ANALYSIS OF SPEECH OF STUTTERER S

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MAY 1984

Dedicated to:

MY BELOVED PARENTS

CERTIFICATE

This is to certify that the dissertation entitled "Analysis of Speech of Stutterer s" is the bonafide work in part fulfilment for degree of M.Sc., *Speech and Hearing of the student with the Register Number 7.*

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DECLARATION

I hereby declare that this dissertation entitled "Analysis of Speech of Stutterer s" is the result of my own study undertaken under the quidance of Shri N.P. Nataraja, Reader and Head *of the Department of Speech Science, All India Institute, of Speech and Hearing, Mysore, and has not been submitted earlier at any University for any other diploma or degree.*

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C H A P T E R - I

INTRODUCTION

> "Stuttering is primarily a puzzle, the pieces of which lie scattered on the tables of speech pathology, psychiatry, neurophysiology, genetics and many other disciplines. At each of these tables workers have painstakingly managed to assemble a part of the puzzle, shouting "Eureka", while ignoring the pieces of their own or other tables which fail to fit" (Van Riper, 1971).

Linguistics could be one such important discipline in which to look for the essential pieces of the puzzle that are still missing.

Investigations in the field of stuttering are being made to describe the stuttering behavior, to find the etiology of the problem, to find the factors maintaining stuttering, to find the factors bringing about spontaneous recovery and to find suitable therapy techniques to treat stutters.

Theories have come and gone. Neurophysiology, biochemistry and psychoanalysis have largely given way to learning psychology, feed back theory and linguistics as frames of reference for investigating stuttering (Bloodstain, 1977).

Though, many theories have been put forth to explain the problem of stuttering, till now there is no single theory which explains all the aspects of stuttering.

Stuttering has in fact received more attention than any other speech disorder and increasing number of investigations are being made to find the cause of stuttering, to explain the nature of stuttering and to develop suitable therapy techniques for stutterers.

The complexity of its manifestations and inconclusive findings of the research and mystry surrounding its etiology have made stuttering an unresolved riddle.

The literature on theories of stuttering runs into volumes. But we are yet to find a theory that explains everything about stuttering.

Johnson & Brown (1935, 1938) and Hahn (1942) reported more stuttering instances on initial consonants than initial vowels in their group through there was great individual variability.

Taylor (1966) confirmed Brown's findings and found that the adults stuttered more on the initial consonants of relatively

long words that are nouns, verbs, adverbs or adjectives, that occur early in a sentence. Silverman & Williams (1967) also noted similar findings in normal disfluency.

In contrast, Bloodstain & Gantmerk (1967) reported evidence that children's stuttering were distributed more or less randomly, with some tendency toward pronouns and conjunctions, a finding opposed by a research of Williams, Silverman & Kools (1969) who found the loci of both stuttering and normal disfluency to be same as for adults.

Wingate (1977) felt that the seemingly separate linguistic features associated with increased stuttering actually reflect a common quality - probably the ease with which a woniis said i.e., the "linguistic stress".

Thus it appears possible that a number of linguistic factors may be operating at any one point to make certain language unit more difficult for stutterers than others, (Hannah, & Gardner, 1968).

In recent years, laryngeal behavior in stutterers has attracted the attention of many investigators and several attempts

have been made to investigate various aspects of phonatory behavior in stutterers.

Few studies have pointed out that there was greater frequency of stuttering in passage which had both voiced and unvoiced sounds than in passage which had only voiced sounds (Adams & Reis, 1974; Coufal, 1976; Gayathri, 1980).

Thus the review of literature indicates that the study of linguistic aspects in stutterers speech will be useful in better understanding of the problem. Further there are no reports, available to the present investigator regarding the behavior of children while reading combined and voiced passage. Therefore it was considered that it will be useful to study the linguistic aspects of stuttering end the laryngeal behavior in adults and children.

Statement of the problem:

The problem was to find out the relationship between frequency of occurance of stuttering and various linguistic factors and to note the relationship betwen voicing and stuttering in adults end children.

The following hypothesis were putforth to study the above problem:

Hypothesis:

1) There will be no difference in the occurance of stuttering on vowels and consonants in case of children.

2) There will be no difference in the occurance of stuttering on different consonants in case of children.

3) There will be no difference in the occurance of stuttering on different vowels;in case of children.

4) There will be no difference in the occurance of stuttering on vowels and consonants in case of adults.

5) There will be no difference in the occurance of stuttering on different consonants in case of adults.

6) There will be no difference in the occurance of stuttering on different vowels in case of adults.

7) There will be no difference in the occurance of stuttering on consonants and vowels in children and adults.

8) There will be difference in the frequency of occurance of stuttering on content words and function words in ease of children.

9) There will be difference in the frequency of occurance of stuttering on content words and function words in case of adults,

10) There will be no difference in the frequency of occurance of different Characteristics of stuttering between adults and children.

(a) There will be no difference in the frequency of occurance of repetitions between adults and children.

(b) There will be no difference in the frequency of occurance of prolongations between adults and children.

(c) There will be no difference in the frequency of occurance of hesitations between adults and children.

(d) There will be no difference in the frequency of occurance of pauses between adults and children.

(e) There will be no difference in the frequency of occurance of omissions between adults and children.

11) There will be no difference in the frequency of occurance of different characteristics within the group i.e., within children and adults.

12) There will be no significant difference in the frequency

of occurance of stuttering while reading combined and voiced passages in case of children.

13) There will be no significant difference in the frequency of occurance of stuttering while reading combined and voiced passages in case of adults.

14) There will be no difference in the frequency of occurance of stuttering in reading voiced and combined passages, between adults and children.

Brief Plan of the Study:-

71 adult stutterers age ranging from 12-35 years and 11 children who were diagnosed as stutterers age ranging from 6-12 years were made to read 2 passages (one passage consisted of both voiced and unvoiced sounds and another passage had only voiced sounds. The readings were recorded using cassette tape recorder.

The recorded speech samples were analyzed with the help of 3 post graduates in speech pathology, to mark the sounds of words on which stuttering blocks had occured.

The judgments were further analyzed to note-

(1) Severity of stuttering seen in the groups.

(2) The type of stuttering blocks.

(3) Rate of speech.

(4) Syllable position.

(5) On consonants and vowels (phonemic characteristics)

(6) Content and function words, and to note

(7) the stuttering blocks in reading combined and voiced passages, both in case of adults and children.

Limitations of the study:

(1) Only limited number of children were taken in this study.

(2) Only reading samples were taken.

(3) Only the audible parts of the stuttering speech were analysed.

(4) All the linguistic factors could not be analysed.

Implications of the study:

(1) The study would reflect more on the operation of certain linguistic characteristics on the moment of stuttering.

(2) Only few studies in Kannada regarding the linguistic features in stuttering speech and the present study was an attempt at it. This, it was hoped, would throw some light on the universality of the stuttering with respect to the attributed linguistic factors.

(3) If there were any age related changes in these linguistic

factors in stuttering and speculation as to their relation to language maturity would be possible.

(4) Analysis of linguistic variables could help in evolving therapy techniques.

(5) Study of laryngeal behaviour in stutterers is useful in better understanding of stuttering.

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C H A P T E R - II

REVIEW OF LITERATURE

> "Stuttering is a baffling disorder for both client and clinician. It is amazing that such an ancient, universal and obvious human problem should defy precise description; despite countless scientific investigations, the basic nature and cause of stuttering still remain a mystery" (Emerick & Hatten, 1974)

Many people have considered stuttering as a puzzle and have tried to solve, but still no solution has been found.

The phenomenon of stuttering is described in different ways by different people to find out the causative factor/s and treatment. As a result there are a variety of definitions and theories. But, still there are lot of confusion regarding stuttering. This is reflected even in definitions of stuttering.

Considerable attempts are being made to put forth a 'common' definition of stuttering. Wingate (1964) has said that, "the definitions of stuttering vary on several dimensions: one kind attempts a fairly straight forward statement of speech characteristics, another implies denial that such a condition exists; other presumptively define in terms of etiology; others

offer a description of the full range of behavioral features observed in only some stutterers; end there are those which are some combination of the fore-going. In many definition* the speech characteristics are either taken for granted, compromised, or minimized."

Hegde (1978) has grouped the definitions into five different categories:-

1. Perceptual - judgemental definitions which restrict the term stuttering to certain forms of disfluencies.
2. Experimental - theoretical definitions which restrict the term to certain forms of disfluencies.
3. Definitions which do not consider disfluencies to be crucial and are based on avoidance behaviors.
4. Definitions in terms of unspecified moler moments, and
5. Definitions based on hypothetical variables.

Wingate's (1964) & Wan Riper's (1971) definitions come under the first category.

After a detailed analysis of the elements of stuttering, Wingate (1964) has offered a definition of stuttering:

"The term 'stuttering' means:

1 (a) Disruption in the fluency of verbal expression, which is (b) characterized by involuntary, audible or silent, repetitions or prolongations in the utterance of short speech elements, namely; sounds, syllables and words of one syllable. These disruptions (c) usually occur frequently or are marked in character and (d) are not readily controllable.

2. Sometimes the disruptions are (e) accompanied by accessory activities involving the speech apparatus, related or unrelated body structures, or stereotyped speech disturbances. These activities give the appearance of speech related struggle.

3. Also, there are not infrequently (f) indications or report of the presence of an emotional state, ranging from a general condition of 'excitement' or 'tension' to be more specific emotions of (a) negative nature such as fear, embrasment, irritation or the like, (g) The immediate source of stuttering is some inco-ordination expressed in the peripheral speech mechanism, the ultimate cause is presently unknown and may be complex or compound."

The first part, according to Wingate, denotes the core feature which have universal applicability; and, the second and third part identify other features which deserve mention. This definition will be used in the present study.

Of late, there is a shift from the belief in "the cause" of stuttering to 'causes' of stuttering i.e., the disorder has developed not from a single cause, but as the result of a complex interrelationship between many factors (Andrews & Harris, 1964).

Van Riper (1971) states that, "stuttering is primarily a disorder of the temporal aspects of speech, not of the articulatory, phonatory, or syllabic features. According to him, the mistiming could be attributed to organicity, to emotional stress or to a malfunctioning servo system."

Many theories have come end gone starting from the time of Aristotle (384 B.C) till today. But none of them have definitely indicated the fector/s which cause the stuttering behavior.

Early investigators like Aristotle (384 B.C); Galen (200 A.0); Dechauliac (1336), Mercuralis (1584) & Francis Bacon (1627) attributed stuttering as an organic condition. They thought that some defects in tongue, such as tongue tie, toe cold tongue, too wet or

too dry tongue cause stuttering. While others considered stuttering is due to dysfunction of some other articulatory organs like lips, or jaw or palate.

Few other early writers (Avicenna, 1037; Sarre d'Alais, 1829) thought that the larynx is abnormal in stutterers. This famous Arabian Physician (Avicenna, 1037) related stuttering to brain lesions, which inturn were the cause of the spasm of the epiglottis, which produced the stuttering symptom.

Attempts have been made to explain stuttering behavior on the basis of learning theories (Johnson, 1958, Johnson, Brown, Curtis, Edney & Keaster, 1967; Brutten & Shoemaker, 1967 and other people). Green & Wells (1927) have attributed the cause of stuttering to the difference in constitutional factor such as nervous system. Some other important theories are, cerebral dominance theory by Orton (1927); Travis (1931); Brynglson (1935); Conflict theory by Sheehan (1958); Diagnosogenic theory of stuttering by Johnson (1957); Anticipatory theory of stuttering by Wischner (1950), Disturbed auditory feed back theories (Van Riper, 1971; Lee, 1951; Black, 1951, Cherry & Sayers, 1956); Stuttering as a form of neurosis (Coriat, 1943; Fletcher, 1943; Barbara, 1954; Glaober, 1958) and other theories. However, there is no common agreement as to the cause and nature of stuttering.

Ainsworth (1972) ham classified the theories of stuttering into two types. Under the first type, he grouped those theories looking for an active agent which causes stuttering within the child. He states that, the "active agent" may be constitutional or psychodynamic in nature. Constitutionally, the exact agent may lie in the relatively generalized cortical activity affecting the speech areas (West, 1958; Eisenson, 1958), may involve relatively complex auditory feed back circuits (Mysok, 1960), or may be a more precise auditory feed back,disturbance (Stromstra, 1959). Psychodynamically, the interruption in neural flow may be triggered by a primary anxiety (Travis, 1972). Ainsworth (1972) has said that these theories consider stuttering as growing out of whet the individual is. According to him these theories tell: "This is the kind of person he is, therefore he stutters."

Ainsworth (1972) has stated that, on the contrary, there are theories that seek active agent outside the child-in the listener, in the immediate environment or in the culture itself (Johnson, Brown, Curtis, Edney & Keaster, 1967).

He also shows that some theories combine the possible "active agents" for example - certain attitudes within the child plus factors in the environment (Bloodstein, 1958) - or constitutional elements plus social pressures (West, 1958).

The causative factor or so called 'theories' which have been attributed to stuttering are too divergent to each other. After an attempt to integrate the theories of stuttering, Ainsworth (1971) has concluded that

"the process of attempting to provide a way of integrating the multiplicity of ideas and facts concerning the nature end sources of stuttering continues to be frustrating and fragmentary."

Attempts have been made to study stuttering from linguistic point of view, with the purpose of finding linguistic factors related stuttering.

The following linguistic variables have been studied by various investigators and are said to be related to the moments of stuttering;

1. Grammatical function.
2. Propositionality or information load.
3. Phonemic characteristics.
4. Sentence length.
5. Word length.
6. Word position in a sentence.
7. Word frequency.

Brown (1937) was the first person to study stuttering from a grammatical stand point. He noted that sutterers have more difficulty with content or lexical words (nouns, verbs, adjectives and adverts) as opposed to function words (prepositions, determiners, conjunctions, articles, possessive pronouns, etc.)

Hahn (1942), Eisenson & Horowitz (1945) and Oxtoby (1958) later confirmed Brown's findings. Hejna (1955) found similar results with the spontaneous speecn or stutterers.

Brown's findings of the grammatical factors of stuttering were also confirmed by Quarrington (1965), Schlesinger, Fore, Fried & Melkman (1965), and Taylor (1966). Williams, Silverman & Kools (1969) found it to be true of the disfluency of stutterers and nonstutterers of elementary school age.

Wingate (1977) questioned as to which level of communicative process; phonology or linguistic or behavioral pattern, was important in explaining the nature of the stuttering block.

Answer for his own questions were provided by Wingate (1977). He has said that, in connected speech in English, the content words -

those most likely to receive heavy stress. The functional words - those least frequently associated with stuttering, are most likely to receive weak stress and therefore stress may be a factor in determining stuttering.

Aborn et al (1959), Nicol & Miller (1959) attributed the greater problem on content word to the less predictability of content word compared to function words.

Blankenship (1964) also observed more stuttering on content words i.e., 63.6% of the time. The highest frequency occured on nouns (45.5%), articles (13.6%), verbs (9.1%) and adjectives (6.8%). Lexical item Preceded Stutterers 52.3% of the time and succeeded them 54.5% of the time.

The resultsof several investigations suggests that instance of disfluency may not be distributed at random in the speech of nonstutterers. Meclay & Osgood (1959) reported that the instances of disfluency tend to be associated with lexical then functional words.

Soderberg (1967) observed that prolongations tended to occur on lexical items (information - carrying words) while repetitions occured with about equal frequency on either lexical or function words.

Quarrington, Conway & Siegel (1962) did not confirm 'the Brown specificiation of a hypothesized grammatic gradient', through they also reported a high incidence on content words. They suggested that "the grammatical gradients" reported by aarlier studies may be a function of position which the grammatical forms take in English.

"It is conceivable that suttering in many young children is related primarily to grammatical uncertainity and in advanced stuttering both grammatical and lexical uncertainties play important roles. Of the two types of uncertainities, grammatical uncerteinity plays a more dominant role. According to the redundancy gradient hypothesis, high uncertainity at the beginnings of clauses regardless of word class, tends to elicit stuttering. In the medial position, high and low uncertainity may be significantly divided between lexical and function words respectively and consequently more stuttering occurs on final positions makes word class an insignificant variable and stuttering is likely to occur."

Contrary to the above findings, Bloodstain (1960) has observed that in the earliest phase of the disorder there may often be a tendency for stuttering to occur abundantly on pronouns, conjunctions and prepositions. In a later atudy, Bloodstein and Gantwerk (1967)

studied the speech sample of 13 stutterers between the ages 2-6 years. They found a tendency for stuttering to occur unusually often on pronouns end conjunctions and less often, in relation to chance expectation, on nouns and interjections. They remarked that incipient stuttering is characterized by greater difficulty with function words.

The relationship between grammatical function and disfluency has also been investigated in 15 normal speaking children aged 3 years 11 months to 4 years 10 months by Halmreich & Bloodstein (1973). Pronouns and conjunctions appeared in a significantly greater proportion among the subjects disfluent words than among their total words, while the content words had a significantly low frequency to disfluency.

This was in agreement with Bloodstain's (1960) previous findings, though a notable difference occured in the case of verbs. The findings were interpreted to be in general in accordance with the hypothesis that a continuity exists between early duttering and certain forms of normal disfluency.

These studies suggest the possibility of some grammatical factors in stuttering. Many studies have reported more stuttering on content or lexical woros while a few studies by Bloodstein and

others report more stuttering on function words other features of the content words like its proportional value, its length, frequency as opposed to those of the function words could possibly operates to bring more stuttering on content words. Thus the review shows that more controlled and elaborative studies both on normal disfluencies and on stuttering are required in this regard.

It refers to the meaningfulness of the material as related to stuttering. Eisenson (1958) considered stuttering as a transient disturbance in communicative, prepositional language usage. He concluded that a proposition which is a unit of meanginful linguistic content induces stuttering and nonsense material which is not prepositional does not do so. Probably because of this, the stutterers do not have considerable difficulty in speaking to children, inferiors and intimate friends.

There appears some overlap in the prepositional aspect and the grammatical aspect of stuttering. It is said that the lexical or content words are highly proportional or are those which carry most of the information in a sentence.

Brown (1945) opined that "it seems reasonable to assume that the desire to avoid stuttering is greatest at those points

in the speech sequence which the stutterer feels ere most conspicuous and important." Blankenship (1964) concluded that this desire probably shared by speakers in general at points of high information i.e., at the content words. It is also true that every speaker is "conscious to some degree" that words of one kind are more important to "conveying what he is trying to say and that these words are more important to meaning......."

Both stuttering end normal hesitations ere said to be associated with points of high information or statistical uncertainity in the speech sequence (Boomer, 1965; Goldman, Eisler and others, 1958).

lanyon (1968, 1969) thought that increased stuttering is related to the greater difficulty of speaking long words than to their information value. However, Soderberg (1971) showed that these discrepant findings could well have resulted from an interaction effect occuring between long words and information on disfluency types. He demonstrated that repetitions were associated with long, low-information words and prolongations with long, high-information words. These results indicate thet more difficult decision making is involved in prolongations

than in repetitions. When long words were eliminated and when sampling of one-syllable words was sufficiently large, stuttering in general related to high information words.

Goldman-Eisler (1958) led the way by showing that the hesitation pauses in normal speech tend to reflect verbal planning. They occur at points of greatest uncertainity which by implication from communication theory, means that they are also points of highest information. Subsequently, several investigators have demonstrated that stuttering too is associated with high points of information (Quarrington, 1965; Schlesinger et al, 1965; Soderberg, 1967; Taylor, 1966).

Apart from a few studies, most of the studies cited above suggests the possibility that propositionality could be an important determiner of stuttering.

Whether stuttering will occur or not seems to depend on the characteristics of the first sound of the word or the first sound of the syllable (Van Riper, 1971). There are a number of studies which have investigated whether stuttering occurs more on vowels or consonants and if there is any relation between the sound characteristics and the occurence of stuttering.

Blumel as early as 1930's has proposed that stuttering is due to a delay in vocalization, i.e., inability to produce voice.

Kenyon (1940) has stated that "it is easy to show that the difficulty of the stutterer is in some way connected with the production of the vowel and that the consonant is not the obstacle. He gives the following evidence to support his view;

1) The stutterer usually prolongs the consonants for several seconds. He has no difficulty with the consonant, which is prolonged only because the vowel is delayed.

2) Also, in stuttering the consonant is repeated only because the succeeding vowel refuses to appear.

3) If his difficulty were with the consonant he would stammer quiet as much at the end of the word as he does at the beginning, and stuttering on the ending consonant dees not occur.

4) The stuttering often occurs on the beginning vowel of a word and therefore the difficulty does not tie with the consonant.

5) Singing differs from speech chiefly in the manner in which the vowel is produced and thus it is evident that the stutterers'trouble is due to a delay of the vowel. This is true of whispering also, because in whispering no phonation occurs.

Wingate (1969) has said that whether one observes a repetition or prolongation, the difficulty is not manifested in the articulatory postures essential to the sound, but instead in moving on to the succeeding ones. He has described stuttering as "Phonetic transition defect".

Fairbanks (1937) has pointed out that the sounds which are more difficult for stutterer require in general more rapid and precise articulation and phonation and necessitate the most extreme and active use of the speech mechanism. He found a significant correlation between the difficulty of sounds for stutterers and their difficulty for 2 years old children.

In a study by Brown (1938), 32 stutterers read a list of 10,000 words. For the group as a whole and in the majority, consonants were more difficult than the vowels. To check on the possibilities of factors other than the phonetic ones (grammatical function of words and their position in sentence), simple words were arranged in hapazard order in the reading test, without any connected meaning.

Results indicated that other than phonetic factors were operating to influence the locus of stuttering. It was found

possible to arrange them in a rank of difficulty but the grammatical factor was more consistent than the phonetic one and could exist independently of others. Stuttering was more likely to occur on accented than unaccented syllables. In his subsequent study, Brown (1945) has reported that stuttering tended to occur on consonants other than /t/, /h/, /w/ and / /.

The higher pitch, increased intensity and longer duration were agreed upon by Schramn (1937) as fundamental characteristics of accented syllables. Thus they require greater activity and increased tension of the speech mechanism. This was given as a physiological explanation for the stutterer's difficulty on these sounds. The psychological component that was attributed to the difficulty of consonants over vowels was that the consonants give clarity and distinctness to speech and hence for meaning. Stuttering is said to be the result of a complex interaction of both.

However, it was questioned that if certain grammatical and semantic functions and certain positions make stuttering more likely, why doesn't every stutterer have difficulty on every word performing such functions or in such positions?

A marked difference between consonants and vowels was found (Hahn, 1942) and only 2.9% of the stuttering occured on words beginning with a vowel. He had his 50 adults stutterers read 550 words reading selections in four socially related varied situations. The conclusions drawn by him were:

(1) It is possible to arrange the sounds in a rank order in terms of difficulty according to median and mean percent of stuttering experienced in relation to each sound. The five sounds associated with greatest amount of stuttering are: g, d, th (unvoiced), 1 & ch.

(2) The ranking can be compared with that of Johnson & Brown (1935) with fair correlation. The g, d, l, th (unvoiced), ch & m in the large percentages and f, s, sh, wh, th (voiced), w and h in the smeller percentages.

(3) Though a general ranking can be set up for a group, individual stutterers vary widely on sounds associated with stuttering and amount of stuttering on a specific sound.

(4) Ranking of difficulty of sounds can not be said to show the influence of physical factors in sound formation. Voiced and voiceless plosive consonant classification, or the location, direction and duration of movement in the sound formation seem to have

little bearing on the formation of the general ranking of difficulty of sounds in stuttering,

(5) Stuttering occurs predominantly on consonants than vowel.

(6) The preponderance of stuttering occurs on initial sounds. The majority of the initial consonants associated with stuttering are at the beginning of accented syllables.

Hunt (1967) regarded the stuttering to occur not on consonants alone but that it may extend to all sounds including vowels. He classified the stuttering as vowel stuttering and consonantal stuttering. The vowel 'u' (as in 'rude') and 'o' seemed to offer greater difficulty than 'e' (as in 'ebb') or 'i' (as in 'it').

In the consonantal stuttering, disfluences were chiefly found to occur on the utterance of explosive consonants and their medials as p, t, k, b, d, m, & c. The aspirated and continuant sound as f, w, s & c offered much less difficulty, as the oral canal was not so completely closed as in explosives. This does not mean that it is on account of difficulty of articulating explosive because he often repeats these sounds in a rapid succession. It is the enunciation of the following sounds, be it a vowel or a consonant which is his difficulty, he cannot join them. It is therefore, during the transition from one

mechanism to another that the impediment chiefly takes place. It is the disturbed relation and the antagonism between the vocal and the articulating mechanism which give rise to stuttering; the spasmodic condition of the flottis which takes place in the explosive sounds is the 'effect' and not the cause of the disturbed relation.

Stuttering also occurs more often on consonants than on vowels (Wingate, 1977). He has stated that the repeated phone or a postured phone is moat often on consonants. In an instance of repetition, according to him, the consonant is actually being made too often, and in the case of postured phone, the phone is produced well if the speaker moved on. In both the cases he has said that the stutterer is not moving on. The actual difficulty is in the following sound - which is usually a dipthong or a vowel. Then stuttering is always said to occur most often in the attempted production of a stressed vowel.

Speaking movements, also have been suspected by many as contributing to the occurance of stuttering events. He has argued that such movements were present, irrespective of whether the vowel is stressed or not stressed. He has concluded that stuttering occurs almost exclusively with the stressed version, regardless of the grammatical or structural characteristics of the word.

Wingate (1977) has stated that the basic problem in the stutterers is with stressed syllables. He has compared the 'exemplary' recording with intensity peaks (accepted as stress) with occurance of stuttering. He has concluded from his results, that the stuttering corresponded with the intensity peaks. He has also said that stuttering always occurs in the attempted production of a 'stressed' vowel. Further he states that the linguistic stress, essentially a phonatory event was the prominent feature in the instances of stuttering. He emphasizes the fact that linguistic stress has beenignored for a long tine.

After studying the role of the initial phoneme in the stuttering of spontaneous speech, Hejna (1955) has concluded that consonant tended to be associated with more stuttering. However, no significant trend among the various consonants was noted. Bloodstein (1958) has noted that the trouble with consonant than vowel may be due to the fact that consonants are distinguished from vowels by a degree of stoppage or impedance of air stream, involving greater articulatory tension. Van Riper (1963) has attributed it to differential learning experiences.

Soderberg (1962) has investigated the frequency and the duration of stuttering instances that were associated with vowels, voiced consonants and voiceless consonants. Three lists of five

syllable phrases were recorded by 15 stutterers reading to two listeners. Each list contained 15 five syllable phrases totalling 50 words. In list one, all initial sounds of words were vowels; in list two, they were voiced consonants; and in list three, voiceless consonants. Semi vowels end consonant blends were omitted. The lists were equated for word frequency, readability, word length, position of the word, its accent and the grammatical function of words. The results showed no evidence of differences among vowels, voiced consonants and voiceless consonants with respect to mean frequency of stuttering instances.

Soderberg's design was criticized by Taylor (1966) as tending to minimize any vowel-consonant differences. In her well controlled study, she had observed more stuttering on consonants contexts were not those found by Brown & Hahn( ). This was attributed to individual variability.

If the correlation between stuttering and anticipation can be accepted, the studies on loci might be interpreted to mean that there is more phonemic fear on consonants rather than in the medial or final position of the word, and perhaps more on plosives than on continuants (Van Riper, 1971).

From the accumulated data on stuttering, it appears that stuttering occurs more on consonants than on vowels. However, it

has been suggested in the 'recoil of vowel' theory that stuttering occurs on the consonant sound because the succeeding vowels fail to appear.

Further, it is suggested that the problem is due to disturbed relation between the vocal and articulatory mechanisms leading to impaired transition for alternative phonations (vocalization) that is required for speech.

The studies dealing with sentence length as related to stuttering have been conducted.

In one of the study conducted by Tornick & Bloodstain (1976) used 20 pairs of sentences. One set consisted of short sentences and the other set had long sentences, the initial segments of each of these were made of those in the short sentences. These twenty sentences were read by 20 stutterers in random order. Only the words which the pairs of sentences had in common were compered for occurancs of stuttering. Significantly more stuttering was found on the same words when they served as the initial segments of long sentences than when they stood alone as short sentences. The results seem to give evidence of the role of motor planning, or anticipated motor complexity in stuttering. The increased stuttering was supposed to be caused by the subjects perception of

or preparation for, the greater length of the long sentences. This may be said to have some significance to either anticipatory struggle or breakdown views of stuttering.

Further studies of word length and stuttering have been carried out. Most of the research indicates that the longer words are stuttered more frequently than the short ones whether measured by number of syllables or number of letters. (Brown, 1938, 1945; Brown & Moren, 1942; Milisen, 1938; Hejna, 1955; Soderberg, 1966, 1971; Taylor, 1966; Wingate, 1967; Lanyon, 1969; Silverman, 1972; Danzger and Halpner, 1973).

Brown (1945) reported that stuttering are not randomly distributed in the speech of stutterers but tend to occur on words which are five or more letters in length (or those which are longer than the average word).

In a study by Soderberg (1966) recorded nine 10 word lists composed of combination of three levels of word length and three levels of word frequency of twenty stutterers. He equated the word lists for stress of initial syllable, grammatical function and initial sounds of words. The results showed a significant frequency of stuttering to be associated with increases of word length and decreases of word frequency. However, word length was the more potent of the two variables.

The explanation for the influence of long words on stuttering appears to be the general rule that stuttering tends to vary with the demands that speech makes on motor planning. This may be evidenced by increased stuttering with increased rate of speech (Johnson & Rosen, 1937), with frequency of usage of words and more stuttering in connected speech as opposed to isolated.

Eisenson (1975) suggested that the longer words may be anxiety producing because of the stutterer's lack of familiarity with them. They may also be words that, because of lack of occurance and practice do not provide basis for familiar or habitual articulatory set.

In general, it appears from the above findings that longer words are stuttered more often than short ones. Many kinds of explanations have been given by various authors regarding this phenomenon. These include the reduced frequency of occurances of long words as opposed to short ones, lack of familiarity, with those words which leads to lack of practice in getting habitual articulatory set. Others attribute it to demands made by long words on motor planning. Still others feel that the psychological reaction of the speaker towards the long words because of their greater duration may result in greater disfluence on these words.

Word position in a sentence end stuttering has been subjected to experimentation and many studies in the literature have revealed the relationship between the word position in a sentence and stuttering. More stuttering was observed on the first word of a sentence, less on the second word and even less on the third (Brown, 1938, 1945).

Taylor (1966) has shown that the word position was a more important determiner of the loci of stuttering than either the length of the word or the phonetic characteristic of the syllable.

It has been reported that more stuttering occured on initial word clauses than on subsequent words even though initial words were more typically the function words and pronouns, while, final words were more often the lexical class (Soderberg,1967) Bloodstein and Gantwerk (1967) have also found that very young stutterers had more trouble on the first words of their utterances.

The above studies confirm that occurance of stuttering is related to the position of the word in a sentence.

Word frequency end stuttering has been another aspect of which has received the attention of researchers. Word frequency has been said to be closely related to the aspect of word length in stuttering. Research concerning the effect of word length and

word frequency on stuttering (Brown & Moren, 1942; Hejna, 1962) has not demonstrated thoroughly the independence of these variables in their relationship.

Bloodstein (1974) has made further advancement in his tension and fragmentation hypothesis of stuttering speech. He has analyzed brief speech samples of six children between the ages 3-6 years, on the basis of a conceptual model of stuttering as tension and fragmentation in speech. The hypothesis advanced states that while the older stutterer tends to fragment words, the early phase of stuttering is characterized chiefly by fragmentations of whole syntactic structures as sentences, co-ordinate and subordinate clauses, verb phrases, noun phrases and prepositional phrases. This was suggested by the prepodnerance of repetitions of words and other large segments, by their occurance at the beginnings of the syntactic structures by their absence from the ends of such structures.

It was assumed that much if not all of the directly observable stuttering behavior would disappear if not for the underlying muscular tension. The other possible effect of the speaker's belief in difficulty of a constituent element of speech is fragmentation. When a stutterer perceives the whole element as too difficult to articulate smoothly and automatically, he may react by saying just the first part of it, and may do this again and again

until he finds the conviction to attempt all of it at once. The surface expressions of fragmentations are repetitions and other forms of stoppage in the flow of speech. This would explain why stoppage and repetitions almost always occur on first sound or syllable or word and almost never on the last.

According to Bloodstain, the fragmentation of words (which produces sound or syllable repetition) that is typical of developed stuttering has its origin in an early stage of fragmentation of higher order constituents of language. He attributes the failure of young children to fragment words to their limited awareness of individual words as such. There is no word bround grammatical factor as such in young children (Bloodstain and Sputwerk, 1967). In addition it is assumed that excessive stuttering on words beginning with consonants as opposed to vowels, on long words as opposed to short ones, on words of low frequency in the language, or on words of high 'information-load' is not expected, except to the extent that any of such words tended to occur frequently as the first words of syntactic units.

A good deal of data that has accumulated reveals that stuttering involves the linguistic level of communication process (Wingate, 1977). After analysing the major dimensions of linguistic feature associated with increased stuttering he opines that there is considerable overlaping among them. For example, content words

clearly tend to be longer than the function words; they are also regularly less familiar than function words; they also occur most frequently near the beginnings of the utterances. According to Wingate (1977) this overlap suggests that the seemingly separate dimensions actually reflect a common quality. Probably the ease with which a word is said. He thinks this common element is to be found in the dimension of linguistic stream, because it is felt that it could explain the other linguistic dimensions of stuttering occurance. In connected speech, it is the content words that regularly contain the stress peaks, whereas the function words rarely do. It can also incorporated the findings of more stuttering on longer words and on leas familiar word since, length and familiarity are essential aspect of the content - function distinction.

"It is thus possible to account for the immediate or phenominal nature of the 'stuttering block' at the phonatory level by assuming the linguistic stress to conceive the central role. The execution of stress prominences in the speech stream is essentially a phonatory function; i.e., the expression of linguistic stress is a function of increased emerging of several actions fundamental to phonation. This explanation clearly reflects a performance (i.e., motor, physiological) difficulty rather than a reactive (i.e., psychological) one". (Wingate 1977).

In a study, Geetha (1979) has attempted to find out the linguistic characteristcs of stuttering, in Kannada language, of 15 stutterers by analysing their spontaneous speech and reading samples. She has concluded that,

(1) The content words are stuttered more often than the function words.

(2) The consonants in general were stuttered more often than vowels. However, stuttering was found on vowels also and in a minority of cases vowel stuttering was more than the consonant stuttering.

(3) Word position in a sentence did have an influence on stuttering. In all cases, though the stuttering was noticed even in word positions beyond the 10th, the stuttering was more concentrated near the first few word positions. There was in general a gradual decrease in the frequency of stuttering with increasing word position.

(4) The syllable position in a word is significantly related to the frequency of stuttering over it i.e., in most cases, the first sound or syllable position of a word is the determiner of stuttering than the medial or final syllables.

(5) There is no difference between the adult and child stutterers in terms of their repetition characteristics of various

linguistic unite as syllable, word, part word, phrases and sentences.

(6) With respect to syllable structure, maximum stuttering was observed on C.V. syllables and the next in the order was V syllable.

(7) In the group, the syllable repetition occured most often followed by the repetitions of words, phrases, part words. Sentences were rarely repeated.

In the above study, it appears that the linguistic factors are important dterminers of stuttering though other factors may also influence it. As suggested by Van Riper, in each individual end in each instance of stuttering, any one or more of these linguistic factors may be operating. But the shortcoming of this study are:-

(1) Subjects were not well matched with regard to age, sex and socioeconomic factors, etc.

(2) Only audible parts of the stuttering speech were analysed.

(3) All the linguistic factors were not analysed.

From the above review of literature on the linguistic factors, suggests that stuttering is related to many of these factors. Stuttering is said to occur more on content or lexical

words (nouns, verbs, adjectives and adverbs) than on function words (prepositions, determiners, conjunctions, articles, possessive and pronouns). Stuttering is reported to occur more on words with high prepositional value; words which ere longer; words which are less frequent and thus less familiar; words which occur in the initial position of sentences more often then those in medial or final position. Initial sound of the utterance is also reported to affect the occurance of stuttering. Consonants in general were reported to be the paints where maximum stuttering occurs compared to vowels. Individual variations have been observed with regard to the particular consonants stuttered. However, Schwartz (1974); Wingate (1977) and others thought the problem is at the phonetic level and Wingate provides evidence for his belief that the linguistic stress plays a central role in the phenomenal nature of the stuttering block.

In recent years, laryngeal behaviour in stutterers has attracted the attention of many investigators and several attempts have been made and are being made to investigate various aspects of phonatory behaviour in stutterers.

Wyke (1970, 1974) believed that stammering is a manifestation of phonatory ataxia, resulting from temporal dysfunction in the operations of the voluntary and reflex mechanisms that

continuously regulate the tone of the phonatory musculature during speech. He distinguished 2 clinical types of stammering. "Voluntary or cortical stammering" could arise from genetic, acquired or emotional inability to produce accurate voluntary presetting of the phonatory musculature for the utterance of particular sounds. The second type is called "reflexogenic stammering". It is the defective reflex maintainance of the prephonatory posture. This would lead to repeated Stress-' provoking voluntary efforts to override unconscious reflex dysfunction, by rapidly repeated voluntary resetting of the musculature and consequent reiteration of the initial sound in the word being uttered.

Schwartz (1974) has attempted to explain the 'core of the stuttering block'. He believed that "the disorder is essentially an inappropriate, vigorous contraction of the posterior crico-arytenoid in response to the subglottal air pressures required for speech." He has further added that "this response occurs as a result of psychological stress which, in stutterers, substantially reduces the effectiveness of the normal supramedullary inhibitory control on the muscle." He has said that if the speaker has difficulty in this function, his voice onset time would be increased.

Conture, Mc Call, Brewer (1974) and Conture (1977) have studied the laryngeal activity accompanying part word repetitions

and sound prolongations in stutterers using nasolaryngoscope. Part-word repetitions were different from fluent productions of the same speech segment in terms of separation of posterior aspect of vocal folds. The majority of sound prolongations were similar to fluent productions of the same speech segments in terms of adouction of the vocal folds.

In the discussion of their study they have putforth the following hypothesis:

(1) That each type of stuttering is associated with a different pattern of laryngeal muscle forces.

(2) The laryngeal behavior associated with certain stuttering is related to simultaneous contraction of adductor and abductor muscles.

(3) That sound prolongations are different from fluent utterances in terms of muscle activity levels.

(4) That the laryngeal behavior observed to be associated with each type of stuttering results in vocal quality characteristics peculiar to stuttering.

Laryngeal muscle activity during fluent and stuttered utterances have also investigated by Freeman & Ushijima (1974, 1978). Simultaneous recordings were obtained from eight laryngeal muscles. Adequate number of stuttered tokens were obtained by

having their subjects read a selected prose passage. Fluent speech samples from the stutterers were secured by repeated readings and by the use of selected fluency evoking conditions including: choral reading, rhythm reading, reading in presence of noise and reading under delayed auditory feed back. Analysis has revealed that stuttering events were accompanied by high levels of laryngeal muscle activity and disruption of normal reciprocity between abductor and adductor, muscle groups. Results were interpreted as demonstrating the existence of a laryngeal component in stuttering.

Starkweather, Hirschman & Tannenbaum (1976) have also found that stutterers were slower in initiating vocalization when compared to normals.

Adams & Reis (1971, 1974) have found that there was greater frequency of stuttering in passage which had both voiced and unvoiced sounds than in the passage which had only voiced sounds. They also found that the adaptation rate was faster in the latter. They have concluded that the frequency of stuttering was related to the onset of phonations required. But Manning & Coufal (1976) found that the difficulty in both stutterers and non-stutterers was during voiced to voiced transitions than, during voicless to voiced, voiced to voiceless and voiceless to voiceless phonatory transitions.

Mackenzie (1955) has found a complete reduction in stuttering for the stutterers who had used electrolarynx. Other reports (Oldray, 1953; Irving & Webb, 1961) have shown that laryngectomized stutterers who had learnt esophageal speech did not show any stuttering.

One of the factor which has bean pointed out as an evidence of faulty phonatory function in stutterers during stuttering behavior is the increase in voice onset time (VOT) in stop consonants in stutterers than in non-stutterers.

Voice onset time (VOT) is defined as the interval of time measured from the release of an initial stop to the onset of vowel periodicity.

In addition, VBT and VTT studies have shown that the laryngeal behavior in stutterers are different when compared with normals. Many studies have found longer VOT's in stutterers, even during their fluent speech (Agnello & Wingate, 1972; Basu, 1979).

Adams & Hayden (1976) hypothesized that the stutterers have difficulty in initiating and terminating phonation independent of the acts of running speech. 10 young adult stutterers served as the experimental group. They were matched for age and sex with

10 normal speakers. Subjects from both the groups were tested individually. The experimental task required that the subjects start and stop phonation as quickly as possible, upon hearing each member of 1000 Hz pure tone series appear and disappear. Subject's vocalizations were permanently recorded using an optical oscillograph. Stutterers performed significantly poorly than normals both in terms of prompt starting and stopping of voicings.

Starkweather, Hirschman & Tannenbaum (1976) have instructed 11 stutterers and matched controls to produce each of twentysix different syllables as quickly as possible following a visual stimulus. Three trials were given for each syllable. The results suggested that the stutterers were slower in initiating vocalization across a wide variety of syllables end that the differences averaged by about 65 msecs. The results were interpreted as suggesting that auditory dysfunction cannot be a cause for the slower vocalization reaction time in stutterers. But, that either vocal dysfunction or a lack of cerebral dominance may be responsible for these differences.

Agnello, Wingate and Wendehl (1974) used a modified measure of VOT and VTT to compare stutterers and nonstutterers. Twelve children with normal fluency, twelve children with stuttering, twelve adults with normal fluency and twelve adults with stuttering served as subjects. Mean age of children was 6.5 years and mean

age of the adults was 28.6 years. Significant differences between VOT and VTT of children and adults were found. Children with stuttering had longer VOT then their normal counterparts. Adult stutterers lagged in VOT and were statistically slower in VTT than their adult counterparts.

Thus, the VOT and VTT studies suggest that the stutterers have difficulty in initiating and terminating phonation independent of the acts of running speech, they are slower in initiating vocalization across a wide variety of syllables, and they have slower VOT's even during their fluent speech.

VOT and VTT studies have also lead researcher to conclude that abnormal laryngeal mechanism is found in stutterers. In addition, therapies which have focused, the attention towards the stutter's laryngeal function have yielded good results.

Perkins, Rudas, Johnson & Bell (1976) studied the effect of lipped rehearsals, whispered rehearsal and loud rehearsals in stutterers. The experiment was undertaken to determine the effects. On stuttering and speech rate, of systematically simplifying the complexity of phonatory and respiratory co-ordinations for speech. They said that the complexity of phonatory adjustments can trigger disco-ordinations of the activities in prolongations,

repetitions and hesitations in stuttering. Though, these motor co-ordinations occur at the physiological level, they said that they can be observed best, at a behavioral level. The results of their experiment suggested that aloud rehearsal resulted in significantly greater adaptation than lipped rehearsals and whispered rehearsal. They said that stuttering is due to disco-ordination of phonation with articulation and respiration.

Adams & Reis (1971) reported that there was significantly less stuttering and that more rapid adaptation occured with 'all voiced' passage when compared with the passage which had both voiceless and voiced sounds. In the latter, the subjects had to effect more off-on phonetory adjustments than in the former. Latter, in the replication of this study (Adams and Reis, 1974), they confirmed the difference in the rate of adaptation, but found that there was higher initial frequency of stuttering in both the passages. They maintained that the fluency is dependent on the correct timing and prompt smooth initiation and maintainance of air flow and glottal vibrations.

Another investigation by Manning and Coufal (1976) compared the speech of 11 adult stutterers and a matched group of 11 nonstutterers. Four types of phoneme to phoneme transitions

were compered. The results indicated that both the groups had a lower percentage of disfluencies during voiced to voiced transitions than during voiceless to voiced, voiced to voiceless and voiceless to voiceless phonatory transitions. They suggested that continued investigation of phonatory aspects of stuttered and non-stuttered disfluencies is essential.

Gayathri (1980) investigated some aspects of phonatory behavior in stutterers. The aim of her study was (a) to test if different degrees of voicing during repeated reading of a passage, bring about difference in the amount of adaptation in stutterers, (b) to test if there is any relationship between the frequency of stuttering and the onset of phonation invaried contexts: syllables, word list and passages in stutterers, (c) to test if there is any relationship between the frequency of stuttering and the accurance of stressed syllables in stutterers.

It was concluded from the three experiments that:

(1) Varying degree of voicing during rehearsals bring about significant differences in the amount of adaptation. Greatest amount of adaptation occurs when there is involvement of voicing during the rehearsals as in aloud rehearsals and whispered rehearsals.

(2) Stutterers have greater frequency of stuttering when transition from voiced to voiceless or voiceless to voiced consonants

is required. This is indicated by greater frequency of stuttering in 'combined' passage and 'combined' word list when compared with the frequency of stuttering in 'voiced' passage and 'voiced' word list. The adaptation rate is also faster in a 'voiced' passage. Therefore the stutterers have lesser difficulty when transitions from voiced to voiceless consonants are not required and vice versa.

(3) Stutterer stutters more often on the non-stressed syllables preceding the stressed syllables. This may be because, the stutterers have difficulty in moving on the following stressed syllables and keep repeating or prolonging the preceding syllable. Stuttering is rare during the transitions from the stressed syllables to the following nonstressed syllables. Stuttering is also less frequent during the transitions from non-stressed syllables to non-stressed syllables.

The results of the 3 experiments suggested that the phonatory behavior in stutterers is not normal. Therefore, any theory which tries to explain the problem of stuttering must also account for the phonatory behavior in stutterers.

Many others have suggested that the laryngeal behavior is different in stutterers when compared to normals.

Thus the review of literature, suggest that the laryngeal

behavior in stutterer is different from that found in normals.

However, the behavior of children in reading the voiced and combined passages has not been studied. Further a comparison of children and adults in terms of their behavior in reading combined and voiced passages is not available.. It may be possible to develop a diagnostic procedure to differentiate children with stuttering from children with other stuttering like behavior by studying the behavior of children with stuttering in reading the combined and voiced passages.

As the review of literature indicates the study of behavior of children and adults with stuttering while reading in terms of linguistic characteristics are scant. The study of such behavior will be useful in better understand the stuttering in children and adults. Thus there is a need for studying the behavior of children and adults in reading combined and voiced passages. Therefore, the present study has been taken up.

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C H A P T E R - III

METHODOLOGY

The purpose of this study was to collect speech sample of stutterers, while reading the passages and to analyze to note the relationship between the various linguistic factors and stuttering in adults and children. Further, it was also intended to study the stuttering behavior of adults and children in a reading and a combined passage (consisting of both voiced and unvoiced sounds) and a voiced passage (consisting of only voiced sounds). For this purpose, it was decided to use the combined and voiced passages developed by Gayathri (1980).

TEST MATERIALS:

Two Passages 'Voiced' (passage - A) and combined (Passage -B) were used as test materials. Both the passages were meaningful and non-emotional. Passage-B was selected from a Kannada Test. This passage had voiceless consonants, voiced consonants, vowels and diohtongs. Passage-A was constructed so that the passage had no voiceless consonants. The words for the Passage-A were also selected from the same text. The number of syllables in each of the passages-A and B were 124 and 139 syllables respectively (Appendix-I).

SUBJECTS:

Table Nos 1(A) and 1(B), shows the distribution of cases age wise and number of subjects in each group i.e., adults and children.

Table 1(A)

Age range in years	N
5-10	6
10-15	16
15-20	23
28-25	21
25-30	8
30-35	8

Table 1 (B)

Groups	N	Age range in years
Adults	71	12 - 35
Children	11	6 - 12

The subjects who selected based on the following criteria:-

1. They had Kannada as their mother tongue,
2. They could read Kannada materiel from a magazine.
3. They did not have any known organic problem.
4. They had stuttering as diagnosed by a speech pathologist of AIISH and the investigators.
5. They were free from any other speech and hearing problem.

The subjects who had visited at AIISH for their problem and those who had visited the speech and hearing camps conducted by AIISH and diagnosed as stutterer by qualified Speech Pathologist, were included for this study. The subjects who had difficulty in reading were excluded from the study.

READING AND SPEECH SAMPLE:

(a) Instructions: Each of the subjects was requested to read aloud the given passages (the specimen copy appended) as he would normally read. These instructions were given in Kannada follows:-

" ನಾನು ಈಗ ಈ ಪುಟ ನಿಮ್ಮ ಕೈನಲ್ಲಿ ಕೊಡ್ತಿನಿ. ಇದನ್ನು ನೀವು
ಮಾಮೂಲಾಗಿ, ಹ್ಯಾಗೆ 'ಓದೆತಿರೆಲ್ಲಾ', ಅದೇ ತರಹ ಜೋರಾಗಿ 'ಓದಿ.
'ಏನಾದರೂ ಕಷ್ಟ ಆದರೆ, ಅಥವಾ ಪ್ರಶ್ನೆ ಇದ್ದರೆ, 'ಓದೋಕೆ ಮುಂಚೆ ಕೇಳಿ"

Thus the subjects were instructed and those who had difficulty in reading the passage, were not included.

(b) Reading; The recording were done in quiet rooms so as to get the clear recording. A National Panasonic Portable Cassette Recorder (No. RQ 512) with a unidirectional microphone and sony C-90 cassettes were used for recording the speech samples, as each subject to read the passages.

ANALYSIS OF THE SPEECH SAMPLES:

Three speech and hearing graduates were requested to be judges for the analysis i.e., to listen to each of the speech recording and to note down the number of blocks in each passage. The judges were given the following instructions:-

"Please listen to the speech samples carefully and mark the occurance of stuttering blocks i.e., repetitions, prolongations, hesitations, abnormal pauses and omissions, by marking the appropriate mark on the sound syllables or the place of which the stuttering blocks occurs in the sheets (in which passages are written) given to you. They were asked to use the following symbols to mark each of the stuttering blocks. ('R' for Repetitions i.e., word or part word repetitions, and if there is any sentence repetitions to underline the whole sentence, 'P' for Prolongation, 'Pa' for Pause, 'H' for Hesitation, '0' for omission).

Further, mark the rate of speech (normal, fast or slow) and also give your impression about the society about the stuttering using 3 point scale (mild, moderate, severe). If have any doubt or questions please ask."

After a demonstration and analysis of speech, they were asked to listen to the samples.

The recorded speech samples were played in i.e., the speech laboratory of the Institute in quiet room. A philips stereo deck (F6112) with 2 speakers were used to play the samples.

The Judges were made to sit comfortably at a distance of 5-6 feet from the speakers. The reading as they were already recorded without any specific order i.e., except that as and when the cases come to the clinic or camp, were played without any change in the order. Each of the judges was given the sheets which had the passages, separate sheets were used for each subjects by each of the judges. Sometimes the judges were asked for replaying of same of the samples.

The total analysis of all the samples of all the subjects took 12 hours approximately. The analysis was done on 4 different days.

3.6

A stuttering block was combined to have occured when at least two out of three judges had marked as a block.

The inter and intra judge reliabilities were determined by marking the judges to mark for 10 speech samples which they had analyzed earlier. Significance of difference were determined using the Wilcoxin matched pair rank test. Thus the inter and intra judges were regarding the stuttering blocks were found to be reliable and validity.

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C H A P T E R - IV

RESULTS AND DISCUSSION

The data sheets for each subject (i.e., 3 for each subjects) which had markings of stuttering block as marked by each judge were further analyzed to obtain information regarding the occurance of stuttering.

(1) Severity of stuttering seen in the groups

(2) The type of stuttering blocks

(3) Rate of speech

(4) Syllable position

(5) On consonants and vowels (phonemic characteristics)

(6) Content and function words

and to note

(7) the stuttering blocks in reading combined and voiced passages, both in case of adults and children.

Severity of stuttering and Rate of speech:

The Judges had made evaluation regarding the severity of stuttering in each subject on a three point scale (mild, moderate, and severe) and also the rate of speech in each subject using a three point scale i.e., normal, fast and slow. No specifications were given by the experimenter to the judge to evaluate the severity and rate of speech.

TABLE 2: SHOWING THE RATINGS GIVEN BY THE JUDGE REGARDING THE SEVERITY AND RATE OF SPEECH OF CHILDREN AND ADULT STUTTERS

Subjects	Severity			Rate of speech		
	Mild	Moderate	Severe	Normal	Fast	Slow
Children	4	4	3	3	1	2
	36.6%	36.6%	27.27%	72.73%	9.09%	18.18%
Adults	46	19	6	47	22	2
	64.78%	26.77%	8.45%	66.20%	30.98%	2.82%

The ratings given by the judge regarding the severity rate of speech of children and adult stutterers are given in Table-2

Among the children, included in the study 4 subjects had mild, 4 had moderate and 3 had severe stuttering. 46 adult subjects have shown mild stuttering and 19 have shown moderate stuttering, only 6 subjects have been considered as having severe stuttering. It is interesting to note that 72.73% of the population inthe children group have shown normal rate of speech i.e., 8 out of 11 subjects. According to Van Riper (1971), fast rate of speech is one of the characteristic feature among children with stuttering. In the present study, only one subject has shown fast rate of speech and 2 have shown slow rate of speech.

Similarly 66.27% of the subjects in the adult group have shown normal rate of speech, (i.e., 47 subjects out of 71), 22 have shown fast rate of speech and only 2 have shown slow rate of speech. The present study has been limited to judgements of the listeners regarding the severity and rate of speech and no attempt has been made in the present study to relate the severity with rate of speech and the duration of reading and rate of speech and characteristics of stuttering or number of blocks with severity judgement. Thus it can be concluded that the majority of the subjects in the present

TABLE 3: SHOWS DIFFERENT TYPES OF STUTTERING BLOCKS, MEAN NUMBER OF STUTTERING BLOCKS AND THEIR RANGE, BOTH IN ADULTS & CHILDREN

Subjects	Repetition		Prolongations		Pauses		Hesistations		Omissions		Total	
	X	Range	X	Range	X	Range	X	Range	X	Range	X	Range
Children N = 11	8.02	0.66-to. 22.33	3.66	0-11	1.37	0.33 tc 3.33	2.66	1-9.33	0.42	0-1.67	16.16	0.33-32.67
Adults N = 71	3.82	0-29.67	0.85	0-8	0.75	0-3.67	1.02	0-6.33	0.23	0-6	6.81	3-29.66

study, both children and adults had normal rate of speech. It will be interesting to study the rate of speech in relation to other variables in stuttering.

Types of stuttering block:

The stuttering blocks, in the present study, have been analysed in terms of repetitions, prolongations, hesitations, pauses and omissions which occured while reading the passages. The study of the Table-3 reveals that children had more stuttering than the adults i.e., mean number of stuttering blocks for children being 16.16 whereas adults have shown a mean of 6.81 only. Further, the range of stuttering blocks has been more in children than in adults.

Further inspection of the Table-3 indicates that the repetitions (of sounds/syllable/part word/word/phrase/sentence) has been the predominant characteristic in both the groups (Mean = 8.02 in children and 3.82 in adults), children have shown more repetitions than adults. It can also be noticed that all children had repetitions as part of their stuttering behavior. Some adult subjects had no repetition as part of their stuttering behavior. It is also of interesting to note sentence repetition by some children apart from sound/syllable,/part word/word and phrase repetitions are significant characteristic of stuttering and thus

an important aspect for identification of stuttering behavior. Lebrum & Hoops (1972) have suggested three different possibilities in the interpretation of repetitions;

1) Being accustomed to repeating words or parts of words to over come a real difficulty, the stutterer generalizes and repeats when there is no difficulty.

2) The stutterer, like normal people, repeats in order to be sure that he has been understood.

3) The stutterer is not sure of having really pronounced the words.

Geetha (1979) has found no significant difference between adults and children in terms of repetitions. However, in the present study, a significant difference between adults and children in terms of frequency of occurance of the repetition has been found i.e., children have significantly more repetitions than adults as part of their stuttering behavior. Thus the hypothesis that there is no significant difference between children and adults in terms of repetitions is rejected. Further, is also rejects the hypothesis that there is difference in frequency of occurance of different characteristics of stuttering. The present study is limited to consideration of only repetitions and not further classification of types of repetitions i.e., sound/syllable/part word/word/phrase & sentence.

Prolongation emerges as next predominant characteristic of stuttering. Both adults and children have shown prolongation more

often than hesitations and omissions. However, in case of adults pauses have occured more frequently than prolongations, but prolongations maintain the lead over pauses in case of children. However, there are both children and adults who have shown prolongation as part of their stuttering. Again children have shown more prolongations then adults. Thus the hypothesis that there is no difference between children and adults in frequency occurance of prolongation as part of their stuttering behavior gets rejected. Further the present findings also reject the hypothesis that there is no difference in the frequency of occurance of different characteristics of stuttering. Thus it may be concluded that the prolongation is one of the predominant characteristic of stuttering and particularly it occurs more frequently in children than in adults.

The other three characteristics that occured can be placed in the order of frequency of occurance, pauses, hesitations and omissions. Among the three, pauses has occured more frequently than the other two in children and in adults, pauses have appeared more frequently than prolongations. Omission in both adults and children has occured very rarely. Thus the hypothesis that there is no differences in frequency of occurance of different characteristi gets rejected with reference to pauses, hesitations and omissions. Further, all these characteristics have been presented by children most often than their counterparts i.e. adults. In otherwords,

pauses, hesitations and omissions have been more in children than in adults. Therefore, the hypothesis that there is no difference between children and adults in a frequency of occurance of characteristics of stuttering gets reflected with reference to pauses, hesitations and omissions.

Thus in general it can be concluded that there is difference in the frequency of occurance of different characteristics of stuttering and there is en heirarchy i.e., the repetitions, prolongations/pauses, hesitations and omissions can be arranged in the order of frequency of occurance. Children have shown more stuttering blocks than adults.

Position of sounds in a word on which stuttering occured most frequently:

Most often stutterers report that they have starting trouble indicating that there is more difficulty on initial sounds of a word or initial word of a sentence considering this, many studies have been conducted to note the relationship between the initial sound/syllable and stuttering. And they have concluded that stuttering occurs more often on initial sounds than on the sounds in other positions i.e., medial or final (Geetha, 1979; Emerick, 1963; Van Riper, 1971).

Froeschels (1961) has opined that stutterers do not stutter at the end of the word. Emerick (1963) also supports the earlier

TABLE 4: SHOWING THE DISTRIBUTION OF STUTTERING BLOCKS ON INITIAL, MEDIAL AND FINAL SOUNDS (SYLLABLE IN A WORD IN CHILDREN AND ADULTS WHILE READING THE PASSAGES)

Group	Blocks on initial sounds or syllables		Blocks on medial sounds or syllables		Blocks on final sounds or syllables	
	$\bar{x}$	Range	$\bar{x}$	Range	$\bar{x}$	Range
Children	11.22	1-23.67	0.98	0-4.33	0.16	0-1.66
Adults	4.64	0-27	0.31	0-5	0.08	0-2

findings by stating that suttering is rare on final sounds.

Table-4 depicts the results of analysis of occurance of stuttering sounds on the initial, medial and final positions in a sentence. It can be seen that in both the cases of children and adults, the stuttering blocks have occured more often on initial sounds than on sounds in other places/position in words. The occurance of stuttering on final sounds is negligible (i.e., 0.16 and 0.08) when compared to other two positions (initial and medial). The occurance of stuttering on the medial sounds is much less than on intial position, but slightly more than final position. Thus the results of the present study are in concurrence with the earlier reports.

It may be concluded that both the children and adults show more stuttering on sounds occuring in initial position than on sounds occuring in medial and final positions. The occurance of stuttering sounds of final position are very rare. Therefore, it can be stated that the position of the sound in a word is related to stuttering. Thus the hypothesis that there is no relationship between the position of the sound/syllable in a word and the frequency of occurance of stuttering is rejected.

Occurance of stuttering blocks on consonants and vowels, while reading the passages in children and adults:

The consonants and vowels (one semi vowel and one blend were also included) on which the repetition, prolongation or hesitations had occured as noted by the judged were considered as having stuttering in the present study. Both children and adults showed stuttering on 14 consonants, one blend and eight vowels. However, adults also showed stuttering on one blend, one consonant and one semi vowel in addition to 14 consonants and one blend. The percentage of frequency of stuttering blocks on consonants, and vowels both in case of children and adults included in this study is given in Table-5a.

The frequency of occurance of stuttering on a particular sound is expressed in terms of percentage indicating the occurance of stuttering on that sound when that sound occurs 100 times, i.e., for example /p/ in children is showing 36.36%, that means the frequency of occurance of stuttering on /p/ is 36.36, when it occurs 100 times in reading in case of children. This was done in order to make a comparison of occurance of stuttering on various sounds. The occurance of stuttering were frequently on content words than on function words has been explained on the basis of information value carried by content words then by the function words.

Brown (1945) while discussing this fact states that "it seems reasonable to assume that the desire to avoid stuttering is

greatest at these points in the speech sequence which the stutterer feels are most conspicuous and important". Blakenship (1964) has concluded that this desire probably shared by speakers in general at points of high information; i.e., at the content words. It is also true that every speaker is "conscious to some degree", that words of one kind are more important to "convey what he is trying to say and that these words are more important to meaning.....". Thus there is a general opinion that the content words are most frequently stuttering as they carry more information than the function words. The results of present study also support the earlier findings.

The inspection of Table-5, shows that /p/ is the most frequently stuttered consonants (36.6%) and /l/ is the least stuttering (1.52) in case of children. Similarly /i/ has shown the maximum (54.54%) stuttering whereas /o/ has shown the minimum stuttering (9.09%). A cursory examination of the Table further indicates that the stuttering is seen more frequently on vowels than on consonants. This was further confined by application of statistical measure i.e., that there is significantly more stuttering on vowels than on consonants in case of children. Thus the hypothesis 1(b) stating that there will be no difference in the occurence of stuttering on vowels and consonant in case of children is rejected. Further the hypothesis that there will be no difference

TABLE 5(a) SHOWS THE FREQUENCY OF OCCURANCE OF STUTTERING ON CONSONANTS AND VOWELS EXPRESSED IN TERMS OF % IN A HIERARAHIAL ORDER IN CASE OF ADULTS AND CHILDREN

ADULTS						CHILDREN					
Consonants & blends	%	Rank		Vowels	%	Rank	Consonants & blends	%	Rank	Vowels	%	Rank
s	20.66	1		u	26.76	1	P	36.36	1	i:	54.54	1
b	17.14	2		a:	21.12	2	s	27.27	2.5	a:	45.45	2
k	16.59	3		a	17.6	.3	kr	27.27	2.5	u:	29.54	3
kr	14.08	4		i:	15.96	4	d	24.24	4.5	u	27.27	4.5
m	12.68	5		i	15.49	5	j	24.24	4.5	e	27.27	4.5
j	11.03	6		u:	10.21	6	m	22.22	6	i	24.67	6
gh	9.86	7		e	9.86	7	k	20.20	7	a	18.18	7
pr	9.5	8		o	2.82	8	h	18.18	8.5	o	9.09	8
h	8.45	9					gh	18.18	8.5			
d	8.21	10					n	17.04	10			
n	7.22	11					r	9.97	11			
t	3.29	12					t	9.09	12			
r	3.22	13					g	8.39	13			
*y	2.82	14					b	3.18	14			
p	2.18	15					l	1.52	15			
g	1.84	16										
bh	1.76	17										
1	0.70	18										

*semi-vowel

in the occurance of stuttering on different consonants and vowels in case of children are also rejected.

Adult stutters studied show /s/ as the most frequently (20.66%) stuttered sound and /l/ as the sound with minimum stuttering (0.70). The vowels /u/ and /o/ have been found to be having maximum and minimum (26.76% and 2.82%) stuttering respectively. A comparison of frequency of occurance of stuttering on vowels and consonants in case of adults indicates more stuttering on vowels than on consonants. This was further confirmed by application of analysis of variance, which also indicates that there is statistically significant difference in the frequency of occurance of stuttering on vowels and consonants. This rejects the hypothesis ( ) that there is no difference between consonants and vowels in terms of frequency of occurance of stuttering in case of adults and the hypothesis that there will be no difference in the occurance of stuttering on consonants and vowels are rejected with respect to adults.

It is interesting to note, from the Table-to that the frequency of occurance of stuttering on consonants and vowels in adults and children are in different order. The consonant on which stuttering is found most frequently in case of children (for example /p/ - 36.36% rank). It is found as not so frequently stuttered sound (2.18% - 15th rank) in case of adults. But both adults and children have shown minimum stuttering on /l/ sound.

Similar trend is seen in case of vowels, i.e., /i/ shows maximum stuttering, in case of children whereas in case of adults /u/ is the most frequently stuttered sound. Again /o/ has shown minimum stuttering both in case of children and adults. Thus the hypothesis that there will be no difference in frequency of occurance of stuttering on consonants and vowels in case of children and adults is rejected.

Several reports are found in literature regarding the occurance of stuttering on consonants and vowels (Brown, 1945; Hahn, 1942; Hunt, 1967; Wingate, 1977; Bloodstain, 1958; Solderberg, 1962; Taylor, 1966 and Geetha, 1979).

There are contradictory findings regarding the frequency of occurance of stuttering on consonants and vowels. According to Hahn (1942) stuttering occurs predominantly on consonants than vowels. Hunt (1967) has tried to classify stuttering as vowel stuttering and consonant stuttering. Wingate (1977) is of the opinion that suttering occurs more often on consonants than on vowels. The results of a study by Solderberg (1962) has shown no difference among vowels, voiced consonants, and voiceless consonants with respect to mean frequency of stuttering.

TABLE 5 (b): STUTTERING ON VOWELS AND CONSONANTS

	CHILDREN		ADULTS	
	Average percent children affected	Angular transformation	Average percent adults affected	Angular transformation
Consonants	17.82	23.93	8.36	15.69
Vowels	29.50	32.31	14.98	22.09
Standard deviation		± 8.67 (21 df)		± 6.66 (24 df)

Note: Table 5(c) shows that there is more stuttering on vowels than on consonants. Statistical analysis was carried out on transformed variate (Angular transformation). There was significant difference between the percentage of affected vowels and consonants ($P < 0.05$) in both adults and children.
The test of significance was carried out using analysis of variance technique.

Table 5(C) showing the % of adults and children who had more stuttering on consonants, more stuttering on vowels and stuttered equally both on consonants and vowels in reading the passage.

Subjects	More on consonants than on vowels	More on vowels than on consonants	Equally on consonants & vowels
Adults (77)	75.35%	12.67	11.98
Children (11)	100%		

The analysis of data to determine the percentage of adults and children showing more stuttering on consonants than on vowels, more stuttering on vowels than on consonants and stuttering equally both on vowels and consonants indicates that 75.35% of adults had more stuttering on consonants than on vowels. 12.67% of adult population had more stuttering on vowels than on consonants and only 11.98% had stuttering both bn consonants and vowels equally. With regard to children, all the subjects had more stuttering on consonants than on vowels.

Geetha (1979) from her study has concluded that consonants in general were stuttered more often than vowels. However, stuttering was found on vowels also end in a minority of cases stuttering was

more on vowels than on consonants.

The results of the present study is not in support of the above mentioned studies, i.e., there is more stuttering on vowels than on consonants. Table 5(b)

It has been reported by Hunt (1967) that dysfluencies were chiefly found to occur on the utterance of mute of explosive consonants and their medials as p, t, k, b, d, m and c. The aspirated and continuant sounds as f, w, s and c offered much less idfficulty, as the oral canal was not so completely closed as in the explosives. Geetha (1979) has found /k/, /m/, /n/, /h/ and /b/ as the most frequently stuttered consonants, by her subjects.

In the present study however, the following sounds showed stuttering most frequently (in the order of frequency of occurance of stuttering) in children, /p/, /s/, /d/, / j / , /m/ and in adults, /s/, /b/, /k/, /m/, / j / . And the blend /kr/, has third rank in children and fourth rank in adults in terms of frequency of occurance of stuttering, thus it can be stated that the results of the present study are similar to earlier reports.

Geetha (1979) has found /a/ as the sound on which stuttering occured moat frequently. However, in the present study,/i/ and /u/

get the first place in children and adults respectively, and long vowel /a:/ gets the second place in both the groups. Thus again the results, with respect to vowels are in the same lines as in other studies.

Thus the analysis of the results shows that the stutterers show more stuttering particularly on certain consonants and vowels than on other sounds. Therefore it can be concluded that, in general, stutterers show an hierarchy in the frequency of stuttering . However, individual difference are found in the hierarchy of frequency of stuttering. The present study did not include relationship between the kind of stuttering block (i.e., repetitions, prolongations, hesitations and pauses), and the sounds (consonants, vowels and blends) on which on stuttering occured. Establishing such a relationship may be useful in understanding the stuttering better.

It is interesting to note that none of the children have shown stuttering the semi-vowel /y/, whereas some adults have stuttered on the same*

The relationship between stuttering and content and function words:

The analysis of data, to observe the frequency of occurance of stuttering on content and function words, both in case of children and adults in reading the passages, revealed the following results (shown in Table-b)

	Content		Function	
	X	Range	X	Range
Children (N = 11)	11.42	0.66-27	1.47	0-5.66
Adults (N = 71)	4.78	0-26	0.67	0-7

The study of table -6 indicates that both children and adults have shown more stuttering on content words then on function words. Further the statistical analysis also indicates that there is a significant difference in the occurance of stuttering on content and function words.

Thus the hypothesis 2(Y) that there will be no difference in frequency of stuttering on content words and function words in reading is rejected. And thus it may be concluded that children show more stuttering on content words than on function words.

Further as it can be seen from the table, there are subjects who have shown no stuttering on function words.

The hypothesis 2(Y) stating that there will be no difference in frequency of stuttering on content words and function words in adults while reading also gets rejected in the light of the results of the present study i.e., adult stutterers of the present study have shown more stuttering on content words than on function words. Thus it may be concluded that adult stutterers show more stuttering while reading, on content words than on function words. There are very few stutterers (mild stutterers) who may not show any stuttering, on content words and some on functional words, as depicted in the table. However, in general, it can be concluded that there will be more stuttering on content words than on function words.

Similar reports have been made by Geetha (1979). The results of the present experiment also supports the findings of Hahn (1942), Eisenson and Horowitz (1945), Ontoby (1958), Abron et al (1959), Maclay and Osgood (1959), Blankership (1964) and others that the stutterers have more difficulty with content words as opposed to function words.

The present study has been limited to only content and function words, but not the sub-categories of these two classes of words as reported by many (Geetha, 1979; Brown, 1937; Bloodstain, 1960).

Stuttering blocks in reading voiced passage and combined passage in case of children and adults

Many have reported that the stutterers show more number of blocks while reading a combined passage than while reading a voiced passage. This difference in the occurance of stuttering blocks in reading these passages has been attributed to the laryngeal functioning in stutterers (Gayathri, 1980; Adams & Reis, 1971; Manning & Caufal, 1976).Schwatz (1974) has proposed a model to explain the 'core of stuttering block', based on laryngeal function in stutterers.

In the present study the passages used were voiced (consisting of only voiced sounds), and combined passages (consisting of both voiced and unvoiced sounds). An attempt has been made here to note the difference in the frequency of blocks in reading voiced and combined passages in children and adults.

TABLE-7

TOTAL NUMBER OF BLOCKS IN VOICED AND COMBINED PASSAGES AND THEIR LEVEL OF SIGNIFICANCE FOR ADULTS AND CHILDREN

GROUPS -	TOTAL NO. OF BLOCKS		LEVEL OF SIGNIFICANCE
	PASSAGE - A	PASSAGE - B	
Children N = 11	15.75	16.57	N.S.
Adults N = 71	5.99	7.63	$P < 0.05$

NOTE: N.S. is, statistically insignificant.
$P < 0.05$ is, statistically significant at 0.05 level.

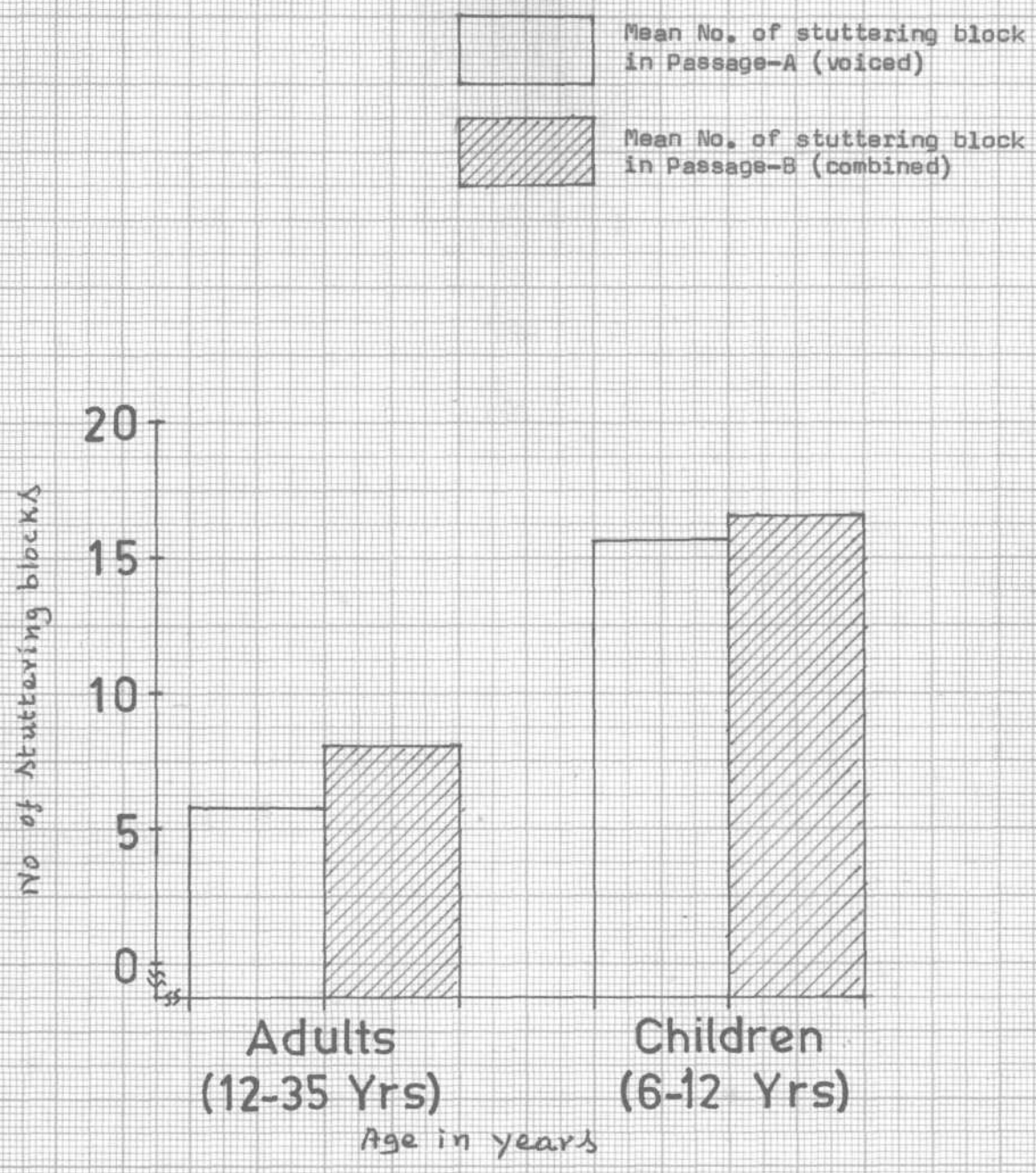

FIGURE: Shows mean number of stuttering blocks occured while reading passage-A (voiced) & passage-B (combined) in both adults and children.

The study of the Table-7 indicates no significant difference in the frequency of occurance of stuttering blocks in case of children in reading the passages whereas the adults, as expected have shown a significant difference in the frequency of occurance of stuttering blocks in reading the passage i.e., the frequency of stuttering occuring more in reading combined passagethan reeding the voiced passage. Thus the hypothesis that there is no significant difference in the frequency of occurance of stuttering blocks in reading combined and voiced passages in case of children is accepted.

The hypothesis that there is no significant difference in the frequency of occurance of stuttering blocks in reading combined and voiced passages, in case of adults is rejected. As stated earlier, there are reports indicating the occurance of more stuttering in adult stutterers in reading combined passage than the voiced passage (Gayathri, 1980; Adams and Reis, 1971). However, no reports are available to the present investigator regarding the behavior of children while reading combined and voiced passages. It is interesting to note this difference in the behavior of adult and young stutterers in reeding the passages.

However, it must also be noted that the number of children included in the present study are only 11. This behavior, especially,

in case of children warrants further investigation. If the results of the present study are supported further, then it will be useful in understanding the stuttering behavior in children and adults. Thus it can be concluded that the adult stutterers show more difficult while reading the combined passage than the voice passage end not much difference is found in case of children.

The results of the present can be summarized as follows;

(1) Most of the stutterers in present study showed normal rate of speech.

(2) The stutterers in the present study exhibited various characteristics of stuttering. The frequency of occurance of these characteristic varied from subject to subject. However, it is possible to range these characteristics, in terms of frequency of occurance in the following hierarchial order;

Repetitions, Prolongations, Hesitations, Pauses, Omissions.

(3) It is found that the initial syllable in the word is most frequently stuttered than the syllable in any other position.

(4) Stuttering was found most frequently on vowels than on consonants, both in case of adults and children in the present study.

(5) The content words were most often submitted for

stuttering than the functional words, both in case of adults and children.

(6) The adult stutterers showed more stuttering while reading combined passage than the voiced passage. However, children did not show any such differences.

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C H A P T E R - V

SUMMARY AND CONCLUSIONS

Studies have been conducted to on several aspects of stuttering. Relationship between linguistic factors and stuttering have also been studied. However, with reference to Kannada language there are only two studies. (Geetha, 1980, Jayaram 19). Therefore it was felt that it is necessary to conduct a study to note relationship between linguistic factors and stuttering in children and adults using Kannada language.

71 adult stutterers and 11 children who were diagnosed were made to read 2 passages (combined and voiced passages). The recorded reading samples were analyzed with the help of three judges, to find out the frequency of occurance of stuttering with relation to linguistic factors. Further, it was also analyzed to find out the frequency of occurance of stuttering in reading combined passage and voiced passages in both the groups.

The following conclusions were drawn based on the results of study:

(1) Most of the stutterers in present study showed normal rate of speech.

(2) The stutterers in the present study exhibited various characteristics of stuttering. The frequency of

occurance of these characteristics varied from subject to subject. However, it is possible to range these characteristics, in terms of frequency of occurance in the following hierarchial order:

Repetitions, Prolongations, Hesitations, Pauses, Omissions.

(3) It is found that the initial syllable in the word is most frequently stuttered than the syllable in any other position.

(4) Stuttering was found most frequently on vowels than on consonants, both in case of adults and children in the present study.

(5) The content words were most often submitted for stuttering than the functional words, both in case of adults and children.

(6) The adult stutterers showed more stuttering while reading combined passage than the voiced passage. However, children did not show any such difference.

R E F E R E N C E S

R E F E R E N C E S

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A P P E N D I X

Passage 'A' (voiced)

ಬೆಂಗಳೂರು ನಮ್ಮ ರಾಜ್ಯದ ಒಂದು ದೊಡ್ಡ ಊರು. ಈ ಊರನ್ನು ನಮ್ಮ ರಾಜ್ಯದ "ಬೊಂಬಾಯಿ" ಎನ್ನುವರು. ಇಂಡಿಯಾದ ದೊಡ್ಡ ನಗರಗಳಲ್ಲಿ ಇದೂ ಒಂದು. ಈ ಊರನ್ನೂ ನೋಡಲು ಜನರು ಬೇರೆ ಬೇರೆ ರಾಜ್ಯಗಳಿಂದ, ಬೇರೆ ಊರುಗಳಿಂದ ಬರುವರು. ಇದಲ್ಲದೇ ನಮ್ಮ ರಾಜ್ಯದಲ್ಲಿರುವ ಬೇಲೂರ್, ಜೋಗ್, ನಂದಿ ಇವು ಗಳನ್ನು ನೋಡಲು ಜನರು ಬರುವರು. ಈ ನಾಡಿನಲ್ಲಿ ರೇಷ್ಮೆಯನ್ನೂ ಬೆಳೆಯುವರು.

Passage 'B' (combined)

ಕೃಷ್ಣಾ ನದಿಯು ಸಹ್ಯಾದ್ರಿ ಪರ್ವತಗಳಲ್ಲಿ ಮಹಾಬಲೇಶ್ವರದ ಹತ್ತಿರ ಹುಟ್ಟುತ್ತದೆ. ಇದು ಹುಟ್ಟುವ ಪ್ರದೇಶವು ರಮಣೀಯ ಸ್ಥಾನ. ಇದು ಮಹಾರಾಷ್ಟ್ರ, ಕರ್ನಾಟಕ ಮತ್ತು ಆಂಧ್ರಪ್ರದೇಶ ಗಳಲ್ಲಿ ಹರಿದು ಬಂಗಾಳ ಕೊಲ್ಲಿಯನ್ನು ಸೇರುತ್ತದೆ. ಇದಕ್ಕೆ ಉಪನದಿಗಳು ಹಲವು. ಕೊಯಿನ, ತುಂಗಭದ್ರಾ, ಘಟಪ್ರಭಾ, ಭೀಮಾ ಮಲಪ್ರಭಾ ಅವುಗಳಲ್ಲಿ ಕೆಲವು. ಕೊಯಿನಾ ನಗರಕ್ಕೆ ಅಣೆಕಟ್ಟನ್ನು ಕಟ್ಟಿ ವಿದ್ಯುತ್ತನ್ನು ಉತ್ಪಾದನೆ ಮಾಡುತ್ತಾರೆ.