

DISFLUENCIES IN CHILDREN (3-4 YEARS)

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CERTIFICATE


This is to certify that the Dissertation
entitled: "Disfluencies in children (3-4 years)"
is the bonafide work on part fulfilment for the
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DECLARATION

I hereby declare that this Dissertation entitled: "Disfluencies in children (3-4 years)" is the result of my own study under the guidance of Dr.S.R.Savithri, Lecturer in Speech Sciences. All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier at any University for any other Diploma or Degree.

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INTRODUCTION

In literature much of information is found on the development of normal articulation, language and voice. But regarding fluency no conclusions have been made.

Fluency is referred to as 'A barometer for the entire speech system (with its) limits apparently set by adequacy of performance of the other dimensions of speech' (Perkins, 1977). According to Stark Weather (1987) Fluency is the effortless production of long continuous utterances at a rapid rate. The three important elements of fluency include continuity, ease and rate.

Fluency is disrupted by pauses, hesitations and repetitions. Disfluencies are found in speech of everyone especially when the person is uncertain of what he is saying. A few of the important factors which influence fluency are language maturity, environmental stress, physical conditions, grammatical complexity, etc.

Fluency is also a characteristic of young children. As the children mature, their speech becomes increasingly fluent. Also, children learn to deal with the lack of fluency in more sophisticated ways.

Growth in the capacity for fluent speech comes from several areas. There is increasing control over the movements of the vocal tract. Children become more fluent as there is increase in their syntactic, semantic, phonologic and pragmatic knowledge. Also the people with whom children communicate, - their parents, siblings, peers, teachers, place, demands on the child's speech.

There are several attempts (Haynes and Hood, 1977; Yairi, 1981; DeJoy and Gregory, 1985) to study the fluency development in children. The most elaborate study is by Kowal, O'Connell and Sabin (1975), which illustrates a number of aspects of fluency development. They asked 168 children 24 (12 boys + 12 girls) at each of seven different age levels to describe a series of cartoons. Most of their observations concern pauses and hesitations. They considered 5 categories of non-fluencies (1) unfilled pauses - defined as any silence less than 270 m.sec. (2) filled pause - um, ah, hm, etc., (3) repeats - repetition of an element, (4) false starts - correction of phrases or words and incomplete utterances, and (5) parenthetical remarks - 'well' 'you know' and 'other fillers'. They observed that vocal hesitations, in general, do not decrease with age but fluctuate with development, increasing between

kindergarten and fourthgrade, then declining by sixth grade, increasing again through eighth grade and sophomore year and then declining at senior year to the same level as kindergarten. They conclude that as children grow the number of disfluencies fluctuate but neither increases nor decreases in any systematic way, although certain types of disfluencies increases while others decreases with age.

The discontinuities in preschool children regardless of the form they took were believed to be normal behaviour and children showing these behaviors were classified as normals (Johnson, 1961). However, the classification of such children as normal/stuttering is a subject of controversy till date. In this context it becomes important for a speech pathologist to know about these developmental changes in fluency, for the assessment of fluency disorders. By comparing the child's fluency with the level of fluency that would be expected for normal child of the same age one could arrive at a decision. Also, it is necessary for a speech pathologist to know how easily children of various ages are able to talk, how to measure the fluency of children's speech and to compare them with the norms.

Eventhough a differential diagnosis of normal non-fluency and stuttering is being done now, normative data

and a test of fluency would definitely enhance the diagnosis and therapy. It would aid in the early identification of children with fluency problem and their rehabilitation. This warrants studies on fluency developments in children. In this context, the present study was undertaken to evaluate the disfluencies of normal children in the age group of 3-4 years and to suggest the type of test materials which can be used in a test for fluency assessment. Specifically, the percentage of different disfluencies occurring in different age groups are provided with.

REVIEW OF LITERATURE

Speech fluency calls for rate, smoothness and effortlessness. In therapy for stutterers, aim is usually at removing the disfluencies. However, to be fluent does not mean that there exists no disfluencies. Even normally fluent speakers show many pauses, hesitations and interjections. Several attempts have been made to investigate the disfluencies in normal children and adults.

This review includes -

1. the terminology and nomenclature used in fluency evaluation,
2. studies by different authors on development of fluency in the age group of three to four years, and
3. the factors affecting fluency

1. Terminology and Nomenclature:

The disfluencies in children have been categorized by many researchers.

Johnson (1961) classifies the following types of speech behaviours as disfluencies. This includes many types.

- i) **Interjection of sounds, syllables, word or phrases:** Extraneous sounds such as 'uh' 'er' and 'hmm' extraneous words such

as 'well' which are distinct from sounds and words associated with the fluent text or with phenomena included in other categories. An instance of interjection may include one or more units of repetition of the interjected material, for eg. 'uh' and 'uh', 'uh', 'uh' are each counted as one instance of interjection. The number of times the interjection is repeated (units of repetition) within each instance is also noted, uhuh is an example of an interjection repeated once and uh uh uh is an example of an interjection repeated twice.

ii) Part word repetition: This category has repetitions of parts of words that is syllables and sounds within each instance of repetition, the number of times the sound or syllable is repeated is counted, buh-boy involves one unit of repetition and guh-guh girl involves two units. This does not distinguish between sound and syllable repetitions. 'Ruh-ruh-run', 'Cuh-come' baba - baby and a-abou-bout are examples of part word repetitions.

iii) Word-repetitions: This category includes repetitions of whole words including words of one syllable. Both the number of instances and the number of repetition units with

in each instance are counted 'I-I-I' was was and going-going are samples of instances of word repetition, the first involves two units of repetition and each of the other two involves one unit. A word repeated for emphasis as in 'very-very clean' is not counted as a disfluency. A part word repetition or an interjection, does not nullify a word repetition, for eg. going uh going or guh-going is classified as word repetition. In any such case the interjected or associated disfluency is also tabulated in the appropriate category.

iv) Phrase repetition: This category includes repetitions of two or more words. Example I was I was going.

v) Revisions: Instances of revision include those in which the content of a phrase is modified or in which there is grammatical modification change in the pronunciation of a word is also counted as a revision. 'I was - I am going ' is an example of this category.

vi) Incomplete phrases: An incomplete phrase is one in which the thought or content is not completed and which is not an instance of phrase repetition. Example: She was and after she got there he came.

vii) Broken word: This is characterized by words which are not completely pronounced and which are not associated with

any other category, or in which the normal rhythm of the word is broken in a way that definitely interferes with the smooth flow of speech. I was g-(pause) oing home is an example of a broken word.

viii) Prolonged sounds: This category includes sounds judged to be unduly prolonged. If a sound is prolonged twice, it is counted both as a prolonged sound and a part word repetition.

Johnson and Moeller in an unpublished manuscript have suggested that the categories of broken words and prolonged sounds may be replaced by categories of dysrhythmic phonation in words and tense pauses. (Williams, Darley and Spristersbach, 1976). Williams, Silverman and Kools (1968) present a revised version of Johnson's disfluency classification system. They include part word repetitions whole word repetitions, phrase repetitions, interjection, revision, tense pauses and disrhythmic phonation.

i) Tense pause: is a disfluency phenomenon judged to exist between words, part words and non-words (i.e. an injection) When at the between point in question, there are barely audible manifestations of heavy breathing or muscular

tightening. The same phenomena within a word would place that word in the category of dysrhythmic phonation.

ii) Dysrhythmic phonation: Identified only with words is that kind of phonation which disturbs or distorts the so-called normal rhythm or flow of speech. The disturbance or distortion may or may not involve tensing and may be attributable to prolongation of a phoneme, an accent or timing which is notably unusual and improper stress, a break, or any other speaking behaviour infelicity not compatible with fluent speech and not included in another category. Dysrhythmic phonation is a within word category. Most of the investigators have utilized the above classificatory system to analyse speech disfluency. Others have put forth their own views.

Davis (1939) considered repetitions a bit more extensively than in terms of exact duplications.

- (1) A repetition is defined as the utterance of the same syllable, word, or group of word more than once. For example 'I want, I want to go'.
- (2) The addition of 'yes' or 'no' to the repeated phrase does not vitiate the repetition for eg. 'put it in her wagon No, put it in her wagon'.

- (3) The inclusion of 'too' or 'hey' still preserves the repetition. For eg. 'Hey, here's some over here Here's some over here too'.
- (4) There can be a repetition within a repetition which counts as a total of two repetitions. For eg. 'put it in her wagon put it, put it in her wagon'.
- (5) A total response which is repeated at the beginning of the following response counts as a phrase repetition. For example, 'you can't, you can't have any'.
- (6) A phrase repetition may occur as part of one response, or involve the repetition of a total response. For example "What are these things? What are these things? or What are these, what are these things?".
- (7) The calling of an individual's name over the over is considered as a repetition. For eg. Mary Mary Mary.
- (8) The absence of the definite or the indefinite article does not vitiate the response as a repetition, because of the difficulty in detecting it in rapid speech. For eg. 'You sleep in the dog house. You sleep in dog house'.
- (9) Two complete responses can be repeated as a group, in which case they are scored as two repetitions. For eg.

'oh', look what he's doing. He's putting his feet in dog house. Oh, look what he's doing. He's putting his feet in the dog house'.

- (10) The insertion of the name does not offset the repetition. For eg. 'Let's rock on the rocking horse. Timmy let's rock on the rocking horse.'

Limitations on repetitions were also established:

- i) Changes of a word which bring about a change in the meaning of the response nullify it as a repetition. For eg. 'That's all I need/that's all we need'.
- ii) Repetition of 'what' or 'humh' were not marked as repetitions as their presence could indicate the child's inability to hear a remark made to him by another.
- iii) The introduction of a non-identical remark between identical remarks cancel the repetition. For example, 'We won't go down, will we watch we won't go down will we?'
- iv) Sounds made in imitation of motors, gas being put in a car, or water coming out of a house, etc. were not marked as repetitions, since the child was attempting to imitate a continuous sound. For example Errrrrr Errrr (a motor).

v) A change of sentence structure invalidates repetition for example 'you can't you cannot'.

Yairi (1981) - classified disfluencies into eight categories, in which word repetition was classified into single syllable word repetition and polysyllabic word repetition. Other types were part word repetition, phrase repetition, interaction revision/incomplete phrase, dysrhythmic phonation, tense pause.

Janssen and Kraaimaat (1980) - has categorized disfluencies into ten types which include fast repetition of a sound, syllable or monosyllabic word, slow repetition of a sound, syllable, word or phrase. The other disfluencies are prolongation of a sound, tense block and interjection of a sound.

Carrell and Tiffany (1960) - refer to the pauses, during encoding, as ear punctuations. Carrell and Tiffany (1960), Liberman (1967) and Scholes (1968) consider pauses which do not perceptually disrupt the smooth flow of speech - fluent pauses. Pauses can disrupt the communication. Martin and Strange (1968) consider hesitation pauses - that is, pauses that disrupt the smooth flow of speech.

Clarke (1971) differentiates between conventional pauses and idiosyncratic pauses. Conventional pause is one that a competent speaker makes for emphasis or to signal something linguistically important while an idiosyncratic pause is an aspect of performance reflecting hesitation or uncertainty over word choice style or syntax.

Kowal, O'Connell and Sabin (1975) considered unfilled pause as a category of disfluency. They define unfilled pause as any silence less than 270 m.sec.

Manning and Monte (1979) have referred phrase repetition, word or syllable repetition as motoric and hesitations such as interjections and revision as formulative disfluencies.

Yairi (1981), Wexler and Mysak (1982) have grouped revision and incomplete phrases into a single category. Although Johnson (1961) and other investigators have categorized disfluencies into many types, Minifie and Cooper (1964) have suggested that disfluencies can be broadly classified into two basic categories:

- i) **disfluencies of syllable insertion** including repetitions, revisions and interjections.
- ii) **disfluencies of deliberation** including pauses and prolongation.

The authors put forth that disfluencies of deliberation interrupt patterns of fluency by adding to the total amount of time required to read a given passage and the disfluencies of syllable insertion not only consume time but also add to the total number of sounds uttered while reading a given passage.

Disfluencies may not occur singly. Two or more types of disfluencies can occur successively. These are referred to as compound disfluencies. There are two types of compound disfluencies.

i) Clustering - A term used by Silverman (1969) to describe the occurrence of more than one disfluency on the same word or consecutive words or both.

ii) Oscillation - A term used by Mysak (1978) to describe the number of repetitions per instance of disfluency. Silverman (1969) refers to the oscillation phenomenon as duration of fluency. Clustering is also referred to as 'run.'

Rudmin (1984) has considered repetitions as 'Articulation Oscillation' wherein the final word of an expression ended in an unvoiced plosive (p, t, k) there is repetition (one or more) of the phoneme.

Dejoy and Gregory (1985) have analysed nine types of disfluencies. They are (1) part word repetition (2) word

repetitions (3) phrase repetitions (4) revision (5) interjection (6) incomplete phrases (7) disrhythmic phonation (8) grammatical pause (9) ungrammatical pause.

Grammatical pauses and silent pauses that occur at such grammatical junctures as (a) immediately preceding coordinating or sub-ordinating conjunctions (b) before relative and interrogative pronounse (c) before all adverbial clauses of time, manner and place and (d) when complete parenthetical references are made (Goldman-Eisler, 1968).

Ungrammatical pauses are silent pauses that occur at non-grammatical points in the flow of speech. They are pauses occuring between repeated units of speech ^between a unit of speech and a revision of the unit or between an interjection and the following word of the meaningful text.

2. Fluency development in children (3-4 years):

Children become more fluent as they grow. Changes are seen in the types of disfluencies and the frequency of occurrence. No single pattern has been found in the development of fluency in children.

Language maturity is one of the important factor which is related to fluency. Increased ability in phonology.

semantics, syntax and pragmatic knowledge influence fluency. As these abilities grow, sentences become longer and more complex. Increase in the pragmatic ability also has a role in fluency of speech.

Most of the earlier studies on fluency development have analysed for repetition. It is been proved that the number and the frequency of repetition decreases as the age increases (Smith, 1926). Also, repetition of speech pattern are characteristic of very young children's speech especially in two to five years (Fisher, 1932). Davis (1939) found the frequency of repetition in the age group of two to five years and noticed that this discontinuity occurred at a mean frequency of 49 per 1000 words. Further, she concluded that repetition is a part of the speech pattern of all children. However, her data also revealed that the amount and kind of repetition differed from child to child. Although repetition of words and phrases decreased with age, syllable repetition were not affected by age. Syllable repetitions occurred much less frequently than others at all ages. Davia (1940) studying the repetition in the speech sample of preschool children opined that the child repeats because he is not adapt at using language in the conventional manner. Syllable repetitions occurred less than half as often as word repetitions and less than a third as often as phrase

repetitions in the speech sample of 193 non-stuttering pre-school children aged two to six years (Branscom Hughes & Oxtoby 1955) and they also showed that boys had more syllable repetitions than girls.

At 42 months of age repetitions seem to be in relation to another person in demand for attention, information or encouragement. Rate of speech is faster and developmental stuttering is also common here (Metraux, 1950). In the same study, younger ages i.e. 18 months, syllable repetition and word repetitions were found more and at 24 months there was an occasional syllable repetition and use of /8/ before many remarks. Word or phrase repetition was found more. Children of 48 months showed little repetition except for an occasional phrase. At 54 months children often interject at the beginning of a phrase. These results were reported on analysis of the speech characteristics of 207 young children.

Bierkan B (1968) studying 110 nursery school children noticed that differences in filled pauses were not significant. Repetition was greater in the younger age groups, which were of syllable, phrase and word. False starts were observed occasionally. Occurrence of unfilled pauses was not significantly different in the age group

of two to five years (McDearman, 1968). Also it was noticed by McDearman that the repetition of word, phrase, sentences decreased at five years when compared to two years.

An elaborate study in the area of fluency development was done by Kowal, O'Connell and Sabin (1975). They considered five categories of non-fluencies (i) unfilled pauses (ii) filled pauses (iii) repeats (iv) false starts (v) parenthetical remarks. All these disfluency types were analysed in the speech samples of 168 normal children. They recorded the speech sample of children at seven age groups (12 boys + 12 girls in each group) from kindergarten through senior year of high school, by asking them to describe a series of 'snoopy cartoons'. Recordings were analysed for the number of syllables the number and type of discontinuities, the rate of speech in syllables per second, the number of syllables per unfilled pause and the duration of unfilled pauses per syllable. Their results indicated that there was only a modest change in the frequency of discontinuities in the increasing age group. Vocal hesitations (excluding unfilled pauses) did not decrease with age but fluctuations were seen with development, increasing between kindergarten and fourth grade, then declining by sixth grade increasing again through eighth grade and sophomore year and then declining at senior

year, to the same as level as kindergarten. Comparing the type of disfluencies parenthetical remarks increased with age. At kindergarten, false starts and repeats were the more common types. By second grade, repeats and false starts occurred less often, while filled pauses and parenthetical remarks increased. By fourth grade false starts and parenthetical remarks increased dramatically while filled pauses and repeats increased slightly. At sixth grade all types decreased except filled pauses which showed only a moderate decline. By eighth grade the filled pauses continued to decline and false starts did not change while repeats and parenthetical remarks increased. By sophomore year, repeats declined but all other types increased, the parenthetical remark most of all. By senior year all types declined moderately.

The average across types showed two increases and two decreases during development. The first increase between kindergarten and fourth grade, which was caused by the increasing occurrence of parenthetical remarks and false starts with moderate declines in the other two types. The decrease between fourth and sixth grade was general. The second increase between sixth grade and sophomore year was caused primarily by the large increase in parenthetical remarks, although filled pauses and false starts also increased.

The second decrease between sophomore and senior years was general across types. Both increases were caused by increasing numbers of parenthetical remarks and false starts, while both decreases were general across all types.

Repeats showed a general decline with age but the type of repeats changed. At kindergarten many repeats were syllable repetitions. By second grade there was a decline in this type and by fourth grade all disappeared. From fourth grade onwards all repeats were of full words.

Kowal, O'Connell and Sabin (1975) concluded that "as children grow they do not have fewer non-fluencies but they learn more adult ways of being non-fluent", the false starts and the parenthetical remarks being more adult than the repeats which is immature type. The filled pauses are neither mature nor immature occurring in the speech of young and old alike.

It seems that the frequency of discontinuities does not show much of a developmental trend. Certain types of discontinuities like false starts and repetitions are more in younger than older children and as children grow these immature types are replaced by more sophisticated types like parenthetical remarks.

Preschool children are found to be more disfluent than older groups (i.e. high school seniors and geriatric persons). The mean total of disfluency per 100 words spoken was highest for preschool children followed by geriatric population and lowest for high school seniors (Yairi and Clifton, 1976). They analysed for seven types of disfluencies as given by Williams (1968).

Suzan and Zuckerman (1980) studied the speech sample of three and four year old children, containing passive sentence types they noticed that the filled pauses increased from three to four years of age where as repetitions decreased. False starts were not significant in that age group.

Yairi (1984) found that more disfluencies occurred at the later part of age two or at the beginning of age three. He concluded that the year between age two and three is an unstable period in speech development as far as fluency is concerned, because large fluctuations in the number of disfluencies were noted. Fagan (1982) studying the speech sample of preschool children found that their speech sample evidenced filled pauses and false starters.

Dejoy and Gregory (1985) on analysing disfluencies as described by Williams (1968) in children opined that 3.5

year olds were more disfluent in all categories except grammatical pauses. The younger children evidenced significantly more frequent part word repetitions, word repetitions, phrase repetitions, incomplete phrases and disrhythmic phonation. Thus, it appears that the types of disfluencies varies across age. Children acquire more sophisticated forms of disfluencies as they grow.

3. Factors influencing fluency:

Several factors have been reported to influence fluency.

Physiological factors	: Size and mass of the speech organs. Spatial and timing coordination of movements of speech organs.
Language complexity	
Grammatical categories	
Sentence type	
Rate of speech	
Ease of utterance	
Environmental factors.	

Table-1: Factors affecting fluency.

1. Physiological factors: Fluency of speech is directly related to the characteristics present in the mechanism of

speech production. The structures which move for speech production are relatively small and light weight when compared to other movements in the body- largest and heaviest being the mandible and the smallest and lightest are the vocal folds. A number of factors like the size and mass of the structures influence fluency. Distances travelled by the movements of those structures are small. All these i.e. small size, mass, distance and muscle lengths of the vocal tract suggest that the production of speech requires relatively little effort.

For the speech to be fluent, a coordination between such movements is necessary. Both spatial and timing coordination of movements contribute to fluency. A set of body parts, muscles and neural mechanism that participate is called a coordinative structure (Fowler and Turvey, 1980).

Muscles that contract during a speech gesture will receive a high frequency neural impulses at the proper movement. Muscles which are relaxed will receive a low frequency neural impulse. The capacity to relax antagonistic muscles has more to do with fluency than the capacity to contract agonist muscles, which is proved in stutterers

(Freeman and Ushijima, 1978). Along with the mass and stiffness of the peripheral mechanism certain neural mechanisms also have an important influence on the timing of movements.

2. Language complexity:

Studies relating disfluencies to language complexity reveal linguistic differences between highly fluent and highly disfluent children. Disfluent children use simpler language transformations than the fluent youngsters (Muma, 1971) and the highly disfluent children use simpler language to avoid the occurrence of more fluency failure, therefore more complex language is possibly related to fluency.

In children who are learning syntax, disfluencies fall proportionally on those structures that children are beginning to use productively in their speech rather than those that are novel or new. When a child first begins to use a new form, it is not likely to be spoken discontinuously but as soon as the child begins to use it more often for productive communicative purposes it is likely to be spoken discontinuously (Colburn, 1979).

3. Grammatical categories:

It is been found that the frequency of occurrence of both unfilled and filled pauses is more before content words than function words (Maclay and Osgood, 1959)Fagen, 1982). Filled pauses are much more common at the beginnings of clauses than with in clause (Boomer, 1965; Cook, 1971; Hawkins, 1971) and they tend to occur before longer and more complex sentences (Cook, Smith and Lallijce (1974). The words following filled pauses are difficult to predict and filled pauses occur mainly before words which are highly uncertain (Cook, 1971).

4. Sentence type:

Discontinuities are likely to occur on longer than on shorter sentences (Dejoy and Gregory, 1973). This may be related to grammatical complexity (Haynes and Hood 1978). They found that when the children produce sentences that were more and more complex, they became more disfluent. Gordon (1982) compared the performance of children in imitation task and the modeling task. She found that disfluencies were more in the modeling task than on imitation. This may be because language formulation is not necessary in imitation.

5. Rate of speech:

Fluency depends on the rate at which the meaningful speech is produced. Rate may be slow or fast according to the rate of syllables produced. This varies from speaker to speaker. Females produce utterances that are more variable in rate and longer utterances, and they are more fluent than males (Malecot, Johnson and Kizziar, 1972). Rate depends on the type of syllables produced. CCV and CVC syllables are produced at a faster rate than VCC syllables and simple V syllables are slower than CCCV's (Mackay, 1974). Syllables are produced consistently faster in longer utterances than in shorter ones (Jones, 1944; Lindblom, 1965). The rate at which continuous syllables can be produced is a function of speed of articulatory movement and the degree of coarticulatory overlap (Gay 1978; Stark Weather, 1981).

6. Ease of utterance:

Fluent speech is effortless, but still needs minimal effort (both mental and muscular effort). When the speaker uses an unusual amount of effort his speech will not be fluent. Effort put to produce speech depends on the sounds produced. Certain types of sounds require more effort than others. For example stops and fricatives require more effort than nasals and glides (Malecot, 1955? Sabtelny-Worth and Sakunda, 1966).

7. Environmental factors and others:

The person to which child is speaking is also an important factor which influences fluency. It is been found that the child speaks more fluently when asked to speak with a puppet than with an experimenter (Martin and Haroldsin, 1972).

Studies have been conducted in the past to control several of these variables. However as controlling these variables will not elicit natural speech, it was decided not to control any variables in the present study. In this study, the speech sample of 12 children elicited during conversation (mother-child/child-child) story telling and picture description was studied for disfluencies.

METHODOLOGY

SUBJECTS: The subjects for this study were twelve normal Kannada speaking children studying in L.K.G. in the age group three to four years and were from middle socio-economic group. Two children in the age groups of two months interval as in Table-A. were selected.

Age range	Male	Female
3 - 3.2	3.1	3.2
3.2- 3.4	3.4	3.3
3.4- 3.6	-	3.5, 3.6
3.6-3.8	3.8	3.8
3.8- 3.10	3.9	3.9
3.10-3.12	-	3.11,3.11

Table-2: Showing the ages of subjects.

TASKS: There were four tasks - picture description, child-child/mother-child conversation, recitation of rhymes and narration of stories. A pilot study was conducted on a single subject to select the types of pictures. Based on the response of the child single pictures were selected for the present study. These included the picture of cow, dog, horse, etc. (Appendix)

PROCEDURE: Each child was individually tested in his/her home and was accompanied by one of the parents and sibling or a child's friend. Initially the child was visually presented with one picture at a time and the tester prompted the child to answer questions asked by her parent. The questions were related to the pictures and included "What is this?" "Have you seen"?, "Show me the body parts", etc. The child was encouraged to narrate the stories he/she knew and recite rhymes. Also, child,-child conversation in play situation and mother-child conversation were considered. All these were recorded on audio-cassettes. When the child was tired the recording was terminated and two recordings on consecutive days were obtained. A minimum of half an hour speech sample was recorded.

ANALYSIS: All the speech samples were transcribed and were analyzed for the following disfluencies.

1. Unfilled pauses: A period of silence.
2. Filled pauses: um, uh, ee, er.
3. Repeats: Syllable, word, part word and phrase repeats.
4. False starters: Grammatical modification of the phrase, correction of phrases or words and incomplete utterances.

5. Parenthetical remarks: (matte) (a:va:ga) (a:me:le)
(ad:) (id:) and other fillers.
6. Prolongations.
7. Part question repetition
8. Audible inspirations/inspirations.

Each instance of disfluency was considered as one disfluency for eg. "mm mm" was considered as two filled pauses, "mathey mathey" was considered as two parenthetical remarks and "da da dara" was considered as two part word repetitions.

Disfluency like "da-da dara" was considered to occur in the initial position of an utterance, "karkon kon kon bande" was considered as a disfluency in the medial position of the utterance and "bereee" was considered as a disfluency in the final part of the utterance.

The grammatical category of the word following disfluency was noted and the disfluencies occurring before the grammatical category such as nouns, verbs, adjectives, adverbs, determiners, pronouns, were calculated. Whenever there were doubts Kannada dictionary was referred.

The total number of utterances and the number of different types of disfluencies in various tasks were calculated and disfluencies were converted to percent by using the following formula:

$$\frac{\text{No. of disfluencies} \times 100}{\text{Total no. of utterances}}$$

Formula used to calculate the percent of disfluencies before various grammatical categories was :

$$\frac{\text{Total no. of disfluencies occurring before each grammatical category}}{\text{Total no. of disfluencies}} \times 100$$

The emerging patterns of disfluencies with respect to different tasks at various age groups are highlighted.

RESULTS AND DISCUSSION

Transcribed speech samples which were obtained from various tasks (picture description, conversation, rhymes, story narration) were analysed for unfilled pauses, filled pauses, repetition, false starters and parenthetical remarks. Sample* were also analysed for prolongations, part question repetition, audible inspiration/expiration. Each disfluency type is discussed separately comparing all the 12 subjects, in all the tasks.

1. Unfilled pauses:

Unfilled pauses (hence-forth UFP) were defined as a period of silence and were analyzed for different tasks in the age group three to four years. In general, it was observed that the average per-cent of UFP's was 5.4 with 9.6%, 5.9%, 2.7% and 3.4% in picture description, conversation, rhymes and story telling respectively. The range of unfilled pauses were 3-21, 2-21, 1-6 and 2-7 respectively in picture description, conversation, rhymes and story telling tasks.

Among the tasks, in picture description, the children exhibited maximum number of UFP's followed by conversation, story telling and rhymes. In the picture description task.

the average percentage of UFP's increased from three years to 3.6 years and decreased at 3.6 to 3.8 years with a peak again in the age range of 3.8 to 3.10 years. In conversation, however, UFP's were maximum in 3.4 to 3.6 years followed by 3.6 to 3.10 years, 3.10 to 3.12 and least in 3 to 3.4 age group. Of the children who exhibited UFP's in rhymes maximum were in the 3 to 3.2 age group (Table-3).

Males exhibited higher percent of UFP's in the age range of 3 to 3.4, and 3.6 to 3.8 in picture description and conversation tasks. However, females exhibited more disfluencies in 3.8 to 3.10 (picture description) and 3 to 3.2 years (rhymes) (Table-3).

On analysing the different places at which the UFP's occurred, in general, it was observed that UFP'S were maximum in the initial position followed by medial position and no UFP's were found in final position (Table-4).

Considering the grammatical categories before which UFP's occurred, in general, it was noticed that UFP's were maximum before nouns followed by verbs, adjectives, locatives, adverb, pronouns and determiners. (Fig.1).

Tasks	Age range										Average		
	3-3.2		3.2-3.4		3.4-3.6		3.6-3.8		3.8-3.10			3.10-3.12	
	M	F	M	F	F	F	M	F	M	F		M	M
Picture description	8	5	11.8	5	4.9	21.4	14.2	3.2	7.8	15	6.1	12.9	9.6
Average	t.5		8.4		13.1		8.6		11.4		9.5		
Conversation	2.3	0	1.8	0	4.3	21	10.09	5.2	8.4	7.9	5.3	4	5.9
Average	1.1		0.9		12.6		8.1		8.1		4.6		
Rhymes	1.1	6.0	0	0	0	0	0	0	3.3	0	2.1	3.4	2.7
Average	3.7		0		0		0		1.6		2.7		
Story larration	A	A	A	A	A	A	A	A	6.7	A	1.6	4.42	3.4
Average	A		A		A		A		6.7		3		
Average	3.7		3.1		8.6		5.6		6.9		4.9		5.4

Table-3: Percentage of unfilled pauses in different tasks: A -Sample could not be elicited.

M - Male
F - Female

O -No disfluencies were found.

Age range		Initial Average		Medial Average		Final	Average
3-3.2	M	90	70	10	30	0	0
	F	50		50		0	
3.2-3.4	M	62.5	56.3	37.5	43.8	0	0
	F	50		50		0	
3.4-3.6	F	22.7	37.4	77.3	62.6	0	0
	F	52		48		0	
3.6-3.8	M	82	78.5	18	21.5	0	0
	F	75		25		0	
3.8-3.10	M	60.4	39.6	39.6	30.2	0	0
	F	79.2		20.8		0	
3.10-3.12	M	45	52.5	55	47.5	0	*
	M	60		40		0	

Table-4: Position of occurrence of UFP's in percentage.

M - Male
F - Female

X-AXIS - Age range in years
Y-AXIS - Percentage

(Scale is not linear)

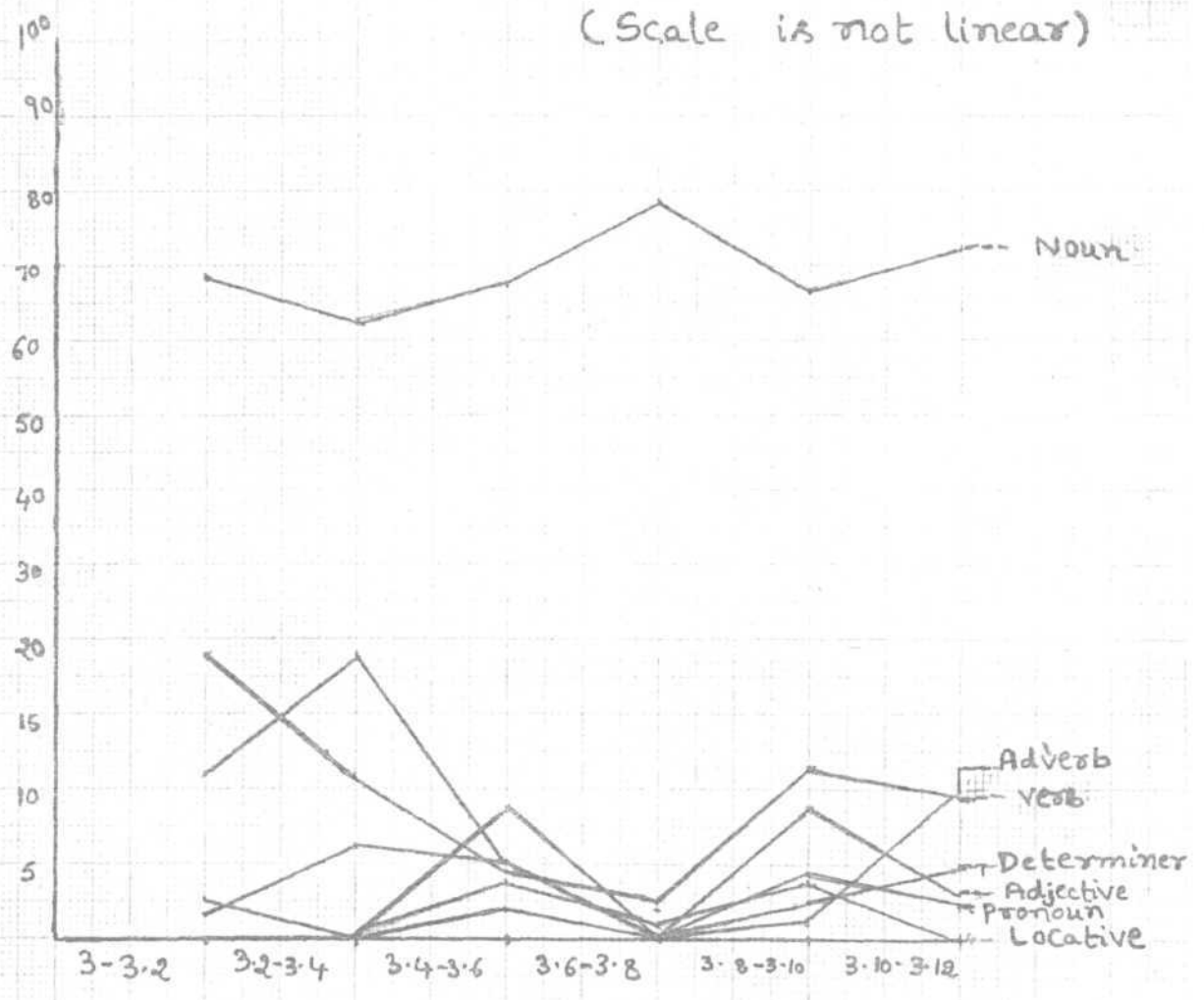


Figure 1:- Percent of unfilled pauses before different grammatical categories (in different age groups)

2. Filled pauses:

Filled pauses (hence forth FP) were defined as fillers like um, uh, ee, er etc. and were analysed for different tasks in the age group three to four year. In general, it was observed that the average percent of F,Ps was 4.7 with 8.6%, 7.6%, 0.06% and 2.45% in picture description, conversation, rhymes and story telling respectively. The ranges of FP's were 0.5 to 30, 0 to 15, 0 to 0.7 and 0.68 to 6.8 respectively in picture description, conversation, rhymes and story telling tasks.

Among the tasks, maximum number of FP's was noticed in picture description followed by conversation, story telling and rhymes. In picture description average percentage of FP's decreased from 3 to 3.8 years with an increase in 3.8 to 3.10 years. FP's again decreased in 3.10 to 3.12 years. However in conversation FP's increased from 3 to 3.6 years and decreased from 3.6 to 3.12 years. In rhymes, FP's were noticed only in 3.2 to 3.4 age group and in story telling it increased from 3.8 to 3.12 years (Table-5). Comparing males and females, males exhibited more FP's in 3 to 3.2; 3.10 to 3.12 years in both picture description and conversation.

It was noticed that FP's were maximum in the initial position followed by medial and final position (Table-6). Analysing the grammatical categories before which the FP's occurred, maximum percentage of disfluencies occurred before nouns followed by adjectives, adverbs, verbs, locatives, determiners and pronouns (Fig.2).

Task	Age range										Average				
	3-3.2		3.2-3.4		3.4-3.6		3.6-3.8		3.8-3.10			3.10-3.12			
	M	F	M	F	F	M	M	F	M	M					
Picture description	30	4	9	8	16	7	3.6	0.5	10	2.24	9.8	8	5	1.8	8.6
Average	17		13		5.3		5.3		6.0		5.15				
Conversation	15	0	3	7	8.2	12	14.1	5.04	6.1	2.1	5.9	5.3	1.7	7.6	
Average	7.5		12		13		5.6		4		3.5				
Rhymes	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0.06	
Average	0		0.35		0		0		0		0				
Story narration	A	A	A	A	A	A	A	A	A	12	A	6.8	0.68	2.9	
Average	A		A		A		A		1.2		3.7				
Average	8.2		8.5		6.1		3.6		2.8		3.08		4.8		

Table-5: Percent of filled pause in different tasks.

A - Sample could not be elicited
 - No disfluencies were found

M - Male; F - Female

Age range		Initial	Average	Medial	Average	Final	Average
3 - 3.2	M F	90.4 71.4	80.9	9.6 28.6	19	0 0	0
3.2 - 3.4	M F	50 46.3	48.2	50 50	50	0 3.7	1.8
3.4 - 3.6	F F	47.8 90	68.9	52.2 10	31.1	0 0	0
3.6 - 3.6	M F	25 84	54.5	75 16	45.5	0 0	0
3.8 - 3.10	M F	73.3 56.3	64.8	26.7 43.7	35.2	0 0	0
3.10 - 3.12	M M	56.7 40	48.4	43.3 60	51.7	0 0	0

Table-6: Position of occurrence of filled pause in percent.

M - Male

F - Female

X-AXIS - Age range in years
 Y-AXIS - Percent
 (Scale is not linear)

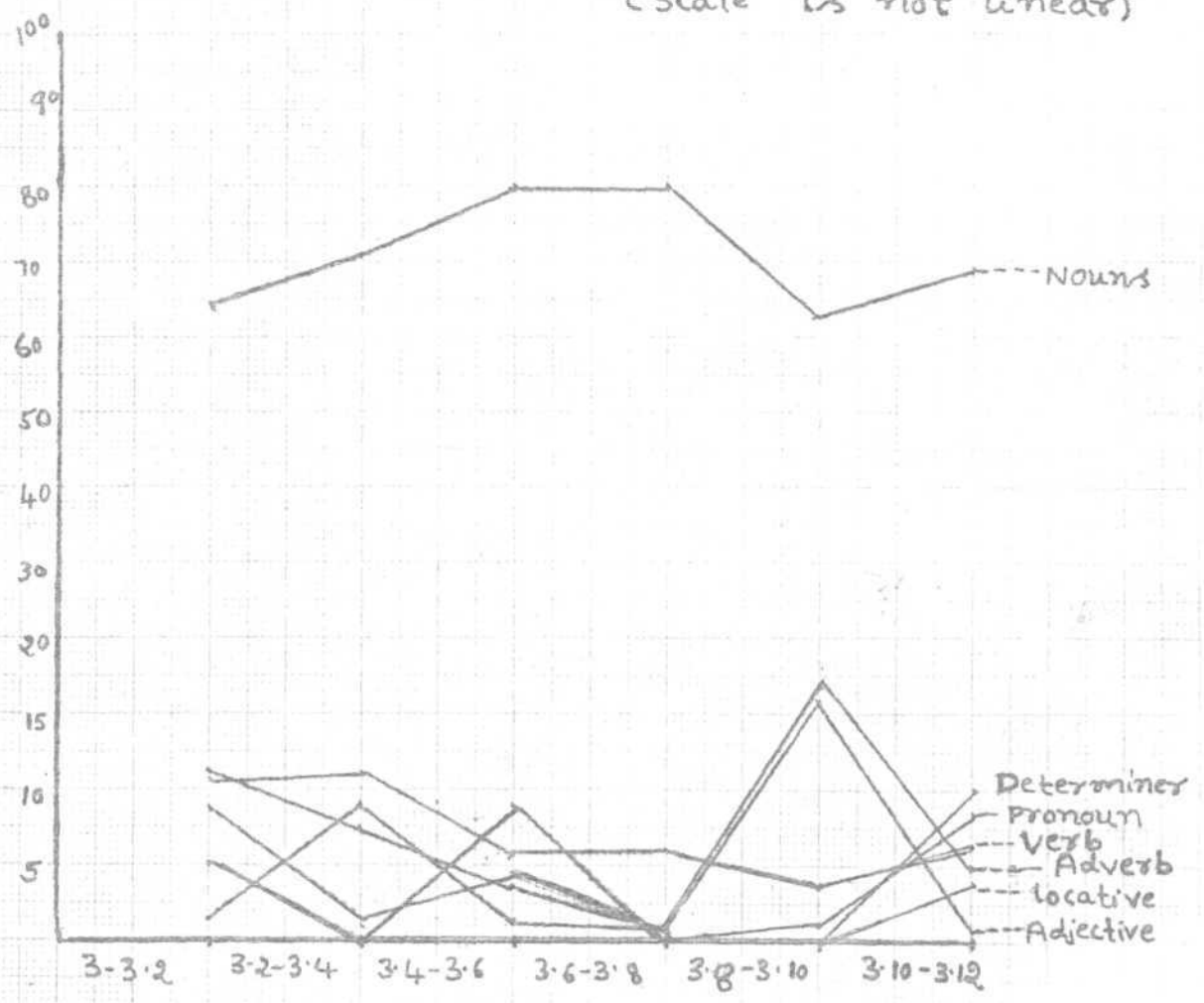


Figure 2:- Percent of Filled pauses before different grammatical Categories

3. Repetition:

Repetitions was defined as repetition of any unit i.e. syllable, word, part word utterance and phrase were analysed in the age group of three to four years. It was observed that the average percent of repetition was 1.6 with 4%, 1.6%, 0 and 0.6 in picture description, conversation, rhymes and story telling respectively. The range of repetitions were 0 to 12.3, 0 to 8.6, 0, and 0.8 to 1 respectively in picture description, conversation, rhymes and story telling tasks. Among the various repetition types, word repetitions occurred more followed by phrase and syllable repetition.

Children exhibited more repetitions in picture description followed by conversation and story narration and no repetitions were found in rhymes. In picture description, there was an increase in repetition from three to 3.4 years and it decreased from 3.6 to 3.12 years. Children of 3.4 to 3.6 years did not exhibit any repetition. In conversation repetition decreased from 3 to 3.12 years (Table-7).

Males exhibited more repetitions in both picture description and conversation in the age groups, 3.2 to 3.4 years and 3.6 to 3.8 years. In the age groups 3 to 3.2 years.

and 3.8 to 3.10 years, females had more repetitions in both picture description and conversation (Table-7). Also more repetitions were noticed in the initial position followed by medial and final position (Table-%). Among the grammatical categories, more repetitions occurred before nouns followed by adverbs, pronouns, verbs, locatives, determiners and adjectives (Fig.3).

Tasks	Age range											Average	
	3 - 3.2		3.2-3.4		3.4-3.6		3.6-3.8		3.0-3.10		3.10-3.12		
	M	F	M	F	F	F	M	F	M	F	M		F
Picture description	0	12.3	10.8	2.2	0	0	6.1	1.4	1.4	13	0	0.9	4
Average	6.15		7		0		3.75		7.2		0.45		
Conversation	3.1	8.6	3.7	0	0.4	0	1.4	0	0.5	0.9	1.1	0.45	1.6
Average	5.85		1.85		0.2		0.7		0.7		0.89		
Rhymes	0	0	0	0	0	0	0	0	0	0	0	0	0
Average	0		0		0		0		0		0		
Story narration	A	A	A	A	A	A	A	A	0	A	0.8	1.02	0.3
Average	A		A		A		A		0		0.91		
Average	4		3		0.06		1.5		2.0		0.6		

Table-7: Percent of repetitions in different tasks. A - Sample could not be elicited
0 - disfluencies were not found.

H - Male; F - Female

Age range		Initial	Average	Medial	Average	Final	Average
3 - 3.2	M	50	49.1	0	13.4	50	37.5
	F	48.2		26.8		25	
3.2 - 3.4	M	68.42	34.21	31.58	57.4	0	8.35
	F	0		83-3		16.7	
3.4 - 3.6	F	100	50	0	0	0	0
	F	0		0		0	
3.6 - 3.8	M	33.3	56.6	46.7	23.35	20	20
	F	80		0		20	
3.8 - 3.10	M	100	86.7	0	6.6	0	6.6
	F	73.4		13.3		13.3	
3.10 - 3.12	M	66.7	66.7	33.3	16.7	0	16.7
	F	66.7		0		33.3	

Table-8: Position of occurrence of repetition in percentage:

M - Male

F - Female

X-AXIS- Age in Year_s
 Y-AXIS- Percent
 (Scale is not linear)

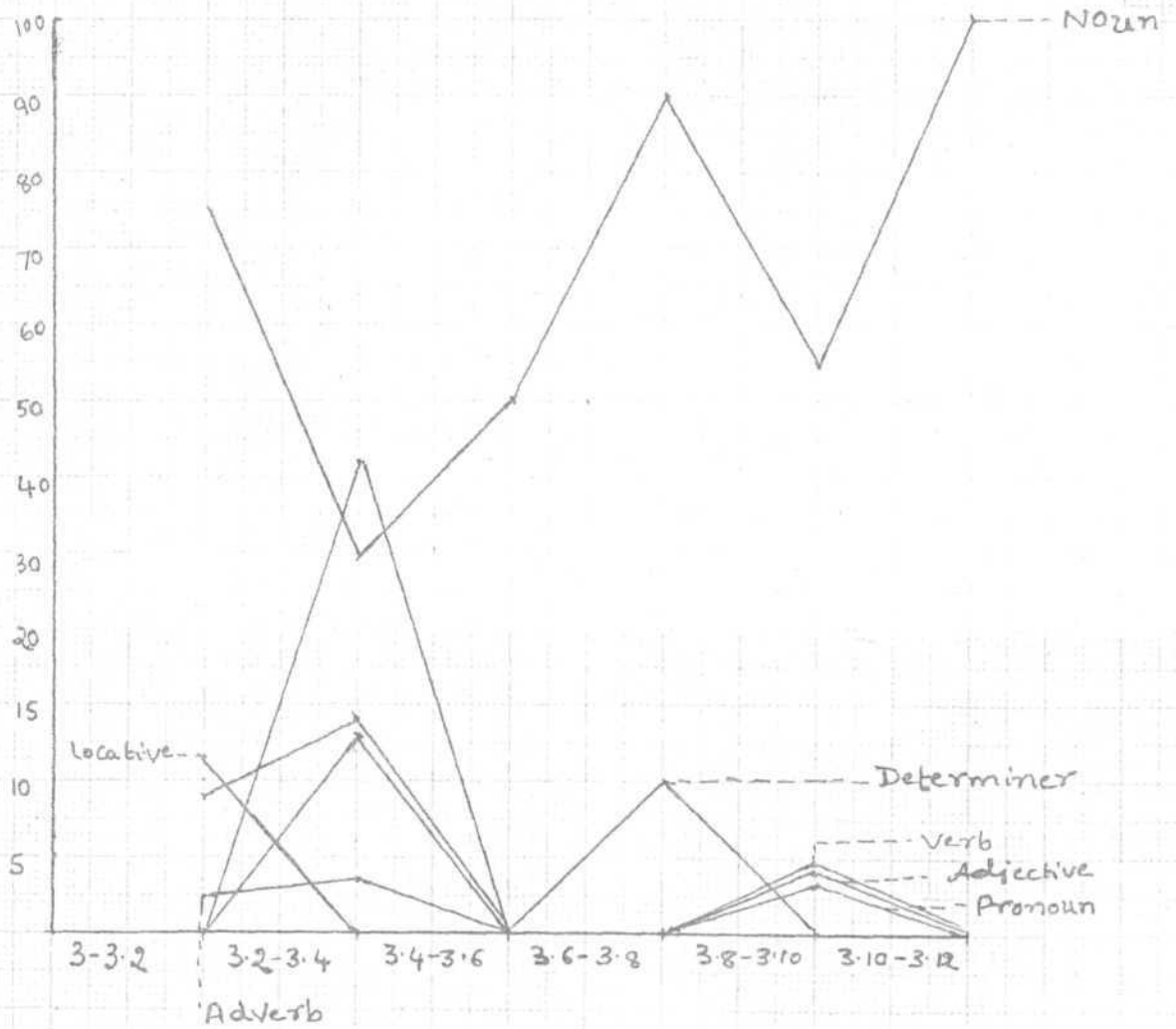


Figure 3i- Percent of Repetitions before different grammatical Categories

4. False starters:

False starters (hence forth FS) were defined as any grammatical modification of the phrase, correction of phrases or words and incomplete utterances. The average percent of FS's was 0.1 with 0.16%, 0.05% and 0 in picture description, conversation, rhymes and story telling respectively. The range of FS's was 0.5 to 0.8, 0 to 0.3 in picture description and conversation. There were no FS's in rhymes and story narration.

More FSs were exhibited in picture description than in conversation. Among the age groups in which FSs were noticed, females showed FS in 3 to 3.2 years and 3.6 to 3.8 years and males in the age range of 3.8 to 3.10 years. In conversation children of 3.10 to 3.12 exhibited FS (Table-8).

Maximum FS were noticed in the initial position followed by medial and final position (Table-10). Among the grammatical categories FS occurred more before nouns followed by pronouns (Fig.4).

Tasks	Age range										Average		
	3-3.2		3.2-3.4		3.4-3.6		3.6-3.8		3.8-3.10			3.10-3.12	
	M	F	M	F	F	F	M	F	M	F	F	F	
Picture Sescription	0	0.5	0	0	0	0.0	.0	0.8	0.6	0	0	0	0.16
Average	0.25		0-		0		0.4		0.28		0		
Conversation	0	0	0	0	0	0	0	0	0	0	0.3	0.3	0.05
Average	0		0		0		0		0		0.3		
Rhymes	0	0	0	0	0	0	0	9	0	0	0	0	0
Average	0		0		0		0		0		0		
Story narration	A	A	A	A	A	A	A	A	0	A	0	0	0
Average	A		A		A		A		A		0		
Average	0.08		0		0		0.13		0.07		0.08		0.05

Table-9: Percent of _____ in different tasks. A - Sample could not be elicited
M - Male; F - Female Flasestartero - Nodisfluencieswerefound.

Age range		Initial		Medial		Final	
		Average		Average		Average	
3 - 3.2	M F	0 0	0	0 100	50	0 0	0
3.2 - 3.4	M F	0 0	0	0 0	0	0 0	0
3.4 - 3.6	F F	0 0	0	0 0	0	0 0	0
3.6 - 3.8	M F	0 100	50	0 0	0	0 0	0
3.8-3.10	M F	50 0	25	0 0	0	0 0	25
3.10-3.12	M M	100 0	50	0 100	50	0 0	0

Table-10: Position of occurrence of false starters in percent.

M Male
F Female

X-AXIS - Age range in years
 Y-AXIS - Percent~~age~~
 (not a linear scale)

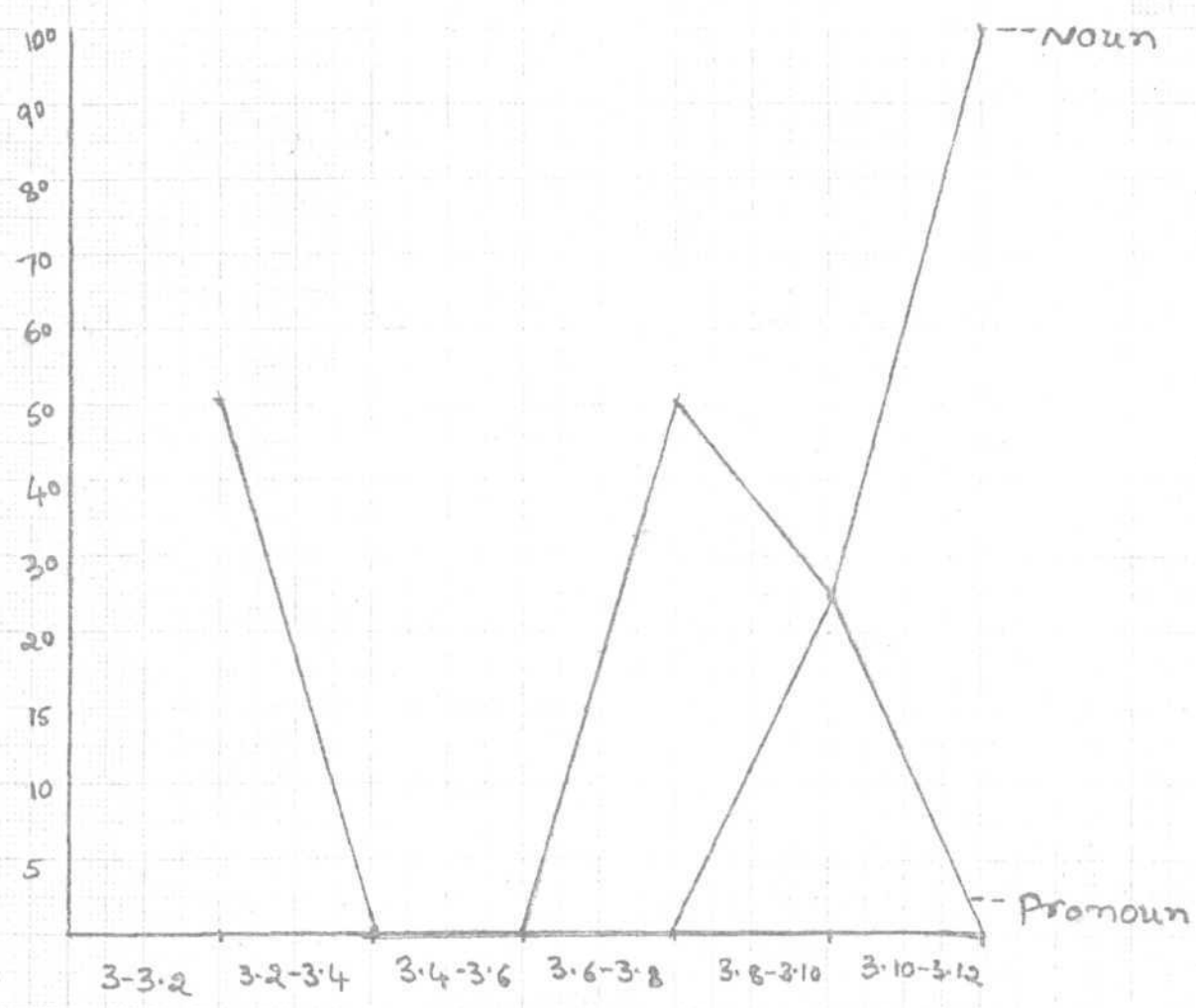


Figure 4:- Percent of False starters before different grammatical categories

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5. Parentetical remarks:

Parentetical remarks (hence forth PR) were fillers like (matte) (a:va:ga), (a:me:le). The average percent of PR was 2.7% with 2.5%, 3.8%, 0 and 5.4% in picture description conversation, rhymes and story telling respectively. The range of PR was 0 to 11.6, 0 to 13.8, 0 and 6 to 10.5 respectively in picture description, conversation, rhymes and story telling.

Among the tasks, Children exhibited more PR in story telling followed by conversation and picture description. In picture description, PR increased from 3 to 3.4 years followed by a decline in 3.4 to 3.8 years. Again it increased in 3.8 to 3.12 years. In conversation, the average percentage of PR increased from 3 to 3.8 years and decreased in 3.8 to 3.10 years and increased again in 3.10 to 3.12 years (Table-11).

Comparing males and females, in picture description, females exhibited more PR in the age groups 3 to 3.2 years, 3.2 to 3.4 years, 3.6 to 3.8 years and 3.8 to 3.10 years. However, in conversation, males had more PRs in 3 to 3.4 age group and females had more in 3.6 to 3.10 years group (Table-11).

Tasks	Age grange										Average		
	3-3.2		3.2-3.4		3.4-3.6		3.6-3.8		3.8-3.10			3.10-3.12	
	M	F	M	F	F	F	M	F	M	F		M	M
Picture description	0	1.1	0	11.6	S.3	0	0.5	0.8	0.84	1.9	0	7.4	2.46
Average	0.6		5.8		2.7		0.6		1.37		3.7		
Conversation	1.5	0	3.2	0	13.8	0	6.42	8.7	0.5	0.9	7.9	3.4	3.84
Average	0.6		1.6		6.9		7.6		0.7		5.65		
Rhymes	0	0	0	0	0	0	0	0	0	0	0	0	
Average	0		0		0		0		0				
Story narration	A	A	A	A	A	A			7.9	A	6.0	10.5	5.4
Average	A		A		A		A		7.9		8.25 1		
Average	0.4		2.5		3.2		2.7		2.5		4.4		2.7

Table II :- Percent of Parenthetical remarks in different tasks

M: Male

F: Female

A: Sample could not be elicited

0: No disfluencies were found.

?

57
70

PRs occurred more in the medial position followed by initial position. No PRs were found in the final positions. Considering the grammatical categories, it was noticed that more PR occurred before nouns followed by pronouns, adverbs, determiners, verbs and adjectives (Fig.5).

Age range		Initial		Medial		Final	
			Average		Average		Average
3 - 3.2	M	100	100	0	0	0	0
	F	100		0			
3.2 - 3.4	M	85.7	60.6	11.5	39.4	0	0
	F	35.5		64.5			
3.4 - 3.6	F	13.3	6.6	86.7	43.4	0	0
	F	0		0			
3.6 - 3.8	M	0	4.3	100	95.7	0	0
	F	8.6		91.4			
3.8 - 3.10	M	70.6	35.3	29.4	64.7	0	0
	F	0		100			
3.10 - 3.12	M	4.8	41	95.2	59.1	0	0
	M	77.1		22.9			

Table: 12 Position of occurrence of parenthetical in percentage.

X-AXIS- Age in years
Y-AXIS- Percentage
(Scale is not linear)

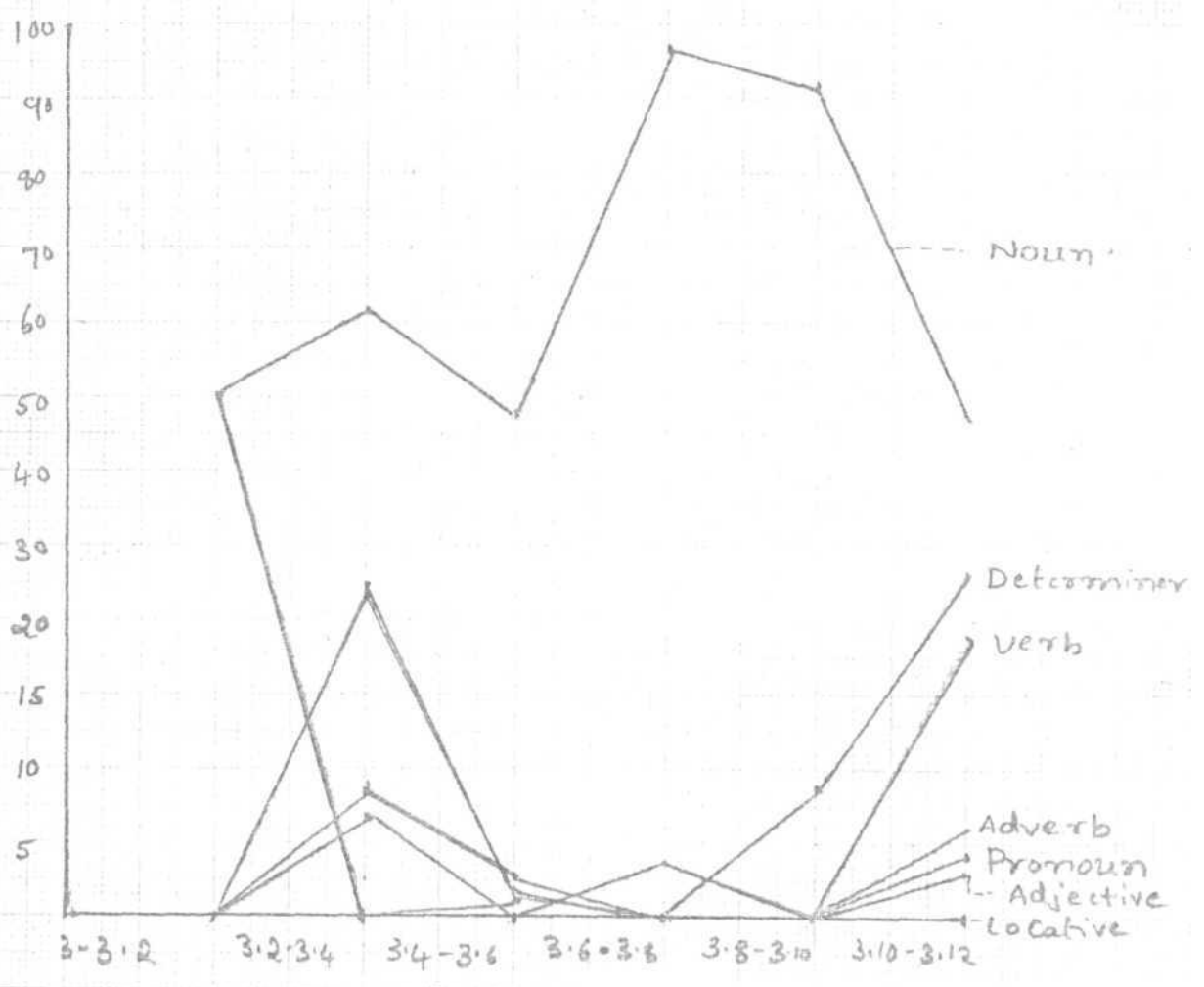


Figure 5:- Percent of Parenthetical remarks before different grammatical categories

No audible inspiration/expiration, prolongations and part question repetitions were noticed in any subjects.

6. Clustering of disfluencies:

Occurrence of two or more types of disfluency on the same utterance was considered as clustering of disfluencies. The following clusters were identified in the speech of children of 3-4 year*.

FP + UFP, UFP + R, PR + UFP, FP + R, PR + FP, UFP + *P,
FP + UFP, + FP, FP + PR, UFP + FP + UFP, UFP + PR + FP,
FP + PR + FP.

DISCUSSION:

In summary UFP's had the maximum percent of occurrence followed by FP, PR, R and FS. The disfluencies occurred more in picture description task (except PR which was observed more in story telling), than other tasks. All types of disfluencies. except PR occurred more in initial position. However, more PRs were noticed in the medial position.

Disfluencies occurred more before content words, especially nouns (62%) than before function words. In general, repeats peaked at 3.0 to 3.2 age group, filled pause at 3.2 to 3.4 years, unfilled pause in 3.4 to 3.6

years, false starts in 3.6 to 3.8 years and PR in 3.10 to 3.12 years. FS though found were negligible.

The result that UFPs Occurred maximally followed by FP is in consonance with the results reported by Kowal, O'Connell and Sabin (1975) and Fagan (1982). Fagan (1982) reported occurrence of more FP in preschool children. Suzan and Zuckerman (1980) noticed that FPs increased from 3-4 years of age. However, the results of this study contradicted this. This differences might perhaps be due to the type of materials used. While Suzan and Zuckermans analysis was restricted to passive sentence types, the present study did not control the sentence type. Also, the findings of this study that UFPs peaked at 3.4 - 3.6 years and declined later is in contradiction to that of McDearman (1968) who reported that the occurrence of UPPs was not significantly different in the age group of 2-5 years.

Pauses are known to serve the speaker by providing time for planning or decision making when uncertainty is high. Mostly it is in the initial part of the utterance which carry more meaning. When the speaker is not sure of

what he wants to say he pauses. Martin and Strange (1968a) gave a more composite view of function of pauses in speech encoding. Pauses occur at major clause boundaries and between them. They concluded that syntactic and semantic structure selection precedes choice of words during encoding and that pauses within major grammatical constituents represent the word selection process. Pauses occurring between major constituents indicate a process of selecting structures larger than the word. The pauses (both filled and unfilled) seen in the speech of children was related to the encoding process the child attempts during speaking.

It has been reported that pauses are not distributed throughout the utterances. More pauses occur and the duration of pauses is longer at points of high uncertainty (Goldman Eiser, 1968, Cook, 1971, Boomer, 1970), because these are locations, where the information load is high. Adam (1982) comments that the immature CNS system, -a developing phonological, syntactic, semantic, pragmatic and cognitive structures act as physiological constraints and thus preschoolers speech are characterized by UFPs and FPs stark Weather (1987) opines that, the pauses seen in the speech of a child or an adult can convey information and they are not considered as discontinuities because the flow of information continues including the pause. A child

uses a filled pause to convey the listener that he is continuing or that because of his language formulations he prefers to pause or that he has not understood the listener or that he is trying to cope up with the anatomical or physiological constraints that are acting upon him.

In the present study, the average percentage of repetition was 1.6%. However, earlier studies (Smith, 1926, Fisher, 1932, Davis, 1939, Bertic Bjerkan (1980) McDearman, 1968; Branscom et al 1955) DeJoy and Gregory 1985; Kowal et al 1975; Yairi, 1981) report higher percent of repetition and they opine that repetition is a characteristic of preschool children. Most of these studies have given more emphasis to repetition.

Among the types of repetitions, in this study, word repetitions, were found more and syllable repetitions were least which agrees with Davis (1939) who also observed low occurrence of syllable repetitions. Branscom et al (1955) states that syllable repetitions occurred less than half as often as word repetitions. However Kowal, O'Connell and Sabin (1975) comparing the types of repetition in children of different grades (KG to Sophomore) report that at the younger age children had more syllable repetitions and in later ages, word repetitions were noticed more.

Repetitions have been explained in various ways. It has been associated with the development of speech and language abilities. Froeschels (1921) opines that a child repeats a word or a syllables in the event of searching towards thoughts or grammatical forms to follow course of conveying information. Fisher (1932) defined repetition as exact repetition of the same remark, verbal or nonverbal with no variation in word or sound pattern. She also speaks of the children as 'continuing to experiment with repetitions, relating this to children's reported interest in having things (sayings, stories) repeated to them, as well as to their apparent enjoyment of intentionally repeating non-sense words, sound patterns, new words, humours remarks, and the like. Thus repetition at least include intentional repeating of larger verbal groupings in the manner of play' (Wingate, 1962).

Kirkpatrick (1915) believes that children repeat because they do not have tangible evidence that they have been understood. The repetitions in the speech of young children are related to the child's difficulty either in formulating linguistic messages or in the motor execution of merely acquired longer utterances (Stark Weather 1981)

In the present study the amount of false starters found was negligible. This agrees with Branacom (1955), Bertil, Bjerkan (1980). This may be because the children become more proficient in the use of language or they may become more precise, and may be able to correct their sentence structures. Kowal, O'Connell and Sabin (1975) found more false starts in KG children comparing it with children of 2nd grade. Haynes and Hood (1977) believe that children, as they grow, use more revisions because of the increase in language complexity and linguistic rules learnt for encoding.

Also, in this study children exhibited more of PRs compared to R and FS. Across the age groups more PRs were exhibited by children of 3.10 to 3.12 years Kowal O'Connell and Sabin (1975) calls PR as more sophisticated type of disfluency and this goes on increasing with age.

The results of the present study indicated that disfluencies occurred more before nouns (content words) than others. Maclay and Osgood(1959), Fagan (1982) also reports of more FPs and UFPs before content words. This may be because content words are the ones which carry more meaning in the utterances and young children use simple sentence structures which consists mainly of content words.

The findings that most disfluencies occur in the initial position is in consonance with Boomer (1965), Cook (1971) and Hawkins (1971), who reported of more pauses in the initial position. This may be because, in an utterance, the initial syllable is highly informationally loaded as a result of which the encoding may be comparatively more difficult for the initial syllable.

Comparing the different types of disfluencies occurring between 3-6 years (Indu, 1990, 4-5 years; Yamini, 1990, 5-6 years) it was observed that in the age of 3-4 years UFPs were predominant, 4-5 years old children showed more of FPs and in the age group of 5-6 years parenthetical remarks increased (Fig.6).

These results enables one to hypothesize on the speech encoding mechanism. While the occurrence of more UFPs in 3-4 years indicate the non continuity of the encoding system, the increased FPs suggest the emergence of the continuity in the encoding system. However, it also suggests that there may be a time lag between the memory and the encoding system for the required word. Further reduction of FPs and increased PRs indicate a more refinement of the speech encoding in terms of continuity. However, these are only speculations and need to be tested further.

X- AXIS - Percentage of disfluencies
 Y- AXIS - Age in years

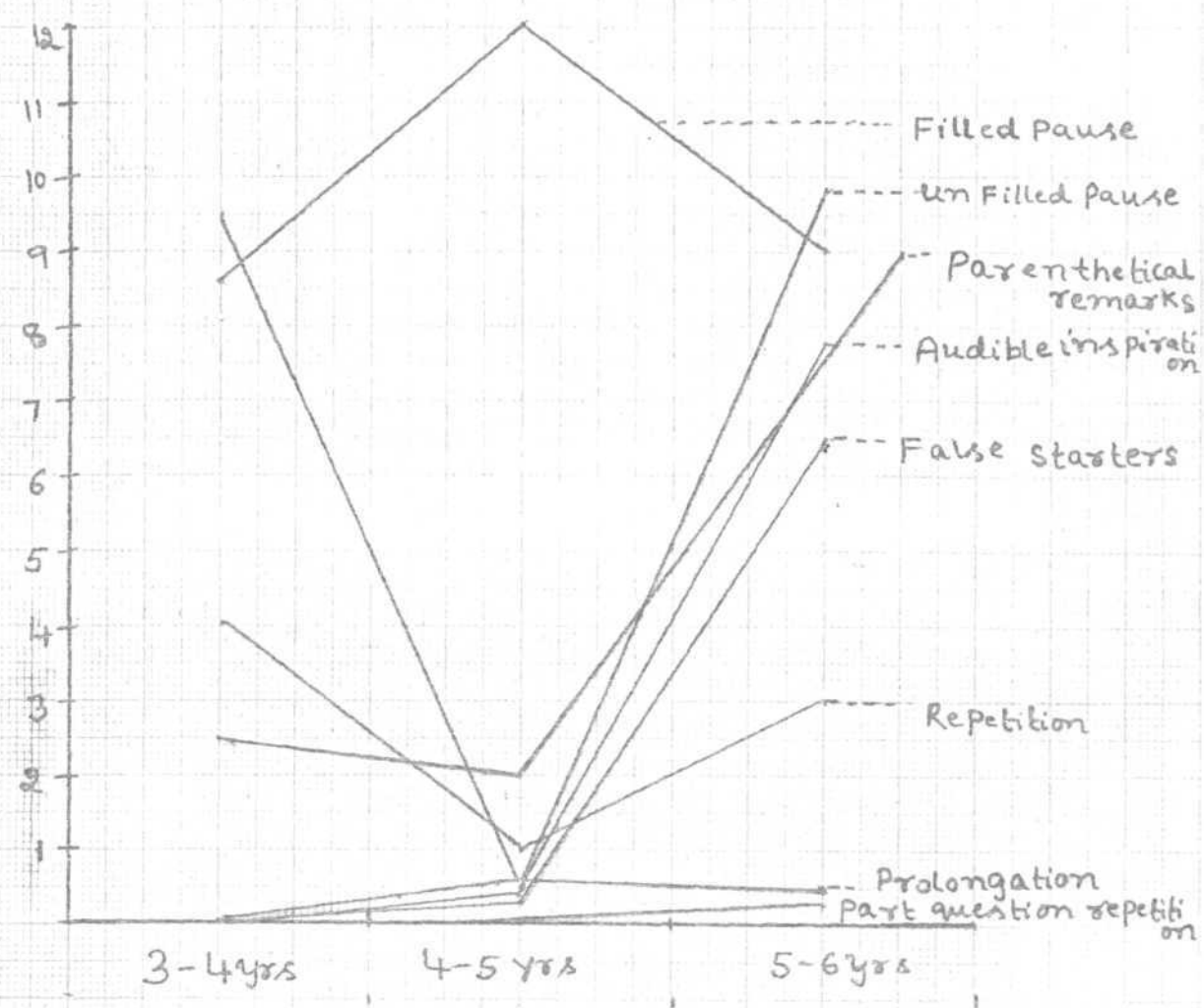


Figure:-6 Percentage and types of disfluencies across 3-6 Years on picture-description task

A TEST FOR FLUENCY - A PROPOSAL

Based on the results of the present study a fluency test has been proposed. Picture description task is recommended for this test. Pictures of animals (single) could be used to elicit responses and common questions to use include what is this? What is it doing? What is its name? Tell the names of the body parts. What does it eat? Where have you seen this? etc. (Appendix for material).

The percentage and the range of the disfluencies as obtained has been suggested as the cut off scores for the test (Table-13).

Hegde (1990) reported that he used a cut off score of 5% irrespective of the age. However, in the present study, the percentage disfluency is much higher than Hegde's report. This might be because Hegde uses word as the unit for percent calculation. Where as in the present study utterance is used as the unit. Utterance was preferred to words in the present study due to the difficulty in classifying a unit as word in Kannada².

Personal Communication with

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Age group in yrs	UFP		FP		R		FS		PR		Total
	Average	Range	Average	Range	Average	Range	Average	Range	Average	Range	
3 - 3.2	7	5-8	17	4-30	6	0-12	0.3	0-1	1	0-1	31
3.2 - 3.4	8	5-12	13	10-16	7	2-11	0	0	6	0-11	34
3.4 - 3.6	13	5-21	5	4-7	0	0	0	0	3	0-5	21
3.6 - 3.8	9	3-14	5	1-10	4	1-6	0.4	0-0.4	1	1	19
3.8 - 3.10	11	8-15	6	2-10	7	1*13	0.3	0-1	1	1-2	22
3.10 - 3.12	10	6-13	5	2-8	0.5	0-1	0	0	4	0-1	19

Table-13 : Average and range of disfluencies in picture description in different age group in percent - cut off scores for the fluency test.

The results of the present study and the cut off scores, obtained. Thus, suggest that variations across the types of disfluencies may bring about a difference in categorizing a child as normal or disordered in fluency. For example, if these cut off scores are considered, a child (3.10-3.12) with UFP = 7%, FP " 3%, R - 4%, FS " 0.1%, and PR = 1.1% would be considered as abnormal because of high percentage of repetitions. If the total percentage is considered, he would still be in the normal category.

In this regard, it is suggested that this test could be used in children with NNF and stuttering to validate and to make it a useful diagnostic indicator and therapeutic tool.

SUMMARY AND CONCLUSION

To differentiate normally non-fluent children from stuttering children, a knowledge of development of fluency is essential. In this study an attempt has been made to evaluate the disfluencies of 12 Kannada speaking normal children between three to four years (two each in two month interval belonging to middle socio-economic class). A minimum of half an hour speech sample was elicited from all children using different tasks (picture description, conversation, rhymes and story telling).

Recorded speech samples were transcribed and analysed for different disfluencies. They are (i) unfilled pauses - a period of silence (ii) filled pauses - urn, uh, ee, er (iii) Repeats - syllable, word, part word and phrase repeats (iv) False starters. Grammatical modification of the phrase correction of phrases, of words and incomplete utterances (v) parenthetical remarks (matte) (a:va:ga) (a:me:le) and other fillers. Samples were also analysed for audible inspiration/expiration part question repetition and prolongations Percent of position of occurrence of disfluenc and the grammatical categories before Which disfluencies occurred were also analysed. Disfluency like 'da da dara was considered to occur in the initial position

of an utterance. 'Karkonkon konbande' was considered as a disfluency in the medial position of the utterance and 'be reee' was considered as a disfluency in the final part of the utterance.

Results indicated that all these subjects had more percent of unfilled pauses, followed by filled pauses, parenthetical remarks, repetitions and false starters. The disfluencies occurred more in picture description task except parenthetical remark which was observed more in story telling than other tasks. All the types of disfluencies, except parenthetical remark, which occurred more in initial position. However, more parenthetical remarks were noticed in the medial position. Disfluencies occurred more before content words, especially nouns.

In general, repeats peaked at 3 - 3.2 years, filled pauses at 3.2 to 3.4 years, unfilled pause in 3.4 to 3.6 years false starts in 3.6 to 3.8 years and parenthetical

remarks in 3.10 to 3.12 years. False starts though found

Based on these results, a test for fluency was proposed and picture description was recommended as a task. The percent disfluency and ranges in each age group is provided with as a cut of score for the differentiation of children

as normally non-fluent/stuttering. However, this is only a proposed test and it has to be administered with children to validate and thus to utilize in diagnosis and therapy.

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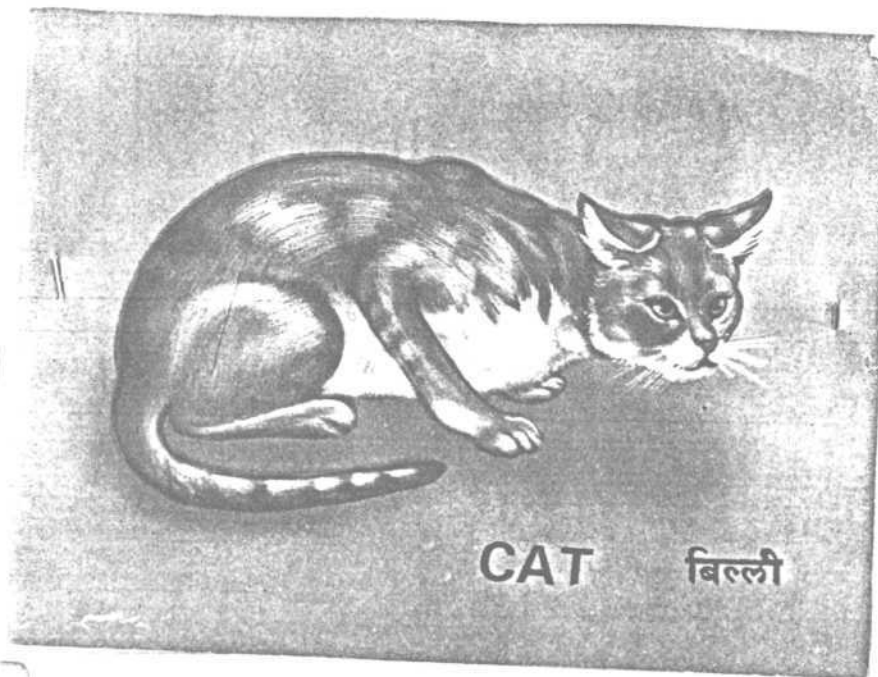
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APPENDIX

SQUIRREL

गिलहरी



CAT

बिल्ली

32

DOG

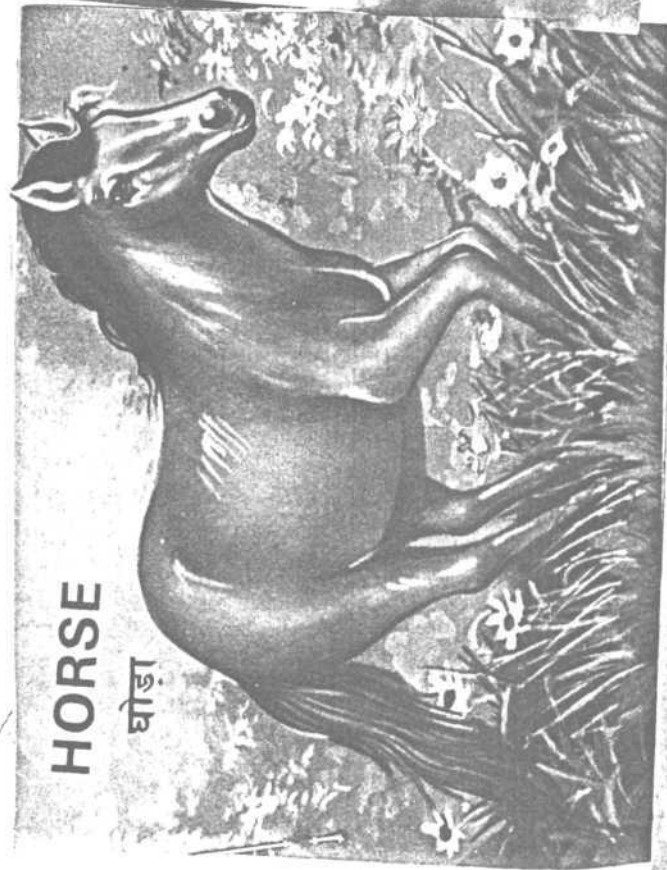
कुत्ता



RABBIT

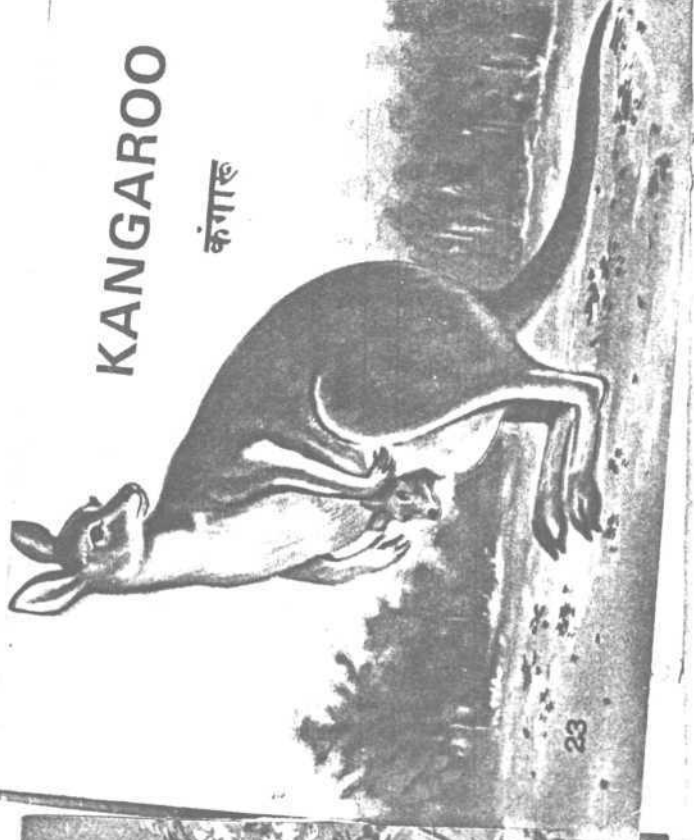
खरगोश





HORSE

घोडा



KANGAROO

कंगारू



DEER हरिण



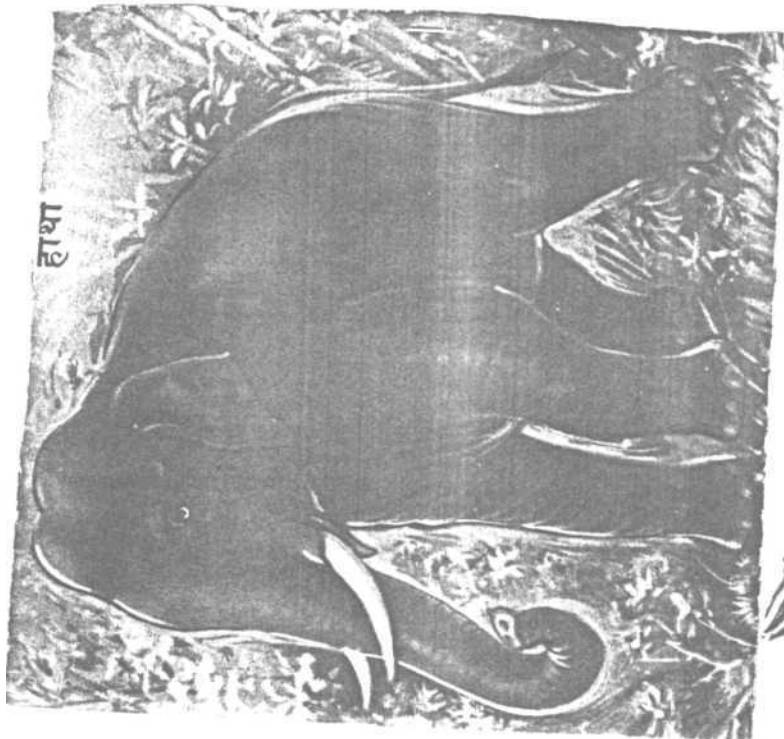
BUFFALO

भैंसा



HORSE

घोड़ा



हाथा



DONKEY

गदगा



GIRAFFE

जिराफ़

