Dr. Fluency is well-organized in terms of units and lessons. It provides reasonable steps for the client to achieve in becoming a more fluent speaker. This type of organization is useful for the client as well as for the clinician in that it shows the client the skills, which they will need to acquire.

Where to find it?

Dr. Fluency is published by Speech Therapy Systems, Ltd. (845 third Avenue, New York, NY 10022, 1-888-DFL-UENC, Internet: <http://www.dfluency.com>,). Among the system requirements are a 486DX IBM compatible computer, or higher; a Windows operating system installed (Windows 95 recommended); a CD-ROM drive; and a Sound Blaster compatible sound system.

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