SOME LINGUISTIC ASPECTS OF STUTTERING IN KANNADA

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Certificate

This is to certify that the Dissertation entitled “Some Linguistic Aspects of Stuttering in Kannada” is the bonafide work in part fulfillment for M.Sc. Speech and Hearing carrying 100 marks, of the student with Register No._____

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This is to certify that the Dissertation entitled “Some Linguistic Aspects of Stuttering in Kannada” has been prepared under my supervision & guidance.

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Declaration

This Dissertation entitled “Some Linguistic Aspects of Stuttering in Kannada” is the result of my own study undertaken under the guidance of Dr. N. Rathna, Professor, Head, Department of Speech Pathology and Director I/c, All India Institute of Speech and Hearing, Mysore. This has not been submitted earlier at any University for any other Diploma or Degree course.

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-Investigator.

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CHAPTER 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 discipline" (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.

Theories have come and gone. Neurophysiology, biochemistry and psychoanalysis have largely given was to learning psychology, feedback theory and linguistics as frames of reference for investigating stuttering (Bloodstein, 1977).

Emerging interest in language has extended to normal disfluency and stuttering. From this direction of inquiry is coming strong evidence that linguistic decision-making factors weigh heavily in all types of disfluency (Perkins. 1977). A fore runner of interesting linguistics analysis was Brown's (1935, 1937 & 1945) description of four word attributes that appeared to control the loci of stuttering in adults. These included, initial phoneme, grammatical function, sentence position and word length.

Johnson & Brown (1935, 1938) and Hahn (1942) reported

more stuttering instances on initial constants than initial vowels in their group though there was great individual variability. Brown (1938) attributed this to be due to greater relative importance of the consonants for clarity and hence for meaning. However, Bluemel felt that the difficulty of the stutterer is in someway connected to the production of vowels and that the consonant is not an obstacle.

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 sentences. Silverman and Williams (1967) also noted similar findings in normal disfluency.

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

A few investigators attempts to explain disfluency by relating it to the linguistic encoding processes. Goldman Eisler (1958) showed that hesitation pauses in normal speech tend to occur at points of greatest uncertainty, 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 and others, 1965; Soderberg, 1965, Taylore, 1966).

After reviewing the vast literature on stuttering, Van Riper (1971) concluded that the core of the disorder is a disruption of timing of the motor sequences of sound, syllable and word production. Perkins and others (1976) also found the possibility that stuttering consistently results from complexity of phonatory co-ordination with articulation and respiration.

Wingats (1977) felt that the seemingly separate linguistic features associated with increased stuttering actually reflect a common quality – probably the ease with which a word is said ie., the “linguistic stress”.

Thus it appears possible that a number of linguistic factors may be operative at any one point to make certain language units more difficult for stutterers than others, (Hannah and Gardner, 1968). In an individual stutterer it is difficult to assess the importance of these factors since the strength of any one factor depends on the person’s a past history of stuttering difficulty. For one stutterer, -

position (getting started) is most important; for another, the amount of information or uncertainty possessed by the word determines, whether or not he will stutter on it; for a third, the phonemic characteristics of the words first sound may be most crucial (Van Kiper , 1971).

After going through the literature, it was felt that it would be fascinating to look for the linguistic variability of stuttering in an Indian language Kannada. It would also be interesting to see if the linguistic variables are universal phenomena or are specific to a particular language.

Statement of the problem:

The present study was aimed at investigating the variability of stuttering on some of the linguistic factors.

The objectives of the study were:

1) To test if the stutterers differ with regard to their difficulty on content as opposed to function words.
2) To test if phonemic characteristics are related to stuttering.
3) To test if position of a word in a sentence and position of syllables in a word are related to stuttering.
4) To analyze the repetition characteristics of stuttering.
5) To see if adult and child stutters differ in their repetition of the language unite.

The following hypotheses were put forth in the present investigation:

1. There would be no difference among the stutters in terms of their difficulty with respect to content and function words.

2. There would not be any relationship between the phonemic characteristics and stuttering, i.e., consonants are stuttered as often as vowels and there is no rank order of difficulty with regard to sounds on which stuttering occurs.

3. (a) There would be no relation between word position in a sentence and stuttering.
   (b) There would be no relation between syllable position in a word and repetition of the syllable.

4. There would be no difference between the adult and the child stutters in terms of their repetition characteristics.

Brief plan of the study:

Spontaneous speech and reading samples of fifteen stutterers ranging in age from 5 – 20 years were recorded on a Cassette Tape Recorder. The spontaneous speech was elicited using TAT and CAT cards respectively with adult and children. Reading samples were elicited only from those who could read a Kannada story taken from the Kannada picture articulation test.

The samples were later transcribed and analyzed on the following linguistic factors with the help of a linguist:

1. Content Vs function words;
2. Phonemic characteristics;
3. Word position in a sentences;
4. Position of sound in the word;
5. Repetition characteristics of stuttering;

Limitations of the study:

1. The subjects were not well matched with regard to age, sex and socioeconomic factors due to the difficulty in getting an adequate number of stutterers.

2. Other methods of eliciting spontaneous speech (like narrating, story telling) had to be employed with a few subjects who failed to given adequate samples with TAT and CAT cards.

3. Reading samples could not be elicited from all the subjects due to the limitations on the part of those subjects.

4. Only the audible parts of the stuttering speech were analyzed.

5. All the linguistic factors could not be analyzed.

Implications of the study:

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

2. There were no 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 linguistics 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.

Definitions:

1. Stutterers: Stutterers are those individuals who exhibit in their speech and in their reading prolongations and /or repetitions and /or hesitations of sounds, syllables, words or phrases to such a degree that it attracts attention of listeners and who have been so diagnosed by qualified speech pathologists.

CHAPTER – II

REVIEW OF LITERATURE

“Oral communication is a complicated facet of human behaviour. It is said to have two major aspects; speech process and the speech act. Speech process includes the speaker’s concept, his language system, his intent and complex inter-relationship between the speaker and the listener. Speech act refers to mechanical production of words. Its basic components include neurological, structural and muscle systems involved in word production plus the various sensory feedback systems essential for monitoring speech. Both speech process and speech act are acquired gradually through maturation and learning and both tend to function more or less automatically in most situations.

The act of speaking is servant to the process of communication and has its rate and style dictated by culture. Each sound and syllable in a word must be successes almost immediately by the next and also each word in a phrase or a sentence. Words must flow in an automated manner with fast checking and correction devices to maintain the required standards. ‘No human activity requires greater coordination than speech. We speak with the entire body – nerves, muscles, glands and blood’ say Berry and Eisenson. Thus when a speaker falters, when breaks in automativity of the act are revealed by disruptions in fluency, identification of responsible agent becomes a redoubtable task”. [Robinson (1964)]

The stuttering problem has challenged men of many lands and times to find its solution. There is no completely satisfactory solution, no simple, uncomplicated was to explain stuttering, no quick and painless way to acquire available knowledge about this perplexing disorder of speech. Variability in frequency and severity and puzzling in-consistencies characterize stuttering in each individual (Van Riper, 1971).

Investigations into the stuttering problem have dealt with mainly on three aspects:

1. To find the etiology of the problem;
2. To find a suitable therapy technique to overcome stuttering; and
3. To describe the moments of stuttering.

1. Stuttering theory: Theories on neurophysiology, biochemistry and psychoanalysis have largely given way to learning psychology, feedback theory and linguistics for explaining the stuttering disorder.

Beginning with Aristotle (384 BC), who felt the tongue as the villain in the case of stuttering, one or the other organ is attributed to cause stuttering. The Hyoid bone, tonsil and uvula, palate and respiratory apparatus were held responsible for stuttering in the later part of the 19th century and the beginning of the 20th century. Some attributed it to certain parts of the nervous system such as the brain and the autonomous nervous system. Orton (1927) and Travis (1931) said that there is a lack of cerebral dominance in stutterers. West (1958) regarded stuttering as a variant of epilepcy akin to pyknolepsy. Eisenson (1958) suggested a relationship between stuttering and preservative behaviours, which is seen in brain-injured persons. Cherry et al (1956)

related stuttering to an instability in the auditory feedback loop, Recently, Schwartz (1974), suggested that the core of the stuttering block was the inappropriate vigorous contraction of the posterior cricoarytenoid muscle in response to subglottal pressure required for speech.

During the latter half of the 19th Century, psychoanalysts began viewing stuttering as a neurosis, as a form of hysteria, with its neurotic core in the traumatic early childhood experience. Fenichel (1945) regarded it as a pregenital conversion neurosis. Glauber (1958) and Travis (1959) considered stuttering as an ego defense mechanism, to prevent unacceptable and anxiety provoking instinctual impulses reaches consciousness and being actually or symbolically expressed. Sheehan (1958) explained stuttering as a double approach-avoidance conflict which represented a precarious equilibrium between the two drives; to speak and to keep silent. Bloodstein (1957) considered the moment of stuttering as a reaction of tension and fragmentation resulting from the threat of failure in the performance of an automatic, serially ordered activity.

The learning theorists consider the stuttering child to be neurologically and psychiatrically normal and to have learnt stuttering because of specific environmental experiences. The most impressing contribution to this idea has been the “Evolutional theory of stuttering” proposed by Johnson (1955, 1956, and 1959).

Wischner (1950, 1952), Shames and Sherrick also hold that stuttering is a learned behavior. Brutten and Shoemaker (1967) in their two factor theory attributed certain aspects of stuttering to be classically conditioned and others to be instrumentally conditioned.

Speech is said to be automatically controlled from the feedback returns through the multiple bilateral channels (air, bone, tissue, tactile, kinesthetic etc.,) which are processed at many levels in the CNS. Any distortion in this process would lead to asynchrony and stuttering. Cherry and Sayers (1956) regard that the production o speech involves a closed feedback action and stuttering represents a type of relaxation oscillation caused by instability of the feed back loop. Sklar (1969) gives a mathematical model to explain this and says the stuttering oscillations can be damped by decreasing the feed back signal – by using ear plugs. Van Riper (1971) believes that stutterers have a defective monitoring system for the production of sequential speech and this might be due to distorted auditory feed back.

2. Stuttering therapy: Several procedures have been used and reported to be successful since the dawn of recorded history in stuttering. Starting from placing pebbles in the mouth and shouting at the sea the various techniques tried include oral surgery and prostheses relaxation technique, various ways of modifying the speech act like vocal phrasing and blending, slowing

the speaking rate (eg., prolongations), masking shadowing & various rhythm methods. Recently behaviour therapist with their learning principles are being tried in attempts at achieving normally fluent speech reliably, effectively and in a systematic way. Some of these include Reciprocal inhibition, systematic desensitization, Assertive training, Negative practice, Reinforcement punishment techniques and time-out, Ingham and Andrews (1973) after reviewing the behaviour therapy approaches to stuttering conclude as follows:

" Masking and shadowing now seem limited in therapeutic promise and the negative practice and anxiety reduction have yet to be demonstrated to have powerful therapeutic potential. Rhythmic speech and prolonged speech appear to have greater therapeutic promise, although they rely on changing the pattern of speech which in turn should be changed toward normal speech. Operant conditioning procedures appear to be useful for effective therapy. In general, however, reports of behaviour therapy for stuttering are disappointing in their absence of concern for appropriate and systematic evaluation of the outcome".

Till now, not a single technique is agreed upon as to provide complete cure of stuttering.

3. Description of stuttering: The third aspect of investigating stuttering as previously mentioned is its description. Description of stuttering has been attempted from two angles:

a) Description of the speech and bodily activities associated with the moment of stuttering;
b) Linguistic description.

Wingate (1964) gives a very comprehensive way of describing the stuttering moment. It includes:

(i) Speech characteristics – like repetitions of sounds, syllables, part words, hesitations, prolongations (may be silent or audible), interjections (sound filled pauses) and broken words.

(ii) Accessory features – these include speech related movements like pursing or puckering of lips, clenching teeth etc., auxiliary body movements (Spasms) like eye blink, sworting, jerking, the head, clenching the fists etc., and verbal features.

(iii) Associate features – these include excitement, tension, personal reactions, feelings or attitudes.

However, not all these features are present in every stutters and in a single stutterer also it varies from time to time. Stuttering is known for its high inconsistencies. For e.g., in a stutterer, stuttering is reduced or absent in conditions like speaking in unison, talking alone, talking to pets, talking with a different dialect, acting on the stage, talking with masking in the ears, talking with a given rhythm, whispering, shouting, using electrolarynx, singing, varying pitch etc., Factors which aggravate or which increase the stuttering

behaviour include emotional states as anxiety, anger, rapid speech, answering questions, speaking to supports and when exhausted.

Linguistic descriptions of stuttering

The recent investigations into stuttering have been toward exploring the linguistic side of the disorders.

In recent evaluative review it has been remarked that stuttering, its causes and treatment have been neglected from the linguistic point of view. It is well recognized that the study of the genesis of language in the child is the proper subject of linguistics as well as of psychology, neurology and other disciplines; however, abnormalities in the genesis of the child's achievement of language have been looked upon as purely physiologically pathological but not linguistically pathological phenomena (Kostic, 1972).

Kostic hypothesized that the:

"linguistic factor in the stuttering syndrome is the problem of time in acquiring speech and language and that deviations in the normal timing of speech processes have pathological consequences recognized as different from stuttering. To demonstrate the effectiveness of this hypothesis, it is necessary to determine the normal timing of speech events, to define deviations in this timing and to relate these deviations to speech pathology, specifically to stuttering".

According to him the discrepancy between the parent and the child on the time dimension of language is seen to occur at three levels – articulation, concept formation and categorization through decision. The central idea underlying the above hypothesis is that discordance on their time dimensions between the adult and the child creates a condition which may lead to stuttering.

"Scientific evidence shows that the child's brain is not ready to generate speech until about 2 yrs. of age. After physiological readiness has been achieved, speech and language grow rapidly during the next 4 – 5 yrs. This same period, from 3 – 6 yrs of age, in the one during which stuttering is most likely to occur. The fact that these two major events, the genesis of language and the occurrence of stuttering, occur during the same period suggests a causal relationship between them".

Johnson and Stewart (1970) reported two linguistically related factors to stuttering in North American Indian societies.

a) Stuttering doesn't occur in groups which don't have a term for it in their language.

b) Stuttering doesn't appear to develop in groups which recognize the developmental nature of child growth and language development and reflect this recognition in both adult language and baby language.

Stewart (1960) verified the observation that the structure of the ‘baby language in a given society might also be related to the presence or absence of stuttering, with particular reference to the acceptability of reduplication as part of the baby language.

Reduced verbal output also has been fairly well documented to be part of the symptomatology of stuttering in adults (Silverman and Williams, 1967; Bloodstein, 1969). Silverman and Williams analyzed 50 utterances from KG and first grade stutterers and non stutterers and reported that stutterers, on the average produced approximately twice as many one word responses as did non stutterers. Johnson (1969) and others hypothesized that this avoidance of speaking and hence, of stuttering is partially responsible for the maintenance of stuttering. Based on this hypothesis one of the goals of therpy has been to encourage them to increase the amount of speaking they do (Tretter, 1972).

Silverman (1976) studied 136 elementary grade children consisting of an equal number of stutterers and non stutterers matched for age ($\pm$ 6 mths), sex and grade placement. They were asked to tell a story to the first CAT card. All stutterers spoke fewer words than their peers on the average. He found significant (at 0.05 level confidence) group differences only for the fourth, fifth and sixth grades and not for the

second and third grades. He suggested that reduced verbal output may be a part of the symptomatology of the stuttering problem of some children by the time they reach fourth grade.

A good deal of data has been accumulated in recent year that suggests that stuttering involves the linguistic level of the communication process. Actually some of the more fascinating aspects of investigations in stuttering have been undertaken in this domain and the obtained data are of the sort that have permitted some intriguing and quite plausible interpretations (Wingate, 1977).

The following linguistic variables have been studies 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

1. Grammatical function and stuttering:

Brown (1937) was the first person of study stuttering from

a grammatical stand point. From the analysis of oral reading of 32 stutterers he concluded that in stutterers there exists a rank order of difficulty with regard to the different points of speech whether conventional eight parts of speech are considered or a finer differentiation is made. Though he did not find a statistically significant rank order, there was agreement among the cases indicating a psychological significance of the rank. The grammatical rank of difficulty was found related to phonetic rank order of difficulty but was more consistent than the latter. In further studies, Brown (1938, 1945) noted that stutterers have more difficulty with content or lexical words (nouns, verbs, adjectives and adverbs) as opposed to function words (prepositions, determiners, conjunctions, articles, possessive pronouns etc.,).

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

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

The results of several investigations suggest that instance of disfluency may not be distributed at random in the speech of non stutterers. Maclay and Osgood (1959) reported that the

instances of disfluency tend to be associated with lexical than functional words.

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

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

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

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

Contrary to the above findings, Bloodstein (1960) observed that in the earliest phase of the disorder there may often be a tendency for stuttering to occur abundantly on pronouns, conjunctions and propositions. In a later study, Bloodstein and Gantwerk(1967) studied the speech samples of 13 stutterers between the ages 2-6 years. They found a tendency for stuttering to occur unusually often on pronouns and 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.

Quarrington, Conway and Siegel (1962) did not confirm “the Brown specification of a hypothesized grammatic gradient”, though they also reported a high incidence on content words. They suggested that “the grammatical gradients” reported by earlier studies may be a function of positions which the grammatical forms take in an English.

Haunah and Gardner (1968) reported after their analysis of spontaneous verbalizations of eight adult stutterers that a traditional syntactic relationship between grammatical function and stuttering does not exist to a significant degree. A more significant factor would seem to be the existence of the unit post verbally rather than its functions as an object/ complement/optional adverb or possibly subject type structure.

Concerning the content item, it is interesting to note that the highest ratio of content items to functions words (6:1) occurs within the verbal unit but that this does not seem to produce a significant correlation with increase or decrease of stuttering within this unit.

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 Helmreich and 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 of disfluency. This was in agreement with Bloodstein's previous finings, though a notable difference occurred in the case of verbs. The findings were interpreted to be in general accord with the hypothesis that a continuity exists between early stuttering and certain forms of normal child disfluency.

In a recent investigation Haynes and Hood (1978) demonstrated a significant relationship between linguistic complexity and disfluency in children. In an earlier study Muma (1971) found linguistic differences between highly fluent and highly disfluent children. Disfluent children were found to use simpler language transformations than the fluent youngsters and it was suggested that the more complex language is

possibly related to disfluency.

However, other investigators found little or no relationship between language behaviour and disfluency in youngsters (Davis, 1940; Silverman, 1972a; Berryman and Kools, 1975; Haynes and Hood, 1977).

Research with adults has suggested that when the language processing system is under stress, disfluency may be a part of a mechanism that the encoder uses to gain processing time and maintain the role of the speaker (McClay and Osgood, 1959; Goldman-Eisler, 1968). Naremore and Dever (1975) have indicated the possible operation of similar mechanism in children.

If the concept of grammatical load is tenable, then the messages of increased complexity should create more ‘stress’ upon the child’s linguistic system and possibly result in added disfluency (Haynes and Hood, 1978). Clinicians who work with beginning stutterers frequently recommended that the parents of these children use simpler language in order to present a more attainable communication model (Van Riper, 1973).

The above studies suggest the possibility of some grammatical factor in stuttering. Many studies report more stuttering on content or lexical words while a few studies by

Bloodstein and others report more stuttering on function words other features of the content words like its propositional value, its length, frequency as opposed to those of the function words could possibly operate to bring more stuttering on content words. More controlled and elaborative studies both on normal disfluencies and on stuttering are required in this regard.

2. Propositionality and information load and stuttering:

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

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

In his earliest report, Brown (1937) showed that in oral reading adult stutterers tended to have most of their difficulty on the part of speech which are more important for conveying

information or meaning i.e., nouns, adjectives, verbs and adverbs. This was also agreed upon by Hahn (1942); Eisenson, and Horowitz (1945); Bluemel (1957); Bloodstein (1958).

Eisenson and Horowitz investigated the oral reading performance of stutterers using three selections of varying propositional value; a simple list of 130 words, a nonsense selection of 130 words and meaningful paragraph taken from a letter written by Franklin Delano Roosevelt. Each of the selections contained the same set of twenty adjectives, ranging in length from one to five syllables. The number of other parts of speech (nouns, verbs, prepositions etc.,) was determined for the propositional selection and the same number was used for the first two selections. They concluded that:

1. An increase in propositional value of these oral reading selections resulted in:

   (a) an increase in stuttering on nouns, verbs, adverbs and adjectives, and
   (b) a decrease in stuttering on pronouns, conjunctions and articles, with no significant difference with respect to preposition.

2. There was a greater difference in percent of words stuttered between a meaningful and a nonsense selection than between the nonsense selection and the reading of a list of words.

3. An increase in propositional value produced a greater range of percent of stuttered words among the various parts of speech. As meanings and the responsibility for communicating meanings became prominent, stuttering increased.

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

Goldman-Eisler (1955) led the way by showing that the hesitation pauses in normal speech tend to reflect verbal planning. They occur at points of greatest uncertainty, which by implication 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 and others, 1965; Soderberg, 1967; I. Taylor, 1966.

Barderick and Sheehan (1956) had their stutterers read one passage composed of numbers, another of ordinary meaningful prose and a third of emotionally loaded words. The number of stuttering increased in the same order.

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 occurring 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 indicated that 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. According to Soderberg, information is not related to consistency effect and only partially accounts for adaptation effect in stuttering. Still, it is clearly a major determinant of disfluency in general and stuttering in particular.

In a study, Hedge (1970) investigated the propositional aspect in stuttering. 10 male stutterers read two passages in Kannada of 150 words each, one meaningful and the other, devoid of meaning. The results did not confirm the proposition

that the meaningfulness per se is a significant factor in stuttering. It was concluded that stuttering probably is largely elicited by a conditioned stimulus pattern.

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

3. Phonemic characteristics and stuttering:

Whether or not stuttering will occur or not seems to depend on the characteristics of the first sound of the words 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 constants and if there is any relation between the sound characteristics and the occurrence of stuttering.

Blumel as early as 1930's supposed that stuttering is due to a delay in vocalization, i.e., inability to produce voice. Kenyon (1940) said; "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 constant 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 the difficulty were with the consonant he would stammer quite as much at the end of the words as he does not the beginning, and stuttering on the ending consonant does 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 stutterer’s trouble is due to a delay of the vowel. This is true of whispering also, because in whispering no phonation occurs.

Later Bluemel (1930) restated his theory as follows “The (first) theory is, I believed, substantially correct, though not sufficiently precise and clarified. Loss of sound imagery undoubtedly occurs; but the difficulty is not so much an inability to recall the sound, as it is a ‘recoil

of the sound’ from the mind”.

In a study, Johnson and Brown (1935) had stutterers read a long passage and then ranked the various speech sounds according to the frequency of stuttering. The order of phonemic difficulty was highly variable between the subjects but displayed some reliable distinctions (e.g., vowel Vs consonants).

Fairbanks (1937) pointed out that the sounds which are more difficult for stutterer required 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 year old children.

The higher pitch, increased intensity and longer duration were agreed upon the Schramm (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 words performing such functions or in such positions?

In a further study by Brown (1938), 32 stutterers read a list of 10,000 words. For the group as a whole and in the great majority, consonants were more difficult than the vowels. To check on the possibilities of factors other than the phonetic ones (grammatical functions of words and their positions in sentence), simple words were arranged in haphazard 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 order 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 unaccounted syllables. In his subsequent study, Brown (1945) reported that stuttering tended to occur on consonants other than /t/, /h/, /w/ and /ð/.

A marked difference between consonants and vowels was found (Hahn, 1942) and only 2.9% of the stuttering occurred on words beginning with a vowel. He had his 50 adults stutters 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 ranking 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), L & CH.

2. The ranking can be compared with that the Johnson and 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 smaller 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’t 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 formulation of the general ranking of difficulty of sounds in stuttering.

5. Stuttering occurs predominantly on consonants than vowel.

6. The prepondernece of stuttering occurs on initial sounds. The majority of the medial consonants associated with stuttering are at the beginning of accented syllables.

Since the phonetic factor in stuttering of this group is not a strong influence, it is suggested that the physical element in the production of sounds has little relation to stuttering and other factors, mostly the psychological must be operating.

Studying the role of the initial phoneme in the stuttering of spontaneous speech, Hejna (1955) concluded that consonant tended to be associated with more stuttering. However, no significant trend among the various consonants was noted. Bloodstein (1958) 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 airstream, involving greater articulatory tension. Van Riper (1963) attributed it to differential learning experiences.

On the basic of “many thousand cases” Froeschels (1961) insisted that stutterers do not stutter at the end of a word. However, Emerick (1963) described a case showing such ‘final stuttering’ although he agrees that it is rare.

Quarrington, Conway and Siegal (1962), using a special set of sentences in order to control other factors, compared the occurrence of stuttering on four consonants said by Johnshon and Brown to be the most difficult ones, with four other consonants said to be the least difficult. They found no significant difference in the amount of stuttering on the different sounds.

Soderberg (1962) investigated the frequency and duration of stuttering instances that are associated with vowels, voiced constants and voiceless consonants. 3 lists of 5 syllable phrases were recorded by 15 stutterers reading to two listeners. Each list contained 15 five syllables phrases totaling 50 words. In list one, all initial sound of words were vowels, in list two, they were voiced consonants and in list three, voiceless consonants. Semivowels and consonant blends were omitted. The lists were equated for word frequency, readability, word length, position of the words, 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 deigns was criticized by Taylor (1966) as tending to minimize any vowel-consonant differences. In her well controlled study she observed more stuttering on consonants but the particular consonantal contexts were not those

found by Brown and Hahn. This was attributed to individual variability.

Hunt (1967) regarding 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 vowels 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, disfluencies were chiefly found to occur on the utterance of mute and explosive consonants and their medials as p, t, k, b, d, m & c. The aspirated and continuant sounds as f, w, s & c offered much less difficulty, as the oral canal was not so completely closed as in the explosives. This does not mean that it is on account of difficulty of articulating explosives because, he often repeated these sounds in a rapid succession. It is the enunciation of the following sound, be it 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 given rise to stuttering; the spasmodic condition of the glottis which takes place in the explosive sounds is the ‘effect’ and not the cause of the distributed relation

The studies on the voice onset time (VOT) characteristics of stuttering have suggested further evidence to this transitional problem in stutterers. To test the hypothesis that the frequency with which vocalization must be initiated in a given speech segment and the frequency of attendant disfluency are positively related, Adams and Reis (1971, 1974) constructed two passages. One passage was composed entirely of voiced speech sounds (all voiced passage). The other contained both voiceless and voiced sounds (combined passage). Thus, in reading the later material, subjects had to effect more ‘off on’ phonatory adjustments than in the all voice section. Aside from this difference, the passages were closely matched along several other linguistic and phonetic parameters 14 stutterers performed five massed oral readings of each passage. Statistical analyses showed that there was significantly less stuttering and more rapid adaptation associated with the all voiced material.

Wingate (1969a) published a critical review of the literature pertaining to conditions under which stutterers enjoy ‘artificial’ fluency. He noted that many such conditions share the features of markedly altering the amount of vocalization required of the individual as he speaks. For eg., in whispered speech which does not required phonation, many stuttering exhibit a substantial increment in fluency. In contrast disfluency is usually most evident during normally loud

conversation or oral reading, acts which demand that phonation be started, stopped and then restarted as the speaker initiates an utterance, resumes speech after a juncture and makes transitions from voiceless to voiced sounds. From these and other observations, Wingate inferred that “vocalization is a crucial element in the complex of stuttering” Thus, recently a number of authors have indirectly implicated the phonatory mechanisms in stuttering (Stramsta, 1965; Wingate, 1969, 1970; Adams and Reis, 1971, 1974; Agnello, 1977; Brenner Perkins and Soderberg, 1972).

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).

Wingate (1971) found a group of 25 male stutterers to be inferior to a matched control group on two tests of phonetic manipulation. Results were consistent with his earlier report (Wingate, 1967a) which revealed that the group of 25 stutterers was much less capable than a comparable group of nonstutterer at solving a series of Slurvianisms. (A Slurvianism is a kind of pun which requires the ‘translation’ of a meaningful expression or saying from a string of independent words presented either visually or auditory and seems to test the manipulation of sound patterning at the suprasegmental level).

He suggested that some inadequacy in sound making skill is an important aspect of stuttering.

He his recent article Wingate (1977) observed that almost all stuttering occurred on the stressed syllable of a word, regardless of the grammatical or structural, characteristics of the word. He emphasized the fact that linguistics stress has been ignored for such a long time.

From the accumulated data on stuttering, it appears that stuttering occurs more on consonants than on vowels. However, it has been suggested in the 'recall of vowel' theory that stuttering occurs on the consonant sound because the succeeding vowel fails 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.

4. Sentence length and stuttering:

The studies dealing with sentence length as related to stuttering are not reported much in the literature. The only study that was available was the one that was recently conducted by Tornick and Bloodstein (1976). They made use of 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. 20 stutterers read in random order, there twenty sentences. Only the words which the pairs of sentences had in common were compared for occurrence 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 given 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.

5. Word length and stuttering:

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

Brown & Moren (1942) demonstrated that word length is an important factor in the occurrence of stuttering. They recorded the instances of stuttering during the subject’s reading

of a lengthy prose passage and from these data they selected adjectives and prepositions for their analysis of the effect of word length. Applying three separate measures of word length (syllable, letter, syllable letter), they formed that for all the three measures, longer adjectives and prepositions were more difficult for stutterers than shorter adjectives and prepositions. They concluded that, other factors being equal the amount of stuttering tends to vary directly with word length. They interpreted in terms of the stutterer's reaction to long words, namely, that the longer words "are more prominent in the speech sequences", because of their greater duration in time and it is logical to assume that for this reason stutterers would place a grater premimum on free speech in relation to them.

Brown (1945)reported that stuttering are not randomly distributed in the speech of stutterers but tend to occur on words which are 5 or more letters in length (or those which are longer than the average words).

Twenty stutterers in a study recorded nine 10 word lists composed of combination of three levels of word length and three levels of word frequency. Soderberg (1966) 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 increased of word

length and decreases of word frequency. However, word length was the more potent of the two variables.

Schlesinger, Melkman and Levy (1966) found that when words of one, two or three syllables were used, young stutterers had more difficulty s the word length increased, and less difficulty if the word had a high frequency of usage. In Wingate's (1967) study 14 adult male stutterers read two lists of words, one list consisting of one syllable word pairs, the second list consisting of two syllable words phonetically equivalent to word pairs in the first list. Results shows a significantly higher frequency of stuttering on two syllable words.

Five studies are reported in which the influence of word length upon the loci of instances of disfluency in the oral reading of stutterers and nonstutterers were investigated (Chaney, 1969; Sasanuma, 1968; Silverman and Williams, 1967a; Williams, Silverman and Kools, 1969, Silverman, 1972). Word length was not found to exert as strong an influence upon the loci of as in normals i.e., stutterers were likely to be more disfluent on short words than their non-stuttering peers. It was suggested that the tendency to be relatively more disfluent on long than on short words is characteristic of speakers in general and hence, not part of the symptomatology of stuttering.

Whether or not this tendency is a real one, the influence of word length on the young non-stutterers disfluency appears to differ from that for the older nonstutterers who exhibit a tendency to be disfluent on poly syllabic words (Silverman, 1972a). Silverman (1975) found in the spontaneous speech of 10 yr old boys that words length appeared to influence disfluency. However, children tended to be disfluent on monosyllabic words I the interview situation.

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 and Rosen, 1937), with frequency of usage of words and more stuttering in connected speech as opposed to isolated sounds.

Eisenson (1975) suggested that the longer words may be anxiety producing because of the stutter’s lack of familiarity with them. They may also be words that, because of lack of occurrence 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 reduce frequency of occurrence

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 toward the long words because of their greater duration may result in greater disfluency on these words.

6. **Word position in a sentence and stuttering:**

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).

Hejna (1955) found a partial support for the position gradient effect in the spontaneous speech of stutterers. Greater than expected levels of stuttering were observed on the 2^{nd}, 3^{rd}, 4^{th}, 6^{th} and 7^{th} word positions. 1^{st} and the 5^{th} word positions were not found to differ significantly from expected frequencies. The failure to find the most stuttering on the 1^{st} word was explained to be due to the fact that in the spontaneous speech, the initial word was often a starter word as ‘well’, ‘And’ which convey little meaning.

Quarrington, Conway and Siegel (1962) contrasted the amount of stuttering on 1st and final words of sentences, finding a significance difference in frequency, with more stuttering on the initial words. Conway and Quarrington (1963) tried to control for other variable as initial phonetic sound, grammatical class and number of syllables by designing the sentences read by the stutterers, also found the initial position had more stuttering than medial and medial more than final position of words in the sentences. Quarrington (1965)found a correlation of 0.49 between position of the word within the sentences and decreasing frequency of stuttering. Blankenship (1964) concluded from his study that Quarrington's speculation that initial position may be associated with a high frequency of stuttering may not only hold true for stutters but for nonstutterers as well.

Taylore (1966b) showed that 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 syllables.

It was also found that more stuttering occurred on initial word clauses than on subsequent words eventhough 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) also found that

very young stutterers had more trouble on the first words of their utterances.

Silverman and Williams (1967) found little difference between the loci of disfluencies in stutterers as compared to normal speakers except that the stutterers had more difficulties in the initial position, in getting started.

The above studies confirmed that occurrence of stuttering is related to the position of the word in sentence.

7. Word frequency and stuttering:

Word frequency is said to be closely related to the aspect of word length in stuttering. Research concerning effects of word length and word frequency on stuttering (Brown and Moren, 1942; Hejna, 1963; Schlesinger et al, 1965) has not demonstrated thoroughly the independence of these variables in their relationship to stuttered speech.

As per Zipf’s (1949) rule on the frequency of occurrence of words, longer words tend to be less frequency in language than shorter ones. Shorter words are more frequently used and are more familiar.

Schlesinger, Melkman and Levy (1966) found that when words of one, two, or three syllables were used, young stutters had

more difficulty as the word length increased, and less difficulty if the word had high frequency of usage. Soderberg (1966) found both factors (length and frequency) to be important determiners but word frequency to be the less important of the two. To account for this, explanations have been cast in terms of conspicuousness, coordinative loading, and the role of reinforcement.

Schlesinger observed that the locus of stuttering could be predicted by (a) the transition probability of words as estimated by forward word-by-word guessing and (b) response as measured by frequency of their occurrence in the language. Words of high transitional probability were stuttered on about half as often as words of low transition probability and low frequency, with words of low transition probability and high frequency occupying an intermediate position.

Danzger and Halpern (1973) also observed stuttering to be affected by frequency usage of words.

Recently, Bloodstein (1974) made further advancement in his tension and fragmentation hypothesis of stuttering speech. He analyzed brief speech samples of 6 children between the ages 3 – 6 yrs, on the basis of a conceptual model of stuttering as tension and fragmentation in speech. The hypothesis

was advanced that while the older stuttering tends to fragment words, the early phase of stuttering is characterized chiefly by fragmentations of whole syntactic structures as sentences, co-ordinate the subordinate clauses, verb phrases, noun phrases and prepositional phrases. This was suggested by the preponderance of repetitions of words and other large segments, by their occurrence at the beginnings of the syntactic structures, by their absence from the ends of such structures.

It is assumed that much if not all of the directly observable stuttering behaviour would disappear if not for the underlying muscular tension. The other possible effect of the speaker's belief in difficulty of a constitute element of speech is fragmentation. When a stutterers 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 convictions 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 word explain why stoppages and repetitions almost always occur on first sound or syllable or word and almost never on the last.

According to Booldstein, 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 not word bound grammatical factor as such in young children (Bloodstein 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 frequency as the first words of syntactic units.

This aspect is related to the difficulty encountered by the child in the language developed period. From the age of 3-5 years, children, with considerable difficulties, errors and false starts, accomplish to a large extent the monumental task of learning the transformations of adult language (McNeill, 1970; Dale, 1972). This period from 3 – 5 years is the same one during which normal speech disfluency is at its height and also when the highest number of cases of onset of stuttering are reported. It is perhaps also no coincidence that an appreciable number of stuttering children have been found to have a history of slow language development.

In a recent report Wingate (1977) suggests that a good deal of data that has accumulated reveals that stuttering involves the linguistic level of communication process. After

analyzing the major dimensions of linguistic feature associated with increased stuttering he opines that there is considerable overlapping among them. For eg., 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 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 dimensions of linguistic, stress, because it is felt that it could explain the other linguistic dimensions of stuttering occurrence. In connected speech, it is content words that regularly contain the stress peaks, where as function words rarely do. It can also incorporate the findings of more stuttering on longer words and on less familiar words since, length and familiarity are essentially aspects of the content – function distinction.

"It is thus possible to account for the immediate or phenomenal 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".

In earlier studies Wingate (1969, 1970) analyzed the various conditions which had beneficial effect on stuttering

(Singing, speaking to rhythm, choral speaking, shadowing speaking under masking and DAF). He felt that this could be explained economically and effectively by a common principle, namely the induction of some change in the phonatory activity of the stuttering speaker. This explanation has been the object of a number of subsequent investigations that have yielded supportive findings (Adams and Hayden, 1974; Adams & Moore, 1972; Agnells Wingate, 1972; and others).

Like Bluemel, even Wingate considers the repetitions or blocks on the consonants is only due to the actual difficulty encountered in saying the following sound which is almost invariably a vowel (or dipthong). Thus, he considers stuttering to be the attempted production of a stressed vowel. He feels that the shaping movements that distinguish one vowel from another perhaps contribute to the occurrence of stuttering event.

From the above review of literature on the linguistic factors, it is suggested 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, possessives and pronouns). Stuttering is reported to occur more on words with high propositional value;

words which are longer; words which are less frequent and thus les familiar; words which occur in the initial position of sentences more often than those in medial or final position. Initial sound of the utterance is also reported to affect the occurrence of stuttering. Consonants in general were reported to be the points where maximum stuttering occurs, compared to vowels. Individual variations have been observed with regard to the particular consonants stuttered. Recently, however Schwartz, Wingate and others thought the problems 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.

Van Riper (1971) observes that multiple factors interact to determine the loci of stuttering. He says,

“it is difficult in the individual stutterer, to assess the importance of the components, since the strength of any factor depends on the person’s past history of stuttering difficulty. For one stutterer, position (getting started) is of most importance, for another, the amount of information or uncertainty possessed by the word determines whether or not he will stutter on it; and for the third fellow, the phonemic characteristic of the word’s first sound may be most crucial”

The above review suggests some variability with regard to linguistic aspects as related to stuttering. This aspect has not been investigated (or reported) in many of the Indian

languages. So, the present study is an attempt to find the linguistics characteristics of stuttering speech in Kannada language and see if there is universality of these features over the language i.e., to see if it is language related.

CHAPTER – III

METHODOLOGY

In this study spontaneous speech and reading of 20 stutterers were recorded and analyzed on some of the linguistic variables.

Subjects

Fifteen stutterers, fourteen males and one female (5 – 20 yeas of age) were the subjects. Of the 15, 11 had Kannada as their mother tongue, two had telugu, one urdu and another tamil. However, those subjects who had mother tongues other than Kannada had good exposure to Kannada and could speak and read Kannada well. The subjects were selected from among the cases who attended a speech and hearing camp held at Mandya, a small town near Mysore and from among those who had registered at the All India Institute of Speech and Hearing clinic, Mysore.

The subjects were selected based on the following criteria:

1. They had good knowledge of Kannada and could speak Kannada well.

2. Some stutterers who had mother tongues other than Kannada were also included to see if there was any effect of bilingualism on the linguistic characteristics of stuttering speech. However, the criterion of good control on Kannada was satisfied.

3. They had clinically normal hearing and no history of any ear discharge, pain etc.

4. They did not have any known organic problems.

5. They had stuttering as diagnosed by atleast one trained speech pathologist.

6. Age was not used as primary criterion for selection the subjects.

Instruments and Materials

1. A Philips cassette tape recorder R.D.No. 144688 with its accessories was used for recording the speech samples.

2. The Thematic Apperception Test (TAT) by Henry Murray and children's Apperception Test (CAT)by Leopold Bellak and Sonya Sorel Bellack, both adapted to Indian conditions by Dr. Uma Chowdhury (1961)were used to elicit a part of the speech samples.

3. The Kannada reading passage from the Kannada picture articulation test developed and standardized by Ram Mohan Babu et al (1972) was the passage used fro reading.

4. Some pictured stories were used to elicit spontaneous speech in case of children in addition to CAT cards.

The recording was done in rooms where the surrounding noise was low (This was especially so in the camp set up).

It was not possible to record the speech samples without the knowledge of the subjects as the tape recorder was a portable one with a built in microphone. The subjects were informed that their speech would be recorded and their permission was taken (in the case of children, permission was taken from the parents to those who accompanied the child). In fact many of the subjects (especially the children) enjoyed the tape recorder. However, elicitation a spontaneous speech proved to be a difficult task.

The TAT (Thematic Apperception Test = Indian adaptation by Uma Choudhury) Cards T_2, T_4, T_7, T_8 were employed with adult stutterer to elicit spontaneous speech and CAT (Children's Apperception Test) cards C_4, C_7, C_8 and C_{10} were used with children. For those subjects who would not say anything on the TAT or CAT cards, picture cut from story chart were used as elicitation materials. For one or two children, a story was told by the experimenter using the story chart and then the children were asked to reproduce the same. Some subjects were asked to narrate something (Regarding their education, family life etc.,) or tell a story, if it was felt that the spontaneous speech elicited by the cards was not adequate.

The story in the Kannada picture articulation test developed and standardized by Ram Mohan Babu et al (1972) ("Bakka thaleya manushya mathu noṇa") was employed as the reading material in the study. For those who could not read (young children)

only spontaneous speech was taken for the analysis.

After the initial evaluation and brief interview, each subject was given the TAT or CAT cards (subjects below 10 years were considered as children and were given CAT cards). The instructions were kept informal. The subjects were asked to go through all the four cards given to them and to say some story or atleast 4 or 5 sentences on each card. they were asked to indicate when they were ready and then the tape recorder would be switched on. The tape recorder was kept 1½ to 2 feet away from the subject and the spontaneous speech and the reading were recorded. In certain cases, the recorded speech was played back to the subjects to motivate the subjects to speak more.

The recorded sample of speech in each case was transcribed into Kannada. This was analyzed on different linguistic variables which have been reported related to stuttering. The variables analyzed are the repetition characteristics (syllable, word, part word, phrase and sentence repetitions), position of the stuttering word in a sentences, phonemic characteristics of stuttering sounds (vowels Vs consonants) and stuttering with regard to content Vs function words).

CHAPTER IV

RESULTS AND DISCUSSION

The spontaneous speech and reading samples of fifteen stutterers ranging in age from 5 years to 20 years were analyzed on the following linguistic variables:

1) Content Vs function words and stuttering
2) Phonemic characteristics and stuttering
3) Word position in sentences and stuttering
4) Syllable position in a word and stuttering
5) Repetition characteristics of child and adult stutterers. Each of these aspects will be discussed separately.

1. Content Vs function words and stuttering:

It is generally agreed that the content or lexical category includes the following parts of speech: nouns, verbs, adjectives and adverbs. The category of function words includes: Prepositions, determiners, conjunction, articles, possessive pronouns etc., In the present investigation, the four lexical subcategories were taken fro analysis. However, with regard to the function word category, since there is no agreement as to some of the subcategories like determiners, articles and pronouns in Kannada language, a linguistic opinion

was taken. Thus the following four subcategories of function words were chosen: Pronouns, Determiners, Post-positions and conjunctions. The articles in Kannada (like ‘ondu’, ‘Kelavu’, ‘ella’ etc.,) were included under the determiners.

The stuttering instances in each case were categorized into one of the above eight subcategories depending on the word or sometimes the phrase on which the blocks occurred. Sometimes, the Webster’s English-Kannada Dictionary was consulted to decide about these word categories. Inspite of this a few blocks could not be placed in nay of these categories and were omitted.

Table 1 given the results obtained by the fifteen subjects with regard to the content-function subcategories.

Table 1

Stuttering and the content-function categories

SS	Content Words				Total	Function Words				Total
	Nouns	Verbs	Adje-ctives	Adverbs		Pro-nouns	Deter-miners	Post-posi-tive	Conjun-ctions	
AS	30	17	6	14	67	13	5	1	4	23
GA	9	6	2	7	24	1	0	1	0	2
RA	19	19	1	7	46	0	4	2	2	8
VI	13	10	2	3	28	2	1	1	2	6
JA	23	12	9	11	55	19	2	1	2	24
MA	12	12	9	1	34	8	1	0	0	9
SU	13	15	5	6	39	2	0	0	0	2
UL	4	12	4	9	29	22	3	0	2	27
NA	29	12	3	7	51	2	3	0	1	6
RE	36	24	11	18	89	14	1	1	0	16
VE	21	14	6	9	50	18	3	2	1	24
KI	21	8	6	8	43	5	0	0	3	8
MN	12	8	2	5	27	4	1	0	0	5
MS	23	20	3	3	49	10	2	1	0	13
AJ	26	12	5	4	47	6	5	0	2	13

The means and standard deviations of each of lexical and function word categories and of the total lexical and function words are given in table 2.

Table 2

Means and S.Ds of various lexical function categories

Content Words	Means	S.D.	Function Words	Mean	S.D.
Nouns	19.4	8.53	Pronouns	8.4	6.97
Verbs	13.4	4.74	Determiners	2.07	1.65
Adjectives	4.93	2.86	Post Position	0.67	0.699
Adverbs	7.47	4.87	Conjunctions	1.27	1.24
Total Content Words	45.2	16.28	Total Function Words	12.4	8.21
t = 8.22 (Significant at 0.01 level					

The data suggests that the content words in general are stuttered more often (M=45.2) than the function words. (M = 12.4). The ‘t’ value (8.22) obtained shows that the mean difference is highly significant. This is in agreement with

Brown's original finding that stutterers have more difficulty with content words as opposed to function words. He also reported that there is a rank order of difficulty with regard to the different parts of speech, whether the conventional 8 parts of speech are considered or a finer differentiation is made. This has been later confirmed by various authors like Hahn (1942), Eisenson and Horowitz (1945), Oxtoby (1958), Abron et al (1959) Maclay and Osgood (1959), Blankenship (1964) and others. Hejna (1955) found similar results with the spontaneous speech of stutterers.

Considering the means of each of the categories we can establish a hierarchy among the various parts of speech. Except for the pronouns, all other function words categories have comparatively less stuttering than the content words categories. In the descending order of stuttering, the word categories includes:

Nouns	-	M = 19.4
Verbs	-	M = 13.4
Pronouns	-	M = 8.4
Adverbs	-	M = 7.47
Adjectives	-	M = 4.29
Determiners	-	M = 2.07
Conjunctions	-	M = 1.27
and Post posi-tional aspect	-	M = 0.67

The highest frequency of stuttering on nouns (45.5%) is also reported by Blankenship (1964). However, the other word categories given by him in the order i.e, articles (13.6%) Verbs (9.1%) and adjectives (6.8%) is not observed in the present study. The reduced frequency of stuttering on determiners (i.e., including articles) in the present study may be due to its reduced occurrence in Kannada compared to English. The hierarchy obtained din the present study does not agree with that given by Hahn (1942). According to Hahn the words associated with greatest difficulty in order are: adjectives, nouns, adverbs, and verbs.

Thus except for the pronouns, the present data supports the widely held view that stuttering occurs predominantly on content word categories like nouns, verbs, adjectives and adverbs and loss of ten on function words. This contradicts the observations of Bloodstein (1960), Bloodstein and Gantewerk (1967), Helmreich and Bloodstein (1973). These authors feel that in the earliest phase of stuttering there is a tendency for stuttering to occur mainly, on pronouns, conjunctions and prepositions. This has not been observed here. In no single case, there is more stuttering on function words compared to content words. However, the onset of stuttering was not available in many cases in the present study. In almost all

cases there is marked difference between the two. There is no obvious difference between the children and adults with regard to these word categories and stuttering. However, in general the pronouns stand third in the series and in one individual (an adult) it out numbers the other content categories in terms of frequency. In children the pronouns category gets the fifth position.

The S.D. scores indicates wide individual variation in each of the content-function subcategories and also in general (i.e., when the groups are taken together). These variations could possibly be due to:

a) Variations in severity of stuttering within the group, and
b) Variations in the amount of these words categories in each individual. This is only partly controlled by the reading material.

There does not seem to be an obvious difference between the subjects having Kannada as their mother tongue as opposed to those having non-Kannada mother tongues (RA, JA, MA and MN) in terms of content-function categories.

Hence, from the study the null hypothesis 1, that there is no difference between the content and function words with

regard to stuttering is rejected.

It is concluded that the content words are stuttered more than the function words.

2. Phonemic characteristics and stuttering

To analyze the phonemic characteristics of stuttering only the repetitions, prolongations, hesitations of sound or syllables were considered., i.e., the repetitions of words, phrases and sentences were not taken into account. Totally, there were 6 vowels (no distinction was made between short and long vowels) and 22 consonant sounds on which stuttering was noticed one or more number of times.

Whenever the sound of syllable repetitions were noted, the following syllable (following the one that is repeated) was taken. This was done assuming that the repetitions could have been due to the difficulty in uttering the sound which follows it. The sounds which were repeated or prolonged or hesitated were included under the first sounds and when the sounds or syllables processed by repetitions were considered, they were included in the second sound category under the respective sounds. Thus the speech and reading samples of all the fifteen stutterers were analyzed.

The table 3 shows the distribution of stuttering for different consonant and vowel sounds for the 15 stutterers, with the means and S.Ds for each sound category. It also gives information as to the number of times each sound stuttered and the number of times it was preceded by repetitions of some other sound. The blank squares indicate that the frequency of stuttering in that particular block is zero.

The ‘t’ test was applied to see if there is any significant difference between the vowels and consonants on which the stuttering occurred. The‘t’ values were found to be highly significant at both 0.05 and 0.01 levels of significance for both the first and the second positions. The values 4.63 and 7.41 respectively for first and second positions. The greater value in the second position is due to the fact that most of the time the syllable being repeated contained the vowel at the end of it and so the following consonant was taken as the second sound. These findings suggest that the consonant are in general stuttered more than the vowels. However, if we compare the means obtained for each of the sounds, the vowel /a/ gets the highest value (M = 8.07). This is followed by the consonants /k/ (M = 5.33), /M/ (M=4.67), /N/ (M=4.4), /H/ (M =3.73) & /B/ (M=3.53). The means for all the 28 sounds range from 0.13 (for /sh/) to 8.07 (for vowel /a/).

Table - 3

Names		CONSONANTS																					VOWELS					
		/k/	/g/	/m/	/n/	/h/	/ya/	/b/	/d̲/	/s/	/ṭ /		/t̲/	/f/	/v/	/r/	/č/	/ǰ/	/sh/	/p/	/ḍ/	/l/	/ḷ/	/ṇ/	/a/	/i/	/u/	/e/	/o/	/I/
		ಕ	ಗ	ಮ	ನ	ಹ	ಯ	ಬ	ದ	ಸ	ಟ		ತ	ಫ	ವ	ರ	ಚ	ಜ	ಶ	ಪ	ಡ	ಲ	ಳ	ಣ	ಅ	ಇ	ಉ	ಎ	ಒ	ಐ
AS	1	1	1	18	1	2		2	4	1	5		5	2		3	1			2	2	5			9	8		5	3	
	2	4	1	1	8			1	3		1		5		2	6	1	1		2		4	1			2				
GA	1	4		1	2	6			3	2	1				1										3	1		1		
	2	1			2				1	1	2		1			3	2						1							
RA	1	7	1	4	3	5		2		1	2		3	1	2	2					1				7			2	2	
	2	4	3		7	4			1		1		4			2					2	1	1	1		1	1		3	
VI	1	6		1	6		2	3			1		1		1					1					5				1	
	2	1	2	2	5			2	1	2			1		2	3	1					1	2	2						
JA	1	5	2	4	9	6		7		2			2			2				1					29			4	4	
	2	3	4	3	8			2	2	3			1		20	2	1	1	2		4	3	3	7				1		
MA	1	3		5	2	3				1						1				1	1				5	3			2	
	2	1	1	1	6	1			3				2		3	2						1								
SU	1	5		4	4	4		6		3			1				1	1		1		1						2	1	
	2	2		1	7	2	1	1	1				4			3		1		1	2	2								
UL	1	1	1	1	2	5		1		1			4			1					1				16	15	1	1	1	
	2	2	2	2	1	1		1	6		3		3		17	3			1		4	2	1	1	3					
NA	1	10	4	2	7	7		4	1	2			1		1	1									9	3	1	2	7	
	2	1	4	5	12		1	1	2		1		1		3	5	2	3	0	1	2	3	1	1			1	1	2	
RE	1	10	1	4	8	11		11	1	4			9		1	2		1		1		1					1	1	2	
	2	2	3	5	24	1	1	2	6	1	3		3		5	10	1	1	2	1	6	7	6	3				1	2	
VE	1	4	3		5	2	2	6		2			3		2	1			1	3		1			16	4			4	
	2	4	2	4	7		1	4	2	3	1		1		4	2	1		1	1	2	3	1				1		1	
KI	1	4		4	5			4		1			5				1			4					2	1				
	2	5	2	8	8	1		2	4	6	1		2		2	4	1			3		2	1	4	10	1				
MN	1	11		5	4								3	1			2	1		1	3	2			1	2		1		
	2	1			5		1	1	1	2	2		1			2	2		1		1	5	1						1	1
MS	1	7	2	9	2			6	4	1			2	1			3			2	4				9	5			3	
	2	2	5	1	9		1	1	6	1	1		4		3	2		2				1			2		1	1	1	
AJ	1	11	3	8	6	5		1	2	3					2			1	1	1	2				10	3		5	2	
	2	3	5	2	8	1			3						7	2		1	2			6	1	2	1	2	1	2	4	
Means	1	5.33	1.2	4.67	4.4	3.73	0.27	3.53	1.0	1.6	0.47		2.6	0.33	0.67	0.87	0.53	0.27	0.13	1.2	0.93	0.67			8.07	3.0	0.2	1.6	2.13	
	2	2.4	2.27	2.33	7.8	0.73	.4	1.2	2.8	1.27	1.07		2.2		4.53	3.4	0.8	0.67	0.6	0.67	1.53	2.73	1.33	1.4	1.2	0.4	0.33	0.33	0.87	0.2
SDs	1	3.23	1.26	4.32	2.36	3.07	0.68	3.07	1.46	1.08	1.26		2.36	0.596	0.79	0.96	0.88	0.44	0.34	1.11	1.24	1.299			9.45	3.898	0.4	1.70	1.82	
	2	1.31	1.65	2.11	5.05	1.06	.49	1.05	1.83	1.657	0.997		1.47	-	5.83	2.12	0.05	0.87	0.80	0.94	1.82	1.95	1.95	1.93	2.54	0.71	0.47	0.59	1.2	0.54

The mean values might have been influenced by extreme scores (as indicated by S.D. scores) in each sound category and for each individual. Hence, the sounds getting the first three places in a rank order of frequencies were taken for each individual and for each of the two sounds positions. Whenever more than one sound got the same frequency, all sounds were taken with equal weight. Those sounds getting the first rank were given a weighted score of 3 and those getting second and third ranks (when 1 or more sounds had the same ranks all were given equal weightage) a weighted score of 2 and were given respectively. The weights were not affected by the magnitude of the differences in frequencies.

Table 3 A and 3 B provide the information regarding the sounds having the first three ranks in each individual for the two sound positions.

Table 3A

Sounds having the first three rank order of frequency in the first positions

Name	**Sounds getting 1st highest frequency of stuttering**	**Sounds getting 2nd highest frequency of stuttering**	**Sounds getting 3rd highest frequency of stuttering**
AS	/m/	/i/	/a/
GA	/h/	/k/	/d/ - /a/
RA	/a/ - /k/	/h/	/m/
VI	/k/ - /n/	/a/	/b/
JA	/a/	/n/	/b/
MA	/a/ - /m/	/k/ - /h/ - /i/	/n/ /o/
SU	/b/	/k/	/m/ /n/ /h/
UL	/a/	/i/	/h/
NA	/k/	/a/	/n/ /h/ /o/
RE	/h/ /b/	/k/	/t/
VE	/a/	/b/	/h/
KI	/n/ /t/	/k/ /b/ /p/ /m/	/a/
MN	/k/	/m/	/n/
MS	/a/ /m/	/k/	/b/
AJ	/k/	/a/	/m/

The sounds in the first column were weighted with a value of 3, for those in second and third column were weighted first and second respectively. When the weighted scores for each for the sounds were added the following order of hierarchy was obtained. /a/ (28), /k/ (27), /m/ (16), /b/ (13), /l/ and /n/ (12 each) and so on .

The same procedure was followed in the case of sounds in the second position also (Table 3 B) and the hierarchy obtained there are as follows:

/n/ (39), /r/ (15), /v/ (13), /t/ and /d/ (8 each) /m/ (7) and so on.

Table 3 B

The sounds having the first three rank order of frequency in the second positions

Name	**Sounds getting the highest frequency of stuttering**	**Sounds getting 2nd highest frequency of stuttering**	**Sounds getting 3rd highest frequency of stuttering**
AS	/n/	/r/	/t/
GA	/r/	/n/ /t/ /c/	/k/ /d/ /s/ /t/ /ḷ/
RA	/n/	/k/ /h/ /t/	/g/ /o/
VI	/n/	/r/	/g/ /m/ /b/ /s/ /v/ /ḷ/ /ṇ/
JA	/v/	/n/	/ṇ/
MA	/n/	/d/ /v/	/t/ /r/
SU	/n/	/t/	/r/
UL	/v/	/d/	/ḍ/
NA	/n/	/m/ /r/	/g/
RE	/n/	/r/	/l/
VE	/n/	/k/ /m/ /b/ /v/	/a/ /l/
KI	/a/	/m/ /n/	/s/
MN	/n/ /l/	/s/ /ṭ/ /r/ /c/	/k/ /ya//b/ /d/ /t/ /sh/ /ḍ/ /ḷ/
MS	/n/	/ḍ/	/g/
AJ	/n/	/v/	/l/

These hierarchies in both cases differ with that obtained by taking mean values. There the hierarch was,

(a) for the first position - /a/ /k/ /m/ /n/ /h/ and /b/

(b) for the second position - /n/ /v/ /r/ /m/ /g/ and /k/

The present findings that the consonants are stuttered more than the vowels is supported by the findings of Brown (1938, 1945); Hahn (1942); Hejna (1955), Bloodstein (1958) Quarrington et al, Taylor and others. This view is in contrast to the view held by Bluemel. Kenyon who feel 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. They give justifications to support this.

The results of the present study also supports Hunt’s view that stuttering not only occurs on consonants but that it may extend to all sounds including vowels. Thus there are a few stutterers in the present study (JA, UL, VE) in whom the vowel (/a/) stuttering is more than any one particular consonant stuttering. Even the means of different sound categories imply this.

The standard deviations again show wide flunectuations,

in some cases it has even exceeded the mean value. This is due to high individual variations.

With regard to the particular sounds being stuttered, there is no agreement between the finings of the present study and those reported in the literature. For instance, Hahn reported more stuttering on G, D, L, TH (unvoiced) CH and M and in smaller percentages on F, S, SH, WH (voiced). Brown reported more stuttering on consonants other than (/t/ /h/ /w/ and /ð/. In the present investigation, though the mean values differ with regard to some of the sounds, we cannot really establish a hierarchy of sounds for the group as a whole. This is because, the S.D. values are very high for each sound category and also, in each case, the stutterers are distributed over many sounds. In each case, the sound on which the highest frequency of stuttering occurs changes. For eg., As has more blocks on /m/ sound, GA on /h/, RA on /ka/ and /a/ etc., In general, the sounds /ya/, /ta/, /fa/ /ch/, /ja/ /gh/, /ḷ/ and /ṇ/ have very low frequencies of stuttering and among the vowels /u/ and /i/ are stuttered rarely.

When we analyze the second sound pattern, we get a different picture. In almost all the cases, the repeated sounds

are followed by the /na/ sound (M=7.8) and /Va/ occupies the next position in terms of frequency as a second sound. Here also the distribution of stuttering is not on one or two sounds in particular but covers almost the whole range of sounds.

From the above findings, it may be concluded that in the present group of stutterers, consonants occur more often in their stuttering compared to vowels though the latter also occur in almost all cases. Each individual seems to differ in terms of the sound having the greatest frequency and there does not appear to be any clear cut hierarchy with regard to the sounds being stuttered by the group as a whole. It may be the transitional properties of sounds (VOT characteristics) that is important in determining stuttering. However, this aspect has not been tested in the present study.

The study hence rejects the null hypothesis that there is a relationship between the phonemic characteristics and stuttering and the alterative hypothesis that there is a relationship is accepted.

The consonants are stuttered more often than the vowels. However, the vowel /a/ gets the highest frequency of stuttering in the first position and a rank order could be established using the weighted scores.

3. Word position in a sentence and stuttering

Here, the stuttering blocks were counted depending on the positions of the stuttered word in the sentence. Again, here also only the syllable and word repetitions and blocks were considered and not the phrase repetitions.

Table 4, gives the frequency of blockage on each of the different word potions starting from first to fifteenth for the 14 subjects. One subject (KI) was not considered for the analysis as his stuttering mainly contained phrase repetitions. The table also provides data as to the mean and S.Ds for each word position.

Thus from the table values, it is clear, except for few variations here and there, that the first 4 – 5 words positions contain the maximum frequency of blocks. There appears to be a gradual tendency for the number of blocks to decrease with the increasing word orders. This supports the finings of Brown and others. Brown reported that stuttering was more on the first word of a sentence, less on the second word and even less on the third. Hejna observed greater than expected levels of stuttering on the second, third and fourth, sixth and seventh word positions. Quarrington et al also reported a significant difference in

Table 4

Word positions in a sentences and stuttering

Names	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th
AS	29	15	14	11	7	3	2	2	1	2					
GA	5	11	7	2											
RA	12	10	8	5	5	1	4			1	1				
VI	11	6	7		3	2		1				1	1		
JA	21	8	12	8	7	4	4	3	2	2	1	1		1	
MA	8	9	6	3	3	1	3		1						
SU	13	8	2	7	4		1	1	1			1			1
UL	19	14	4	6	5	3	6	3	2	1	2				
NA	13	12	15	6	3	2	1	2	3	1	2		1	1	
RE	18	14	10	10	8	4	4	3	1			1			
VE	18	7	6	2	8	4	6	7	4	2	1	1	1		1
MN	2	7	8	4		2	2	3	1		1				
MS	8	10	14	5	7	9	2	3	3			2			
AJ	11	11	12	9	7	5	3		2		1			1	
Means	13.43	10.14	705	5.57	4.79	2.86	2.71	2.0	1.5	0.64	0.57	0.5	0.21	0.21	0.143
S.Ds	6.80	2.75	3.98	3.11	2.62	2.26	1.87	1.85	1.18	0.8	0.73	0.63	0.41	0.41	0.35

frequency of stuttering between initial and final words of a sentence. Conway and Quarrington and others have also found similar results for the disfluency characteristics of stutterers, non stutterers, children and adults.

In the present study, the word positions having stuttering range from one to fifteen. The mean values show gradual decline with each words position indicating reduced stuttering occurrence with increasing words order. Thus, the mean frequency of blocks for the fourteen subjects range from 13.43 (for the first word position) to 0.143 (for the fifteenth position). However, only two subjects have blocks on the fifteenth position and that too on one occasion each. The blocks are very much reduced in frequency from the tenth word onwards. This could be a limitation in using the spontaneous speech for analyzing the word position and stuttering. Even the reading passage used did not have many sentences which were longer than ten words. In five subjects, the first word of the sentences has less number of blocks compared to second or third words. These deviations from the group trend could probably be a chance occurrence or due to factors other than the positional factor, for eg., the content-function factor, the factor of phonemic characteristics of the word being stuttered.

The S.D. values indicate wide individual variations with in each word position. There does not seem to be any obvious difference between the (a) adult and child stutterers and (b) those having Kannada Vs non-Kannada mother tongue, with regard to the word position and stuttering.

Again, from the findings the hypothesis number 3 (a) that there is no relation between word position in a sentences and stuttering is rejected and the contrary hypothesis is accepted a word position is related to stuttering in that the first few word positions are likely to carry more stuttering than the later words. There is a hierarchy with regard to word positions and stuttering.

4. Syllable position in a word and stuttering

It is said that “the position of the sound in the word is of major importance in determining whether or not stuttering will occur on it”. Many investigators have found that stuttering is more frequent on the initial sounds or syllables than or later sounds or syllables of a word. According to Van Riper, when stuttering does occur later in the word, it is usually on the syllable having the primary or secondary accent. Froeschels, based on many thousand cases, insisted that stutterers do not stutter at the end of a word. Emerick also agreed that final shuttering is rare.

In the present investigation, the sound and syllable repetitions and block were analyzed to see if the same thing holds good in Kannada speakers also. The syllables in a word were classified into initial, medial and final positions and when a word contained only two syllables, it was classified as only initial and final positions.

The data obtained in the study is given in Table 5. The result clearly shows that it is the first syllable of the word which is stuttered often. The frequencies in the medial and final positions are in most instances zero. There are only two instances (in only two individual) of occurrence of median and final syllable blocks, and even there the frequency is very less.

Table 5

Stuttering and the sound or syllable positions in the word

Names	Initial	Medial	Final
AS	54	0	14
GA	14	0	0
RA	31	0	0
VI	19	1	0
JA	92	0	1
MA	29	0	0
SU	23	1	0
UL	61	0	0
NA	63	0	0
RE	183	0	0
VE	41	0	0
KI	71	0	0
MN	30	0	0
MS	63	0	0
AJ	93	0	0

The above data supports the generally held view that the first sound in a word carries the maximum amount of stuttering and stuttering occurs rarely if ever on the medial and final position of the words. Hence, the null hypothesis 3 (b) is rejected and the hypothesis that there is a relationship between syllable position in a word and stuttering is accepted.

Stuttering is related to the first syllable position in a word.

5. Repetition characteristics of stuttering.

The repetitions more than hesitations, are said to be the significant characteristic of stuttering and thus an important aspect for identification of stuttering behaviour (Huffman, 1974). Yvan Lebrum and Richard Hoops (1972) felt that there are atleast three different possibilities in the interpretation of repetitions:

(i) Being accustomed to repeating words or parts of words of overcome a real difficulty, the stutterer generalizes and repeats when there is no difficulty.

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

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

The repetition characteristics of stuttering speech was analyzed to check one of Bloodstein's (1974) hypothesis. According to his conceptual model of stuttering as tension and fragmentation in speech, "which the older stuttering is characterized chiefly by fragmentation of whole syntactic structures such as sentences, co-ordinate and subordinate clauses, verb phrases, noun phrases, and prepositional phrases. This according to Booldstein is suggested by the predominance of repetitions of words and other large segments, by their occurrence at the beginnings of syntactic structures. He also predicted that the loci of early stuttering will not be influenced directly by Word-bound factor such as initial sound, word length or word frequency.

Therefore, in the present investigation the repetitions of various syntactic units like syllable, part word, word, phrases and sentences were analyzed as to then frequency and composition. Only four children were available for this investigation and they were compared with the eleven adult stutterers. The child stutterers (AS, GA, RA and VI)

ranged in age from five years to eight years and the rest of the stutterers ranged in age from 11 years to 20 years.

The analysis of repetition were thus made on two dimensions:

a) Frequency of repetitions of various linguistic unit.

b) Characteristic of the repeated syllable or part word depending on its compositions.

(a) Frequency of repetitions of various linguistic units:

As stated previously, the repetitions were counted for each of the linguistic units as syllables, part words, words, phrases and sentences. Table 6 gives the data on the fifteen stutters and the repetitions.

Table 6

Repetitions of various linguistic units

Name	Age	Syllables	Part Words	Words	Phrases	Sentences
AS	5 Yrs	58	9	13	1	2
GA	6 Yrs	14	1	6	2	1
RA	7 Yrs	31	4	10	12	0
VI	8 Yrs	20	0	7	1	0
JA	11 Yrs	93	0	16	2	0
MA	12 Yrs	29	2	7	5	0
SU	12 Yrs	24	1	10	5	0
UL	15 Yrs	61	4	18	5	0
NA	15 Yrs	63	2	11	3	0
RE	15 Yrs	183	2	7	1	0
VE	15 Yrs	41	0	27	5	0
KI	16 Yrs	71	2	21	65	2
MN	16 Yrs	30	0	3	2	1
MS	19 Yrs	63	2	13	2	0
AJ	20 Yrs	93	0	4	0	0
Mean		58.27	1.93	11.53	7.4	0.4

Table 7

Means and 't' values for child and adult stutter for the repetitions of various linguistic units

	Syllable	**Part Word**	**Word**	**Phrases**
Mean (children)	30.75	3.5	9	4
Mean (adults)	68.27	1.36	12.45	8.64
't' value	1.57	1.63	0.88	0.48

From the table values it is clear that the stutters in general tend to repeat syllables more often (M = 58.27) than other linguistic units. The range within the group is very wide which could be partly attributed to the variability in terms of severity. The next in the hierarchy is the word repetitions followed by phrase, part words and finally the sentence repetitions. Sentence repetition is very infrequent in the group. This general pattern is found in all subjects except for two (KI, RA) in whom phrase repetitions are greater than word repetitions.

Table 7 indicates the means for the four children and

eleven adult stutterers for syllables, part word, word and phrase repetitions. Though the mean values for the syllable repetitions between the adult and child stutterers differ markedly the ‘t’ test shows the difference is not significant even at 0.05 confidence level. The mean difference between the two groups is also not significant for part word and phrase repetitions.

This supports the hypothesis four that there is no difference between the children and adult stutterers in terms of repetitions characteristics. This contradicts Bloodstein’s tension and fragmentation hypothesis. The children and adults did not significantly differ in terms of the repetition of various linguistic units.

The highest frequency of sound or syllable repetitions compared to other units in the present study is in agreement with the views held by Reid (1946) and Van Riper (1971), that in most stutterers, the early behaviour is primarily syllabic repetitions or prolongations of a sound or articulatory posture. Stetson maintained that the breath pulse is the basic integrator of the syllable. According to him, the searching behaviour in achieving the necessary timing of the breath pulse and in the successive articulatory postures is found in the repetitive type of stuttering.

Generally in the two groups, phrase repetitions are less frequent than word repetitions. However, in two stutterers (RA & KI), Phrase repetitions are more common. This is very marked in case of KI and in his case the reason for this seems obvious i.e., he used to repeat the bigger syntactic units till he could get the next sound or syllable and the word out. He seemed to have a problem on a particular set of sounds like /m/, /n/, /s/ etc., This could be a factor in RA's case also but was not obvious from his speech. It could possibly due to uncertainty in his speech sequences.

Sentence repetitions in general are very rare and it does not seem to be characteristic of child or adult stuttering.

(b) <u>Syllable structure and stuttering</u>

To see if the type of syllable (i.e., different vowel consonant combination) has any effect on the stuttering, the stuttering blocks were analyzed with regard to the type of V-C combination in each of the syllable and part word repetitions.

(i) Syllable stuttering was classified into five

syllabic structures – Vowel (v), consonant-vowel (CV) vowel-consonant (VC), consonant-vowel-consonant (CVC) and consonant-consonant-vowel (CCV).

The frequency of stuttering on different combinations for the fifteen subjects is given in table 8.

Table 8

Types of syllable structure and stuttering

Names	V	CV	VC	CVC	CCV
AS	23	20	12	1	2
GA	3	8	0	3	0
RA	9	14	1	5	2
VI	3	17	0	0	0
JA	58	35	0	0	0
MA	11	15	1	2	0
SU	1	23	0	0	0
UL	41	20	0	0	0
NA	21	42	0	0	0
RE	45	138	0	0	0
VE	15	24	1	0	1
KI	3	67	1	0	1
KN	2	27	0	1	0
MS	15	45	2	0	2
AJ	33	60	0	0	0
Mean	18.87	37	1.13	0.8	0.53

From the table it appears that C.V. and V syllables carry more stuttering than the rest of them. The mean value for the C.V. syllable is the highest (37) of all and next in the vowel structure. The frequency of stuttering on V.C, C.V.C. and C.C.V. syllables is comparatively less. The greater number of blocks on C.V syllables than on the V syllables also confirms the earlier conclusion that the consonants are more than the vowels though vowels also the stuttered upon. The transitional hypothesis that stuttering is due to the problem in transition form vowel to consonant or voice versa may not be justified fully by the above observation as stuttering on C.V.C. syllable is comparatively very low. In one or two cases, vowel structure has got more stuttering instances than C.V. structure which also confirms the earlier observation of increased vowel stuttering in a few cases. This again justifies Hunt's view regarding the vowel and consonant stuttering. There is not much of a difference seen between children and adults in this regard. The result support the view of Brown and others that "words beginning with consonants produced more stuttering than those beginning with vowels" in a majority of subjects.

(ii) Characteristic of syllabic structure in part word repetition

As in syllable repetitions, here also the part word

repetitions were classified into different C.V. structure. They were: V.C.V, C.V.C.V, V.C.C.V, C.V.C.C.V.

In general as seen earlier, the part word repetitions are very few. The results obtained by the subjects are given in table 9. The values show that among the above syllable types, V.C.V. and C.V.C.V are comparatively more frequent than the rest. No general conclusions can be made from the data as the values are small and are very scattered.

The analysis of syllable structure of syllable and part word stuttering revealed that syllables with C.V. syllables are stuttered more than the others and next highest frequency occurred on the vowel syllable. In part word blocks, those with V.C.V. and C.V.C.V. are noticed often.

Table 9

Part word repetition characteristics

Names	V.C.V.	C.V.C.V.	V.C.C.V.	C.V.C.C.V.	C.V.C.C.V.C.
AS	5	2	2	0	0
GA	0	1	0	0	0
RA	1	2	1	0	0
VI	-	-	-	-	-
JA	-	-	-	-	-
MA	-	2	-	-	-
SU	-	1	-	-	-
UL	3	1	-	-	-
NA	1	-	-	-	1
RE	1	1	-	-	-
VE	-	-	-	-	-
KI	2	-	-	-	-
MN	-	-	-	-	-
MS	1	-	-	1	-
AJ	-	-	-	-	-
Mean	0.93	0.67	0.2	0.07	0.07

CHAPTER – V

SUMMARY AND CONCLUSIONS

Studies on the linguistic variables of stuttering are not available in the Indian languages. The present study is an attempt to find some of these linguistic variables of stuttering in Kannada language.

The study investigated the spontaneous speech and reading samples of 15 stutteres (1 female and 14 males) ranging in age from 5 years to 20 years. There were 3 children (5 years to 8 years) and 11 adults (11 years to 20 years) Stutterers. The speech samples were collected using some of the C.A.T. and T.A.T. cards, one reading passage taken from the Kannada articulation test. The speech samples were recorded, transcribed and analyzed on the following linguistic variables:

1. Content (nouns, verbs, adjectives and adverbs) Vs function words (pronouns, articles, determiners, conjunctions etc.,)
2. Phoneme characteristics
3. Word position in a sentence
4. Syllable position in a word
5. Repetitions of various linguistic units (syllables, part words, words, phrases and sentences)

The following null hypothesis were made in the study to

test the above variables:

1. There would be no difference among the stutterers in terms of their difficulty with respect to content and function words.

2. There would not be any relationship between the phonemic characteristics and stuttering i.e., consonants are stuttered as often as vowels and that there is not rank order of difficulty with regard to sounds on which stuttering occurs.

3. (a) There would be no relation between word position in a sentences and stuttering.
   (b) There would be no relation between syllable position in a word and stuttering.

4. There would be no difference between the adult and child stutterers in terms of their repetition characteristic.

Conclusions

The analysis of the data yielded the following conclusions:

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

The mean difference obtained between the content and function word stuttering was shown to be highly significant.

(b) That we can establish a hierarchy among the content and function word categories with regard to the amount of stuttering. The hierarchy obtained in the study was: Nouns, Verbs, Pronouns, Adverbs, Adjectives, Determiners, Conjunctions and finally

the post positional aspect in Kannada. Thus, except for the pronouns, all other content word categories rank and highest with regard to the frequency of stuttering. This is in agreements with the literature on stuttering that content words in general are stuttered more and contradicts and view of Bloodstein and others who report that the earliest phase of stuttering is characterized by more stuttering on functions words.

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

(b) For the group as a whole, the vowel /a/ got the highest frequency of stuttering when it was the first sound. Other sounds getting more frequent stuttering in order of merit include /ka/, /ma/, /ha/, /ba/. The individuals vary widely in terms of their difficulty with any particular sound. When the weighted scores were used to assign hierarchy the following sounds get the highest weightages in the order /a/, /k/, /m/, /b/, and /h/ in the first position and /n/, /r/, /v/, /t̲/, /o/ and /m/ in second position.

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 10^{th} 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. Hence, the hypothesis 3 (b) should be rejected.

5. The fourth null hypothesis that there is no difference between the adult and child stutters in term of their repetition characteristics was accepted i..e, the children do not differ from adults with regard to the various linguistic units as syllable, word, part word, phrase and sentence repetitions. This contradicts the suggestion of Bloodstein's recent tension and fragmentation hypothesis.

6. With respect to the syllable structure, maximum stuttering was observed on C.V. syllables (M = 37) and the next in the order was V syllable (M = 18.87).

7. In the group, the syllable repetition occurred most often (M = 58.27) followed by the repetitions of words, phrases, part words. Sentences were rarely repeated.

From the present study, it appears that the linguistic factors are important determiners of stuttering through other factors may also influence it. As suggested by Van Riper, in each individual and in each instance of stuttering,

any one or more of these linguistic factors may be operating. In the present investigation these aspects are not dealt completely and satisfactorily due to shortage of time and lack of adequate sample.

Recommendations for further study

1. These and the other linguistic variables known to influence stuttering may be studied on a larger population. Additional factors that may be studied are: Word length, suprasegmental feature of the stuttered word or syllables (i.e., stress, accent, intonational aspects), sentence length, propositionality, word frequency, rate of speaking or reading and others.

2. The linguistic factors may be studied in case of normal disfluency, the early phase of stuttering and the successive phases so that if there is any relation between the stages and the linguistic factors may be established.

3. The variables of sex and age may be studied with regard to the linguistic factors in stuttering.

4. Linguistic variables and stuttering may also be explored I relation to the language development, bilingualism and multilingualism.

5. The influence of sociocultural factors with regard to the linguistic variables of stuttering may be studied.

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