

AN INVESTIGATION OF DISFLUENT SPEECH
BEHAVIOR IN DOWN'S SYNDROME

by

VINCENT EUGENE KEANE

A DISSERTATION

Presented to the Department of Speech
and the Graduate School of the University of Oregon
in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

September 1970

VITA

NAME OF AUTHOR: Vincent Eugene Keane
PLACE OF BIRTH: Jersey City, New Jersey
DATE OF BIRTH: July 20, 1932

UNDERGRADUATE AND GRADUATE SCHOOLS ATTENDED:

Seton Hall University
Fordham University
New York University
Teachers College, Columbia University
University of Iowa
Indiana University
Northwestern University
University of Oregon
University of Oregon Medical School

DEGREES AWARDED:

Bachelor of Arts, 1954, Seton Hall University
Master of Arts, 1961, University of Iowa

AREAS OF SPECIAL INTEREST:

Stuttering
Speech and Language Problems in the Mentally Retarded
Aphasia

PROFESSIONAL EXPERIENCE:

Director of School Hearing and Speech Services and Assistant
Director, Mount Carmel Guild Diagnostic Center, Newark,
New Jersey, 1961-1966

AWARDS AND HONORS:

Research Assistantship, Hospital School for Handicapped Children, University of Iowa, 1960-1961

Vice President (1962-1963) and Treasurer (1965-1966), New Jersey Speech and Hearing Association

Certificate of Clinical Competence in Speech Pathology, American Speech and Hearing Association

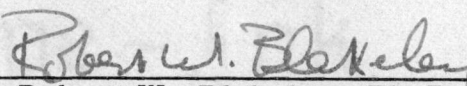
Neurological and Sensory Disease Traineeship, University of Oregon, 1966

PUBLICATIONS:

KEANE, V. E., Personality studies of stutterers. J. N. J. Speech Hearing Assn., IV, 8-11 (1965).

KEANE, V. E., S S S Stuttering-- What to do? Catholic Educator, XXXVII, 82-84 (1966).

APPROVED:



Robert W. Blakeley, Ph. D.

ACKNOWLEDGMENTS

Due to the scope and magnitude of this particular investigation, the writer is gratefully indebted to many individuals for their assistance and cooperation. One hesitates to attempt to name all those who helped in any manner, shape, or form for fear of inadvertently omitting any one person and secondly, because the list would be extensive. The writer begs the indulgence of anyone he might have neglected to mention, and hic et nunc, extends his sincere and grateful appreciation to all who acceded to his numerous requests for aid and support. However, the writer is especially thankful to the following:

Dr. Robert W. Blakeley, the chairman of his doctoral committee, for his capable direction, sound advice, continual encouragement, and for always giving so generously of his time and professional talent during the course of this investigation.

Drs. Ralph O. Coleman, C. Donald Nelson, Bruce P. Ryan, V. Knute Espeseth, and Ned J. Christensen, the members of his doctoral committee, for their pragmatic comments, suggestions, and criticisms during both the early formulation of this study as well as its progression which contributed toward making the final product worthwhile.

Drs. Coleman, Nelson, and Nancy R. Marshall for their participation in Panel I.

Drs. Blakeley, Robert L. Casteel, and Robert C. Marshall for their participation in Panel II.

Dr. David M. Haugen, Kathleen M. Griffin, and Stephen C. McFarlane for their participation in Panel III.

Dr. Nancy R. Marshall and Kathleen M. Griffin for their significant assistance in the topographical analysis.

Dr. Wilma L. Carson for her generous and dependable help on many occasions in the course of this study.

Dr. Steven G. Goldstein for providing statistical advice and consultation.

Dr. James M. Pomeroy, Superintendent and Mr. Joseph Stowitschek, Supervisor of the Communication Disorders Section at Fairview Hospital and Training Center in Salem, Oregon for their permission and cooperation in obtaining the sample of institutionalized subjects.

The directors and teachers at the various day centers for the retarded in Portland, Salem, and Eugene, Oregon for their permission and cooperation in securing the sample of day center subjects.

Mr. Gordon R. Hauck and Mr. Stan Gomulkiewicz, Coordinators of Special Education in Kirkland, and Vancouver, Washington,

respectively, for their permission and cooperation in acquiring the sample of public school subjects.

Dr. Luvern H. Kunze of the University of Washington for his assistance in obtaining subjects.

The Instructional Aids Department of the University of Oregon Medical School, Mr. Randall McCauley of Fairview Hospital and Training Center, the Department of Speech, Broadcast Communication Area of the University of Oregon, and Child Development Center of the University of Washington for their expertise in filming the disfluent subjects.

Dr. McKenzie W. Buck of the Portland Center for Hearing and Speech and the Multi-Discipline Clinic of the University of Oregon Medical School for the use of video-tape equipment.

Dr. Richard L. Sleeter, Director of the Crippled Children's Division of the University of Oregon Medical School for assistance in procuring the video-tapes.

Dr. Robert D. Boyd for arranging for psychological testing.

Miss Donna Sasse and Miss Peggy Hatfield for their indispensable help in typing up the drafts of this manuscript.

The Neurological and Sensory Disease Section, Bureau of Chronic Diseases, U. S. Public Health Service for financial support during his doctoral training.

Last but not least, Mr. and Mrs. Eugene P. Keane of Livingston, New Jersey, his parents, for their sacrifices and encouragement during his doctoral program.

TABLE OF CONTENTS

	Page
LIST OF TABLES	xii
LIST OF FIGURES	xv
Chapter	
I. THE PROBLEM	1
Introduction to the Problem	1
Statement of the Problem	9
Terminology	11
Importance of the Study	20
II. REVIEW OF THE LITERATURE	24
Introduction	24
Review of Studies concerning Stuttering in the Mentally Retarded	28
Review of Studies concerning Stuttering in Down's Syndrome.	34
III. METHODS AND PROCEDURES	42
Subjects	42
Materials	47
Procedures	50
Analysis of Disfluencies	65
Summary of Methods and Procedures	70
IV. RESULTS AND DISCUSSION	73
Organization of the Data	73
Descriptive Features	75
Distinctive Components	103
Comparisons within Stuttering Sample	113
Summary of the Results	119

Chapter	Page
V. IMPLICATIONS OF THE STUDY	121
Limitations	121
Implications of the Major Conclusion	123
Suggestions for Further Research	135
VI. SUMMARY AND CONCLUSIONS	138
Restatement of the Problem and Procedures	138
Summary of Major Findings	141
Conclusions	143
REFERENCES	147
APPENDICES	156
Appendix A. Standard Interview Procedure	156
Appendix B. Developmental Verbal Communication Scale	158
Appendix C. Instructions to Members of Panel I.	159
Appendix D. Instructions to Members of Panel II	160
Appendix E. Iowa Scale of Stuttering Severity and List of Secondary Symptoms	161
Appendix F. Instructions to Members of Panel III (Session 1--Iowa Scale and Secondary Symptoms)	163
Appendix G. Criteria for Awareness of Stuttering	164
Appendix H. Instructions to Members of Panel III (Session 2--Identification of Awareness)	165
Appendix I. Experimental Sentences Used to Determine Consistency	166
Appendix J. Bloodstein's Developmental Phases of Stuttering Behavior	167

Chapter	Page
Appendix K. Flow Chart of Subjects Used in This Investigation	169
Appendix L. Flow Chart of Procedures Employed During This Investigation	170
Appendix M. Outline of the Various Kinds of Data Determined in This Study	171

LIST OF TABLES

Table		Page
1	Incidence of stuttering in non-mongoloid mentally retarded populations	31
2	Incidence of stuttering in Down's Syndrome	40
3	Breakdown of intelligence scales administered to Total Sample (170 subjects)	44
4	Chronological Age and I. Q. distribution for Total Sample	48
5	Interjudge reliability coefficients (Rho) between investigator and judges, and among judges in Panel I . .	55
6	Percentages of interjudge agreement of one category between investigator and judges, and among judges in Panel I	56
7	Interjudge percentages of agreement regarding number of disfluencies present in five video-tapes . . .	67
8	Tallies for the different types of disfluency between investigator (No. 1) and scorer (No. 2) for five subjects	68
9	The number of fluent and disfluent subjects found within the various sub-groups in the Total Sample . . .	76
10	Percentages of disfluent speech and stuttering behavior found within the Total Sample	77
11	Intrajudge reliability coefficients (Phi) and percentages of agreement for Panel II	78
12	Chronological ages (N = 20) and Intelligence Quotients (N = 18) for the Stuttering Sample	82

Table	Page
13	Breakdown of the Stuttering Sample on Developmental Verbal Communication Scale 83
14	Breakdown of Total Sample on Developmental Verbal Communication Scale 85
15	Interjudge reliability coefficients (Rho) for placing Stuttering Sample on Iowa Scale of Stuttering Severity . . . 90
16	Type and frequency of the most prominent symptoms displayed by Stuttering Sample 92
17	Number of symptoms agreed on by two or more judges in Panel III together with the number and percentage of subjects. 93
18	Identification and agreement concerning the number of different types of secondary symptoms by Panel III 94
19	Summary Table of five severity measures for Stuttering Sample. 96
20	Instances of agreement of stuttering awareness as judged by Panel III 98
21	Results of questionnaire concerning stuttering awareness from two persons in the environment of the subjects who stutter. 100
22	Overall view of results of procedures of determining awareness of Stuttering Sample. 102
23	Consistency measures for 13 subjects in Stuttering Sample. 105
24	Loci of stuttering in only disfluencies consisting of sound and syllable repetitions and sound prolongations 107
25	Number of loci of stuttering classified within each category for Stuttering Sample 108

Table		Page
26	Classification of disfluencies evidenced by Stuttering Sample	110
27	Results of <u>t</u> tests of the significance of the differences between the means of experimental and control groups on C. A. and I. Q.	114
28	Results of <u>t</u> tests between the means of experimental and control groups on measures of severity and number of stuttering disfluencies (sound and syllable repetitions and sound prolongations).	115
29	Comparison of the five subjects who had the highest number of sound and syllable repetitions and sound prolongations with the five subjects who had the lowest number on five different measures of stuttering behavior	118

LIST OF FIGURES

Figure		Page
1	Sex and institutional composition of the Stuttering Sample	81
2	Classification of subjects (institutionalized and non-institutionalized) on Developmental Verbal Communication Scale	87
3	Histogram of the types of disfluency found in the Stuttering Sample	111
4	Comparison of aware and non-aware groups on Iowa Scale of Stuttering Severity and number of stuttering disfluencies	116

CHAPTER I

THE PROBLEM

Introduction to the Problem

Among the many connotations that the term "disfluent speech behavior" may evoke, stuttering is probably one of the first to come to mind, even though the two terms are not necessarily synonymous.

In spite of the fact that stuttering has, in all likelihood, been one of the most thoroughly researched speech disorders, the problem still retains much of its enigmatic character. The precise etiology of stuttering, if indeed there is only one, is still unknown and an effective therapeutic approach in all cases remains elusive, yet the literature on the subject is voluminous. Nevertheless, some generally accepted facts concerning the basic nature and lawful pattern of the disorder do exist and some information about the person who stutters has been empirically determined.

Among all communication problems, stuttering stands out as one of the most challenging. It is the second most prevalent speech disorder found in children within public school systems according to the results of a survey of 1,462 speech clinicians involving 186,962 children with speech problems from all sectors of the United States

(Bingham et al. , 1961). Incidence figures vary but it is estimated that slightly less than 1% of the general population in the United States stutters (Bloodstein, 1969; Sheehan, 1970). Andrews and Harris (1964) report that its prevalence in Western Europe is also approximately 1%. The problem is found more frequently in school age children than in adults and in males rather than females (Bloodstein, 1969).

Certain aspects of the disorder remain to be given complete and systematic investigation. One such area that has received only meager attention until recently, is the reported higher incidence of stuttering within certain specific populations, such as the Northwest Coast Indians (Lemert, 1953), the Japanese (Lemert, 1962), the Negroes or Blacks in the United States (Glasner, 1970), the Ibo and Idoma people of West Africa (Morgenstern, 1953), and the mentally retarded (Schlanger, 1953; Schlanger and Gottsleben, 1957; and Schaeffer and Shearer, 1968).

The results of such studies may possibly shed more light on the milieu in which stuttering develops and, in turn, might ultimately have etiological implications. Since a number of studies have corroborated the higher incidence of stuttering within the mentally retarded, this particular population seems likely to yield significant results.

The mentally retarded have been the focus of much research in the United States especially during the last decade. Many such individuals are confined to institutions while others can be found in day centers, public school special education programs, and sheltered workshops for the retarded. They are, therefore, a readily accessible population. This factor has undoubtedly contributed toward much research in this area. At the present time more information seems to be known about retardates as a specific population than is known about the Northwest Coast Indians, the Japanese, etc.

Among the many subdivisions within mental retardation, stuttering has been said to occur with greatest frequency in Down's Syndrome or mongolism (Bloodstein, 1969). For this reason this syndrome was chosen by the investigator as the modus operandi through which the problem of stuttering might more fruitfully be investigated.

Heber (1961) lists eight different medical classifications of mental retardation. Mongolism or Down's Syndrome is listed under a subcategory called "Mental Retardation Associated with Diseases and Conditions due to (Unknown) Prenatal Influence" (p. 16). This particular group within the retarded population are usually easily identifiable by their characteristic appearance. Although there are a number of physical characteristics associated with Down's Syndrome,

all of them are rarely found in a given mongoloid (Robinson and Robinson, 1965) and no one characteristic is always present in every case (Carson, 1970).

This particular syndrome was first described in the literature by Langdon Down (1866), hence, the name Down's Syndrome. Since the unique features of individuals with this syndrome closely resemble the natives of Mongolia, they are often referred to in the literature as "mongols" or "mongoloids," although both terms are actually misnomers because this syndrome is found in all races.

Children having this condition have also been referred to as "unfinished children" (Shuttleworth, 1886). The disorder has also been called "congenital acromicria" (Benda, 1969). The etiology of mongolism was only recently discovered by three French investigators, Lejeune, Gautier, and Turpin (1959) to be a chromosomal aberration, due to an excess of cellular chromosomal material. Three specific types of Down's Syndrome have been differentiated:

1. Trisomy #21, which is the most common, results from a failure of the two chromosomes of pair #21 to separate (nondisjunction) during meiosis prior to ovulation. This produces an abnormal ovum with 24 instead of 23 chromosomes;
2. Translocation, which is rare, is caused by an overdose of

chromosome #21 material which is usually attached to chromosome #15; and

3. Mosaicism, which is very rare, results from an error in division of an early embryonic cell (Robinson and Robinson, 1965).

The incidence of Down's Syndrome is approximately one in 650 live births (Penrose and Smith, 1966). This disorder usually results in mental retardation in the moderate and severe ranges, that is, I. Q. s generally fall below 50 (Robinson and Robinson, 1965).

It has commonly been observed that the majority of individuals with Down's Syndrome have speech and, more significantly, language problems. Jordan (1966) indicated that "an incidence of language defects exists in mongoloid persons to a degree higher than that found in non-retarded and in retarded non-mongoloid persons" (p. 167).

Blanchard (1964) found that of the many physical conditions usually resulting in mental retardation, mongolism appears to be one of the "most damaging to patterns of verbal communication" (p. 617).

Strazzulla (1953) was one of the first to describe the speech and language difficulties of the mongoloid and to advocate remedial procedures. Furthermore, it should be noted that research evidence to date has not revealed any unique or peculiar configuration with regard to the linguistic pattern of mongoloids. Jordan (1966) and

Evans and Hampson (1968) have also noted this fact in contrast to Voelker (1936) who called the communication problem of mongoloids "dyslogia mongolia."

The results of several studies (Schlanger, 1953; Gottsleben, 1955; Schlanger and Gottsleben, 1957; Schaeffer and Shearer, 1968; and Hubschman, 1970) have revealed that the incidence of stuttering is more prevalent among various retarded populations, than that found in the normal (non-retarded) population. The majority of these studies have been concerned with institutionalized retardates. Such reports have led Bloodstein (1969) to conclude that "stuttering-- apparently of all degrees of severity and complexity--would seem to occur more frequently in this population than in any other single identifiable group of people" (p. 134).

A few studies (Gottsleben, 1955; Shubert, 1966; and Hubschman, 1970, etc.) have concerned themselves directly with the incidence of stuttering in Down's Syndrome. Incidence figures have ranged from 15 to 48% of the particular mongoloid population sampled. Thus the incidence of stuttering seems to be even higher in mongoloids than in non-mongoloid retardates. Bloodstein (1969) substantiated this by noting that "among the various classifications of mental defectives, stuttering has been reported to be most common by far in mongols" (p. 134). Benda (1969) has confirmed the frequency of

occurrence of stuttering in mongoloids by remarking that "stammering [stuttering] is not rare in very anxious [mongoloid] children, particularly among the more intelligent ones who feel that they are under too much pressure" (p. 73). Jordan (1966) has also reported that "stuttering seems to be more commonly encountered in the syndrome [Down's] than in cases of other syndromes and familial defectives" (p. 166).

Most of these surveys have proceeded no further than reporting a higher incidence of stuttering in their respective retarded populations. Relatively little empirical or descriptive data are available concerning the types of disfluency and the basic nature of the stuttering behavior displayed by those retardates who were identified as stutterers.

Many reasons may be offered to account for the paucity of research in this area. First, investigations of the behavior of retarded individuals, especially mongoloids, pose many pragmatic problems, primarily because it is so difficult to control all the variables involved. Second, since the language development of retardates, especially those with Down's Syndrome, is generally impaired, lack of intelligibility is a factor which limits the preciseness of the investigation, e. g. , disfluencies may be difficult to categorize. Third, the modicum of verbal output in many cases limits the

amount of data. Therefore, the length of the sample of behavior must be increased in order to obtain an adequate sample of behavior.

In spite of these imposed limitations, it seems advantageous to look into the types of disfluency and the nature of the disfluent speech behavior manifested by mongoloids. Are the characteristics and features of the problem the same or are they different from those found in non-mongoloid stutterers? This question is particularly relevant to study because of the inevitable question which results from the reportedly higher incidence. Such a question was succinctly raised by Bloodstein (1958) in discussing this matter: "What is meant by 'stuttering' in these cases?" Other questions which arise from the first are: Are we talking about the same entity in mongoloids? Can mongoloids really stutter? This factor becomes increasingly germane because some writers, namely, Weiss (1964) and Cabanas (1954) have labeled the disfluent speech behavior of mongoloids as "cluttering." In other words, if the disfluent speech behavior evidenced by mongoloids cannot be termed "stuttering" because it does not conform to the features of stuttering that have been well documented in non-mongoloid stutterers who are not retarded, then the higher incidence of disfluent speech behavior assumes little or no importance in the sense that it has no implications for stuttering.

Statement of the Problem

The general question to be investigated in this study is: Does the symptomatology of the disfluent speech behavior manifested by those with Down's Syndrome differ from such behavior found in persons who are regarded as "stutterers" within the non-retarded population? More specifically, how does the severity, awareness, consistency, loci, and types of disfluency found in mongoloids differ from and/or compare with such behavior evidenced by so-called "normal" stutterers? In essence, do mongoloids display genuine stuttering behavior?

The hypothesis to be tested in this investigation is: Mongoloids do not exhibit stuttering behavior, sui generis. That is, their disfluent speech behavior differs in some intrinsic way from stuttering behavior. The aim of this study will be to accept or reject this particular null hypothesis.

This investigation will endeavor to answer three primary questions:

1. What are the descriptive features of those mongoloids judged to stutter in terms of incidence, male to female ratio, I. Q. and age range, and status of language development?
2. What are the descriptive features of the disfluent speech

behavior of the mongoloids who stutter with regard to severity and awareness of the problem?

3. How do the distinctive components of their disfluent speech behavior, namely, consistency, loci, and types of disfluency compare with such components found in the stuttering behavior of stutterers who are not retarded?

Additional data will be obtained which will provide the answers to the following secondary questions:

1. What is the incidence of stuttering in the mongoloid population sampled?
2. Is there a significant difference between the incidence of stuttering found in institutionalized mongoloids as compared with non-institutionalized mongoloids?
3. Is there a significant difference between the incidence of stuttering found in male as compared with female mongoloids?
4. Is there a difference between the language skills of the mongoloids judged to stutter and the remainder of the sample?
5. What is the mean level of severity of stuttering, according to the Iowa Scale of Stuttering Severity, of the mongoloids judged to stutter?

6. How much evidence do mongoloids demonstrate that they are aware of their stuttering problem?
7. What is the breakdown among the categories of disfluencies employed by the mongoloids judged to stutter? Closely related to this question: Do mongoloid stutterers manifest more sound and syllable repetitions and sound prolongations than other types of disfluency?
8. Are the loci of the disfluencies displayed by the stuttering mongoloids different from, or the same as, those found in normal (non-retarded) stutterers?
9. How consistent are the mongoloids who stutter in stuttering on the same words in a series of sentences said three times?
10. What are the language abilities according to the Developmental Verbal Communication Scale for the total sample of 200 individuals with Down's Syndrome?

Terminology

Definitions

The more important terms that are employed in this investigation are defined as follows:

1. Disfluent Speech Behavior encompasses any interruption or disturbance in the normal flow, rhythm, or prosody of speech. It "refers to any kind of speech which is not smooth or fluent" (Van Riper, 1963b). Several different types of disfluent speech behavior have been referred to in the literature: normal disfluency, stuttering, cluttering, neurotic stuttering, constitutional stuttering, etc. (Van Riper, 1963a; Freund, 1966; and Johnson et al., 1967). However, there is less agreement as to the basic nature of the other types of disfluent speech behavior than there is with regard to normal disfluency and stuttering. Disfluent speech behavior is found in both stutterers and non-stutterers. Nevertheless, there are both quantitative and qualitative differences in the disfluent speech behavior between stutterers and non-stutterers. Therefore, disfluent speech behavior is not necessarily stuttering, but stuttering always involves disfluent speech behavior.
2. Stuttering will refer to any one or to any combination of the following criteria:
 - a. Frequently occurring or distinctive sound, syllable, and/or one syllable word repetitions which appear not to be readily controllable and which are sometimes

- referred to as "clonic" blocks, as opposed to repetitions of words of more than one syllable and phrases.
- b. Frequently occurring or distinctive sound prolongations which appear not to be readily controllable.
 - c. Frequently occurring or distinctive involuntary hesitations in speech behavior which appear not to be readily controllable and which are sometimes referred to as "tonic" blocks.
 - d. Any visible and/or audible evidence of struggle behavior in the form of forcing, blocking, unusual stress or tension, facial grimaces, bodily movements made in conjunction with an attempt to initiate or force sound production.
 - e. Any visible and/or audible reactions of anticipation or avoidance of producing certain sounds and/or syllables in the form of any device employed to postpone, disguise, start, or release the sound or syllable. Such devices may be in the form of repetitions of words or phrases.
 - f. Any other consistent or distinctive breaks, disturbances, or interruptions in the forward flow of speech that call attention to themselves and that may interfere

with communication.

- g. Changes in rate, pitch, inflectional patterns, loudness, articulation, and/or vocal quality which accompany a so-called "stuttering moment."

This definition is derived in part from those of Van Riper (1954) and Wingate (1964). These criteria will subsequently be referred to in Chapters III and IV in connection with Panel II.

3. Down's Syndrome or Mongolism is a common form of mental retardation associated with short stature, small skull with a flat occiput, fissured tongue, small and slanting palpebral fissures, epicanthal folds, short flat nose, small ears, and rounded mandible, giving the appearance of persons of the Mongoloid race. Other signs include delayed tooth eruption, short and broad neck, prominent abdomen, short extremities with broad flat hands and feet and clinodactyly of the fifth fingers, hypogonadism, generalized muscular hypotonia, straight silky pubic hair, and delayed development of secondary sex characteristics. Ocular and cardiovascular abnormalities may also be associated with mongolism. The majority of patients affected with Down's Syndrome have a total of 47 chromosomes, the extra

chromosome being either 21 or 22 (Jablonski, 1969).

4. Cluttering is difficult to define precisely because as Johnson et al. (1967) state: "The definition and clinical significance of the term [cluttering] are in the process of clarification" (p. 242). However, Weiss (1964), in one of the few publications on cluttering, has listed three "obligatory" symptoms, which are as follows:

- a. Short attention span and its corollary, poor concentration.
- b. Lack of (complete) awareness of the disorder, and
- c. Excessive number of repetitions in speech (p. 61).

Weiss further defines cluttering as "the manifestation of Central Language Imbalance in the area of verbal utterance" in which heredity is "the most constant etiological factor" (pp. 6, 8).

5. Severity refers to the number, type, and intensity of symptoms associated with the stuttering moment. When such symptoms become obvious and consistent in form, they are referred to as "secondary."
6. Awareness refers to the perception of difficulty akin to stuttering in verbal communication on the part of the subject. In this study, this perception may be expressed

verbally by the subject or may be discerned in the behavior of the subject by judges or by those in the environment.

Erikson (1960) has indicated that:

the most frequent definition of awareness or unawareness is in terms of verbal report. . . . A definition of awareness in terms of verbalization places a heavy burden upon the adequacy of the language to reflect the richness of perceptual experience and images (p. 280).

Since there is some question as to whether mongoloids possess enough language skills to be able to verbally express this perception, two additional methods were employed in this study to assess awareness. These methods were evidence of awareness in video-tape samples as judged by a panel of judges and the opinions of two responsible persons in the environment of the subject.

7. Consistency Effect refers to the tendency, first reported by Johnson and Knott (1937), for stuttering to occur in conjunction with the same words during repeated readings or recitations of the same material, or in response to the same cues or stimuli (Van Riper, 1963b).
8. Loci of Stuttering refers to the places or locations of the stuttering moments within a certain context, that is, the part of speech, position in the sentence, length of the word, whether it occurs on the initial sound of the word, and

whether a consonant or vowel was involved. Such loci have been extensively described with reference to stuttering by Brown (1945) and Taylor in two publications (1966a; 1966b).

9. Topographical Analysis refers to the various types of disfluency manifested by the mongoloids judged to stutter and to the examination of those kinds of disfluent responses. Johnson, Darley, and Spriestersbach (1963) list eight different classifications of disfluency. Young (1961) modified Johnson's system to five categories "in view of the rarity of occurrence of phrase repetitions, incomplete phrases, broken words . . ." (p. 35). But since Young found that broken words appear to be associated with ratings of severity of stuttering, it was decided to include this category (broken words) in the topographical analysis of disfluent speech behavior used in this study. Williams, Silverman, and Kools (1968) have labeled broken words "disrhythmic phonations." It is to be noted that the category known as "pauses or hesitations" has been deliberately omitted because, as Johnson (1961) has indicated, there is a great deal of "unsystematic judgment involved in deciding whether a given pause is or is not part of the meaningfully fluent production of speech" (p. 3). Ergo, the system of

categories to be employed in this investigation is composed of six different types, the five used by Young (1961) with some modifications plus disrhythmic phonations (Williams, Silverman, and Kools, 1968). They are as follows:

- a. Interjections--this category includes interjected sounds, syllables, words, or phrases which are clearly distinct from the context, e. g. , "uh, " "er, " and "hummm. "
- b. Part-word repetitions--repetitions of sounds or syllables or any other parts of words are classified in this category, e. g. , "ruh ruh run" or "buh boy. "
- c. Word-phrase repetitions--repetitions of whole words, including words of one syllable, or of phrases (two or more words) are counted in this category, e. g. , "I I I, " "was was, " or "I was I was going. "
- d. Prolongations--sounds or parts of words that are prolonged and words spoken with unusual stress are categorized here. The tension accompanying the prolongations occurs between words, e. g. , s - s - s - sound.
- e. Disrhythmic phonations (broken words)--that kind of phonation which disturbs or distorts the so-called normal rhythm or flow of speech. The disturbance or distortion may or may not involve tension . . . and may

be attributable to a prolonged sound, an accent or timing which is notably unusual, an improper stress, a break, or any other speaking-behavior infelicity not compatible with fluent speech and not included in another category. They occur within words only, e. g. , "I was g- (pause) oing home. "

f. Revisions--this category represents disfluencies in which either the content or the grammatical construction of a phrase or sentence was modified, or in which formulation of the statement or remark that had been started was not completed, e. g. , "I was - I am going home. "

10. Judges has reference to any one of nine persons who served as judges on either Panel I, II, or III. Each judge holds Clinical Certification in Speech Pathology from the American Speech and Hearing Association.
11. Scorer has reference to any one of two persons who assisted the investigator in establishing the reliability of the topographical analysis. Each scorer holds Clinical Certification in Speech Pathology from the American Speech and Hearing Association.
12. Investigator has reference to the person who conducted the present study.

Abbreviations

1. S. S. means the Stuttering Sample or the mongoloids who were judged to stutter.
2. T. S. means the Total Sample or the 200 mongoloids initially interviewed.
3. D. V. C. S. means the Developmental Verbal Communication Scale.
4. E. M. R. means Educable Mentally Retarded.
5. T. M. R. means Trainable Mentally Retarded.

Importance of the Study

There are a number of reasons which can be proposed to support the value and significance of this investigation.

First, its chief value lies in the fact that it will provide data and information which will delineate more precisely the specific nature of the disfluent speech behavior in mongoloids which, heretofore, has not been systematically examined. Zisk and Bialer (1967) in their review of the literature concerning speech and language problems found in Down's Syndrome concluded that:

the largest gap in our knowledge exists in the area of rhythmic deviations. Published reports leave unclear the exact nature of the problem, thus making it exceedingly difficult to speculate as to possible causes. Further research should aim at providing precise definitions and objective criteria of the behavior under consideration (p. 239).

The data obtained from this study should provide some resolution to the doubts and disagreements expressed in the literature (Cabanas, 1954; Weiss, 1964; Bloodstein, 1958; and West and Ansberry, 1968) as to whether mongoloids really exhibit stuttering behavior. It is also hoped that the information derived from this investigation will serve as the basis for further research in the area which a fortiori, perhaps will uncover the reason for a higher incidence of stuttering in mongoloids. Certainly there must be a cause for the greater frequency of stuttering in mongoloids. The answer to this particular question could have a marked bearing on the etiology of stuttering, per se.

Second, it would appear that the results of this study, whatever they may be, have implications for some of the theories of stuttering etiology. If the results of this study are positive--differences between the disfluent speech behavior of mongoloids and normal stutterers are found--then theories of etiology which put a premium on certain characteristics of stutterers, such as hypersensitivity (Johnson, 1959) would remain unscathed. Such findings would also point to the possibility of different types of disfluent speech behavior which might stem from different agents. This situation is very much in keeping with Van Riper's (1954; 1963a) eclectic theory on multi-causality. If, on the other hand, the findings indicate negative

results, namely, no differences, then the theories of Bloodstein (1969) and West (1958) would appear to receive some support.

Third, if the data show that the disfluent speech behavior of mongoloids is indeed stuttering, the results would cast some suspicion on a few traditional concepts about stutterers which are contrary to the notion that retardates are capable of stuttering.

Fourth, among the suggested categories for future research in stuttering, Sheehan (1970) lists "Persons with stuttering as an Incidental Problem" (p. 346). He implies that more can be learned about stuttering "when it is a relatively minor part of the picture." Those with Down's Syndrome would certainly fall into this category.

Fifth, in line with suggested categories for further research in stuttering, it may prove profitable and fruitful to investigate the nature and environment of the disorder in specific populations where it exists in a higher frequency. The etiology of the problem, since it has been delimited in a sense within such groups, may be more easily ascertainable. The results of such studies may open up vistas, previously unknown, concerning the etiology of the total problem. Mongoloids who stutter would fall into such a category.

Sixth, this study will provide some basic information for the speech clinician who may be working with mongoloid stutterers. The findings of this study may also prove to be an impetus to further

research designed to determine more effective therapeutic techniques for mongoloids who stutter.

The importance of this investigation, then, lies in its ability to describe more carefully and scientifically the types of disfluency and the nature of the disfluent speech behavior displayed by those with Down's Syndrome. Such information ultimately may have some bearing on the etiology and on some of our time-honored opinions concerning stuttering and those who have the problem. The results of this study also should prove to have some pragmatic value for those speech clinicians engaged in ameliorating the speech and language behavior of mongoloids.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

During the past ten to 15 years, there has been an increasing number of studies reported in the literature which have been concerned with the communication problems of the mentally retarded. This turn of events is in contradistinction to the prevailing Zeitgeist of 20 years ago within the field of Speech Pathology; attitudes at that time appeared to imply that speech therapy with such individuals was unrewarding and ergo, of questionable value. West, Kennedy, and Carr (1947) advised that "the true mongol is particularly unresponsive to speech rehabilitation and it is practically useless to attempt such training" (p. 215).

This was a commonly held opinion among speech clinicians, not only with reference to mongoloids, but for all mentally retarded individuals. Yet the incidence of speech problems found in the retarded ranges from as low as 8% of children with I. Q. s between 50 and 75 (New York public schools) cited by Donovan (1957), to as high as 79%, found by Schlanger and Gottsleben (1957) among the residents of The Training School in Vineland, New Jersey. Matthews (1957)

stated that "in many speech clinics, little provision is made for the mentally retarded child with a speech problem. In some clinics, no cases with an I. Q. of less than 70 are admitted" (p. 543).

This pessimistic attitude on the part of professional workers in Speech Pathology probably was in part due to the lack of effective therapeutic methods in dealing with the communication problems of such children. The few clinicians who did work with retarded children spent hours in repetitious drills on sound production ad nauseam with little or no progress. Therefore, it seemed natural to conclude that speech therapy with such children was virtually a waste of time. As Blakeley (1966) indicated, "The blame for failure has been placed on the brains of the retardates and experimental method which should direct experimenters down a hundred other avenues has not been followed" (p. 346).

The primary emphasis of the speech therapy approach was usually focused on improving articulation to increase sound intelligibility. Relatively little attention was devoted to language development. As early as 1952, Karlin and Strazzulla (1952) suggested that "language defects in the mentally deficient children are more striking than speech defects . . ." (p. 294). With reference to the importance of language therapy with retardates, Lillywhite and Bradley (1969) have succinctly pointed out that "the child's [retarded]

communication problem is primarily one of basic language deficiency, that is, a lack of structural framework for the formulation of symbolic concepts" (p. 123).

Undoubtedly the increase in federal funding in this area since the early 1960s has also played a prominent role in reversing opinions due to augmented knowledge. As a consequence, more effective remedial approaches and procedures have since been discovered. In summation, Siegel (1964) has pointed out:

In recent years there has been a surge of interest in the special problems of the retarded child, including his speech and language difficulties. Speech clinicians have a vital contribution to make in this area (p. 194).

Most of these recent investigations have concentrated either on the articulation or the language problems of the retarded. Comparatively few investigators have concerned themselves directly with disfluent speech behavior or stuttering patterns found in the mentally retarded. Yet a review of a few prominent textbooks in Speech Pathology (Travis, 1957; Van Riper, 1963a; and West and Ansberry, 1968) indicated that more stuttering, or some form of disfluency, is found in the mentally retarded than in the normal population.

Apparently the first reference to a high incidence of stuttering in a retarded population was made by Gens (1951) when he stated that "we may investigate the rather high incidence of stuttering in mongoloids and relate it to the many theories of stuttering" (p. 25).

Van Riper (1963a) documents his statement concerning a 20% incidence of stuttering in the retarded with a reference to the foregoing statement by Gens (1951). However, as Sheehan, Martyn, and Kilburn (1968) pointed out, Gens did not state any specific percentage but merely referred to the higher than normal incidence of stuttering apparent in mongoloids. West and Ansberry (1968) wrote that "the mongol often exhibits a defect that resembles stuttering." They further indicated that it is questionable whether this behavior can be called stuttering since the mongoloid "apparently is not embarrassed by it and since it does not show remissions and exacerbations that can be traced to changes of social pressure" (p. 64). No empirical evidence is supplied by these authors to support this contention.

Matthews (1957) also indicated that "there is some evidence to suggest that the incidence of stuttering in mongoloids is higher than that in the non-mongoloid mentally retarded population . . ." (p. 538). Sheehan (1970), however, takes issue with this view by stating that "assertions that stuttering appears more frequently among the retarded, or relates to either end of the distribution of intelligence, appear totally unfounded" (p. 119). This author confirms his statement with the results of two studies (Sheehan, Martyn, and Kilburn, 1968; and Martyn, Sheehan, and Slutz, 1969), which will be referred to subsequently.

Review of Studies Concerning Stuttering
in the Mentally Retarded

There have been a number of studies which have dealt with the incidence of stuttering within various mentally retarded populations. Louttit and Halls (1936) conducted a survey of speech problems among Indiana school children which included 20 ungraded classes for 620 "subnormals." They found that 20 out of the 620 (3.2%) stuttered. Wohl (1951) reported that out of 145 in special schools for the mentally and physically handicapped, 5.5% stuttered. Karlin and Strazzulla (1952) found an incidence of only 2% in a group of 50 mentally retarded youngsters attending an outpatient hospital clinic for retarded children in Brooklyn, New York.

Schlanger (1953) reported that 20% of 74 mentally handicapped children, enrolled in St. Coletta's School for Exceptional Children in Wisconsin, were diagnosed as stutterers. Schlanger and Gottsleben (1957), referred to previously, reported on the incidence of speech problems among 516 mentally retarded residents at The Training School over a period of five years. Of the 516, 17% were found to stutter. Stark (1963) found the incidence of stuttering to be 10% in a survey of educationally subnormal children in Glasgow, Scotland.

A survey of speech and hearing disorders taken at the Pineland Hospital and Training Center in Maine by Holmes and Pelletier (1967)

revealed an incidence of 2% for "disorders of rhythm" in a population of 1,153 retarded patients. Schaeffer and Shearer (1968) conducted a similar investigation in an institution for the mentally retarded-- the Dixon State School in Illinois. These investigators reported that 4.9% (205) out of 4,307 residents stuttered. This is by far one of the largest populations sampled of any of the studies reported in the literature. On the other hand, when all residents with no communicable speech were excluded, the resulting incidence of stuttering was augmented to 7.6%.

Watnick (1967) reported on the results of a questionnaire sent to the teachers of educable mentally retarded classes in Connecticut. These teachers indicated that out of 2,942 E. M. R. children, 120 (4%) were stutterers. The symptoms noted most often were hesitations and repetitions; and only 46 of the 120 manifested "reactions" to their problem. The vitality of this procedure leaves something to be desired because one is never certain of how much agreement exists between the respondents and the person conducting the investigation on the precise meaning of the terms in the questions. For instance, assuming that each teacher was only answering for one stutterer, only 81 teachers of the 120 stutterers answered the question concerning "reactions" to stuttering.

Sheehan, Martyn, and Kilburn (1968) conducted a survey of

speech disorders among 216 mentally retarded patients at the Porterville State Hospital in California. They reported finding only one stutterer and one clutterer in their sample. However, 83 out of the 216 had no speech at all and over 50% were profoundly retarded (I. Q. below 25). In an attempt to cross validate their finding of an incidence of less than 1%, Martyn, Sheehan, and Slutz (1969) surveyed 346 mentally retarded patients at Camarillo State Hospital in California. These 346 patients were said to have "differed in important demographic characteristics from those in Porterville" (in the earlier study), e. g. , they were older, all were ambulatory, etc. These authors found three stutterers and one clutterer among the 346 patients tested, and therefore, concluded that "the proportion of stutterers in the retarded turns out to be the same as that in the normal population--from Maine to California!" (p. 209). Thus, two different mentally retarded institutionalized populations were studied with approximately the same result.

In reviewing these investigations of stuttering within various mentally retarded populations, with the exception of mongoloids, the results of which may be found in Table 1, some obvious deficiencies emerge. The first is that all the foregoing studies, with the exception of Sheehan, Martyn, and Kilburn (1968) and Martyn, Sheehan, and Slutz (1969), have neglected to state their criteria for identifying

TABLE 1. Incidence of stuttering in non-mongoloid mentally retarded populations.

Investigator	Population Sampled	Total N	Stutterers	
			N	%
1. Louttit and Halls (1936)	Non-institutionalized	620	20	3.22
2. Wohl (1951)	Special Schools for Mentally and Physically Handicapped	145	*	5.5
3. Karlin and Strazzulla (1952)	Non-institutionalized	50	1	2.0
4. Schlanger (1953)	Institutionalized	74	*	20.0
5. Schlanger and Gottsleben (1957)	Institutionalized	516	*	17.0
6. Stark (1963)	Educationally Subnormal Children	*	*	10.0
7. Holmes and Pelletier (1967)	Institutionalized	1,153	25	2.0
8. Watnick (1967)	Non-institutionalized E. M. R. Children	2,942	120	4.0
9. Schaeffer and Shearer (1968)	Institutionalized	4,307	205	4.9
	When non-verbal subjects were excluded			7.6
10. Sheehan, Martyn, and Kilburn (1968)	Institutionalized	216	1	.005
11. Martyn, Sheehan, and Slutz (1969)	Institutionalized	346	3	.009

* Figure not available

and diagnosing stuttering. In short, it is not known what these investigators meant by "stuttering." Second, the samples of retarded populations in the majority of studies cited were restricted to institutionalized subjects. Third, there was no distinction made between normal disfluency and stuttering. Fourth, in several of the studies there was no differentiation made between the total sample and those who were unable to verbalize.

It also should be noted that Luchsinger and Arnold (1965) cite some European sources as indicating that there is a high incidence of stuttering in cases of mental deficiency. Nevertheless, they term such disfluent speech behavior as "dyslogic dysphemia" which "appears to result from an organically predetermined disorder of coordination" (p. 703).

Only a few studies in this area have concerned themselves with a description of the disfluent symptoms found in retarded persons. Lerman, Powers, and Rigrodsky (1965) were interested in examining the characteristics of non-mongoloid retardates who were classified as stutterers. They administered a questionnaire, "The Fluency Profile" to the teacher, cottage aid, and speech clinician of 14 retardates in order to determine the most prominent features of their stuttering behavior. The results revealed that the stutterers involved in this study reflected stuttering behavior which closely

paralleled Bloodstein's (1960b) first two phases of stuttering development. The most noteworthy conclusion was that sound, word, and situation fears in the form of avoidant and/or apprehensive behavior were noticeably deficient in these retarded stutterers. Syllable repetitions, hesitations, and prolongations were characteristic of their disfluent speech behavior. However, it should be recalled that these results are based solely on the observations of those in the stutterers' environment. Strauss (1967) administered the Children's Manifest Anxiety Scale (CMAS) to 20 institutionalized mentally retarded stutterers and to 20 institutionalized non-stuttering retardates, matching each group as closely as possible in terms of sex, I. Q. , and C. A. The results indicated that the stutterers, as a group, "scored significantly higher, anxiety-wise, than their non-stuttering counterparts" (p. 27). But the use of this particular instrument with retardates having a mean I. Q. of 58 appears to be debatable. One wonders whether or not the subjects were able to understand the purport of some of the statements to which they were required to answer "yes" or "no," e. g. , "I have worried about things that did not really make any difference later. "

Review of Studies Concerning Stuttering
in Down's Syndrome

Some investigators have studied stuttering in Down's Syndrome, per se. Gottsleben (1955) compared 36 mongoloids with 36 non-mongoloid retardates matched for C. A. , I. Q. , and sex. He reported a diagnosis of stuttering in 33% of the mongoloids and in 14% of the non-mongoloids. The identifications were confirmed by at least two speech clinicians over a six-year period. Schlanger and Gottsleben (1957), mentioned previously, found that 45% of 44 mongoloids at The Training School stuttered. Snyder (1963) discovered three stutterers in 18 mongoloids tested at the Clover Bottom Hospital and School at Donelson, Tennessee in the course of a study concerning speech and language behavior in institutionalized mongoloids.

Rohovsky (1965) examined stuttering in institutionalized and non-institutionalized persons with Down's Syndrome. She reported the incidence of stuttering to be 48% in 27 mongoloids who were considered to have a "high verbal" output (more than three-word phrases) and 24.5% in the total group of 54 subjects. More institutionalized mongoloids (35%) in the total group of institutionalized subjects were found to stutter than non-institutionalized (19%). The sex ratio was five females to one male in the institutionalized group compared with four to three in the non-institutionalized group. The

severity of the stuttering reactions generally was judged to be mild. This particular investigator placed a number of restrictions on the final sample of mongoloids with the result that only a total of nine institutionalized and 18 non-institutionalized subjects were rated by a panel of judges for stuttering behavior. It is tenuous, therefore, to apply these results to the general mongoloid population. It is also difficult to reconcile the fact that this writer discusses "reactions" to stuttering, e. g. , "eye blinks, . . . facial contortions to be the prevalent reactions in these observed subjects" (p. 26), and yet judges stuttering behavior based on "effortless [italics mine] repetitions of words, phrases, or the first sounds or syllables of words . . ." (Van Riper, 1954). In addition to limiting the behavior to only repetitions, this definition of primary stuttering can be too easily confused with normal disfluency. This may account for the spuriously high frequency of stuttering found in this study.

Shubert (1966) matched 80 mongoloids with 80 non-mongoloid institutionalized mentally retarded children and adults on "functioning level," C. A. , and sex. He reported that the incidence of stuttering was 15% in mongoloids and 8.8% in the non-mongoloids. Martyn, Sheehan, and Slutz (1969), noted earlier, found one mongoloid among the three stutterers they located in their study of 346 retardates. As a result, they stated that "previous reports of a higher incidence of

stuttering in mongoloids specifically and in the retarded generally were not supported" (p. 209). Since these authors only sampled 42 mongoloids, it is difficult to see how their statement can be fully justified.

Friebrun (1970) reported "no greater incidence of stuttering in those persons exhibiting Down's Syndrome" in a study currently being conducted in New York. Preus (1970) found that 46.8% of 47 mongoloids in Oslo, Norway stuttered on 5% or more "on the words of the recording when whole-word-repetitions were included," but only 34% stuttered on 5% or more "when whole-word-repetitions were excluded." This researcher defined stuttering as "whole-word-repetitions, part-word repetitions, prolongations and secondary symptoms." The addition of whole word repetitions here has dubious merit because such disfluencies are not usually classified as types of disfluency associated with stuttering (Boehmler, 1958; Williams and Kent, 1958; and Wingate, 1962). The incidence figures may also have been exaggerated because the author only considered mongoloids "on the basis of having speech that was possible to examine for the presence of stuttering." However, this study is the only one known to the present investigator that attempted to statistically distinguish stuttering from cluttering mongoloids with the result that of the 47 tested, "31.9% had a clear or pronounced tendency to cluttering."

On the other hand, the definition used for cluttering was so vague that the differentiation is suspect.

Hubschman (1970) tested 109 mongoloids at the North Jersey Training School in Totowa, New Jersey and reported that 28 (26%) stuttered. Eighteen out of the 28 (64%) were considered to be "mild" in terms of severity. Nevertheless, the sample was confined to female institutionalized patients and no criteria for stuttering were given.

Two writers have commented to some extent on speech disfluencies and associated behavior in mongoloids. Both of these authors are of the opinion that the disfluent speech behavior evidenced by those with Down's Syndrome is more properly classified as "cluttering" rather than stuttering. Thus Cabanas (1954), after observing 50 mongoloid children over a two year period, differentiated the disfluent symptomatology of mongoloids descriptively from intellectually "normal" stutterers. He concluded that since the disfluent mongoloid does not anticipate blocks, is not aware of his blocking, stutters on all sounds rather than specific sounds, and has more difficulty with vowels than consonants, "the speech disorder of the mongolian child is rather of the cluttering type" (p. 36). However, this analysis of the disfluent symptoms of mongoloids is based on the author's "notes and observations" and he offers no data to

authenticate his report. Martyn, Sheehan, and Slutz (1969) agreed with Cabanas (1954) on the basis of observing one mongoloid "stuttering," that "what is involved, if anything, is not true stuttering but a kind of cluttering" (p. 209). According to this foregoing statement, it is non sequitur that these authors listed the mongoloid as a stut-
terer and not a clutterer, since they did find one clutterer in their results.

Weiss (1964) states that "almost all the mongoloid children we have encountered manifested symptoms of cluttering" (p. 9). He goes on to say that "in feeble-mindedness and other cases of mental deficiency, as in organic brain disorders, cluttering is considered to be a part and consequence of the total syndrome." Weiss does not support these statements with empirical evidence.

Some of the same general criticisms of these studies can be made, as were proposed in the case of the studies concerning stuttering in the mentally retarded. The primary one is that these investigators, with the exception of Rohovsky (1965); Preus (1970); and Martyn, Sheehan, and Slutz (1969) failed to specify their criteria for stuttering. This shortcoming in this group of studies has also been noted by Zisk and Bialer (1967). Another noteworthy drawback can be found in the studies which attempt to differentiate between stuttering and other forms of disfluency in mongoloids. With the

exception of Preus (1970), these publications do not contain scientific data to document the observations made by their authors. The results of this group of studies are summarized in Table 2.

There is one other study that can be mentioned which is indirectly related to this area. Edson (1964) examined the types of nonfluency (same as disfluency) of non-stuttering mongoloid and non-stuttering non-mongoloid institutionalized mentally retarded children. She found that the non-mongoloid group had a greater number of sound and syllable repetitions than the mongoloid group. But it must be borne in mind that these mongoloid subjects were not diagnosed as stutterers.

In summary, the following general conclusions can be elicited from a review of the literature in this area:

1. There seems to be genuine equivocation in the literature with regard to whether a higher than normal incidence of stuttering behavior exists in the general mentally retarded population, albeit the majority of studies would appear to support such a trend.
2. There is much more unanimity than disagreement that a higher incidence of some form of disfluent speech behavior is present in the specific disorder called "Down's Syndrome" (mongolism).

TABLE 2. Incidence of stuttering in Down's Syndrome.

Investigator	Population Sampled	Total N	Stutterers	
			N	%
1. Gottsleben (1955)	Institutionalized	36	12	33.0
2. Schlanger and Gottsleben (1957)	Institutionalized	44	20	45.0
3. Snyder (1963)	Institutionalized	18	3	16.67
4. Rohovsky (1965)	Institutionalized and Non-institutionalized			
	Total group (High and low verbal)	54	13	24.5
	When the low verbal group is excluded . .	27	13	48.0
5. Shubert (1966)	Institutionalized	80	12	15.0
6. Martyn, Sheehan, and Slutz (1969)	Institutionalized	42	1	.024
7. Friebrun (1970)	(Not known)	*	*	< 1.0
8. Preus (1970)	Day homes for the mentally deficient in Oslo, Norway			
	When whole word repetitions are included . .	47	23	46.8
	When whole word repetitions are excluded . .	47	16	34.0
9. Hubschman (1970)	Institutionalized	109	28	26.0

* Figure not available

3. The precise nature of the disfluent speech behavior within Down's Syndrome has yet to be completely delineated. Most investigators have labeled it "stuttering" but some (Cabanas, 1954; Weiss, 1964) have referred to it as "cluttering."

CHAPTER III

METHODS AND PROCEDURES

Subjects

The 200 subjects in this research project were individuals with Down's Syndrome (mongolism). The total sample was divided into two groups, one consisting of 100 institutionalized subjects and another composed of 100 non-institutionalized subjects. According to a survey of special educational and mental health agencies undertaken recently (1970) at the request of this investigator, the U. S. Office of Education, Bureau of Education for the Handicapped, Washington, D. C. was unable to furnish current data which would document the percentage of mongoloids in institutions as opposed to those who are not institutionalized. Such information does not appear to be available at this time in any form except by estimate. Therefore, the 1:1 ratio of institutionalized to non-institutionalized subjects appears to be a satisfactory ratio for the purposes of this study.

Each of the two groups was further subdivided into 50 males and 50 females, since the sex ratio within mongolism is approximately 1:1 (Hecht, 1969). This proportion made a total of 100 males and 100 females.

The 100 institutionalized subjects were residents at the Fairview Hospital and Training Center in Salem, Oregon. The authorities at Fairview Hospital and Training Center compiled a list, by means of computer selection, of all mongoloids within the institution who fit the following criteria, as potential subjects for this study:

1. The subject must have been medically diagnosed as a mongoloid, that is, the individual had been placed in code #64 (mongolism) (Heber, 1961) by a physician.
2. The subject must have attained the chronological age of six years. This particular age was selected because by this age, according to Gesell and Amatura (1947), mongoloids are more apt to speak in sentences.
3. The subject must have been institutionalized continuously for more than one year.

In making the final choice of 100 subjects, mongoloids who were living in cottages designed as cottages for the physically and emotionally handicapped were excluded from the sample because these factors were judged to be possible compounding variables which may have adversely influenced verbal behavior. Of a possible 250 who fit the criteria, 100 were chosen by means of structured random sampling, taking into consideration the widest possible age and I. Q. range and the sex ratio of 50 males and 50 females.

The institutionalized sample ranged in chronological age from 6 years, 11 months to 46 years, 3 months with a mean age of 16 years, 3 months and a median age of 15 years, 8 months. The I. Q. s of this group ranged from 10 through 56. However, it must be noted that the majority (82%) of the psychometric results were derived via the Peabody Picture Vocabulary Test or the Vineland Social Maturity Scale. Only 18 out of the 100 subjects had been tested by means of the Wechsler or Stanford-Binet Intelligence scales as shown in Table 3.

TABLE 3. Breakdown of intelligence scales administered to Total Sample (170 subjects).

	Inst.	Non-inst.	Total
1. Stanford-Binet *	15	55	70
2. WAIS	3		3
3. WISC		4	4
4. Leiter Inter. Perf. Scale		4	4
5. Cattell Infant Intell. Scale		3	3
6. Peabody Picture Vocab. Test	59		59
7. Vineland Social Maturity Scale	23	2	25
8. Unknown		2	2
Total	100	70	170

*Form M (1937) or Form L-M (1960)

The 100 non-institutionalized subjects were divided into two subgroups; one group was composed of 75 subjects from day centers for the retarded while the other group was made up of 25 subjects

attending public school special education programs. The day center subjects were taken from ten day centers for the retarded located in Portland, Salem, and Eugene, Oregon. The public school subjects came from public school special education programs in Kirkland and Vancouver, Washington and in Portland and Beaverton, Oregon. In this manner, two large segments of the non-institutionalized mongoloid population were sampled, that is, those attending day programs for the retarded and those enrolled in public school programs. Since Oregon only recently enacted legislation which provided state support for T. M. R. classes, most of the latter group came from Washington. Due to this factor, the proportion of mongoloids attending public school programs in Oregon is much less than 50% at this time. Twenty-five was selected as the approximate figure (25%) for the public school sample in this study.

Two of the same criteria were applied to this group as were required of the institutionalized sample.

1. A medical diagnosis of Down's Syndrome was determined by means of a letter or other official indication in the subjects' records from a physician stating that the subject was mongoloid.
2. The subject must have reached the chronological age of six years.

3. Subjects with any other known physical problems, such as cleft palate or moderate to severe hearing loss, were eliminated from the sample.

Once the three criteria were met, the subject was included in the study. There was no particular method of sampling employed to choose subjects from the day centers for the retarded. If they fit the criteria, they were selected on a first come, first served basis. This procedure was found necessary to use because the population of mongoloids who are not institutionalized is limited in Oregon.

The entire non-institutionalized sample ranged in chronological age from 6 years, 1 month to 31 years, 6 months with a mean age of 13 years and a median age of 11 years, 7 months. The I. Q. s of this group ranged from 13 to 71. Thirty subjects out of the 100 in the non-institutionalized group did not have any recorded I. Q. in their official file. Therefore, the I. Q. records of only 70 subjects in this group were ascertained. The I. Q. scores were determined by means of several different intelligence scales. For a breakdown of the psychometric instruments used, see Table 3, page 44. The Stanford-Binet scale was employed with far greater frequency with the non-institutionalized subjects (55 times) compared with the institutionalized subjects (15 times). Eighty-five per cent of the psychological testing (145 out of 170 tests) was performed within the last

five years.

The day center subjects ranged in chronological age from 6 years, 3 months to 31 years, 6 months with a mean age of 13 years, 7 months. The I. Q. spread was from 27 to 60. The public school group ranged in chronological age from 6 years, 1 month to 20 years, 3 months with a mean age of 11 years, 10 months. Their range in I. Q. was from 13 to 71. The complete distribution of age and I. Q. for the total sample is found in Table 4.

A flow chart of the subjects used in this investigation is found in Appendix K.

Materials

The following materials were employed in the course of this investigation:

1. Fifteen cards from the Peabody Language Development Kit (Dunn and Smith, 1965 and 1968) were used in the Standard Interview Procedure (Appendix A). From Level #P (Primary) ten cards were chosen, five each from the categories marked food and household. These categories represent the most common objects with which the subjects should be familiar, since they are likely to come into contact with them daily, even in an institutional setting. From

TABLE 4. Chronological Age and I. Q. distribution for Total Sample. (I. Q. data are based on results of different intelligence tests.)

	Institutionalized	Non-Institutionalized			Total Sample
		Day Center	Public School	Sub-Total	
Number of Subjects	100	75	25	100	200
Chronological Age Range	6-11 to 46-3	6-3 to 31-6	6-1 to 20-3	6-1 to 31-6	6-1 to 46-3
Mean Age	16-3	13-7	11-10	13-0	14-8
Median Age	15-8	11-9	10-3	11-7	13-3
No. with Available I. Q. Scores	100	46	24	70	170
I. Q. Range	10-56	27-60	13-71	13-71	10-71
I. Q. Q_1	10	35.5	36	35.5	19.5
I. Q. Q_2	21	39.5	45.5	40.5	32.5
I. Q. Q_3	32	42.5	50	45.5	41.5

Level #1 five cards were chosen from the category of activity. The pictures from this category were included because the possibility of eliciting more connected speech seemed greater when presenting activity pictures.

2. Fifteen common objects, which were not identical with any of the pictures from the Peabody Language Development Kit, were also selected to present to the subjects during the Standard Interview Procedure. These objects were picked because they are found in the daily environment of the subjects. These objects were furnished by the investigator.
3. A Wollensack Magnetic tape recorder (Model T-1500) was used to record the interviews of every tenth subject for presentation to Panel I and for the consistency measure. All recordings were made on Scotch Magnetic recording tape at a tape speed of 7-1/2 inches per second.
4. A one-inch Ampex video recorder (VR 7500) was used to record the disfluent mongoloid on video-tape. This recorder was also utilized in the analysis of the video-tapes. One-inch Scotch Video-Tape (Cat. No. 357-1-3000 R97) was used for all recordings.
5. A Setchell-Carlson (Model 2100 SD) television monitor was

employed to view the video-tapes by Panels II and III and for analysis of the tapes.

6. Different type and size cameras were used to do the video-taping depending on the location of the set.

Procedures

To determine the feasibility of testing the hypothesis of this study and the procedures which might be most advantageous in answering the question, a pilot project to study 100 mongoloids was designed and carried out prior to the initiation of the present investigation. The procedural approach for this study is, therefore, based on experience gained as a result of the pilot project.

The general design of this investigation involved three distinct phases: (1) interviewing, (2) judging, and (3) follow-up. Since each phase consisted of several different procedures, each will be discussed separately.

Interviewing Phase

The purpose of this phase was to interview 200 mongoloid subjects for evidence of disfluent speech behavior and to video-tape those subjects who exhibited such behavior.

The total sample was interviewed by means of the Standard

Interview Procedure (Appendix A). This interview procedure was designed with the purpose of eliciting structural, automatic, and spontaneous samples of speech from each of the subjects in the form of connected speech as opposed to one word responses. The instructions to each subject were kept deliberately brief and simple in nature. An effort to provide social reinforcement for every appropriate response was made. The interviews averaged about ten minutes in length.

The interview for the institutionalized subjects took place in a therapy room in the Speech and Hearing Clinic at Fairview Hospital and Training Center. At the day centers for the retarded, the interviews were conducted in a separate room at the center where no other activities were scheduled at the time. An effort was made to reduce the ambient noise in the environment of the testing room by choosing rooms in relatively quiet locations. All interview rooms were well lighted and generally adequate for the purposes of this study.

The investigator recorded the following pertinent information on an index card for each subject interviewed: (1) age; (2) date of birth; (3) medical confirmation of diagnosis of Down's Syndrome; (4) I. Q. , test administered, and date of testing; (5) other speech problems, if any; (6) Developmental Verbal Communication Scale

(Appendix B) rating; and (7) whether or not the subject was disfluent together with a description of this disfluent speech behavior.

The chief purpose of the interviewing phase was to select the mongoloids who were disfluent from the total sample. Three or more disfluencies in the subject's verbal behavior served as the criterion for selecting disfluent subjects. Any type of disfluency was considered rather than just those disfluencies associated with stuttering behavior. (See Terminology in Chapter I for the definition of topographical analysis.) Since the investigator holds the Certificate of Clinical Competence in Speech Pathology from the American Speech and Hearing Association, he was judged qualified to make this preliminary decision.

After a total of 200 mongoloids had been interviewed in the foregoing manner, those found to be disfluent were video-taped, using the same Standard Interview Procedure (Appendix A). The video-taping took place in one of four different locations: (1) the television studios at the Department of Speech, Broadcast Communication Area of the University of Oregon; (2) the television studios at the Fairview Hospital and Training Center; (3) Instructional Aids Department of the University of Oregon Medical School; and (4) the television studios of the Child Development Center at the University of Washington. The parents of the disfluent mongoloids were

requested to sign a release form giving the investigator permission to use the video-tapes for clinical, educational, or scientific purposes, before the video-taping took place. Four parents refused to give their consent to allow their children to be video-taped for one reason or another. These subjects, therefore, had to be excluded from the total sample and replacements obtained who were not necessarily disfluent but who met the original criteria for selection. As a result, some potential stutterers were lost.

An additional feature of the interview procedure was that each subject in the total sample was placed in one of six categories on a Developmental Verbal Communication Scale (see Appendix B). The six categories on this scale ranged from no attempts at vocalization or verbalization to generally intelligible speech and adequately structured language. The goals of the Developmental Verbal Communication Scale were threefold: (1) to determine the level of verbal communication of those subjects judged to stutter, (2) to gather information about the developmental levels of verbal communication in a population of mongoloids in toto, and (3) to permit comparisons to be made of levels of verbal communication between institutionalized and non-institutionalized male and female mongoloids and various other sub-groups. In order to ascertain interjudge agreement on this scale, 20 interviews (every tenth subject of the 200) were audio-tape

recorded for later presentation to Panel I.

Judging Phase

During this phase of the procedures, three separate panels of judges made decisions concerning three different aspects of the verbal behavior of the mongoloid subjects.

Panel I. The task of Panel I was to establish interjudge reliability with the investigator with reference to placement of subjects on the Developmental Verbal Communication Scale. The three judges on this panel hold the Ph. D. degree in Speech Pathology and have had extensive experience with language disorders in children. Following a given set of instructions (Appendix C), this panel was presented with six training tapes (one for each category on the scale) in order to familiarize them with the task. A short discussion followed each training tape. The judges were then presented with the 20 audio-tapes (every tenth subject interviewed) put in random order. The panel placed each subject in an appropriate category on the scale according to the level of verbal communication skill displayed. They recorded their choice on special data sheets designed for this purpose. Judging sessions lasted for approximately five hours, and three sessions were required to accomplish the task.

The Spearman Rank-Order Correlation Coefficient (Rho) was

used to determine interjudge reliability. These reliability coefficients were as follows: (1) between the investigator and Judge No. 1, .996; (2) between the investigator and Judge No. 2, .997; and (3) between the investigator and Judge No. 3, .996. All reliability coefficients were significant at the .001 level of confidence. Interjudge reliability coefficients between the three judges are shown in Table 5.

TABLE 5. Interjudge reliability coefficients (Rho) between investigator and judges, and among judges in Panel I.

	Investigator	Judge No. 1	Judge No. 2	Judge No. 3
Investigator	----	.996*	.997*	.996*
Judge No. 1	.996*	----	.996*	.996*
Judge No. 2	.997*	.996*	----	.996*
Judge No. 3	.996*	.996*	.996*	----

*Significant at .001 level of confidence (.6652 required with df of 19)

Another method by which these data can be analyzed is by way of percentages of agreement. However, it must be remembered that these percentages only reflect a difference of one category between the investigator and any one judge. For example, the investigator may have placed the subject in category No. 5 on the D. V. C. S. and the judge put this same subject in category No. 6, a difference of

one category. In other words, the percentage of agreement between the investigator and Judge No. 1 was 75%, which means that they differed by only one category five times. The interjudge percentages of agreement are listed in Table 6.

TABLE 6. Percentages of interjudge agreement of one category between investigator and judges, and among judges in Panel I.

	Investigator	Judge No. 1	Judge No. 2	Judge No. 3
Investigator	--	75	85	75
Judge No. 1	75	--	80	80
Judge No. 2	85	80	--	80
Judge No. 3	75	80	80	--

Panel II. The task of Panel II was to decide from the video-taped samples which disfluent mongoloids manifested stuttering behavior. Judges were required to make a dichotomous decision as to whether the subjects did or did not exhibit stuttering behavior based on criteria agreed to in advance. All three of these judges hold the Ph. D. degree in Speech Pathology and indicated that one of their special interests was stuttering. All three had substantial clinical experience with stutterers.

This panel was first presented with ten possible criteria as a

foundation for judging stuttering behavior, based in large measure on definitions of stuttering by Van Riper (1954), Johnson et al. (1956), and Wingate (1964). Each criterion was then discussed at length by the members of the panel and a vote taken whether to include the particular criterion or to amend it in some way before inclusion. The agreement of all three judges was required before each criterion was subsumed into the criteria for stuttering. Criteria such as self-concept (Sheehan, 1958) could not be considered because the judges could make their choice based only on evidence displayed in the video-taped samples. Three possible criteria were eliminated and the wording of several was altered. The final set of criteria for stuttering selection is listed in Chapter I under Terminology in the definition of stuttering.

Prior to presentation of the video-tapes of the disfluent mongoloids, a set of instructions (Appendix D) was read to the judges. Three training tapes were then played to the panel in order to orient them to the task. Some discussion among the judges followed each training tape. A total of 47 tapes were presented to Panel II in a randomly selected order; 27 tapes were played once and ten of the tapes were chosen randomly to be played a second time in order to determine intrajudge reliability. No video-tape viewed a second time was either preceded or followed by that same tape. Data sheets

were given to each judge to record his decision. The final criterion for deciding which subjects could be considered stutterers and which subjects could not be so considered was the agreement of two of the three judges. Five sessions totaling more than 12 hours of judging were required in order to complete this task.

Before the initial meeting of this panel, the video-tapes of the 37 disfluent mongoloids ranged in length from 7 minutes, 22 seconds to 16 minutes, 43 seconds. All tapes that exceeded 12 minutes in length were edited to a maximum of 12 minutes to reduce the time of judging. This averaged out to about five minutes of speaking time for each subject. This was deemed ample time to make a determination regarding stuttering (Tuthill, 1946; Young, 1961). Where editing was done, the same section of each tape was eliminated, usually the counting or automatic speech portion. The average length of the 37 video-tapes after editing was 10 minutes, 24 seconds.

Panel III. Members of this panel were requested to perform two tasks. They were asked to make judgments, concerning severity and subject awareness of the stuttering behavior based on the presentation of video-tapes of the mongoloids who were judged to stutter by Panel II. All members of this panel had clinical experience with stutterers.

The first task required that the judges place each subject in

one of the categories on the Iowa Scale of Stuttering Severity according to the severity of stuttering symptoms displayed on the tapes.

This scale consists of eight different categories, ranging from No Stuttering (0) to Very Severe (7) (see Appendix E). While viewing the tapes and determining levels of severity, the judges were also asked to indicate, by means of a check mark, the most obvious symptoms of stuttering noted in each tape on a list of secondary characteristics provided (Appendix E).

Following a given set of instructions (Appendix F) and three training tapes together with some discussion, this panel made these two determinations regarding severity. The length of each videotape sample was reduced to five minutes. The first two and one-half minutes consisted of the structured speech portion of the tape. The second two and one-half minutes comprised a portion of spontaneous speech. Five minutes was deemed enough time to make such judgments. This did not constitute five minutes of continuous speech on the part of the subject. However, Lewis and Sherman (1951) found that samples of stuttered speech of a duration as short as nine seconds could be reliably placed on the Iowa Scale of Stuttering Severity.

For the second task, Panel III endeavored to pick out instances or evidence for awareness of stuttering on the part of these 20 mongoloids. The full length of each videotape was shown during this

task, that is, to a maximum of 12 minutes.

Awareness of stuttering on the part of mongoloids is an attribute not easily assessed. Nevertheless, it was considered to be a critical feature of the problem and crucial enough to attempt to measure. Johnson (1959) and Van Riper (1963a) both have pointed out that in order for stuttering to develop into a chronic problem, the person must begin to react to his awareness, sensitivity, and concern over his disfluencies by stuttering more. Robinson (1964) states that: "the advanced forms of stuttering are initiated when early patterns of broken speech become objects of concern or frustration to the speaker" (p. 48). Sheehan (1958) refers to self-concept which includes an awareness of being a stutterer as one of the integral features of the problem. Sheehan, Martyn, and Kilburn (1968) included this symptom as part of their definition of stuttering. Since Cabanas (1954) and Weiss (1964) have implied that mongoloids who are disfluent are not aware of their disfluencies and, therefore, cannot be stutterers, it was thought advantageous to examine this feature of mongoloids' stuttering behavior.

A list of certain criteria as possible evidence of awareness was first presented to the panel for consideration. Five different types of behavior (Van Riper, 1963a) which might indicate awareness, such as avoidance, postponement, use of starters, etc., were listed

with a few examples of each (Appendix G). Each criterion was discussed and agreed on by the panel members. A data sheet was provided for each judge on which specific instances of awareness behavior could be recorded. The panel members were requested to identify the instance by means of the word, or words, that the subject was saying and then to describe briefly the awareness behavior in terms of the pre-selected criteria.

After the instructions (Appendix H) were read to the panel, one training tape was viewed and discussed. The video-tapes of the mongoloids judged to stutter by Panel II were then presented to Panel III in a randomly selected order. This panel met in two sessions for a total of eight hours in order to complete these tasks.

Follow-up Phase

This phase consisted of the investigator returning to Fairview Hospital and Training Center and to each of the day centers for the retarded, where a mongoloid who stuttered had been found, in order to acquire information concerning consistency and additional data regarding severity and awareness. Data with regard to the consistency effect and awareness were obtained from each of the mongoloids who stuttered, while further information concerning severity and awareness was procured from two responsible individuals in each subject's

daily environment.

Consistency is a phenomenon that is usually found in the behavior of those who stutter. It was defined in Chapter I under Terminology. Bloodstein (1961) found "that the consistency effect extends to the repetitions and prolongations of young children in the earliest phase of stuttering" (p. 69). Bloodstein, Alper, and Zisk (1965) stated that "the consistency effect may consequently be said to be a basic identifying feature of anticipatory struggle reactions" (p. 33). But in the same article these authors reported that "a study of the consistency effect in the disfluencies of normal children strongly suggests that anticipatory struggle reactions are not confined to the speech of children who stutter . . ." (p. 50). Neelley and Timmons (1967) also found that "adaptation and consistency, at least with respect to disfluent speech behavior, occur in both stuttering and nonstuttering children" (p. 255). Therefore, consistency is not an exclusive but a commonly found feature of stuttering behavior. This is the rationale for investigating it in this study.

There may be some question as to why consistency was selected for examination over adaptation, since both phenomena are often associated with stuttering. The results of several studies (Starbuck and Steer, 1953; Neelley and Timmons, 1967; and Williams, Silverman, and Kools, 1968) have indicated beyond a

reasonable doubt that adaptation is also found in the disfluent speech behavior of non-stutterers. Adaptation can no longer be considered to be a unique feature of stuttering behavior but there is still some uncertainty as to whether consistency can assume such a role.

Since most mongoloids are not capable of engaging in oral reading, the traditional method chosen to establish consistency had to be modified. The procedure employed in this study was to have the subjects repeat after the investigator seven simple sentences consisting of 51 words. These were the identical sentences used by Bloodstein (1960a) and Neelley and Timmons (1967) with younger children to determine consistency (Appendix I). In view of the short auditory memory span of the mongoloid subjects, it was necessary to break down the sentences into a few words at a time, even though the length of the longest sentence in the group was only eight words. This particular segment of the interview was audio-tape recorded for later designation of stuttering moments. Once this procedure was accomplished, consistency was determined by means of the weighted percentage method. This method was chosen over the usual percentage method because Cullinan (1963) found the weighted percentage method to be more stable. The formula for this method is:

$$C_{wp} = \frac{100(2X_2 + 3X_3 + \dots + kX_k)}{k(X_1 + X_2 + \dots + X_k)}$$

X_1, X_2, \dots, X_k are the number of words stuttered 1, 2, . . . k times, respectively, and k is the number of readings.

The follow-up procedures also involved ascertaining the awareness of each subject about his speech difficulty. This was accomplished by two means:

1. Each subject was asked directly the following questions:
 - a. Do you have trouble talking sometimes?
 - b. Is it hard for you to talk sometimes?
 - c. What's wrong with the way you talk?
 - d. What is stuttering?
2. Two responsible persons from the daily environment of each subject were asked two questions:
 - a. As far as you can determine from observation, does (name of subject) seem to be aware of his stuttering problem?
 - b. If the answer to the above question is "yes," how do you know that he is aware? What evidence does he give that he is aware? Has he ever said or done anything which would lead you to believe that he is aware of stuttering? Cite circumstances, if possible.

The two responsible persons in the environment were interviewed in person by the investigator. Before any questions were posed to the informer, it was determined how well and how long this person knew the subject in question. By "responsible" is meant that the individual (1) was not retarded, (2) knew the subject for at least

six months, and (3) knew the subject "well" in his estimation. In most instances, those individuals interviewed were cottage aids in the institution or teachers and directors of the day centers. A few mothers were also part of this group.

The last step in the follow-up procedures was to request each of the two informers interviewed regarding awareness to place the subject in one of Bloodstein's (1960b) Four Phases of Stuttering Development (Appendix J). These phases consist of descriptions of four progressive stages in the development of stuttering. It should be pointed out that these four phases are similar to but not exactly the same as the developmental stages described by Van Riper (1963a) and Freund (1966). This was done in order to determine more information regarding severity from two persons in close day-to-day contact with the subject. The descriptions of each of the four stages were typed up and given to each informer for his selection after a general explanation of these stages by the investigator.

Analysis of Disfluencies

A particularly important aspect in the design of this study is the analysis of the disfluencies and stuttering moments found in the mongoloids judged to stutter. The data from this analysis are critical to answering the original question posed in Chapter I.

The disfluencies found in the video-taped samples of the stuttering mongoloids were analyzed in two ways. First, a topographical analysis was made by designating the different types of disfluency displayed by the subjects. Second, the loci or places of the stuttering moments were determined. Six minutes of each video-tape (three minutes of structured speech and three minutes of spontaneous speech) were examined in the preceding manner.

The first step in this procedure was to transcribe from the video-tapes the verbalizations of the stuttering mongoloids by means of a dictaphone. Verbatim transcriptions of the six-minute sample of each mongoloid who stuttered were then typed. One scorer (Ph. D. speech pathologist who works with retarded children) then checked the typed transcriptions while viewing the tapes with the investigator in order to attempt to complete any of the previously unintelligible comments that the investigator had missed. The transcriptions were then retyped. A second scorer (speech pathologist who had special training in the analysis of disfluencies as part of a course in stuttering within the last year) was shown five of the video-tapes and identified each disfluency noted by underlining the disfluent word on a copy of the transcription. While being shown the video-tapes a second time, this scorer then classified by type all the disfluencies noted, so that interjudge percentage of agreement with the investigator

could be determined. The percentages of agreement regarding the number of disfluencies determined in each of the five tapes is shown in Table 7.

TABLE 7. Interjudge percentages of agreement regarding number of disfluencies present in five video-tapes.

Subject	Number of Disfluencies		Percentage of Agreement
	Investigator	Scorer II	
1. C. F.	12	11	91.6
2. R. B.	23	23	100.0
3. R. S.	16	17	94.1
4. D. M.	11	12	91.6
5. R. W.	23	22	95.6

The interjudge reliability determined by means of the Pearson Product-Moment Correlation coefficient (r) for the classification of disfluencies was .970 which is significant at the .001 level of confidence. The tallies of the investigator and scorer with regard to the classification of disfluencies are shown in Table 8.

In view of the relatively high agreement between the investigator and the scorer, the investigator classified the remaining video-tapes of the stuttering mongoloids as far as types of disfluency.

The second part of this analysis involved the loci or places of the stuttering moment within a word or within the context of a sentence. Brown (1945) and Taylor (1966b) have found that the

TABLE 8. Tallies for the different types of disfluency between investigator (No. 1) and scorer (No. 2) for five subjects.

Subject	Type of Disfluency						Total
	1	2	3	4	5	6	
1. C. F.							
1		5	1		6		12
2		4	1		6		11
2. R. B.							
1		4	4		15		23
2		3	6		14		23
3. R. S.							
1		4	4		8		16
2		4	4		9		17
4. D. M.							
1		2	3		6		11
2		2	4		6		12
5. R. W.							
1		7			10		17
2		7			9		16

principal attributes that determine the loci of stuttering are: (1) the initial sound of a word; (2) first few words (three) of a sentence; (3) noun, verb, adjective, or adverb; and (4) longer words (more than five letters). These four locations may be termed "properties of stuttered words" (Taylor, 1966b) or "loci of stuttering" (Brown, 1945).

It was also decided to add one more category, that is, consonants over vowels, because Cabanas (1954) claimed that

mongoloids had more difficulty with vowels than consonants. Johnson and Brown (1935) indicated that consonants posed more of a problem for stutterers than did vowels. Since this category is not necessarily synonymous with the initial sound in a word, it was considered separately.

Part-word repetitions and prolongations, since they have been identified more with stuttering than other types of disfluency (Bloodstein, 1969; Wingate, 1964), were analyzed separately and together with other types of disfluency for loci of stuttering. The investigator categorized the disfluencies according to the five loci of stuttering enumerated.

Following the topographical and loci of stuttering analyses, two final procedures were accomplished. The number of stuttered words per minute was determined for the S. S. by dividing the total number of stuttered words by the total amount of speaking time for all the subjects. This measure is more objective than many of the other subjective means of assessing severity. The percentage of stuttered words was calculated by dividing the total number of stuttered words for the S. S. by the total number of words spoken by all the subjects in the S. S. The procedure use for counting the number of spoken words by each subject was the method recommended by Johnson, Darley, and Spriestersbach (1963).

Summary of Methods and Procedures

In summary, this study was designed to investigate eight different features and components of stuttering behavior in mongoloids. The first five are essentially descriptive in nature. The last three are distinctive in the sense that they are more often associated with stuttering behavior. A rationale for the classification system of these eight aspects of the problem will be given in Chapter IV. A summary of the methods and procedures will be presented according to this classification system and considered in this manner in Chapter IV. An outline of the various kinds of data sought by this study is found in Appendix M.

Descriptive Features

Five aspects of the problem were considered under this heading:

1. The incidence of stuttering within the T. S. of 200 subjects was determined by Panel II by means of judging 37 videotapes of disfluent mongoloids for evidence of stuttering. Intrajudge reliability was obtained for each judge via the Fourfold Coefficient (Φ).
2. By non-verbal components of the S. S. is meant the ratio of stuttering in males and females, institutionalized and

non-institutionalized subjects and the age and intelligence range of these subjects. All these measures were derived once the S. S. had been established.

3. The language development of the S. S. was determined through the use of the D. V. C. S. as part of the Standard Interview Procedure. Interjudge reliability between the investigator and Panel I was determined by means of the Spearman Rank-Order Correlation Coefficient (Rho) for 20 of the 200 subjects interviewed.
4. The severity of the stuttering behavior displayed by each subject in the S. S. was assessed in a number of ways: the number of stuttered words per minute, the average percentage of stuttered words, placement on the Iowa Scale of Stuttering Severity by Panel III, placement in one of Bloodstein's (1960b) Four Developmental Phases of Stuttering by two responsible persons in the environment, and by identification of secondary symptoms by Panel III. All these measures were determined by an analysis of five or six minute segments of the video-tapes.
5. Awareness of the stuttering problem was ascertained by three methods: evidence in the video-tapes as judged by Panel III, evidence determined through the use of a

questionnaire to two persons in the environment (same two persons who placed subjects in one of Four Developmental Phases), and the answers of the subjects to certain questions posed by the investigator.

Distinctive Components

Three aspects of the problem fall under this heading:

6. The consistency effect was measured by having subjects repeat eight sentences three times after the investigator and then determining the weighted consistency percentages, based on the number of time the subjects stuttered on the same words during each recitation.
7. The loci of stuttering were ascertained by placing the disfluencies of each subject under five different classifications according to the places of stuttering.
8. The topographical analysis was determined by categorizing the disfluencies of each subject in one of six different types of disfluency. Interjudge reliability between the investigator and a scorer was obtained for five of the 20 video-taped samples.

A flow chart of the procedures employed during this investigation is found in Appendix L.

CHAPTER IV

RESULTS AND DISCUSSION

Organization of the Data

The considerable amount of data amassed during this study can be analyzed in several ways. The present investigator chose to treat the data in the manner outlined at the conclusion of Chapter III for many reasons: (1) By this arrangement, the various methods which were employed to secure information about certain aspects of behavior, whether by a panel or through the Follow-up Procedures, have been subsumed and synthesized under one heading; (2) The essential features and components of the data have been dealt with in sequential order, from the least important to the most substantive as far as the question at hand is concerned; (3) This approach appears to be the most inclusive yet concise; and (4) It should prove to be relatively easy to follow.

The data have been divided into eight diverse aspects, five of which have been termed "descriptive features" and the last three, "distinctive components." The first five are essentially descriptive in nature and are only indirectly related to answering the question posed by this research. The first three of these features are

demographic of the subjects rather than the stuttering behavior under consideration, namely, (1) the incidence of stuttering found within the T. S. ; (2) the non-verbal composition of the S. S. ; and (3) the language development of the mongoloids who stutter as well as of those who do not. Under the non-verbal composition, the ratio of males to females, the ratio of institutionalized to non-institutionalized, and the age and I. Q. ranges of the S. S. have been considered. This information is primarily statistical.

With the next two features within the category of "descriptive features," that is, severity and awareness, together with the different procedures utilized to garner these data, the basic nature of the disfluent speech behavior under consideration begins to evolve. These two features, then, begin to assume more importance in relation to the primary question.

It was the original intent of this investigator to make certain direct comparisons between the final three "distinctive components" in mongoloids and these same components in non-mongoloid non-retarded stutterers. This plan was abandoned after a review of the literature revealed that the consistency effect is also found in normal disfluent speech behavior (Neelley and Timmons, 1967), and the loci of stuttering are essentially similar in normally disfluent individuals to that which is found in stutterers (Silverman and Williams, 1967).

In other words, consistency and the loci of stuttering are not exclusively "distinctive" components of stuttering behavior. In spite of this fact, they occur frequently enough together with certain types of disfluency within stuttering behavior to warrant the appellation "distinctive components." The disfluencies of the S. S. have also been categorized according to type in the topographical analysis. The information from these final three components is more crucial to the fundamental nature of the disfluent speech behavior of mongoloid stutterers than the other five features.

All told, 17 different kinds or bits of information (five categories plus 12 sub-categories) have been gleaned with reference to the disfluent speech behavior of mongoloids judged to stutter, including several which heretofore have not been examined in mongoloids. This method of systematizing the data should serve to clarify the answer to what is meant by stuttering in mongoloids.

Descriptive Features

The Incidence of Stuttering in Total Sample

The incidence percentage of stuttering behavior found in 200 mongoloids as a result of this investigation was 10% or 20 stutterers. If the 18 mongoloids from the T. S. who were put in categories No. 1 and No. 2 of the Developmental Verbal Communication Scale, (no

verbal behavior) are excluded, the resulting percentage rises to 10.9%. The incidence of stuttering in the normal population as reported in Chapter I is approximately 1%. However, it should be noted that the two populations (T. S. and general normal population) are not identical in terms of mean age or I. Q.

Thirty-seven of the 200 mongoloids initially interviewed were judged to be disfluent by the investigator in the course of the Standard Interview Procedure (Appendix A). Table 9 shows the number of fluent and disfluent subjects found within the various sub-groups of the T. S.

TABLE 9. The number of fluent and disfluent subjects found within the various sub-groups in the Total Sample.

	Institutionalized			Non-Institutionalized				Grand Total	
	M	F	Sub-Total	Day Cen.		Pub. Sch.			Sub-Total
				M	F	M	F		
Fluent	40	45	85	28	32	4	14	78	163
Disfluent	10	5	15	12	3	6	1	22	37
Total	50	50	100	40	35	10	15	100	200

After these 37 subjects were video-taped and presented to Panel II, two of the three judges or better detected instances of stuttering behavior in 20 out of the 37 tapes reviewed. In determining the final selection, the criterion was based on agreement of two of the three

judges. The results showed that while two of the three judges agreed on the final 20 subjects, three of three judges agreed on 15 of the 20 subjects. This means that there was 75% agreement among the three judges for the S. S. chosen. It might also be added here that the figure of 10% of stutterers found in this mongoloid population was identical with the percentage of stutterers obtained in the pilot project. These findings regarding the T. S. and the T. S. minus those subjects placed in categories No. 1 and No. 2 on the D. V. C. S. (no verbal behavior) are shown in Table 10.

TABLE 10. Percentages of disfluent speech and stuttering behavior found within the Total Sample.

	N	Disfluent		Stutterers	
		N	%	N	%
Total Sample	200	37	18.5	20	10.0
Sample excluding Categories No. 1 & No. 2 on D. V. C. S.	182	37	20.3	20	10.9

Intrajudge reliability coefficients were calculated by means of the Fourfold Coefficient (Phi) for the three judges who composed Panel II. It will be recalled that ten tapes, placed in random order and intermingled with the other 37, were judged a second time. The intrajudge reliability coefficients ranged from .41 to .77. Only one of these coefficients failed to reach significance. The percentage of

agreement within judges ranged from 70% to 90% as can be seen in Table 11.

TABLE 11. Intrajudge reliability coefficients (Phi) and percentages of agreement for Panel II.

	Number of disagreements within judges	Reliability coefficients	Percentages of agreement
Judge No. 1	2	.60*	80
Judge No. 2	3	.41	70
Judge No. 3	1	.77*	90

*Significant at .01 level (.576)

Judge No. 1 agreed with himself in eight out of the ten cases; Judge No. 2 agreed with himself in seven out of the ten cases; and Judge No. 3 agreed with himself in nine out of the ten cases. The average percentage of agreement within the three judges was 80%.

Non-Verbal Composition of Stuttering Sample

Incidence of Stuttering in Male and Female Mongoloids. Of the 20 mongoloids judged to stutter, 16 were males and four were females. The significance of this difference was tested by means of Chi Square. The result was $\chi^2 = 7.2$ which is significant at the .01 level of confidence (6.635 needed for .01 level with $df = 1$). This sex

ratio of 4:1 is approximately the same as the sex ratio found within the normal population of stutterers (Johnson et al. , 1967; Sheehan, 1970). This finding is essentially in agreement with Gottsleben (1955) who reported finding a greater number of male than female mongoloid stutterers but in disagreement with Rohovsky (1965) who located more females. Since the sex ratio with Down's Syndrome is approximately 1:1 (Hecht, 1969), it can be said that about 16% of mongoloid males stutter as compared with 4% of mongoloid females. The only qualification that can be added to the foregoing statement is that it depends upon how random one considers this sample to be.

Incidence of Stuttering in Institutionalized as Compared with Non-Institutionalized Mongoloids. Of the 20 mongoloids in the S. S. , 12 were non-institutionalized and eight were institutionalized. The significance of this difference was evaluated by means of Chi Square. $\chi^2 = .8$ which is not significant. Rohovsky (1965) appears to be the only other investigator who examined stuttering in these two populations. She found more stuttering in institutionalized mongoloids (35% vs. 19%) but her sample was much smaller (53) than the T. S. (200) reported here.

Since the percentage of mongoloids within institutions as opposed to those who are non-institutionalized is not a readily available figure and probably varies from one geographical area to the next,

it is precarious to make any further assumptions based on the ratio found in this study. There have been very few studies reported in the literature concerning stuttering in institutionalized individuals. The few that have been done concern the blind and partially sighted (Weinberg, 1964).

Figure 1 shows the sex and institutionalized percentages of the S. S.

Age Range of the Stuttering Sample. The age range of the S. S. was from 6 years, 3 months to 32 years, 2 months with a mean age of 18 years, 1 month and a median age of 15 years, 11 months. For a further breakdown of the males and females within the sample, see Table 12.

I. Q. Information with regard to the Stuttering Sample. The intelligence quotients for 18 out of the 20 subjects in the S. S. ranged from 19 through 71; the mean I. Q. was 38.2 with a S. D. of 12.8 and the median I. Q. was 37.5. According to a survey of 22 state institutions for the mentally retarded conducted by the Western Interstate Commission for Higher Education (Payne, Johnson, and Abelson, 1969), the mean I. Q. of 2,606 mongoloids was 28.6. Therefore, the mean I. Q. of the S. S. appears to be somewhat higher than the average I. Q. of those with Down's Syndrome who are institutionalized.

Once the mongoloid stutterers were determined, it was found

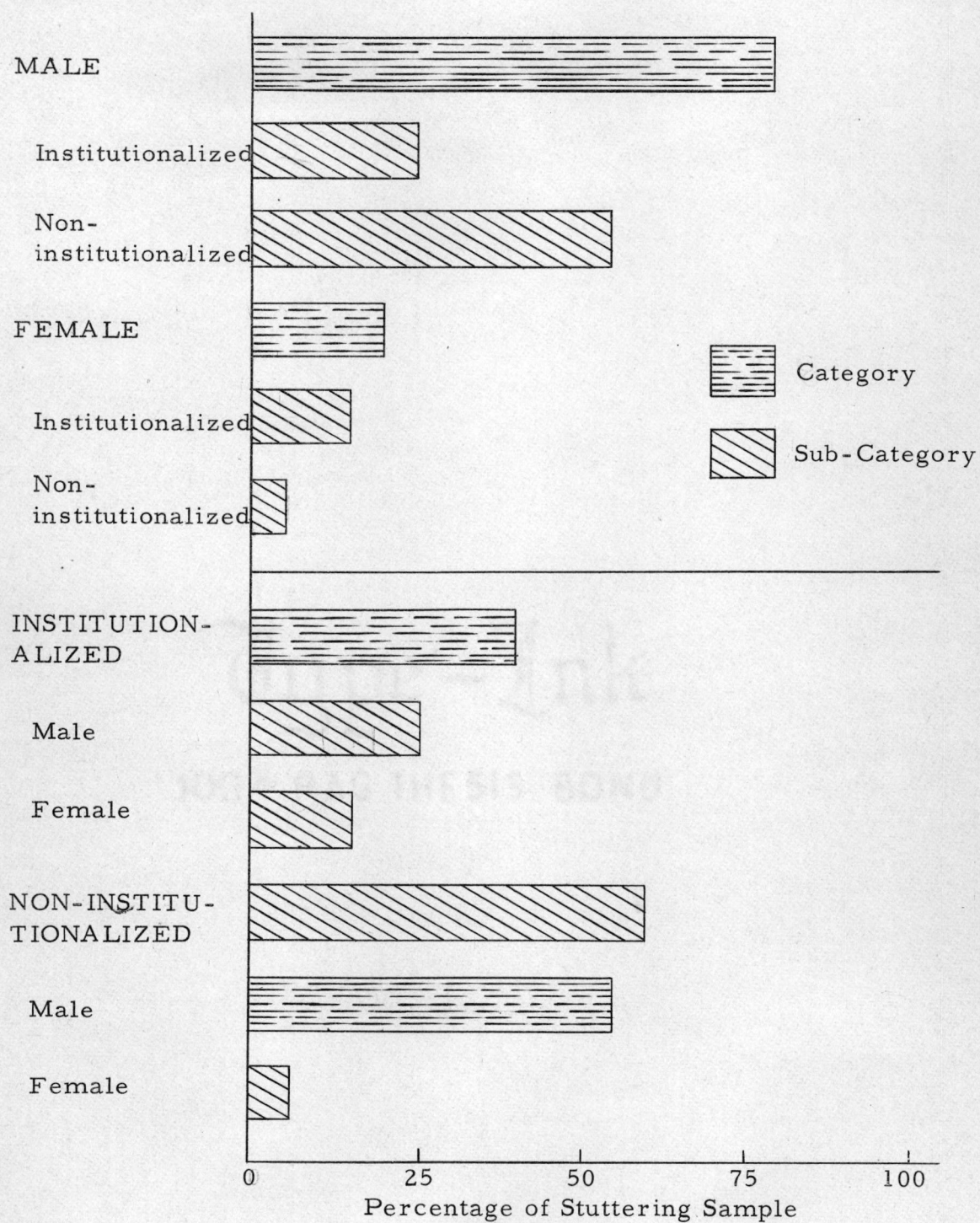


FIGURE 1. Sex and institutional composition of the Stuttering Sample

that a number of them did not have scores from intelligence tests that were administered within the last five years. In these cases an up-to-date I. Q. score was requested and in a few cases arranged for by the investigator. Since two subjects without current I. Q. scores had moved out of state between the time of the video-taping and the meeting of Panel II, scores for these two subjects could not be obtained. In the remaining 18 subjects, an I. Q. score that had been ascertained within the last five years from either the Stanford-Binet or Wechsler Intelligence Scales was required. With the exception of three subjects, who were administered either the Wechsler Intelligence Scale for Children (WISC) or the Wechsler Adult Intelligence Scale (WAIS), all the remaining subjects had been tested with the Stanford-Binet Intelligence Scale (Form L-M). The results are shown in Table 12.

TABLE 12. Chronological ages (N = 20) and Intelligence Quotients (N = 18) for the Stuttering Sample.

	Male	Female	Total
Chronological Age	N = 16	N = 4	N = 20
Range	6-3 to 27-2	13-0 to 27-2	6-3 to 32-2
Mean	16-10	23-1	18-1
Median	15-7	24-5	15-11
I. Q.	N = 14	N = 4	N = 18
Range	19 to 71	19 to 41	19 to 71
Mean	40.6	29.5	38.2
Median	40.0	29.0	37.5
S. D.	12.7	8.9	12.8

Language Development in Stuttering Sample

Eighty per cent of the mongoloids judged to stutter were placed in categories No. 5 and No. 6 on the Developmental Verbal Communication Scale (Appendix B), thus demonstrating near adequate or adequate language development and speech intelligibility. This statement does not mean that these subjects were without language or speech problems but that they were not grossly impaired. Only four subjects in the S. S. were judged to have limited language skills and impaired intelligibility. The breakdown of the sample is displayed in Table 13.

TABLE 13. Breakdown of the Stuttering Sample on the Developmental Verbal Communication Scale.

Category	Distribution of S. S.	Distribution of the remainder of T. S.
1	0	7
2	0	11
3	1	39
4	3	57
5	14	58
6	<u>2</u>	<u>8</u>
Total	20	180

This finding may account for the fact that Holmes and Pelletier (1967) and Sheehan, Martyn, and Kilburn (1968) were unable to locate many stutterers within their samples. A large portion of their

samples contained subjects who had unintelligible speech or were non-verbal.

Table 14 shows the breakdown of the total sample according to the D. V. C. S. When compared with the remainder of the sample and considering that they only constitute 10% of the T. S. , the stutterers do not form a normal distribution on the D. V. C. S. The curve is skewed in the direction of the higher categories of language development.

It also should be noted that 19 subjects in the S. S. were evaluated by the investigator as having articulation problems in addition to their stuttering difficulty. These articulation problems ranged from mild (little effect on intelligibility) to severe (greatly impaired intelligibility). Approximately half were diagnosed as mild while the others were moderate to severe. A frontal lisp was part of the articulation difficulty in nine cases. Three of the 20 subjects also had voice quality and resonance problems, such as hoarseness and hyponasality.

Since the application of this scale to the non-stuttering mongoloid population, while interesting, is extraneous to the question at hand, the following remarks have been confined to a few generalizations:

1. There are more non-institutionalized mongoloids (54) in the

TABLE 14. Breakdown of Total Sample on Developmental Verbal Communication Scale (Appendix B).

Category	INSTITUTIONALIZED			NON-INSTITUTIONALIZED						GRAND TOTAL		
	M	F	Total	Day Center			Public School			Total	N	%
				M	F	Sub- Total	M	F	Sub- Total			
No. 1	3	3	6	1	0	1	0	0	0	1	7	3.5
No. 2	3	8	11	0	0	0	0	0	0	0	11	5.5
No. 3	10	13	23	9	5	14	2	1	3	17	40	20.0
No. 4	15	17	32	8	14	22	3	3	6	28	60	30.0
No. 5	15	9	24	21	14	35	3	10	13	48	72	36.0
No. 6	<u>4</u>	<u>0</u>	<u>4</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>3</u>	<u>6</u>	<u>10</u>	<u>5.0</u>
Totals	50	50	100	40	35	75	10	15	25	100	200	100.0

upper categories of the scale (No. 5 and No. 6) shown in Figure 2, thus displaying more facility at language skills than institutionalized mongoloids (28). This finding is in agreement with Strazzulla (1953) who suggested that non-institutionalized mongoloids develop more adequate speech. This, in turn, would also appear to signify the importance of a greater variety of environmental stimuli in the development of language of retarded as well as non-retarded children.

2. The males (72) just exceed the females (70) in the last three categories on the scale (connected speech) in both institutionalized and non-institutionalized subjects. If one considers the last two categories only (near adequate or adequate language development), the males (46) exceed the females (36) by a larger margin.
3. Approximately 71% of the total mongoloid population used connected speech (two or more words in connected responses--categories No. 4 through No. 6) as opposed to no verbalization or only single word responses. However, this connected speech was not always intelligible.
4. Approximately 20% of this mongoloid population employed only single word responses (category No. 3) and 9% were non-verbal (categories No. 1 and No. 2).

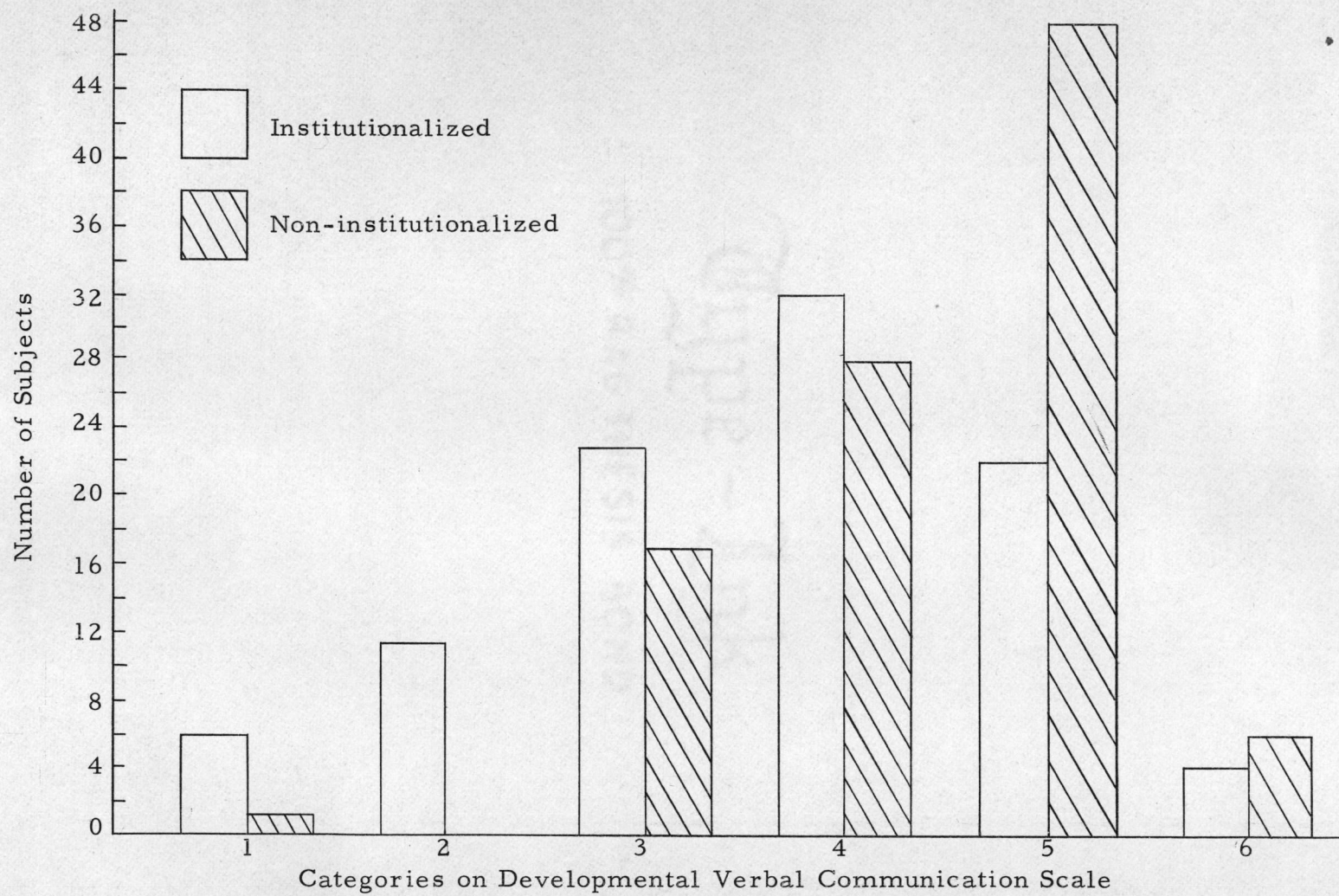


FIGURE 2. Classification of subjects (institutionalized and non-institutionalized) on the Developmental Verbal Communication Scale

Severity of Stuttering within Stuttering Sample

The severity of the stuttering behavior displayed by mongoloids was assessed through five specific procedures. The results of each of those procedures will now be enumerated.

Number of Stuttered Words per Minute. The average number of stuttered words per minute for the S. S. was 7.51. It was calculated from a total of 437 stuttered words spoken in a total of 58 minutes, 10 seconds for all 20 subjects. This rate was also determined by way of the mean of the rate for each subject in the S. S., in which case it amounted to 7.64 stuttered words per minute with a S. D. of 3.39. Both rates are in close proximity to each other. Since there is a wide variety in these rates among stutterers, no comparisons with normal stutterers are possible.

Percentage of Stuttered Words. The percentage of stuttered words is based on the number of stuttered words over the total number of words uttered by the subject during the course of the six-minute sample. This figure was calculated for each subject as well as for the entire S. S.

If the percentage is determined from the number of stuttered words (437) over the total number of words spoken by the 20 subjects (4,034), it amounts to 10.83%. The mean percentage for the total of 20 subjects was 11.35% stuttered words of the total number of words

spoken by the subjects. Both percentages are in close agreement with the percentages of stuttered words of 10.8 quoted by Bloodstein (1944) and 9.7 by Brown (1945). The number of words spoken by the 20 subjects during this six-minute segment ranged from 123 to 332 with a mean of 202 words.

Placement on the Iowa Scale of Stuttering Severity. It will be recalled that one of the tasks of Panel III was to place each mongoloid judged to stutter in one of the eight categories on the Iowa Scale of Stuttering Severity (Appendix E). The results of this judging indicated a mean of means of 3.62 which falls in between Mild to Moderate (3) and Moderate (4) on the scale. Mean of means refers to the fact that the judgments of the three judges were averaged and the total of these averages divided by the 20 subjects in the S. S.

The average rating range was from 1.6 [between Very Mild (1) and Mild (2)] to 5.0 [Moderate to Severe (5)]. Only six of the 20 subjects were classified in categories No. 4 (Moderate) or No. 5 (Moderate to Severe) according to the average ratings of the three judges from Panel III. The average rating of ten subjects fell between No. 3 (Mild to Moderate) and No. 4 (Moderate). The average rating for each subject is displayed in the Summary Table 19, p. 96.

This result of an essentially mild form of stuttering in the S. S. is in conformity with the findings of Rohovsky (1965), Hubschman

(1970), and Lerman, Powers, and Rigrotsky (1965). The question of why the disorder may be confined to milder forms will be taken up later.

The interjudge agreement with regard to this task was determined by means of the Spearman Rank-Order Correlation Coefficient (Rho). The coefficients ranged from .973 to .976 and were all significant at the .001 level of confidence. They are shown in Table 15.

TABLE 15. Interjudge reliability coefficients (Rho) for placing Stuttering Sample on Iowa Scale of Stuttering Severity.

	Judge No. 1	Judge No. 2	Judge No. 3
Judge No. 1	----	.973*	.976*
Judge No. 2	.973*	----	.976*
Judge No. 3	.976*	.976*	----

*Significant at .001 level of confidence

Placement in one of Bloodstein's Four Developmental Phases.

Two persons in the environment placed each subject in one of Bloodstein's (1960b) four phases of stuttering development (Appendix J) as part of the Follow-up Procedures. The results indicated that of the 17 subjects out of 20 evaluated by this procedure, the average phase was 1.7 or somewhere between Phase No. 1 (Incipient Stuttering) and Phase No. 2 (Transitional Stuttering). The range was from Phase

No. 1 to Phase No. 3 with no subject being placed in Phase No. 4 (Advanced Stuttering). Lerman, Powers, and Rigrodsky (1965) in evaluating non-mongoloid retardates who stuttered, found almost identical results using a similar approach with Bloodstein's (1960b) Phases.

A few individuals interviewed said that the choice was "too difficult" or "it is hard to make a decision." Such persons were not compelled to complete the task because it was felt that they would only be guessing. In one case both of the respondents did not think the individual subject in question stuttered. As a result, the task was not required of them. Therefore, responses were obtained in only 17 cases and in four of those, only one respondent accomplished the task. Summary Table 19 (p. 96) illustrates the distribution.

In the last analysis, the value of this particular procedure might be questioned. In the opinion of the investigator, it proved to be too cumbersome a task to expect persons in the environment to perform within a short time without prior information about stuttering behavior and a chance to study the four phases.

However, this finding points again to the milder form with few exceptions, that stuttering behavior seems to take in those with Down's Syndrome.

Secondary Symptoms Evidenced by Stuttering Sample. Panel III indicated the secondary characteristics of stuttering behavior which

were apparent in the course of a five-minute segment of the 20 video-tapes of those judged to stutter.

The results of this survey indicated that a total of 15 different behaviors were identified 92 times as secondary symptoms within the S. S. At least one secondary symptom was identified by one or more judges in the stuttering behavior of all 20 subjects. Forcing, visible tension, and facial grimaces were the most evident. The types, together with the frequency, of secondary symptoms which were noted are listed in Table 16.

TABLE 16. Type and frequency of the most prominent symptoms displayed by the Stuttering Sample.

Symptom	Number of times displayed
1. Forcing	18
2. Visible tension	17
3. Facial grimaces	15
4. Closing eyes	8
5. Turning head	7
6. Holding breath	6
7. Gasping	4
8. Lip tension	4
9. Moving hands	3
10. Other symptoms	<u>10</u>
Total	92

Of the 92 identifications, 31 were agreed to by two of the three judges and ten were agreed to by all three judges. It is more meaningful when a certain symptom is identified by more than one judge.

This situation occurred in 41 of the 92 (45%) identifications of various symptoms. The number of symptoms agreed to by two or more of the judges is presented in Table 17.

TABLE 17. Number of symptoms agreed on by two or more judges in Panel III together with the number and percentage of subjects.

Number of Symptoms	Number of Subjects	Percentage of Subjects	Total No. of Symptoms
none	2	10	--
1	6	30	6
2	6	30	12
3	2	10	6
4	3	15	12
5	<u>1</u>	<u>5</u>	<u>5</u>
Total	20	100	41

For example, only one symptom was observed in six subjects who constituted 30% of the S. S. From Table 17 it can be seen that 60% of the subjects manifested at least two symptoms which were agreed on by two or more judges. It is also apparent that 12 of the 20 subjects had more than one secondary characteristic.

The total number of different types of secondary symptoms and the amount of agreement between judges for each subject is listed in Table 18.

TABLE 18. Identification and agreement concerning the number of different types of secondary symptoms by Panel III.

Subject	No. identified by 1 judge	No. agreed on by 2 judges	No. agreed on by 3 judges	Total No. of symptoms
1.	3	1	-	4
2.	3	2	1	6
3.	2	2	1	5
4.	3	2	-	5
5.	3	1	-	4
6.	2	-	-	2
7.	5	-	1	6
8.	1	2	3	6
9.	2	2	-	4
10.	2	2	-	4
11.	2	2	-	4
12.	2	2	2	6
13.	2	1	-	3
14.	4	2	-	6
15.	2	1	-	3
16.	5	2	-	7
17.	-	2	2	4
18.	4	1	-	5
19.	1	4	-	5
20.	3	-	-	3
Totals	51	31	10	92
Percentages of Total	55	34	11	100

Table 18 indicates that, e. g., Subject No. 1 had three different symptoms which were noted by only one judge, one symptom noted by two judges, and no symptoms noted by the three judges thus giving this subject a total of four symptoms. The majority of subjects appeared to be reacting to their problem in attempting to release their

"blocks" by means of secondary symptoms, according to two or more judges. This is the primary conclusion that is conveyed by these findings. However, it is difficult to evaluate further these findings in a concrete manner since symptoms vary greatly within stutterers.

A recapitulation of the results of the five severity measures is found in Table 19. The problem is how best to synthesize and solidify these results into some meaningful form. One can arbitrarily establish that, in order to qualify as manifesting a moderate degree of severity, a subject must meet the following criteria: (1) eight stuttered words or more per minute, (2) a rating of 3 (Mild to Moderate) or above on the Iowa Scale of Stuttering Severity, (3) a rating of 2 (Transitional Stuttering) or above in Bloodstein's Phases, (4) two or more secondary symptoms agreed on by two or more judges, and (5) more than the average of 10% stuttered words. If one further dictates that the subject must fall into four out of the five criteria, eight subjects would meet this standard. If one states that the subject should meet three out of the five criteria, 11 subjects would so qualify.

In summary, while the severity of stuttering behavior in the majority of subjects in this study can only be termed "mild," greater degrees of severity were not foreign to this sample. Mongoloids who stutter are capable of evidencing degrees of stuttering severity.

TABLE 19. Summary table of the five severity measures for the Stuttering Sample.

Subject	No. of stuttered words per minute	Percentage of stuttered words	Iowa Scale Average	Bloodstein's Phases Average	No. of symptoms agreed on by 2 or more judges
1.*	10.6	17	5.0	2	1
2.	2.3	3	3.3	1.5	3
3.	4.1	7	4.3	-	3
4.	6.7	9	4.3	1.5	2
5.+	10.6	17	3.6	-	1
6.	3.8	5	1.6	1	-
7.+	9.3	11	3.6	1	1
8.*	14.4	22	5.0	1	5
9.	4.4	8	3.6	1	2
10.*	10.7	18	3.6	3	2
11.+	7.8	9	3.6	2	2
12.*	11.6	20	4.3	2.5	4
13.	2.3	3	2.3	-	1
14.*	8.1	11	3.3	2	2
15.	4.4	6	3.0	2	1
16.*	11.7	19	4.6	2	2
17.*	9.4	10	4.3	2	4
18.	4.1	6	3.3	2	1
19.*	9.2	15	3.6	1.5	4
20.	7.3	11	2.3	1	-

*Meets 4 out of 5 of the arbitrarily established criteria

+Meets 3 out of 5 of the arbitrarily established criteria

Awareness of Stuttering within the Stuttering Sample

Since awareness of stuttering is a feature that is exceedingly difficult to document accurately in mongoloids, three different techniques were adopted in order to attempt to measure this aspect of the problem. The three techniques consisted of evidence of awareness determined by Panel III in the video-tapes, the results of a questionnaire to two responsible persons in the environment of the subjects, and the results of questions posed by the investigator to the subjects.

The overall result indicated that five out of the 20 (25%) of the S. S. had at least a vague awareness of some difficulty in communication which approached stuttering as far as could be ascertained from these mongoloid subjects. This is shown in Table 22, p. 102. In the other 15 subjects, the evidence was not sufficient to warrant any reasonably firm conclusion. In only one case was there clear-cut evidence that the subject was aware of his speech problem. This subject identified his stuttering moments and spoke of stuttering. The standard for deciding whether or not a particular subject was aware was the positive results (evidence of awareness) in two of three or better of the procedures employed. Therefore, the majority in the S. S. were not fully cognizant of their stuttering problem as far as could be determined from the results of this study.

Evidence of Awareness in Video-taped Samples. The first technique used to determine awareness was evidence of avoidance, postponement, escape, use of starters, and abnormal apprehension on the part of the subjects as decided by Panel III. Two of the three judges had to agree on the specific instance in order for it to be considered and these instances had to occur two or more times before the subject was judged aware by this technique. See Table 20 for the instances of agreement of awareness on the part of Panel III.

TABLE 20. Instances of agreement of stuttering awareness as judged by Panel III.

Subject	No. of instances where 2 of 3 judges agreed	No. of instances where 3 of 3 judges agreed	Total no. of instances of agreement
1.	3	2	5*
2.	1		1
3.	1		1
4.	1	1	2*
5.		1	1
6.	1		1
7.	1		1
8.			none
9.			none
10.			none
11.			none
12.	4		4*
13.	1		1
14.	2		2*
15.		1	1
16.	1		1
17.			none
18.	3		3*
19.			none
20.			none
Total	19	5	24

*Meets criterion of two or more instances of agreement regarding a specific occurrence on the video-tape.

Since one of the criteria according to this method was more than one instance of awareness, only five subjects met this specification.

Admittedly this was an arduous task for the judges and one in which it was unlikely that there would be much agreement. As it turned out, the three judges identified a total of 116 instances of awareness but two of the three judges or better agreed on only 24 (20%).

Evidence of Awareness as Determined through the Use of a Questionnaire to Two Persons in the Immediate Environment. The second procedure involved the use of a questionnaire to two persons in the environment of the stuttering subjects. In order for the answer to be considered in the final result, the respondent had to produce some concrete evidence in the form of an occurrence, judged acceptable and satisfactory to the investigator, which indicated evidence of awareness. Answers such as "Yes, I think he is aware" without any documentation were recorded but were not counted in the final analysis. A few of the respondents indicated that they did not know if the subject in question was aware or stated that they were not in a position to judge. Such individuals were not coerced into giving a definite answer.

The two discretionary criteria for the acceptance of responses in the final tally were: (1) if one respondent produced evidence for

his opinion and one did not, the subject was judged aware, (2) in the case of a tie, that is, if one of the respondents gave an affirmative answer and the other answered in the negative, the subject was judged not aware. The final tally of this procedure revealed five positive answers and 15 in the negative. The results of this questionnaire method are in Table 21.

TABLE 21. Results of questionnaire concerning stuttering awareness from two persons in the environment of the subjects who stutter.

Subject	Respondent No. 1	Respondent No. 2	Result
1.	yes	yes	yes
2.	no	no	no
3.	-	-	-
4.	yes	yes*	yes
5.	-	-	-
6.	no	no	no
7.	no	yes	no
8.	no	?	no
9.	no	yes	no
10.	?	no	no
11.	?	yes	yes
12.	?	yes*	no
13.	?	no	no
14.	yes*	yes*	no
15.	?	no	no
16.	no	?	no
17.	yes	?	yes
18.	yes*	yes	yes
19.	no	no	no
20.	no	yes*	no

*No documentation furnished with opinion

While the results of this method may prove to be valuable in the sense that they provided data from persons in day-to-day contact with the subjects, the procedure left something to be desired. Even though certain questions concerning familiarity with the subject were asked of all respondents, one could never be sure how much contact the respondent actually had with the subject in question. For example, one potential respondent in the institution said, "You never really get to know these kids unless they cause trouble." In another case, it seemed obvious to the investigator that the subject stuttered but the respondent was not aware of it. This method may have some merit but its validity is questionable.

Answers to the Investigator's Questions about Awareness on the Part of the S. S. The last procedure consisted of the investigator asking each subject in the S. S. four questions (listed in Chapter III). If the subject in his answers gave any indication of a stuttering problem or anything akin to stuttering, he was deemed to be aware of the problem. Examples that were accepted are as follows: (1) "It's hard to get started talking," (2) "I don't like to stutter," (3) "I stuttered again," (4) "I talk funny," and (5) "You can't hold a job right if you stutter." Such statements on the part of these mongoloids who stutter would certainly appear to display some kind of perception of what stuttering is. In spite of the subjectiveness involved in the

judgment on the part of the investigator, only one subject was judged definitely aware, three subjects were judged vaguely aware, and 14 of the subjects said nothing which would signify any awareness of their speech difficulty.

An overall view of these three procedures for assessing awareness is shown in Table 22.

TABLE 22. Overall view of results of procedures of determining awareness of Stuttering Sample.

Subject	Evidence determined by Panel III	Opinion of those in environment	Investigator's questions	Those who met criteria
1.	x	x		x
2.				
3.				
4.	x	x	x	x
5.				
6.			x	
7.				
8.				
9.				
10.				
11.		x	x	x
12.	x		x	x
13.				
14.	x			
15.				
16.				
17.		x		
18.	x	x		x
19.				
20.				

As can be seen from Table 22, only five subjects met the criteria of positive evidence in two of three or better of the procedures and ergo, were thought to be aware of their stuttering behavior.

Distinctive Components

Consistency within the Stuttering Sample

The results of the consistency measures revealed that the subjects in this study, while not showing sizeable consistency percentages, nevertheless do show a trend toward consistency.

The consistency effect could only be determined in 13 of the 20 subjects. Two subjects moved out-of-state after the videotaping took place and five subjects simply did not stutter during the initial repetition of the sentences. Of the 13, two demonstrated consistency percentages above 50% and the percentages were above 20% in eight subjects. This essentially indicates a trend and nothing more. These low figures are probably related to the method employed to determine consistency which had to be modified to meet the limited abilities of the mongoloid subjects as explained in Chapter III. There is also some doubt whether subjects would stutter as much during the repetition of sentences as they would in oral reading since there is less communicative responsibility in the former procedure. Bloodstein (1960a) found percentages of consistency ranging from

50% to 100% for a group of young stutterers tested by a method similar to the one utilized in this study.

When one compares these consistency percentages with the percentages of words stuttered during the initial repetition of the sentences for the 13 subjects, nine of the differences reach significance as is shown in Table 23.

Bloodstein, Alper, and Zisk (1965) made similar comparisons while analyzing data from normal children who were disfluent. As these authors pointed out: "Any conclusion about degree of consistency of disfluency must be drawn with careful regard for the initial number of disfluencies" (p. 37). Johnson and Knott (1937) stated that the percentage of consistency to be expected on the basis of chance alone is equal to the initial percentage of stuttering. Since there are significant differences in nine of the 13 cases between the consistency measure and the initial percentage of disfluency, it may be said that these subjects demonstrated the consistency effect beyond chance expectation. It can be concluded that this phenomenon is not unique to normal (non-mongoloid) stutterers, yet the average percentage of consistency was only 25.48.

TABLE 23. Consistency measures for 13 subjects in Stuttering Sample.

Subject	Weighted Consistency Percentage	Initial Percentage of Disfluency	Difference	<u>t</u>	Level of Significance
1.	51.5	13.7	37.8	10.13	.001
2.	----				
3.	----				
4.	30.0	15.7	14.3	3.83	.01
5.	----				
6.	----				
7.	39.4	9.8	29.6	7.94	.001
8.	25.0	5.9	19.1	5.12	.001
9.	----				
10.	57.1	11.8	45.3	12.15	.001
11.	22.2	9.8	12.4	3.32	.01
12.	16.7	9.8	6.9	1.85	NS
13.	----				
14.	5.5	7.8	-2.3	-.62	NS
15.	6.7	5.9	.8	.21	NS
16.	23.8	5.9	17.9	4.80	.001
17.	16.7	11.8	4.9	1.31	NS
18.	----				
19.	16.7	3.9	12.8	3.43	.01
20.	20.0	3.9	16.1	4.32	.01

Loci of Stuttering in Stuttering Sample

The analysis of the places of disfluencies within the S. S. revealed the following results:

1. Approximately 92% (91.78%) of the total number of disfluencies fell into one or more of the five categories of loci enumerated.
2. Even when the category of consonants is excluded from the system of categories, as has been traditionally done (Brown, 1945; Silverman and Williams, 1967), about 92% (91.78%) of the loci of stuttering fall into one or more of the four categories remaining. This finding is in close agreement with Brown who found that "only 5.3 per cent of the stutterings recorded could not be accounted for in terms of at least one of the four factors" (p. 192).
3. Sixty-nine (69.08%) per cent of the total number of disfluencies fell into three or more of the five categories.
4. Sixty-six (66.18%) per cent of the total number of disfluencies consisted of consonant phonemes.

If one considers part-word repetitions and sound prolongations to be associated with stuttering behavior, 99.3% or 322 loci out of the total of 324 disfluencies fell into at least one of these two categories, as is shown in Table 24.

TABLE 24. Loci of stuttering in only disfluencies consisting of sound and syllable repetitions and sound prolongations.

Subject	No. of sound and syllable repetitions and sound prolongations	No. which fall into one or more loci
1.	19	19
2.	3	3
3.	4	4
4.	16	16
5.	19	19
6.	11	11
7.	21	21
8.	24	24
9.	8	7
10.	11	11
11.	27	27
12.	27	27
13.	3	3
14.	18	18
15.	12	11
16.	31	31
17.	30	30
18.	7	7
19.	17	17
20.	16	16
Total	324	322

Table 25 lists the number of loci within each of the five categories that have been determined for each subject. It should be noted that the majority of disfluencies were classified under more than one category.

One can state with a fair degree of certitude that the vast majority of disfluencies evidenced by the mongoloids in this study

TABLE 25. Number of loci of stuttering classified within each category for Stuttering Sample.

Subject	Total no. of disfluencies	Consonants	Initial sound	First few words	Noun, verb, adjective or adverb	Longer words
1.	37	17	18	11	23	10
2.	5	1	3	2	3	2
3.	11	4	5	2	5	3
4.	19	16	17	5	18	11
5.	23	17	18	3	21	9
6.	12	8	11	3	9	5
7.	28	19	21	5	22	14
8.	28	21	24	1	23	20
9.	11	6	7	2	10	7
10.	12	11	11	1	12	6
11.	31	19	26	8	22	18
12.	29	26	28	3	29	20
13.	7	2	3	2	5	2
14.	26	18	18	3	21	14
15.	16	9	13	5	8	1
16.	38	24	31	12	36	15
17.	33	19	30	8	23	9
18.	13	6	7	7	7	2
19.	17	15	17	2	14	6
20.	17	16	16	6	17	9
Totals	413	274	324	91	328	183
Percentage of	413	66.2	78.3	22.1	79.2	44.2

fell in at least one of the loci of stuttering usually described. As in normal stutterers, the moments of stuttering did not occur in a random manner. The evidence accumulated in this study contradicts Cabanas (1954) who stated that "blocking in mongolians occurs mostly on vowels" (p. 36). These results are in congruity with Brown (1945) and Taylor (1966a; 1966b) who investigated the loci of stuttering in normal stutterers.

Topographical Analysis

The most relevant finding of this study is that 78.44% of the disfluencies (minus 24 unintelligible disfluencies) were of the types that are usually associated with stuttering behavior. That is, 324 out of the 413 intelligible disfluencies were either sound or syllable repetitions or sound prolongations, which for all intents and purposes, are what distinguish stuttering from normal disfluency. If the unintelligible disfluencies (24) are added to the total number of disfluencies (413), making a grand total of 437, 74.14% of the disfluencies consist of sound and syllable repetitions and sound prolongations.

Table 26 as well as Figure 3 show the classification of all the disfluencies manifested by those in the stuttering sample. It will be noted that the percentage of sound and syllable repetitions and sound

TABLE 26. Classification of disfluencies evidenced by Stuttering Sample.

Subject	Inter- jections	Part-word repetitions	Word-phrase repetitions	Disrhythmic phonations	Prolon- gations	Revi- sions	Total
1.	11	6	7		13		37
2.	1	3	1				5
3.	5	1	2		3		11
4.			3		16		19
5.		4	4		15		23
6.		5	1		6		12
7.	3	4	4		17		28
8.	4				24		28
9.		2	3		6		11
10.		7	1		4		12
11.	2	2	1	1	25		31
12.		4		1	23	1	29
13.	2	2	2		1		7
14.		4	7	1	14		26
15.		4	4		8		16
16.		13	6	1	18		38
17.		2	3		28		33
18.	2	1	3		6	1	13
19.		7			10		17
20.			1		16		17
Totals	<u>30</u>	<u>71</u>	<u>53</u>	<u>4</u>	<u>253</u>	<u>2</u>	<u>413</u>
Percentage	7.3	17.2	12.8	.9	61.2	.5	100

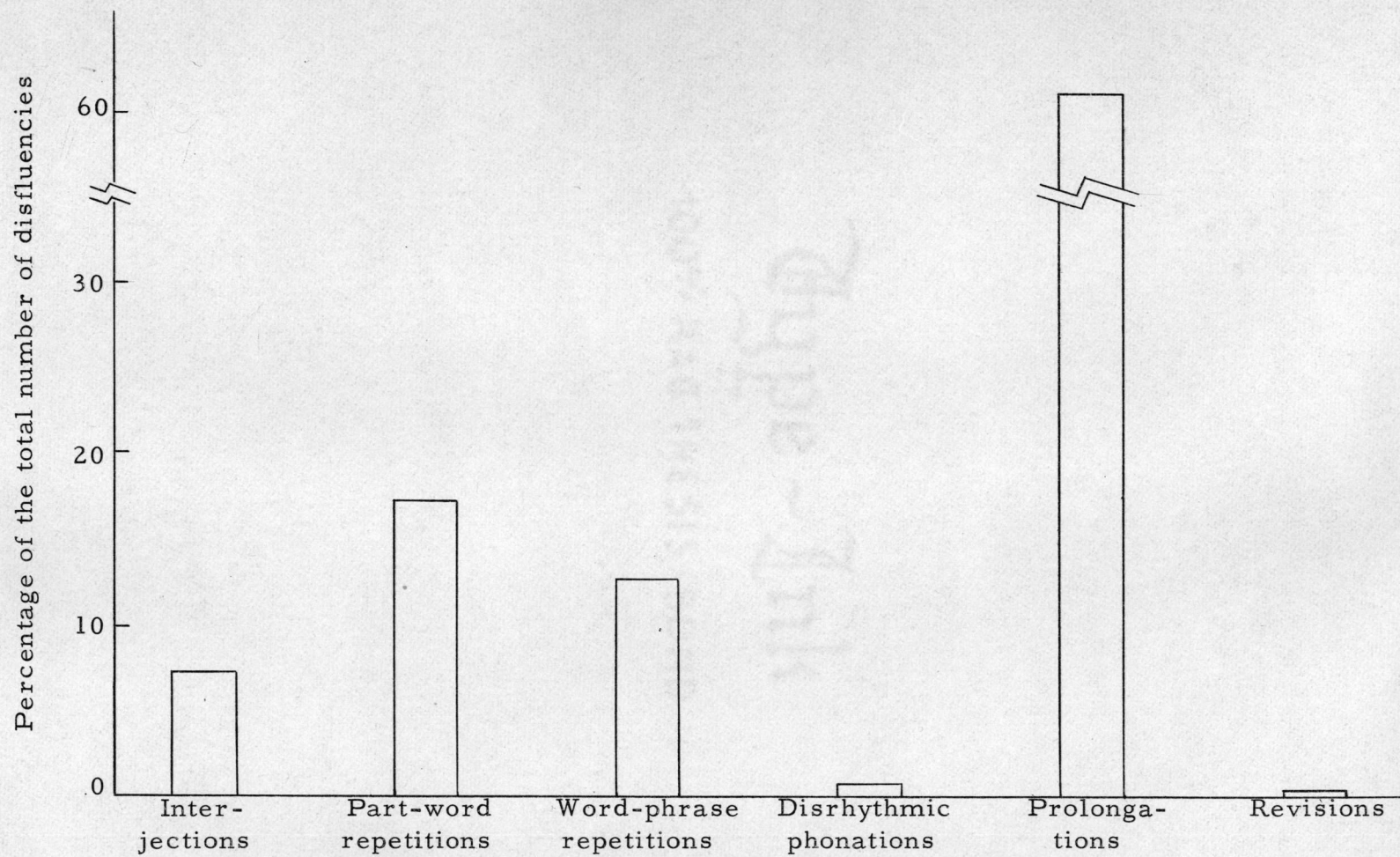


FIGURE 3. Histogram of the types of disfluency found in the Stuttering Sample

prolongations exceed the other types of disfluency and are, therefore, predominant in the disfluent speech behavior of the mongoloids in this study. As Wingate (1964) cogently articulated:

One or the other, or both, [repetitions of single-unit speech elements and prolongations] of these kernel characteristics are found in all cases of stuttering; in effect, it is by virtue of these characteristics that certain types of disfluent speech are called "stuttering." . . . The crux of a definition of stuttering, then, should center on these elements (p. 487).

Andrews and Harris (1964) also stated that:

Repetition of sound or syllable is the earliest and most fundamental symptom of stuttering and is present in almost all cases from the start of the disorder. . . . Prolongations of sound occur rarely in normal speech, whereas in stuttering they often form a characteristic part of the abnormality (p. 1).

These two types of disfluency may be thought of as the sine qua non of stuttering behavior.

In conclusion, the following syllogism is offered: Individuals who manifest primarily sound and syllable repetitions and sound prolongations in their disfluent speech behavior are called "stutterers" in our society and culture. Seventy-eight per cent of the disfluencies evidenced by the stuttering sample consisted of sound and syllable repetitions and sound prolongations. Ergo, these mongoloid subjects can be designated as "stutterers."

Comparisons within Stuttering Sample

Comparisons within the results of this investigation can be made between various sub-groups. One such group that commands immediate interest is the group of subjects who were thought to be aware of their stuttering problem. They comprised only a minor portion of the S. S. This is a somewhat unusual finding for stutterers who display so-called "secondary" characteristics. The question is: How does this particular group compare with a like group of subjects, who were not judged to be aware of their disfluencies, in terms of severity and number of stuttering disfluencies? The results of such a comparison could yield findings with notable implications. For the purpose of this sub-study, those mongoloids judged to be aware have been designated as the "aware group" and will serve as the experimentals and those judged not to be aware will be called the "non-aware" group or the controls.

The aware group consisting of five subjects was matched as closely as possible on C. A. , I. Q. , and sex with a control group of five other non-aware subjects from the S. S. All ten subjects were male. The mean C. A. of the experimental group was 20 years, 8 months, while the mean C. A. of the control group was 18 years, 6 months. The mean I. Q. of the aware group was 37.4, whereas the mean I. Q. of the non-aware group was 41. The results of the

matching are shown in Table 27.

TABLE 27. Results of t tests of the significance of the differences between the means of the experimental and control groups on C. A. and I. Q.

	Aware Group	Non-Aware Group	t	Signif.
C. A.	20-8	18-6	.6413	ns
I. Q.	37.4	41.0	.5960	ns

With $df = 4$, 2.776 required for significance at the .05 level

As can be seen from Table 27, no significant differences were found between both groups as far as C. A. or I. Q. was concerned.

The first question to be answered was: How does awareness affect severity? The results of the Iowa Scale of Stuttering Severity were chosen as the best overall indicators of severity which was assessed in this study. The mean rating for the aware group on this scale was 4.1 which is about Moderate (4), while the mean rating for the non-aware group was 3.6 which is between Mild to Moderate (3) and Moderate (4). A t value of .9952 for this difference between both groups was not significant.

The next question posed was: How does awareness affect the number of sound and syllable repetitions and sound prolongations (stuttering disfluencies)? The mean number of such disfluencies for

the aware group was 19.2, while the mean number for the non-aware group was 18. The results of a t test yielded a value of .1769 which was not significant. The findings of both t tests are presented in Table 28.

TABLE 28. Results of t tests between the means of the experimental and control groups on measures of severity and number of stuttering disfluencies (sound and syllable repetitions and sound prolongations).

	Aware Group	Non-Aware Group	<u>t</u>	Signif.
Severity (Iowa Scale Ratings)	4.1	3.6	.9952	ns
Stuttering Disfluencies	19.2	18.0	.1769	ns

With $df = 4$, 2.776 required for significance at the .05 level

The results of these comparisons appear to indicate that awareness of the stuttering problem had little or no significant effect on severity or on the number of stuttering disfluencies for the subjects in this sub-study. The factor of awareness did not increase these measures as would be expected. Therefore, the role of awareness in the development and maintenance of the problem may be called into question. A further comparison of these two groups is graphically portrayed in Figure 4.

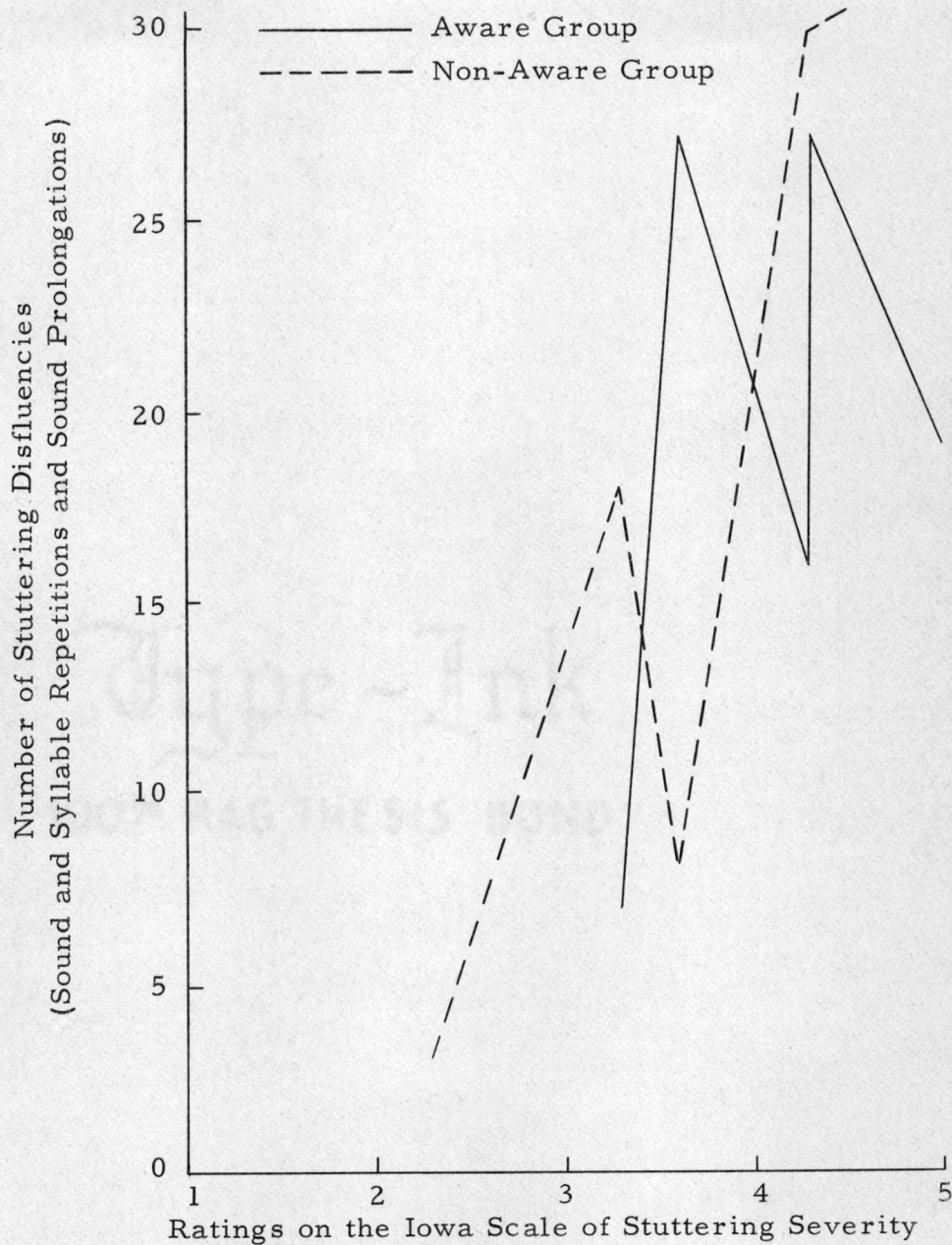


FIGURE 4. Comparison of aware and non-aware groups on Iowa Scale of Stuttering Severity and number of stuttering disfluencies

Three qualifications to the above tentative conclusion must be noted. The methods used to assess awareness, while they were the best presently available, were crude and whether they accomplished their purpose is open to question. Second, it must be remembered that the severity of stuttering characteristics manifested by these subjects was generally mild. The lack of awareness may have prevented them from developing more obvious symptoms. Third, the number of subjects in this sub-study was too small to warrant any firm deductions.

Another comparison between various sub-groups within the S. S. can be made. A comparison is displayed between the five highest and the five lowest in the number of sound and syllable repetitions and sound prolongations in terms of other measures of stuttering behavior in Table 29. The results appear to indicate the major role within this mongoloid population of sound and syllable repetitions and sound prolongations in determining other dimensions of stuttering behavior. In other words, when these two types of disfluency occur frequently enough, the total number of disfluencies, consistency, and measures of severity seem to proportionately increase. The only measure which did not totally conform in this analysis was awareness.

TABLE 29. Comparison of the five subjects who had the highest number of sound and syllable repetitions and sound prolongations with the five subjects who had the lowest number on five different measures of stuttering behavior.

Subject	SSR & SP	Total number of disfluencies	Consistency	Severity (overall)	Iowa Scale	Aware- ness
<u>Five Highest</u>						
16	31	38	23.8	*	4.6	
17	30	33	16.7	*	4.3	
11	27	31	22.2	+	3.6	x
12	27	39	16.7	*	4.3	x
8	24	28	25.0	*	5.0	
Mean	27.8	31.8	20.9		4.3	
<u>Five Lowest</u>						
2	3	5	0.0	-	3.3	
13	3	7	0.0	-	2.3	
3	4	11	no measure	-	4.3	
18	7	13	0.0	-	3.3	x
9	8	11	0.0	-	3.6	
Mean	4.8	9.4	0.0		3.4	

* Subject met 4 out of 5 of the arbitrarily established criteria

+ Subject met 3 out of 5 of the arbitrarily established criteria

x Evidence of awareness was given in two out of three or better of the procedures employed

Summary of the Results

The results of this investigation may be summarized in the following manner:

Descriptive Features

1. The incidence of stuttering was found to be 10% or 20 out of the T.S. tested.
2. Non-Verbal Composition findings are as follows: the sex ratio was 16 males to four females; the S.S. was composed of 12 non-institutionalized subjects and eight institutionalized subjects; the age range of the S.S. was 6 years, 3 months to 32 years, 2 months with a mean age of 18 years, 1 month; and the I.Q. of the S.S. ranged from 19 through 71 with a mean I.Q. of 38.
3. Language Development in the S.S. was near adequate or adequate according to placement on the D.V.C.S.
4. Measures of severity revealed these results: the average number of stuttered words per minute was 7.51; the percentage of stuttered words was 10.83%; the average placement on the Iowa Scale of Stuttering Severity was 3.62, that is, between Mild to Moderate (3) and Moderate (4); the average of the average placement in Bloodstein's

Phases of Stuttering Development was between incipient and transitional stuttering; and secondary symptoms were definitely apparent in the majority of subjects in this study.

5. Attempts at evaluating awareness revealed that: five subjects displayed evidence of awareness on the video-tapes as judged by Panel III; five subjects were judged to be aware of their stuttering problem by two persons in their environment; and four subjects were determined to be aware through questions posed by the investigator.

Distinctive Components

6. The S. S. demonstrated trends in the direction of the consistency effect.
7. The vast majority (92%) of disfluencies of the S. S. fell in one of the loci of stuttering.
8. Sound and syllable repetitions and sound prolongations exceeded all other types of disfluency in the disfluent speech behavior of the S. S.

CHAPTER V

IMPLICATIONS OF THE STUDY

Limitations

Before discussing the implications of this research, it appears appropriate to consider some of its limitations. In this manner, what is implied may be viewed in light of the limitations.

The first apparent drawback of this investigation is the lack of a control group of non-retarded (normal) stutterers with which direct comparisons could be made. Two reasons necessitated the decision not to employ a control group. One involved the time it would take to locate a matched control group of stutterers and the second concerned the almost impossible task of matching the groups in terms of M.A. as well as C.A. In spite of the fact that this factor may jaundice the conclusions to some extent, the purpose of the investigation was essentially fulfilled.

A second limitation was that only two of the three judges on Panel II attained intrajudge reliability coefficients which were significant. This finding may be accounted for on the basis of the established variability of stuttering behavior both between and within stutterers as well as both between and within listeners from one time

to another. Tuthill (1946) found only 37% agreement on stuttered words between laymen, students with training in speech pathology, stutterers, and professional speech pathologists. In discussing these findings, Johnson et al. (1967) commented that:

Tuthill's findings, together with all the other available information bearing on the point, make it very plain that what one person would call "stuttering" another might call perfectly normal speech and that what a particular person would call "normal" at one time he might label "stuttering" at another (p. 279).

This factor is not considered critical enough to detract appreciably from any of the results of this study because the reliability of the other two judges was significant at the .01 level of confidence.

Another limitation of the study is that the mongoloid subjects, both institutionalized and non-institutionalized, were not drawn in a completely random manner but were selected with certain criteria in mind. Therefore, generalizations made from the results of this study to the general mongoloid population must be qualified.

A fourth limitation concerns the Developmental Verbal Communication Scale (Appendix B). Albeit this scale proved to be effective for purposes of this study, it is not without its inadequacies. It is suggested that the following recommendations be incorporated before any further use is made of the scale:

1. There is too great a gap between categories No. 4 and No. 5. It is not likely that one can easily proceed from

"single word responses that are generally intelligible" to "two or more words in connected responses which are intelligible for the most part." There should be an additional category in between No. 4 and No. 5 described as "connected responses of three or more words which are intelligible approximately one-half of the time."

2. Instead of "two or more words" in categories No. 4, No. 5, and No. 6, perhaps "three or more words" would be more meaningful, since so many two-word combinations express one concept, such as "bye bye," "ice cream," "hot dog," etc.

Implications of the Major Conclusion

The primary conclusion of this study is that the mongoloids who were judged to stutter did, indeed, exhibit stuttering behavior and did so in greater numbers than found in the non-retarded population. While they may have shown some cluttering-like symptoms at times, the majority of the features and components of their disfluent speech behavior were more similar to stuttering than to other kinds of disfluent speech behavior, such as constitutional and neurotic stuttering (Van Riper, 1963a; Freund, 1966). Therefore, the null hypothesis stated in Chapter I can be genuinely questioned, if not

rejected. The answer to Bloodstein's (1958) original question is that stuttering in mongoloids essentially resembles that found in non-retarded stutterers in most respects. The two qualifications to the above statement were that the behavior appeared to be confined to a milder form of severity and that awareness of the problem did not seem to be a crucial element.

Primary Implication

The singular implication of the conclusion that mongoloids stutter in significant numbers, is that it may represent a critical step in a process which could have some bearing on the etiology of stuttering. The results of this study corroborated the higher incidence of stuttering in mongoloids and established that the disfluent speech behavior in question is stuttering. The next logical step in the process is to determine the causative factor which produces the increase of stuttering behavior in Down's Syndrome. Is the answer to be found in the neurological differences between the mongoloid and the non-mongoloid? Is the cause located in the environment of mongoloids? Does it result from their low intellectual level?

It is possible that the etiology of stuttering may be more easily discerned and identified within this specific population than within other groups in which stuttering exists for a few reasons. First,

the population to be examined is limited and confined to mongoloids where an increased incidence of stuttering is known to exist. Second, those with Down's Syndrome are a homogeneous and readily accessible group. Third, the environment of institutionalized mongoloids can be more easily controlled than in the case of other groups of stutterers. Fourth, the accumulation of research findings reported in the literature concerning Down's Syndrome may serve as a background of available information. Such information may prove advantageous in delineating the cause of stuttering by eliminating certain possible factors. Admittedly, the determination of this causative factor is a critical step in a process which may relate to the etiology of stuttering. However, if this factor is resolved within mongoloids, this same agent may be associated with the cause of stuttering in non-mongoloids, especially since the behavior is essentially similar in both populations. If this factor remains unresolved, then this primary implication falls short of its mark.

Gottsleben (1955) indicated that a possible reason for the increase of stuttering in mongoloids may lie in the:

neuro-muscular system which predisposes them to stutter, but that actual stuttering does not develop unless the individual is subjected to psychological barriers which he cannot meet in a manner which is satisfactory both to himself and to society. Thus, the conflict is expressed in stuttering (p. 217).

In commenting on this "interesting relationship" between

stuttering and Down's Syndrome, Jordan (1966) stated that:

It may be that the appearance of mongoloid children--that otherwise irrelevant trait--leads to differential treatment, and that the problem arises in children secondarily to their biological deviations and primarily to the interpersonal problems their appearances may precipitate (p. 167).

Rohovsky (1965) wrote that:

It might be that the primary basic factor is a delay of myelinization in the speech areas of the cortex. The secondary psychological factors come when the mongoloid is exposed to excessive emotional stress which augments the stuttering (p. 31).

Of the three reasons proposed by these authors, it seems to this writer that the first may come close to a possible, although not completely satisfactory explanation. As far as the third reason is concerned (Rohovsky, 1965), any effect of myelinization on the speech process is a hypothesis which has yet to be proved or disproved. Presently there is no research evidence to support this point of view. However, this does not eliminate it from the realm of possibility. Jordan's (1966) explanation does not seem credible because if there is "differential treatment," it is probably focused in the direction of more attention since mongoloids have greater needs. It seems unlikely that their appearances can cause such radically different treatment as to result in stuttering. Evans and Hampson (1968) comment that it is "wrong to make such speculations [as Jordan's] until the facts from which such speculations start are

more firmly based" (p. 174). Gottsleben's (1955) position of a basic "neuro-muscular system which predisposes them to stutter" is a plausible explanation but the "psychological barriers" of which he speaks are hypothetical. According to his rationale, it seems likely that the percentage of stuttering should be higher because these individuals are subjected to many frustrations.

A more likely reason for the higher incidence of stuttering in mongoloids is found in Bloodstein's (1969) theory of stuttering etiology. Those individuals with Down's Syndrome seem to fit very well into this theory. Bloodstein states that "stuttering is caused by communicative failure as perceived by the child" (p. 44). By "communicative failure" he means a belief in the difficulty of speech which has somehow been engendered because of one or more of three reasons: (1) other communication disorders, such as articulation problems, difficulties in language development, pronunciation defects, etc.; (2) "the anxieties and demands focused in most cases by the parents with varying degrees of subtlety on the communication process" (Bloodstein, Alper, and Zisk, 1965, p. 47); and (3) the personality of the child in the form of insecurity, excessive need for approval, or a low threshold of tolerance for frustration. Any of these factors can produce a belief in the difficulty of speech. Of the three reasons, the first appears most likely to be applicable in the case of those with Down's

Syndrome. Most mongoloids have a basic inadequacy at verbal communication which is more pronounced in this population than in other types of retardates (Jordan, 1966). This inadequacy may lead to frustration and tension in the speech process which, in turn, frequently could result in fragmentation of speech or stuttering behavior. Whether any other predisposing factor may be involved in this process, such as a neurological deficit, is difficult to evaluate without further empirical evidence.

It may be important to know how much of a speech and language impairment the mongoloid youngster had at or close to the time of the original diagnosis of stuttering because this information may indicate the extent to which this factor played a role in the development of stuttering. In view of the fact that most mongoloids are usually identified at birth, the possibility of following them in a longitudinal study becomes more feasible than it would be in the normal population. An outline of such a possible study has been proposed under Suggestions for Further Research. The findings of such a research study may lend considerable weight to Bloodstein's (1969) theory.

Theoretical Implications

The second reason that may be offered to indicate the significance of the primary conclusion is that the higher incidence of

stuttering in mongoloids may have some effect on present-day theories of etiology (Gens, 1951). How do the current etiological theories of stuttering account for this factor? In what way do the findings of this research conflict with theoretical concepts regarding stuttering? Since Bloodstein's (1969) theory and the implications thereof have been reviewed in the previous section, they will not be repeated here.

This conclusion appears to have some direct bearing on Johnson's (1959) interaction hypothesis. According to Johnson, one of the essential elements in the development and maintenance of stuttering is the sensitivity of the stutterer to his own disfluencies and to his listeners' reactions to these disfluencies. When analyzed in mongoloids, this concept does not seem to endure. Can mongoloids detect the usual subtle reactions of listeners to their disfluencies? If they can detect the meaning of such reactions, are they in turn capable of responding in some way to these reactions of listeners? The usual form such responses take in stutterers is to attempt to stutter less which can result in more stuttering. That mongoloids can react in such a manner is questionable because of their limited perceptual and intellectual capacities. One of the tentative findings of this study is that the majority of mongoloids who stutter are not aware of their speech difficulty. Therefore, if these subjects were

not aware of their stuttering moments, how can they be cognizant of any connection between reactions of listeners to their stuttering and their so-called stuttering "blocks"? In summary, it is dubious that mongoloids are as sensitive to their listeners as Johnson (1959) would have stutterers be.

The perceptual ability of mongoloids to their environment has yet to be definitively measured. But at least one study by Clausen (1968) pointed to a decreased sensitivity in some perceptual functions. It is not implied here that mongoloids are totally insensitive to their environment. If they were, they would not be able to perceive their inadequacies at communicating verbally and hence, Bloodstein's (1969) theory would not hold. What is implied is a decreased sensitivity. In essence, the interaction hypothesis of Johnson (1959) does not seem to be applicable in the case of the mongoloid stutterer.

Another theoretical concept which might be scrutinized in light of this conclusion is the so-called "breakdown" or neurological theories of stuttering. Such theories, of which there are many, regard stuttering as a breakdown of the speech function under some type of stress due to constitutional or organic factors. Since mongoloids have a basic genetic deficit, which has resulted in brain dysfunction, their stuttering behavior as well as their other physical deficiencies may well arise from this same agent. It is possible that there is a

basic deficiency in the neural integration of the speech musculature, resulting from the brain dysfunction, which produces this fragmentation in speech. However, some other factors would probably have to affect the net result or be precipitating agents to produce the stuttering. Such agents could be in the form of some psychological or emotional stress in the environment or it could be due to low frustration tolerance. This point of view is in line with the dysphemic theory of West (1958). On the other hand, this deficit in neural integration may be present in degrees so that only those mongoloids with a more serious deficiency have problems with stuttering. There is no question that there is a neural deficit in mongoloids but whether and/or how this factor actually relates to stuttering is something that appears to be impossible to document at this time.

It might be added that Van Riper's (1954; 1963a) eclectic theory of multicausality is not affected by this conclusion because according to his theory, there are many causes of stuttering. The etiology of stuttering in mongoloids may or may not relate to the cause in non-mongoloids. There are numerous other theories of stuttering etiology but the majority of them would not be directly affected by this conclusion. The present writer is more predisposed to the opinion that the frequency of stuttering in mongoloids is best explained on the basis of Bloodstein's (1969) environmental theory.

Implications on Traditional Concepts about Stutterers

There are a number of generalizations about stutterers present in the literature that need to be reevaluated in light of this finding.

These traditional a priori concepts do not appear to be applicable to the stutterer who also has Down's Syndrome.

1. Stutterers have average or above average I. Q. s (Berry and Eisenson, 1956; Andrews and Harris, 1964). This particular generalization was originally made on the basis of the results of I. Q. testing with college stutterers but it obviously holds little support when applied to mongoloids. Further research with non-college stutterers has revealed that their I. Q. s were in the average range (Schindler, 1955). The results of this study have confirmed that such a statement about stutterers is sine fundamento in re (without any foundation in reality).
2. Travis (1957) defines stuttering "as an advertisement of strong, unconscious motives of which the stutterer is deeply ashamed" (p. 919) because of his unspeakable feelings. This particular interpretation of stuttering does not seem to fit mongoloids who are not even aware of the problem for the most part, let alone deeply ashamed of "unspeakable feelings."

3. West (1958) has referred to one trait that is "common to most, if not all, stutterers" and calls it "moral perfectionism" (pp. 185-186). It is difficult to envision mongoloids fitting this particular generalization. They may well be perfectionists about a specific task but the realization of the moral consequences of an act appears to be farfetched when applied to individuals with an average I. Q. of 38.
4. Glasner (1970) states that "one of the cardinal characteristics of the child who stutters is his obvious hypersensitivity" (p. 252). Robinson (1964) also has taken special note of this quality in stutterers. Since the certitude of definite evidence for sensitivity in mongoloids was questioned with regard to Johnson's (1959) interaction hypothesis, the point will not be belabored here, except to state that it is doubtful that mongoloids can be as hypersensitive as described by these authors. Ergo, hypersensitivity does not seem to be a unique characteristic of all stutterers.
5. Froeschels (1961) has said that "the mind plays a great role in the development of stuttering" (p. 195). In making this statement it is assumed that Froeschels meant the mind in toto because he was referring to the "relatively fewer stutterers" in schools for retarded children. Since

mongoloids are capable of exhibiting stuttering behavior, it is no longer certain that the mind or intellect plays such a prominent role in the development of stuttering. However, it may well be that in order for stuttering to assume more severe forms, an intact intellect is necessary. According to the results of this study, the degree of severity displayed by the mongoloids who stuttered was only mild.

Other Implications

The last reason for the significance of the primary conclusion, together with the other findings, is that they provide basic information with some clinical implications for speech clinicians who work with mongoloid stutterers. It seems clear now that mongoloids who are disfluent are capable of stuttering. If the disfluency problem is diagnosed as stuttering, it should be treated as such. However, some modification in traditional therapy procedures may be called for because the mongoloids are probably not fully aware of their stuttering problem. Since behavior modification does not deal directly with such reactions as attitudes and feelings about stuttering but only with the behavior, per se, perhaps this approach would be the most effectual to employ with such individuals. This is an area where further research is required to reveal more effective

therapeutic approaches. There is some evidence to suggest that the majority of mentally retarded stutterers are not receiving speech therapy (Watnick, 1967). The basic findings from this study, together with the results of further research efforts directed toward more efficacious clinical techniques, will furnish the speech clinician with the resources necessary to cope with the problem. This knowledge should contribute to increasing therapy services to retarded stutterers.

Suggestions for Further Research

Further research is needed in order to implement the findings of this investigation. A specific study is suggested which will attempt to answer the next logical question in the process: Why does a higher frequency of stuttering exist in mongoloids?

The purpose of this investigation would be to examine the status of verbalization and language development at or around the time of the initial appearance of disfluencies in mongoloid children. Depending on the degree of severity of the speech and language problems at the time of the evaluations, the results would tend to substantiate or detract from Bloodstein's (1969) theory. It is proposed that this be a longitudinal study for a period of five years.

The subjects should be 100 mongoloids, either institutionalized

or non-institutionalized. It does not seem to make a critical difference. However, institutionalized subjects would probably prove easier to follow. These subjects should be approximately two to five years of age and should be followed for a period of at least five years with interviews every three months. The criterion for acceptance into the study should be no verbalization (vocalization would be acceptable) at the time of the initial interview. During this five-year period, the mongoloid subjects should begin to verbalize and to manifest stuttering behavior, if they are going to do so. It is known from this investigation that approximately 10% of this population should demonstrate stuttering behavior.

The parents or institutional personnel should be instructed to report any consistent disfluent speech behavior which is evident for more than three days. Upon receiving such a report, the investigator should conduct a speech and language evaluation being careful to note levels of development and the severity of any other communication problem which may be present concomitantly with the disfluency problem. If the subject is still disfluent during the next interview, he would be classified as a stutterer.

Once at least ten mongoloids who stutter have been found, the investigator should endeavor to match these ten subjects on C. A. , M. A. , and sex as closely as possible with a control group of ten non-stutterers from the other 90 mongoloids. He should then

determine if there were any significant differences in the speech and language behaviors between those who stutter and those who do not at the time when the first symptoms of stuttering appeared in the group which stutters. In this manner, the influence of other speech and language problems on the inception of stuttering may be inferred. If there are significant differences between the stuttering and non-stuttering mongoloids in favor of the stuttering group demonstrating more communication difficulties, then it would seem that a breakthrough in the area of etiology of stuttering may have been made. If no significant differences are found, other avenues leading to the answer to this compelling question will have to be explored.

Another area that may prove fruitful in further research efforts is the examination of the stuttering behavior in mongoloids over longer periods of time. The purpose of such an investigation would be to determine how stable the behavior remains. This study could be accomplished as part of the previously mentioned project or in a specially designed research study. It was this investigator's clinical impression that the behavior tended to change radically in some cases over a period of six months.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Restatement of the Problem and Procedures

Although there have been a few contradictory findings (Sheehan, Martyn, and Kilburn, 1968), stuttering in the mentally retarded has been reported in the literature as occurring with a greater frequency than that found in the normal population (Schlanger, 1953; Schlanger and Gottsleben, 1957). Within the various classifications of mental deficiency, stuttering has been almost consistently said to take place in a higher incidence within Down's Syndrome (mongolism) than in either the normal population or in the mentally retarded as a whole (Gottsleben, 1955; Rohovsky, 1965). This finding has led many to speculate as to whether mongoloids actually manifest stuttering behavior or whether their stuttering-like symptoms represent some other form of disfluent speech behavior, for instance, cluttering (Cabanas, 1954; Zisk and Bialer, 1967). This situation has impelled Bloodstein (1969) to inquire "whether what we are observing here is stuttering at all, in the usual sense" (p. 134).

The purpose of this investigation was to study the basic nature of disfluent speech behavior evidenced by mongoloids and to

determine how it conforms to generally accepted features and components of stuttering behavior. The primary research question posed was: Does the symptomatology of the disfluent speech behavior manifested by those with Down's Syndrome differ from such behavior found in non-retarded (normal) stutterers?

The procedure consisted of initially testing 200 mongoloids, 100 institutionalized and 100 non-institutionalized for disfluent speech behavior. Of the 100 non-institutionalized subjects, 75 were from day centers for the retarded and 25 were attending public school special education programs. A total of 100 males and 100 females were included in the study. All subjects were six years of age or over and did not have any other major physical anomaly. A standard interview procedure which elicited both structured and spontaneous samples of speech was employed.

The disfluent mongoloids were chosen based on a criterion of three or more observed disfluencies during the interview. These subjects subsequently were video-taped, utilizing the same interview procedure, for presentation to Panel II composed of three speech pathologists. This panel made a judgment concerning the presence or absence of stuttering behavior in the video-tape samples of the disfluent subjects, based on certain previously agreed on criteria for stuttering. Intrajudge reliability was ascertained by viewing ten

tapes a second time while intermingled with the other tapes. Once the subjects demonstrating stuttering behavior were determined, the video-tapes of those subjects were played to another panel of three speech pathologists (Panel III). The task of this second panel was three-fold: (1) to place each subject on the Iowa Scale of Stuttering Severity, (2) to indicate the secondary symptoms which were apparent; and (3) to point out any instances of awareness of the problem on the part of the subjects. These assignments were accomplished during two viewings.

A Follow-up Procedure, involving the mongoloids judged to stutter, sought information concerning the consistency effect and subject awareness of stuttering. The latter was ascertained from two persons in the subject's immediate environment and from the subjects themselves. Finally, based on an analysis of six-minute video-taped segments, a topographical description of the disfluencies, the loci of stuttering, percentages of stuttered words, and number of stuttered words per minute were determined and computed for each stuttering subject. Interjudge reliability (.970) was calculated for five of the tapes as part of the analysis of the types of disfluency.

In addition, each subject initially interviewed was placed on a six-point Developmental Verbal Communication Scale, ranging from

no attempts at vocalization (or verbalization) to generally intelligible speech and adequately structured language. One of the purposes of this scale was to provide a means of separating those subjects with adequate language skills from those with inadequate skills within the stuttering sample. A third panel of three speech pathologists (Panel I) determined interjudge agreement (ranged from .996 to .997) with the investigator by placing 20 of the 200 subjects on this communication scale after listening to audio-tape samples of their interviews.

Summary of Major Findings

1. Twenty of the 37 subjects thought to be disfluent by the investigator were judged to display stuttering behavior by Panel II. Therefore, the incidence of stuttering found in this study was 10% or 20 of the 200 subjects initially interviewed. Intrajudge agreement determined by means of the Fourfold Coefficient ranged from .41 to .77 with two coefficients significant at the .01 level of confidence.
2. Part-word repetitions and sound prolongations encompassed 78% of the six types of disfluency analyzed in this study. These two types of disfluency traditionally have been associated with stuttering (Boehmler, 1958; Wingate, 1964; and Bloodstein, 1969).

3. The vast majority (92%) of the disfluencies evidenced in the stuttering sample fell within at least one of the four loci of stuttering usually connected with stuttering behavior (Brown, 1945; Taylor, 1966b).
4. Sixty-six per cent of the total number of disfluencies consisted of consonant phonemes.
5. The mongoloids who stuttered demonstrated a trend in the direction of the consistency effect but failed to show sizeable consistency percentages. The range of percentages for 13 subjects was between 5.5% and 57.1%. However, the method (repetition of sentences) used to determine consistency may have adversely affected the results.
6. The net result of the five measures of severity was that the stuttering behavior under consideration was judged to be mild to moderate. The average placement on the Iowa Scale of Stuttering Severity was 3.62, that is, between Mild to Moderate (3) and Moderate (4). The percentage of stuttered words was 10.83%. The average number of stuttered words per minute was 7.51.
7. Each subject in the stuttering sample of 20 subjects manifested at least one secondary characteristic. Sixty per cent of the subjects had two or more symptoms which were

agreed on by two or more judges. Forcing, visible tension, and facial grimaces were the most apparent.

8. Five of the 20 subjects displayed evidence of awareness in the video-tapes as judged by Panel III. Five subjects were thought to be aware of their stuttering problem by two persons in their environment. Only four subjects were determined to be aware through questions asked by the investigator. Finally, five subjects met the criterion for evidence of awareness in at least two of the three procedures used.
9. Of the 20 mongoloids judged to stutter, 16 were males and four were females; 12 were non-institutionalized and eight were institutionalized. The age range was from 6 to 32 years with a mean age of 18 years and their I. Q. range was from 19 through 71 with a mean I. Q. of 38.
10. The results of the administration of the Developmental Verbal Communication Scale revealed that 80% of the mongoloids who stuttered had near adequate or adequate language development, that is, they were placed in the last two categories of the scale.

Conclusions

Within the limitations of the present study, the following conclusions appear to be warranted:

1. The mongoloid subjects judged to stutter in this study manifested primarily genuine stuttering to the exclusion of other types of disfluent speech behavior.
2. The symptomatology of the stuttering behavior displayed by the mongoloid stutterers differed in degree but not in type from normal stuttering behavior. Their stuttering was milder in severity with little or no evidence of awareness of the problem on the part of these subjects.
3. It appears to be well documented both from the results of this and similar studies that a higher than normal incidence of stuttering behavior exists within Down's Syndrome.
4. Since the majority of mongoloids who stutter do not seem to be aware of their speech problem, the role of awareness in the development of stuttering is brought into some question. Those mongoloid stutterers judged to be aware did not seem to evidence any more secondary symptoms than those who were judged not aware. However, this lack of awareness may be one reason why the behavior is confined to milder forms of stuttering severity.
5. The majority of mongoloid stutterers in this study had near adequate language skills and their speech intelligibility was generally fair. This does not imply that they were without

speech and/or language problems but only that they were not severely impaired.

6. Institutionalization does not appear to be a significant factor in the development of stuttering within the mongoloids in this study.
7. The sex ratio of approximately four males to one female was identical in this sub-population of stutterers to what it is in the normal population of stutterers (Sheehan, 1970).
8. The results of this investigation seem to lend support to the etiological theory of stuttering proposed by Bloodstein (1969). It is thought that the stuttering of mongoloids stems from their inadequate speech and language skills which lead to a belief in the difficulty of verbal communication. This situation may result in stuttering.

In summary, it has been established that stuttering behavior exists with greater frequency in Down's Syndrome than in the normal population. The next relevant question to be answered is: Why has this phenomenon occurred within this syndrome? Although it seems like an oversimplification of the stuttering problem, the cause may well be exposed once this question has been adequately answered, since this study has indicated that the same kind of problem takes place in both the normal and mongoloid populations. At least, it

behooves us to take a closer look at stuttering within this population.

In conclusion, the major contribution of this investigation has been that it has more exactly described the precise nature of disfluent speech behavior in those with Down's Syndrome. It is hoped that the information derived from this study will not only clarify some of the ambiguities present in the literature but will serve as a stimulus to further research in this most provocative area. There is a possibility that the results of such research could have a profound bearing on the etiology of stuttering.

REFERENCES

- ANDREWS, G. and HARRIS, M., The Syndrome of Stuttering. London: The Spastics Society Medical Education and Information Unit in Association with William Heinemann Medical Books Ltd. (1964).
- BENDA, C., Down's Syndrome, Mongolism and Its Management. (rev. ed.). New York: Grune & Stratton (1969).
- BERRY, M. and EISENSON, J., Speech Disorders, Principles and Practices of Therapy. New York: Appleton-Century-Crofts, Inc. (1956).
- BINGHAM, D., VAN HATTUM, R., FAULK, M., and TAUSSIG, E., Program organization and management. J. Speech Hearing Dis., Monograph Supplement 8, 33-49 (1961).
- BLAKELEY, R., Speech defects and mental retardation. Public Health Reports, 81, 343-347 (1966).
- BLANCHARD, I., Speech pattern and etiology in mental retardation. A. J. ment. Def., 68, 612-617 (1964).
- BLOODSTEIN, O., Studies in the psychology of stuttering: XIX. The relationship between oral reading rate and severity of stuttering. J. Speech Dis., 9, 161-173 (1944).
- BLOODSTEIN, O., Stuttering as an anticipatory struggle reaction. In Eisenson, J., (Ed.) Stuttering, A Symposium. New York: Harper & Brothers (1958).
- BLOODSTEIN, O., The development of stuttering: I. Changes in nine basic features. J. Speech Hearing Dis., 25, 219-237 (1960a).
- BLOODSTEIN, O., The development of stuttering: II. Developmental Phases. J. Speech Hearing Dis., 25, 366-376 (1960b).
- BLOODSTEIN, O., The development of stuttering: III. Theoretical and clinical implications. J. Speech Hearing Dis., 26, 67-82 (1961).

- BLOODSTEIN, O., A Handbook on Stuttering. Chicago: National Easter Seal Society for Crippled Children and Adults (1969).
- BLOODSTEIN, O., ALPER, J., and ZISK, P., Stuttering as an outgrowth of normal disfluency. In Barbara, D. (Ed.), New Directions in Stuttering. Springfield: Charles C. Thomas, Publisher (1965).
- BOEHMLER, R. M., Listener responses to non-fluencies. J. Speech Hear. Res., 1, 132-141 (1958).
- BROWN, S. F., The loci of stutterings in the speech sequence. J. Speech Dis., 10, 181-192 (1945).
- CABANAS, R., Some findings in speech and voice therapy among mentally deficient children. Folia Phoniatic., 6, 34-37 (1954).
- CARSON, W., Assistant Professor of Pediatrics, University of Oregon Medical School. Personal Communication (1970).
- CLAUSEN, J., Behavioral characteristics of Down's syndrome subjects. A. J. ment. Def., 73, 118-126 (1968).
- CULLINAN, W. L., Stability of consistency measures in stuttering. J. Speech Hearing Res., 6, 134-138 (1963).
- DONOVAN, H., Organization and development of a speech program for the mentally retarded children in the New York public schools. A. J. ment. Def., 22, 455-459 (1957).
- DOWN, J. L., Observations on ethnic classifications of idiots. London Hospital Reports, III, 259 (1866).
- DUNN, L. and SMITH, J., Peabody Language Development Kits, Manual for Level #1. Minneapolis: American Guidance Service, Inc. (1965).
- DUNN, L. and SMITH, J., Peabody Language Development Kits, Manual for Level #P. Minneapolis: American Guidance Service, Inc. (1968).
- EDSON, S. K., The incidence of certain types of nonfluencies among a group of institutionalized mongoloid and non-mongoloid children. M. A. Thesis, University of Kansas (1964).

- ERIKSEN, C. W., Discrimination and learning without awareness. Psychol. Rev., 67, 279-299 (1960).
- EVANS, D. and HAMPSON, M., The language of mongols. British J. Dis. Comm., 3, 171-181 (1968).
- FREUND, H., Psychopathology and the Problems of Stuttering. Springfield: Charles C. Thomas, Publisher (1966).
- FRIEBRUN, R., Director, Department of Speech Pathology and Audiology, Mental Retardation Center, New York Medical College. Personal Communication (1970).
- FROESCHELS, E., New viewpoints on stuttering. Folia Phoniatic., 13, 187-201 (1961).
- GENS, G. W., The speech pathologist looks at the mentally deficient child. Trng. Sch. Bull., 48, 19-27 (1951).
- GESELL, A. and AMATURA, C., Developmental Diagnosis, Normal and Abnormal Child Development. (2nd ed.). New York: Paul B. Hoeber, Inc. (1947).
- GLASNER, P. J., Developmental view. In Sheehan, J. G., Stuttering Research and Therapy. New York: Harper & Row, Publishers (1970).
- GOTTSLEBEN, R. H., The incidence of stuttering in a group of mongoloids. Trng. Sch. Bull., 51, 209-218 (1955).
- HEBER, R., A manual on terminology and classification in mental retardation. (2nd ed.). A. J. ment. Def., Monograph Supplement (1961).
- HECHT, F., Associate Professor of Pediatrics and Medicine, University of Oregon Medical School. Personal Communication (1969).
- HOLMES, R. and PELLETIER, L., Pineland hospital speech and hearing survey. Pownal, Maine: 25 pp. (Mimeo) (1967).
- HUBSCHMAN, E., Stuttering among mongoloid residents at the North Jersey Training School. Paper presented at N. J. S. H. A. convention, Atlantic City (1970).

- JABLONSKI, S., Illustrated Dictionary of Eponymic Syndromes and Diseases and their Synonyms. Philadelphia: W. B. Saunders Company (1969).
- JOHNSON, W., Measurements of oral reading and speaking rate and disfluency of adult male and female stutterers and non-stutterers. J. Speech Hearing Dis., Monograph Supplement 7, 1-20 (1961).
- JOHNSON, W. and ASSOCIATES, The Onset of Stuttering. Minneapolis: University of Minnesota Press (1959).
- JOHNSON, W. and BROWN, S., Stuttering in relation to various speech sounds. Quart. J. Speech, 21, 481-496 (1935).
- JOHNSON, W., BROWN, S., CURTIS, J., EDNEY, C., and KEASTER, J., Speech Handicapped School Children. (rev. ed.). New York: Harper & Brothers, Publishers (1956).
- JOHNSON, W., BROWN, S., CURTIS, J., EDNEY, C., and KEASTER, J., Speech Handicapped School Children. (3rd. ed.). New York: Harper & Row, Publishers (1967).
- JOHNSON, W., DARLEY, F., and SPRIESTERBACH, D., Diagnostic Methods in Speech Pathology. New York: Harper & Row, Publishers (1963).
- JOHNSON, W. and KNOTT, J., Studies in the psychology of stuttering: I. The distribution of moments in stuttering in successive readings of the same material. J. Speech Dis., 2, 17-19 (1937).
- JORDAN, T. E., The Mentally Retarded. (2nd ed.). Columbus: Charles E. Merrill Books, Inc. (1966).
- KARLIN, I. and STRAZZULLA, M., Speech and language problems of mentally deficient children. J. Speech Hearing Dis., 17, 286-294 (1952).
- LEJEUNE, J., GAUTIER, M., and TURPIN, R., Les chromosomes humains en culture de tissus. C. R. Acad. Sci., 248, 602 (1959).

- LEMERT, E. M., Some Indians who stutter. J. Speech Hearing Dis., 18, 168-174 (1953).
- LEMERT, E. M., Stuttering and social structure in two Pacific societies. J. Speech Hearing Dis., 27, 3-10 (1962).
- LERMAN, J., POWERS, G., and RIGRODSKY, S., Stuttering patterns observed in a sample of mentally retarded individuals. Trng. Sch. Bull., 62, 27-32 (1965).
- LEWIS, D. and SHERMAN, D., Measuring the severity of stuttering. J. Speech Hearing Dis., 16, 320-326 (1951).
- LILLYWHITE, H. and BRADLEY, D., Communication Problems in Mental Retardation. New York: Harper & Row, Publishers (1969).
- LOUTTIT, C. and HALLS, E., Survey of speech defects among public school children of Indiana. J. Speech Dis., 1, 73-80 (1936).
- LUCHSINGER, R. and ARNOLD, G., Voice - Speech - Language. Belmont: Wadsworth Publishing Company, Inc. (1965).
- MARTYN, M., SHEEHAN, J., and SLUTZ, K., Incidence of stuttering and other speech disorders among the retarded. A. J. ment. Def., 74, 206-211 (1969).
- MATTHEWS, J., Speech problems of the mentally retarded. In Travis, L. (Ed.), Handbook of Speech Pathology. New York: Appleton-Century-Crofts, Inc. (1957).
- MORGENSTERN, J. J., Psychological and Social Factors in Children's Stammering. Ph.D. dissertation, University of Edinburgh (1953).
- NEELLEY, J. and TIMMONS, R., Adaptation and consistency in the disfluent speech behavior of young stutterers and nonstutterers. J. Speech Hearing Res., 10, 250-256 (1967).
- PAYNE, D., JOHNSON, R., and ABELSON, R., A Comprehensive Description of Institutionalized Retardates in the Western United States. Boulder: Western Interstate Commission for Higher Education (1969).

- PENROSE, L. and SMITH, G., Down's Anomaly. Boston: Little, Brown and Company (1966).
- PREUS, A., Stammering ved Downs syndron (mongolisme). Unpublished Dissertation, University of Oslo, Norway (1970).
- ROBINSON, F. B., Introduction to Stuttering. Englewood Cliffs: Prentice-Hall, Inc. (1964).
- ROBINSON, H. and ROBINSON, N., The Mentally Retarded Child. New York: McGraw-Hill Book Co. (1965).
- ROHOVSKY, K. A., A study of stuttering in institutionalized and non-institutionalized mongoloids. M. A. Thesis, Ohio State University (1965).
- SCHAEFFER, M. and SHEARER, W., A survey of mentally retarded stutterers. Mental Retardation, 6, 44-45 (1968).
- SCHINDLER, M. D., A study of educational adjustments of stuttering and nonstuttering children. In Johnson, W. and Leutenegger, R. (Eds.), Stuttering in Children and Adults. Minneapolis: University of Minnesota Press (1955).
- SCHLANGER, B. B., Speech measurements of institutionalized mentally handicapped children. A. J. ment. Def., 58, 114-122 (1953).
- SCHLANGER, B. and GOTTSLEBEN, R., Analysis of speech defects among the institutionalized mentally retarded. J. Speech Hearing Dis., 22, 98-103 (1957).
- SHEEHAN, J., Conflict theory of stuttering. In Eisenson, J. (Ed.), Stuttering, A Symposium. New York: Harper & Brothers, Publishers (1958).
- SHEEHAN, J. G., Stuttering Research and Therapy. New York: Harper & Row, Publishers (1970).
- SHEEHAN, J., MARTYN, M., and KILBURN, K., Speech disorders in retardation. A. J. ment. Def., 73, 251-256 (1968).

- SHUBERT, O., The incidence rate of stuttering in a matched group of institutionalized mentally retarded. Paper presented at A.A.M.D. convention, Chicago (1966).
- SHUTTLEWORTH, G. E., Clinical lecture on idiocy and imbecility. Brit. med. J., 1, 183 (1886).
- SIEGEL, G., Prevailing concepts in speech research with mentally retarded children. Asha, 4, 192-194 (1964).
- SILVERMAN, F. and WILLIAMS, D., Loci of disfluencies in the speech of nonstutterers during oral reading. J. Speech Hearing Res., 10, 790-800 (1967).
- SNYDER, H. J., An investigation of the speech and oral language behavior of a group of institutionalized mongoloids. M. S. Thesis, Vanderbilt University (1963).
- STARBUCK, H. and STEER, M., The adaptation effect in stuttering speech behavior and normal speech behavior. J. Speech Hearing Dis., 18, 252-255 (1953).
- STARK, R., Unpublished Fellowship Thesis. London: College of Speech Therapists (1963).
- STRAUSS, P. K., A comparison of manifest anxiety levels in mentally retarded stutterers and nonstutterers as measured by the Children's Manifest Anxiety Scale. M. A. Thesis, University of Texas (1967).
- STRAZZULLA, M., Speech problems of the mongoloid child. Quarterly Review of Pediatrics, 8, 268-273 (1953).
- TAYLOR, I. K., What words are stuttered? Psychol. Bull., 65, 233-242 (1966).
- TAYLOR, I. K., The properties of stuttered words. J. Verb. Learn. Verb. Behav., 5, 112-118 (1966).
- TRAVIS, L. E. (Ed.), Handbook of Speech Pathology. New York: Appleton-Century-Crofts, Inc. (1957).
- TUTHILL, C., A quantitative study of extensional meaning with special reference to stuttering. Speech Monogr., 13, 81-98 (1946).

- VAN RIPER, C., Speech Correction, Principles and Methods. (3rd ed.). New York: Prentice-Hall, Inc. (1954).
- VAN RIPER, C., Speech Correction, Principles and Methods. (4th ed.). Englewood Cliffs: Prentice-Hall, Inc. (1963a).
- VAN RIPER, C. (Ed.), Stuttering Words. Memphis: Speech Foundation of America, Publication No. 2 (1963b).
- VOELKER, C. H., Amelioration of dyslogia mongolia. J. Abnorm. Soc. Psych., 31, 266-270 (1936-1937).
- WATNICK, M., Stuttering in the educable mentally retarded: Incidence and description as reported by the classroom teacher. M. S. Thesis, Southern Connecticut State College (1967).
- WEINBERG, B., Stuttering among blind and partially sighted children. J. Speech Hearing Dis., 29, 322-326 (1964).
- WEISS, D., Cluttering. Englewood Cliffs: Prentice-Hall, Inc. (1964).
- WEST, R., An agnostic's speculations about stuttering. In Eisen-son, J. (Ed.), Stuttering, A Symposium. New York: Harper & Brothers, Publishers (1958).
- WEST, R. and ANSBERRY, M., The Rehabilitation of Speech. (4th ed.). New York: Harper & Row, Publishers (1968).
- WEST, R., KENNEDY, L., and CARR, A., The Rehabilitation of Speech. (rev. ed.). New York: Harper & Brothers, Pub-lishers (1947).
- WILLIAMS, D. and KENT, L., Listener evaluations of speech inter-ruptions. J. Speech Hearing Res., 1, 124-131 (1958).
- WILLIAMS, D., SILVERMAN, F., and KOOLS, J., Disfluency be-havior of elementary school stutterers and nonstutterers: The adaptation effect. J. Speech Hearing Res., 11, 622-630 (1968).
- WINGATE, M. E., Evaluation and stuttering: III. Identification of stuttering and the use of a label. J. Speech Hearing Dis., 27, 368-377 (1962).

WINGATE, M. E., A standard definition of stuttering. J. Speech Hearing Dis., 29, 484-489 (1964).

WOHL, M., The incidence of speech defect in the population. Speech, 15, 13-14 (1951).

YOUNG, M. A., Predicting ratings of severity of stuttering. J. Speech Hearing Dis., Monograph Supplement 7, 31-54 (1961).

ZISK, P. and BIALER, I., Speech and language problems in mongolism: A review of the literature. J. Speech Hearing Dis., 32, 228-241 (1967).

APPENDIX A. Standard Interview Procedure

General Instructions

We are going to look at some pictures and things. Tell me all you can about them. O. K. ?

1. PICTURES

Specific Instructions

Tell me all you can about this picture? What is it? (What do you do with it?) (What is going on here?)

Show each subject 15 pictures from the Peabody Language Development Kit, Primary Level and Level #1 (Five pictures from each of three different categories: food, household, and activity.)

2. OBJECTS

Tell me all you can about each of these things? What is it? (What is it for?)

- | | |
|---------------|----------------------------|
| a. toothbrush | h. towel |
| b. cup | i. chair (in room) |
| c. soap | j. table or desk (in room) |
| d. ball | k. shoe |
| e. pencil | l. spoon |
| f. key | m. glass (drinking glass) |
| g. toy car | n. light (in room) |
| | o. watch (examiner's) |

3. COUNTING FROM ONE TO TEN

Specific Instructions

Let me hear you count from one to ten.

If the subject stops counting before he reaches ten, begin to count slowly to ten, being certain to encourage the subject to imitate.

APPENDIX A. Continued

4. SIMPLE QUESTIONS

- a. What did you do this morning?
- b. Tell me about Batman (or cartoons) on T. V.
- c. What games do you like to play?
- d. Do you go to school? Tell me about what you learn in school?
- e. Do you have any brothers or sisters? Tell me about them.

APPENDIX B. Developmental Verbal Communication Scale

1. No attempts at vocalization or verbalization.
2. Unintelligible vocalization and/or verbalization in the form of sounds, noises, jargon, etc.
3. Occasional intelligible meaningful syllables and/or single word responses.
4. Attempts at combining two or more words which are only rarely successful and predominantly unintelligible. However, single word responses are generally intelligible.
5. Two or more words in connected responses which are for the most part, functionally complete (meaning is understood) but structurally incomplete (grammatically incorrect).
6. Two or more words in connected responses which are for the most part, both functionally (meaning is understood) and structurally (grammatically correct) complete.

APPENDIX C. Instructions to Members of Panel I

Twenty-six (26) audio-taped samples including six (6) training tapes, of a standard interview with individuals who have Down's Syndrome will be presented to you one at a time. The 26 tapes average approximately 10 minutes each in length. Please listen carefully to each tape while noting the type of verbal language behavior that is manifested by the subject.

At the conclusion of each tape, please make a judgment as to what level or category on the Developmental Verbal Communication Scale, a copy of which has been given to you, best describes and represents the level of verbal communication skills that the particular subject demonstrated on the tape. You must make a choice in each case. A subject can only be placed in one category and not in between categories. Each tape will only be played once.

Please indicate your choice by writing the number of the specific level or category (Nos. 1 through 6) in the column marked "Category on Scale" adjacent to the number of the tape to which you have just finished listening. Please wait until the conclusion of each tape before marking your choice in an independent manner. Are there any questions concerning this task before we proceed?

APPENDIX D. Instructions to Members of Panel II

Fifty (50) video-taped samples including three (3) training tapes, of mongoloids who have been found with two or more disfluencies in their speech behavior will be presented to you one at a time. The 50 tapes average about 10 minutes each in duration. Please carefully listen to and watch each tape.

Following each presentation, you will be asked to try and judge whether the subject under consideration can be considered to be a stutterer or not, on the basis of the criteria for stuttering which were mutually agreed on previously, plus your judgment of the sample of speech behavior manifested on the tape. This judgment is the Primary Task of this panel. You must make a choice in each case. Each tape will only be played once. Please indicate your choice by means of a check mark in the appropriate column and on the correct line according to the number of the sample presented. Please wait until the tape has ended before marking your choice in an independent manner. Are there any questions concerning this task before we proceed?

APPENDIX E. Iowa Scale of Stuttering Severity and List of Secondary Symptoms

Panel III, Judge No. _____

Tape No. _____

Instructions: You are asked to perform two tasks. First, please rate the severity of each subject's stuttering behavior on the following scale by placing a check mark opposite the appropriate description. Second, please check off any secondary symptoms noted in each sample.

I IOWA SCALE OF STUTTERING SEVERITY

- _____ 0 No Stuttering
- _____ 1 Very Mild--stuttering on less than 1% of words; very little relevant tension; disfluencies generally less than one second in duration; patterns of disfluency simple; no apparent associated movements of body, arms, legs, or head.
- _____ 2 Mild--stuttering on 1% to 2% of words; tension scarcely perceptible; very few, if any, disfluencies last as long as a full second; patterns of disfluency simple; no conspicuous associated movements of body, arms, legs, or head.
- _____ 3 Mild to Moderate--stuttering on about 2% to 5% of words; tension noticeable but not very distracting; most disfluencies do not last longer than a full second; patterns of disfluency mostly simple; no distracting associated movements.
- _____ 4 Moderate--stuttering on about 5% to 8% of words; tension occasionally distracting; disfluencies average about one second in duration; disfluency patterns characterized by an occasional complicating sound or facial grimace; an occasional distracting associated movement.

APPENDIX E. Continued

- _____ 5 Moderate to Severe--stuttering on about 8% to 12% of words; consistently noticeable tension; disfluencies average about 2 seconds in duration; a few distracting sounds and facial grimaces; a few distracting associated movements.
- _____ 6 Severe--stuttering on about 12% to 25% of words; conspicuous tension; disfluencies average 3 to 4 seconds in duration; conspicuous distracting sound and facial grimaces; conspicuous distracting associated movements.
- _____ 7 Very Severe--stuttering on more than 25% of words; very conspicuous tension; disfluencies average more than 4 seconds in duration; very conspicuous distracting sounds and facial grimaces; very conspicuous distracting associated movements.

II SECONDARY SYMPTOMS

- | | |
|-----------------------------|----------------------------------|
| _____ 1. Holding breath | _____ 6. Any visible tension |
| _____ 2. Gasping for breath | _____ 7. Turning or jerking head |
| _____ 3. Closing eyes | _____ 8. Moving hands |
| _____ 4. Protruding tongue | _____ 9. Moving body |
| _____ 5. Facial grimaces | _____ 10. Attempts at forcing |
- _____ 11. Any other (specify) _____

APPENDIX F. Instructions to Members of Panel III (Session 1--
Iowa Scale and Secondary Symptoms)

Twenty-three (23) video-taped samples including three (3) training tapes of approximately 5 minutes duration each, of a standard interview with individuals who have Down's Syndrome will be presented to you one at a time. The subjects on Tapes 4 through 23 have been judged to be individuals who stutter. Please watch and listen to each tape being careful to appraise the severity of each subject's stuttering behavior and the type of secondary symptoms manifested.

You will be asked to perform two tasks during this session. First, please place each subject on the Iowa Scale of Stuttering Severity by checking the appropriate descriptive category, based on your appraisal of the severity of the stuttering symptoms which the particular subject evidenced. Secondly, please check off the primary type or types of secondary symptoms which were apparent in each particular sample of stuttering behavior. Please perform both tasks for each tape viewed, using only one data sheet for each sample. The data sheets have all been appropriately numbered.

Please perform these tasks in as independent a manner as possible. Are there any questions before we proceed?

APPENDIX G. Criteria for Awareness of Stuttering

1. AVOIDANCE

- a. Substitution of another word for the one he was going to say,
- b. Circumlocution or obvious avoidance of saying a certain word,
- c. Pretending to think,
- d. Changing the order of the words in the sentence,
- e. Giving up on the speech attempt altogether.

2. POSTPONEMENT

- a. Pausing at a strategic location within a sentence,
- b. Repeating preceding words or phrases,
- c. Use of "well," "ah," "oh," or "you see" or any other irrelevant words to delay the speech attempt,
- d. Sub-vocal rehearsal.

3. STARTERS

- a. Use of such words as "well" or "and" to enable the stutterer to get started on the feared word,
- b. Use of timing devices, such as eye blinks, jaw jerks, etc. to help the stutterer to initiate the feared word,
- c. Sudden increases in tension or force to get the feared word started.

4. ESCAPE

- a. Finishing the word on residual air or lowered vital capacity,
- b. Attempts to break the "block" by means of head-jerk, gasp, or interjection,
- c. Backing up and getting a running start on the word.

5. APPREHENSION ABOUT SPEAKING AND ANTICIPATION OF STUTTERING

- a. Use of any unnatural speech pattern, such as a monotone, so that no particular word stands out to be feared.

APPENDIX H. Instructions to Members of Panel III (Session 2--
Identification of Awareness

Twenty-one (21) video-taped samples including one training tape of approximately 10 minutes duration each, of a standard interview with individuals who have Down's Syndrome will be presented to you one at a time. The subjects on Tapes 2 through 21 have been judged to be individuals who stutter. Please watch and listen carefully to each tape while taking special note of any instance of evidence of awareness of the stuttering problem on the part of the mongoloid. Some of the tapes may not contain any evidence of awareness, while other tapes may contain several such instances.

When you feel as though you have detected an instance of awareness, based on our prior discussion of criteria for such awareness in the behavior of the subject, please first identify the instance by writing the word or words spoken by the subject at that time in Column 2 on your data sheet, opposite the appropriate number of the instance. Secondly, describe what the subject did or how you think he or she indicated his or her awareness of the problem briefly in Column 3.

Please perform the task in as independent a manner as possible. Are there any questions before we proceed?

APPENDIX I. Experimental Sentences Used to Determine
Consistency

1. We are going to buy some candy bars.
2. Jack likes to feed the little puppies.
3. Tom has lots of fun playing ball.
4. We like to eat ice cream cones.
5. Jane wants to build a playhouse.
6. Fred asked his father to play with him.
7. Betty has made a dress for her doll.

TOTAL: 51 words

APPENDIX J. Bloodstein's Developmental Phases of Stuttering Behavior (1960b)

PHASE ONE Incipient Stuttering

1. The difficulty is usually episodic.
2. The stutterings tend to occur on the initial word of the sentence.
3. There is a marked tendency for stutterings to occur on the "small" parts of speech.
4. The characteristic symptom is repetition.
5. Stuttering is intensified by variable sources of communicative pressure.
6. Generally speaking, the child does not react to himself emotionally as a stutterer, and speaks freely in all situations.

PHASE TWO Transitional Stuttering

1. The disorder is essentially chronic.
2. The individual stutters primarily when he "talks fast and gets excited."
3. The stutterings have attached themselves primarily to the major parts of speech.
4. The case thinks of and reacts to himself as a stutterer, but continues to speak freely in all situations.

PHASE THREE Confirmed Stuttering

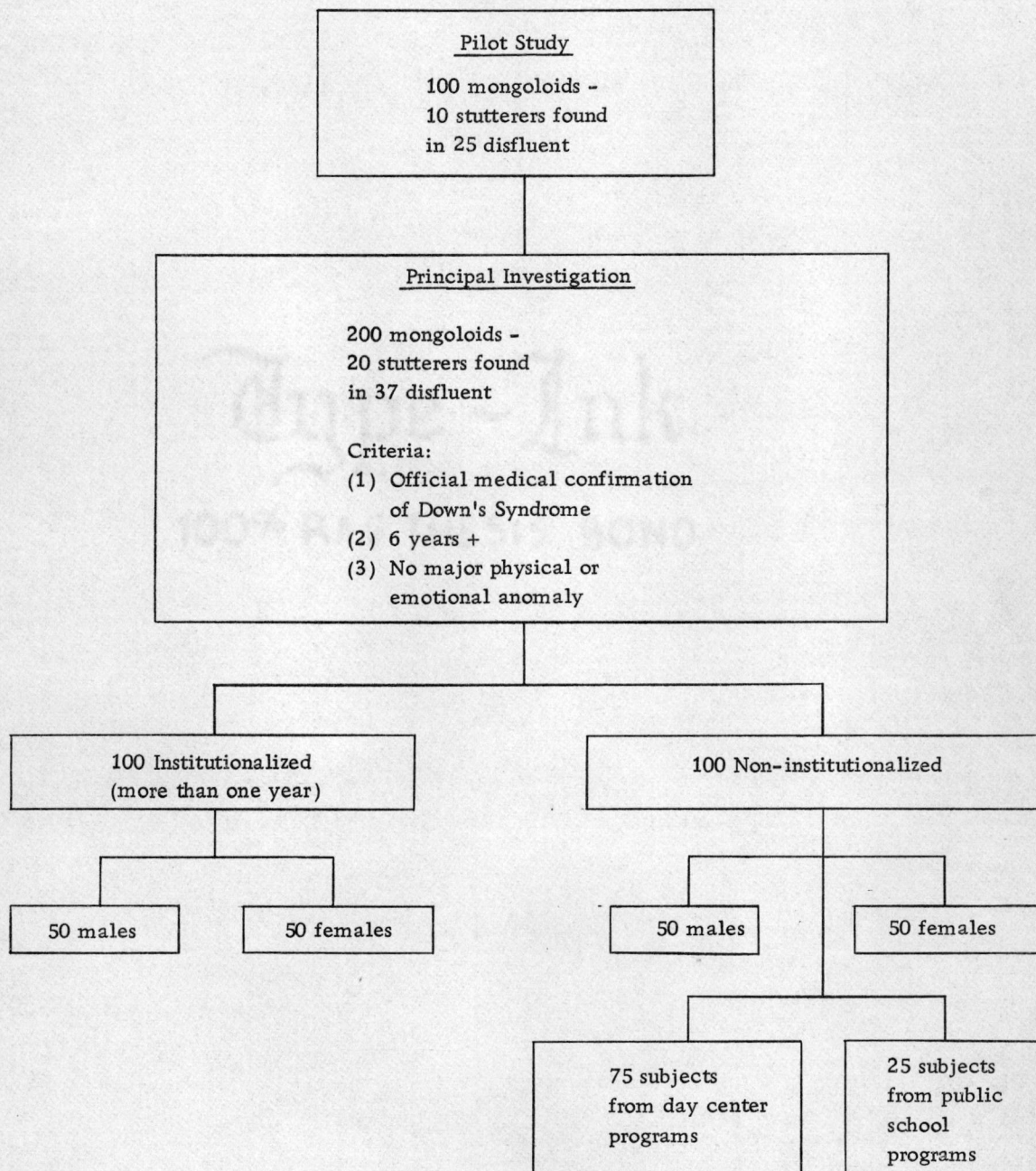
1. There is now distinctly more difficulty in some situations than in others.
2. In most cases word substitutions, word and sound difficulties, and, to a somewhat lesser degree, conspicuous anticipations are present.
3. Despite these characteristics, and the complex stuttering symptoms which are often present, there are few deep feelings of fear or embarrassment, and essentially no tendency to avoid speaking.

APPENDIX J. Continued

PHASE FOUR Advanced Stuttering

1. Vivid anticipations of stuttering.
2. Special difficulty in response to various sounds, words, situations, and listeners.
3. Frequent word substitution and circumlocution.
4. Avoidance of certain speaking situations.
5. Other evidences of fear and embarrassment.

APPENDIX K. Flow Chart of Subjects Used in This Investigation

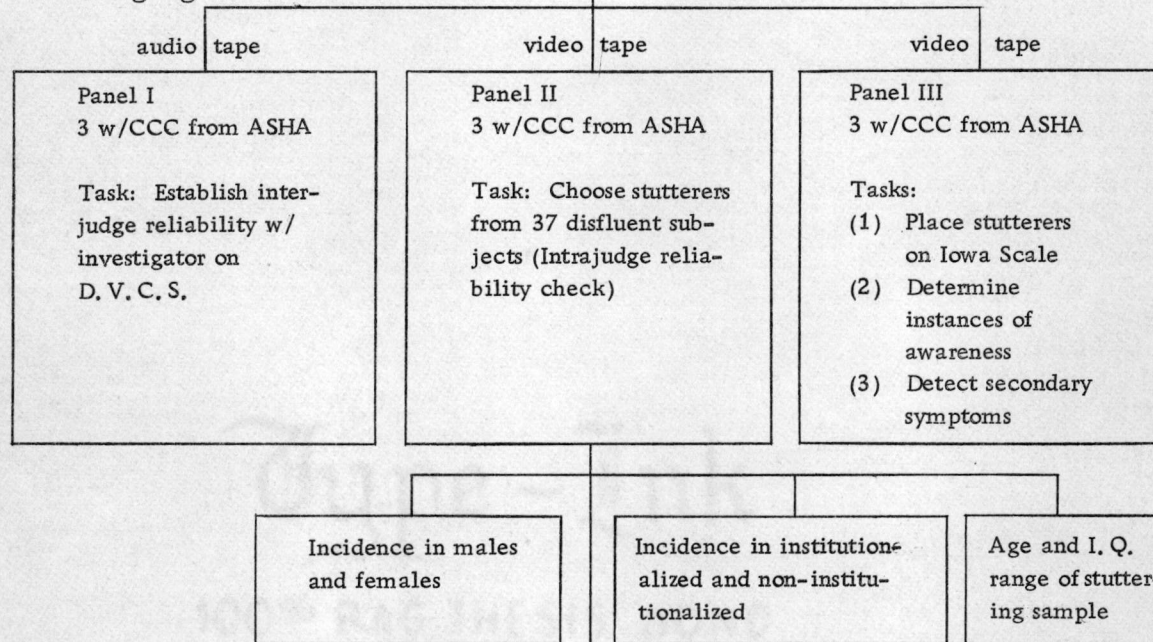


APPENDIX L. Flow Chart of Procedures Employed During This Investigation

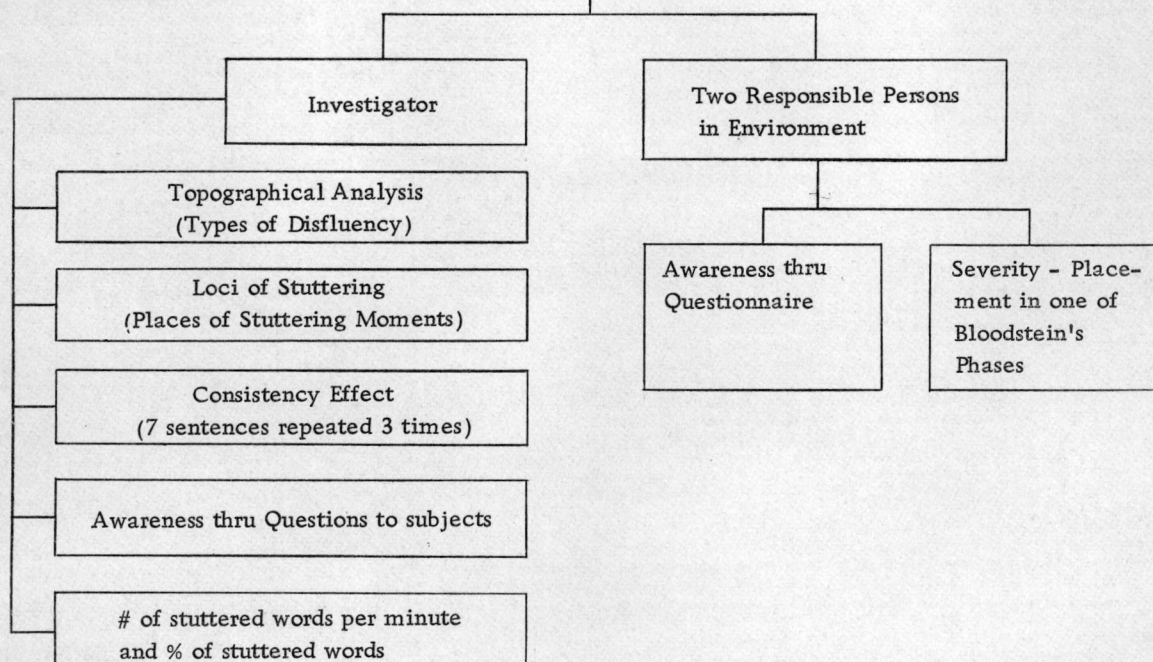
I. Interviewing Phase

Investigator selects those subjects w/3 disfluencies from 200 mongoloids interviewed

II. Judging Phase



III Follow-up Phase



APPENDIX M. Outline of the Various Kinds of Data Determined in
This Study

I. DESCRIPTIVE FEATURES

- A. Incidence of Stuttering in mongoloids
- B. Non-Verbal Composition of mongoloids judged to stutter
 - 1. Incidence of stuttering in male and female mongoloids
 - 2. Incidence of stuttering in institutionalized and non-institutionalized mongoloids
 - 3. Age range of mongoloids judged to stutter
 - 4. I. Q. information on mongoloids judged to stutter
- C. Language Development of mongoloids judged to stutter
- D. Severity of Stuttering in mongoloids
 - 1. Number of Stuttered Words per minute
 - 2. Percentage of Stuttered Words
 - 3. Placement on the Iowa Scale of Stuttering Severity
 - 4. Placement in one of Bloodstein's Four Developmental Phases
 - 5. Secondary Symptoms evidenced by Stuttering Sample
- E. Awareness of Stuttering within the Stuttering Sample
 - 1. Evidence of awareness in video-taped samples
 - 2. Evidence of awareness as determined through use of Questionnaire given to two persons in environment
 - 3. Answers to the Investigator's Questions about awareness on the part of the Stuttering Sample

II. DISTINCTIVE COMPONENTS

- A. Consistency Effect
 - B. Loci of Stuttering
 - C. Topographical Analysis
- } of disfluencies evidenced by the Stuttering Sample

Typed by Barbara Glenn