

PREDICTORS OF SUCCESS IN
FAMILY-INTERVENTION
STUTTERING THERAPY

THESIS

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By

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INTRODUCTION

Documentation is the first step in determining what works and what does not work in health care. It provides the hard evidence to support actions and to motivate needed change. The importance of documentation was recognized as early as the late nineteenth century, when mortality data prompted Florence Nightingale, one of the pioneering professionals in medical accountability, to lobby successfully for reform in London hospitals (Iezzoni, 1994). When findings revealed that the death rate in London hospitals in 1861 was 91% compared to 16% in naval and military hospitals, her arguments supporting improvements in sanitation and infection control gained the power and credibility needed to bring about life-saving change.

No legitimate health care practitioner in this century questions the need for documentation. In fact, with the advent of the information age, extensive documentation is often assumed to be universally available to support most types of treatment. Some patients expect immediate access to complex statistical data so their caregivers can justify medical trends or predict treatment results. Unfortunately, in numerous areas of clinical practice, this abundance of documented data simply does not exist (Frattali, 1998b). Even worse, in some cases where bodies of data do exist, documentation without validity or reliability has been used to promote practices that are ineffective at best, and dangerous or damaging at worst (Sheehan, 1980).

Before reliable judgements can be made regarding the effectiveness of any clinical treatment, sufficient information must be gathered for examination and

comparison. For therapeutic treatments in fields such as speech-language pathology, "reliable" has often been incorrectly defined to mean generally true rather than statistically consistent. When a treatment seems successful over time with a number of clients, clinicians often forego the tedium of objective, standardized, or even consistent data collection (Ellwood, 1988). Many practitioners have viewed documentation as time away from client care, and have therefore devoted minimal attention to data collection. In fact, as Ellwood (1988) reports, documentation is often noted and recorded only to the extent that it is required by funding providers or certifying agencies to insure payment or to promote job security.

For better or worse, documentation demands have increased exponentially in the current climate of managed health care. Using expectations illustrated by Deming's (1982) business model, payers expect providers of health service to produce "better outcomes at lower costs". Although lower costs are clearly measurable, "better outcomes" are not always so easily documented or even defined. For Florence Nightingale, a successful outcome was simply a patient who did not die during his or her hospital stay. For other practitioners--particularly those in the allied health professions--defining success is a much more challenging and subtle task.

As Frattali (1998a) argued, for some types of therapy, "cures" are not a realistic final goal. Even "change" may not occur in a way that is objectively quantifiable. Some therapy is most beneficial and cost-effective if it instructs the client in the use of compensatory strategies or if it educates a family member in facilitating a desired goal. Warren (1998) further warns that even if an objective measure presents itself,

there are typically concerns about whether or not the measure is valid in determining if the patient is qualitatively better after treatment.

Because of the difficulties in objectifying clinical successes, many methods of outcome measurement in allied health fields have relied on subjective information and "individually-defined procedures" (Hicks, 1998, p. 28). Establishing success indicators in treatment was and is often left to clinical managers or to the clinicians actually providing the treatment. But because of increasing demands from outside entities, there is a significant movement in allied health towards more consistent documentation.

According to Frattali (1998b), the 1970s brought an end to the belief that practitioners could be relied upon to provide "better" or even adequate care without also supplying proof of the quality of that care. This need for proof clearly calls for more than subjective impressions offered by the practitioners themselves. Consistent, reliable, generally-recognized, and clearly-defined outcome measures are needed to support assertions of improved results and to increase accountability in clinical practice.

In response to this generalized call for improved accountability through documentable and objective reports of outcomes, leaders in speech-language pathology have attempted to quantify the changes experienced by their clients due to the application of therapy in a number of ways. In her synopsis on the outcome measures in therapy, Frattali (1998a) uses the World Health Organization of Impairments, Disabilities, and Handicaps (WHO, 1980) framework to organize the wide variety of outcome measures used in speech-language pathology into three primary areas. The

first of these areas is labeled as the changes that occur in modality-specific behaviors. Examples of this type of measurement include percentage of correct productions or the frequency of occurrence of a desired response. The second type of outcome measure category includes changes in functional abilities. One specific type of functionality measure is the ability to clarify information by requesting repetitions as needed. The third and final category included in Frattali's list of outcome measures are those that describe changes in a client's quality of life. One example of this type of change is increased willingness to interact because of improved communication abilities.

Frattali's (1998a) list of the three primary assessment areas are arranged along a continuum that reflects two fundamental trends. When moving from modality specific behaviors to functional ability to quality of life, the trend is from most objective to most subjective. In other words, the trend moves from most easily measured to most difficult to measure. Unfortunately, when clinicians, payers, and clients seek to determine the most realistic and valid result of treatment, their ideal goal--the one that likely prompted the client to seek treatment--is a substantive improvement in that client's quality of life. This means that the measure which is most reflective of real change is also the most difficult to assess. Frattali (1998a) expressed this conflicted ideal in the measurement of clinical success when she quoted one payer's illogical plea: "I want a quantitative measure for a qualitative product" (p. 63). This conflicted statement adequately sums up the dilemma faced by many speech-language pathologists.

In an attempt to reach a compromise between the raw objective data gleaned

from specific modality measurements and the total subjectivity of quality of life judgements, many speech-language pathologists are using outcome measures that attempt to quantify functional change in their client's communication skills. One system that measures this type of outcome is the Functional Independence Measure (FIM), which is frequently used in many adult rehabilitation settings (State University of New York at Buffalo, 1993). FIM scales are based on a seven-point ordinal scale, which the clinician uses to rank various aspects of the client's communication function.

Because the FIM scale fails to measure discrete yet significant improvements in speech and language, the American Speech, Language, and Hearing Association (ASHA) developed its Functional Assessment of Communication Skills for Adults (Frattali et al., 1995) to aid in documenting finer incremental change. The FIM scale and ASHA's FACS are two measures that represent a collection of functional outcome measures developed recently to provide more consistent, reliable, and valid data in speech-language pathology.

The field of stuttering therapy, like other areas of speech-language pathology, faces the same dilemma in the gathering of data and the measurement of clinical outcomes. This dilemma is further complicated in stuttering therapy by deficits in the body of knowledge regarding stuttering in general. This scarcity of information prompted ASHA to warn practitioners that its "Guidelines for Practice in Stuttering Treatment," published in 1995, were not to be considered as standards since "the state of knowledge in several key areas was not developed well enough for the promulgation of 'standards'" (p. 26).

Prior to ASHA's published concern over the state of knowledge regarding stuttering treatment, Conture and Guitar (1993) identified numerous informational gaps that stymie attempts to establish treatment efficacy. They argued that stuttering treatment research still lacks consensus in such elemental areas as 1) the nature of the measurement sample (What type of task should we measure? What type of setting?), 2) the validity of the measure (Does the measuring instrument actually measure what it is intended to measure?), and 3) the type of validity (Should we measure frequency of stuttering or the client's ability and willingness to communicate?)

As with Fratteli's outcome measure continuum, Conture and Guitar (1993) suggested that establishing the ideal method of measuring real change facilitated by stuttering treatment is a major hurdle given the current state of the art. They asserted unequivocally that "the true test of the efficacy of treatment...will be the extent to which the child easily, freely, and readily communicates with whatever conversational partners he or she wants" (p. 267). The challenge comes with trying to codify such communication reliably.

To make the challenge of outcome measurement in stuttering therapy even more complex, there are inconsistencies in the measurement and labeling the stuttering behaviors themselves. This means that a lack of objective data exists not only in the outcome of therapy, but before the therapy actually begins. Kent (1996) suggested that these perceptually-based discrepancies must be recognized when attempts are made to measure outcomes objectively in stuttering therapy. Kent further illustrated this caution by citing Cordes and Ingham (1994a, 1994b), who concluded that the amount of

potential inconsistencies in counting stuttering is often greater than improvements attributed to treatment.

According to Blood and Conture (1998), the difficulties inherent in documenting stuttering behaviors and the outcomes in stuttering therapy have forced practitioners and researchers to address functionality and quality of life changes. This need is apparent when evaluations are made following the same World Health Organization (WHO) model of impairment, disability, and handicap presented by Fratteli (1998b). As Blood and Conture explained (1998), in stuttering, the severity of a client's impairment (the frequency of stuttering behaviors) is not often consistent with the severity of that client's disability (the effect stuttering has on communication) or the level of the client's handicap. A client with stuttering labeled as "severe" by behavioral measures (percentage of syllables stuttered, for example) may be able to communicate freely and effectively with anyone he or she chooses. On the other hand, a client with few documentable dysfluencies may be so inhibited by these "imperfections" that communication is reduced to an absolute minimum.

Because of the inconsistencies in the nature and severity of fluency disorders, many practitioners and researchers suggest that the context, objectives, and measures of success in therapy be broadened to provide a more realistic view of treatment efficacy. Mowrer (1998) suggested including parental observations as a method of evaluating progress. Mallard (1998a) promoted a broader, more functional approach to determining treatment outcomes. He suggested individualizing therapy for each client, adopting those objectives which the client is most invested in achieving, then applying

outcome measures that are judged by the clinician to be most appropriate for measuring those client-selected objectives.

Given the difficulties in measuring stuttering behaviors, in applying treatments consistently (Conture & Guitar, 1993), in selecting valid outcome measures, and in establishing construct validity, it is no surprise that both documentation and accountability is lacking in the field of dysfluency treatment. Although ambitious attempts were made as far back as 1980 to document treatment effectiveness through meta-analysis of numerous treatment reports (Andrews, Guitar, and Howie, 1980), a need still exists for statistically-supported evidence to validate the application of certain methods of treatment for those who stutter (Sheehan, 1980; Blood & Conture, 1998).

Once outcome data were gathered on an array of functional and quality of life changes reported by those involved in the Family-Intervention Stuttering Therapy Program at SWT, the decision was made to explore the further use of those data in an effort to improve service delivery. One practical application of these data was a study designed to compare the available outcome reports to the extensive information gathered from each participating family prior to treatment. This study design developed into a statistical search for outcome predictors.

The use of outcome predictors is well documented in the field of medicine (Gujarati, 1988). The choice an oncologist makes between performing surgery on a cancer patient or prescribing radiation treatments can be based on statistically-derived predictors of success. Factors such as symptoms, age, and history can be used to

determine the need for more or less radical treatment, and to predict the success of the applied treatment. The use of predictors is much less evident in the therapeutic-behavioral sciences, where variables and outcomes are prone to be much more subjective.

As a result of the lack of documentation and outcome data in general, there appears to be a shortage of the identification of outcome predictors in speech-language pathology overall and fluency disorders in particular. Data on predictors in other behavioral sciences related to family therapy are also sparse, though such studies do exist. One study identified predictors of psychological change due to family-based treatment for obesity (Myers, Raynor, & Epstein, 1988). Though this study was at least oriented toward predictors in a type of family-based therapy, its results offer little to clarify the search for such predictors in stuttering therapy. The proposed search for correlations between client characteristics and success in family-intervention stuttering therapy at Southwest Texas appears to be unique in the field at the time this time.

The need for outcome predictors in stuttering treatment is strongly implied by researchers and theorists like Cooper (1977) and Guitar (1998), who assert that it is vital to apply the appropriate type of therapy to each individual case. Cooper (1977) challenged providers of dysfluency therapy to refrain from treatment until they are well acquainted with what he thought was their most fundamental treatment challenge. He asserted that the most important responsibility for the speech pathologist in assisting clients who stutter is to properly assess which therapy most closely matches each client's internal criterion for success. He further stated that successful clinicians

are able to determine how much "psychic energy" the stutterer is capable and willing to expend on the control of their speech. He contended that the available energy must be carefully channeled via an appropriately-tailored therapy approach.

Guitar (1998) agrees that a one-type-cures-all treatment does not exist. His text on the treatment of fluency disorders is structured around contrasts in therapy types prescribed for contrasts in needs. To add to this complexity, he also suggests that multiple combinations of therapy types are likely to be most appropriate for some clients.

The challenges set forth by Cooper and Guitar relate the importance of determining what therapy is most appropriate for each client. Logic dictates that the only way to make such a determination is to make a prediction of how a client will respond to a method of treatment. These predictions can be made subjectively, with what some would call instinct, or more objectively, based on information from statistical research. Because of the shortage of objective documentation in some areas of stuttering treatment, there has been a lack of such objective outcome predictors. This lack has made it difficult for clinicians to help clients make appropriate choices in therapy using substantiated evidence. The potential usefulness of such evidence provided the motivation for this research by those involved with stuttering therapy at Southwest Texas State University.

Family stuttering therapy at Southwest Texas State University began in 1986 in the Department of Communication Disorders. The Family-Intervention Stuttering Program (FISP) was modeled after a therapy approach introduced to the SWT program

director through personal contact with Lena Rustin, who later documented her methods (1987a, 1987b). This approach employs a family problem-solving perspective that integrates speech therapy, social skills training, and transfer activities. Through participation in the program, the stuttering child and the child's family--both parents and siblings over six years of age--are equipped with a variety of tools they can employ during therapy and at home. These tools enable the participants to manage the child's stuttering and promote an increase in speech control (Mallard, 1998a; Rustin & Kuhr, 1989).

In the years subsequent to the establishment of FISP at SWT, the results achieved through the program appeared to support its success. By 1992, 82% of the 28 families participating to that point reported that their children did not require further speech therapy for stuttering following their involvement in the program (Mallard, 1992). As the program continued and the number of participants grew to over 45, more extensive, long-term evaluation of therapy success was undertaken in response to the widespread concern over the need for accountability in the field of stuttering therapy. The information gathered from the participating families both before therapy and during this long-term follow-up provided the data needed to conduct a statistical search for outcome predictors in family stuttering therapy at Southwest Texas State University.

Blood and Conture concluded their report on outcome measures in fluency disorders by calling for "well-defined studies involving relatively few subjects examining real-life differences" (p. 401). In response to this call and in an attempt to

increase effectiveness in an apparently successful treatment program, the primary clinician involved in stuttering therapy at Southwest Texas State University (SWT) undertook just such a project to document the program's efficacy. This program provided an ideal forum for such a study. It complied with Blood and Conture's criteria in virtually every aspect. First, there had been relatively few subjects (45) involved in the program. Second, the objectives targeted throughout the program were designed to facilitate real-life changes for the clients and their families. Finally, because the theory supporting the program had remained consistent throughout its history, the possibilities for implementing a well-defined, valid study were enhanced.

The research described here is one response to the increasing need for accountability in the field of stuttering treatment. The specific purpose of this study was to determine whether information gathered in the case histories of clients participating in family-intervention stuttering therapy can be used to predict the success of certain clients in this type of therapy. It is intended that the data gained from this research will add to the body of knowledge accumulating in the field of dysfluency research. It is also one institution's response to the call for more clinical documentation to promote efficacy in the treatment of fluency disorders. Of course, the ultimate value of identifying such predictors lies in their potential to improve services to individuals who stutter. Adding the results of this study to the current body of knowledge will hopefully allow practitioners to guide potential clients more effectively toward the type of therapy that will allow them to become the most effective and uninhibited communicators possible.

METHOD

All subjects included in this study completed the Family-Intervention Stuttering Program at Southwest Texas State University at some time between its inception in 1985 until 1997. There were a total of 45 subjects, 35 male and 10 female. This ratio is reflective of most reports of the population of stutterers at large (Bloodstein, 1995). Age range of subjects at the time that their parents were interviewed prior to treatment was from 3 years 3 months to almost 15 years, with a mean age of 8.97 years (see Appendices A-E for complete client profiles formatted according to variables used in this study).

Recall that the Program at SWT is modeled after a therapy model developed by Rustin (1987a, 1987b). An important part of this therapy is a comprehensive assessment prior to beginning treatment. This assessment was scheduled after the child was referred to therapy, and followed a telephone interview with the parent or parents in which the program was explained and questions were answered.

The assessment was designed to analyze two areas. First, each child's speech and language skills were screened, with emphasis on the fluency problem through measurement of stuttering in conversation and reading and through the identification of various stuttering-related struggle behaviors (Mallard, 1998). Each child also underwent a hearing screening. Second, the history of the stuttering problem, patterns of family interaction, and the child's place in the family framework were recorded

through an extensive case history interview with both parents (Rustin & Cook, 1983). To be considered for participation in therapy, both parents were required to attend the interview session, unless the child lived with a single parent. In that case, the parent with whom the child lived had to attend the assessment, though the other parent was encouraged to attend if both parents agreed. All interviews were conducted by the director of the stuttering program. Most sessions lasted for approximately two hours (Mallard, 1998b).

During the session, the interviewing clinician asked each parent the same questions included on the case history form (Mallard, 1998b). Their responses to each question were recorded by an assisting clinician, or audio-recorded for later transcription. The format for the case history data sheet was consistent from one program year to the next.

The case history form (see Appendix F for complete form) included information relating to the child's physiological, linguistic, social/environmental, and psychological/emotional development and status. As shown in the column headings of Appendices A-D, these divisions correspond to the subtopics noted on Rustin, Botterill, and Kelman's (1996) comprehensive summary chart for young dysfluent children. The forms presented very specific questions about such subjects as the child's health, behavior in a variety of environments, sibling relationships, relationship with parents, stuttering behaviors, personality type, and probable motivation to begin therapy. Parental judgements made about subjective information were recorded without alteration throughout the interview process.

Potential predictors of success (independent variables) were isolated from the information included in case histories. These variables included such items as gender, family history of stuttering (recovered or not), stuttering behaviors exhibited, presence or absence of other speech-language-hearing disorders, and education level of parents were included in the initial selection process. The variable names were used as column headings in a spreadsheet using Microsoft Excel software, (Microsoft, 1998), and the columns were placed in four groups relating to Rustin, Botterill, and Kelman's (1996) four categories. Finally, data from each case history were recorded under each variable heading in the spreadsheet until the spreadsheet had been completed for each subject.

As patterns emerged from the accumulated preliminary data, related variables were added to the study to promote further evaluation. For instance, when accumulating data began to reveal that a large proportion of clients had a history of asthma, asthma was added as a separate category to explore possible significance. In contrast, some factors initially selected for study were discarded due to inconsistencies in reporting. One such variable was economic status of the participating families. Specific income figures were not gathered for the families during the interview process. The only related information gathered was the profession of each parent. Though socioeconomic status can be extrapolated from vocation in urban regions, attempts to codify families according to their income were eventually abandoned because this information was not available for rural areas.

Another reason some factors initially selected for analysis were discarded was a

lack variance among available subjects. In other words, since the number of subjects was relatively small (45), some of the targeted variables were removed from the study due to an inadequate number of representatives per group to establish a significant association. For example, ethnicity was initially considered as an independent variable, but a statistically-significant sample of nonwhite subjects was not available from the body of subjects. Therefore, this variable had to be discarded as a potential predictor in this study.

In order to insure intrajudge reliability, rigid criteria was established for all independent variables not stated explicitly in the case history forms. For instance, information such as age, gender, and history of prior therapy required no criteria since parents reported objective data in direct response to a specific question. In contrast, other questions (such as age of linguistic competence and onset associated with family changes) invited parents to relate information in the form of comparatives or anecdotes. The criteria established to extract reported information from the 45 case histories promoted accuracy of the database. In order to test the reliability of this method, the researcher completed five exhaustive passes through the case histories using the criteria to confirm consistency of the data.

Following the process of selecting and refining factors included in the available parent interview forms, a total of 44 independent variables were isolated for analysis. These variables are presented as column headings in Appendices A-D. Once all case histories were examined and factors were recorded, data on the spreadsheet was converted to facilitate statistical analyses using SPSS Advanced Statistical Software

(Norusis, 1994). For example, nominal data (yes/no) were changed to numeric values (1/ 0). In other cases, because the number of subjects was relatively small, interval-level data were grouped to allow for greater probability to discover statistically-significant results. This grouping occurred with items such as the ages of clients, where the 45 subjects were divided into four groups ranging from 2.45 years to 5 years, 5 to 7 years, 7 to 9 years, and 11 or more years.

The selection of the outcome predictors used in this study came as a result of the clinical experience of the program director. Prior to 1986, the director had been involved a successful application of the Precision Fluency Shaping Program (Webster, 1980) at the Bill Wilkerson Hearing and Speech Center in Nashville, Tennessee (Mallard & Kelley, 1982). This therapy, as with most studies documenting results of stuttering therapy (Bloodstein, 1995), records therapy effectiveness according to percentage of stuttering before and after therapy (Webster, 1980). Success in therapy is defined as a significant reduction in this percentage following treatment.

According to follow-up data gathered on the clients involved in the Precision Fluency Shaping Program, many clients were able to demonstrate fluent speech during the assessment, as recorded by objective, data-based measures (Mallard & Kelley, 1982). This is the type of outcome measure advocated by stuttering researchers who strongly favor experimentally-reproducible scientific support for therapy methods, and who are typically forced to discount the cognitive or emotional change (or lack of change) exacted by treatment (Cordes & Ingham, 1994a)

In contrast to the objective results presented by the clients during formal

assessment, Mallard & Kelly's follow-up information showed that many clients did not use the fluent speech they had shown they were capable of in normal conversation--an apparent cognitive and/or emotional choice (Mallard & Kelley, 1982). In other words, "fluency data implied one thing, but the reality of how many clients conversed in normal conversational situations implied something entirely different" (Mallard, 1998a, p. 124). Mallard's concerns over this discrepancy were echoed by Mowrer (1998), who asserted that researchers and clinicians "need far more information and insight about stuttering than has been provided by the carefully controlled experimental research studies conducted during the past several decades" (p. 89). In fact, the concerns over the limits of behavioral-therapy outcome measures had been expressed previously by a others in the field (Sheehan, 1980; Cooper, 1987).

The disjunction between ideal fluency performance during assessment and the reality of normal conversational fluency inspired Mallard to reevaluate the validity of using objective measures as the only method of determining outcomes in fluency treatment (Mallard, 1998a). An earlier study supported this reevaluation when its results showed that a child's level of speech control and willingness to interact could increase in spite of the fact that his or her percentage of fluent speech decreased (Mallard & Westbrook, 1988). Mallard sought a way to establish functionally Conture and Guitar's (1993) ideal measure of treatment efficacy, which they said would be "the extent to which the child easily, freely, and readily communicates with whatever conversational partners he or she wants" (p. 267). In this effort, his goal was to identify an outcome that would more closely resemble what Frattali (1998b) called an

"ultimate outcome" (p. 10). This type of outcome demonstrates the social validity of intervention in areas like functional communication. It also attempts to get at the meaningfulness of therapy, and is consequently the central interest of payers, clients, and clients' families (Frattali, 1998b).

Success Measure #1: Family Deals Effectively with Stuttering

Using this rationale, Mallard selected a measure for outcome in the program according to the primary emphasis in therapy: problem solving. If, after completing the program, the "family had the knowledge and techniques to deal with stuttering in the home environment, then success was achieved no matter how much disfluency was present during speech evaluation sessions" (Mallard, 1998b, p. 5). This factor was selected since it reflected one of the primary goals in the therapy approach: to equip the family and the child to deal effectively with his or her stuttering in the normal speaking environment. If, following participation in the FISP, further therapy for stuttering was not sought by the family or by the child, therapy in FISP was considered successful in equipping them to deal with the stuttering.

Success Measure #2: ASHA's Seven Levels of Speech Control

The second method used to measure success was the family's rating of the child's level of speech control using the American Speech-Language-Hearing Association's (ASHA's) 7-levels of Speech Control. This measure is part of ASHA's National Outcome Measurement System (NOMS), which was designed to provide its members with standardized information useful for making judgements relating to functional outcomes (Baum, 1998). Using this measure, a speaker is ranked from Level

1 (non-functional, listener cannot comprehend message) to Level 7 (Speech normal in all situations). One reason this measure was selected for use in this study was because of the difficulties in attempting to assess former clients face-to-face. Most lived outside of the city and some lived outside of the state, so arranging meetings with them was not possible in the context of this research. This measure was also chosen because the time elapsed since the completion of therapy for some clients was over 14 years, further complicating the feasibility of meetings with former clients and the accurate assessment of their speech.

ASHA's NOMS measure is criticized by some in the field of behavioral fluency treatment as having an overreliance on subjective client perceptions and an overdependence on functionality and the achieveability of goals (Cordes, et al, 1998). However, this approach to measuring outcomes is ASHA's best effort at balancing "the need for information now and having scientific rigor" (Baum, 1998, p.9). Besides serving a more immediate goal as a recognized measure for an individual's outcome in this therapy program, this measure is currently undergoing tests for reliability and validity nationwide. Its use in this study represents this program's efforts toward that larger goal.

Success Measure #3: Families' Ratings of the Appropriateness of Therapy Approach

The final measure of outcome was each family's evaluation of the appropriateness of the therapy approach used in FISP. This information was gathered from each participating family as part of a follow-up questionnaire distributed in 1998. As part of this follow-up, participants were asked to describe the appropriateness of

the therapy approach of FISP for their family using a five-point Likert scale. Families were asked to state their degree of agreement (strongly agree, agree, neutral, disagree, strongly disagree) to the statement, "Therapy emphasis was appropriate for our family."

Statistical Procedures

In order to identify simple associations between all possible pairs of variables prior to analysis using logistic regression, all variables were compared using Pearson's chi-square statistic ($\alpha < 0.05$). SPSS Software was employed to identify these significant associations (Norusis, 1994).

Following this preliminary screening method, stepwise logistic regression was used to discover if relationships existed between predictor variables and therapy outcome. Stepwise logistic regression is a method of analysis commonly used in clinical science to isolate outcome predictors from an array of independent variables (Norusis, 1994). In this study, stepwise logistic regression was used as a form of experimental data analysis to identify a mathematical equation that could be used to guide the selection of candidates for future therapy. The basic equation used to determine predictors using this method of analysis is "Probability = $1 / (1 + e^{-z})$ ", where e = base of natural logarithms (approximately 2.718), $z = b_0 + b_1X_1 + \dots + b_zX_z$ " (Norusis, 1994). When this equation was applied to the available data, a new equation was then identified to be used to guide the selection of future clients for therapy.

RESULTS

As noted above, prior to analyzing the data to discover outcome predictors of therapy, every variable included in the study was compared to every other variable in the study using Pearson's Chi-square statistic. It is important to recall that the isolation of these two variables does not in any way imply cause, but simply reveals association (Norusis, 1994).

Simple Associations Using Outcome Measure #1: Child Did Not Return to Therapy

Using Pearson's Chi-square statistic to compare the first success measure (child did not need to return to therapy) and each of the 44 independent variables, two associations were discovered to be significant ($\alpha < 0.05$).

1. The first association revealed that late acquisition of language increased the likelihood that the child would return to therapy.

2. The second association revealed that an older sibling in the home decreased the likelihood that the client would return to therapy.

Simple Associations Using Outcome Measure #2: ASHA's Levels of Speech Control

Using the second measure of outcome, ASHA's 7-levels of speech control, two independent variables were identified as significantly associated with treatment results.

1. The first variable was parents' reports of the authority structure in their home. If parents reported that they shared authority in the home, the level of speech control exhibited by their child following therapy was likely to be higher.

2. The second variable associated with ASHA's level of speech control was

parents' assessment of their child's attainment of linguistic competence. If parents reported that their child achieved linguistic competence late, rather than early or at a normal time, that child's speech control rating was likely to be lower. It is noteworthy to recall that this second variable, which relates to the child's development of linguistic competence, was also discovered to be associated with the first outcome measure (child did not return to therapy).

Simple Associations Using Outcome Measure #3: Therapy Appropriate or Not

Finally, using the third measure of success, a follow-up item from the questionnaire allowing families to report whether or not the therapy approach was appropriate for them, two independent variables were revealed as having significant association with outcome.

1. The first of these variables was age. The younger the client, the more likely the parents were to report that this therapy approach was appropriate for them.
2. The second variable associated with outcome using this measure was parent reports of whether or not the child was affectionate. If the family reported that their child was notably or highly affectionate, they were less likely to judge this therapy approach as appropriate for their family.

Stepwise Logistic Regression Using Outcome Measure #1

Following the above-mentioned screening method, stepwise logistic regression was used to discover if relationships existed between the independent variables extracted from the case history interview forms and therapy outcome. Stepwise logistic regression was also used to identify a mathematical equation that could be used to

guide the selection of candidates for future therapy. The basic equation used to determine predictors using this method of analysis is "Probability= $1/1+e^{-z}$ ", where e =base of natural logarithms (approximately 2.718), $z=b_0+b_1X_1+...+b_zX_z$ " (Norusis, 1994). When this equation was applied, the following equation was identified to be used to guide the selection of future clients for therapy: $z=(-0.5108) + 3.2956$ (Language Competence) (-2.0917) (Child Troubled by Stuttering).

The two predictors of outcome discovered using this statistical process were (a) parent reports concerning their child's time of language acquisition and (b) whether or not their child was troubled by their stuttering. These variables provided percentages of likelihood of the need to return to therapy if the following combinations of conditions were reported in the client's case history:

1. If language acquisition was late and the child was not troubled by stuttering, the likelihood of return to therapy was 94%;
2. If language acquisition was late and the child was troubled by stuttering, the likelihood of return to therapy was 67%;
3. If language acquisition was normal and the child was not troubled by stuttering, the likelihood of return to therapy was 38%;
4. If language acquisition was normal and the child was troubled by stuttering, the likelihood of return to therapy was 7% in this study.

These results indicate that the late acquisition of language increased the likelihood that the child would return to therapy. On the other hand, if parents reported that their child was troubled by his or her stuttering, the likelihood that the child

would find it necessary to return to therapy decreased.

Advanced Regression Analysis, Outcome Measures #2 & #3

No significant results for outcome measures 2 or 3 were found using regression analysis because of the complexities of extracting statistical correspondence from ordinal-level data on 5 and 7 point scales. The potential for discovering predictors using this ordinal data would likely increase if the number of case histories had been greater than the number available for this study.

DISCUSSION

This research was designed to determine if predictors of success could be identified for participants in the family-intervention stuttering therapy program at Southwest Texas State University. Using stepwise regression analysis, this study yielded two statistically-significant predictors of outcome, late language acquisition and child not troubled by stuttering. The presence of these factors in the case history of participants increased the likelihood that the child would not be successful in this therapy.

These results were obtained by evaluating data that were, in large part, subjective. In fact, both the source of the independent variables and the outcome measures used as dependent variables were based upon the reporting or judgement of the parents rather than purely objective criteria. While this approach to research is inclined to create controversy, its use is both necessary and appropriate given the therapy program being analyzed (Mallard, 1998a). It is also more likely to reflect some of the real-life improvements targeted for measurement by the World Health Organization in its model of impairment, disability, and handicap (Fratteli, 1998).

Recall that this approach to stuttering treatment is based on the premise that stuttering is unique to each child (Mallard, 1998a). Treatment is most effective when each family's capabilities to aid their child in controlling stuttering in social contexts are addressed specifically (Mallard, 1998a; 1998b). Participants undergo training designed to meet each family's specific strengths and needs while maintaining a

general focus around the areas of speech skills, social skills, and transfer activities (Mallard, 1998a; 1998b).

Because of its varied approach, this therapy, by necessity, is reliant upon subjective rather than objective outcome measures to determine its effectiveness. This is because families participating in the program are encouraged to explore different solutions to the same problem (Mallard, 1998a). Limiting the definition of success to a single outcome measure, particularly an objective outcome measure such as percentage of dysfluency, does not allow for the realistic measurement of the target of therapy, which is increasing the family's ability to successfully manage the problem of stuttering (Mallard, 1998a).

Another reason that this study relies on case history data is because each set of parents was required to complete a comprehensive interview prior to the initiation of therapy. The forms and the interview procedures have remained consistent since the program was instituted in 1986. Therefore, when the decision was made to undertake a study to discover if predictors of outcome existed for this therapy approach, the case history interview records provided the only source of consistent data across all families.

The issue of spontaneous recovery must be addressed when examining the results of any treatment program for stuttering. Curlee and Yairi (1997) and Sheehan (1980) recognized this possibility and warned against inappropriately crediting treatment methods that may have had little or no part in the remission of stuttering. They concluded that treatment methods, in particular those applied during early

childhood, were not often helpful in decreasing stuttering. On the other hand, Curlee and Yairi did concede that most treatments were not likely to do harm. In this regard, Curlee and Yairi were supported by Bernstein Ratner (1997), who warned against overapplying the results of empirical data in making treatment decisions, particularly in discouraging treatment when the child or the family was strongly motivated to seek help.

With these warnings in mind, it is helpful to consider further the research by Yairi and Ambrose (1999) relating to the persistence of stuttering in early childhood. They state that the possibility of spontaneous recovery is "primarily a phenomenon of early childhood" (p. 1109). Yairi and Ambrose also relate predictions of spontaneous recovery to the course of stuttering and the length of time stuttering persists since onset. That is, the longer a child stutters, the more likely his or her stuttering is to be persistent. More specifically, if a child stutters for more than three to four years, he or she is likely to be a persistent stutterer who will not recover spontaneously (Yairi & Ambrose, 1999).

Yairi & Ambrose's (1999) conclusions validate the results of the present study by providing evidence that the vast majority of participants in the SWT Program were likely to be perseverative stutterers. Only seven of the 45 children in this study were less than seven years old. This means that the other 38 were unlikely to experience spontaneous recovery. Additionally, of the seven children younger than seven years old, three had stuttered for over three years. Since this duration of stuttering implies that the child will likely not recover (Yairi & Ambrose, 1999), the number of children

in this study who were likely to stop stuttering spontaneously is further reduced. All told, at least 84% of participants were very likely to be persistent stutterers.

Result 1: Linguistic Competence

Of the two results in this study, parent reports of linguistic competence was isolated as the most powerful predictor of therapy outcome using stepwise logistic regression. If the parents said that their child was late in obtaining linguistic competence, the child's likelihood for success in therapy declined.

There is controversy in current research regarding the relationship between stuttering and language development. Many studies suggest that language skills are generally slower to develop in children who stutter (Andrew & Harris, 1964; Bloodstein, 1987; Darley, 1955, Kline & Starkweather, 1979). Others maintain that such a relationship does not exist (Watkins, Yairi, Ambrose, 1999; Seider, Gladstein, & Kidd, 1982), or exists only among subgroups of stutterers rather than the group as a whole (Nippold, 1990). That a result relating to the rate of linguistic development was discovered in this study serves to further complicate the controversy. This is true even though this study does not specifically imply a relationship between stuttering and linguistic competence, but rather a relationship between therapy outcome and linguistic competence.

During the case history interview, each set of parents was asked two questions relating to their child's language development, "What was the general development of your child's language?" and, "How did this child compare (linguistically) with your other children?" Parents responded to these questions by stating that their child was

either "early," "normal," or "late" in language development, and either "earlier," "the same," or "later" than his or her sibling/s. If parents reported that the child was either late in language development, later than his or her siblings, or both, that child fell in the language-delayed category. Parent responses were recorded without consideration for the criteria used by the parent to determine the rate of their child's language development.

As indicated earlier, this research revealed that if parents reported their child as being late in obtaining linguistic competence, that child was more likely to return to therapy following family-intervention treatment. In other words, children who were viewed as language-delayed by their parents were less likely to achieve success as defined by this study. Whether or not the parents' assessment of their child's language development was accurate, the fact remains that the parents perceived their child as linguistically delayed or as developing later in comparison with siblings, and the collective perceptions of parents involved in this study proved to be statistically significant in predicting outcome.

Exploring the reasons for the relationship between late language development and lack of success in therapy leads to a complex array of possible implications. Are language-delayed children with fluency disorders less likely to achieve success given this combination of impairments and/or risk factors? Do parents' expectations of their child's language performance somehow relate to Starkweather's "Demands and Capacities" model (Starkweather, 1987; Starkweather and Gottwald, 1990), sabotaging the child's chance for success in family-intervention treatment? In other words, does a

child who fails to meet parental expectations in language skill or development respond negatively to the stress of an environment in which he or she is perceived as delayed, including the stress of family-based therapy? This could be loosely associated with Guitar's (1998) conclusion that stress is the common denominator among studies relating to environmental factors in childhood stuttering.

Result 2: Child Troubled by Stuttering

The second predictor of treatment outcome was parent reports of their child's level of concern over stuttering. Specifically, if parents indicated that their child was not troubled by his or her stuttering, the probability of that child needing further treatment after the family-intervention program increased. According to success criteria established for this study, this means that a lack of child concern over stuttering decreased the chance for success in this type of therapy.

Explicit data gathered for this variable was typically obtained from the case-history interview forms under the questions, 1) "Does the (stuttering) problem bother you (the parents)?" and 2) "Why are you seeking help at this time?" In response to the former question, some parents indicated comparative level of concern about speech between themselves and their children. In response to the latter question, many parents indicated that their child recently seemed more troubled by his or her stuttering, so they felt help should be sought in response to this increasing concern. Additionally, if parents indicated that their child was concerned in response to any other question on the interview form, these responses were also considered and recorded as child troubled by stuttering responses. In 82% of the case history forms, parents indicated

that their child was troubled by stuttering. On the other hand, 18% of the forms included explicit statements from parents that their child was not troubled by his or her stuttering. When these explicit responses were noted, the child was classified as not troubled by his or her stuttering. Criteria for this variable was, therefore, dichotomous, with no allowance for ranges of concern.

The discovery that lack of concern on the part of the child reduced that child's probability for success in therapy invites speculation. One possible explanation is that the child's lack of concern implies lack of motivation to change. Reflexively, this statement suggests that a certain level of concern translates into sufficient motivation to bring about success in therapy (Silverman, 1980; Cooper, 1977).

When viewed as a precursor to motivation in therapy, a child's concern about his or her stuttering is clearly a desirable response. But what if concern over the problem results in anxiety, fear of communication, and a negative self-concept rather than an increase in motivation? Although the results in this study do not appear to support this negative view of the child's concern level, it must be considered given the subjective nature of the data.

Researchers and practitioners in stuttering therapy have recognized the complications that arise when stutterers begin altering their speech in an attempt to reduce stuttering (Cooper, 1987). This response typically yields an array of secondary stuttering characteristics such as concomitant body movements, tension, and avoidance behaviors (Guitar, 1998). In severe stutterers, these secondary characteristics become complex and well-habituated (Guitar, 1998). It would, therefore, seem reasonable that

a child with these secondary stuttering characteristics might be less likely to experience success in therapy given the more complex nature of his or her stuttering behaviors.

With this progression in mind, it is conceivable that a child's increased concern over stuttering could have been detrimental to success in therapy. Of course, the results of this study call for a more positive view. Because lack of concern actually increased the probability for lack of success, then being troubled was a clearly a positive trait in this type of therapy. Again, one explanation for this phenomena is that concern implied motivation rather than the negative emotions that lead to complicating secondary stuttering behaviors.

Given the central role assigned to the child in this method of treatment, it seems logical that the child's concern level figured so prominently in this study's result. (Mallard, 1991 & 1998b; Rustin, 1987a, 1987b). Unlike treatment approaches that are clinician-directed, where short-term and long-term therapy goals are determined by the clinician (Healey, Scott, & Ellis, 1995; Guitar, 1998), this family-intervention approach is designed to allow the child to make decisions and set goals to manage stuttering (Mallard, 1998b; Rustin, 1987b). This includes encouraging the child to advise each member of the family, teachers, and friends on how best to help him or her deal with the problems associated with stuttering (Mallard, 1998). It would stand to reason then, that this particular child-centered therapy approach is much more reliant upon the motivation of the child to demonstrate independence in managing his or her stuttering.

In June of 1999, a reunion of families previously involved in SWT's Family-Intervention Stuttering Program was held. The researcher in this study asked parents, children, and siblings what advice they would give to those considering taking part in the program. Without knowledge of the results of this study, parents and children stated the most important component in this type of therapy was the child's desire to improve. It is notable that some of the children involved in this discussion had participated in the treatment program at least twelve years prior, and were, at the time of the reunion, over twenty years old. Their strong consensus in the formulation this response offered a long-term, first-person perspective on predictors of success in this therapy. The conclusion of this discussion group was certainly reflective of the statistically-derived predictor, "child not troubled by stuttering," and the negative impact its presence had on treatment outcome. It seems reasonable to conclude that a child's desire to improve can be tied directly to the degree to which he or she is troubled by stuttering.

It is important to remember that the two predictors discovered in this study were shown to be most powerful in the prediction of outcome when considered in tandem. There was no prior research directly addressing these two variables and stuttering children found in preparation for this discussion. However, given the outcome of this study, further research regarding interaction of these traits might reveal greater insight into the relationship between them.

Given the wide range and large number of categories of information subjected to statistical analysis, questions arise as to why certain variables were not isolated as

predictive of success. Research has revealed results regarding familial history of stuttering (Kidd, 1977, 1984; Ambrose et. al., 1993; Felsenfield, 1997; Yairi, Ambrose, & Cox, 1996). Although variables were established indicating whether or not a family history of stuttering (recovered and unrecovered) was present, no association was made. The most obvious explanation for the lack of association in this study lies is the fact that family history in previous studies are related more to likelihood of recovery, not response to a particular type of treatment (Curlee & Yairi, 1997).

This study strongly illustrates the vital importance of the selection of appropriate outcome measure in stuttering research, as suggested by Mowrer (1998). Evaluation of any program requires that the researcher/practitioner must measure what the treatment actually targets (Conture & Guitar, 1993; Frattali, 1998a; Blood & Conture, 1998; Mallard, 1998b). Though there was one common result (rate of linguistic competence) during the initial, filtering stage of statistical analysis between two of the three outcome measures (no need to seek other therapy and ASHA's seven levels of speech control), these factors were not found to be unilaterally predictive of success once more complex analysis was undertaken. These conflicting results reflect the history of countless attempts to measure outcome in stuttering therapy (Mowrer, 1972; Conture & Guitar, 1993; Sheehan, 1980). They also testify to the dangers of limiting the assessment of therapy success to a single characteristic. They suggest again the need to consider more inclusive, complex methods of evaluation to attempt to get at real changes in the lives of clients following therapy.

To reiterate the message of this research, one of the most pressing goals of

treatment in stuttering and in all other areas in speech-language pathology is to provide functionally-meaningful outcome measures. Pragmatically, resolving these discrepancies and inadequacies will satisfy the requirements of third-party payers (Rao, Blosser & Huffman, 1998) and therefore allow clients in need to continue to receive the services they require to function as effective communicators. Professionally, documenting the quality of service by using practical, realistic measures of outcome will improve accountability. Ethically, determining to measure performance not by what is easy to measure, but by what is a true reflection of success, will elevate speech-language pathologists as care providers and will allow real and lasting change in the lives of their clients. In order to effect these improvements, further research is needed to extend the initial goals of this study into every realm of treatment for stuttering, including a wide variety of outcome measures. It is hoped that this increase of information will eventually allow the complex art of effective stuttering therapy to be as effectively explained by science.

Physiological Factors extracted from case histories and analyzed as possible outcome predictors													
Client Number	Client Gender	Client Age at time of Interview	Black	Caucasian	Hispanic	Handedness	Family History of Stutter Recovrd	Family History of Stutter Unrecvrd	Attn Or Nervous Disord	Normal Birth	Asthma	Allergies	Adopted
	M=1 F=2	< 5yrs=1 5-7yrs=2 7-9yrs=3 9-11yr=4 11< yrs=5	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1	Right=1 Left=2 Unknown=3	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1
1	1	3	0	1	0	2	1	0	0	1	0	0	0
2	2	3	0	1	0	2	1	0	0	1	0	0	0
3	1	1	0	1	0	1	0	0	0	1	0	0	0
4	1	5	0	0	1	1	1	0	0	1	1	1	0
5	2	4	0	1	0	1	1	0	0	1	0	1	0
6	1	2	0	1	0	1	0	0	0	1	0	0	0
7	1	5	0	1	0	1	0	0	0	1	0	0	0
8	1	3	0	1	0	1			0		0	0	1
9	1	4	0	1	0	1	0	0	0	0	0	0	0
10	1	3	0	1	0	2	1	0	0	1	1	1	0
11	1	3	0	0	1	1	1	0	0	1	0	0	0
12	2	3	0	0	1	1	1	0	0	0	0	0	0
13	1	3	0	1	0	1	1	0	0	1	0	0	0
14	2	3	0	1	0	1	1	0	0	1	0	0	0
15	1	5	0	1	0	1	1	0	1	0	0	1	0
16	2	4	0	1	0	1	0	0	1	0	0	0	0
17	1	4	0	1	0	1	1	0	1	0	0	0	0
18	1	3	0	1	0	1	1	0	0	1	0	0	0
19	1	4	1	0	0	1			0		1	0	1
20	1	1	0	1	0		1	0	0	1	0	0	0
21	1	3	0	1	0	1	1	0	0	1	1	0	0
22	1	3	0	1	0	3	0	0	0	0	0	0	0
23	1	3	0	1	0	1	1	0	1	1	0	0	0
24	1	2	0	1	0	1	0	0	0	1	0	0	0
25	1	3	0	1	0	1	1	0	0	0	0	1	0
26	1	5	0	1	0	1	1	0	0	1	0	0	0
27	1	5	0	1	0	1	0	0	1	0	0	0	0
28	2	2	0	1	0	1	1	0	0	0	0	0	0
29	2	5	0	1	0	1	0	1	0	0	0	0	0
30	1	4	0	1	0	2	0	0	1	1	0	0	0
31	1	4	0	1	0	1	0	1	0	1	0	0	0
32	2	3	0	1	0	1			1		0	0	1
33	2	3	0	0	1	1	1	0	1	1	0	0	0
34	1	5	0	1	0	1	0	0	0	1	0	0	0
35	1	5	0	1	0	1	0	1	1	0	0	0	0
36	1	5	0	1	0	1	1	0	1	0	0	0	0
37	2	3	0	1	0		1	0	0	0	0	0	0
38	1	3	0	1	0	1	1	0	0	1	0	0	0
39	1	4	0	0	1	1	1	0	1	1	0	0	0
40	1	1	0	1	0	1	0	0	0	1	0	0	0
41	1	2	0	1	0	1	0	1	0	0	0	0	0
42	1	4	0	1	0	1			0		0	1	
43	1	5	0	1	0	1	0	0	1	0	1	0	0
44	1	5	0	1	0	2	0	1	0	0	0	1	0
45	1	5	0	1	0	1	0	0	0	0	1	0	0

Linguistic Factors extracted from case histories and analyzed as possible outcome predictors													
Client Number	Onset Age of Stuttering	Length of Time Stuttering	Other Speech/Language/Hearing Problems?	Stuttering changes with mood/envir	Prior therapy for stuttering?	Age of Linguistic Competence	Primary Characteristics	Secondary Characteristics	Onset of Stuttering Associated w/ Family Problems?	Severity of Stuttering (Conversation)	Severity of Stuttering (Reading)	Speaking Rate	Reading Rate
	<2yrs=1 2-4yrs=2 4-6yrs=3 6+yrs=4	<3yrs=1 3yrs=2	No=0 Yes=1	No=0 Yes=1	None=0 0-1=1 1-3=2 3-5=3 5+=4	Early=0 Normal=1 Late=2	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1	<5%=1 6-20%=2 21-40=3 41+=4	<5%=1 6-20%=2 21-40=3 41+=4	wpm	wpm
1	2	2	0	1	1	1	1	1	1	2	2	87	133
2	1	2	0	0	0	1	1	1	0	2	1	55	50
3	2	1	1	1	1	1	1	1	1	1		120	
4	2	2	0	1	4	1	1	1	1	2	3	63	78
5	1	2	1	1	1	0	1	1	0	2	2	92	124
6	2	2	0	1	2	1	1	0	0	3	2	89	96
7	3	2	0	1	4	1	1	1	0	2	2	67	133
8	3	2	1	1	2	1	1	1	1	1	1	118	100
9	1	2	0	1	1	0	1	0	0				
10	4	2	0	1	0	1	1	1	1	1	1	100	92
11	3	2	0	1	2	1	1	1	1	2	1		
12	1	2	0	1	1	1	1	1	1	4	3	54	52
13	2	2	0	1	3	1	1	1	0				
14	2	2	1	1	2	2	1	1	0				
15	4	2	0	1	1	1	1	1	0	3	2	82	152
16	2	2	1	1	3	1	1	1	0	1	2	80	110
17	3	2	0	1	2	1	1	1	0	2	1	88	123
18	2	2	0	0	2	1	1	1	1	2	1	79	112
19	2	2	0	1	2	1	1	0	0	4	3	90	57
20	1	1	0	1	0	0	1	1	1				
21	2	2	0	1	2	1	1	1	1	3	1	88	94
22	2	2	0	1	2	1	1	1	0	3	2	69	79
23	2	2	0	1	2	1	1	1	1	1	1	80	56
24	2	2	1	1	2	1	1	1	0	2		84	
25	2	2	0	1	1	0	1	0	1				
26	1	2	0	1	1	1	1	1	0	1	1	109	135
27	2	2	1	1	4	1	1	1	1	1	1	107	144
28	3	1	1	1	0	1	1	1	0	2	3	52	48
29	4	2	1	1		2	1	1	0				
30	1	2	0	1	4	1	1	1	1	2	2	130	64
31	2	2	1	1	3	1	1	1	0	2	1	100	110
32	2	2	0	1	3	1	1	1	0	3	4	46	32
33	2	2	0	1	3	1	1	1	1				
34	3	2	1	0	2	2	1	1	1	2	1	78	144
35	3	2	1	1	4	2	1	1	1	3	1	81	122
36	2	2	0	1	4	0	1	1	1				
37	4	1	0	1	0	0	1	0	1				
38	1	2	0	1	1	0	1	1	0				
39	3	2	0	1	2	1	1	1	0	2	2	160	143
40	1	1	1	0	0	0	1	1	1				
41	2	2	0	1	1	0	1	1	0				
42	4	2	1	0	1	1	1	0	1				
43	1	2	0	1	3	0	1	1	0				
44	2	2	0	1	4	1	1	1	0	2	3	126	66
45	2	2	0	1	3	1	0	1	1	2	2	51	

Environmental/Social Factors extracted from case histories and analyzed as possible predictors of outcome

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Client Number	Dual Parent Home	Client Birth Order	Number of Children in Family	Mother at home	Mother works part time	Mother works full time	Stay at home father	Father works full time	Education of Mother	Education of Father	Authority Structure in Home	SES of Family	Mother or Father's Child	Parents' Religious affiliation?	Older sibling in family	Younger sibling in family	Divorce and remarriage
	No=0 Yes=1			No=0 Yes=1	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1	9 - 12yr=1 13 - 16yr=2 17<=3	9 - 12yr=1 13 - 16yr=2 17<=3	Neither=0 Mother=1 Father=2 Both=3	No diff=0 Some diff=1 Difficulties=2	Neither=0 Mother=1 Father=2 Both=3	None=0 M&F same=1 M&F diff=2	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1
1	1	1	1	1	0	0	0	1	2	1	2	0	1	2	0	0	0
2	0	3	3	0	0	1	0		2	2	1	1	1	2	1	0	0
3	1	2	2	0	0	1	0	1	2	3	1	0	0	2	1	0	0
4	1	3	4	0	0	1	0	1	1	1	3	0	3	1	1	1	0
5	1	2	2	0	1	0	0	1	1	2	2	2	3	1	1	0	0
6	1	3	3	1	0	0	0	1	2	3	1	0	3	1	1	0	0
7	1	3	3	1	0	0	0	1	1	2	1	1	3	1	1	0	0
8	1	1	2	0	0	1	0	1	3	3	3	0	2	1	0	1	0
9	1	2	2	0	0	1	0	1	3	3	3	0	0	1	1	0	0
10	0	2	3	0	0	1	0	1	1	2	1	2	1	2	1	1	0
11	1	2	2	0	0	1	0	1	1	1	3	0	1	1	1	0	0
12	1	2	2	1	0	0	1	0	2	1	1	2	3	1	1	0	0
13	1	2	2	0	0	1	0	1	3	2	1	0	2	1	1	0	0
14	1	1	3	0	0	1	0	1	1	3	2	1	2	2	0	1	0
15	1	1	3	0	0	1	0	1	2	3	3	0	3	2	0	1	0
16	1	1	1	0	0	1	0	1	1	2	3	0	0	2	0	0	0
17	0	2	4	1	0	0	0	1	3	2	3	0	0	2	1	1	1
18	1	1	2	1	0	0	1	0	3	3	3	0	0	0	0	1	0
19	1	1	2	0	0	1	0	1	3	3	3	0	0	1	0	1	0
20	1	1	2	1	0	0	0	1	2	3	2	0	1	1	0	1	0
21	1	3	3	0	0	1	0	1	2	3	2	0	2	1	1	0	0
22	1	1	2	1	0	0	0	1	2	1	3	0	2	1	0	1	0
23	1	1	3	1	0	0	0	1	2	2	3	0	1	1	0	1	0
24	1	2	3	1	0	0	0	1	2	1	3	1	3	1	1	1	0
25	1	1	2	1	0	0	0	1	1	2	1	0	1	2	0	1	0
26	1	2	2	0	0	1	0	1	2	2	3	0	1	1	1	0	0
27	0	1	2	0	0	1	0		2	2	1	0	1	0	0	1	0
28	1	2	2	0	0	1	0	1	3	3	2	0	1	1	1	0	0
29	1	2	2	1	0	0	0	1	2	2	1	0	0	1	1	0	0
30	1	2	2	0	0	1	0	1	3	3	1	0	1	1	1	0	0
31	1	2	3	1	0	0	0	1	2	3	3	0	3	1	1	1	0
32	1	2	2	1	0	0	0	1	2	2	3	0	3	1	1	0	0
33	0	3	3	0	0	1	0	1	2	2	2	0	2	1	1	0	0
34	1	2	2	0	0	1	0	1	1	2	3	0	3	1	1	0	0
35	1	1	2	0	0	1	0	1	1	2	1	0	2	2	0	1	0
36	1	1	2	0	0	1	0	1	1	2	3	0	0	1	0	1	0
37	1	2	2	0	0	1	0	1	3	2	3	0	1	2	1	0	0
38	1	2	2	0	1	0	0	1	2	3	3	0	0	1	1	0	0
39	1	2	2	0	0	1	0	1	1	2	2	0	1	1	1	0	0
40	1	4	4	1	0	0	0	1	2	2	3	0	1	2	1	0	0
41	1	1	2	0	1	0	0	1	2	1	3	0	2	1	0	1	0
42	1	1	2	0	0	1	0	1	1	2			1	2	0	1	0
43	1	1	3	0	0	1	0	1	3	3	3	0	2	1	0	1	0
44	1	1	2	1	0	0	0	1	1	2	3	1	2	1	0	1	0
45	1	3	3	1	0	0	0	1	1	2	3	0	0	2	1	0	0

Psychological/Emotional Factors extracted from case histories and analyzed as possible predictors of outcome											
Client Number	Stuttering Troubles Child?	Meets academic expectations	Stuttering Troubles Mother?	Stuttering Troubles Father?	Mother & Father Same Concern Level	Sensitivity of Client (as characterized by Parents)	Perfectionist	Leader or Follower	Temper	Worrier	Affectionate
	No=0 Yes=1	No=0 Yes=1 Exceeds=2	No=0 Somewhat=1 Yes=2	No=0 Somewhat=1 Yes=2	No=0 Yes=1	No=0 Yes=1 Very/Highly=2	No=0 Yes=1	Neither=0 Leader=1 Follower=2 Both=3	No=0 Yes=1	No=0 Yes=1	No=0 Yes=1
1	0	1	2	1	1	2	1	1	1	0	0
2	1	1	1	1	1	2	0	1	1	0	1
3	0		2	1	1	1	0	1	1	1	0
4	1	0	2	0	0	2	0	1	1	1	0
5	1	1	2	2	1	2	1	1	0	1	0
6	1	0	2	1	1	1	1	1	0	1	0
7	1	1	2			1	0	1	0	0	1
8	1	1	2	2	1	1	0	2	0	0	0
9	1	1	1	1	1	2	0	1	0	0	0
10	1	2	1			2	1	2	0	1	0
11	1	0	2	2	1	0	0	3	0	0	1
12	1	1	2	2	1	1	0	1	0	1	0
13	1	1	2	2	1	1	0	1	0	0	0
14	1	1	2	2	1	2	1	1	1	1	0
15	1	0	2	2	1	1	0	2	0	0	0
16	1	2	2	2	1	0	1	2	0	0	0
17	1	1	2	0	0	2	0	2	1	1	0
18	1	2	2	2	1	2	0	2	1	1	0
19	1	0	2	2	1	2	0	2	0	0	0
20	0		2	0	0	2	0		0	0	0
21	1	1	2	2	1	2	1	0	0	1	0
22	0	1	2	1	1	2	0	2	0	1	0
23	1	1	0	2	0	2	0	1	0	0	0
24	0	1	2	2	1	2	0	2	1	0	1
25	1	0	2	2	1	2	0	3	0	0	0
26	1	1	2	1	1	2	0		1	0	0
27	1	1	1		1	2	0	1	0	1	0
28	0	2	1	1	1	1	0	2	0	0	1
29	1	2	2	2	1	2	1	1	0	1	0
30	1	1	2	2	1	2	1	1	1	0	1
31	1	1	2	2	1	2	1	1	1	0	1
32	1	1	1	2	1	1	0	1	1	0	1
33	1	1	1	2	1	1	0	1	0	1	0
34	1	1	1	2	1	2	1	1	0	1	1
35	1	0	2	2	1	1	0	0	0	0	0
36	1	1	2	2	1	1	1	1	0	1	0
37	1	1	2	2	1	1	1	1	0	0	0
38	1	1	2	1	1	1	1	1	1	1	0
39	1	0	2	2	1	2	1	1	0	1	1
40	0	1	2	2	1	2	0	3	0	0	0
41	0	1	2	0	0	2	0	1	0	0	1
42	1	1	2	2	1		1	2	1	1	0
43	1	1	1	1	1	2	0	1	0	0	1
44	1	2	2	1	1	1	0	2	0	1	0
45	1	1	0	1	0	1	1	3	1	1	0

Outcome Measures			
Client Number	#1 Return to therapy after program	#2 ASHA Control Level	#3 Therapy Emphasis Appropriate for us
	No=0 Yes=1	Ordinal Scale 1 - 7 1=Unintelligible 7=Normal	Ordinal Scale 1-6 1=Strongly Agree 5=Strongly Disagree 6=Does not apply
1	1	6	1
2	0	6	3
3	1	6	1
4	0		
5	0		
6	0	5 5	2
7	0		
8	1	5	2
9	0	6 5	3
10	0	6	1
11			
12	0		
13	0	6	1
14	1	2	2
15	0	5	1
16	0	5 5	3
17	0		
18	0	4	1
19	0		
20	0	6	1
21	0	3	2
22	1	6	2
23	0	6	1
24	0	7	2
25	0	6 5	2
26	0		
27	0	6	1
28	0		
29			
30	0	6	3
31	0		
32	1	5	2
33	0	4 5	2
34	0		
35	1	6	4
36			
37	0	6 5	2
38	0	5	1
39	0	4 5	4
40	0	7	1
41	0		
42			
43	0	5	3
44	0	5	2
45	0	6	1

Case History

A. R. Mallard, Ph.D.

Southwest Texas Speech-Language-Hearing Clinic

San Marcos, Texas

Lena Rustin

Michael Palin Centre for Stammering Children

London England

A. IDENTIFYING INFORMATION

Name of child:	Siblings (ages):
Address:	Referral:
Phone:	Address:
Date of birth:	School:
Age:	Grade:
Parents:	Date of interview:

B. PRESENT COMPLAINT

How do you describe your child's speech problem?

When did the present problem first start?

Was the onset associated with family changes?

How was the stuttering behavior first demonstrated?

How often does the stuttering occur?

How severe is the problem to you?

In which contexts does the stuttering occur?

Has the problem had an effect on your family?

Does the problem bother you?

Has your child had previous speech therapy? If so, with whom and their address:

Why are you seeking help at this time?

What information do you have about the problem of stuttering?

C. SPEECH AND LANGUAGE DEVELOPMENT

Development of sounds

General Development of Language

Age of : first words two-word utterances sentences

Spontaneity of talking

Comparison with other children

D. PERSONAL HISTORY

Pregnancy and Delivery	Feeding
complications	breast or bottle
home or hospital	when weaned
full term	difficulties
birthweight	Development
mother's health pre & post pregnancy	placid or active
Neonatal Period	response to mother
difficulties breathing or sucking	cry excessively
convulsions	Developmental Milestones
jaundice	sitting unsupported
Apgar score	standing
	walking
	compared to siblings
Any problem reaching milestones?	Illnesses
Bladder and Bowel Control	patient in hospital
when obtained day night	other clinics
any difficulties	serious illnesses
training used	neurological disorders
Extended Separation from Parents	child guidance clinics

E. GENERAL HEALTH

Indicate areas in which you have experienced problems (either in the past or present)

Asthma	Concentration
Headaches	longest time on a task
Stomach Aches	clumsiness
Vision	preferred hand
Hearing	Tics and Mannerisms
Eating difficulties	twitches on face or shoulders
Sleeping difficulties	eye blinking
Nightmares	thumb sucking
Bedwetting	nail biting
Muscular system	sucking tongue
Fainting Spells	security toy
Epilepsy	

F. FAMILY STRUCTURE AND HISTORY

Parents:

How long date prior to marriage

How long married

Married before

Children adopted or fostered

Miscarriages or still births

Where each parent was born

Parental data:MotherFather

age

occupation

religion

education

general health

major illnesses

personality (mother)

as seen by father

personality (father)

as seen by mother

nervous disorder

care of psychiatrist

stuttering

Extended family

contact with

occupation

parental upbringing

authority structure

History of

psychiatric treatment

depression

suicide

stuttering

left-handed

bedwetting

mental illness

alcoholism

epilepsy

trouble with law

Home circumstances

house or apartment

number of rooms

others in home

sleeping arrangements

facilities (bath, etc.)

neighborhood (how long lived there?)

Financial difficulties

Is there anything in your family history that you believe might be related to your child's stuttering?

G. FAMILY LIFE

Parental Relationship	Child help with shopping, errands
get along	Child have home responsibilities
things enjoy doing together	Family Pattern of Relationships
how spend weekends and evenings	mother or father's child
authority structure in home	confide in:
	mother, father, both
father's participation in household tasks	Discipline
Parent-Child Interaction	household rules with
help with homework	consequences
activities do together	abide by rules
go out together	climb on furniture
play together	play outside when raining
help make things	leave house without saying
	where going
Child's participation in Family Activities	restrictions on friends,
help with dressing, eating	reading, TV
who helps	who punishes
taken to school	method used
	child's reaction to
	punishment
Describe a typical day in your home	child have pocket money?
	free to spend money?

H. SOCIAL RELATIONSHIPS

Peer relationships	
get along with other children	fights
friends	member of youth group
prefer children own age, older, younger	enemies
girls or boys	Sibling relationships
leader or follower	position in family
bully	get along with others
allow to be bullied	attached to any one person
Adult Relationships	jealousy
mother	arguments come to blows
father	Sex
other adults	interested in opposite sex
teachers	instructed in sexual matters
easy/hard to get along with	sexual problems
person attached to	School
Antisocial Trends	progress
disobedient	best subject
destructive	worst subject
set fires	meet your expectations
lies	steals

I. TEMPERAMENTAL AND PERSONALITY ATTRIBUTES

Meeting New People	Sensitivity
adults	Emotions
other children	happy or sad
strangers	cry excessively
shy or clinging	worrier
how quickly adapt	irritable
New Situations	sulk
reaction to new places, things, foods	temper
explore or hang back	perfectionist
how quickly adapt	fears
Emotional Expression	emotion re school
vigorous in expression of feelings	school refusal
whimper	fussy
chuckle or roar with laughter	rituals
Affections (how shown?)	handling of criticism
	handling of failure
	handling of disappointment

Is there anything in this case history that has not been covered that you believe I should know that relates to your child's stuttering?

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