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AN ABSTRACT OF THE THESIS OF Carol Deno Kimball for the Master
of Science in Speech Communication presented June 5, 1975.

Title: Recovery From Stuttering in a Sample of Elementary
School Children.

APPROVED BY MEMBERS OF THE THESIS COMMITTEE:

Robert L. Gasteel, Chairman

Mary E. Gordon

Jack R. Hegrenes

Chadwick Karr

Joan McMahon

Several studies have been undertaken to determine the incidence
of recovery from stuttering; however, the results of these investiga-
tions are not reliable due to methodological limitations. For the most
part, ex-post-facto recall judgments on the parts of adults or parents

of young children were relied upon in gathering data for the research. It would appear that a requisite factor in determining incidence of recovery from stuttering should be the use of a formal instrument which would quantify the auditory and visual aspects of speaking behavior to determine the presence or absence of stuttering.

The primary purpose of this study was to determine the incidence of recovery from stuttering in a sample of children who had received treatment for stuttering and had subsequently been dismissed from treatment. Also examined was whether or not significant differences existed between the speaking performances of these subjects and a sample of control subjects of the same sex, grade level, and approximate academic ability. To control for experimental bias, a double-blind design was utilized. A secondary part of the study examined the possible effects of the former treatment received by the experimental subjects on the recovery from stuttering.

Because it is probably the most formal instrument developed to date which measures and classifies both the auditory and visual dimensions of stuttering according to severity, the Stuttering Severity Instrument (SSI) was chosen for this research. The SSI yields a numerical representation of severity based upon the measurement of three observable parameters of stuttering: frequency of stuttering, duration of the stuttering occurrence, and physical concomitants that accompany the stuttered speech.

Forty-two children from Portland Public School District Number One (21 experimental, 21 control) performed two speaking tasks: a reading task and a job (conversation) task. Results of the application of the SSI to these speaking performances indicated that the incidence of recovery from stuttering in the experimental sample was 28.6 per cent. All subjects in the research, however, fell into the normal fluency to very mild disfluency range.

When individual parameters measured by the SSI were analyzed by the Mann-Whitney U Test, it was determined that significant differences existed between the experimental and control samples on the following: total SSI scores; total frequency scores; job task scores; and total scores, frequency scores, and duration scores when the effects of whole monosyllabic word repetitions were deleted from the scores. No significant differences existed between the two samples when reading task scores, duration scores, and physical concomitant scores were compared. When the scores for head movement and eye-contact were extrapolated from the total physical concomitant score, no significant differences were noted between the groups either for these scores alone or for the physical concomitant parameter when these scores were deleted.

A qualitative analysis of the speaking performances indicated that similarities and overlaps existed between the experimental and control subjects when the types of stuttering, the duration of stuttering occur-

rences, and the types of physical concomitants were compared.

Thus, the use of a formal assessment instrument in this research on recovery from stuttering allowed for a more discriminating assessment of the speaking behaviors of the experimental and control subjects, who would have been essentially indistinguishable on their speaking performances using informal analysis.

An informal analysis of the treatment used by the former clinicians of the experimental subjects and the SSI scores received by each subject, revealed that all three types of treatment (direct, indirect, and nondirect) were used with children of various ages who were in treatment for various lengths of time, and all three appeared to be equally successful when used in the management of stuttering.

RECOVERY FROM STUTTERING IN A SAMPLE
OF ELEMENTARY SCHOOL CHILDREN

by

CAROL DENO KIMBALL

A thesis submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE
in
SPEECH COMMUNICATION
EMPHASIS: SPEECH PATHOLOGY/AUDIOLOGY

Portland State University

1975

TO THE OFFICE OF GRADUATE STUDIES AND RESEARCH:

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June 5, 1975

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CHAPTER I

REVIEW OF THE LITERATURE AND STATEMENT OF PURPOSE

I. RECOVERY FROM STUTTERING

For years researchers have directed their efforts toward acquiring more insight into the nature of the speech disorder of stuttering. Due to the complexity of this disorder and the disagreement among investigators as to its etiology, onset, development, and treatment, many aspects remain a mystery to speech pathologists.

One puzzling aspect is that many children demonstrate early symptoms of stuttering behavior in their speech, yet with maturation, develop normal fluency (Johnson, 1942, 1955; Metraux, 1950). Another interesting fact is that some children who receive management in the public schools designed to modify their stuttering develop a normal speech flow; however, others continue their disfluent speech patterns (Horowitz, 1962; Sheehan and Martyn, 1966, 1970; Martyn and Sheehan, 1968; Cooper, 1972).

Several extensive studies have been directed toward determining the incidence of recovery from stuttering in sample populations (Johnson, 1942; Glasner and Rosenthal, 1957; Morley, 1957; Wingate, 1964; Dick-

son, 1965, 1971; Shearer and Williams, 1965; Sheehan and Martyn, 1966, 1970; Martyn and Sheehan, 1968; Cooper, 1972).

Direct Observational Studies

Earliest studies resulted in data which indicated the incidence of the speech disorder of stuttering and the percentage of recovery in certain populations that were directly observed over a period of time.

Two groups of subjects, 46 disfluent and 46 fluent children, were examined by Johnson (1942). The original diagnosis of stuttering was made by parents, teachers, or relatives of these children. Interview and case history techniques were utilized at the beginning of the study, and were followed by a fairly long period of observation for each subject (median period of observation was two years, four months). At the completion of the study, 25 of the 46 subjects originally diagnosed as disfluent, or 54.3 per cent, were judged by the examiners to exhibit normal fluency. Five of these subjects or 10.8 per cent demonstrated nearly normal fluency.

In 1946, a longitudinal study was initiated by the University of Durham and the City Health Services in Newcastle-Upon-Tyne, England. In this study the speech development of children was observed regularly from birth to sixteen years of age. Each child's speech was examined every two years beginning in 1950, and judgments as to the presence or absence of stuttering were subjectively made by a speech clinician, the child's mother, and a health officer, based upon direct

observation of the child (Morley, 1957). Of the 944 children who were observed until 1957, 37 of the children (4 per cent) were reported to exhibit some form of stuttering between the ages of two and seven years. Andrews and Harris (1969) reported that by the conclusion of this study in 1962, 43 cases of stuttering had been observed, and 34 or approximately 80 per cent of these children had developed fluency without treatment. This left 9 children or .95 per cent of the total population still actively stuttering.

Interview Studies

Glasner and Rosenthal (1957) differed in the research method and design they used to study recovery from stuttering in young children. Interviews were conducted by trained speech pathologists with all parents registering their children for the first grade in 25 different schools in Maryland. In all, 996 parents were questioned about the speech of their children (551 males and 445 females). One-hundred and fifty-three (15.4 per cent of the total sample) reported that their children had demonstrated stuttering behaviors in the past. Of these children, 83 or 54.2 per cent had completely recovered from their former stuttering patterns before they entered first grade. This left 48 children who continued to be disfluent and 22 who exhibited these behaviors intermittently. Thus, approximately 5 to 7 per cent of the original total population were still actively stuttering.

Glasner and Rosenthal asked the parents to answer the question

"what did you do about the stuttering?". Their responses fell into three groups: 1) active corrective measures were stressed in which the child's attention was focused on his stuttering, 2) the seriousness and significance of the stuttering behavior was minimized and did not focus on the disfluency, and 3) professional help was sought. It was noted that 70.2 per cent of the cases in which the correction was minimized were said to have stopped stuttering. In addition, 47.5 per cent of the children who were actively corrected were said to have stopped stuttering. This latter figure is very interesting since most speech pathologists probably would not have recommended active intervention by the parents.

Several other researchers (Shearer and Williams, 1965; Sheehan and Martyn, 1966, 1970; Martyn and Sheehan, 1968; Cooper, 1972) have utilized the interview method in their investigations; however, they have relied upon subjective recall judgments on the part of the disfluent or formerly disfluent populations to determine the recovery rates.

Fifty-eight persons (43 males and 15 females) who had previously considered themselves to be disfluent, who had never received professional speech treatment, and who now considered themselves to be fluent speakers were subjects in a study conducted by Shearer and Williams (1965). They determined that the recovery process in all their subjects was very gradual. Of the 58 total subjects, 26 (45 per

cent) reported recovery between the ages of five and eleven years and 32 (55 per cent) between the adolescent years of 12 and 17.

Sheehan and Martyn (1966) undertook a study to determine the incidence of recovery from stuttering in an adult population and the factors which might be associated with the recovery. They conducted a general speech survey of 2,406 new students, both undergraduate and graduate, at the University of California, Berkeley, during registration in the fall semester of 1964. Three different populations were discovered in this survey: 1) active stutterers, 2) spontaneously recovered stutterers, and 3) speakers who exhibited normal fluency and had no history of stuttering.

Individual structured interviews yielded the finding that of the 58 persons (2.4 per cent of the total population) who had reported stuttering at some time in their life, 47 (81 per cent) had recovered and 11 (19 per cent) were still actively stuttering. These 11 students comprised .45 per cent of the total population. Results also indicated that fewer individuals who considered themselves to have been severely disfluent and fewer individuals who received treatment in the public schools had recovered from their stuttering behavior. Sheehan and Martyn (1966) suggest that the more severe a person's stuttering is, the more likely he is to receive speech treatment in the public schools. Thus, if severity is used as a predictor for prognosis, those enrolled in public school speech treatment likely have the poorest prognosis.

Martyn and Sheehan (1968) discussed an expansion and replication of their previous study using additional subjects from the spring, 1965 registration at UCLA. Of 1,081 incoming students examined, 21 (1.9 per cent of the total population) reported stuttering at some point in their lives, 16 of whom had recovered (76.2 per cent) and 5 of whom were still actively stuttering (23.8 per cent). These 5 students comprised .46 per cent of the total population.

In 1970, Sheehan and Martyn again added fresh data to their previous findings. Upon examination of 1,651 new students registering at UCLA in 1967, they discovered 68 students (4.1 per cent of the total population) who reported stuttering at some point in their lives, 53 (78 per cent) of whom had recovered from their stuttering and 15 (22 per cent) who were still actively stuttering. These 15 students made up .91 per cent of the total population.

Sheehan and Martyn combined the data from all three of their samples to assess the influence of the level of severity of the stuttering on recovery. Of the total number of subjects who had recovered, 87 per cent who had considered their disfluency to be mild had recovered, 75 per cent who had considered their disfluency to be moderate had recovered, and only 50 per cent of severely disfluent speakers regained normal fluency. Thus, their results indicate that the more severe the stuttering behavior, the less likely the recovery will occur.

The combination of the data also indicated a ratio of recovery of

about four to one, or that four of five persons who exhibit stuttering recover fluent speech spontaneously.

Cooper (1972) replicated the Sheehan and Martyn studies on a junior and senior high school population in Tuscaloosa, Alabama. Speech clinicians interviewed 5,054 students observing 119 who were actively stuttering (2.3 per cent of the total population) and discovering 68 students (1.3 per cent of the total population) who reported recovery from stuttering. This investigation indicated that approximately 36 per cent of the 187 students who at one time were disfluent, had recovered normal fluency. This recovery rate for the total population varied between the junior high school and senior high school populations. In the junior high school, the rate of recovery was 30 per cent and in the senior high school, the recovery rate was 44 per cent, for the combined rate of 36 per cent.

It is interesting to note the variation in active stuttering incidence figures between the Sheehan and Martyn (1966, 1968, 1970) studies on adults and the Cooper (1972) replication on junior and senior high school students. The combined data from the Sheehan and Martyn studies indicated that .6 per cent of the total population ($n = 5,138$) were actively stuttering at the time of the research, whereas Cooper found that of 5,054 students, 2.3 per cent were actively stuttering. It is possible that the Cooper incidence figure is higher because of his younger population and the fact that some of the students may still have been

in the gradual recovery from stuttering process. It is also quite possible that the stutterers who are severe and unlikely to recover without treatment do not attend college, but rather settle in an environment where the need for verbal communication is minimal.

Questionnaire Studies

Other researchers have designed questionnaires to investigate the recovery from stuttering and factors which might be related to the recovery.

Wingate (1964) developed a questionnaire which he gave to 50 speakers who had at one time considered themselves to be stutterers but who had subsequently developed fluency. Of the 32 male and 18 female subjects, 79 per cent of the males and 61 per cent of the females reported the onset of their stuttering prior to age seven. Sixty per cent of the subjects reported that recovery occurred during adolescence, and all but one of the subjects reported that their recovery was gradual.

Dickson (1965, 1971) designed a questionnaire to determine the following: 1) the reported incidence of incipient stuttering symptoms in a childhood population in elementary and junior high school, and the parental reaction to these symptoms; 2) the percentage of spontaneous recovery experienced at each grade level, and 3) the duration of the symptoms and the age at which recovery was noted. Dickson defined incipient stuttering as "repetitions of sounds or words, or

getting stuck on or between words." In a pilot study (Dickson, 1971) the questionnaire was sent to parents of children enrolled in the campus school at State University College in Buffalo, New York. Responses received from 421 parents indicated that 10 per cent of the parents felt their children had exhibited incipient stuttering behaviors, which occurred mostly between the ages of 2 and 4 years. Spontaneous recovery was reported by 60 per cent of the parents of children who were reported to have incipient stuttering symptoms. In the majority of these children, recovery occurred within six months to two years after the stuttering was initially noticed.

The questionnaire was then distributed to parents of 5,750 elementary and junior high school children in suburban Buffalo, New York. Of these, 3,923 returned the questionnaire and therefore comprised the study sample. The incidence of incipient stuttering behaviors was 10 per cent at the elementary school level and 8 per cent at the junior high level, for a total number of 369 students or 9 per cent. Approximately 164 respondents (4.2 per cent of the total population) reported that their children still retained some stuttering behavior, and 196 respondents (5 per cent of the total population) reported that their children had experienced spontaneous recovery of their symptoms.

Of the 164 parents who reported that their children retained the symptoms of stuttering, 116 of the parents (71 per cent) reported that it was diminishing in occurrence, which according to Dickson (1971)

may be an indication that spontaneous recovery will occur before adulthood.

Other Considerations

Perhaps the most significant finding in these studies is the verification of the existence of a population which has recovered from stuttering. The point of view that "once a stutterer, always a stutterer," must be re-examined by those who maintain it, since the findings of several researchers (Dickson, 1965; Sheehan and Martyn, 1966, 1970; Martyn and Sheehan, 1968; Cooper, 1972) indicate that when subjects are examined for speech fluency they fall into three distinct groups:

1) those whose speech patterns do not call attention to themselves - whose disfluencies are considered by listeners to be normal, 2) those who exhibit disfluencies which are perceived by the listener to be stuttering, but whose fluency will improve spontaneously, and 3) those who exhibit disfluencies which are perceived by the listener to be stuttering and who will retain these behaviors (Martyn and Sheehan, 1968).

Although the results of all these studies indicate that recovery from stuttering behavior occurs in a majority of those who at one time were disfluent, and that this recovery in most cases occurs prior to or in early adolescence, the conclusions about the incidence of recovery from stuttering and the age of recovery which were reached in these studies cannot be reliably compared because of the following methodological limitations: 1) the varying definitions of stuttering, inci-

dence, and recovery, 2) the varying methods of diagnosis and measurement of stuttering and recovery, and 3) the differing populations comprising the studies (see Figure 1).

Wingate (1964), Shearer and Williams (1965), Sheehan and Martyn (1966, 1970), and Martyn and Sheehan (1968) utilized an ex-post-facto research design to determine childhood recovery from stuttering using adults as experimental subjects. They relied upon the ability of these adults to recall incidences from their past which might have been related to their speech. They depended also upon subjective judgments on the part of these adults as to the presence of stuttering, its onset and its disappearance. An ex-post-facto research design was also utilized by Glasner and Rosenthal (1957) and Dickson (1965, 1971), but they relied upon parental judgment as to the presence, onset, and duration of stuttering and the recovery of normal fluency.

Such methods do not lead to accurate assessment of recovery from stuttering due to the fallibility of memory, the lack of a precise definition of stuttering and recovery, the absence of written information or records, and personal pride, all of which are factors which could be threats to the reliability and validity of the studies and which should be considered when evaluating the conclusions drawn by each of the researchers (Sheehan, 1967; Sheehan and Martyn, 1970; VanRiper, 1971).

Dickson (1971) also supports this view, and adds that these studies

Study	Population	N	Method of Measurement	Percentage of Recovery	Percentage of Total n Actively Stuttering at Time of Study
Johnson (1942)	Children	46 Fluent 46 Disfluent	Direct Observation	54.3	
Glasner and Rosenthal (1957)	Children	996	Parent Interview	54.2	5.0 - 7.0
Andrews and Harris (1962)	Children	944	Direct Observation Longitudinally	80.0	.95
Sheehan and Martyn (1966)	Adults	2,406	Interview and Questionnaire	81.0	.45
Martyn and Sheehan (1968)	Adults	1,081	Interview and Questionnaire	76.2	.46
Sheehan and Martyn (1970)	Adults	1,651	Interview and Questionnaire	78.0	.91
Dickson (1971)	Elem. and Jr. High	3,923	Questionnaire	55.0	4.2
Cooper (1972)	Jr. and Sr. High	5,054	Interview and Questionnaire	36.0	2.3

Figure 1. Previous studies which determined incidence of recovery from stuttering.

have excluded the populations that "lacking an awareness of a problem, manifested incipient stuttering symptoms and spontaneously outgrew them." He feels that if this population were used, the recovery rates would increase significantly.

Similar methodological differences are present when one examines the figures on incidence of stuttering. The most widely used incidence figures are those determined by the Midcentury Whitehouse Conference on Children and Youth (1952). They reported a stuttering incidence of .7 per cent between the ages of 5 and 21 years, and approximately 1 per cent for all ages. The literature is lacking in precise information regarding the research model used in this study. The only information known is that various sample populations throughout the United States were examined for speech disorders. Without further information, it is not known whether the investigators used a uniform definition of stuttering, or whether the samples in the study were truly representative of the general population. As is demonstrated in Figure 1, the incidence figures for active stuttering ranged from .45 per cent to 7 per cent. Because of methodological differences in the research designs used in these studies, it cannot be determined which incidence figures are most realistic. Thus, as in the studies on recovery from stuttering, more formal research must be undertaken to assess the incidence of stuttering in the United States.

Returning to the limitation imposed by the lack of a precise defi-

inition of stuttering, let us consider the fundamental questions which must be raised when defining it. Which dimensions of the stuttering behavior will be measured: auditory, visual, or both? Which types of speech behaviors will be considered stuttering? Which kind of speaking sample will be evaluated? Which kind of measurement will be used: objective, subjective, formal, or informal?

Bloodstein (1969) wrote that "from a scientific standpoint, the problem of defining a phenomenon is intimately bound up with the operations we use to measure it." He suggested that it would be most profitable to use the measurable dimensions of stuttering behavior to express quantitatively the presence of absence and the severity of stuttering.

It would appear that a requisite factor in research determining the incidence of recovery from stuttering in a given population would be the use of a formal instrument which would measure the auditory and visual dimensions of the speaking behavior. In this way, more formal and reliable information regarding the phenomenon of recovery from stuttering could be obtained.

II. MEASUREMENTS OF STUTTERING BEHAVIOR

Many methods of evaluating the severity of stuttering behavior have been devised, ranging from an objective to a subjective approach, and including scales, numerical formulae and self-reports. Attempts

have been made to measure both by counting stuttering instances and by employing psychological perception rating scales for the listener (Young and Prather, 1962; Riley, 1972).

Perception Rating Scales for Frequency and Severity of Stuttering

In 1961, Johnson developed procedures for obtaining samples of speech and oral reading and for analyzing them with regard to different types of disfluency. He employed tape recorded samples from 100 fluent and 100 disfluent speakers in his research in order to obtain normative numerical scores for each type of disfluency.

In 1951, Lewis and Sherman developed a scale for rating the severity of stuttering based in terms of "difficulty at the moment of stuttering." They employed a nine-point scale extending from one for the most mild disfluency, to nine for the most severe disfluency. Tape-recorded samples of speech were collected which represented all nine ratings. Thus, if a clinician wanted to measure the severity of a client's stuttering, he could take a speech sample and compare it to Lewis and Sherman's samples to see which of the nine levels of severity it matched. Young (1961), Young and Prather (1962), Johnson, Darley, and Spriestersbach (1963), and Williams, Wark, and Minifie (1963) have also employed similar rating scales to determine the severity of stuttering in a speaker's performance.

Many have critiqued the method of relying on the subjective judgment of a listener to determine the fluency quality of a person's speech.

Trotter and Kools (1955) discussed a listener adaptation effect to stuttering with repeated exposure, and stated that what might be reported as improvement by the clinician or listener, could really be just a result of adaptation to the stuttering pattern.

Johnson (1961) also discussed factors which could introduce a bias into the listener evaluation of a speaker's performance. He felt that if the listener knew he was evaluating the speech for the severity of stuttering or knew that the speaker was considered to be disfluent, he would more likely classify various normal utterances as stuttering.

Williams and Kent, in a 1958 report, also agreed that a subjective judgment by a listener regarding stuttering was not reliable. They stated that when subjects were asked to listen to a speech sample and keep track of stuttering interruptions, they marked the same interruptions as when they were instructed to keep track of normal interruptions on the same speech sample. Williams and Kent (1958) stated that "they tended to 'hear' what they were instructed to listen for at the time."

Numerical Scales and Formulae

A more formal system of classifying and measuring disfluency was proposed by Wertheim (1972). She attempted to quantify the frequency of occurrence of "repetitions" and "blocks" in 200-word speech samples taken from three different social situations: 1) a two-person situation where the task was to answer questions, 2) a two-person

situation where the task was to talk freely, and 3) a group situation where the task was to talk freely. Prolongation of words, broken words, sound/syllable/word repetitions, and interruptions by interjection were considered to be stuttering. Facial and body movements were to be noted, but they were not rated. Upon evaluation of a child with this method, not only his severity of stuttering could be determined, but also the qualitative pattern of the stuttering and situational information.

Minifie and Cooker (1964) developed a disfluency index using speaking rate to measure degree of disfluency. They proposed using the ratio of total number of syllables uttered and words per minute to determine fluency scores, which would take into consideration both the frequency and the duration of the stuttering occurrences. They felt this was an excellent way to scale the severity of stuttering over a continuous period of time.

Both the Minifie and Cooker (1964) and the Wertheim (1972) methods attempted to measure disfluency in a more objective manner than had been done in the past. These methods did not, however, include all parameters of stuttering behavior in determining severity.

Williams, Wark and Minifie (1963) feel that stuttering is usually identified in relation to what the observer sees and hears a person do during phonation. They further state that "... it might be assumed... that both auditory and visual cues represent important variables in the

judgmental tasks of determining stuttering frequency and severity."

Keeping this in mind, the Stuttering Severity Instrument (SSI), designed by Riley in 1972 for both clinical and research purposes, is probably the most formal method of measuring and classifying stuttering behaviors according to severity that has been developed to date. The SSI yields a single numerical representation of severity based on the measurement of three observable parameters of stuttering: the frequency of repetitions and prolongations, the duration of the stuttering occurrences, and the observable physical concomitants which accompany the stuttered speech. This measurement is taken during a reading task and a job (conversation) task. The SSI is valuable to the speech clinician or researcher for its inclusion of three observable dimensions of speaking behaviors, for its formal assessment of severity, for its standardized procedures for scoring, and for normative data. Furthermore, it can be used as a reference point for measuring clinical changes in the stuttering behavior of a client (Riley, 1972).

III. IMPLICATIONS OF PAST RESEARCH FOR THIS STUDY

Several studies have verified the existence of individuals who at some time in their lives exhibited stuttering behaviors, who subsequently recovered from their stuttering, and whose recovery in most cases, occurred prior to or in early adolescence (Morley, 1957; Wingate, 1964; Dickson, 1965, 1971; Sheehan and Martyn, 1966, 1970;

Martyn and Sheehan, 1968).

The results of these and other reports (Mills and Streit, 1942; Metraux, 1950; Johnson, 1955; Barbara, 1956; Glasner and Rosenthal, 1957; VanRiper, 1971) indicated the onset of disfluency usually occurs prior to the age of seven years. Also significant were findings which indicated that the incidence of stuttering behavior is greatest during the pre-school and early school years (Burdin, 1940; Mills and Streit, 1942; Midcentury White House Conference, 1952; Eisenson, 1966; VanRiper, 1971; Shames and Beams, 1972; Peckham, 1973).

In light of these facts, it would seem that a study of recovery from stuttering in a sample population of children would be more meaningful than a study using adult subjects.

The results of previous studies on incidence of recovery from stuttering are not reliable due to methodological limitations in the research design. One such limitation in all cases, was the fact that the diagnosis and measurement of stuttering was made by the subject, by his parents, or by an observer with no formal method of measurement used as a guideline. By using a formal instrument which would quantify observable dimensions of stuttering in a speaker's performance, including both visual and auditory cues, perhaps more objective and formal information could be determined on recovery from stuttering.

V. STATEMENT OF PURPOSE

This investigation was designed to identify the incidence of recov-

ery from stuttering in an experimental sample of students from Portland Public School District Number One. The principle questions posed in the study were:

1. What is the incidence of recovery from stuttering in the experimental sample?
2. When the results of the application of the Stuttering Severity Instrument to the speaking performances of the experimental sample are compared to those of a control sample, does one of the samples score higher than the other either in total scores or in individual parameter scores?
3. What effect has method of treatment had upon recovery from stuttering?
4. What are the effects of age at intervention, length of time in treatment, elapsed time following dismissal, and age at the time of this study on the SSI scores of the experimental subjects?

CHAPTER II

METHODS AND PROCEDURES

I. METHODS

General Plan

Twenty-one children from Portland Public School District Number One, who had been placed in an intervention program for stuttering during either kindergarten, first, or second grade and had been subsequently dismissed from the program, comprised the experimental sample in this study. The classroom teacher of each of these experimental subjects chose one other student who was matched for sex, grade level, and approximate academic ability to participate in the study as part of the control sample. All subjects performed two speaking tasks: a reading task and a job or conversation task. These speech samples were evaluated using the Stuttering Severity Instrument (SSI) at the time of performance. Audio tape recordings were made in order to verify the scores at a later date. In order to protect the research from examiner or subject bias, the examiner was not aware until after scoring the speaking tasks whether or not each student was an experimental or control subject.

The research was designed to establish the incidence of recovery from stuttering in the experimental sample and to determine whether or not significant differences existed between the experimental and control samples in their speaking performances evaluated by the SSI.

The Mann-Whitney U Test was chosen as the principal method of analyzing the data, with .05 used as the level of significance. Other methods employed where appropriate were the Spearman rank correlation coefficient, the chi-square test for two independent samples, percentage computation, and informal analysis.

In addition, the former speech pathologists of the experimental subjects classified the stuttering treatment procedures they used with the subjects as direct, indirect, or nondirect in order that possible effects of type of treatment on recovery from stuttering might be examined.

Subjects

A list of potential experimental subjects was determined from approximately 10,000 closed speech files, located in the Child Services Building in Portland Public School District Number One. This list consisted of 279 children who had been in a speech program for management of stuttering in the last ten years (1964-1974) and were subsequently dismissed. Criteria for selecting the experimental subjects from this list were the following:

1. The child must have been diagnosed as exhibiting stuttering

during the time he/she was enrolled in kindergarten, first, or second grade.

2. The child must have been enrolled in an intervention program for his stuttering with a speech pathologist who is currently in the Portland area.

3. The child must have been discontinued from this program.

When these criteria were applied to the list of 279 potential subjects, 76 subjects remained who met the criteria. Of these 76, only 21 were still living and going to elementary school in Portland Public School District Number One, and thus comprised the experimental sample in this study.

An informal analysis of the experimental sample revealed that it was comprised of 14 males and 7 females ranging in grade level from second through eighth grade. Of the 21 subjects, 7 were diagnosed as stuttering in kindergarten, 6 in first grade, and 8 in second grade. Reasons for diagnosis varied ranging from "disfluency" to "secondary stuttering" to "disfluency, functional articulation and language problems."

Severity ratings at the time of diagnosis varied from mild to moderately severe; however, in some instances no severity rating was given and in other instances it was unclear whether the rating was meant for the disfluency or another aspect of the subject's speech. These elements plus the fact that it is not known on what basis the

severity rating was made, prohibited the comparison of the previous level of severity and the severity measured by the SSI.

General information regarding the ages of the experimental subjects at intervention, at dismissal, and at the time of the SSI as well as information on the length of treatment and the months post treatment is included in Table I.

The classroom teacher of each experimental subject received an explanation of the purpose of the study. Each teacher was given the name of the experimental subject from his classroom, and was asked to select a control subject from the same classroom who was matched for sex, grade level, and approximate academic ability with the experimental subject (see Appendix A).

Nature of the Testing Situation

In order to protect the research from examiner or subject bias, the study was double-blind in nature; that is, the subjects were not aware of the true purpose of their speaking performance, and the examiner was not aware either at the time of the performance or at the time of verifying the scores from the audio tapes, whether or not each subject was a member of the experimental or control sample.

In addition to allowing for a double-blind research design, the control subjects were used in order to discover more information about the amount of disfluency present in a "normal" population. Since the reliability and validity of the SSI were determined only with a group

TABLE I
AGE AND TREATMENT INFORMATION
ABOUT THE EXPERIMENTAL
SAMPLE

	Range (Years and Months)
Age at Intervention	5 - 1 to 8 - 4
Length of Treatment	0 - 6 to 1 - 1
Age at Dismissal	6 - 1 to 9 - 5
Months Post Treatment	0 - 4 to 6 - 2
Age at Time of SSI	7 - 11 to 13 - 10

of children and adults who had already been subjectively diagnosed as demonstrating stuttering, it appeared that the use of a control sample would provide more information regarding those behaviors which are characteristic of the majority of speakers and possibly those behaviors which would discriminate between "normal disfluency" and stuttering.

II. PROCEDURES

Test Procedures

The teacher of each subject was asked to send the student to the examiner according to specific instructions (see Appendix B). Upon arrival at the test setting, each subject was given the following information:

"I am a student working on a project in which I am visiting certain schools in Portland to get samples of _____ grade boys/girls reading and talking on a tape recorder. I asked your teacher to choose two people from your classroom to help me. It should only take you about five or ten minutes. First of all, I would like to have you read this short story for me. You can read it to yourself first. If there are any words you are not sure of, I'll be glad to help you with them. If you think that this story is too hard, let me know and we will choose another one. When you are ready, let me know and I'll turn on

the recorder and you can read the story out loud. "

The reading passages used in this study were taken from the Pacesetters in Personal Reading Series, Book 3, Thief in the Basement and Other Stories. This book was chosen because it contained stories that had readability or difficulty levels ranging from first grade, ninth month to fifth grade, seventh month. The passages chosen for this research for each grade level were those recommended by the authors of the text for use in an informal reading inventory. Since 125 words are needed for evaluation according to the SSI, if the passage for a particular grade level did not contain this number, it was extended in length until it did.

In order to minimize the effect of reading ability on the speaking performance, each subject was given a passage at about one year below his current grade placement. In the event that a child could not read, the examiner had stimulus picture cards depicting fairy tales which the subjects could talk about while the examiner tracked 150 words.

After each subject completed the reading task, he was asked to perform a job task or conversation task. He was given a choice of the following topics: his summer vacation, his family, his pets, or his classes in school. He was given one minute to decide what he would talk about, and then the following instructions were given:

" I would like you to talk for about two minutes about your
_____. Please keep talking until I signal you to

stop. If you run out of things to say about _____, don't worry, I'll ask you some other questions. When you are ready, let me know, and I'll turn on the recorder."

The examiner also had pictures available in the event that a subject needed some visible stimulus for conversation. At the end of the taping, each subject was thanked for his participation, and was instructed to return to the classroom. Each subject was away from his classroom a maximum of 10 to 15 minutes, including travel time to and from the test setting.

Test Instrument

The two speaking performances of each subject were evaluated by the examiner with the Stuttering Severity Instrument (Riley, 1972). Each speaking task was given three scores: a frequency score, a duration score, and a physical concomitant score. Together these three comprised the Total SSI Score. The range of scores possible according to this instrument is 0 to 45. Riley (1975) uses 8 as the cut-off point, with scores ≤ 8 indicating normal fluency and scores of > 8 demonstrating varying degrees of stuttering.

Scoring Procedures

In this research, observable physical concomitants were evaluated during the speaking performances, and were scored immediately after the subject had left the room. The frequency and duration

parameters were tracked during the speaking performance and were also later verified with an audio tape recording.

The total words in the speaking performance were represented by one dot (.) per word. The repetition or prolongation of a sound, syllable, or monosyllabic word or the silent prolongation of an articulatory posture were represented by one slash (/) each. The following is an example of tracking frequency:

M-my name is John-John Doe.
 / . . / .

To determine the Total Frequency Score, the first 25 words of both the reading and job or conversation tasks were discarded and the percentage of stuttering instances in the next 100 words in each task was determined. Riley (1972) provided an ordinal scale for converting the percentages to Task Scores. These Task Scores for both reading and job tasks were combined to obtain the Total Frequency Score (see Appendix D). If at any time during the reading task, it was not clear whether or not the repetition or prolongation was due to reading difficulty or was actually a stuttering occurrence, it was marked (R) and was dealt with as a reading difficulty. Thus, it did not adversely affect the SSI score.

In order to measure duration, the length of each instance of stuttering was estimated when tracking. Instead of putting a slash (/) for all the frequency counts, a number was put in to indicate the length.

The slash was maintained only if it was a fleeting (/) or half-second (/) stuttering occurrence. The following is a sample of the tracking of duration:

M-m-m-m-m-my name i-is John Doe.
2 / . .

The Total Duration Score was found by combining the duration of the three longest stuttering instances and determining their Task Score according to the ordinal scale provided by Riley (see Appendix D).

Riley (1972) defined physical concomitants as the audible and visible phenomena that accompany the stuttered speech. He divided these concomitants into four areas and evaluated them on a scale from 0=none to 5=severe and painful looking (see Appendix D).

It was felt by this examiner that the physical concomitant area of the SSI was the area most subject to examiner bias. Therefore, formal rules were created to assure more reliability in scoring the speech samples in this research, and to provide rules for replication (see Appendix E).

Examiner Reliability

Inter- and intrajudge reliability were determined in a pilot study. Two judges who had previous training using the SSI (an instructor in speech pathology and a public school speech pathologist) along with this examiner (a graduate student in speech pathology) evaluated the video-

taped performances of six individuals according to the SSI. The rules for scoring established by Riley (1972) were used in addition to the rules developed by the examiner.

Prior to the pilot study, it was decided that in order for inter- and intrajudge evaluations to be considered reliable, the scores for each parameter, subparameter, and total performance must be within one point of each other and the total number of words must be in at least 95 per cent agreement. In all cases, the scores were identical or within ± 1 point, and agreement between judges on total words ranged from 95.5 per cent to 98 per cent.

Intrajudge test-retest reliability for total words ranged from 97.9 per cent to 99.4 per cent agreement. As in the interjudge evaluations, all scores were within 1 point of each other.

Classification of Treatment

A second part of the research included determining the primary method of treatment used by the former clinician of each subject. A classification system, influenced by Hahn (1961) was developed and sent to the former clinician of each subject along with an explanation of the purpose of the study (see Appendices F, G). The information received from the clinicians was evaluated along with the SSI scores to determine possible effects of type of treatment on recovery from stuttering.

Analysis of Data

The procedures used for statistical treatment of the data were

chosen based upon the following rationale:

- (1) The research design employed the use of two independent samples.
- (2) The subjects used in the study were not drawn from a normally distributed population.
- (3) The level of measurement achieved in the research was in an ordinal scale.
- (4) The design of the research met the assumptions associated with nonparametric statistical tests.

Because it had been shown to be one of the most powerful nonparametric tests when the researcher wishes to study the differences between two independent groups when at least ordinal measurement has been achieved, the Mann-Whitney U Test was chosen to analyze the data. The hypothesis tested by the Mann-Whitney U is that the medians of the two independent groups are equal. This analysis yields a z-value which is tested by referring to a normal distribution table to determine the probability associated with the occurrence of values as extreme as the observed z (Siegel, 1956; Bruning and Kintz, 1968).

This particular statistical test allowed for comparisons to be made between the total scores received by the experimental and control groups on the Stuttering Severity Instrument, as well as between their scores on each individual parameter measured by the SSI.

The Spearman rank correlation coefficient, which determines the

degree of association between two variables which are measured in at least an ordinal scale, was used to establish the degree of correlation between combinations of the following variables: age at intervention, age at dismissal from treatment, age at evaluation by the SSI, length of time in treatment, length of time post-treatment, and SSI score.

Where the data consisted of measurement involving nominal scaling in discrete categories, the chi-square test for independent samples was employed. This test determines whether two groups differ significantly with regard to a specific characteristic. For the purposes of this research, the chi-square test allowed the analysis of the difference between the experimental and control groups in scoring consistency on the two subsections of the frequency portion of the SSI.

With certain meaningful data, statistical methods could not be applied. In these instances, descriptive analysis or percentage computation was employed where appropriate.

CHAPTER III

RESULTS AND DISCUSSION

I. RESULTS

The results of this research will be discussed relative to the principal questions posed, the statistical procedures and descriptive analysis applied to the data, and the results they produced.

What is the incidence of recovery from stuttering in the experimental sample?

According to Riley (1975), when the Stuttering Severity Instrument (SSI) is used to evaluate a speaking performance, a score of ≤ 8 indicates that the subject is exhibiting normal fluency on the speaking tasks, and scores of > 8 indicate varying degrees of stuttering. As shown in Table II, 28.6 per cent of the experimental sample received scores of ≤ 8 , which indicated that on their speaking performances evaluated by the SSI, they exhibited normal fluency or recovery from stuttering (see Tables III and IV for scores received by all subjects).

When the results of the application of the SSI to the speaking performances of the experimental sample are compared to those of a con-

TABLE II

INCIDENCE OF RECOVERY FROM STUTTERING IN A SAMPLE
OF ELEMENTARY CHILDREN AS MEASURED BY THE
STUTTERING SEVERITY INSTRUMENT

	Percentage of SSI Scores ≤ 8	Percentage of SSI Scores > 8
Experimental Sample n = 21	28.6	71.4
Control Sample n = 21	71.4	28.6

Riley (1975) has established that a score of ≤ 8 indicates normal fluency or recovery from stuttering; a score of > 8 indicates varying degrees of stuttering.

TABLE III
 SCORES RECEIVED BY THE EXPERIMENTAL SUBJECTS
 ON SPEAKING PERFORMANCES EVALUATED BY
 THE STUTTERING SEVERITY INSTRUMENT

Subjects	Frequency	Duration	Physical Concomitants	TOTAL
S ¹	2	1	2-0-3-1 = 6	9
S ²	8	4	0-0-3-0 = 3	15
S ³	8	4	0-0-3-2 = 5	17
S ⁴	0	0	0-0-0-0 = 0	0
S ⁵	7	4	0-0-3-1 = 4	15
S ⁶	3	3	0-0-3-0 = 3	9
S ⁷	5	4	2-0-0-2 = 4	13
S ⁸	4	4	0-3-3-2 = 8	16
S ⁹	2	2	3-0-3-3 = 9	13
S ¹⁰	5	4	0-0-0-3 = 3	12
S ¹¹	2	3	0-0-3-1 = 4	9
S ¹²	7	4	0-0-0-3 = 3	14
S ¹³	2	1	0-0-0-2 = 2	5
S ¹⁴	4	4	0-0-3-0 = 3	11
S ¹⁵	4	3	1-0-0-1 = 2	9
S ¹⁶	3	3	0-0-0-0 = 0	6
S ¹⁷	2	2	0-0-0-0 = 0	4
S ¹⁸	0	0	1-0-3-0 = 4	4
S ¹⁹	2	3	1-0-3-0 = 4	9
S ²⁰	5	4	0-0-0-0 = 0	9
S ²¹	0	0	0-0-3-2 = 5	5

TABLE IV
 SCORES RECEIVED BY THE CONTROL SUBJECTS
 ON SPEAKING PERFORMANCES EVALUATED BY
 THE STUTTERING SEVERITY INSTRUMENT

Subjects	Frequency	Duration	Physical Concomitants	TOTAL
S ¹	2	3	0-0-0-0 = 0	5
S ²	4	3	0-0-0-0 = 0	7
S ³	2	3	0-0-0-2 = 2	7
S ⁴	2	2	0-0-3-1 = 4	8
S ⁵	7	4	0-0-3-1 = 4	15
S ⁶	3	4	0-0-0-1 = 1	8
S ⁷	2	4	1-0-0-2 = 3	9
S ⁸	0	0	0-0-3-1 = 4	4
S ⁹	2	3	0-0-5-0 = 5	10
S ¹⁰	2	3	0-0-0-1 = 1	6
S ¹¹	3	4	3-0-0-1 = 4	11
S ¹²	2	3	0-0-0-2 = 2	7
S ¹³	0	0	0-0-0-1 = 1	1
S ¹⁴	3	3	0-0-3-1 = 4	10
S ¹⁵	0	0	0-0-0-0 = 0	0
S ¹⁶	0	0	0-0-3-1 = 4	4
S ¹⁷	2	1	1-0-0-0 = 1	4
S ¹⁸	0	0	0-0-0-0 = 0	0
S ¹⁹	0	0	0-0-3-0 = 3	3
S ²⁰	2	1	0-0-0-0 = 0	3
S ²¹	2	2	1-0-3-1 = 5	9

trol sample, does one of the samples score higher than the other either in the total scores or the individual parameter scores?

The Mann-Whitney U Test was applied to the data to determine whether or not the experimental and control samples differed significantly in their speaking performances as measured by the SSI. The level of significance chosen for use in this research was .05. If the probability (p) associated with the z -value yielded by the Mann-Whitney analysis was $\leq .05$, the scores for the two groups were considered to be significantly different. Thus, if $p \leq .05$, the statistical inference can be made that the observed difference in performance of the two samples was great enough that it did not occur merely by chance, but that the samples were actually different.

Since the question proposed in the research regarding the difference in scores between the two samples indicated the predicted direction of the difference, a one-tailed test was used.

The results of the application of the Mann-Whitney U Test to the data were as follows (see also Table V):

- (1) When the total SSI scores of both groups were examined, there was a difference significant at the .007 level of confidence. Thus, the two sample groups were different enough that the results probably did not occur merely by chance.
- (2) When the frequency parameter alone was analyzed, the results yielded a significant difference at the .01 level of confidence.

TABLE V

APPLICATION OF MANN-WHITNEY U TEST TO DETERMINE
PROBABILITIES ASSOCIATED WITH VALUES AS
EXTREME AS OBSERVED VALUES OF z
IN THE NORMAL DISTRIBUTION

Mann-Whitney U Test	Values of U	Probabilities
Total SSI Scores	2.48	.0066*
Total Frequency Scores	2.29	.0110*
Reading Task Scores	#	#
Job Task Scores	2.04	.0207*
Total Duration Scores	1.48	.0694
Total Physical Concomitant Scores	1.32	.0934
Total SSI Scores Less Whole Monosyllabic Word Repetitions	2.38	.0087*
Total Frequency Scores Less Whole Monosyllabic Word Repetitions	1.84	.0329*
Total Duration Scores Less Whole Monosyllabic Word Repetitions	1.92	.0274*
Area III Scores of the Physical Concomitant Portion of the SSI	.91	.1814
Total SSI Scores Less the Area III Scores for Physical Concomitants	2.20	.0139*
Physical Concomitant Scores Less Area III Scores	1.03	.1515
Total Frequency and Duration Scores	1.99	.0233*

* Significant at .05 level of confidence.

Because $n = 20$ for reading frequency scores, tables of U values were consulted rather than determining a z value. There was no significant difference between the reading frequency scores of the sample groups, as the U' value received was 144, and in order to be significant at the .05 level, the value would have had to be ≤ 138 (Siegel, 1956).

In other words, the probability that this difference in scoring occurred by chance is 1 in 100.

- (3) Because one subject in each sample could not perform the reading task, $n = 20$ for the reading frequency scores. Therefore tables of U values were consulted rather than determining z values for the scores (Siegel, 1956). Upon examination of the U table for one-tailed tests at the .05 level of confidence, it was determined that there was no significant difference between the two samples on reading task scores.
- (4) Differences between groups on the job task portion of the frequency score were significant at the .02 level of confidence. This means that the probability that the difference in scores occurred merely by chance is 2 in 100.
- (5) When the scores achieved on the parameter of the test measuring duration were examined, the probability achieved was .07. This result revealed that the groups were not significantly different in the duration aspect of their speaking performances.
- (6) No significant difference was demonstrated when the scores received on the physical concomitant portion of the SSI were examined, as the probability determined was .09 which exceeds the region of rejection chosen for this study.
- (7) A Mann-Whitney analysis was performed on the total SSI scores, the frequency scores only, and the duration scores only, when

the effect of whole monosyllabic word repetitions was deleted from the scores. The results were as follows:

- (a) When total SSI scores were compared, a probability of .03 was achieved, which indicated that there still remained a significant difference between the two samples.
- (b) Likewise, the experimental and control populations remained significantly different when their frequency scores were compared. The resultant probability level was .03, which means that it fit into the region of rejection.
- (c) Previously, when whole monosyllabic word repetitions were counted, the duration scores between the two groups were not significantly different ($p = .07$). When the effect of these repetitions was deleted from the duration score however, the two groups were significantly different at the .03 level of confidence, which means that the difference probably did not occur merely by chance.
- (g) The physical concomitant score on the SSI is derived by totaling the scores received in each of four areas. In an analysis of scores on the third area only, which examines eye-contact during the performance, a probability level of .18 was determined. This indicated that there was no significant difference between the groups. Therefore, a Mann-Whitney analysis was performed on the total physical concomitant area less the

• eye-contact (area III) scores, and on the total SSI scores

when the effects of the eye-contact rating were deleted from the scores. This demonstrated the following:

- (a) Even when the ratings in area III which examined eye-contact were deleted from the score, there remained no significant difference between the groups in the physical concomitants observed during the speaking performances ($p = .15$).
- (b) The effect of the elimination of the eye-contact rating upon the difference between groups on total SSI scores was that they remained significantly different on their speaking performances at the .01 level of confidence.
- (9) When the scores for physical concomitants were completely deleted from the total and only the combination of the frequency and duration scores was compared, a significant difference at the .02 level of confidence was observed. This again demonstrated that the two sample groups were actually different since the probability of the difference occurring by chance was 2 of 100.

What effect has type of treatment had on recovery from stuttering in the experimental sample?

The former clinicians of the experimental subjects were asked to recall whether the type of treatment they used with the subjects was

direct, indirect, or nondirect. A set of classification guidelines was sent to each clinician to assist in the categorization of the treatment type (see Appendices F, G).

An informal analysis demonstrated that all three treatment types appeared to be equally successful. Table VI, which illustrates the SSI score and type of treatment received by each subject, reveals that all three treatment types can be found with the low, medium and the higher scores received on the SSI.

An examination of the length of time in treatment and treatment type revealed essentially the same information (see Table VII). All three types of treatment were utilized with different subjects who were in treatment for varying lengths of time, and all three appeared to have a positive effect on recovery from stuttering. Because base rates of treatment were not available for all subjects, however, we cannot say that a particular type and length of treatment was responsible for the positive effect. We can only say their effects appear to be equal.

The fact that some clinicians used more than one type of treatment precluded using any formal statistical analysis because of the possible interaction effect the different types could have on the speech.

What are the effects of age at intervention, time in treatment, and elapsed time following dismissal on the SSI score?

The Spearman rank correlation coefficient test was used to determine degrees of association between combinations of the following

TABLE VI
SSI SCORES AND TYPE OF TREATMENT RECEIVED
BY THE EXPERIMENTAL SUBJECTS

Subject	SSI Score	Type of Treatment
S ¹	0	Nondirect
S ²	4	Nondirect,* Indirect
S ³	4	Nondirect
S ⁴	5	Direct
S ⁵	5	Nondirect
S ⁶	6	Nondirect, Indirect
S ⁷	9	Nondirect, Indirect
S ⁸	9	Indirect
S ⁹	9	Direct
S ¹⁰	9	Nondirect
S ¹¹	9	Nondirect
S ¹²	9	Nondirect
S ¹³	11	Nondirect
S ¹⁴	12	Nondirect, Indirect
S ¹⁵	13	Nondirect
S ¹⁶	13	Indirect
S ¹⁷	14	Indirect,* Nondirect, Direct
S ¹⁸	15	Nondirect
S ¹⁹	15	Indirect
S ²⁰	16	Nondirect
S ²¹	17	Direct

* Predominant method used by former speech pathologist.

TABLE VII
SSI SCORES AND LENGTH OF TREATMENT RECEIVED
BY THE EXPERIMENTAL SUBJECTS

Subjects	Months in Treatment	Type of Treatment
S ¹⁷	6	Indirect, * Nondirect, Direct
S ⁵	8	Nondirect
S ⁸	8	Indirect
S ¹⁰	8	Nondirect
S ²¹	8	Direct
S ¹⁸	9	Nondirect
S ²	10	Nondirect, * Indirect
S ¹⁵	10	Nondirect
S ¹⁹	10	Indirect
S ⁹	11	Direct
S ⁶	15	Nondirect, Indirect
S ¹	16	Nondirect
S ³	16	Nondirect
S ¹¹	16	Nondirect
S ⁷	16	Nondirect, Indirect
S ¹³	16	Nondirect
S ¹⁶	16	Indirect
S ¹²	19	Nondirect
S ¹⁴	19	Nondirect, Indirect
S ²⁰	21	Nondirect
S ⁴	25	Direct

* Predominant method used by former speech pathologist.

variables: age at intervention, age at dismissal from treatment, age at evaluation by the SSI, length of time in treatment, length of time post-treatment, and SSI score.

Using Guilford's (1956) general verbal descriptions for correlation coefficients, the results of the analyses were as follows:

- (1) A correlation coefficient of $-.25$ was determined when examining the number of months post-treatment and the score received on the SSI. This indicated a very low correlation with a small but definite negative relationship between the two variables. In other words, there was a slight trend toward a higher SSI score the longer the time post treatment.
- (2) An investigation of months in treatment and scores received on the SSI disclosed a correlation coefficient of $-.06$, which indicated no significant correlation, or that the number of months in treatment was not associated with the fluency of the subjects at the time of the SSI.
- (3) When the age at the time of the SSI and the SSI scores were compared, the resultant correlation coefficient of $-.14$ indicated no significant correlation between the age of the subjects and the fluency exhibited during the speaking performances evaluated by the SSI.
- (4) Again, no significant correlation ($+.08$) was revealed when the two variables investigated were age at dismissal and SSI score.

- (5) A low correlation with a small but definite relationship was revealed when this analysis was applied to the age at intervention and SSI score. Thus the coefficient of $+ .29$ indicated a slight trend toward a lower score the younger the subject was at the time of intervention.
- (6) The correlation coefficient determined for the age at diagnosis and length of treatment was $- .14$ which indicated that there was no significant correlation between these two variables.

The frequency score received by a subject on the SSI was a composite of two scores, one for a reading task and one for a job task. An informal analysis revealed that some subjects received scores for both tasks, some received scores for only one of the tasks, and still others received zero scores for both tasks (see Figure 2). A chi-square test for independent samples was employed to determine whether or not the experimental and control samples differed significantly in the consistency of their scoring. A chi-square of 10.164 was determined which indicated that $p = .01$ or that the groups differ significantly in the consistency of their performance on the frequency portion of the SSI. In other words, there was more consistency in disfluency demonstrated by the experimental sample.

What is the value of using the Stuttering Severity Instrument?

The Stuttering Severity Instrument (SSI) is probably the most formal instrument developed to date that measures stuttering behaviors.

COMPOSITION OF FREQUENCY SCORES

Figure 2. Illustration of consistency of scoring on frequency portion of the Stuttering Severity Instrument. The total frequency score is a composite of two scores, one for a reading task and one for a job task. A chi-square analysis demonstrated that the experimental sample was significantly more consistent in the frequency of their stuttering occurrences on the two speaking tasks.

It is useful because it yields a numerical representation of severity that can be compared with normative data to determine the level of severity.

The SSI has value for the clinical or public school speech pathologist and the researcher in that 1) it is a formal instrument with procedures for scoring and evaluating, 2) it measures observable behaviors of stuttering, 3) it can be easily administered in any speaking situation, 4) it can be used as a reference point for measuring clinical changes, and 5) its formal design allows for replication of research in which it is used (Riley, 1972).

II. DISCUSSION

A unique characteristic of this study and one which has provided very interesting results is that it is the only one known to use a formal measurement instrument to assess the incidence of recovery from stuttering. An additional feature of the research is that the speaking performances of both a sample of children who had previously been diagnosed as stuttering and a sample of control children with no history of stuttering were evaluated by the same instrument. This design allowed for the statistical analysis of the relative performance of the groups.

A comparison of the total scores received on the Stuttering Severity Instrument (SSI) revealed there were significant differences be-

tween the experimental and control samples in their speaking performances. Significant differences were also noted between the total frequency scores, the job task scores only, and also between total duration scores when the effect of monosyllabic word repetitions was deleted from the score. No significant differences were noted between the reading task scores, the duration scores, the physical concomitant scores, the scores received for head movement and lack of eye-contact, and scores received for monosyllabic word repetitions.

When the speech of the subjects in this study was evaluated by the SSI, the format was such that two subjects from the same classroom came to the examiner one at a time to perform the speaking tasks. The evaluations were double-blind in nature; that is, the examiner was unaware until after determining the SSI scores whether or not each subject was a member of the experimental or control sample, and the subjects were unaware of the purpose of their speaking performances.

This examiner feels strongly that without the availability of the specific parameter measurements provided by the SSI, a discrimination between the experimental and control subjects would have been extremely difficult or impossible to make because of the similarities in their speaking performances. With the SSI, very small variations in the speech of the experimental and control samples were able to be identified, tabulated, and rated according to severity. This impor-

tant finding has value for public school and clinical speech pathologists as well as for future research, in that it has demonstrated that disfluent speaking behavior is indeed measurable, and when it is measured formally, a more discriminating assessment of behaviors characteristic of "normal disfluency" and behaviors characteristic of stuttering is possible.

In order to stress the value and utility of employing an instrument such as the SSI to measure fluency, as opposed to using an informal method of measurement, the similarities and overlaps which occurred in the speech of the experimental and control subjects and which make discrimination between them very difficult, will be discussed in greater depth. Also discussed will be some factors which must be considered in the clinical use and interpretation of the SSI.

Keeping in mind that Riley has indicated that when one is using the SSI to evaluate a speaking performance, a score of ≤ 8 is representative of normal fluency, and scores of > 8 demonstrate varying degrees of stuttering, the application of the SSI to the speaking performances in this study, yielded the finding that 28.6 per cent of the experimental group evidenced normal fluency or recovery from stuttering and 71.4 per cent of the control subjects demonstrated normal fluency (see Table II). Also 71.4 per cent of the experimental and 28.6 per cent of the control sample received scores of > 8 which indicated varying degrees of stuttering. It is critical before attempting

to draw conclusions from these data in isolation, to further examine such factors as the individual scores, the experimental scores in comparison with the control scores, the range of scores, and other interacting elements of the speaking performances.

To begin with, let us look at the total scores received by both sample groups on the SSI. As is graphically demonstrated in Figure 3, 21 subjects scored ≤ 8 and 21 received total scores of > 8 . Further inspection of the scores of the latter group reveals that 8 subjects (6 experimental, 2 control) received a score of 9, demonstrating the most minimal amount of stuttering possible according to this measurement instrument. If one were to look at the total scores in a molar fashion according to categories, these 8 subjects would definitely be considered part of the disfluent category, or in terms of the 6 experimental subjects, would not have shown evidence of recovery from stuttering.

An examination of the aspects of a speaking performance which could account for the one point difference between 8 and 9, however, reinforces the fact that one must take a more molecular approach and look at all interacting elements which influence the score. For example, if a subject has two disfluencies, both during the job task, he receives a frequency score of 3; however, if these disfluencies occur during the reading task, the frequency score received is only 2. Thus, the type of speaking situation could possibly affect whether or not a

Figure 3. Total scores received by the experimental and control subjects when reading and job (conversation) tasks were evaluated according to the Stuttering Severity Instrument.

subject is considered fluent or disfluent.

An additional element which could influence whether a subject's score is 8 or 9 is the duration of the stuttering occurrence. According to the SSI, a duration increase of as little as less than one-half second can cause an increase of one point in the score received. Moreover the scoring of the duration portion of the SSI as well as the physical concomitant portion could easily be affected by listener bias, which could result in a higher score than if another examiner had evaluated the speaking performance.

Keeping in mind the very fine variations in speaking or listening behavior that can account for an increase in scores, let us again look at the total SSI scores received by all the subjects as shown in Figure 3. Considering that the maximum score possible on the SSI is 45, and the highest score received by either an experimental or control subject was 17, one can see that all the subjects fell into the normal fluency to mild disfluency range.

It is interesting to note that 6 control subjects (28.6 per cent) received scores above Riley's cut-off point of 8. Different factors might account for or have an interacting effect upon this outcome. Perhaps these subjects were "undiagnosed stutterers," or perhaps they were very uncomfortable and nervous about the particular speaking situation. Berry and Eisenson (1956), Sander (1961), Young (1975) and others have expressed that fluency in individual speakers varies

from day to day, hour to hour, and situation to situation. Perhaps a more reliable assessment which is representative of a person's degree of fluency could be obtained if several speaking performances were evaluated over a period of time.

An observation mentioned earlier in this chapter is that the experimental and control subjects were essentially indistinguishable on their speaking performances using informal analysis. When evaluated by the SSI, the scores received by the experimental subjects ranged from 0 through 17 and the scores received by the control subjects ranged from 0 through 15. Further analysis indicated the majority of subjects from both research samples received points for all three parameters measured by the SSI: frequency, duration, and physical concomitants. When their speaking performances are examined one parameter at a time, similarities and differences become more apparent.

Statistically, there was a significant difference between the experimental and control samples on the scores they received for the total frequency portion of the SSI, which measures percentage of stuttering occurrences present in their speaking performances (see Figure 4). If quality is evaluated informally, however, parallelisms in the speech of both samples become apparent. Table VIII demonstrates the distribution and comparison of the types of disfluency emitted by both the experimental and control subjects during their evaluation by

Figure 4. Total frequency scores received by the experimental and control subjects when reading and job tasks were evaluated by the Stuttering Severity Instrument for repetitions or prolongations of sounds, syllables, or monosyllabic words and for silent prolongations of an articulatory posture.

TABLE VIII

DISTRIBUTION AND COMPARISON OF TYPES OF DISFLUENCY
EMITTED DURING SPEAKING PERFORMANCES

Frequency Count	Word Repetitions	Sound Repetitions	Syllable Repetitions	Prolongations	Totals
Reading Task:					
X	17	10	2	1	30
C	4	14	3	0	21
Job Task:					
X	17	8	0	1	26
C	11	2	0	0	13
Total Scores:					
X	34	18	1	2	56
C	15	16	0	0	34

X = Experimental Sample, C = Control Sample

the SSI. The four behaviors tracked and scored included monosyllabic word repetitions, sound repetitions, syllable repetitions, and prolongations of sounds or words. As is illustrated in Table VIII, the experimental sample had a higher overall frequency than the control sample, but there was considerable similarity and overlap between the two groups for the various types of disfluency and on the different speaking tasks (see Figures 5, 6). For each of the two research samples, monosyllabic repetitions and sound repetitions comprised the majority of the total frequency count. A breakdown of this total into its two components, job task scores and reading task scores, reveals further qualities which make it difficult to differentiate between the speaking performances of the experimental and those of the control subjects without the use of a formal instrument such as the SSI. When only the job task performances are reviewed, although there was more disfluency present in the performances of the experimental subjects, one can see that both sample groups demonstrated the same types of disfluency (see Table VIII). An interesting observation apparent when examining only the reading task performances, is that although the types of disfluency demonstrated by both groups are the same, in two categories (sound repetitions and syllable repetitions) the totals of the control subjects slightly exceed those of the experimental subjects. This informal observation of the close similarity and overlap between the two sample groups is substantiated statistically by the results of an

Figure 5. Frequency scores received by the experimental and control subjects when their job task was evaluated by the Stuttering Severity Instrument for repetitions or prolongations of sounds, syllables, or monosyllabic words and for silent prolongations of an articulatory posture.

Figure 6. Frequency scores received by the experimental and control subjects when their reading tasks were evaluated by the Stuttering Severity Instrument for repetitions or prolongations of sounds, syllables, or monosyllabic words, and for silent prolongations of an articulatory posture.

application of the Mann-Whitney U Test to the data, which indicated there was no significant difference between the two samples in reading performances. Additional support for this observation was discovered in a report by Silverman (1974), who examined the types of disfluency present in the speech of 56 children who had been identified by speech pathologists as stuttering and 56 children who had no history of stuttering. After analyzing their disfluency types both in storytelling and in oral reading, Silverman ascertained that the storytelling task differentiated the two samples much better than the oral reading task did.

Figure 7 graphically illustrates the total duration scores received by the subjects on the SSI, which were demonstrated to be not significantly different according to the Mann-Whitney U Test. The scores from each group ranged from 0 to 4, which according to Riley (1972) means that the length of the three longest stuttering occurrences can range from fleeting to nine-seconds. In this research, however, the range actually spanned from fleeting to four seconds in duration for both samples.

According to the SSI, the duration of the stuttering occurrence is estimated from its beginning to the completion of the sound, syllable or word. When tracking the length of the repetition of a monosyllabic word, this means that the measurement includes the time necessary to repeat the word as well as the pause time between the repetitions.

Figure 7. Total duration scores received by the experimental and control subjects when the length of the stuttering occurrences during the reading and job task were evaluated by the Stuttering Severity Instrument.

Johnson (1961), who evaluated types of disfluency in the reading and job tasks of adults, omitted pause time from his measure. He felt that it should be omitted because of the "relatively unsystematic judgment involved in deciding whether a given pause is or is not part of the meaningfully fluent production of the speech." This examiner agrees strongly with Johnson's statement. In the present study, many of the monosyllabic word repetitions were seemingly effortless repetitions of conjunctions joining components of a compound or complex sentence. It was the impression of this examiner that perhaps this pause and repetition of the conjunction indicated a word selection process or "collecting of thoughts" before completion of the sentence. Measurement of these repetitions both for frequency and duration was required, however, in order to comply with the rules for scoring the SSI.

Interestingly, although a statistical analysis of the total duration scores indicated no significant difference between the sample groups, when the effects of monosyllabic word repetitions were omitted from the duration score, the range of scores from 0 to 4 remained the same for both groups; however, the difference in scores became statistically significant. This may be a result of the fact that the experimental subjects as a whole demonstrated significantly more stuttering occurrences than the control subjects both when monosyllabic word repetitions were included and when they were deleted from the total frequency scores.

The experimental subjects were also more consistent in their performances in that a significantly greater number of experimental subjects than control subjects were disfluent in both the job and reading tasks.

The physical concomitants measured by the SSI also did not differentiate between the experimental and control subjects on their performances in this study (see Figure 8). Although the range of scores (0 through 9 for the experimental sample and 0 through 5 for the control sample) might appear to indicate a wide variance, statistical analysis indicated there was no significant difference between the two groups in their concomitant behaviors.

The majority of points received by all subjects for physical concomitants were acquired in the area which measures head movement and eye-contact. Therefore, a Mann-Whitney U Test was used to compare the medians of the groups for this area alone. The results verified that again there was no significant difference between the experimental and control subjects in their scores. In other words, the control subjects had just as much head movement and lack of eye-contact as the experimental subjects.

To summarize the discussion thus far, the use of a formal instrument to assess the speaking performances of the experimental and control subjects in this study demonstrated that it is possible to determine much more information about the similarities and differences between the speakers than when informal analysis is employed.

Figure 8. Total physical concomitant scores received by the experimental and control subjects when their reading and job tasks were evaluated by the Stuttering Severity Instrument along with guidelines developed by the examiner.

Information from the survey sent to the former speech clinicians of the experimental subjects, which asked them to classify the type of treatment they used, indicated that all three types of treatment (direct, indirect and nondirect) were used with children of various ages who were in treatment for various lengths of time. In addition, an informal analysis of the SSI score received by each subject coupled with the type of treatment received, revealed that all three types of treatment appeared successful when used in the management of stuttering.

Sheehan and Martyn (1966) suggested that the more severe a person's disfluency is, the more likely he is to receive speech treatment in the public schools, and thus if severity is used as a predictor for prognosis, those enrolled in public school speech treatment have the poorest prognosis. In the Sheehan and Martyn studies, the severity of stuttering was based upon ex-post-facto reports from the subjects themselves. Severity ratings at diagnosis are not available for all the subjects in this research; however, even without these ratings, one can infer that the results of this study contrast with the inference of poor prognosis made by Sheehan and Martyn, since according to the SSI, the subjects in this research demonstrated fluency or nearly normal fluency (scores ranged from 0 through 17).

Using caution in the interpretation of results of treatment is emphasized by Dickson (1971) who stated that "remedial efforts with

disfluent children may well encompass subjects who would show spontaneous remission of symptoms regardless of the techniques used." He further discussed that it is possible that what might appear to be treatment success, may be nothing more than remission that would occur without the benefit of formal speech treatment.

Cooper (1972) discussed that one must also be careful when interpreting the results of treatment or intervention because of the fact that many unmeasured and uncontrolled variables exist such as stuttering type and severity, duration of treatment, and type of treatment.

A few variables concerning the experimental subjects in this study were available from the speech records and allowed for the analysis of their possible effects upon the SSI scores. A Spearman rank correlation coefficient test revealed there was no correlation between the number of months in treatment and the SSI scores, the age at dismissal and the SSI scores, and the age at the time of the evaluation by the SSI and the score received. A very low negative correlation between the number of months post treatment and the SSI scores indicated a slight trend toward a higher score the longer the time post treatment. When thinking in terms of recovery from stuttering, this is not the trend that one might expect but rather one would expect a trend that indicated a lower score the longer the time post treatment, since recovery takes place over a period of time with or without treat-

ment. Another slight trend (a low positive correlation) was noted between age at intervention and SSI score: the younger the child at diagnosis, the lower the SSI score he received.

Certainly the results of this study suggest that the efforts of the former speech clinicians should be highly praised, since the experimental subjects in the study demonstrated normal fluency to very mild disfluency. Because original levels of severity and base rates of treatment were not available, however, it is impossible to give the clinicians feedback as to whether a particular type or length of treatment was most responsible for any changes that might have occurred in the child's speech.

It would be very helpful if information such as basis for diagnosis, degree of severity at diagnosis, length of time in treatment, number of times per week in treatment, actual treatment time, type of treatment used, methods used in treatment, basis for dismissal, and other factors regarding the speech behavior of the subjects was recorded systematically. Not only would it allow for further comparison between their former degree of stuttering and their current fluency status, but more information about the interacting elements which possibly effected the change in speaking behaviors from what was previously considered stuttering to what is now considered normal or near normal fluency could be determined.

An important outcome of such recordkeeping would be the fact

that not only could the speech clinicians be lauded for their successful treatment efforts, but they could be given feedback regarding specific factors which seemed to have the greatest effect on the establishment of fluency. A possibility is that this reinforcement of specific efforts used in treatment, would help the clinicians develop more of a direction or personal philosophy with regard to stuttering and would influence the methods they used for diagnosis and treatment.

CHAPTER IV

SUMMARY AND IMPLICATIONS

I. SUMMARY

Several studies have been undertaken to determine the incidence of recovery from stuttering; however, the results of these investigations are not reliable due to methodological limitations. For the most part, ex-post-facto recall judgments on the parts of adults or parents of young children were relied upon in gathering data for the research. It would appear that a requisite factor in determining incidence of recovery from stuttering should be the use of a formal instrument which would quantify the auditory and visual aspects of speaking behavior to determine the presence or absence of stuttering.

The primary purpose of this study was to determine the incidence of recovery from stuttering in a sample of children who had received treatment for stuttering and had subsequently been dismissed from treatment. Also examined was whether or not significant differences existed between the speaking performances of these subjects and a sample of control subjects of the same sex, grade level, and approximate academic ability. To control for experimental bias, a double-

blind design was utilized. A secondary part of the study examined the possible effects of the former treatment received by the experimental subjects on the recovery from stuttering.

Because it is probably the most formal instrument developed to date which measures and classifies both the auditory and visual dimensions of stuttering according to severity, the Stuttering Severity Instrument (SSI) was chosen for this research. The SSI yields a numerical representation of severity based upon the measurement of three observable parameters of stuttering: frequency of stuttering instances, duration of the stuttering instances, and physical concomitants which accompany the stuttered speech.

Forty-two children from Portland Public School District Number One (21 experimental, 21 control) performed two speaking tasks: a reading task and a job (conversation) task. Results of the application of the SSI to these speaking performances indicated that the incidence of recovery from stuttering in the experimental sample was 28.6 per cent. All subjects in the research, however, fell into the normal fluency to very mild disfluency range.

When individual parameters measured by the SSI were analyzed by the Mann-Whitney U Test, it was determined that significant differences existed between the experimental and control samples on the following: total SSI scores; total frequency scores; job task scores; and total scores, frequency scores, and duration scores when the effects of

whole monosyllabic word repetitions were deleted from the scores. No significant differences existed between the two samples when reading task scores, duration scores, and physical concomitant scores were compared. When the scores for head movement and eye-contact were extrapolated from the total physical concomitant score, no significant differences were noted between groups either for these scores alone or for the physical concomitant parameter when these scores were deleted.

A qualitative analysis of the speaking performances indicated that similarities and overlaps existed between the experimental and control subjects when the types of stuttering, the duration of stuttering occurrences, and the types of physical concomitants were compared. Thus the use of a formal assessment instrument in this research on recovery from stuttering allowed for a more discriminating assessment of the speaking behaviors of the experimental and control subjects, who would have been essentially indistinguishable on their speaking performances using informal analysis.

An informal analysis of the treatment used by the former clinicians of the experimental subjects and the SSI scores received by each subject, revealed that all three types of treatment (direct, indirect, and nondirect) were used with children of various ages who were in treatment for various lengths of time, and all three types appeared to be equally successful when used in the management of stuttering.

II. IMPLICATIONS OF THIS STUDY

Implications for Future Research

In an earlier chapter, the methodological limitations of previous studies on recovery from stuttering were discussed. The two major limitations which affected the interpretation or comparison of the results were: 1) the studies were ex-post-facto in nature relying upon the subjective judgment of the subject, his parent, or an observer as to the presence or absence of stuttering at any time, and 2) no formal instrument was used to measure the stuttering or recovery.

Attempts were made to design this research as methodologically sound as possible. The Stuttering Severity Instrument (SSI) was chosen for the research because it is probably the most formal instrument developed to date which measures the auditory and visual aspects of a speaking performance. Although the current fluency status in the speaking performances of the experimental subjects was able to be determined by the SSI, unfortunately, the assumption had to be made that the subjects were correctly diagnosed by their former speech pathologist as demonstrating stuttering. Because former speech records were inconsistent and at times not completely clear, the level of stuttering severity at diagnosis or during treatment could not be determined and compared with the present severity level.

For the above reasons, this examiner would suggest that a future

study on recovery from stuttering be conducted which is longitudinal in nature; that is, the speaking performances of subjects would be evaluated regularly over a period of time. Additionally, formal measurement should be used for the original diagnosis of stuttering, and the same instrument should be used to measure changes throughout the longitudinal research. In this way, more reliable results could be obtained on the changes of the fluency status of the subjects, and more replication studies could be done to determine information on recovery from stuttering.

The SSI, which was used to determine the incidence of recovery from stuttering in this research, has been standardized, but only on a group of 137 children and adults who had been previously diagnosed as demonstrating stuttering. Observations noted in this study imply that perhaps the SSI measures some behaviors that are not just typical of stuttering, but are possibly characteristic of most speakers.

If this is the case, subjects whose speaking performances are considered by casual observers to demonstrate fluency, might well be considered to demonstrate stuttering according to the SSI. This suggests another area for future research; that is, perhaps further standardization of the SSI is necessary using both a population that exhibits normal fluency and a population that demonstrates stuttering, in order to separate those behaviors which differentiate between normal fluency and stuttering.

Implications for Public School and Clinical Speech Pathologists

Many speech pathologists undoubtedly find themselves facing the dilemma of whether or not to place a child in speech treatment for stuttering. Many times the reason for this indecision is uncertainty as to whether the speaking behavior being observed is stuttering or "normal disfluency." The Stuttering Severity Instrument affords the speech pathologist a method of determining exactly which behaviors he is observing in a given speaking performance, as well as how excessive these behaviors are. It also can be used over long periods of time to measure changes in speaking behavior. Thus, whether the disfluencies are increasing or decreasing according to the SSI might influence the decision as to whether or not to intervene and begin speech management. An advantage of the SSI is that it can be utilized in any speaking situation without the child even realizing he is being evaluated. The speech pathologist can evaluate a child's speech in his own setting, in the child's classroom, and even in the lunchroom or on the playground.

If accurate, complete, consistent and systematic records are kept on all children who are suspected of stuttering (both those who are on re-check lists for continual re-evaluation and those who are in treatment) the speech pathologist can determine whether behaviors are increasing or decreasing, or in other words whether or not recovery from stuttering is taking place. Accurate, complete and

consistent records means that data regarding basis for diagnosis (SSI or otherwise), length of time in treatment, actual treatment time, number of sessions attended, SSI or other evaluations given throughout the re-evaluation or treatment period, and reason for dismissal, should be kept at all times for each child. Such systematic recordkeeping will not only enable each speech pathologist to evaluate the fluency status of his clients in a longitudinal manner, but will allow for more information for another investigator doing research on stuttering. If records are kept describing methods used in the treatment of stuttering, both the speech pathologist and other researchers will be able to hypothesize which methods specifically had effects on the recovery from stuttering.

In summary, it is felt that this research has made a significant contribution to the information that is known about recovery from stuttering. It is the first study known to use a formal assessment instrument to evaluate the presence or absence of stuttering in a speaker's performance. Another unique value of this study lies in the fact that it compared the speaking performances of children who had previously been diagnosed as demonstrating stuttering with those of children who had no history of stuttering, to determine similarities and differences in their speech behaviors.

Even though research on recovery from stuttering has taken place over a period of approximately the last ten years, there were so many

limitations in research designs that the area is just beginning to be explored. It is hoped that very soon other investigators will become interested and undertake continued longitudinal research using more formal designs in order to gain additional insight into the phenomenon of recovery from stuttering.

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APPENDIX A

LETTER TO CLASSROOM TEACHERS

I am a graduate student in the Speech Department at Portland State University and I am currently developing my Master's thesis. The Central Evaluations Office has approved my research and has given me permission to gather my data in Portland Public School District Number One during the last two weeks of October.

My research includes examining the speech of elementary school students who were in a speech class at one time and were subsequently dismissed. My procedure will be to meet with each child for approximately five to ten minutes, during which time I will tape record a sample of his/her speech in reading and in conversation.

At this time, 21 former speech students have been selected for this study. One of these students, _____, is in your classroom.

I would appreciate very much if you could assist me with my research in the following ways:

1. Choose one other student for me to use in my research.
This student should be the same sex, grade, and approximate academic ability as _____.
2. Send the two students to me one at a time according to the directions attached on the day I visit your school.

I will be _____ School on _____ at _____ to meet with the two students. If this time is not convenient, please call me and we can arrange for another time.

I appreciate your assistance.

Sincerely,

APPENDIX B

DIRECTIONS FOR SENDING STUDENTS TO THE EXAMINER

In order to protect the research from bias, either on the part of the students or myself, two things are very important and necessary:

1. I must not be aware of whether or not I am speaking with the former speech student or with the student you selected for me from your classroom. Therefore, would you please do the following:
 - a. Send the two students to me one at a time in alphabetical order.
 - b. Rather than tell me the names of the students at the time of my testing, would you fill in the names on the enclosed form and return it to my thesis director in the stamped, addressed envelope. He will keep the names until I finish my research.
2. The student should not be aware either of the purpose of the research or of why he/she was chosen to participate. Therefore would you please give each student the following directions before he/she leaves the classroom for the test setting:

_____, would you please go down to _____.
There is a woman there who needs two _____ grade
boys/girls to help her with a project. It will only take
five or ten minutes. When you are finished, I will choose
one other person to help her.

APPENDIX C

SUBJECT IDENTIFICATION FORM

SCHOOL:TEACHER:GRADE:DATE OF TESTING:STUDENTS TESTED:

Student #1 _____

Student #2 _____

APPENDIX D STUTTERING SEVERITY INSTRUMENT EVALUATION SCALE

Frequency (Use A or B, not both)

<i>A. For readers. Use 1 and 2.</i>				<i>B. For nonreaders</i>	
<i>1. Job Task</i>		<i>2. Reading Task</i>		<i>Picture Task</i>	
<i>Per- centage</i>	<i>Task Score</i>	<i>Per- centage</i>	<i>Task Score</i>	<i>Per- centage</i>	<i>Task Score</i>
1	2	1	2	1	4
2-3	3	2-3	2	2-3	6
4	4	4-5	5	4	8
5-6	5	6-9	6	5-6	10
7-9	6	10-16	7	7-9	12
10-14	7	17-26	8	10-14	14
15-28	8	27 and up	9	15-28	16
29 and up	9			29 and up	18

Total
Frequency
Score
A 1 & 2
or
B

Duration

<i>Estimated Length of Three Longest Blocks</i>	<i>Task Score</i>
Fleeting	1
One half second	2
One full second	3
2 to 9 seconds	4
10 to 30 seconds (by second hand)	5
30 to 60 seconds	6
More than 60 seconds	7

Total Duration
Score

Physical Concomitants

Evaluating Scale: 0 = none; 1 = not noticeable unless looking for it; 2 = barely noticeable to casual observer; 3 = distracting; 4 = very distracting; 5 = severe and painful looking.

1. Distracting Sounds. Noisy breathing, whistling, sniffing, blowing, clicking sounds..... 0 1 2 3 4 5
2. Facial grimaces. Jaw jerking, tongue protruding, lip pressing, jaw muscles tense..... 0 1 2 3 4 5
3. Head movement. Back, forward, turning away, poor eye contact, constant looking around..... 0 1 2 3 4 5
4. Extremities movement. Arm and hand movement, hands about face, torso movement, leg movements, foot tapping or swinging..... 0 1 2 3 4 5

Total Physical
Concomitant
Score

APPENDIX E

RULES FOR SCORING PHYSICAL CONCOMMITANT PORTION
OF STUTTERING SEVERITY INSTRUMENT

AREA I: DISTRACTING SOUNDS

A. Verbal Junk:	<u>Score</u>	<u>Frequ/150 Wds.</u>
1. Nonsyntactical components	0 -	0
2. Rephrasing	1 -	5
	2 -	10
	3 -	15
	4 -	20
	5 -	Above 20

B. Audible Breathing:	<u>Score*</u>	<u>Percent/Sample</u>
1. With stuttering occurrence	0 -	0%
2. Without stuttering occurrence	1 -	10%
	2 -	25%
	3 -	50%
	4 -	75%
	5 -	Above 75%

C. Noises:	<u>Score</u>	<u>Frequ/150 Wds.</u>
1. Whistling	0 -	0
2. Popping	1 -	1
3. Clicking	2 -	3
	3 -	5
	4 -	7
	5 -	Above 9

TOTAL THREE SUBSECTIONS TO OBTAIN AREA I SCORE

AREA II: FACIAL MOVEMENTS AND/OR TENSION

A. Movements:	Score [#]	Frequ/150 Wds.
1. Tongue, jaws, lips	0 -	0
2. Eyes	1 -	3
	2 -	5
	3 -	7
	4 -	9
	5 -	Above 9

B. Articulatory Tension :	Score [#]	Frequ/150 Wds.
1. Tongue, jaws, lips	0 -	0
2. Eyes	1 -	1
	2 -	3
	3 -	5
	4 -	7
	5 -	Above 9

TOTAL BOTH SUBSECTIONS TO OBTAIN AREA II SCOREAREA III: HEAD MOVEMENTS AND/OR TENSION

A. Head Movements Only:	Score	Frequ/150 Wds.
	0 -	0
	1 -	3
	2 -	5
	3 -	7
	4 -	9
	5 -	Above 9

B. Head Jerking W/Tension:	Score	Frequ/150 Wds.
	0 -	0
	1 -	1
	2 -	3
	3 -	5
	4 -	10
	5 -	Above 15

C. Eye Contact:	Score	Frequency
	0 -	50 - 100 %
	3 -	25 - 49 %
	5 -	Below 25 %

TOTAL THREE SUBSECTIONS TO OBTAIN AREA III SCORE

AREA IV: EXTREMITIES MOVEMENT

A. Arm, Hand, Torso, Leg Movements:	Score [°]	%/150 Wds.
	0	- 0%
	1	- 10%
	2	- 25%
	3	- 50%
	4	- 75%
	5	- Above 75%

-
- * Use subjective judgment and raise 1 point or more depending upon length and degree of audibility.
- # Use subjective judgment and raise 1 point or more depending upon severity of movement or tense posture.
- ° Use subjective judgment and raise 1 point or more depending upon degree of tension with the movement and/or degree of amplitude of movement. Points may be added for one or both these areas.

APPENDIX F

LETTER TO FORMER SPEECH CLINICIANS

I am a graduate student in the area of Speech and Hearing Sciences at Portland State University and I am currently doing research for my Master's thesis in the Portland Public Schools. My project has been approved by Mrs. Ruth Peets, Specialist in Speech and Hearing, and Dr. Victor Doherty, Central Evaluations Office.

My research includes examining the speech of elementary school students who at one time were diagnosed as stuttering, who received treatment for their stuttering, and who were subsequently discontinued from treatment. Tape recorded samples of conversation and reading were evaluated with the Stuttering Severity Instrument to discover the presence or absence of stuttering.

A second part of my research includes determining the method of treatment used with each subject. When I have this information, I will examine it along with the results of the Stuttering Severity Instrument to determine if the type of treatment might have had an effect on recovery from stuttering.

As the former clinician of one of my subjects, I would sincerely appreciate your assistance with the second part of my research. I have enclosed a copy of the student's speech and hearing class card, which includes your comments regarding his speech. Also enclosed is a classification system which divides speech treatment into three methods: direct, indirect, or nondirect. I would appreciate it very much if you would indicate on this form the type of treatment used with this student, and return the form to me in the enclosed self-addressed, stamped envelope as soon as possible.

If you have any questions, I can be reached at _____ in the daytime and _____ in the evening.

I appreciate your assistance with my research and look forward to your reply.

Sincerely,

APPENDIX G

TREATMENT CLASSIFICATION SYSTEM

CHARACTERISTICS OF THE DIRECT METHOD

- the child recognizes his interference in communication and understands the reasons for working on his speech.
- the clinician plans goals for the child, and the child understands these goals in relation to his speaking behavior.
- the clinician gives directions to the child for doing the things he needs to do to communicate effectively by modeling the correct responses, and then shapes the appropriate responses in the child's speech.
- the clinician and the child continually evaluate his speech and the clinician reinforces appropriate speaking behaviors.
- the clinician and the child meet on a consultative basis and together they evaluate the child's speech.

CHARACTERISTICS OF THE INDIRECT METHOD

- the child may or may not recognize his interferences in communicating.
- the child's own speech is not corrected directly, but the correct production is modeled for him by the clinician.
- a behavior other than speech is emphasized in treatment, the effect of which will develop more appropriate speaking behaviors (i. e. relaxation training).
- the treatment is structured so that the emphasis is not on changing an undesirable speaking behavior, but on continuing to appropriately do the things he needs to do to communicate effectively.
- the child is part of a group in which his speech is used as a model for others in the group for articulation or language training. The clinician shapes the speech indirectly.
- the clinician and the child meet on a consultative basis and only the clinician evaluates the child's speech.

CHARACTERISTICS OF THE NONDIRECT METHOD

- the clinician works with the classroom teacher and/or the parents in changing the child's environment so that it is a more comfortable one in which to speak.
- the child attends speech class, but speech is not worked on directly. The goal is to provide a comfortable setting in which to speak.
- the child is referred to another professional for treatment (i. e. medical doctor, psychologist, psychiatrist).

STUDENT:

CLINICIAN:

METHOD OF TREATMENT: