

Use of Systematic Fluency Training for Young Children: A Case Report

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Abstract

A description of Systematic Fluency Training for Young Children (SFTYC) will be related to current research regarding the assessment and treatment of pre-school-aged stutterers. The use of this program with a severely dysfluent boy will be described. The overall severity of the child's dysfluency was reduced from very severe to mild. The results indicate that SFTYC was useful when modified to meet the client's needs.

Stuttering as a Physiological Defect

In a review of the literature to 1982, Andrews et al (1983) conclude that dysfluency results from an inadequacy in the central processing capacity based on research which has established that children who stutter have slower voiced onset time, decreased performance on tests of central auditory function, delayed speech development, a prevalence of articulation errors and slower auditory-motor response times. The recommended treatment is a direct modification of speech processes in the form of practice using a slower, fluent speech pattern to develop control of the sensory-motor aspects of speech. Recently, Riley and Riley (1985) recommended the need for more emphasis on oral motor abilities of dysfluent children based on their research on children with both fluency and phonological disorders.

Stuttering as a Learned Behaviour

The importance of contingent reinforcement and punishment on the development and maintenance of dysfluency is emphasized by the fact that most stuttering behaviour can be decreased by contingent responses (Andrews et al, 1983; Costello, 1983). Positive reinforcement for fluency is an integral part of behavioural programs which have demonstrated success with pre-school stutterers. In a review of four treatment programs with school-aged stutterers, Ryan and Ryan (1983) concluded that Gradual Increase in the Length and Complexity of Utterance (GILCU) (Ryan, 1974) was most effective in producing normal sounding speech which was resistant to post-treatment relapse, efficient in treatment hours and administered correctly by clini-

cians. In support of the role of learning, Costello (1983) and Conture (1982) indicate that parents who model a slower speech pattern assist their child's development of fluency.

Stuttering as a Neurotic Response

Andrews et al (1983) conclude that stuttering does not result from neurosis; however, Gemelli (1982) cautions that in his clinical experience as a psychiatrist, speech pathologists tend to underestimate the presence of psychopathology in children who stutter. There are manifestations of tension, especially as young stutterers become more severe, as well as fear of words and situations which coincide with tension in the communicative situation. The role of parents who routinely reprimand, correct, show displeasure, intolerance and anxiety over styles of speech appears to have relevance, but is not a known entity.

The relationship between the development of dysfluency and environmental and emotional tension is no more clear than the effect of negative parental response to dysfluency. However, it has been documented repeatedly that the amount or severity of dysfluency increases with amount of environmental and emotional tension. The rate or severity of dysfluency varies considerably and often predictably within an individual.

Individual treatment which aims only at modifying parents' or childrens' attitudes about speaking is unlikely to benefit the child. There are no data to support the effectiveness of modifying parents' reactions to stutterers (Costello, 1982). Costello asserts that changing the parenting abilities and patterns of family interaction is not a realistic goal.

Yiari and Lewis (1984) refute Johnston's claim that stuttering begins in parents' perceptions with data on the dysfluencies of preschool stutterers within 2 months of diagnosis, compared to normal children. They concluded that stuttering children displayed qualitatively and quantitatively different dysfluency. This finding lends support to the theory that stuttering is a measurable difference in the speech behaviour of the child, not an anxious reaction of parents.

Although these factors have been presented separately, it is recognized that they interact in yet unquantified ways within the individual stutterer. A detailed assessment of the pre-school-aged child who stutters must include evaluation of oral-motor abilities, attention, auditory processing, language and the climate in which stuttering occurs (Riley and Riley, 1980). Children who

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stutter are three times more likely to have an articulation disorder (Andrews et al, 1983), as well as one or more of the above mentioned associated problems. These associated problems may interfere with treatment and prognosis.

Description of SFTYC

Systematic Fluency Training for Young Children (SFTYC) is a commercially available program written by R.E. Shine, Ph.D. It's development is based on the theory that "stuttering may best be understood as a coordinative disorder involving disruption of the physiological speaking processes ... and the auditory system as well ... stuttering is maintained because the child does not learn to compensate for lack of co-ordination by making necessary adjustments of the physiological processes of speech." (Shine, 1980, p. 1).

SFTYC trains a fluent pattern of speech based on progressively longer utterances. Positive reinforcement for fluency is incorporated in a structured format. The program consists of training for clinicians to identify dysfluencies; assessment and fluency training.

Training the Clinician

The first step trains clinicians to reliably count dysfluencies. Ryan and Ryan (1983) found that when clinicians err, they undercount dysfluencies. Training of "significant others" occurs later in the program.

Four types of dysfluencies are identified: whole word repetitions (WW), part word repetitions (PW), prolongations (PROL) and struggle behaviour (SB). The author does not include interjections, incomplete phrases, phrase repetitions, pauses and revisions in this count unless they are associated with struggle behaviours nor does he explain how to quantify blocks or avoidance behaviours.

Assessment

The assessment consists of the History of the Problem, Rate of Stuttering, Severity Rating, Comprehensive Stuttering Analysis, Physiological Speaking Processes, Description of Struggle Behaviours, and Parent Interview. The severity of these measures is combined with the rate of dysfluency and percentage of stuttered words to decide who receives treatment. The criterion measures are 3-7 SW/M.

Fluency Training

Establishment Phases

The child receives training in fluent motor speech patterns. The first fluent voice trained is whispered, modified to prolonged, easy and finally, the new speaking voice using normal speech parameters. Examples of these speaking voices are found on the Training Cassette. Specific instructions to establish each voice with clinician responses and criteria to pass through steps are detailed. The steps proceed from monosyllabic words to five minutes of fluent conversation.

Four subprograms run concurrently to establish fluency. Each session is divided equally between the subprograms. Parents or "significant others" are trained to duplicate these activities at home. Materials for stimulating each step are provided.

The criterion to pass through treatment steps is .5 SW/M. If the child fails to achieve criterion scores to pass to the next step, a number of reasons are provided in the manual. The possibility of the need for treatment of associated problems, if they exist, is not mentioned.

Environmental Program

The purpose is to assist the child to generalize use of the fluent speaking mode and to determine progress at home. The Environmental Program consists of predetermined periods of conversation during the day when the parents count the number of dysfluencies heard. The types of activities which comprise these measurement periods are unspecified.

Parents are encouraged to use a slowed rate of speech in all communicative interaction; however, modification of parents' speech is not trained or documented. Parents are requested to try giving advice to ascertain it's effectiveness. The relative effect of their helpful hints is discussed with the clinician in an unstructured format.

Transfer

The transfer phase of SFTYC is less detailed than the preceding sections. Many children generalize spontaneously; therefore transfer of fluency for preschool children is not normally as large a part of the program as for the older stutterer (Costello, 1983). The transfer program includes a variety of additional speaking environments.

Maintenance

A schedule of re-evaluation is provided to ensure maintenance of fluency. If the child has regressed, the clinician is not given specific direction regarding where to begin treatment. Presumably, the client re-enters the program at the point where he fails to achieve fluency criterion scores.

Shine (1980) claims that of 20 children, 17 were discharged with an average length of treatment of 10.4 months, twice weekly in 40 - 50 min. sessions.

Application of SFTYC

E was referred at age 4. 2. He had been stuttering since he began to combine words, approximately two years. The familial history of stuttering included the paternal grandfather, uncle and cousins. Mother reported late onset of speech but no other developmental or medical problems.

E was the eldest of three children. The family was well-adjusted financially and emotionally. Their greatest concern was E's speech. Mother found that the only suggestion that helped him was "slow down".

The results of the initial assessment appear in Table 1. E's dysfluency was related to oral-motor dyscoordination and expressive language delay. He had developed secondary behaviours characterized by visible laryngeal tension and head and body jerks. A great deal of communicative frustration resulted from his unintelligibility. Sound, word and situational fears resulted in further retardation of articulation and language development. Articulation testing revealed place and manner distortions accompanying dysfluency but was otherwise normal. Standardized assessment of expressive language was not completed because E refused to comply with testing. Anti-expectancy devices to avoid dysfluency manifested as distractible behaviour, loss of attention and uncooperation. Treatment began three times weekly for forty-five minutes.

Results

The difficulties encountered in the administration of SFTYC will be described. Additions to the assessment included: analysis of avoidance behaviours; consideration of the interaction between language delay, oral-motor dyscoordination and dysfluency and expansion of the type of dysfluencies counted to include interjections, incomplete phrases, pauses, revisions and blocks.

Because listener reaction to dysfluency is not analyzed in SFTYC, parental counselling regarding appropriate reactions to dysfluency was initiated. The clinicians's reactions to dysfluencies in spontaneous speech during the session was established. Counselling to decrease the number of environmental fluency disrupters within the family's interaction was also initiated.

E had difficulty learning to use the Prolonged Speaking Voice (PSV); therefore the Fundamental Frequency Meter (S.I. American Inc., Model f) assisted in the establishment of continuous voice. Relaxation exercises did not assist in the reduction of laryngeal tension and blocks.

This client's language delay precluded his smooth progression to more linguistically complex material in SFTYC once PSV was established. Therefore a language treatment program beginning at three syllables in length was carefully planned to include phonetic complexity (which is not included in SFTYC) as well as semantic and syntactic complexity, while maintaining fluency. Oral-motor dyscoordination precluded successful repetition of syllable sequences. Therefore Systematic Syllable Training (Riley and Riley, 1983) in real and nonsense words was initiated at this time. Concurrent language therapy was required periodically as E progressed through SFTYC steps.

Because of the language and oral-motor treatment, a home program was initiated before the Environmental Program as recommended in SFTYC. When the child's language skill had improved to the point where re-entry into SFTYC was possible, the Environmental Program was incorporated. Natural speech samples taped at home were analyzed to assess generalization.

E became bored with the materials provided in SFTYC. Toys brought from home were used in therapy activities to be duplicated at home. E's own materials served as a vehicle to transfer fluency stimulus control from the SFTYC materials.

E's treatment did not progress to the Transfer and Maintenance phases. Unfortunately, E was unable to continue in our program upon entering school. His treatment was transferred to the school speech correctionist. The acquired fluency was generalizing to home and the school classroom as reported by his mother and teacher. Analysis of audio tapes supported her conclusion. A comparison of the initial and final assessments appears in Table 1.

Table 1. Comparison of Initial and Final Assessment.

Assessment Variable	May/84	Oct/85
Age	4.2	5.9
M.L.U. (morphemes)	4.4	5.7
Developmental Sentence Scoring (D.S.S.) (Lee, 1974)	<10th percentile	<10th percentile
R.D.L.S. (Reynell, 1977)		
Comprehension	3.07 -2 s.d.	5.06-5.08 .2 s.d.
Expression	incomplete	5.06-5.10
Stuttering Severity Index (S.S.I.) (Riley, 1980)	96-100 percentile very severe	24-40 percentile mild
% syllables dysfluent	30.0	13.3
# syllables/min	86	87
# dysfluent syllables/min	26	11.6
Longest block	3 secs	<1 sec.
Greatest # repetition units	8	4

Note: R.D.L.S. refers to Reynell Developmental Language Scales (Rev.)

Analysis of Table 1 indicates that Mean Length of Utterance (M.L.U.) and D.S.S. scores increased, although they were still delayed. Formal testing however revealed age appropriate language development. This discrepancy may be explained by the more structured nature of the testing situation, in which E displayed use of syntactic forms and vocabulary, i.e., his linguistic competence. During unstructured conversation, E attempted to maintain fluency by using more simple language that was familiar and safe. E's spontaneous speech consisted of circumlocution and incomplete sentences which further depressed his D.S.S. score. Utterances tended to be short and simple.

E's speech rate continued to be slow (87 syllables per min) but was perceived to sound "normal". Intelligibility was greatly improved, thereby decreasing communicative frustration. Consequently a major improvement in attitude and behaviour was noted. Oral-motor co-ordination was characterized by less groping and inappropriate articulatory postures. Secondary behaviours were extinguished.

Discussion of Assessment Factors

A major disadvantage of SFTYC is that the initial assessment is not the basis for treatment. The treatment program proceeds as described without incorporation of associated problems based on assessment findings. With regard to the case presented, language delay and oral-motor dysco-ordination contributed significantly to the maintenance of dysfluency and resistance to treatment. If the child fails a step, the author's suggestions for why the failure may have occurred include references to the physiological speaking processes or the need for greater structure, not to the presence of associated problems.

The discussion of individual assessment variables will be based on Table 2.

Table 2. A Summary of the Relationship between Assessment Variables and SFTYC.

Assessment Variable	SFTYC
Physiological processes	+
Rate of dysfluency	+
Rate of speech	+
Type of dysfluency	Incomplete
Articulation, oral-motor language and auditory skills	Incomplete
Variability of dysfluency	Incomplete
Parental response to dysfluency	Incomplete
Parental speech model	+
Reliability measures	—
Natural samples included	—
Attitude of client and parent toward speech	Incomplete
Avoidance of sounds, words and situations	—
Environmental fluency disrupters	—
Environmental tension	—

Note: + indicates that variable is included in SFTYC; — indicates that the variable is omitted. Incomplete indicates that the variable is assessed incompletely.

However, whole and part word repetitions and prolongations are dysfluencies exhibited by nonstutterers as well (Yiari and Lewis, 1984). Young stutterers and non-stutterers exhibited both types of behaviours and

the difference between these two groups was primarily quantitative. Qualitative differences may exist between young stutterers' and nonstutterers' dysfluencies; however, the relationship has not been established. Omitting these behaviours from a count of the rate of dysfluency may not accurately reflect the frequency of dysfluency.

Measures such as the longest prolongation (Riley, 1980) and the number of repetitions (Yiari and Lewis, 1984) also define severity. These measures are not recorded in the SFTYC assessment protocol. A reduction in the length of prolongations and number of repetition units were the first indications of improvement in E's case, and should be included in the assessment.

The assessment of the variability of dysfluency is not complete. The situational variability of stuttering is questioned briefly and parents are encouraged to think of variables which may be related. However, the effect of environmental tension and fluency disrupters in the family are not included in the assessment. The clinician is not given a rationale to answer the inevitable question "Why does he stutter sometimes and not others?"

Related to the issue of variability of stuttering, Ryan and Ryan (1983) advocate administering the criterion test (or initial baseline measure) three times in order to establish the reliability of this measure. Natural speech samples are required for assessment, from home and school, which normally indicate different rates of stuttering than those obtained in the clinic. (Ryan and Ryan, 1983). Obtrusive and unobtrusive measures may also indicate variable rates. Natural samples taken from the home or school are not included in the initial assessment. Dysfluency is not measured unobtrusively. Parents are asked during the assessment if the child's speech is characteristic of his normal speaking ability; however, if the parent denies this, no alternative strategy is recommended.

The assessment and treatment of attitude is not included in SFTYC. The problem of negative parental reactions to dysfluency is addressed in the treatment program, but not included in the assessment.

The role of fear and avoidance (of sounds, words, and situations) is not assessed. Avoidance is frequently reported in school-aged stutterers but rarely noticed by parents or teachers (Ryan and Ryan, 1983). Therefore, it needs careful assessment by the speech language pathologist. Reduction of fear and avoidance and a positive change in attitude were among the first improvements to be noted in E's treatment. Therefore, assessment and documentation of these factors is an important part of developing a treatment program and evaluating its effectiveness.

As a result of the SFTYC assessment, dysfluency is explained to the child's parents as a co-ordination problem not caused by parents and is intended to provide confidence that they can help. The explanation is simple enough for lay people to understand. However, parents may know their child sometimes verbalizes frustration

and stutters more when the environment is tense. They may suspect that their attitudes and anxiety about their child's speech contribute to the problem. These issues must be addressed; however they have not been adequately assessed by SFTYC at this point. The role of environmental responses to dysfluency must be explained in the context of the development and maintenance of the disorder, as well as in the remediation of it.

Parents may also question why they have been advised that their child will 'grow out of it'. By the age of 16, 30-60% (Ingham, 1983) to 78% (Andrews et al, 1983)

Table 3. A Summary of the Relationship between Treatment Variables and SFTYC.

Treatment Variable	SFTYC
Physiological	
Treatment is based on assessment	—
Speech production is modified	+
Awareness of dysfluency is taught	—
Three phases of management include establishment, transfer and maintenance	+
Psycholinguistic	
Responses based on: increasing length of utterance	+
phonological complexity	—
semantic complexity	—
pragmatic complexity	+
Psychosocial	
Response contingent reinforcement	+
Modification of avoidance	—
Modification of attitude	—
Modification of listener reaction	—
Modification of others' speech models	indirect
Counselling includes effect of: environmental fluency disrupters	—
environmental tension	—
Training involves significant others	+
Program Structure	
Data collected	+
Valid criteria for progression through treatment steps	+
Well documented	+
Designed to improve communication competence	indirect

Note: + indicates that variable is included in SFTYC; — indicates that the variable is omitted. Indirect indicates that the variable is treated indirectly.

will have recovered. Six out of eight preschool children greatly improved without intervention (Ryan, 1984). Severity appears to be of little predictive value. Shine reports that the child who does not spontaneously recover does not learn to compensate for lack of coordination. Others postulate that the presence of associated problems may interfere with recovery. (Riley and Riley, 1980; Gemelli, 1982). The answer to this question cannot yet be stated with certainty.

Discussion of Treatment Factors

A discussion of treatment factors will be based on Table 3.

Physiological

The direct approach involving modification of the client's speech processes has received support in the literature. In a review of four treatment programs with school-aged stutterers, Ryan and Ryan (1983) concluded that GILCU (Ryan, 1974) was most effective. This program is very similar to SFTYC in that it combines practice of a fluent motor pattern with an appropriate reinforcement schedule.

Psycholinguistic

Progression through the steps of the Establishment Phase is based on increasing length, syntactic and pragmatic complexity. The lack of assessment of sound, word and situational avoidances results in omission of semantic and phonological complexity and the client required sub-steps written to incorporate specific treatment of sound and word avoidance.

Psychosocial

Awareness of dysfluency is not taught directly. Shine (1980) reports that calling attention to stuttering may actually result in a decrease in the behaviour; however, it is not a necessary step in learning the fluent pattern. Costello (1982) reports that in her experience, explanations confuse pre-school-aged children.

The initial stages of treatment included confrontation of avoidance of sounds, words and situations, namely, the formal language teaching situation. Unfortunately, no comment can be made regarding the effectiveness of SFTYC's Transfer and Maintenance programs from these data because the client was discharged to another program when he reached school age.

An improvement in attitude was one of the first changes noted in this client's recovery. It presumably came about in response to positive reinforcement for fluency. Therefore, although modification of attitude, listener reaction, avoidance and environmental fluency disrupters are not included in SFTYC, the reinforcement schedule had an indirectly positive effect on these factors.

During the initial stages of the program, the parents are not counselled regarding how to react to the child's speech at home. Consequently, assuming listener reac-

tion is related to the severity of dysfluency, parents and other listeners may inadvertently reinforce dysfluency.

In the SFTYC program, the amount of dysfluency allowed during treatment sessions is reduced to a minimum; however, the clinician's reaction to dysfluency is not specified. Costello (1983) advocates that allowing chatter during the session may have two purposes. Firstly, it may serve as a probe for generalization and secondly, it establishes stimulus control of fluency from the clinician to the child, to make him more responsible for producing fluent utterances, rather than as a response to the stimulus the clinician provides. Shine (1985) has since suggested that the amount of conversation or the amount of dysfluency allowed during a session may have to be rigorously controlled, especially if the child is failing steps.

The effect of parental speech models is addressed in the significant others' training. Parents are encouraged to slow their rate of speech when speaking to their child at all times. Costello (1983) and Conture (1982) indicate that parents who model a slower speech pattern assist their child's development of fluency. Meyers and Freeman (1985) demonstrated a correlation between the rate of mother's speech and dysfluency. As the amount of dysfluency increased, so did the mother's rate of speech. In SFTYC, the modification of parents' speech rate is not measured. In light of the above findings, it may be desirable to record the effect that modifying parents' rate of speech has on dysfluency.

Program Structure

One advantage of SFTYC is the documentation and structure it provides for an individual receiving responsibility for a client in mid-treatment. The speech correctionist was reluctant to treat E because of her lack of confidence in the correct procedure. The structure of SFTYC in this situation is an advantage. However, because of the limitations of the program, assessment by a speech language pathologist and supervision of treatment is essential in order to make the modifications where necessary.

The criterion to pass through treatment steps is .5 SW/M, which is also used in other behavioural programs (Costello, 1983; Ryan, 1974).

Summary

SFTYC was effective in establishing fluency when combined with treatment of associated problems based on the assessment. This client's difficulties lay in a complex interaction of oral-motor dysco-ordination, language delay and dysfluency. The contribution of each has not been clarified in the literature; however, the treatment of dysfluency alone in this case was not successful. When the level of E's language had progressed to the point that re-entry into the program was possible, and fluency had been established in a number of basic sentence structures SFTYC was a valuable program. In response to this difficulty, Shine (personal communica-

tion, Feb., 1985) advocates a more language-based approach combined with a prolonged speech pattern.

The major drawbacks in the application of SFTYC with this client were: incomplete measurement of the types of dysfluencies, situational variability, avoidance and attitudes of the child and parents; lack of natural samples and inattention to environmental fluency disrupters and the need for incorporation of associated deficits into the treatment program. The major advantages of the program were: the structured format; provision of a base from which to develop the child's individual program; data collection; and involvement of the "significant other". There is support in the literature for the effectiveness of other fluency training programs which are similar to SFTYC in treatment goals and format.

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