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

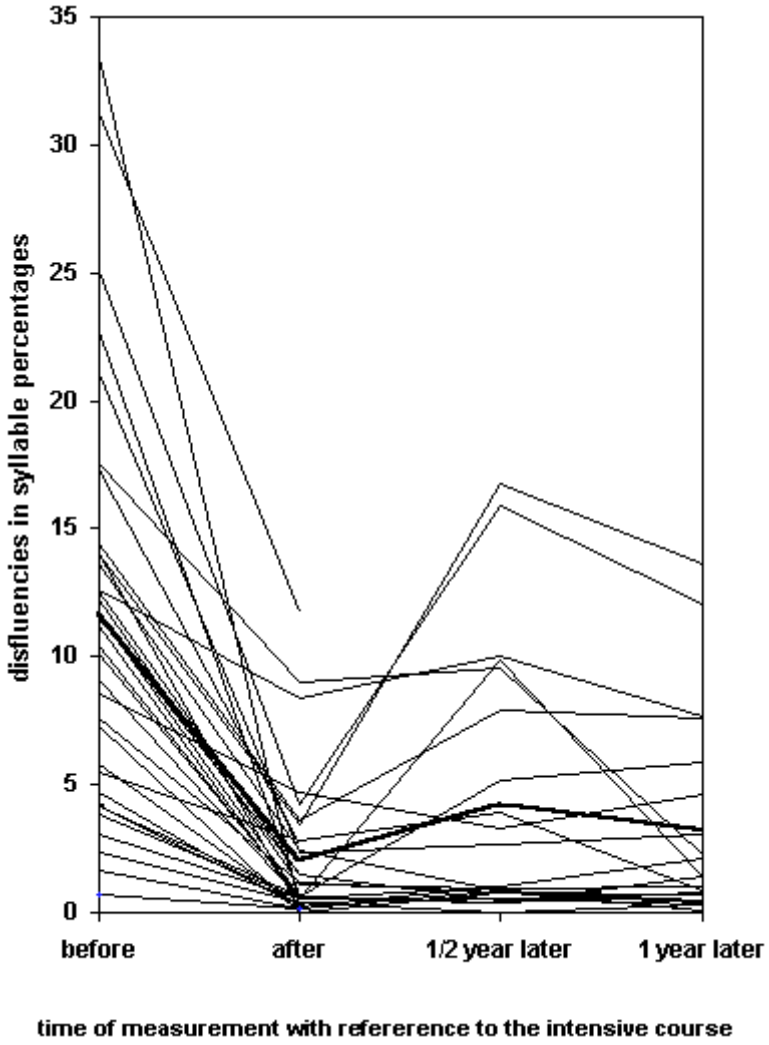
The study examines the effectiveness of the Kasseler Stuttering Therapy on a statistically sufficient number of clients. Because of the well known fact that there is a high number of relapses among stutterers after therapy, the maintenance data has been recorded for at least one year up until now and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

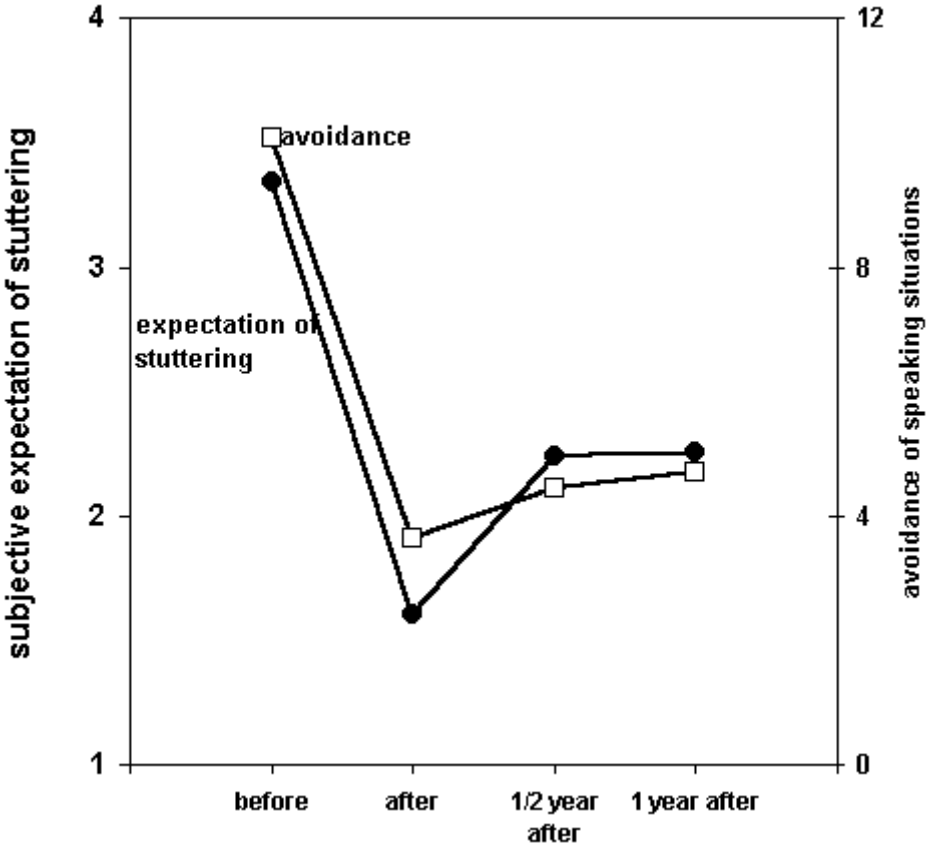
If one considers the mean average for the four speech situations for the whole group of the clients, (bold type), then the slight relapse after half a year has been further diminished by the their fluency at a high level on a long-term basis.



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).

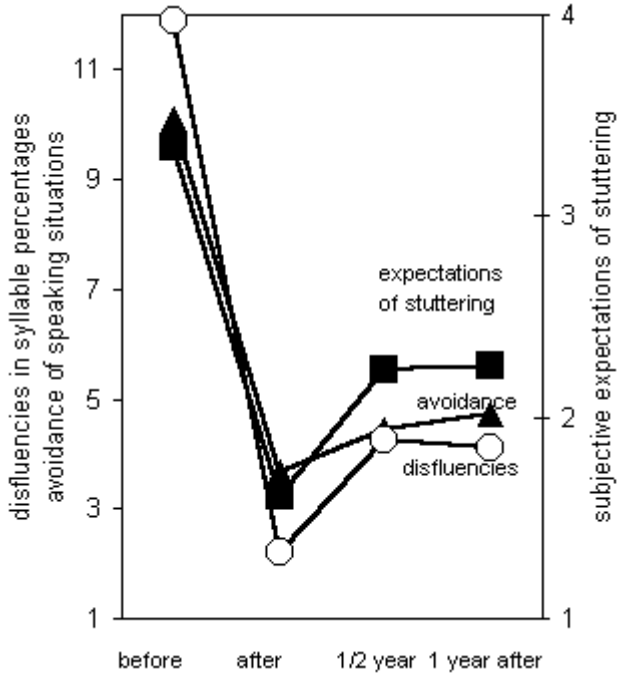
Subjective measurements

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 dichotically ("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.