Treating the Young Stutterer: An Overview
Le traitement du jeune bègue : un aperçu

by • par

Rosalee C. Shenker, PhD
The Montreal Fluency Centre and McGill University
Montreal, Quebec

ABSTRACT

In the last decade considerable attention has been generated toward better understanding of assessment and treatment of stuttering at onset. This paper presents an overview of stuttering in early childhood, focusing on current issues in assessment and treatment. The range of treatment options for young stutterers is described and clinicians are presented with some questions to ask before embarking on a treatment plan. Issues related to efficacy of treatment and measurement of outcomes are also discussed.

ABRÉGÉ

Au cours des dix dernières années, on a accordé beaucoup d'attention à la compréhension de l'évaluation et du traitement précoces du bégalement. Ce mémoire donne un aperçu du bégaiement chez les jeunes enfants et met l'accent sur l'actualité en matière d'évaluation et de traitement. Nous y décrivons la gamme d'options de traitement à l'égard des jeunes bègues et présentons aux cliniciens quelques questions qu'ils doivent se poser avant d'amorcer un plan de traitement. On examine également des questions portant sur l'efficacité du traitement et sur la mesure des résultats.

KEY WORDS: stuttering • preschool • treatment

Most stuttering has its onset in early childhood. It most typically occurs between the ages of two to four, peaking before six years of age (Bloodstein, 1987). However, there has been a general reluctance among speech-language pathologists to treat early stuttering. This concern may be rooted in Johnson's diagnosogenic theory of stuttering acquisition (1959), which suggested that stuttering develops as a result of parental misdiagnosis of their children's early 'normal nonfluencies'. Although Johnson's theory did not lend itself to readily testable predictions, his point of view has survived for decades as a dominant influence on stuttering research and clinical practice, and a convincing argument used by paediatricians and speech-language pathologists to deter wary parents from initiating direct forms of treatment at early ages.

Support for a 'wait and see' approach is provided by reports which estimate that spontaneous remission rates range from 32% to over 80% (Andrews & Harris, 1964; Bloodstein, 1987; Curlee & Yairi, 1997). For example, Yairi and Ambrose (1992, 1996) report 65% or more natural remission occurring within the first two years after stuttering onset.

Nevertheless, stuttering at onset is in its simplest form and is perhaps most readily correctable, unencumbered by the environmental, developmental, and psycho-social characteristics that are associated with more chronic stuttering. Within the last decade, clinicians have gradually embraced the position that early intervention for stuttering is desirable, due to the growing belief in the efficacy of early as compared to advanced stuttering therapy. Encouraging reports with regard to the effectiveness of treatment for young disfluent children suggest that the initiation of early treatment procedures for resolution of early stuttering behaviour can prevent the development of chronic stuttering (Fosnot, 1993; Gottwald & Starkweather, 1995; Lincoln & Onslow, 1997; Onslow, Andrews, & Lincoln, 1994). Clinicians and researchers who support early intervention argue that remissions become less likely the longer stuttering persists (Andrews, 1984), that the rate of remission without treatment may be lower than previously suggested (Ingham, 1983; Ingham & Cordes 1998; Martin & Lindamood, 1986; Ramig, 1993), and that many children who do stop stuttering had been assisted by the self-directed intervention of parents or other caregivers (Ingham, 1983; Onslow et al., 1994; Wingate, 1976).

Armed with appropriate guidelines for early intervention, clinicians are discovering that the treatments developed for young stutterers can be highly effective. Indeed, this choice seems most

expedient when compared to the difficulties encountered in the treatment of advanced stuttering (Ingham & Cordes, 1998). Most young children under the age of five who successfully complete clinical programs do so quickly, with natural sounding speech, little fear of relapse, and no need for the constant vigilance over time required by adult fluency maintenance programs (Boberg & Kully, 1985).

Developing efficacious treatments is neither simple nor easy. The intent of this article is to provide practising clinicians with a clinical overview of the current status of fluency intervention programs for children within the two to six year range, concentrating on the rationales, descriptions of clinical facilitative 'techniques', and reported outcomes for early interventions. The objective is to encourage clinicians to explore the range of treatment options available for the preschool stutterer, concluding with some questions to which clinicians may refer in order to choose a treatment for early stuttering that is both efficacious and functional.

Certain caveats must be considered before clinicians armed with programmed instruction manuals leap fearlessly into the treatment pool. Clinical responsibility should require an insistence on the pursuit of scientifically acceptable treatment outcome data that demonstrate the efficacy of the treatment we select. This is the legacy Dr. Einer Boberg has left us to pursue responsibly and with methodological rigor. His insistence upon the development of clinical outcome measures which would combine the functional benefits of clinical experience with the science of research is a charge to all clinicians and researchers. Yet, surveying the growing literature related to treatment of young stutterers, it is disappointing to see how few clinical accounts of therapy include scientifically rigorous empirical evidence derived from clinic trials, long-term outcome studies, and reliability measures. In 1993 Yairi pointed out that only six studies on treatment efficacy for preschool stutterers involving a total of 14 children had been published. Therein stands a challenge to clinicians who, with the appropriate treatment tools, can provide convincing data to support clinical outcomes.

Treating the Young Stutterer: Assessment Guidelines

Clinicians will be more confident in proposing treatment that is predicated on a comprehensive assessment of factors related to severity, as well as the individual child's need for therapy. Therefore, the main purposes of assessment will be to: (a) diagnose the problem and determine the treatment goals, and (b) provide objective measures as a basis for evaluating subsequent change.

The purpose of assessment is to answer the questions, 'does this child stutter and what is the risk for continuing to stutter?' The components of an initial assessment includes a thorough parent interview, and observation and measurement of behavioural characteristics of disfluency based upon speaking samples obtained from a variety of settings in order to document pretreatment levels of disfluency. Treatment outcome assessment should be based on a combination of reliable pre/post measures, the aim of which is to show a generalized reduction of stuttering and healthy client attitudes in the posttreatment stage.

Parent Interview

Case history can be obtained by written response to a standard form and/or through parent interview. Relevant information should include questions about time and age of onset, as well as characteristics of stuttering, family history, and therapy history as detailed below. You will also want to question parents to determine how they define and describe their child's stuttering, as well as their own level of concern about the problem.

Onset and characteristics of stuttering. The amount of time a child has been stuttering seems to be an important variable in recovery. Yairi and his associates have observed that children who spontaneously recovered from early stuttering usually did so within 12 to 14 months after onset was reported by parents (1997). It has been noted that the chances of developing chronic stuttering seem to increase as the child continues to stutter. In order to better understand the risk factors related to each case, it is important to determine at what age stuttering was first noticed, time elapsed since onset and the parent's perception of changes in the nature of the stuttering over time. Parents should be asked to describe the behavioural characteristics of stuttering at its onset and any variability in those behaviours described as stuttering (e.g., syllable repetitions, sound prolongations, tense pauses), related to frequency, duration, or increased tension (e.g., effort in speaking). It is also important to note any changes in behaviour which could be perceived as the child's frustration about speech, as well as parents' description of any strategies the child has attempted to use in order to control stuttering.

Family history. Parents are asked if they are aware of the incidence and prevalence of stuttering in other family members, maternal or paternal, both in their immediate as well as extended family. When a history is identified it should be documented as extensively as possible (Culatta & Goldberg, 1995). When relatives with stuttering history are identified, it is important to explore their treatment history and whether their stuttering remitted or persisted. Children from families whose members exhibit chronic, nonrecovered stuttering appear to have a higher risk of continued stuttering than those children whose affected relatives had recovered (Yairi, Ambrose, Paden, & Thornburg, 1996).

Stuttering History. Clinicians should probe the details of any previous therapy or informal suggestions which may have been made by parents in attempts to respond to their child's

stuttering in the form of suggestions for decreasing disfluencies. It is equally important to explore the child's response to any informal management strategies that parents may have used. This information can be helpful in identifying useful treatment goals or counseling parents regarding the specific management of stuttering. Clinicians may wish to identify any unusual stresses on the child which parents feel might be related to onset or development of stuttering. This can provide some insight into the kinds of pressures to which the child may be vulnerable, as well as the variability noted in severity of early disfluencies over time. For a comprehensive checklist of potential stresses in a child's life consult the Social Adjustment Rating Scale (Holmes & Rahe, 1967). The family interview is also an opportunity for the clinician to try to establish how a particular child's personality and/or sensitive temperament might be viewed as affecting the child's stuttering. Exploration of these areas may enable us to give feedback to parents in the form of accurate information regarding their potential influence on stuttering development.

Behavioural Assessment

Since early stuttering is affected by many situational variables, assessment of speech behaviours seen at the initial clinical meeting may not provide an accurate picture of its variability. Therefore, direct assessment of the child will necessitate the measurement of disfluencies from a variety of samples taken from both within and beyond clinic settings in order to make the best-informed decision regarding treatment. The objectives of the sampling are to gather information related to the range and severity of stuttering and to note the presence of other co-existing speech or language difficulties related in particular to intelligibility, organization of expressive language, or word finding. The length of the sample may vary dependent upon the child's willingness to speak and the severity of the stuttering; however, a five-minute example of interaction with the child or a minimum of 300 syllables per situation sampled is useful as a guideline.

One task in assessing early stuttering is calculating the percentage of stuttered-like syllables (i.e., repetitions, sound prolongations, tense pauses, and within-word disruptions characterized by dysrhythmic phonation) compared to normal disfluencies (i.e., polysyllabic whole word and phrase repetitions, interjections, revisions, incomplete phrases). In spite of the lack of universal consensus in defining stuttering, clinicians must determine a pretreatment baseline for each child. It is, therefore, important to verify with parents whether they consider a particular speech event to be stuttered or normal. This definition by consensus (Bloodstein, 1987) is a useful clinical method for establishing judgements of what is considered to be stuttered speech for each individual case.

In gathering a clinical sample, clinicians may initially observe parents interact through play with their child. This opportunity to watch parents interact with their children also allows the clinician to observe the child's speech, how fluency is affected by various cues, and what strategies may be used by the child for self-correction of a disfluent utterance. It also allows the clinician to probe the effects of parents' communication behaviours (e.g., speaking rate, conversational turn taking, language complexity, and questioning) may have on the child's fluency, as well as what treatment strategies are offered by the parents when the child stutters. While this helps to introduce the child to the clinical setting, clinicians may be more skilled at eliciting a more varied baseline speech sample.

Since speaking samples collected in the clinic often do not accurately reflect the variability noted in early stuttering, the clinician should request that parents bring a recording made outside the clinic, for comparison. During the initial assessment, the clinician can also introduce parents to the concept of a perceptual severity rating (Onslow et al., 1994). These ratings, made by the parents for a specific interval of time, or based on one days' cumulative speaking, will allow the clinician to compare the severity of disfluencies noted in the clinic with those occurring in beyond-clinic settings. After clinical reliability is established between clinician and parents, tracking the daily or situational variability of early stuttering by monitoring the parent's severity ratings can be a valuable tool for making ongoing clinical decisions, describing stuttering, and talking about it in a meaningful way.

Finally, the speaking sample obtained should be analysed for the presence of any co-existing speech and/or language problems. In the presence of these difficulties, clinicians will want to document the existence of phonological, linguistic, or word finding problems more carefully, through additional appropriate standardized testing when applicable.

In order to obtain a standard sample of speech for analysis and documentation of stuttering behaviours, clinicians often use the Stuttering Severity Instrument (SSI-3; Riley, 1980). Although its validity has not been convincingly demonstrated (McCauley, 1996) clinicians may still find the SSI useful as a standardized procedure for gathering baseline speaking samples which can then be described in terms of frequency, duration, and observed physiological characteristics of stuttering and can be repeated as needed.

Measurement of pretreatment stuttering behaviours is essential to the initial assessment of disfluency and critical to measuring the progress in treatment. Measures may be repeated just prior to initiation of treatment, at regular intervals during therapy, and during maintenance of fluency. The analysis of speech samples can include measures of : (a) the percentage of syllables stuttered (%SS), (b) speech rate (syllables spoken per minute), (c) duration of stuttering, (d) types of disfluencies, (e) disfluency clusters (i.e., two or more disfluencies on the same

word or on adjacent syllables or words within an utterance), and (f) the description of nonspeech behaviours such as loss of eye contact, blinking, or jaw or lip movements.

Since the scope of this article does not permit an inclusive discussion of assessment, the reader is directed to several publications which can serve as guides in the development of evaluation protocols (Adams, 1977, 1980; Conture, 1990; Costello & Ingham, 1984; Culatta & Goldberg, 1995; Gordon & Luper, 1992; Gregory & Hill, 1984; Guitar, 1998; Pindzola & White, 1986; Rustin, Botterill, & Kellman, 1996; Zebrowski, 1994).

Factors to Consider

The decision to recommend treatment for young children who may have been stuttering for short periods of time has been widely debated in recent literature (Bernstein Ratner, 1997; Curlee & Yairi, 1997; Ingham & Cordes, 1998; Packman & Onslow, 1998; Zebrowski, 1997). Some feel that the majority of young children who begin to stutter will recover spontaneously (Curlee & Yairi, 1997; Yairi & Ambrose, 1992) and suggest waiting for periods of 15 months or more following onset to initiate treatment.

However, Ingham and Cordes (1998) interpret the literature as suggesting that children who received intervention earlier than age five displayed more substantial treatment benefits than older children and are less likely to suffer from relapse. In fact, according to Lincoln, Onslow, Lewis, and Wilson (1996), although older children took only a median of one additional clinic visit to reach their fluency criteria, they were slightly more prone to relapse. It is recommended that parents be given information about the potential benefits of early intervention based upon the long-term follow-up evidence from treatment research studies (Kully & Boberg, 1991; Lincoln & Onslow, 1997) in order to aid them in making an informed decision regarding proposed intervention. The choice to treat early stuttering can be more economical and far less burdensome upon the healthcare system than deferment of treatment until school age or later.

To summarize, a number of factors should be considered in guiding a clinician's decision to treat a young disfluent child. Treatment may be recommended when a majority of the following risk factors are noted. These include:

1. When a family history includes members who have had a history of unrecovered stuttering.

2. When an increase in the frequency of stuttered-like disfluencies has been noted.

3. When the child is approaching the age of five years.

4. When stuttering occurs with coexisting speech and language problems.

5. When the child is experiencing difficulty or interference when attempting to communicate normally and/or receiving negative reactions from others.

6. When parents are experiencing distress in relation to their child's stuttering.

7. When stuttering has persisted at least six months post onset without a significant decreasing trend in disfluencies and in the presence of other conditions noted here.

Treatment Models for Early Stuttering

In the past decade a variety of treatment paradigms has been proposed for young children at risk for stuttering (Rustin et al., 1996; Costello, 1983; Fosnot, 1993; Gregory, & Hill, 1984; Martin, Kuhl, & Haroldson, 1972; Meyers & Woodford, 1992; Reed & Godden, 1977; Ryan, 1974; Ryan & Van Kirk Ryan, 1983; Harrison, & Onslow, in press; Starkweather, Gottwald, & Halfond, 1990). Intervention for young stutterers falls into two general categories, direct and indirect, although integrated combinations have also been described (Guitar, 1998; Ramig & Bennett, 1997). Direct treatments are usually defined as those that explicitly teach the child to change speech and related behaviours, whether they are parent or clinician administered. Indirect treatment does not use overt or explicit methods, rather, it targets parent information and counseling, or clinician and/or parent modeling of 'fluent' speech for the child, as treatment goals. While the focus of this discussion is on the preschool child, some of the treatments described in this article may also be adapted for treating children in the 7-11 year range.

Some of the factors which clinicians may want to keep in mind when choosing a treatment model for young stutterers include: (a) whether the treatment can be adapted for weekly or intensive modes, (b) if the treatment is feasible for group or individual clients, (c) if parents are directly involved in treatment, and (d) what resources, personnel, space, and equipment are needed to carry out the treatment.

Indirect Treatment

Van Riper (1973) described the indirect approach as focusing on:

> removing or reducing the stressful conditions which presumably precipitate the disfluency. Its major rationale is preventative, the therapists generally seeking to keep the child from developing awareness of stuttering or fears of speaking so that the disorder will not progress. Many workers, for example, feel that all their efforts should be concentrated on altering parental attitudes, the family milieu and the conditions of communicative stress, with absolutely no interaction with the child himself (p. 372).

Clinical Description

Bloodstein's (1987) anticipatory struggle theory suggested that the focus of early intervention should be to remove the

stresses in the environment which are thought to be responsible for the development of stuttering. One conceptual model which has formed the basis for much indirect early intervention emphasizes understanding the dynamics of the child's interactions with the environment. The rationale for this approach is explained by the demands and capacities model of early stuttering, which proposes that fluency is at risk when demands in the environment or based within the child exceed that child's cognitive, linguistic, motoric, and/or social-emotional capacities for maintaining fluent speech (Adams, 1990; Starkweather & Gottwald, 1990). Although programs described as indirect can vary in their degree of 'directness', the majority of treatments described for young stutterers focus on training parents to mitigate pressures in the child's environment in order to facilitate fluency. Programs described by Conture (1990), Guitar (1998), Rustin et al. (1996), and Starkweather et al., (1990) have been used by clinicians to shape parent-child interactions in the preschool years. Clinical goals are generated from information gathered about the differences between parent and child on a variety of indices, including speaking rate, speech continuity, grammatical complexity, and vocabulary. In addition, the child's phonological, syntactic, pragmatic, emotional, and cognitive development are evaluated.

Based upon observations of these communicative behaviours and interactions, specific hypotheses are formulated to test the effect of altering specific aspects of parents' interactions on a child's fluency. Implicit in this body of literature is the belief that parents communicative interactions with their children play a critical role in determining the child's eventual status as either a fluent speaker or a stutterer. Factors such as communication turn taking and interruptions, as well as components of parents' verbal interactions such as questioning, complexity of utterance, and speech rate, are presumed to play a role in exacerbating and maintaining early disfluencies. Identification and reduction of these factors become the focus of training.

Therapy can take the form of weekly individual or group parent counseling session(s) to educate and give general information and suggestions, or a series of prescriptive sessions whose objectives are to change specific parental behaviours. Among other things, parents may be asked to model a slower speaking rate, limit the number of questions, interruptions, and criticisms directed to the child, restrict their own linguistic complexity, and refrain from correcting the child's speech or offering suggestions on how to speak more fluently. Parents may be guided by record-keeping tasks which help to note change. Weekly appointments help to facilitate home practice of new skills learned in the clinic setting. Clinicians work with the parents in order to guide them in modifying their speech behaviours when interacting with their young children in beyond clinic settings.

Conclusions

Although indirect treatment has been the treatment of choice for many clinicians, little empirical support for this approach exists. Researchers have tried to provide empirical evidence of the environmental factors implicated by the anticipatory struggle theory (Costello, 1983), to identify those factors in families in which stuttering prevailed (Cox, Seider, & Kidd, 1984), and to find evidence of the role parents play in contributing to stuttering (Kelly, 1994; Meyers, 1989, 1990; Meyers & Freeman, 1985a, b; Zebrowski, 1997; Zebrowski, Weiss, Sevelkoul, & Hammer, 1996).

Most studies provided findings which were based on a small number of children. Additionally, variables that could have contributed to increased fluency, such as spontaneous recovery and syntactic simplification resulting from reduced complexity of utterance were not controlled. Starkweather, Gottwald, and Halfond (1990) reported on the two-year posttreatment maintenance of fluency in 45 preschool children by telephone calls to parents; however, their claims of success are unsupported by appropriate beyond-clinic data. In addition, little evidence has been provided to suggest that parents are actually applying their newly learned sills in beyond-clinic settings in any systematic manner.

Recently, Nippold and Rudzinski (1995) examined the role of parents' speech behaviours, including speech rate, questioning, interrupting, criticizing, and critical comments in relation to children's disfluency in order to assess the effects of these behaviours on stuttering. Following a review of the relevant research, they found that the numerous studies that evaluated the treatment of early stuttering through indirect strategies did not find evidence to support the view that modification of parental speech behaviours contributed significantly to reduction of children's stuttering. In a recent treatment study using objective measures, Fortier-Blanc, Labonté, Beauchemin, and Jutras (1997) failed to find a significant decrease in frequency of stuttering for a group of children whose parents had participated in an indirect treatment group. This supports Nippold and Rudzinski's (1995) conclusion that the evidence is not sufficient to support a significant relationship between modification of parents' speech behaviours and fluency development.

One reason suggested by Onslow (1992) for the lack of empirically based treatment, proposes that the difficulties inherent in manipulating so many variables in the child's environment may have resulted in inability to design procedures to evaluate treatments which are based on environmental targets. It may also be more efficacious to work with both parents and children, rather than implementing programs which seek to train parents without the child's direct participation. If manipulation of environmental variables is effective treatment for some families, more empirically based investigations of program outcomes are needed in order to document these changes.

In their summary, Nippold and Rudzinski (1995) cautioned speech-language pathologists to question the effectiveness of indirect treatment methods, encouraging clinicians to move away from procedures which involved parent counseling and limited clinical contacts with the child, in view of the growing body of evidence demonstrating the clinical effectiveness of direct behaviourally oriented methods for the treatment of stuttering in young children.

Direct Treatment

As described by Conture (1990), direct treatment of stuttering "involves explicit, overt, and direct attempts to modify the child's speech and related behaviour" (p. 94). Even when not considered the initial treatment of choice, direct treatment is typically recommended following deterioration of fluency or insufficient improvement in the child's fluency despite changes in the communication interaction styles of parents. Direct treatment is often categorized as either: (a) stuttering modification, or (b) fluency shaping approaches. One stuttering modification objective is to help children to stutter in a less abnormal way. Fluency is increased by reducing tension, thereby allowing a more relaxed and easy manner of stuttering (Conture, 1990; Luper & Mulder, 1964; Van Riper, 1973). The core elements of fluency shaping therapy includes contingencies for fluency and/or stuttering, with reliance on data collected within and beyond the clinic to make treament decisions. Fluency shaping treatment can be weekly or intensive, programmed or nonprogrammed. Fluency may be elicited through programmed manipulation of length and complexity (Costello, 1983; Ryan, 1974; Ryan & Van Kirk Ryan, 1983; Shine, 1988). Others aim to decrease disfluency through training parents to administer appropriate response contingent stimuli in order to decrease disfluency in a positive and nonpunitive manner through a nonprogrammed format (Harrison & Onslow, in press; Lincoln & Onslow, 1997). Some clinicians have successfully combined aspects of both stuttering modification and fluency shaping approaches into an integrated model (Gregory & Hill, 1984; Guitar, 1998; Kully & Boberg, 1991; Kully & Langevin, in press). In addition, recent publications have suggested how stuttering could be managed when other coexisting speech and language conditions are present (Bernstein Ratner, 1995).

Stuttering Modification

Direct treatment using a stuttering modification approach is less structured, does not use programmed instruction and includes as treatment goals the facilitation of fluency and desensitisation to fluency disrupters. Stuttering modification therapy might begin with less direct goals such as parent counseling (Luper & Mulder, 1964). Procedures directed at the child include making speech pleasant, creating fluency models, and manipulation of clinical conditions and linguistic complexity in order to integrate and facilitate fluency in the clinic. This would be followed by a gradual introduction of fluency disrupters to increase the child's tolerance for communication pressures, in order to prevent the development of struggle and avoidance (Van Riper, 1973). Stuttering modification treatment often includes the introduction of appropriate analogies to help the child to understand the physiological nature of stuttering and treatment concepts such as smooth, easy movements and continuous voicing to reduce the effort associated with disfluency (Conture, 1990). Secondary goals related to the control of repetitions or effortful speech might be implemented through a series of games and activities which introduce these concepts at the child's level of understanding and whose aim is to help the child to stutter in an easier fashion. While the reduction of disfluency is a goal of stuttering modification, an equally important objective is the development of the child as a confident speaker and the shaping of positive parental attitudes toward stuttering (Guitar, 1998).

Fluency Shaping

Clinicians using a fluency shaping approach to the treatment of stuttering rely on behavioural principles to establish fluent speech within the clinic and to gradually transfer that fluency to beyond clinic settings. Treatment can be group or individual, programmed or nonprogrammed, structured or nonstructured, with an emphasis on collection of objective data to verify decrease in stuttered syllables at each stage of treatment.

Fluency shaping therapies often rely on variants of prolonged speech to initially reduce speaking rate. The decision to use prolonged speech techniques for reducing speaking rate in order to shape fluency was originally developed to account for differences in motor speech production seen in adult stutterers (Curlee & Perkins, 1969), and has been adapted for use with young stutterers. Clinicians and parents model variations of prolonged speech sometimes described to the child as 'turtle talking', combined with smooth, continuous breath flow, and easy speech patterns (Adams, 1980; Pindzola, 1987; Shine, 1988). Sometimes analogies, games, and activities prepared at the preschool child's linguistic levels are used to explain the concepts of slow-fast and bumpy-smooth speech (Meyers & Woodford, 1992). Older preschool children are taught to use these novel speech patterns through repetition of a model and repeated practice.

These programs may rely on both clinician and parent participation, as intervention often requires the support of parents and other significant persons in the child's life, both within and beyond the clinic. Parent involvement is essential in all stages of treatment. They observe and participate in all activities and may actively model slow rate and other fluency facilitators in order to help in generalisation of these 'targets' to beyond clinic settings.

Many models which rely on fluency shaping techniques to control stuttering do not include strategies for dealing with negative attitudes or feelings about stuttering since attitudes are felt to be modified by the successful treatment experience. When negative attitudes persist, other treatment goals may need to be considered. Guitar (1998) has proposed a model for school-aged children who may be resistant to treatment due to a strong emotional response to stuttering. This approach combines goals for cognitive and affective change with fluency modification techniques. While this approach may not be appropriate for the young preschool child, it could be adapted for the older child.

Extended length of utterance. One model for fluency shaping is carried out through a structured, programmed treatment mode which is based on gradually increasing fluency while elaborating the length and complexity of verbal output (Costello, 1983; Ryan, 1974; Ryan & Van Kirk Ryan, 1983). This paradigm is based on an intervention that begins with establishment of fluency at the word level and gradually shapes fluency in responses requiring longer and more complex utterances. Each level of complexity includes tasks which require a different response from the child with respect to language length and complexity, generalisation, and motor planning. This approach sometimes has to be modified in order to accommodate the child's idiosyncratic needs.

It should be noted that programs that manipulate length and complexity of utterance may not be completely appropriate for children who stutter and also have coexisting language difficulties. It is my clinical experience that although these children may initially be able to establish fluency when linguistic complexity is reduced, they may be unable to increase the complexity of utterance and maintain speech fluency until treatment goals are redefined to deal with their specific linguistic deficits. I have also noted that unintelligible children who are positively reinforced for shorter fluent utterances may be reluctant to increase their linguistic complexity preferring to remain fluent and intelligible within a less complex linguistic structure. In addition, producing longer utterances may not necessarily produce equivalent increases in the complexity of language (Bernstein Ratner & Sih, 1987). Children who fall into these categories may have to have treatment plans designed for flexibility as speech and language goals are redefined.

Initially, clinicians may find that the programs which are commercially available for direct treatment will be useful in developing their competence or treatment plans. These 'kits' provide step-by-step guides to direct therapy, with worksheets, materials, and record keeping forms included (Cooper & Cooper, 1985; Meyers & Woodford, 1992; Pindzola, 1987; Ryan, 1974; Shine, 1988).

Response Contingent Therapy. Considerable supporting data have been provided for direct therapy which modifies stuttering behaviours by delivering a stimulus contingent upon them. Two early studies showed that stuttering in preschool children was eliminated clinically when adults presented differential contingencies for stutter-free and stuttered speech. Martin et al. (1972) eliminated stuttering in two preschool children by using a puppet to time-out the children from speaking, contingent on a moment of stuttering. Reed and Godden (1977) achieved similar results with two children using a verbal stimulus, "slow-down", contingent on stuttering. Although few conclusions can be drawn from results with four preschool children, the possibility that response-contingent stimulation procedures were effective in controlling early stuttering was evident.

More recently, Onslow and his associates (Harrison & Onslow, in press; Onslow, Costa, & Rue, 1990; Onslow et al., 1994) have described a direct treatment for young stutterers which is based upon both clinician and parents administering response contingent stimulation in the clinic, as well as in everyday speaking environments. In the Lidcombe Program, described by Onslow and colleagues, the child and one or both parents are seen for weekly, one-hour clinic sessions, most of which are devoted to training parents in the procedures and overseeing their implementation. Parents are first taught to praise stutter-free speech, and then gradually to 'correct' stuttering in a variety of ways, including repeating the stuttered utterance without stuttering or asking the child to repeat the stuttered word. Regular measures are made in the clinic and in the child's environment which provide a means to specify treatment targets and guide the clinician's and parent's management decisions during the program. Ongoing data collection allows the clinician and parent to communicate about the child's progress. This allows the treatment format to be altered according to the severity of the stuttering or stability of fluency.

The Lidcombe program has been criticized for over-simplification of stuttering which is a multifactorial problem. Initially, concerns were expressed regarding its potential to cause harm to children through a negative parental message, as well as the possibility that drawing attention to stuttered speech may worsen it (Cook & Rustin, 1997). However, reported clinical outcomes continue to show a rapid reduction in stuttering during treatment, with stability of outcomes maintained over time. Following encouraging preliminary findings (Onslow et al., 1994), recent reported results continue to provide more supportive data for posttreatment maintenance of fluency (Lincoln & Onslow, 1997). In summary, this program's reliance on empirically based clinical outcomes provides an encouraging model that clinicians can easily embrace by combining clinical practice with scientifically credible treatment data in treating stuttering in its early stages.

Integrated models

Clinicians increasingly will choose to combine various as-

pects of direct and indirect therapies in order to tailor a treatment model to their own specifications. Integrated approaches can combine the counseling aspects of stuttering modification with fluency shaping techniques to directly decrease stuttering. Models of integrated approaches can be found in Gregory and Hill (1980) and Guitar (1998).

Treating Children with Coexisiting Speech and Language Problems

Children who stutter and have coexisting language concerns may benefit from modifications of treatment goals when the complexity of the targeted stuttering modification of fluency shaping goal exceeds the child's linguistic abilities. Bernstein Ratner (1995) has described several approaches for combining fluency with speech and language goals. For example, in a sequential model, the initial treatment goals are language or speech based. If stuttering behaviours persist, fluency goals are simultaneously added and stuttering is treated concurrently with speech and language. However, the child initially practises fluency only with language and phonological targets which have been mastered. Another example of a sequential model would be to identify fluency as the initial treatment goal, subsequently adding a language component.

Another proposal would alternate blocks of fluency treatment with language and/or phonology therapy. This allows for a scaffolding approach, concentrating on learning new skills while stabilizing and generalising others, and may be appropriate for preschool stutterers, whose fluency, language, and speech treatment goals change over time.

Conture, Louko, and Edwards (1993) developed an approach to treating children with fluency and phonological problems which avoids the demands of direct correction of articulation by using indirect auditory stimulation and opportunities for improving production. This blended model works on combined fluency and other speech and language goals to integrate newly mastered language and phonology structures within the support of fluency facilitators. The ultimate goal of this therapy is to help the child to maintain fluency when confronted by speech and language demands.

To date the clinical efficacy of these approaches have not been well documented by empirical data supporting these therapy models for treating stuttering when speech and language goals need to be included. In a problem solving based clinical treatment model, it will be necessary for the clinician to frequently reassess treatment goals in children with coexisting speech and language problems in order to choose the most appropriate goals for dealing with coexisting speech and language problems.

Conclusions

Despite the reported reduction of stuttering to near zero levels as attainable clinical goals, very little empirical documentation of clinical outcomes has existed for the preschool population, with many clinicians willing to accept the parent's subjective impression of progress as the singular indication of change (Starkweather et al., 1990). There are, however, an increasing number of direct treatment studies providing quantitive data relative to pre- and posttreatment measures in and beyond clinic settings, and for maintenance of fluency. In one encouraging study, Fosnot (1993) provided outcome data on 33 preschool children who were followed at six-month intervals for a five-year period following treatment and found that 30 had remained fluent. In an older population, Kully and Boberg (1991) found that 8 of 10 children followed for up to 18 months after an integrated program had maintained their fluency. Other examples have been cited in the work of Onslow and his colleagues (Onslow, 1992; Onslow et al., 1994).

Although these findings support the efficacy of early intervention for stuttering, some problems of interpretation remain in the absence of control groups. The difficulties and ethical constraints related to the design of controlled treatment studies may contribute to the reluctance of clinical researchers to initiate empirically based clinical outcome studies.

Another concern is that treatments whose targets were developed to meet the needs of adult stutterers, may not be the appropriate models for treating the young stutterer. Adapted direct techniques which teach young children to "stutter more fluently" in order to reduce the struggle and avoidance associated with stuttering, or to control stuttering with a novel speech pattern such as prolonged speech or its variants, may be abandoned by the young stutterer as ineffective or unnatural in beyond-clinic settings. Young school-aged children may be reluctant to use speaking techniques which are considered to be 'unnatural', resulting in a resistance to self monitoring of fluency skills in natural settings. Treatments for preschool-aged children, which are child driven, recognizing their learning styles and problem solving strategies may ultimately provide for the most stable treatment outcomes.

Additionally, the need to better understand the variables affecting spontaneous recovery in the absence of direct intervention must be considered. Clinicians who prefer to defer direct treatment in favour of a more spontaneous recovery have a responsibility to monitor that process. This can be accomplished by collecting recorded speech samples at regular intervals or through parent generated severity ratings in beyond-clinic settings. This would provide the clinician with a rationale for monitoring spontaneous recovery and guide treatment decisions as the child's risk increases (Ingham & Cordes, 1998).

In summarizing, it is felt that direct treatments have been shown to be effective in reducing young stutterers' disfluencies both within and beyond clinical environments. Due to the paucity of quantitative studies the same cannot be said for treat-

ments that use indirect treatment strategies (Nippold & Rudzinski, 1995). Since the probability of successful outcomes also appears to decrease with age (Ingham & Cordes, 1998), clinicians are urged to adopt the most efficacious treatment models in developing intelligent clinical rationales for early intervention.

Clinician Questions

It is understandable that the choice to treat young stutterers may initially conflict with practical constraints or clinician's feeling of inadequacy in regards to training and experience, leading to continued reluctance to try out these methods. Clinicians must weigh all 'real world' concerns against desired clinical outcomes, in order to develop treatment paradigms which are both rigorous and realistic. Before choosing a treatment for young stutterers clinicians may find it useful to ask themselves the following questions as the first step in initiating a treatment plan designed to successfully meet the various requirements of both client and clinician.

Will the treatment you choose be effective in eliminating stuttering?

A major goal of treatment should be a rapid decrease in the behaviours defined as stuttering. Frequent measures or 'probes' of fluency should be obtained within and beyond the clinic in order to chart the child's progress and guide decision making. These measures may include percent syllables stuttered, duration of stuttering, and speaking rate. In cases where fluency does not decrease substantively and quickly, problems in treatment should be identified and addressed. Alternative approaches should be explored only if problems cannot be successfully solved. Some problems which may arise involve the reluctance of parents to provide beyond clinic measures, inconsistency in treatment, coexisting speech and language problems, or unwillingness of the child to participate in the treatment.

Will treatment lead to acceptable outcomes outside the clinic?

Most of the clinical programs cited will lead to a reduction of stuttered disfluencies in clinical settings. Of far greater importance, however, is the extent to which treatment effects generalize beyond the clinic. In implementing a treatment model, clinicians must be concerned with the repeated evaluation of speech performance beyond clinic settings. In replication of in-clinic outcomes to beyond clinic conditions consideration must be given to the support required in the environment by the parents, teachers, and others involved with the child in order to transfer fluency. The potential practical problems in the transfer of in-clinic fluency to outside clinic settings can be reduced by choosing a treatment model which has shown to produce positive outcomes through documentation of generalisation of spontaneous self monitoring, self correction, and naturalness of speech.

Have the results of the treatment method been demonstrated by long-term follow-up studies?

Clinicians should be guided in their choice of therapy by those treatment programs whose stated outcomes are measurable behavioural, affective, and cognitive changes which endure over time. If no criteria for measuring outcome exist, criteria must be established, defined, and incorporated into the treatment plan by the repeated evaluation of speech performance in beyond-clinic settings, in order to show that the treatment has produced the desired change.

Is the treatment fun?

An important consideration, sometimes overlooked, is whether the treatment you have chosen will encourage communication that is a pleasurable activity for the child and his or her family. Are the activities child inspired, representing the interests of the child so that he or she looks forward to sessions with you? Can the treatment of choice be adapted to the youngest or upgraded to the oldest preschool age child to encourage an enthusiastic and positive clinical relationship?

Finally, in selecting treatment options it may be necessary for clinicians to consider some contemporary issues related to economic costs and client satisfaction. By clearly defining the parameters of therapy in terms of number of sessions and parental responsibilities, treatments which are empirically based may be more efficient in use of time and personnel. This is an important consideration in today's healthcare system, where economic efficiency and patient satisfaction may define treatment priorities. In addition, clinical wisdom should allow for the choice of a treatment that makes theoretical sense when all alternatives are equally weighed. The age of the child, nature and severity of stuttering, as well as availability of the child and his or her support system must be a matter of consideration in choosing the most practical model of treatment. This can only be accomplished when clinicians define the goals of treatment and establish rigorous guidelines for measurement of clinical outcomes.

In conclusion, this paper has presented an overview of approaches to treatment which currently exist for the young stutterer, in the hopes of providing a variety of options to tempt clinicians working in the area of fluency disorders to pursue the existing literature more fully.

Guidelines have been proposed which may aid clinicians in choosing treatment options to best suit their individual setting, be it school, clinic, hospital, or private practice. It is the responsibility of each clinician to ask the following questions about

the treatment they currently provide, or contemplate providing:

1. Does your treatment result in a rapid reduction in stuttered disfluencies?

2. Does your treatment lead to effective long-term outcomes?

3. How do you know this?

If you can easily answer these questions, then continue on your course. If your answers raise questions about the efficacy of treatment you are currently providing, please consider some of the other options cited in this paper by identifying the problems. Once the problems in your current service delivery models have been identified, brainstorming and problem solving sessions with your professional colleagues or with others via electronic mail can help you to reorganize your treatment plan.

Despite methodological concerns about the influence of spontaneous recovery on measures of treatment effects with preschoolers, recent findings strongly suggest that the benefits gained by treating stuttering in its early stages outweigh the disadvantages of waiting. With well-defined criteria for service delivery, you can make an important difference.

Please address all correspondence to: Rosalee Shenker, 2055 Northcliffe, 3rd floor, Montreal, Quebec H4A 3K6. E-mail: mirs@musica.mcgill.ca.

Acknowledgements

I am indebted to Deborah Kully for her valued friendship, and for her extensive and thoughtful comments on the manuscript. Thank you to Elizabeth Harrison for sharing her clinical perspectives and helping me to more fully understand the importance of treating young stutterers, and to Einer Boberg for setting the standard for my clinical endeavours.

References

Adams, M. R. (1977). A clinical strategy for differentiating the normally nonfluent child and the incipient stutterer. *Journal of Fluency Disorders, 2,* 141-148.

Adams, M. R. (1980). The young stutterer: Diagnosis, treatment and assessment of progress. *Seminars in Speech, Language and Hearing, 1,* 289-299.

Adams, M. R. (1990). The demands and capacities model I: Theoretical elaboration. *Journal of Fluency Disorders, 15,* 135-141.

Andrews, G. (1984). The epidemiology of stuttering. In R. Curlee & W. Perkins (Eds.), *Nature and treatment of stuttering* (pp. 1-12). San Diego, CA: College Hill.

Andrews, G., & Harris, M. (1964). The syndrome of stuttering. *Clinics in DevelopmentAl Medicine* (No. 7). London: Spastics Society Medical Education and Information Unit in association with Heinmann Medical Books.

Bernstein Ratner, N. (1997). Leaving Las Vegas: Clinical odds and individual outcomes. *American Journal of Speech-Language Pathology, 6*(2), 29-33.

Bernstein Ratner, N. (1995). Treating the child who stutters with concomitant language and phonology impairment. *Language, Speech and Hearing in the Schools, 26*(2), 180-186.

Bernstein-Ratner, N., & Sih, C. C. (1987) . Effects of gradual increase in sentence length and complexity on children's disfluency. *Journal of Speech and Hearing Disorders,* 52, 278-287.

Bloodstein, O. (1987). *A Handbook on Stuttering.* Chicago: National Easter Seal Society.

Boberg, E., & Kully, D. (1984). Techniques for transferring fluency. In W.H. Perkins (Ed.), *Current Therapy of Communication Disorders* (pp. 183-187). New York: Thieme-Stratton.

Conture, E. (1990) *Stuttering* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Conture, E. G., Louko, L., & Edwards, M. L. (1993). Simultaneously treating stuttering and disordered phonology in children: Experimental therapy, preliminary findings. *American Journal of Speech-Language Pathology, 2,* 72-81.

Cook, F., & Rustin, L. (1997). Commentary on the lidcombe programme of early stuttering. *European Journal of Disorders of Communication, 32,* 250-257.

Cooper, E. B., & Cooper, C. S. (1985). *Personalized fluency control therapy.* Allen, TX: DLM.

Costello, J. M. (1983). Current behavioral treatments of children. In D. Prins & R. J. Ingham (Eds.), *Treatment of stuttering in early childhood: Methods and issues* (pp. 69-112). San Diego, CA: College-Hill Press.

Costello, J. M., & Ingham, R. J. (1984). Assessment stragegies for stuttering. In R.F. Curlee & W. H. Perkins (Eds.), *Nature and treatment of stuttering: New directions* (pp. 303-333). San Diego, CA: College-Hill Press.

Cox, N.J., Seider, R.A., & Kidd, K.K. (1984). Some environmental factors and hypotheses for stuttering in families with several stutterers. *Journal of Speech and Hearing Research, 27,* 543-548.

Culatta, R., & Goldberg, S. (1995). *Stuttering therapy: An integrated approach to theory and practice.* Boston: Allyn and Bacon.

Curlee, R. F., & Perkins, W. (1969). Conversational rate control therapy for stuttering. *Journal of Speech and Hearing Disorders, 34,* 245-250.

Curlee, R. F., & Yairi, E. (1997). Early intervention with early childhood stuttering: A critical examination of the data. *American Journal of Speech-LanguagePathology, 6,* 8-18

Fortier-Blanc, J. , Labonté, S., Beauchemin, M., & Jutras, G. (1997, August). *Does indirect stuttering therapy produce effective changes in preschoolers?* Paper presented at the Second World Congress of the International Fluency Association, San Francisco, CA.

Fosnot, S. M. (1993). Research design for examining treatment efficacy in fluency disorders, *Journal of Fluency Disorders, 18,* 221-251.

Gordon, P., & Luper, H. (1992). The early identification of beginning stuttering I: Protocols. *American Journal of Speech-Language Pathology, 1,* 43-53.

Gottwald, S., & Starkweather, C. W. (1995). Fluency intervention for preschoolers and their families in the public schools. *Language, Speech, and Hearing Services in Schools, 26,* 117-126.

Gregory, H. H., & Hill, D. (1984). Stuttering therapy for children. In W.H. Perkins (Ed.), *Current therapy of communication disorders: Stuttering disorders* (pp. 77-93). New York: Thieme-Stratton.

Guitar, B. (1998). *Stuttering: An integrated approach to its nature and treatment* (2nd ed.). Baltimore, MD: Williams and Wilkins.

Harrison, E., & Onslow, M. (in press). Early interventon for stuttering: The Lidcombe program. In R. F. Curlee (Ed.), *Stuttering and related disorders of fluency* (2nd ed., pp. 65-79). New York: Thieme Medical Publishers.

Holmes, T., & Rahe, R. (1967). Social adjustment rating scale. *Journal of Psychosomatic Research, 11*, 213-218.

Ingham, R. J. (1983). Stuttering and spontaneous remission: When will the emperor realize he has no clothes on? In D. Prins & R. Ingham (Eds.), *Treatment of stuttering in early childhood: Methods and Issues* (pp. 113-140). San Diego, CA: College-Hill Press.

Ingham, R. J., & Cordes, A. K. (1998). Treatment decisions for young children who stutter: Future concerns and complexities. *American Journal of Speech-Language Pathology, 7*, 10-19.

Johnson, W. (1959). *The onset of stuttering.* Minneapolis, MO: University of Minnesota Press.

Kelly, E. (1994). Speaking rates and turn-taking behaviours of children who stutter and their fathers. *Journal of Speech and Hearing Research, 35*, 1284-1294.

Kully, D., & Boberg, E. (1991). Therapy for school age children. In W. Perkins (Ed.), *Seminars in Speech and Language. Stuttering: challenges of therapy* (pp. 291-300). New York: Thieme Medical Publishers.

Kully, D., & Langevin, M. (in press). Intensive treatment for stuttering adolescents. In R.R. Curlee (Ed.), *Stuttering and related disorders of fluency* (2nd ed.), New York: Thieme Medical Publishers.

Lincoln, M., & Onslow, M. (1997). Long term outcome of early intervention for stuttering. *American Journal of Speech-Language Pathology, 6*(1), 51-58.

Lincoln, M., Onslow, M., Lewis, C., & Wilson, L. (1996). A clinical trial of an operant tratment for school-age children who stutter. *American Journal of Speech-Language Pathology, 5*(2), 73-85.

Luper, H. L., & Mulder, R. L. (1964). *Stuttering: Therapy for children.* Englewood Cliffs, NJ: Prentice Hall.

Martin, R. R., Kuhl, P., & Haroldson, S. (1972). An experimental treatment with two preschool stuttering children. *Journal of Speech and Hearing Research, 15*, 743-752.

Martin, R. R., & Lindamood, L. (1986). Stuttering and spontaneous recovery: Implications for the speech-language pathologist. *Language, Speech and Hearing Services in Schools, 17*, 207-218.

McCauley, R. J. (1996). Familiar strangers: Criterion-referenced measures in communication disorders. *Language, speech and hearing services in schools, 27*(2) 121-131.

Meyers, S. (1989). Nonfluencies of preschool stutterers and conversational partners: Observing reciprocal relationships. *Journal of Speech and Hearing Disorders, 54*, 106-112.

Meyers, S. (1990). Verbal behaviors of preschool stutterers and conversational partners: Observing reciprocal relationships. *Journal of Speech and Hearing Disorders, 55*, 706-712.

Meyers, S., & Freeman, S. (1985a). Are mothers of stutterers different? An investigation of social communicative interactions. *Journal of Fluency Disorders, 10*, 193-209.

Meyers, S., & Freeman, S. (1985b). Interruptions as a variable in stuttering and disfluency. *Journal of Speech and Hearing Research, 28*, 428-435.

Meyers, S., & Woodford, L. L. (1992). *The Fluency Development System for Young Children.* Buffalo, NY: United Educational Services.

Nippold, M. A., & Rudzinski, M. (1995). Parents' speech and children's stuttering: A critique of the literature. *Journal of Speech and Hearing Research, 38*, 978-989.

Onslow, M. (1992). Choosing a treatment procedure for early stuttering: issues and future directions. *Journal of Speech and Hearing Research, 35*, 983-993.

Onslow, M., Andrews, C., & Lincoln, M. (1994). A control/experimental trial of an operant treatment for early stuttering. *Journal of Speech and Hearing Research, 37*, 1224-1259.

Onslow, M., Costa, L., & Rue, S. (1990). Direct early intervention with stuttering: Some preliminary data. *Journal of Speech and Hearing Disorders, 55*, 405-416

Packman, A., & Onslow, M. (1998). What is the take-home message from Curlee and Yairi? *American Journal of Speech-Language Pathology, 7*(3), 5-9.

Pindzola, R. H. (1987). *Stuttering Intervention Program.* Austin, TX: Pro-Ed.

Pindzola, R. H., & White, D. (1986). A protocol for differentiating the incipient sturterer. *Language, Speech and Hearing Services in the Schools, 17*, 2-15.

Ramig, P. R. (1993). High reported spontaneous stuttering recovery rates: Fact or fiction? *Language, Speech and Hearing Services in Schools, 24*, 156-160.

Ramig, P. R., & Bennett, E. M. (1997). Clinical management of children: Direct management strategies. In R. F. Curlee & G.M. Siegel (Eds.), *Nature and treatment of stuttering: New directions.* Needham Heights, MA: Allyn & Bacon.

Reed, C. G., & Godden, A. L. (1977). An experimental treatment using verbal punishment with two preschool stutterers. *Journal of Fluency Disorders, 2*, 225-233.

Riley, G. (1980). *Stuttering severity instrument for young children.* (Rev. ed.). Tigard, OR: C. C. Publications.

Rustin, L., Botterill, W., & Kelman, E. (1996). *Assessment and therapy for young dysfluent children: Family interaction.* London: Whurr.

Ryan, B. P. (1974). *Programmed therapy for stuttering in children and adults.* Springfield, IL: Thomas.

Ryan, B., & Van Kirk Ryan, B. (1995). Programmed stuttering treatment for children: Comparison of two establishment programs through transfer, maintenance and follow-up. *Journal of Speech and Hearing Research, 38*, 61-65.

Starkweather, C. W., & Gottwald, S. R. (1990). The demands and capacities model II: Clinical applications. *Journal of Fluency Disorders, 15*, 143-158.

Starkweather, C.W., Gottwald, S. R., & Halfond, M. (1990). *Stuttering Prevention:A Clinical Method.* Englewood Cliffs, NJ: Prentice-Hall.

Shine, R. E. (1988). *Systematic fluency training for young children*

(3rd ed.). Austin, TX: Pro-ed.

Van Riper, C. (1973). *The Treatment of Stuttering.* Englewood Cliffs, NJ: Prentice Hall.

Wall, M. J., & Meyers, F. L. (1984). *Clinical management of childhood stuttering.* Baltimore, MD: University Park Press.

Wingate, M. (1976). *Stuttering: Theory and treatment.* New York: Irvington.

Yairi, E. (1993). Epidemiologic and other considerations in treatment efficacy research with preschool-age children who stutter. *Journal of Fluency Disorders, 18*, 197-220.

Yairi, E. (1997). Disfluency characteristics of childhood stuttering. In R.F. Curlee & G. M. Siegel (Eds.), *Nature and treatment of stuttering: New Directions* (2nd ed., pp. 49-78). Needham Heights, MA: Allyn and Bacon.

Yairi, E., & Ambrose, N. (1992). A longitudinal study of stuttering in children: A preliminary report. *Journal of Speech and Hearing Research, 35*, 755-760.

Yairi, E., & Ambrose, N. (1996). Erratum. *Journal of Speech and Hearing Research, 39*, 826.

Yairi, E., Ambrose, N., Paden, E., & Thornburg, R. (1996). Predictive factors of persistence and recovery: Pathways of childhood stuttering, *Journal of Communication Disorders,* 29, 51-77.

Zebrowski, P. (1994). Stuttering. In J. Tombline, H. Morris, & D. Spriestersbach, (Eds.), *Diagnosis in Speech-Language Pathology* (pp. 215-245). San Diego, CA: Singular.

Zebrowski, P. M. (1997) Assisting young children who stutter and their families: defining the role of the speech-language pathologist. *American Journal of Speech-Language Pathology, 6*(2), 19-28.

Zebrowski, P. M., Weiss, A., Savelkoul, E., & Hammer, C., (1996). The effect of maternal rate reduction on the stuttering speech rates and linguistic productions of children who stutter: Evidence from individual dyads. *Clinical linguistics and phonetics, 10*, 189-206.