

DISFLUENCIES IN HINDI SPEAKING CHILDREN (6 - 7 YEARS)

Register No.M8903

A DISSERTATION SUBMITTED AS PART FULFILMENT OF FINAL YEAR  
M.Sc., (SPEECH AND HEARING) TO THE UNIVERSITY OF MYSORE.

ALL INDIA INSTITUTE OF SPEECH AND HEARING: MYSORE-570 006.

1991

M Y F A M I L Y M E M B E R S


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M Y G U I D E

**CERTIFICATE**

This is to certify that the  
Dissertation entitled: DISFLUENCIES  
IN HINDI SPEAKING CHILDREN (6-7 YEARS)  
is the bonafide work in part fulfilment  
for the degree of M.sc., (Speech and  
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Mysore, 1991.

  
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C E R T I F I C A T E

This is to certify that this  
Dissertation entitled: DISFLUENCIES  
IN HINDI SPEAKING CHILDREN (6-7 YEARS)  
has been prepared under my supervision  
and guidance.

April 1991  
Mysore, 1991.

*Savithri S.R.*  
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GUIDE

## DECLARATION

This Dissertation entitled: DISFLUENCIES IN HINDI SPEAKING CHILDREN (6-7 YEARS) is the result of my own study undertaken 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.

Mysore, 1991.

REGISTER No.M8903.

## ACKNOWLEDGEMENT

I express my GRATITUDE to Dr.s.R.Savithri, Lecturer in Speech Sciences, All India Institute of Speech and Hearing, Mysore, for her excellent supervision and guidance.

I thank Dr.(Miss) S.Nikam, Director, All India Institute of Speech and Hearing, Mysore, for allowing me to study of this dissertation.

My sincere thanks to Dr.N.P.Nataraja, Prof, and HOD, Dept. of Speech Sciences, AIISH, Mysore for allowing me to use the equipments from the Departments.

I am indebted to my Bhaiya Sri Kiran Kumar Lal for his timely encouragement and helping me in all aspects, and also to my Bhabhi Mrs. Premlatha for her love and affection which brought a colourful life in this dissertation.

I am also indebted to my beloved sister Madhu, Brother Vishnu, nephew Banti and Niece Nitu whose love reinforced me during writing this dissertation.

I thank Rathnamala, Rasitha, and Krishnamala for their artistic drawings.

I thank Anitha Didi and her son Jitu, CFTRI, Mysore for their affectionate help.

My sincere thanks to the Principal, St.Anthony Convent school, Allahabad, for allowing me to conduct my study at the School.

I thank Mrs. Rajalakshmi R Gopal who contributed her affection and talent in typing this dissertation neatly.

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## INTRODUCTION

### FLUENCY:

\*A barometer for the entire speech system ... (with its) limits ... apparently set by adequacy of performance of the other dimensions of speech" (Perkins, 1972).

"Developmental stages in cognition and language have been the frequent object of investigation. However, the development of speech fluency in children has received far less attention. Fluency, the ability for speech to flow without undue pausing or hesitation, is so integrally tied to speech and language, that, it is often overlooked as a subject of investigation. Yet the development of fluency can provide important clues to the emergence of new stages in the domain of cognition and language" (Lindsay, 1989).

Fluency, according to ordinary usage, is the ability to speak a second language rapidly and continuously and without any particular effort or thought. The fluent speaker does not think about how to say what he wants to but about what he wants to say and about the reactions of his listeners\* He has learned the language so well that he automatically produces it with correct semantics. Syntax and phonology (starkweather, 1980). According to starkweather

(1980) "Fluency refers to effortless production of long, continuous utterances at a rapid rate, be it the first language or second language". However, the phenomenon of speech is not always without disruptions, which in turn lead to breaks in fluency.

"Fluency referring to a native language, means something else although the two meanings are quite similar. A person is said to speak his native language fluently when he speaks without pausing or hesitating more than is normal and when he does not have to struggle or speak in a slow labored fashion" (Starkweather, 1980). Based on this. Starkweather (1987) considered fluency as a multidimensional behaviour and the dimensions of fluency suggested are: the continuity or smoothness of speech, the rate of speech and the effort a speaker makes in producing speech and rhythmic structure. These three elements of fluency are related to each other. First, the pauses and hesitations that break up the smooth, continuous flow of speech determine the length and influence the rate of each utterance. Pauses and hesitations occur in even the most fluent speech. Naturally, they slow down the rate at which words are produced, and it is rate, more than any other element, that signals fluency.

Rate can be thought of in several ways: the rate of information flow (roughly measured in words per minute and reduced by pauses and hesitations), the rate at which syllables are produced (according to the speed of articulatory movement and the extent to which adjoining sounds can be overlapped), and the duration of the individual consonants and vowels.

Effort can be physical or mental. Physical effort refers to the movement of the articulators and mental effort refers to the coding process. Of late, fluency is the focus of research and several studies have focused attention on the developmental nature of fluency in normal children (DeJoy and Gregory, 1985; Haynes and Hood, 1977; Kowal, O'Connell and Sabin, 1975; Yairi and Lewis, 1984; Wexler and Mysak, 1982; Indu, 1990; Yamini, 1990; Nagapoornima, 1990). Although these studies differ from one another in many aspects, they all provide evidence that the disfluencies normal children exhibit in the course of developing language show certain patterns that are systematic over time.

These studies reveal that children's speech becomes increasingly fluent as they mature. When children first begin to use speech to convey ideas, their speech lacks fluency. It is produced slowly and many of the features of normal rhythm are missing. As their fluency increases\*

children also learn to deal with lapses of fluency, such as discontinuities in a more sophisticated way (starkweather, 1987). Some children do not develop the capacity for fluent speech as rapidly as others and at times the demands for fluency made by their environments are too much for them to handle. Since their environmental demands are greater than their capacity to produce, the child lacks fluency in speech conditions that arise as a result of fluency disruptions;- Dysfluencies with include stuttering and cluttering.

To evaluate dysfluencies, one should know about the disfluencies normal children exhibit: knowledge about disfluencies helps a clinician in better diagnosis and management of the dysfluent speakers. In this regard, attempts have been made in the past and tests of fluency in Kannada are proposed for the age groups 3-4 years (Nagapoomima, 1990), 4-5 years (Indu, 1990) and 5-6 years (Yamini, 1990). The present study aims at evaluating the disfluencies of 6-7 years old Hindi speaking children on a story description task which will be helpful as a tool for diagnosis and management of patients with fluency disorder.

## REVIEW OF LITERATURE

This chapter reviews the following:

- I. Terms and definitions of disfluencies.
- II. Factors effecting fluency.
- III. a) Studies on the development of fluency in children  
b) Disfluency characteristics of 6-7 year old children.

### I. Terms and definitions of disfluencies:

Johnson (1961) classified the following types of speech behaviour as disfluencies:

**1. Interjection** of sounds, syllables, words, or phrases - Extraneous sounds such as 'uh', 'er', 'hmmm'; 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 example, '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? 'uh uh' is an example of an interjection repeated once and 'uh uh uh' is an example of an interjection repeated twice.

**2. Part-word repetitions** - This category has repetition\* 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', 'ba-ba-baby' and 'a-bou-bout' are examples of part word repetitions.

**3. Word-repetitions** - This category includes repetitions of whole words including words of one syllable. Both the number of instances and number of repetition units within 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 example, 'going uh going' or 'guh-going going' is classified as word repetition. In any case, the interjected or associated disfluency is also tabulated in the appropriate category.

**4. Phrase repetitions** - This category includes repetitions of two or more words. Example I was I was going.

**5. Revisions** - Instances of revision include those in which the content of a phrase is modified, or in which there is

grammatical modification. Change in pronunciation of a word is also counted as a revision, 'I was-I am going' is an example of this category.

**6. Incomplete phrases** - An incomplete phrase is one where in 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'.

**7. Broken words** - 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 are characterized by this category. 'I was g - (pause) -oing home' is an example of a broken word.

**8. 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 tension pauses (Williams, Darley and Spriesterbach, (1978). Williams, Silverman and Kools (1966) presented a revised version of Johnson's disfluency classification system which includes: part-word repetitions.

whole word repetitions, phrase repetitions, interjections, - revisions, tense pauses and dysrhythmic phonations. Dysrhythmic phonation is identified only with words. It refers to 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 is not characterized in another category. Tension Pause - "Tension is a disfluency phenomenon judged to exist between words, part-words, and nonwords (that is, an interjection) 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' (Williams, Darley and Spriesterbach, 1976).

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 words 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 example, "put it in her wagon. No, put it in her wagon".

3. The inclusion of "too" or "hey" still preserves the repetition. For example, "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 example, "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"?
7. The calling of an individuals name over and over is considered as a repetition. For example. May, 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 a rapid speech. For example, "you sleep in the dog house. You sleep in dog house".
9. The complete responses can be repeated as a group, in which case they are scored as two repetitions- For example, "Oh, look what he's doing. He's putting his feet in the dog house. Oh, look what his doing. He's putting his feeting in the dog house".

10. The insertion of the name does not offset the repetition. For example, "let's rock on the rocking horse. Timmy let's rock on the rocking horse".

Limitations on repetitions were also established.

1. Changes of a word which bring about a change in the meaning of the response nullify it as a repetition. For example, "that's all I need. That's all we need".
2. Repetition of "what" or 'hunh' were not marked as repetitions as their presence could indicate the child's inability to hear a remark made to him by another.
3. The introduction of a nonidentical remark between identical remarks cancel the repetition. For example, "We won't go down, will we? Watch we won't go down, will we?".
4. 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, "errrrrrrrr. errrrrrrrra" (a motor).
5. A change of sentence structure invalidates repetition. For example, "you can't. You cannot".

Unintelligible repeated syllables were scored as repetitions on the basis that they may have carried meaning to the child if not to the ear of the adult recorder. Since,

the study concerned considered repetitions as a part of communicative speech, repetitions of either meaningful or nonsensical syllables, words or phrases for the apparent enjoyment of rhythm were eliminated. The elimination was made on the basis of detection of rhythmical form in which the word or group of words repeated presented a chanting quality a definite recurrence of pitch pattern, a regular cadence or emphasis.

Yairi (1981) put forth two types of word repetitions - single-syllable word repetition and polysyllabic word repetition. The other six categories of disfluencies included Part-Word Repetition, Phrase Repetition, Interjection, Revision-Incomplete phrase, Disrhythmic Phonation (primarily and prolongation or broken words), and Tense Pause (audible tense vocalization between words).

Janssen and Kraaimaat (1980) 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.

Manning and Monte (1979) suggested two types of disfluencies: "motoric" and "formulative". Rudmln (1984)

reports of a speech phenomenon labelled "articulation oscillation" - that is, when the final word of an expression ended in an unvoiced plosive (t,k, p) , then one or two repetitions of the same phoneme was produced.

Goldman-Eisler (1968) provided evidence that 40-50% of speaking time is spent pausing. Carrell and Tiffany (1960) refer to the pauses, during encoding, as oral punctuations. Carrell and Tiffany (1960); Lieberman (1967) and scholes (1968) consider pauses which do not perceptually disrupt the smooth flow of speech, that is, fluent pauses. However, pauses can disrupt communication. Martin and Strange (1968a) 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 et al (1975) considered unfilled pause as a category of disfluency. They define unfilled pause as any silence beyond 270 m.sec.

DeJoy and Gregory (1985) have analyzed nine types of disfluencies. They are (1) part-word repetition, (2) word

repetitions, (3) phrase repetitions, (4) revisions, (5) interjections, (6) incomplete phrases, and (7) disrhythmic Phonations (Williams, 1966), (8) grammatical pauses, (9) ungrammatical pauses. Grammatical pauses are silent pauses that occur at such grammatical junctures as (a) immediately preceding coordinating or subordinating conjunctions; (b) before relative and interrogative pronouns; (c) before all adverbial clauses of time, manner and place; and (d) when complete parenthetical references are made (Goldman-Weisler, 1968). Ungrammatical pauses are silent pauses that occur at non-grammatical points in the flow of speech. They are pauses occurring between repeated units of speech, between a unit of speech and a revision of the unit or between an injection and the following word of meaningful text.

Most of the investigators use Johnson's (1961) classification of disfluency. But some recent studies (Yairi, 1981; Wexler and Mysak, 1982) have grouped revision and incomplete phrase into a single category.

Although Johnson (1961) and other investigators have categorized disfluencies into more than two types, Minifie and Cooker (1964) have suggested that disfluencies can be broadly classified into two basic categories - 'disfluencies of syllable insertion' including repetitions, revisions and interjections, and '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. They are referred to as compound disfluencies. There are two types of compound disfluencies (1) 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? (2) 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.

Silverman (1973) considered runs in the speech disfluency of children. "A run was defined as two or more identical and/or consecutive numbers of disfluencies" (Silverman, 1973).

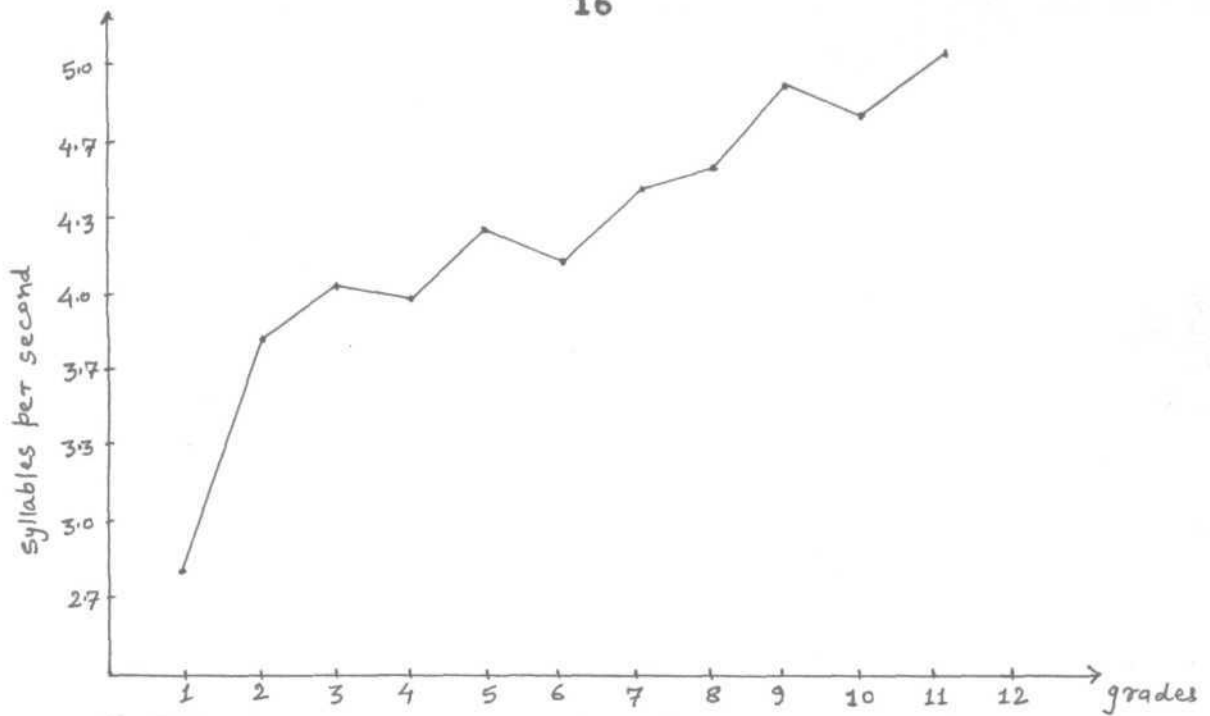
## **II. Factors affecting fluency:**

Several factors - continuity, rate, effort, rhythm, anatomical and physiological framework of fluency, motor and linguistic factors, aerodynamic factors, lexicon, language complexity, sex, situation, seem to affect fluency.

Rate: Rate refers to how quickly or slowly the speech may flow according to the speed with which syllables are produced (Starkweather, 1980). Syllables beginning with consonants, even with clusters of consonants are produced faster than syllables beginning with vowels (starkweather 1980). The rate is faster in longer utterances (Malecot, Johnston, Kizziar, 1972) and is slower during whispered speech (Brown and Brandt, 1971; Parnell, Amerman and Wells, 1977) and in noisy conditions (Hanley and Steer, 1949? Ringel and Steer, 1963; Winchester and Gibbons, 1958). A perceived failure of information is consequently a signal to the speaker that if he slows down there is a better chance of successful communication (Longhurst, and Siegel, 1973). Coarticulation influences rate (starkweather, 1980) and hence fluency is affected by rate.

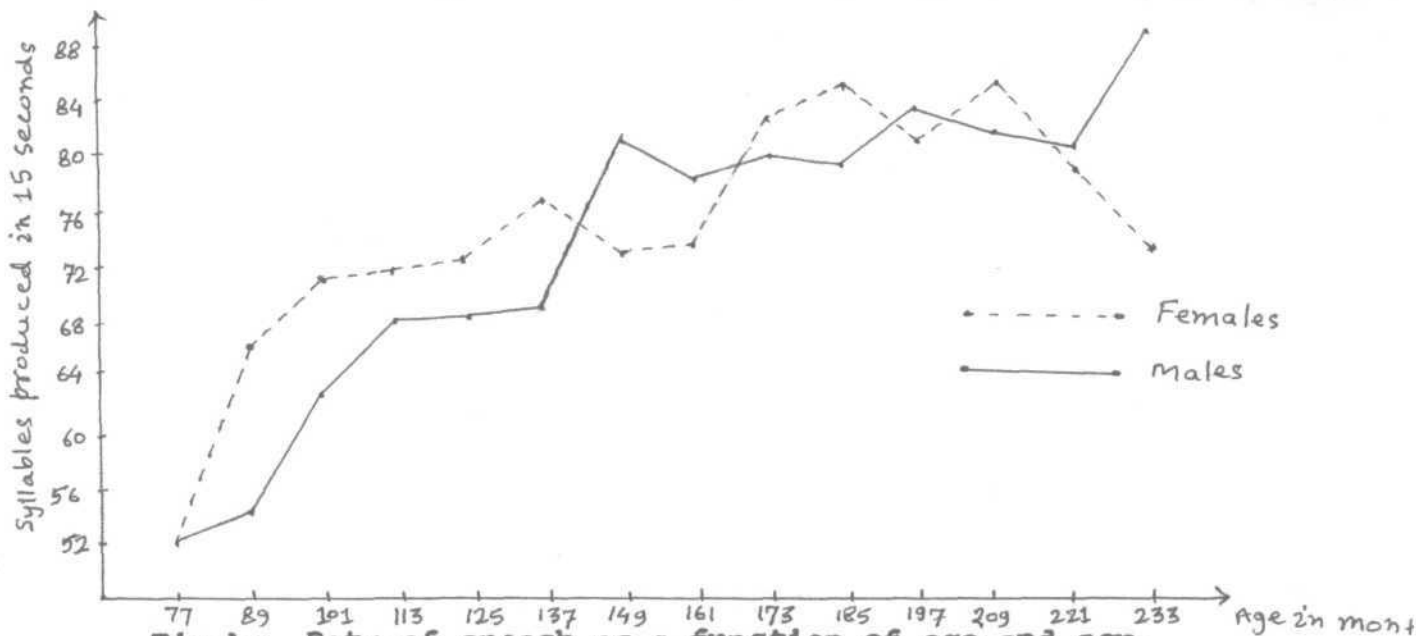
Rate is measured by the number of syllables uttered per second (Dawson, 1929). One of the earliest studies by Dawson(1929) on 200 children at 12 different grade level indicated that the rate developed quickly in the lower grades 1-3 around 4 syllables/second and the development slowed down at grades 4,6, 8, 9 and 11 (Fig.a).

Dawson used a variety of speech tasks such as counting, repetition of words, saying a nursery rhyme, a tongue twister and an ordinary sentence as fast as they could. The study also indicated sex differences where girls talked faster than boys upto age 12, across all speech tasks and between 12-19



**Fig.a:** Speech rate as a function of age.

years a minor see-sawing between the two sex with a final change where in the boys seemed to talk much faster at 20 years. (fig.b)



**Fig.b:** Rate of speech as a function of age and sex.

In a study on the development of rate incorporating subjects from kindergarten through senior year of high school Kowal et al (1975) indicated a discontinuity in the development between 4th and 6th grades after which the rate continued to increase until the 10th grade with a slight decrease in the rate at high school. Fig.c.

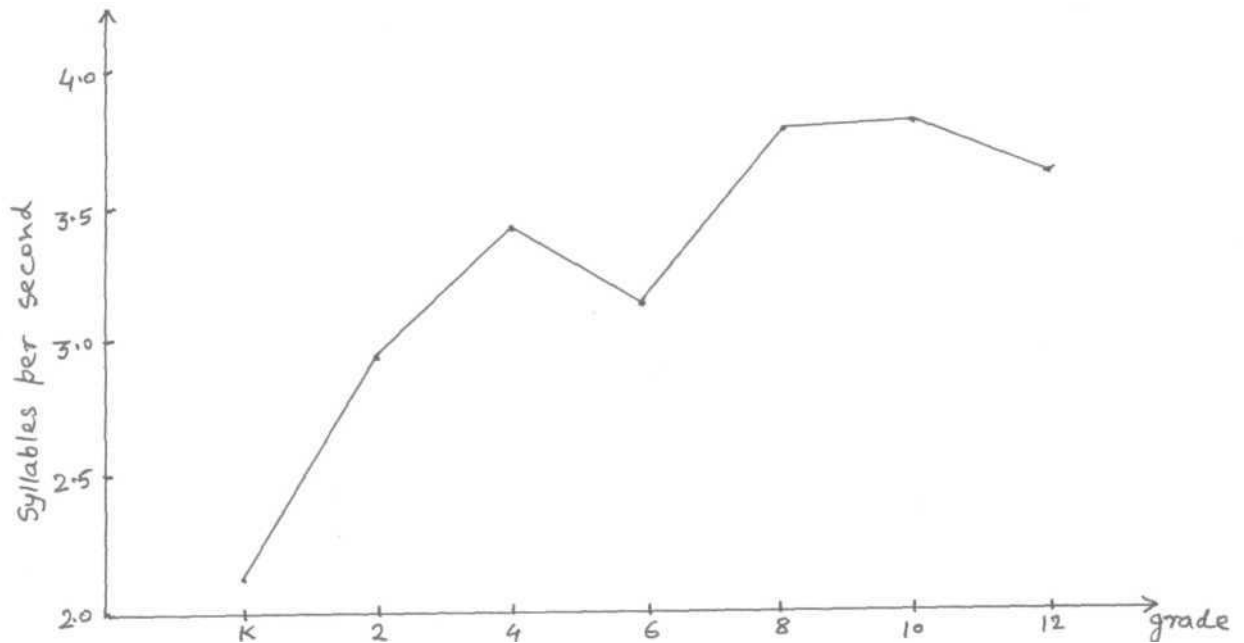


Fig.c: Syllables per sec. as a function of age.

It is found that the rate and the utterance length increase as the child grows, with more rapid development in early years when there is also a difference in the rate between sex, favouring girls (Starkweather, 1980), spurts and lags in the development of fluency are associated with increases and decreases, respectively, in the frequency of pauses and hesitations, suggesting that these nonfluencies may in fact be a

behaviour for achieving faster rate or longer utterances in growing children (Starkweather, 1980).

Stress is related to fluency in a complex manner, where the most important one is that it takes additional effort to produce stress. Hence, the stressed syllables may be considered as momentary decrease in the fluency of speech production (starkweather, 1980). Rhythmical patterning refers to temporal sequencing of similar events (Dalton and Hardcastle, 1977). Eilers (1975) reported that young children (eighteen to thirty six months) were unable to imitate sentences lacking normal rhythm. The rhythm of speech is an essential perceptual cue to recognize speech as meaningful stimuli (Starkweather, 1987).

The anatomical framework of fluency include the vocal tract and the CNS (Starkweather, 1987). In children, motor and linguistic factors also influence fluency (Wexler, and Mysak, 1982). DeJoy and Gregory (1985) indicated that during the later preschool years, children become more accomplished in the symbolic/motoric selection. They added that the forward flow of speech becomes relatively more automatic and disfluency declines in frequency. The reduction in frequency may well reflect increased temporal precision and control, and simplification of the control process (Sharkey and Folkins, 1985) leading to a greater automatlcity (starkweather,1989).

Van Riper (1971) indicated that disruption of proper programming of the physiological movements necessary for fluent speech causes stuttering. Adams (1982) provided the physiologic and aerodynamic requirements thought to be integral to fluent speech production. Coordination; spatial coordination and timing coordination are essential physiological aspects of fluency (Starkweather, 1987). Physiological weakness of coordination in speaking could manifest itself as a lack of fluency - slowed rate, repeated elements, hesitation, perhaps unusual amounts of effort in speaking (Starkweather, 1987).

**Duration:** The duration of speech sound is directly related to fluency in several ways. The less time individual sounds take up, the more can be produced in the same period of time (Umeda, 1975). The relationship of stress, pauses and syllabic rate influence the duration of speech sounds. Apart from these, influences of nearby sounds ie vowels or consonants and of pauses (Fairbanks, 1963) on the duration of a sound, sentence boundaries in which they occur (Umeda, 1975) should be considered. Language can also affect the duration of speech sounds used (Umeda, 1975).

The duration of speech sounds changes in the growing children. Oiler and Smith (1977) on examining the babbling of infants found a lengthening of final syllables. As children grow, the average duration of both vowels and

consonants decreases along with variability of duration (DiSimoni, 1974a, 1974b). DiSimoni also found tendency for speech sounds to be shorter in longer utterances between 6-9 years and not in the speech of the 3 year old child studying VOT in children between 3 and 4 years. Menyuk and Klatt (1975) found that children showed proportionately much greater shortening in the voiced than in the unvoiced category.

**Stress**: Another factor which affect fluency is stress. Children seem to acquire the ability to perceive and produce stress contrasts before they use stress meaningfully (Spring and Dale, 1987). In the one word stage, disyllabic words are often produced with the unstressed syllable omitted or distorted or with the stressed syllable substituted for it (Atkinson-King, 1973). Once stress contrasts have been mastered, the preschool child's speech rhythms become more adult in form, although development continues during school years as control over timing and rate of syllable production increase (Tingley and Allen, 1975). At normal speeds, stress is likely to be found on words that carry more information. Moreover, stressed syllables require more time and more effort and are consequently less fluently produced than unstressed syllables (Kowal et al 1975). At older ages, children learn the use

of linguistic stress, comprehension precedes production and the girls out-perform boys in the stage of stress development at the age studied (Kowal et al. 1975).

**Effort:** Speech produced effortlessly is characteristic of fluent speech (Starkweather, 1987). Effort is consequently related to rate, stress and duration of speech sounds. The two types of efforts are: mental effort or concentration where the thoughts are focussed on the content rather than on the processes of utterances and muscular effort, where the effort provides a flow of air, opens and closes the glottis and moves the tongue, lips, jaw, velum and pharynx (Starkweather, 1987). Among the speech sounds, stops and fricatives require more effort than nasals and glides (Malecot, 1955; Subtelny, Worth and Sakuda, 1966).

**Language complexity:** Davis (1940); Silverman (1972) and Haynes and Hood (1977) found little or no relationship between language behaviour and disfluency in children, similarly. Cordon, Luper and Peterson (1986) who replicated Pearl and Bernthal's (1980) study with 5 year old non-stutterers, generally found little support for complexity/disfluency hypothesis.

Analysis of language samples by Haynes and Hood (1978) who studied 20 male and 20 female children between 60 and 72



months supported that language influences disfluency. They found that the percentage of disfluency was significantly higher in the complex modeling condition. Significant increase in word-repetition, revision incomplete phrases and disrhythmic phonations occurred in the complex modeling situation.

McLaughlin and Cullian (1989) studied the spontaneous language samples and elicited utterances using modeling procedures in 10 males and 10 females between 60-71 months. Two levels of utterance length and two levels of linguistic complexity constituted the four sets of utterances. Analysis delineated significantly greater rates for over all disfluencies and "stutterings" (part-word repetitions, word-repetitions, disrhythmic phonations and tense pauses) occurred in those modeling tasks that evoked linguistically more complex utterances.

Gordan and Aupdr (1989) studied disfluencies on modeling task and imitation task. Three different syntactic constructions: (1) simple affirmative declarative with copula + ing (SARD) (2) future (PUT) and (3) passive (PAS) were considered. 36 children, 12 in each age group of 3-, 5- and 7- year old nonstuttering children were asked to repeat 30 sentences from the imitation task stimuli and produced response construction from 30 pictures from the

modeling task stimuli. 3-year-olds showed significantly more disfluencies than the 5-year-olds and the later showed significantly more disfluencies than the 7-year-olds. Significantly more disfluencies on the modeling task than on the imitation task was found in all the three age groups. A significant complexity effect was seen for the PAS construction.

It has been found that highly disfluent group of Children aged 4 years use language that was less complex (Muma, 1967) and fewer discontinuities were observed in the speech of 4 years old who had good comprehension (Caldwell, 1971).

The relationship between syntactic complexity and disfluencies has also been highlighted by several researchers. It was noticed that an increase in syntactic complexity increased the disfluency in children aged 3.11 years to 6.4 years on an imitation task (Soderberg, 1961; Bernstein, 1981).

**Sex:** Children in both sex have been studied by several investigators (Branscom, Hughes and Oxtoby, 1955; Bjerkan, 1980; McLaughlin and Cullian, 1989). Branscom, Hughes and Oxtoby (1985), in their report suggested that there were no statistically significant sex differences with respect to repetition instances. They observed greater incidence of phrase-repetition for free play situation than in the test situation.

**Other factors:** The influence of variables like autonomic nervous system and stress (Meyers, 1977), the synchrony of laryngeal adjustments (Freeman and Ushijima, 1975), the integrity of the coarticulatory mechanisms (stromsta, 1965; Stromsta and Fibiger, 1980) and the child's phonological, syntactic semantic and pragmatic development should also be considered as factors that can affect fluency.

Structured and/or unstructured situations have been used to elicit speech samples. Telling stories in response to CAT cards, a structured speaking task, was adopted by Johnson (1959), free-play observation was employed by Davis (1939, 1940) and Oxtoby (1943)- While Hughes (1943) and Branscom (1942) utilized speech fluency test to measure speech repetition in children (Branscom, Hughes and Oxtoby, 1955): nursery school speech was employed by Bjerkan (1980); conversation alone with the experimenter in a playroom which had a table on which toys and materials were placed was selected by Wexler and Mysak (1982); and McLaughlin and Cullian (1989) used a set of 30 pictures to elicit atleast 60 utterances containing subject predicate relationships.

In general, it is evident that several factors affect fluency and the speech sample can be elicited in various tasks using different methods.

**III. a) Studies on the development of fluency in children:**

The beginning of the study of speech fluency is not more than a century. In 1891, Kirpatrick advocated that repetition is seen in children as they do not have tangible evidence that they have been understood, With the onset of the twentieth century, as early as 1904, Conradi considered speech disfluency to occur due to the playful pleasure children take in repeating certain sounds. Brandenburg (1915) and Nice (1920) studied a single child and put-forth the incidence of repetition of word and/or sentence. Later on, Adams (1932), Fisher (1932) and Smith (1926) studied preschool children in groups and reported on the extent of repetitions but, systematic definitions and the different types of repetitions were not indicated, and no distinctions were made in terms of age and sex groups.

Quantification of disfluency began at the University of Iowa in the late 1930s and early 1940s as the issue of diagnosogenic theory of stuttering by Johnson (1942) was emerging. Johnson (1948) indicated that non-fluencies decrease in general from infancy to adulthood. Johnson et al. (1959) have shown that disfluencies like word repetition, interjections, phrases etc... are a common phenomenon in child's speech.

Examining this basic work on the phenomenon of normal disfluency, Yairi (1981) has recognized several limitations which include: the sampling adopted? the number of subjects included in the study and the type of recording adapted. Iowa studies and the later investigators have been criticised on the basis that:

1. Sampling of several age groups were adopted rather than longitudinal sampling,
2. there were only twentyfive 2 year old children, and
3. investigators were forced to count disfluencies instantaneously due to the non-readily-available electronic recording.

Results of the study by Yairi and Clifton (1972) contradict Johnson's findings. These investigators indicated that the total disfluency decreased from preschool to high school age but with further advances along the age, in the geriatric group, an apparent increase in the total speech disfluency was observed.

Research on wide age ranges of children to quantify the disfluencies include those by Branscom et al. (1955); Yairi and Clifton (1972); Kowal et al. (1975); Maynes and Hood (1977) and Bjerkan (1980); Nagapoornima (1990); Indu (1990) and Yamini (1990). Egland (1955) studied the speech behaviour in children only in the age range 65-72 months.

Branscom, Hughes and Oxtoby (1955) studied 193 children in the age range 2 to 6 years for the disfluency in two different contexts - free play and fluency test. Analysis of the results revealed that syllable repetitions occurred less than half as often as word repetitions: and less than a third as often as phrase repetitions.

Egland (1955) found sound or syllable repetitions to be more, followed in order by word repetitions and phrase repetitions; in nonstuttering children between 65-72 months.

Yairi and Clifton (1972) compared the disfluent speech behaviours of preschool children, high school seniors, and geriatric persons, all of whom were considered as normal speakers. Each of the three groups consisted of 15 subjects approximately half male and half female. Three picture cards were used for each subject to elicit spontaneous speech samples. Findings support the view that total disfluency decreases from preschool to high school age. However, disfluencies were found to increase in the geriatrics. This developmental trend of increased disfluency from young adulthood (high school) to old age may be due to some undetermined factors, physiological or psychological, which affect the quality of speech output of geriatric persons and result in disfluency rates. Interjections, revisions - incomplete phrases and word repetitions typically regarded as characte-

ristic of normal speakers were the three types of disfluencies present most frequently in each of the three groups. Tense pause was the least occurring disfluency in all the three groups. Scanning the percentage profiles revealed that the category of interjection was the main factor distinguishing pattern in the three groups.

Kowal, et al (1975) found that the repetitions at senior year reduced to about one-sixth of kindergarten level and was very low in absolute terms. The part-word repetitions made up a sizeable proportion of repetitions in the kindergarten and second graders but dropped out of picture by fourth grade. He also reported that at young ages children use more of unfilled and filled pauses and as they grow they use more sophisticated types of disfluencies such as false starts and parenthetical remarks.

Haynes and Hood (1977) and Wexler and Mysak (1982) observed that repetitions (part-word; word and phrase repetitions) increased from 4 to 6 years age in children. However, not all studies support this.

Haynes and Hood (1977) indicated that word repetitions are a predominant disfluency type in children under age 6 and that they decrease as the youngsters approached the age of 8. His study seems to contradict the study by Egland (1955).

Word fragmentation interrupts communication in stutterers (Bjerkan, 1980). Bjerkan (1980) investigated the occurrence of word fragmentation and word repetitions in normal 110 nursery school children in the age range 2 years 2 months to 6 years. Analysis of instances of disfluency indicated that these nonstuttering children had an average frequency of word repetition of 6.3% and that its frequency decreased with age. When MLU (Mean length of utterance) increased, repetitions were found to decrease and this was larger between the age range 2-3 years. Word fragmentation was virtually non-occurrent in these children.

Yamini (1990), Indu (1990) and Nagapoornima (1990) studied 36 normal Kannada speaking children of age from 3 years to 6 years (two each in two months interval). Speech sample was elicited from all children using different tasks (picture description, conversation, rhymes and story narration). Recorded speech samples were transcribed and analysed for different disfluencies. They were: filled pause, unfilled pause, repeats (syllable, part-word, word and phrase), false starts, parenthetical remarks, sound prolongation, part-question repetitions, audible inspiration and clusters. Three positions: initial, medial and final - were considered. The grammatical categories included, nouns, determiners, pronouns, verbs, adjectives, adverbs, locatives, negatives, conjunctions and interjections\*



Results indicated that 3-4 year old children had more percentage 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 remarks, occurred more in the initial position. However, more parenthetical remarks were noticed in the medial position. Disfluencies occurred more before content words especially nouns (Nagapoonima, 1990).

Children in the age group 4-5 years had more filled pauses followed by repetitions and parenthetical remarks. Audible inspiration was seen minimally in the age group (4-4.4) years and the other types of disfluencies occurred minimally. More disfluencies occurred before content words like nouns than before function words. More disfluencies occurred on the initial part of the utterances than in the medial or final part (Indu, 1990).

In the age group 5-6 years, more utterances were elicited in conversation, followed by picture description and story narration tasks. The disfluencies occurred more in the initial position than the medial and final position. Unfilled pauses, filled pauses, parenthetical

remarks and audible inspirations occurred most frequently and prolongations, part-question repetitions, repeats and false starts occurred least. Among the false starts, precisions occurred most frequently in all the tasks. The grammatical categories on/before which the disfluencies occurred most were nouns, in all the tasks. Unfilled pauses and filled pauses occurred maximally. These two occurred more before content words than before function words (Yamini, 1990).

**b) Disfluency characteristics of 6-7 year old children:**

Kools and Berryman (1971) studied the differences in disfluency behaviour between male and female nonstuttering children at the age range from 6.4 years to 8.3 years. They studied (1) Interjections of sounds, syllables, words or phrases, (2) part-word repetition, (3) word repetitions (4) phrase repetitions (5) revisions (6) incomplete phrases (7) disrhythmic phonation (8) tension (tense pauses). The number of disfluencies per 100 words was used as the score value in each category in order to equate difference in length of the obtained speech samples. The result showed that the male subjects mean score was significantly greater than the female subjects, only for the category of 'Incomplete Phrases', Subjects of both sex did not differ significantly in the mean number of disfluencies of all types combined.

Haynes and Hood (1977) studied five male and five female each at 4-, 6-, and 8- years. These investigators counted disfluencies only from the utterances scored in Developmental Sentence Analysis (Lee, 1974) and analysed them. Results revealed word repetitions to be a predominant disfluency type in children under age 6 and that they tended to decrease as the youngsters approached the age of 8. Between the ages 4 and 6, the repetitions (part-word repetitions, word repetitions and phrase repetitions) were found to increase. Regarding the interjections, disrhythmic phonation, revisions and incomplete phrases, Haynes and Hood (1977) found them to increase between 4 and 6 years.

Wexler and Mysak (1982) studied the disfluency characteristics of 2-, 4-, and 6- year old males. The age ranges were 2.2 year to 2.9 years, 4.2 years to 4.11 years and 6.1 years to 6.9 years speech samples were tape recorded while conversing with the experimenter and the utterances were transcribed. Disfluencies were identified and classified according to revision of Johnson's (1961) classification system, which includes the following disfluency types, interjections, part word repetitions, word repetitions, phrase repetitions, revision incomplete phrase, disrhythmic phonation and tense pause. In addition, two kinds of compound disfluencies (1) clustering (2) oscillation were also

investigated. Frequency of disfluency was measured as an average per 100 words.

Results showed that disrhythmic phonation part word repetitions, phrase repetition and word repetition were among the least frequently occurring types of 4-, and 6-year olds. The patterns of disfluency types were compared among the different age groups. Rank orders for disfluency types were found to be highly correlated between ages, 2, 4 and 6. Analysis showed that 2-year old had significant higher disfluency frequencies for word repetitions and phrase repetitions than did either 4 or 6 year olds. 2-year olds had 2.1 word repetitions per 100 words as compared with 0.9 for 4- and 6- year olds, and had 2.2 phrase repetitions, as compared with 0.6 for 4-, and 6- year olds. 6- year olds had lesser frequency of disrhythmic phonations than 2- and 4- year olds. For total frequency of disfluency, the mean frequency was 14.6 per 100 words for 2-year olds and 9.1 for both 4- and 6 year olds.

In a study by Ratner and Sih (1987), the children were required to imitate 70 sentences (Seven version of each of 10 sentence types). Stimulus sentences were designed to represent utterances of varying length as well as a developmental hierarchy of syntactic complexity; in order of increasing

difficulty suggested by the child language development literature (Brogan, 1968; Hamburger and Crain, 1982; Klima and Bellugi, 1966; Lust and Mervis, 1980; Menyuk, 1969; Tager-Flusberg, DeVilliers and Hakuta, 1982; Wells 1985). These sentences were:

a) Simple active affirmative declarative (SARD)  
 b) Negative (NEG) (c) Question (QUES) (d) Passive (PASS)  
 e) Dative (DAT) (f) A simple sentence expanded with a terminal prepositional phrase (PREP) (g) Coordinate sentence with forward reduction (COOR) (h) Right-embedded relative clause (RERC) (i) Left embedded complement clause (LECC) and (j) Center-embedded relative clause (CERC). All subjects were required to repeat the stimulus sentences after the examiner. Subjects were allowed to request repetition of the stimuli, and stimuli were repeated a maximum of two additional times if a subject child faltered in mid repetition and appeared to be unable to complete the task. All responses were recorded and analyzed.

The following analyses were performed upon the data (1) the percentage of sentences with at least one dysfluency (SDYS) was calculated for each subjects group and sentence type (2) The percentage of dysfluent syllables (SYLLDYS) was determined. (3) The percentage of sentence changed (CHANGED) was determined. For the stuttering group alone.

The percentage of stuttered syllables (SYLLSTUT) and the number of sentences containing at least one stuttered moment (SSTUT) were determined for each sentence type. Repetitions of words and phrases were counted as dysfluent syllables ie. if a child repeated, "The man was ... the man was ..." he was accorded three dysfluent syllables. The incidence of unfilled pauses was proportioned over the length of the child's utterance in syllables.

An examination of stutteters SYLLDYS and SYLLSTUT patterns showed that Coor (Coordination with forward reduction) was the least dysfluently produced sentence type for this group, despite the fact that it was matched for syllable length with four additional sentence types in the stimulus set.

Gordon and Luper (1989) studied speech disfluencies in non-stutterers. They counted disfluencies from the utterances of three different syntactic constructions:  
1) Simple active affirmative declarative with copula + ing (SAAD); (2) Future (FUT); (3) Passive (PAS). The stimuli

for the sentence-modeling task were made up of 30 randomly arranged sentence stimulation pictures representing the three syntactic constructions.

Results revealed that the 5-year olds had an over all mean of 14.58 disfluencies for the two experimental tasks with a mean of 2.83 disfluencies for subject on the sentence imitation task and 11.75 disfluencies on the sentence modeling task. The 7-year olds had an overall mean of 9.50 disfluencies for the two experimental tasks. The total and mean number of disfluencies/syntactic construction of the 5 year olds had a mean of 4.58 disfluencies on the SAAD, 4.08 on the FUT and 5.92 on the PAS construction. The 7 year olds had a mean of 3.17 on SAAD, 2.83 on PUT and 3.50 disfluencies on the PAS construction. The total and mean number of sentence production errors/syntactic constructions were higher in 5 year olds than the 7 year olds in both the tasks. The mean number of disfluencies of the 3 year olds was significantly greater than the means for both the 5- and 7 year olds.

The review indicates a lacuna in the area of fluency inspite of extensive research. The present study in an attempt to fill this lacuna. It is intended to investigate the disfluency patterns of 6-7 year old Hindi speaking children, which will serve as a base for a test.

## METHODOLOGY

Subjects: The subjects for this study were twelve normal Hindi speaking children in the age range of 6-7 years who were from middle socio-economic status. Two children, one male and one female, each in two months age interval (6-6.2 years; 6.2-6.4 years.... 6.10-7 years) were selected.

Material: A pilot study was conducted initially to select the appropriate story pictures. Eleven Panchatantra\* stories were selected for this task and pictures (ranging from 5-15) appropriate to suit these stories were drawn. Pictures for a given story were visually presented to a 6.0 year old Hindi speaking child and his responses were audio-recorded. Of these eleven stories, five were rejected as the child had difficulty either with the familiarity of the story or making the story with the pictures and only six stories were selected. Pictures ranging from 5 to 13 depicting these stories formed the material and are presented in appendix-I.

Test environment: The experiment was conducted in a quiet place in a school at Allahabad.

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\*A world-famous moral story book written originally in Sanskrit by Vishnu Sharma. It tries to teach moral through stories involving animals.



**Procedure:** Initially a general conversation was held with the children. They were familiarized with the pictures and were instructed to narrate the story. Pictures for a particular story were visually presented separately to the children. Each child was tested individually. When the child had difficulty, he was prompted by the experimenter. Pictures of stories were presented in the increasing order of the number of pictures. The speech samples were audio-recorded for all stories for each child. A portable mono Philips tape-recorder and Meltrack DR-X 90 audio-cassettes were used for recording the speech samples.

**Analysis:** The speech samples were transcribed and the utterances were analyzed for the disfluencies. An example of the transcription is illustrated in the appendix-II. In this study the following types of disfluencies were studied.

1. **Filled pauses** (Henceforth, F.P) - characterized by extraneous sounds such as /a/, /am/, /um/, /hm//u/.
2. **Unfilled pauses** (Henceforth, UFP) - characterized by silence judged to affect the smooth flow of speech.
3. **Repeats** (Henceforth, R) - **This included:**
  - a) Syllabic repetitions (SyR) - Repetitions of syllables.
  - b) Part word repetitions (PwR) - Repetitions of a part of the polysyllabic word.

- c) Word repetitions (WR) - Repetitions of whole words including words of one syllable.
- d) Phrase repetitions (PhR) - Repetitions of two or more words.
- e) Sentence repetitions (SR) - Repetitions of a complete sentence including two word sentences.

4. **Parentetical Remarks** (Henceforth, PR) - This referred to fillers like, /Phir/, /Uske baid/, /kya: hua: ki/, /kya: kahte hai/, /aur/, etc.

5. **False starts (Henceforth, FS)** - This included:

- a) Content modification, eg. /teen kharagh soh/ ... /do: kharaghosh/
- b) Grammatical correction - eg. /usne/ /bo:let/, /usne/ /bo:la:/
- c) Change in pronunciation -eg. /malchi/ for /machali/
- d) Incomplete sentence/phrase - eg. /pa:ni me e:k/
- e) Precision/addition of adjective, adverb, etc -eg. /te:ji: se/ /bahut te:ji se/
- f) Change in the structure of sentence -eg. /vo: kha:ne ko: diya:/ - /vo: kha:ne ke liye diya:/.
- g) (Change in meaning eg. /u:per/ nahi /ni:ce/
- h) Negation - eg. /kachue/ are Nahi /kargosh/.

6. **Sound prolongations:** (Henceforth, P) -This category was identified with words where in the phonation disturbs or distorts the so-called normal rhythm or flow of speech.

7. **Audible Inspiration** (Hence forth, AI): This was judged to exist between words, part-words and non-words (interjections). Between point in question are audible manifestation of inspiration.
8. **Clusters** (Hence forth, C): Characterized by instances of different disfluency types occurring on the same word and/or consecutive words.

**Analysis type I:** An instance of disfluency was defined as a disfluency occurring once and this was measured as one disfluency. when two disfluencies of the same type occurred successively or between other disfluency (ies), they were considered as two disfluencies. /pe/ /ped/ is an example of one disfluency (repetition) while /pe/ /pe/ /ped/ and /pe/ /u/ /pe/ /ped/ are examples of two disfluencies (repetitions). Disfluency like /phir/ phir/ was considered as two parenthetical remarks and /ba/ /ba/ /bandar/ was considered as two syllable repetitions.

The position of the disfluency was also considered, for example, in / b / /ba/ /bander/ the repetition occurred in the 'initial position' and in /ped/ if the sound /e/ is abnormally prolonged then it was considered as a disfluency (prolongation) occurring in the 'medial position'. If the disfluency occurred at the end of word/sentence, then the disfluency was said to occur in the 'final position'. eg.

in /bander/ /ped/ /pe:/ /cala:/ /ja:ne:/ /Laga:/, the disfluency (FS) occurred at the end (final position) of a sentence. If the disfluency occurred prior to a grammatical category, it was considered to occur 'before' a grammatical category. For eg. in /ka/ /kachua:/, the syllable repetition occurs before a noun. If the disfluency occurred in a grammatical category, it was considered to occur 'on' a grammatical category. For ex. in /ghadiyal/ /bola:/ /boli:/, the false start (grammatical correction) occurs on the verb. If the disfluency occurred after the grammatical category, then it was considered to occur 'after' the grammatical category.

The percentage of disfluency was calculated as the ratio of the number of disfluencies to the total number of words, multiplied by 100.

$$\text{Percentage of disfluency} = \frac{\text{No. of disfluencies}}{\text{Total no. of words}} \times 100$$

The grammatical category of the word following and preceding disfluency was noted. Grammatical categories such as: nouns, pronouns, verbs, adverbs, adjectives, locatives, negatives, conjunctions, interjections, and determiners were calculated. The percentage of disfluency on/before/of a grammatical category was calculated by using the following formula:

$$\text{The Percentage disfluency on/before a grammatical category.} = \frac{\text{No. of disfluencies on/before/after a grammatical category}}{\text{Total no. of disfluencies.}} \times 100$$

The percentage disfluency in various positions were calculated by the formula.

$$\frac{\text{No. of disfluencies in the initial/medial/final position} \times 100}{\text{Total no. of disfluencies}}$$

**Analysis type II:** An instance of disfluency was measured as one disfluency occurring once irrespective of the no. of disfluencies in each instance. For eg. /pe/ ped/ and /pe/ /pe//pe/ /ped/ were each considered as one instance of disfluency.

This analysis was performed, as Indu (1990), Nagapournima (1990) and Yamini, (1990) reported high percent of disfluencies (on analysis type I) which was not in consonance with the results of the Western studies. This discrepancy was attributed to the type of analysis. The percent of different types of disfluencies for position, age and grammatical category, were analysed to describe the disfluencies in Hindi speaking children (6-7 years). The disfluencies thus observed are highlighted and the scores and the range for different types of disfluencies are provided.

## RESULTS AND DISCUSSION

The different types and percent of disfluencies were calculated and the results are discussed with respect to task, type of disfluency, grammatical category on/before/after which disfluencies occurred and the position of occurrence of disfluencies for each age group.

Two types of analysis will be presented separately and discussed - viz.

Type I - Each disfluency was counted as one.

Type II - An instance of disfluency was considered as one disfluency.

The following notations have been used in the results and discussion.

$S_1$ = Subject one	$S_2$ = Subject two
UFP = Unfilled pause	Fs = False starts
FP = Filled pause	P = Prolongations
R = Repeats	AI = Audible Inspirations
PR = Parenthetical remarks	M = Male
Sy.R = Syllable repetitions	F = Female
PWR = Part-word Repetitions	D = Disfluency
W.R = Word Repetitions	TND = Total no.of disfluencies
S.R = Sentence Repetitions	
Ph.R = Phrase Repetitions	

**6.0 - 6.2 years: Analysis Type I**

S<sub>2</sub> exhibited greater no.of words than S<sub>1</sub> and the overall percentage of disfluencies of s<sub>1</sub> was greater than S<sub>2</sub>(Table-1).

	S <sub>1</sub> (M)	S <sub>2</sub> (F)
Total no.of words	629	984
Total no.of disfluency	282	268
Percentage of disfluency	44.03	27.23

Table-1: The number of words and Percentage of disfluencies in S<sub>1</sub> and S<sub>2</sub> between, 6.0 - 6.2 years.

Both the subjects had UFP as the most frequently occurring type of disfluency followed by AI and P was the least occurring type of disfluency. In general, the order of occurrence of disfluencies were UFP-AI-FP-R-PR-FS-C-P and UFP-AI-R-PR-FP-FS-C-P, for S<sub>1</sub> and S<sub>2</sub> respectively (Table-2).

The percentage of disfluency were more in S<sub>1</sub> than in S<sub>2</sub> and S<sub>1</sub> exhibited more percent of UFP and AI, FP and PR when compared to S<sub>2</sub>.

	Percentage of disfluencies		
	$S_1(M)$	$S_2(F)$	Average
UFP	13.35	7.52	10.43
FP	4.61	2.43	3.52
AI	12.87	5.89	9.38
PR	4.13	2.74	3.43
R	4.61	4.47	4.54
FS	2.38	2.13	2.25
C	1.90	1.32	1.61
P	0.95	0.71	0.83

Table-2: Different types of disfluencies in percent 6.0 - 6.2 years.

The disfluency R was more in  $S_1$  than  $S_2$ . The different types of R were also more in  $S_1$  than in  $S_2$ . In both the subjects the SyR and WR were more than other types of repeats. (Table-3).

Types of repeats	$S_1(M)$	$S_2(F)$	Average
Sy.R	1.74	1.01	1.37
P.W.R.	0.95	0.91	0.93
W.R.	1.27	1.72	1.49
Ph.R	0.47	0.51	0.49
S.R.	0.15	0.30	0.225

Table-3: Different types of repeats in percentage in 6.0 - 6.2 years.



With respect to the grammatical categories before/on/after which the disfluencies occurred, in general, the disfluencies occurred maximally, 'before' the grammatical categories and least 'on' the grammatical categories in  $S_1$ . However, the disfluencies occurred maximally 'after' the grammatical categories and least 'on' the grammatical categories in  $S_2$ . The disfluencies occurred more 'before/on/after' nouns, verbs, pronouns, and conjunctions in both the subjects and less before/on/after other grammatical categories. The percentage of disfluencies occurred after/on/before were more for nouns and pronouns in  $S_1$  than  $S_2$  and were less for verbs and conjunctions in  $S_1$  than  $S_2$ . The order of occurrence of disfluencies before/on/after the grammatical categories were noun-pronoun-verb-conjunction-interjection-adjective-preposition-adverb and conjunction-pronoun-verb-noun-interjection-adverb-preposition-adjective respectively in  $S_1$  and  $S_2$  (Table-4).

Regarding the position of occurrence of disfluencies, both the subjects showed maximum disfluencies in the initial position and least in the medial position.

S<sub>1</sub>

Grammatical Categories	Sub-jects	Before.	on	After	Percent
		58.10	12.16	29.72	22.91
	S <sub>2</sub>	57.95	7.95	34.09	18.96
Pronoun	S <sub>1</sub>	57.53	9.58	32.87	22.60
	S <sub>2</sub>	61.45	6.25	32.29	20.68
Verb	S <sub>1</sub>	18.96	13.79	67.24	11.95
	S <sub>2</sub>	27.47	3.29	69.23	19.61
Adverb	S <sub>1</sub>	54.54	9.09	36.36	3.40
	S <sub>2</sub>	43.33	0	56.66	6.46
Adjective	S <sub>1</sub>	47.82	13.04	39.13	7.12
	S <sub>2</sub>	63.63	9.09	27.27	2.37
Preposition	S <sub>1</sub>	61.53	0	38.46	4.02
	S <sub>2</sub>	18.75	6.25	75.0	3.44
Interjection	S <sub>1</sub>	50.0	20.83	29.16	7.43
	S <sub>2</sub>	38.70	48.38	12.90	6.68
Conjunction	S <sub>1</sub>	34.04	34.04	31.91	14.55
	S <sub>2</sub>	29.70	24.75	45.54	21.76

Table-4: Percentage of disfluencies before/on/after  
the grammatical categories 6.0 - 6.2 years.

	Initial		Medial		Final	
	S <sub>1</sub>	S <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>
AI	71.42	71.42	28.57	14.28	0	14.28
P	16.66	57.14	0	0	83.33	42.85
R	100	63.15	0	26.31	0	10.52
FS	66.66	50.0	11.11	16.66	22.22	33.33

Table-5: Position of occurrence of disfluencies (6-6.2 years)

When individual type of disfluency was considered:

1. AI occurred more often in the initial position in both the subjects and S<sub>1</sub> did not show any AI in the final position.
2. P occurred more often in the final position for S<sub>1</sub> whereas it was more in the initial position for S<sub>2</sub>.
3. R occurred more often in the initial position in both the subjects, S<sub>2</sub> exhibited R in the medial and the final position also.
4. FS occurred more often in the initial position followed by final and medial position in both the subjects (Table-5).

Several types of clusters was observed such as SyR + UP + AI, PR + AI + RWR, PR + FP + AI, FS + UP + AI, UP + AI + PWR, AI + WR, AI + FP and UP + AI + FP, PR + AI + UP, UP + PWR + SyR, AI + HW + UP, PR + PWR, AI + UP, AI + FP + HW, in S<sub>1</sub> and S<sub>15</sub> respectively.

Thus, in the age range of 6- 6.2 years:

1. Male subject had higher percentage of disfluency compared to the female subject.
2. UFP and AI were the most frequently occurring disfluency and P had the lowest percentage of occurrence.
3. Among the various types of repetitions word and syllable repetitions were the most frequent.
4. Among the grammatical categories, percentage of disfluencies were high before/on/after the pronouns and nouns and low before/on/after adverbs and prepositions.
5. Disfluencies occurred maximally in the initial position followed by final and media positions.

**Analysis type-II** : It was observed that repetitions, filled pauses and parenthetical remarks were affected by the types of analysis done, out of which repetitions seem to be most affected.

In type II analysis, it was found that S<sub>1</sub> had 43.40 percentage disfluency and S<sub>2</sub> had 26.32 percentage disfluency. Of these, the percentage of UP was maximum followed by AI, PR, R, FP, FS, C and P. Comparing this to type I analysis (Table-6), the percentage of disfluency though reduced, was not as low as 5 percent as measured by Hegde, (1990).

Disflu- encies	Sub- jects	Analysis type - I		Analysis type - II	
		% Disflu- ency	$\frac{D}{TND} \times 100$	% disflu- ency	$\frac{D}{TND} \times 100$
FP	S <sub>1</sub>	4.61	10.28	3.81	8.79
	S <sub>2</sub>	2.43	8.95	2.23	8.49
UFP	S <sub>1</sub>	13.35	29.78	13.35	30.76
	S <sub>2</sub>	7.52	27.61	7.52	28.57
R	S <sub>1</sub>	4.61	10.28	3.97	9.15
	S <sub>2</sub>	4.47	16.41	3.86	14.67
PR	S <sub>1</sub>	4.13	9.21	4.13	9.52
	S <sub>2</sub>	19.74	10.07	2.64	10.03
FS	S <sub>1</sub>	2.38	5.32	2.38	5.49
	S <sub>2</sub>	2.13	7.83	2.13	8.10
P	S <sub>1</sub>	0.95	2.12	0.95	2.19
	S <sub>2</sub>	0.71	2.61	0.71	2.70
C	S <sub>1</sub>	1.90	4.25	1.90	4.39
	S <sub>2</sub>	1.32	4.85	1.32	5.02
AI	S <sub>1</sub>	12.87	28.72	12.87	29.67
	S <sub>2</sub>	5.89	21.64	5.89	22.39

Table-6: Type I and Type II analysis compared in 6.0 -6.2 years.

**6.2 - 6.4 years: Analysis Type-I**

$S_1$  uttered more number of words than  $S_2$  and the overall percentage of disfluencies of  $S_2$  was greater than  $S_1$  (Table-7).

	$S_1$ (M)	$S_2$ (F)
Total no.of words	100.0	979
Total no.of dis-fluency	265	315
Percentage of disfluency	26.5	32.17

Table-7: The number of words and percentage of disfluencies in  $S_1$  and  $S_2$  (6.2-6.4 years)

Both the subjects had UFP as the most frequently occurring type of disfluency followed by AI and P was the least occurring type of disfluency. In general, the order of occurrence of disfluencies were UFP-AI-R-FS-C-PR-FP-P and UFP-AI-FP-R-PR-FS-C-P, for  $S_1$  and  $S_2$  respectively (Table-8). The percentage of disfluency were more in  $S_2$  than in  $S_1$ .  $S_2$  exhibited more UFP, FP, AI and PR, whereas  $S_1$  exhibited more of UFP and AI.

Disfluencies	Percentage of disfluencies		Average
	S <sub>1</sub> (M)	S <sub>2</sub> (F)	
UFP	10.2	11.5	10.85
FP	0.7	4.49	2.59
AI	9.9	4.49	7.19
PR	0.9	4.09	2.49
R	1.9	3.67	2.78
FS	1.4	1.63	1.51
C	1.2	1.33	1.26
P	0.3	0.92	0.61

Table-8: Percentage of different types of disfluencies in (6.2-5.4 years).

The disfluency R was more in S<sub>2</sub> than in S<sub>1</sub>. The different types of R were also more in S<sub>2</sub> than in S<sub>1</sub>. In S<sub>2</sub>, SyR and WR were more than other repeats whereas In S<sub>1</sub> SyR and PWR were more (Table-9).

Types of repeats	S <sub>1</sub> (M)	S <sub>2</sub> (F)	Average
SyR	0.7	1.12	0.91
PWR	0.5	0.12	0.31
WR	0.3	1.12	0.71
PhR	0.2	0.51	0.35
SR	0.2	0.20	0.20

Table-9: Different types of repeats in percentage in (6.2 - 6.4) years.

With respect to the grammatical categories before/on/after which the disfluencies occurred, in general, the disfluencies occurred maximally 'before' the grammatical categories and least 'on' the grammatical categories in  $S_1$ . However the disfluencies occurred maximally 'after' the grammatical categories and least 'on' the grammatical categories in  $S_2$ . The disfluencies occurred more 'before-on-after', nouns, verbs, pronouns and conjunction in both the subjects and least 'before/on/after' other grammatical categories. The order of occurrence of disfluencies 'before/on/after' grammatical categories was verb-noun-pronoun-conjunction-adverb-preposition-adjective-interjection and verb-noun-conjunction-pronouns-interjection-adverb-preposition-adjectives in  $S_1$  and  $S_2$  respective (Table-10).

Regarding the position of occurrence of disfluencies both the subjects showed maximum disfluencies in the initial position and least in the medial position for  $S_2$  and least in the final position in  $S_1$ .

When individual type of disfluency was considered (1) AI occurred more often in the initial position in both the subjects. Also  $S_2$  did not show any AI in final position. (2) P occurred in the initial and the final position in  $S_2$  where as the occurred only in the initial position in  $s_1$ .



(3) R occurred more often in the initial position in both the subjects. In S<sub>1</sub> it occurred once in medial position.

(4) FS occurred in all the position in both the subjects but it occurred more often in the initial position (Table-11)

Grammatical categories	Sub-jects	Before	on	After	Average
Noun		60.41	5.20	34.37	25.66
		55.0	7.0	38.0	20.08
Pronoun		48.27	9.19	42.52	23.26
		65.82	5.06	29.11	15.86
Verb		39.0	2.0	59.0	26.73
		33.87	4.03	62.09	24.89
Adverb		61.76	0	38.23	9.09
		45.0	0	55.0	4.01
Adjective		70.0	10.0	20.0	2.67
		33.33	16.66	50.0	2.40
Preposition		38.46	0	61.53	3.47
		21.42	0	78.57	2.81
Interjection		25.0	37.5	37.5	2.13
		38.88	46.29	14.81	11.64
Conjunction	S	20.51	28.20	51.28	10.42
		31.57	17.89	50.52	19.07

Table-10: Percent disfluencies before/on/after the grammatical categories (6.2-6.4 years).

Disfluencies	Initial		Medial		Final	
	S <sub>1</sub>	S <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>
AI	58.33	57.14	33.33	42,,85	8.33	0
P	100.0	66.66	0	0	0	33.33
R	92.30	100.0	7.69	0	0	0
FS	57.14	58.33	28.57	8,,33	14.28	33.33

Table-11: Position of occurrence of disfluencies (6.2-6.4) Years.

Several types of clusters were observed such as P + PR, PR + FP, AI + FP, UP + PWR + P, PR + UFP + BP, AI + PR + UFP, and AI + SyR + UFP, PWR + UFP + AI, UFP + PWR, AI + UFP + PR, PR + FS + AI, in S<sub>2</sub> and S<sub>1</sub> respectively.

Thus in the age range of 6.2 - 6.4 years:

1. Female subject had higher percentage of disfluencies,
2. UFP and AI occurred maximally and P occurred minimally,
3. Syllable and word repetitions occurred more frequently than other kinds of repeats.
4. Percentage disfluencies were maximum before/on/after the grammatical categories verb and noun and minimum before/on/after the grammatical categories prepositions and adjectives, and
5. Disfluencies were maximum in the initial position.

**Analysis Type II:** In Type II analysis, it was found that  $S_1$  had 25.8% disfluency and  $S_2$  had 30.74% disfluencies. Of these, the percentage of UFP was maximum followed by AI, R, FS, C, PR, FP and P in  $S_1$  and in  $S_2$  it was UFP, AI, FP, PR, R, FS, C, and P. Table-12 compares type I and type II analysis.

Disfluencies	Sub-jects	Analysis Type I		Analysis Type II	
		% disflu-ency	$\frac{D}{TND} \times 100$	% Disflu-ency	$\frac{D}{TND} \times 100$
FP	$S_1$	0.7	2.64	0.5	1.93
	$S_2$	4.49	13.96	3.98	12.95
UFP	$S_1$	10.2	38.49	10.2	39.53
	$S_2$	11.5	35.87	11.5	37.54
R	$S_1$	1.9	7.16	1.6	6.20
	$S_2$	3.67	11.42	3.16	10.29
PR	$S_1$	0.9	3.39	0.7	2.71
		4.09	12.69	3.67	11.96
FS	$S_1$	1.4	5.28	1.4	5.42
	$S_2$	1.65	5.07	1.63	5.31
P	$S_1$	0.3	1.13	0.3	1.16
	$S_2$	0.92	2.85	0.92	2.99
C	$S_1$	1.2	4.52	1.2	4.75
	$S_2$	1.33	4.12	1.33	4.31
AI	$S_1$	9.9	37.35	9.9	38.37
	$S_2$	4.49	13.96	4.49	14.61

Table-12: Type I and Type II analysis compared in 6.2-6.4 years.

**6.4-6.6 years: Analysis Type-I**

$S_2$  uttered less number of words than  $S_1$ . The overall percentage of disfluencies of  $S_2$  was greater than  $S_1$  (Table-13).

	$S_1$ (M)	$S_2$ (F)
Total no.of words	1042	1071
Total no.of disfluencies.	315	234
Percentage of disfluencies.	30.33	21.84

Table-13: The number of words and percentage of disfluencies in  $S_1$  and  $S_2$  between 6.4-6.6 years.

Considering the disfluencies, both the subjects had UFP and AI as the most frequently occurring type of disfluency.  $S_1$  showed greater AI than  $S_2$ , but  $S_2$  showed greater UFP than  $S_1$ , the least occurring type of disfluency was P in  $S_1$  and C in  $S_2$ . In general, the order of occurrence of disfluencies were AI-UFP-PR-R-FS-C-FP-P and UFP-FP-AI-R-FS-PR-P-C for  $S_1$  and  $S_2$  respectively (Table-14).

The disfluency R was more in  $S_1$  than in  $S_2$ . The percentage of different types of R were also more in  $S_1$  than in  $S_2$ . Only the WR was more in  $S_1$  than in  $S_2$  and among the different types of R, PWR, and SyR occurred minimally (Table-15).

Disfluencies	Percentage of disfluency		Average
	S <sub>1</sub> (M)	S <sub>2</sub> (F)	
UFP	7.29	7.75	7.52
FP	1.63	3.83	2.73
AI	7.77	2.89	5.33
PR	4.13	1.59	2.86
R	3.16	2.14	2.65
FS	2.88	1.68	2.28
C	1.92	0.93	1.42
P	1.44	1.03	1.23

Table-14: Percentage of different types of disfluencies in 6.4-6.6 years

Types of repeats	S <sub>1</sub> (M)	S <sub>2</sub> (F)	Average
SyR	0.28	0.09	0.18
CWR	0.28	0.09	0.18
WR	1.54	1.31	1.43
PhR	0.67	0.19	0.43
SR	0.38	0.47	0.425

Table-15: Different types of repeats in percentage (6.4-6.6) years.

With respect to the grammatical categories before/on/ after which the disfluencies occurred, in general, the

disfluencies occurred maximally 'before' the grammatical categories and least 'on' the grammatical categories in both the subjects. The disfluencies occurred more 'before-on-after' nouns, pronouns and verbs in both the subjects and less 'before/on/after' other grammatical categories. The order of occurrence of disfluencies 'before/on/after' the grammatical categories was noun-pronoun-verb-conjunction-interjection-adverb-adjective-preposition, and pronoun-noun-verb-conjunction-interjection-adverb-preposition-adjective in  $S_1$ , and  $S_2$  respective (Table-16).

Considering the position of occurrence of disfluencies; both the subjects showed more disfluencies in the initial position and least in the medial position. When individual type of disfluency was considered: (1) AI occurred more often in the initial position, less in medial position and no AI in final position was noticed. (2) P occurred more often in the final position and less in the initial position. No, P was found in the medial position. (3) R occurred more often in the initial position and less in the final position, and No R occurred in the medial position. (4) FS was found in all the positions, most in the initial position and least in the final position. (Table-17).

Grammatical categories	Subjects	Before	On	After	Percentage
Noun	S <sub>1</sub>	53.03	12.87	34.09	24.35
	S <sub>2</sub>	61.72	8.64	29.62	19.56
Pronoun	S <sub>1</sub>	57.69	8.46	33.84	23.98
	S <sub>2</sub>	48.97	7.14	43.87	23.67
Verb	S <sub>1</sub>	13.88	2.77	83.33	19.92
	S <sub>2</sub>	30.66	1.33	68.0	18.11
Adverb	S <sub>1</sub>	63.41	4.87	31.70	7.56
	S <sub>2</sub>	42.85	0	57.14	5.07
Adjective	S <sub>1</sub>	47.05	11.76	41.17	3.13
	S <sub>2</sub>	60.0	10.0	30.0	2.41
Preposition	S <sub>1</sub>	50.0	0	50.0	2.58
	S <sub>2</sub>	50.0	12.50	37.50	3.86
Interjection	S <sub>1</sub>	24.48	42.85	32.65	9.04
	S <sub>2</sub>	31.37	56.86	11.76	12.31
Conjunction	S <sub>1</sub>	54.90	50.98	13.72	9.40
	S <sub>2</sub>	25.80	27.41	46.77	14.97

Table-16: Percentage of disfluencies before/on/after the grammatical categories (6.4-6.6) years.

Disfluencies.	Initial		Medial		Final	
	S <sub>1</sub>	S <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>S<sub>2</sub></sub>	
AI	71.42	83.33	28.57	16.56	0	0
P	6.66	41.66	0	0	93.33	58.33
R	80.0	50.0	0	0	20.0	50.0
FS	63.63	50.0	27.27	40.0	9.09	10.0

Table-17: Percent disfluencies in different positions (6.4-6.6) years.

Several types of clusters were observed. Such as, P+AI, FP+WR, PR+FP, AI+UP, WR+UFP+AI, UP+AI+P, AI+UFP+PWR, FP+AI+WR, PR+UFP+AI, FP+FS+UFP. These combinations were found in S<sub>1</sub> and PWR +AI+FP, AI+UFP+FP, PR)UFP+WR, AI+UFP+RW and PR+AI+UP were found in S<sub>2</sub>.

To summarize, in the age range of 6-4-6.6 years:

1. Male child exhibited higher percentage of disfluency.
2. UFP and AI were the most frequently occurring type of disfluency,
3. Word repetitions occurred more than any other kind of repetitions,
4. Maximum disfluencies occurred before/on/after nouns and pronouns and least before/on/after adjectives and preposition and
5. Disfluencies were more in the initial position.



Analysis Type-II: It was found that the total percentage of disfluency reduced from 30.23% to 29.07% in a. and from 21.84% to 21.01% in S<sub>2</sub>. Of these, the percentage of AI was maximum followed by UFP, PR, FS,R,C, P and FP in S<sub>1</sub> and the percentage of UFP was maximum in S<sub>2</sub> followed by FP,AI, R,FS, PR,P and C. Table-18 compares type I and type II analysis.

Disflu- ency	Sub- jects	Analysis Type-1		Analysis Type-11	
		% disflu- ency	$\frac{D}{TND} \times 100$	% disflu- ency	$\frac{D}{TND} \times 100$
FP	S <sub>1</sub>	1.63	5.39	1.34	4.62
	S <sub>2</sub>	3.83	17.52	3.36	16.00
UFP	S <sub>1</sub>	7.29	24.12	7.29	25.08
	S <sub>2</sub>	7.75	35.47	7.75	36.88
R	S <sub>1</sub>	3.16	10.47	2.78	9.57
	S <sub>2</sub>	2.14	9.82	1.77	8.44
PR	S <sub>1</sub>	4.13	13.65	3.64	12.54
	S <sub>2</sub>	1.59	7.26	1.59	7.55
FS	S <sub>1</sub>	2.88	9.52	2.88	9.90
	S <sub>2</sub>	1.68	7.69	1.68	8.0
P	S <sub>1</sub>	1.44	4.76	1.44	4.95
	S <sub>2</sub>	1.03	*.3\$	1.03	4.88
C	S <sub>1</sub>	1.92	6.34	1.92	6.60
	S <sub>2</sub>	0.93	4.27	0.93	4.44
AI	S <sub>1</sub>	7.77	25.71	7.77	26.73
	S <sub>2</sub>	2.89	13.24	2.89	13.77

Table-18: Type I and Type II analysis compares in 6.4-6.6 years.

**6.6-6.8 years: Analysis Type-I:**

The number of words uttered by  $S_1$  was less than  $S_2$  and the percentage of disfluencies of  $S_1$  was greater than  $S_2$  (Table-19).

	$S_1$ (M)	$S_2$ (F)
Total No.of words	1389	1571
Total no.of dis-fluency	691	331
Percentage of disfluency	49.74	21.06

Table-19: The number of words and percentage of disfluencies in  $S_1$  and  $S_2$  between 6.6-6.8 years.

Regarding the disfluencies, both the subjects had UFP and AI as the most frequently occurring type of disfluency. The most frequently occurring disfluencies found in  $S_1$  were UFP, AI, R and FP. Whereas in  $S_2$  It was UFP, R and AI. In general, the order of occurrence of disfluencies were, UFP, AI, R, FP, PR, FS, C, P and UFP, R, AI, PR, FP, C, P for  $S_1$  and  $S_2$  respectively. Among other disfluencies there was not much difference (Table-20).

The disfluency R was more in  $S_1$  than  $S_2$ . The most often occurring R was WR and the least occurring disfluency was SYR in  $S_1$ . However, in  $S_2$  the most often occurring disfluency was WR and the least occurring disfluency SR (Table-21)

Disflu- ency	Percentage_of_disfluency		Average
	S <sub>1</sub> (M)	S <sub>2</sub> (F)	
UFP	12.96	7.00	9.98
FP	5.69	0.89	3.29
AI	9.22	3.12	6.17
PR	4.54	2.61	3.58
R	7.99	4.96	6.48
FS	3.74	1.53	2.64
C	3.31	0.51	1.91
P	2.30	0.45	1.38

Table-20: Different types of disfluencies in percent in 6.6-6.8 years.

Types of repeats	S <sub>1</sub> (M)	S <sub>2</sub> (F)	Average
SyR	2.16	0.32	1.24
PWR	1.66	0.39	1.02
WR	2.88	2.16	2.52
Ph.R	1.01	1.34	1.18
SR	0.29	0.76	0.53

Table-21: Different types of repeats in percentage in 6.6-6.8 years.

Regarding the grammatical categories 'before-on-after' which the disfluencies occurred, in general the disfluencies occurred maximally 'before' the grammatical categories and least 'on' the grammatical categories.

Disfluencies occurred more 'before-on-after' noun, pronoun, conjunction, verb and interjection and less on other grammatical categories in  $S_1$ . However, the disfluencies occurred more 'before-on-after', noun, verb, conjunction and pronoun and less on other grammatical categories in  $S_2$ . The order of occurrence of disfluencies 'before-on-after' grammatical categories was noun-pronoun-conjunction-verb-interjection-adverb-preposition-adjective and noun-verb-conjunction-pronoun-adverb-interjection-adjective-preposition in a, and S- respectively (Table-22).

Both the subjects showed more disfluencies in the initial position and least in the medial position.

1. AI was found in the initial position in both the subjects and in the medial position only in  $S_1$ . No AI was found in the final position.
2. P occurred in the initial and the final positions in both the subjects.
3. R occurred in the initial position in both the subjects and only 4.34% in the final position in  $S_1$ . No R was found in the medial position.
4. FS was found in all the three positions in both the subjects. In  $S_1$ , it was more in the initial and the medial position, where as in  $S_2$  it was more in the initial and the final positions (Table-23).

Grammatical categories	Sub-jects	Before	On	After	Average
Noun	S <sub>1</sub>	50.54	7.60	41.84	20.04
	S <sub>2</sub>	60.48	8.05	31.15	23.89
Pronoun	S <sub>1</sub>	51.93	4.41	43.64	19.91
	S <sub>2</sub>	59.61	7.69	32.69	20.03
Verb	S <sub>1</sub>	36.36	5.78	57.85	13.18
	S <sub>2</sub>	17.11	2.70	80.18	21.38
Adverb	S <sub>1</sub>	50.57	1.14	48.27	9.47
	S <sub>2</sub>	41.66	20.83	37.50	4.62
Adjectives	S <sub>1</sub>	46.34	7.31	46.27	4.46
	S <sub>2</sub>	80.0	13.33	6.66	2.89
Preposition	S <sub>1</sub>	23.40	4.25	72.34	5.11
	S <sub>2</sub>	36.36	0	63.63	2.11
Interjection	S <sub>1</sub>	35.06	42.98	21.92	12.41
	S <sub>2</sub>	17.39	65.21	17.39	4.43
Conjunction	S <sub>1</sub>	33.56	19.58	46.85	15.57
	S <sub>2</sub>	33.64	32.71	33.64	20.61

Table-22: Percentage of disfluencies before/on/after the grammatical categories(6.6-6.8 years)

Disfluencies	Initial		Medial		Final	
	S <sub>1</sub>	S <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>
AI	78.57	100.0	21.42	0	0	0
P	43.75	71.42	0	0	56.25	28.57
R	95.65	100.0	0	0	4.34	0
FS	60.86	46.15	34.78	15.38	4.34	38.46

Table-23: Position of occurrence of disfluencies 6.6-6.8 years.

Several types of clusters were observed such as: PWR+UFP+AI, UFP+SyR, WR+UFP+AI, PR+AI, FP+WR, AI+UFP+FP+SyR, PR+UFP+FP+AI, PR+UFP+AI, UFP+FP+WR. FP+WR, AI+WR in S<sub>1</sub> and AI+RW, P+PhR+UFP, FS+UFP+FP, AI+PR+UFP, UFP+RW, PR+FW, PR+UFP+WR in S<sub>2</sub>.

In summary, (1) male child exhibited higher percentage of disfluency, (2) UFP and R were the most frequently occurring disfluencies, (3) word and syllable repetitions occurred more frequently than other types of repeats, (4) more disfluencies occurred before/on/after nouns and pronouns and least/occurred before/on/after prepositions and adjectives and (5) disfluencies in the initial position of the word were more than the other positions.

Analysis type-II: The percentage of disfluencies reduced from 49.74% to 46.07% in S<sub>1</sub> and it reduced from 21.06% to

19.85% in  $S_2$ . The percentage of UFP was maximum in both the cases followed by AI-R-FP-PR-FS-C-P in  $S_1$  and R-AI-PR-FS-FP-C-P in  $S_2$ . Table-24 compares type I and type II analysis.

Disflu- encies	Sub- jects	Analysis Type I		Analysis Type II	
		% disflu- ency	$\frac{D}{TND} \times 100$	% disflu- ency	$\frac{D}{TND} \times 100$
FP	$S_1$	5.69	11.43	4.39	9.53
	$S_2$	0.89	4.22	0.76	3.84
UFP	$S_1$	12.96	26.04	12.96	28.12
	$S_2$	7.00	33.23	7.00	35.25
R	$S_1$	7.99	16.06	6.40	13.90
	$S_2$	4.96	23.56	4.20	21.15
PR	$S_1$	4.54	9.11	3.74	8.12
	$S_2$	2.61	12.38	2.29	11.53
FS	$S_1$	3.74	7.52	3.74	8.12
	$S_2$	1.53	7.25	1.53	7.69
P	$S_1$	2.30	4.63	2.30	5.0
	$S_2$	0.45	2.11	0.45	2.24
C	$S_1$	3.31	6.65	3.31	7.81
	$S_2$	0.51	2.41	0.51	2.56
AI	$S_1$	9.22	18.52	9.22	20.0
	$S_2$	3.12	14.80	3.12	15.70

Table-24: Type I and Type II analysis compared in 6.6-6.8 years.

6.8 - 6.10 years : Analysis Type I

S<sub>1</sub> uttered less number of words than S<sub>2</sub> and the overall percentage of disfluencies in S<sub>1</sub> was less than in S<sub>2</sub> (Table-25)

	S <sub>1</sub> (M)	S <sub>1</sub> (F)
Total no.of words	916	1492
Total no.of disfluencies	253	508
Percentage of disfluency	27.62	34.05

Table-25: The no.of words and percentage of disfluencies in S<sub>1</sub> and S<sub>2</sub> in (6.8-6.10) years.

The most frequently occurring types of disfluencies were AI and UFP in S<sub>1</sub> , and AI, UFP and FP in S<sub>2</sub>. The least frequently occurring type of disfluency was P in S<sub>1</sub> and C in S<sub>2</sub>. In general, the order/ of the occurrence of disfluencies UFP-AI-R-PR-FS-FP-C-P and UFP-AI-FP-R-PR-P-FS-C in S<sub>1</sub> and S<sub>2</sub> respectively (Table-26).

The disfluency R was more in S<sub>2</sub> than in S<sub>1</sub>. The most frequently occurring R was WR in both the subjects and the least occurring R was SR in S<sub>1</sub> and PWR in S<sub>2</sub> (Table-27).



Disfluencies	Percentage of disfluency		Average
	S <sub>1</sub> (M)	S <sub>2</sub> (F)	
UFP	10.48	7.84	9.16
FP	1.42	5.63	3.53
AI	6.55	6.23	6.39
PR	1.97	4.42	3.195
R	4.14	4.62	4.38
FS	1.64	1.94	1.79
C	1.20	1.34	1.27
P	0.22	2.01	1.12

Table-26: Different types of disfluencies in percent in 6.8- 6.10 years.

Types of repeats	S <sub>1</sub> (M)	S <sub>2</sub> (F)	Average
SyR	1.53	0.87	1.20
PWR	0.33	0.27	0.30
WR	1.53	2.01	1.77
PhR	0.44	0.80	0.62
SR	0.33	0.67	0.50

Table-27: Different types of repeats in percentage in 6.8 - 6.10 years.

The disfluencies occurred maximally after the grammatical categories and least 'on' the grammatical categories in both the subjects. Most frequently, the disfluencies occurred 'before-on-after' the nouns, pronouns, and verbs in  $S_1$  and 'before-on-after' the nouns, conjunction, verbs and interjections in  $S_2$ . The percentage was less for other disfluencies in both the subjects. The order of occurrence of disfluencies 'before-on-after' the grammatical categories was noun, pronoun, verb, conjunction, adverb, preposition, interjection, adjective and noun, conjunction, verb, interjection, pronoun, adverb, adjective, preposition in  $S_1$  and  $S_2$  respectively (Table-28).

Both the subjects showed more disfluencies in the initial position and least disfluencies in the medial position (Table-29).

1. Most of the AI occurred in the initial position in both the subjects. AI did not occur in the final position in  $S_1$ .
2. P occurred in both the initial and the final positions in both the subjects and in the medial position in  $S_2$ . The percentage of P was very less in both the positions in  $S_1$  than  $S_2$ .
3. R occurred mostly in the initial position. However, it occurred in the final position for  $S_1$ .
4. FS occurred in all the positions in both the subjects. However the percentage was more in the initial position and least in the medial position.

Grammatical categorries	Sub- jects	Before	On	After	Percent- age
Noun	S <sub>1</sub>	53.09	9.73	37.16	27.09
	S <sub>2</sub>	60.36	5.48	34.14	21.63
Pronoun	S <sub>1</sub>	48.27	8.04	43.67	20.66
	S <sub>2</sub>	23.61	15.27	61.11	9.49
Verb	S <sub>1</sub>	37.80	2.43	50.75	19.66
	S <sub>2</sub>	25.34	2.05	72.60	19.26
Adverb	S <sub>1</sub>	40.62	6.25	53.12	7.67
	S <sub>2</sub>	54.54	0	45.45	7.25
Adjective	S <sub>1</sub>	66.66	11.11	22.22	2.15
	S <sub>2</sub>	46.15	19.23	34.61	3.43
Preposition	S <sub>1</sub>	29.16	0	70.83	5.75
	S <sub>2</sub>	47.61	0	32.38	2.77
Interjection	S <sub>1</sub>	30.76	53.84	15.38	3.11
	S <sub>2</sub>	32.17	53.91	13.91	15.77
Conjunction	S <sub>1</sub>	31.57	29.82	38.59	13.66
		31.44	21.38	47.16	20.97

Table-28: Percentage of disfluencies before/on/after  
the grammatical categories 6.8 - 6.10 years<

Disfluencies	Initial		Medial		Final	
	S <sub>1</sub>	S <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>
AI	75.0	83.33	25.0	8.33	0	8.33
P	50.0	51.72	0	6.89	50.0	41.37
R	94.11	100.00	0	0	5.86	0
FS	57.14	32.63	14.28	31.57	28.57	15.78

Table-29: Position of occurrence of disfluencies  
6.8-6.10 years.

Different patterns of clusters were observed in both the subjects. AI+UP+WR, AI+UFP+PhR, AI+PR+UFP, UFP+WR, FP+PWR+UFP, AI+WR, SyR+WR+AI, FP+AI were found in S<sub>1</sub>. UFP+AI+FP, FS+UFP+AI, FP+SyR+UFP+AI, PhR+UFP+FS, FP+FS+PhR, PR+USP+P, AI+FP, FP+PR, AI+SyR+P, AI+PR+FP were found in S<sub>2</sub>. Most of the clusters included AI and FP. However no consistent patterns of clusters were found in both the subjects.

In the age group of 6.8 - 6.10 years, in general the following observations were made:

1. Female child showed higher percentage of disfluencies.
2. UFP and AI had high percentage of occurrence,
3. Word and syllable repetitions occurred were frequently than other kinds of repetitions,
4. Nouns as a grammatical category was the target of maximum disfluencies, and
5. Disfluencies were more in the initial positions.

Analysis type II: in analysis type II it was found that the total percentage of disfluency reduced from 27.62 to 26.31% in  $S_1$  and from 34.05 to 30.96% in  $S_2$ . Among the individual disfluencies the percentage of UFP was maximum followed by AI-R-PR-FS-Fp-c-P in  $S_1$  and AI-FP-R-PR-P-FS-C in  $S_2$ . Table 30 depicts a comparison between Type I and Type II analysis.

Disfluencies	Sub-jects	Analysis Type I		Analysis Type II	
		% disflu-ency	$\frac{D}{TND} \times 100$	% disflu-ency	$\frac{D}{TND} \times 100$
FP		1.42	5.13	1.20	4.56
		5.63	16.53	4.22	13.63
UFP		10.48	37.94	10.48	39.83
		7.84	23.03	7.84	25.32
R		4.14	15.01	3.38	12.86
		4.62	13.58	3.75	12.12
PR		1.97	7.11	1.63	6.22
		4.42	12.99	3.61	11.68
FS		1.64	5.92	1.63	6.22
		1.94	5.70	1.94	6.27
P		0.22	0.79	0.22	0.82
		2.01	5.90	2.01	6.49
C		1.80	4.5	1.20	4.56
		1.34	3.93	1.34	4.32
AI		6.55	23.71	6.55	24.89
		6.23	18.30	6.23	20.12

Table-30: Type I and Type II analysis compared in 6.8-6.10 years.

**6.10-7.0 years: Analysis Type-I:**

The no.of words uttered and the percentage of disfluencies in  $S_1$  were more than in  $S_2$  (Table 31).

	$S_1(M)$	$S_2(F)$
Total no.of words	1211	1095
Total no.of disfluencies	38	275
Percentage of disfluencies	31.95	25.11

Table-31: The number of words and percentage of disfluencies in  $S_1$  and  $S_2$  between 6.10 - 7.0 years.

The most frequently occurring type of disfluencies were R, UFP and AI in  $S_1$ . However, in  $S_2$ , they were UFP and AI. The least occurring type of disfluency was P in  $S_1$  and PR in  $S_2$ . In general, the order of occurrence of disfluencies was R-AI-UFP-FP-FSrC-PR-P and UFP-AI-R-FP-P-FS-C-PR in  $S_1$  and  $S_2$  respectively (Table-32).

All types of repeats was observed in both the subjects. R was more in  $S_1$  than  $S_2$ . The most frequently occurring type of repetition was WR in both the subjects and the least occurring was PWR in  $S_1$ , and SR in  $S_2$  (Table-33).

Disfluencies	Percentage of disfluency		Average
	S <sub>1</sub> (M)	S <sub>2</sub> (F)	
UFP	7.51	6.48	6.995
FP	2.15	3.83	2.99
AI	7.51	5.66	6.59
PR	1.57	0.27	0.92
R	8.91	4.20	6.56
FS	1.98	1.64	1.81
C	1.73	1.19	1.46
P	0.58	1.82	1.20

Table-32: Different types of disfluencies in percent in 6-10 - 7.0 years.

Types of repeats	S <sub>1</sub> (M)	S <sub>2</sub> (F)	Average
SyR	1.32	0.64	0.98
PWR	0.33	0.46	0.395
WR	3.96	1.74	2.85
PhR	2.56	1.01	1.79
SR	0.74	0.36	0.55

Table-33: Different types of repeats in percentage in 6.10 - 7.0 years.

Most frequently the disfluencies occurred 'before-on-after' the nouns and pronouns in  $S_1$  and 'before-on-after' the pronouns and verbs in  $S_2$ . The percentage was less for other grammatical categories in both the subjects. The order of occurrence of disfluencies, 'before-on-after', the grammatical categories was pronoun-noun-verb-conjunction-adj active-interjection-adverb-preposition and pronoun-verb-conjunction-noun-interjection-adverb-preposition-adjective in  $S_1$  and  $S_2$  respectively (Table-34).

Regarding the position of occurrence of disfluencies, both the subjects showed more disfluencies in the initial position (Table-35).

1. AI occurred maximally in the initial position in both the subjects. It occurred once in the medial position in  $S_1$ .
2. P was found only in the initial and the final positions in both the subjects. The percentage was more in  $S_2$  than in  $S_1$ .
3. R occurred maximally in the initial position and once in final position in both the subjects. The percentage was more in  $S_1$  than in  $S_2$ .
4. FS was found in all the positions in both the subjects. The percentage was maximum in the initial position followed by the medial and final positions.



Grammatical Category	Subjects	Before	On	After	Percentage
Noun	S <sub>1</sub>	49.61	20.61	29.77	26.09
	S <sub>2</sub>	58.90	9.56	31.50	15.43
Pronoun	S <sub>1</sub>	51.42	15.71	32.85	27.88
	S <sub>2</sub>	59.77	7.40	37.81	28.54
Verb	S <sub>1</sub>	32.53	6.02	61.44	16.53
	S <sub>2</sub>	37.50	0	72.50	16.91
Adverb	S <sub>1</sub>	43.47	8.69	47.82	4.58
	S <sub>2</sub>	46.42	7.14	46.42	5.91
Adjective	S <sub>1</sub>	55.26	7.89	36.84	7.56
	S <sub>2</sub>	60.0	0	40.0	1.05
Preposition	S <sub>1</sub>	38.88	11.11	50.0	3.58
	S <sub>2</sub>	9.09	0	90.90	2.32
Interjection	S <sub>1</sub>	28.0	68.0	4.0	4.98
	S <sub>2</sub>	15.62	71.87	12.5	13.53
Conjunction	S <sub>1</sub>	22.72	27.27	50.0	8.76
	S <sub>2</sub>	33.76	6.49	59.74	16.27

Table-34: Percentage of disfluencies before/on/after the grammatical categories 6.10-7.0 years.

Disflu- encies	Initial		Medial		Final	
	S <sub>1</sub>	S <sub>2</sub>	S <sub>1</sub>	S <sub>2</sub>	S <sub>g2</sub>	
AI	91.66	100.0	8.33	0	0	0
P	71.42	42.85	0	0	28.57	57.14
R	95.00	90.90	0	0	5.0	9.09
FS	60.00	50.0	30.0	41.66	10.0	8.33

Table-35: Position of occurrence of disfluencies  
6.10-7.0 years.

The clusters observed were WR+AI, WR+FP, AI+UFP, PhR+AI, RW+UFP, UFP+AI+FP, RW+UFP+AI, UFP+PhR+FP, and AI+RW+SyR, AI+FP+WR, PhR, FP, UFP+WR+FP, PWR+AI+UP, PR+RW, FP+AI+Fs in S<sub>1</sub> and S<sub>2</sub> respectively.

In general, it was observed that the male child showt higher percentage of disfluencies than the female child. Among the disfluencies, UFP, AI and R occurred maximally and among repetitions word and phrase had high percentage of occurrence. Disfluencies were observed more in the initial position and before/on/after pronouns and nouns, and least before/on/after prepositions.

**Analysis type-II**: Total percentage of disfluencies reduce from 31.95 to 29.23% in S<sub>1</sub> and from 25.11 to 23.28% in S<sub>2</sub>.

The order of disfluencies was AI-UFP-R-FS-FP-C-PR-P and UFP-AI-R-FP-P-FS-C-PR in  $S_1$  and  $S_2$  respectively. These percentage as compared with type I analysis are in Table-36.

Disfluencies	Subjects	Analysis Type I		Analysis Type II	
		% disfluencies	D X 100 TND	% disfluencies	D X 100 TND
FP	$S_1$	2.15	6.71	1.73	5.93
	$S_2$	3.83	15.27	2.73	11.76
UFP	$S_1$	7.51	28.51	7.51	25.70
	$S_2$	6.48	25.81	6.48	27.84
R	$S_1$	8.91	27.90	6.93	23.72
	$S_2$	4.20	16.72	3.47	14.90
PR	$S_1$	1.57	4.95	1.23	4.23
	$S_2$	0.27	1.09	0.27	1.17
FS	$S_1$	1.98	6.20	1.98	6.77
	$S_2$	1.64	6.54	1.64	7.05
P	$S_1$	0.58	1.80	0.58	1.97
	$S_2$	1.82	7.27	1.82	7.84
C	$S_1$	1.73	5.42	1.73	5.93
	$S_2$	1.19	4.72	1.19	5.09
AI	$S_1$	7.51	23.51	7.51	25.70
	$S_2$	5.66	22.54	5.66	24.31

Table-36: Type I and Type II analysis compared in 6-10-7.0 years.

## DISCUSSION

In general, it was observed that (1) the percentage of disfluencies in male and female and the different age group had a pattern i.e. in male subjects the percentage decreased from 6.0 to 6.4 and there was a peak at the age of 6.6 to 6.8 after which the percentage of disfluencies reduced. In females, no consistent pattern was noticed. However, peaks appeared in the age range of 6.2-6.4 and 6.8-6.10 years.

(2) Among the types of disfluencies seen in this study, UFP had the highest percentage of occurrence in all the age groups. Other types of disfluencies which had higher percentage were, FP, AI and R. Disfluencies which occurred least were FS, P and C.

(3) The disfluency FP was high in the age group 6.6-6.8 years in males.

(4) PR was seen to fluctuate across the age range studied with a highest percentage of occurrence in 6.6 - 6.8 years of age.

(5) Repetitions of all kinds fluctuate between the age groups studied. The percentage of word and syllable repetition was high among different types of repeats in all age groups studied. The overall percentage of R was higher in the age groups 6.8 - 6.12 years. Also, male subjects showed higher percentage of R than females in all the age groups studied.

(6) FS was found to have the maximum percentage in 6.6 to 6.8 years and males showed more FS than females.

(7) Prolongation was the least occurring disfluency in all age groups

studied. (8) Though different forms of clusters were observed, no consistent pattern could be identified. (9) With respect to grammatical categories in all the age groups, the disfluencies occurred maximally 'before' the grammatical categories and least 'on' the grammatical categories. The disfluencies were also found to occur maximally 'before/on/after' nouns, pronouns and least 'before/on/after' prepositions (10) With respect to the percent of occurrence of disfluencies in positions, more disfluencies occurred in the initial part of the word.

The observation that UFP occurred maximally in all most all the age groups, supports the findings as Kowal et al (1975). UFP occurred 5.4%, 4.5% and 5.9% respectively in 3-4, 4-5 and 5-6 years (Nagapoomima, 1990? Indu, 1990; Yamini, 1990). Adams(1982) comments that the immature central nervous system, a developing phonological, syntactic, semantic pragmatic and cognitive structures act as physiological constraints and thus preschooler's speech are characterized by Unfilled Pauses and Filled Pauses.

Martin and strange (1968a), putforth a composite view of function of pause in speech encoding and asserted that syntactic-semantic structure selection preceded choice of words during encoding and that pauses within major grammatical

constituents represented the word selection process: pauses occurring between major constituents indicated a process of selecting structures larger than words. Starkweather (1980) put-forth that pauses and hesitations, certainly serve the speaker by providing time for planning or decision making when uncertainty is high and may also serve the listener by informing him that a new clause, some other relatively improbable and hence informationally loaded, material is coming up.

The results of the present study indicated that PR increased in the age groups from 6.6 to 6.8 years and again decreased from 6.8 to 6.12 years age group. This result support those reported by Kowal et al (1975).

Starkweather (1987) opines that parenthetical remarks also serve to fill up time at a point when the speaker has nothing meaningful ready to reproduce. Further, the parenthetical remark is a coordinated and studied use of language. Hence, it does not represent an error, but rather is more like a correction, or at least provide the time for corrections of thought or of language to occur before the utterance (starkweather, 1987). Thus, Starkweather (1987) consideres that filled pauses and parenthetical remarks as speech behaviours, are clearly more than stumbles.

Among the false starts precisions, incomplete utterances/ phrases, content modifications and grammatical corrections occur maximally in this study. Change in pronunciation was least observed and false starts occurred more in 6.0 to 6.6 year age group and was less in 6.8 to 6.12 years age group. The result that males exhibited greater FS than females, support the results of Kools and Berryman (1971).

False starts, revisions and incomplete phrases can be considered to be corrections, essentially the same kind of corrections as parenthetical remarks, except that the error is not quite detected until after the utterance has begun (Starkweather, 1987). "A speaker begins to say something in a certain way, gets part way into the utterances and realises that the beginning of the sentence would lead to an ungrammatical ending, express an incongruous thought or an illogical conclusion, or state a position that could not be defended, would be socially inappropriate, might lead a word of uncertain meaning or make any of a number of other mistakes" (Starkweather, 1987). However, it is probable that FS occurs whenever the child wants to emphasize an aspect by repeating an utterance or a phrase in a differing word order or wants to be more precise by adding other details like an adjective, adverb, etc. or wants to negate an earlier view point.

Audible inspirations were also noticed frequently in the speech of the children considered in the present study. It contradicts the findings of Wexler and Mysak (1982). AI decreased as the age increased in present study and male subjects had higher percentage of AI than female subjects.

In the present study the different types of repetitions fluctuated between the age groups studied. Also the type of analysis affected the percentage of repetitions. In second type of analysis all subjects showed reduction in the percentage. Repetitions were found less in the age group between 6.0 to 6.6 years and the percentage increased in the age group between 6.6 to 6.12 years. This result contradicts those of Wexler and Mysak (1982) in that repetitions were not the least disfluencies observed (and those of Haynes and Hood (1977). SyR, and WR occurred frequently and PWR, PhR and SR occurred relatively less, in children between 6.7 years. This results support Bronscom et al. (1955) and Yairi and Clifton (1972), who reported that word repetitions were one of the type of disfluency present most frequently in the preschool children. Egland (1955) found sound or syllable repetitions to the most common disfluency type in non-stutterers.



Kirkpatrick (1915) believes that children repeat because they do not have tangible evidence that they have been understood. According to Fisher (1932) children repeat because they show interest on having things (sayings, stories) repeated to them and also enjoy intentional repetition of nonsense words, sound patterns, new words, hamorous remarks etc. Matraux (1950) opines that the repetitions in the speech of young kindergarten children could be an attempt to make personal social contact and relates to the childs interest in repetition and his demand for repetition from others. Foreschels (1969) states that a child repeats a word or syllable etc. in the event of searching for words, thoughts, or grammatical forms to follow his cause of conveying information.

According to Starkweather (1981), 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 newly acquired longer utterances. Wexler and Mysak (1982) have hypothesized a 'motor factor' which reflects the part-word repetitions and disfnthmic phonation that characterize the speech of the younger kindergarten children than the older ones which may reflect on a less mature speech motor system in the later preschoolers.

Repetitions, a form of discontinuity, found in youngest children could be errors. However word or phrase repetitions could also imply that the young children may be stalling for time just as the older children. Stall for time by saying 'uh' or 'ya knowwaddimean' (Starkweather, 1987).

Haynes and Hood (1977) suggest that children repeat in the early ages to gain processing time and later shifts to interjections and revisions because of an increase in language complexity and linguistic rules learnt by the child for encodings. This may also be a relevant explanation to the results obtained in this study where in children have used filled pauses and prolongations in the early years followed by the usage of repeats of parenthetical remarks.

Prolongations were found to be minimal in this study.  
In the present study, maximum disfluencies were observed  
"before-on-after" the content words ie. nouns, pronouns,  
verbs (and conjunctions) Disfluencies were minimum "before-  
on-after" adverbs, prepositions, adjectives and interjec-  
tions. This result confirms the results of Maclay and Osgood (1959) and Cook (1971). However, it is contradictory to the findings of Helmerich and Bloodstein (1973).

The results of this study indicated that majority of the  
disfluencies occurred in the initial position. This confirms

the report of Helmrich and Boodstein (1973). Few disfluencies occurred in the final position and negligible disfluencies were exhibited in the medial position. Clusters were present in all the subjects. Maximum clusters were found in the age group of 6.6 to 6.8 years in the male subject. Yamini (1990) reported clusters in the age interval 5.2 - 5.4 years. Silverman (1973)? Colburn (1985) reported that clustering of disfluency within the speech of nonstuttering preschool children is a normal phenomenon and does not increase substantially over time".

Cook (1971) and Hawkins (1971) report that the initial part of an utterance has a high degree of uncertainty. Moreover the syntactic structure is not fully developed in the speech of the 6-7 year old children where they use more content words than functional words and hence disfluencies may be high before content words than functional words.

Apart from this, Subtelny et al (1966) have also found that the intraoral air pressure values are different for different consonants and vowels and also for stressed sounds which require greater intraoral pressure. Hence, this may reflect as to why children have higher disfluency before content words than functional words as the content words are stressed most often than the functional words.

It has been reported by Broadbent (1974) that there is interference and interaction in the CNS of the various functions which are performed simultaneously. One can assume that language formulation and speech motor act function simultaneously and there is a potential for a kind of interference with speech production by the language formulation. So there could be an inherent internal CNS interference on the speech and language act and if individuals differ in their abilities to overcome the potentially disruptive effects on speaking of the interference of language formulation, then they may break down in speech due to language formulation or vice-versa. Hence one may presume that such discontinuities in disfluent speakers are likely to be located at place, where language formulation is occurring (starkweather and Gordon, 1983).

Hegde (1990) reported a 5 percent disfluency criteria to select patients for therapy. In the earlier studies (Nagapoornima, 1990; Indu, 1990; Yamini, 1990) high percent of disfluencies were noticed. The difference between the obtained disfluency percent and the reported 5 percent by Hegde (1990) was attributed to the difference in the analysis. In this study, to overcome this, 2 types of analysis were performed. In the Type II analysis, though percentage

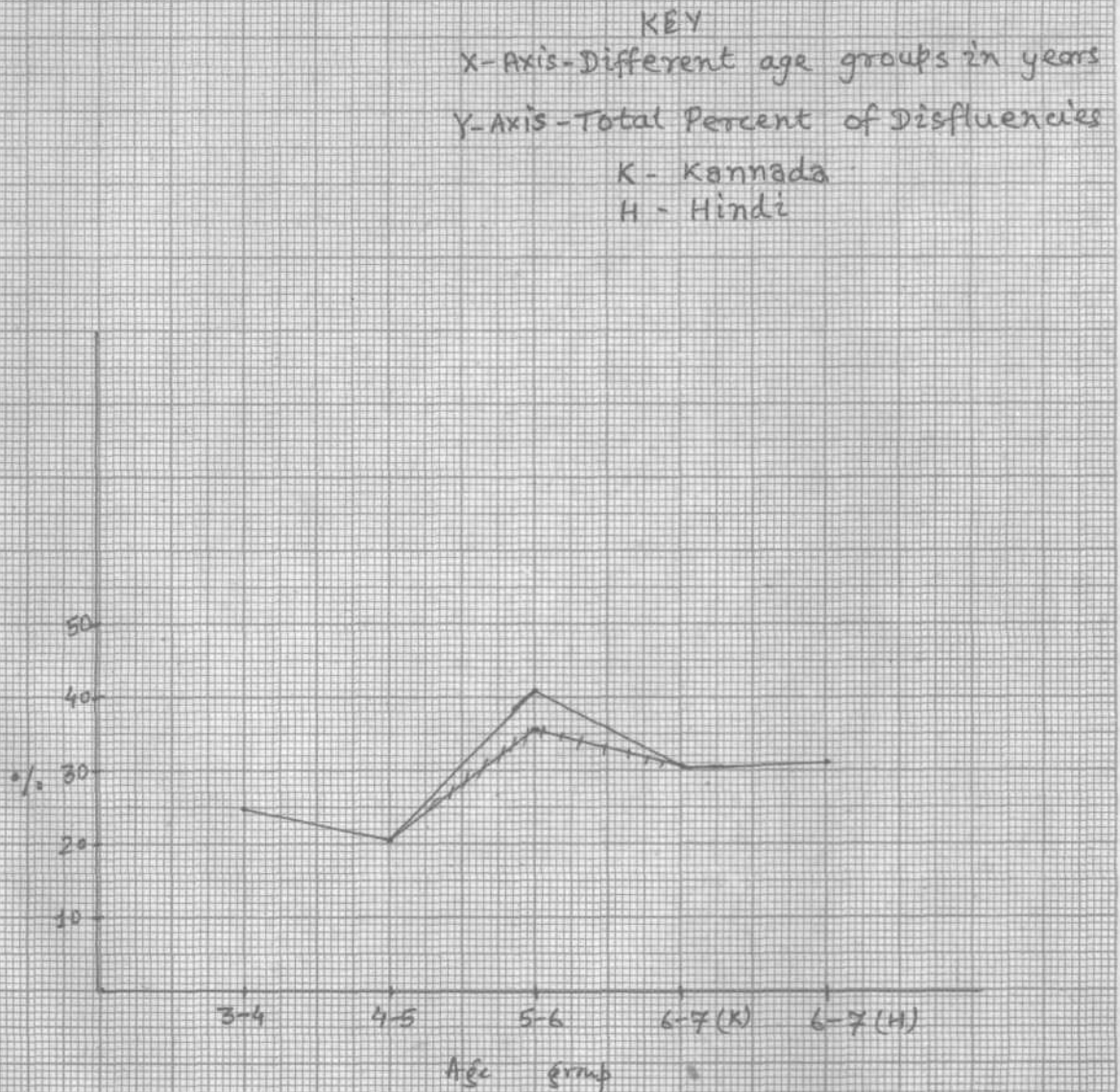


Fig-1- The percentage of disfluency obtained in all age groups (3-7) years.

disfluency was less than that in type I, it was much higher than 5% (Heade. 1990). In this regard, the results of the present study are not in consonance with Hygde (1990).

Other studies on normal Kannada speaking children, Nagapoornima (1990), 3-4 years; Indu (1990) - 4-5 years? Yamini, (1990) 5-6 years? Rajendraswamy (1991) 6-7 years are also compared with this study.

Disflencies	Age Group			
	3-4	4-5	5-6	6-7
FP	9.6	12	7.66	3.11
UFP	8.6	1.52	9.2	9.16
R	4.0	.64	3.21	4.57
PR	2.5	5.27	7.49	2.75
FS	.16	.39	6.51	2.04
P	0	.13	1+11	1.06
AI	0	.18	5.38	6.84
PWR	0	0	.04	0
C	0	0	0	1.49
Total	24-86	20.13	40.60	31.02

Table-37: Percent of disfluencies across the ages.

Table-37 presents the percentage disfluency. It can be observed that filled pauses have decreased in the age of 6-7 and AI have increased. Table-37 depicts the percentage and

range of disfluency in each of the age group as obtained in this study.

This study has added to the knowledge in the area of fluency development in Hindi language. Though, the scores and range of percentage disfluency are provided, this should not be confused for a standardized test result. However, it could be used as a base and further, standardization of this could be performed on normal Hindi speaking children, the results of which will be of help in the assessment and rehabilitation of fluency disorders.

Types of disfluencies(in percent)		Age in years					
		6.0-5.2	6.2-6.4	6.4-6.6	6.6-6.8	6.8-6.10	6.10-6.12
FP	COS Range	3.52 2.43-4.61	2.59 0.7-4.49	2.73 1.63-3.83	3.29 0.89-5.69	3.53 1.42-5.63	2.99 2.15-3.63
UFP	COS Range	10.43 7.52-13.35	10.85 10.2-11.5	7.52 7.29-7.75	9.98 7.00-12.96	9.16 7.84-10.48	6.995 6.48-7.51
R	COS Range	4.54 4.47-4.61	2.78 1.9-3.67	2.65 2.14-3.16	6.48 4.96-7.99	4.38 4.14-1.62	6.56 4.20-8.91
PR	COS Range	3.43 2.74-4.13	2.49 0.9-4.09	2.86 1.59-4.13	3.58 2.61-4.54	3.195 1.27-4.42	0.92 0.27-1.57
FS	COS Range	2.25 2.13-2.38	1.51 1.4-1.63	2.28 1.68-2.88	2.64 1.53-3.74	1.79 1.64-1.94	1.81 1.64-1.98
P	COS Range	0.83 0.71-0.95	0.61 0.3-0.91	1.23 1.03-1.44	1.38 0.45-2.30	1.12 0.22-2.01	1.20 0.58-1.32
C	COS Range	1.61 1.32-1.90	1.26 1.2-1.33	1.42 0.93-1.92	1.91 0.51-3.31	1.27 1.20-1.34	1.46 1.19-1.73
AI	COS Range	9.38 5.39-12.87	7.19 4.49-9.9	5.33 2.89-7.77	6.17 3.12-9.22	6.39 6.23-6.55	6.59 5.66-7.51
Total	Cos	35.99	29.28	26.02	35.43	30.84	28.53

Table-38: Cut off scores (COS) and the range for the different sub-groups for the different disfluency types in the age range 6-7 years.for .Story narration task .



## SUMMARY AND CONCLUSION

The speech features involved in an assessment of fluency have been subsumed under a general concept of 'transition smoothness' (Dalton and Hardcastle, 1977). These features include: "Pawning (that is discontinuities of gaps in the speech audio signal due for example, to articulatory closures" hesitations and juncture pauses), rhythmical patterning (the regular succession of spressed beats in a speech utterance), regulation of tempo, intonation and stress patterns, and other features including interjections, interruptions etc, which cannot be easily included under the other categories (Dalton and Hard Castle (1977)). They add that these features could affect normal speech in various ways.

An understanding of the multidimensionality of normal fluency will help the clinician in diagnosis and rehabilitation of cases with fluency disorders. Several attempts (Branscom, et al 1955; Haynes and Hood, 1977; Kowal et al. 1975) have been made in the past to describe the development of speech fluency in normal children. However, the differentiation of normally non-fluent children and stuttering children remains a matter of controversy. Still much is needed in the area of speech fluency in normal children. In this context, the present study was conducted to explore the speech fluency of Hindi speaking normal children.

Twelve normal Hindi speaking children (two each in two month interval) from middle-socio-economic status were considered for the study. Speech was elicited by story telling. Six common stories were selected from the panchatantra, and pictures (ranging from 5-15) were drawn. Pictures for a given story were visually presented to the subject one at a time and responses were audio recorded and were transcribed and analysed.

Two types of analysis were done. In type I analysis: an instance of disfluency was defined as a disfluency occurring once and this was measured as one disfluency. In type II analysis: an instance of disfluency was measured as a disfluency occurring once irrespective of the number of disfluency in each instance. The number of words uttered, percentage of disfluencies, and percentage of different types of disfluencies for position, age and grammatical categories were calculated. Eight categories of disfluencies, Filled pauses, Unfilled pauses, Repeats; Parenthetical Remarks. False Starts; Prolongations, clusters, and Audible inspiration; three positions: initial, medial, final; and the grammatical categories; noun, pronoun, verb, adverb, adjective, preposition, interjection and conjunction were considered.

The results revealed that female subjects uttered more number of words than the male subjects. The overall percentage of disfluency was less for females than for males - 35.15% for males and 26.89% for females. In all the subjects at least 85% of the disfluencies occurred in the initial position followed by final and medial position. Disfluencies in the medial position were minimal. Unfilled pause, parenthetical remarks and audible inspiration occurred most frequently and false starts, prolongation and clusters occurred least. In repetition WR and SyR were the most frequently occurring where as PWR, PhR and SR occurred least.

Disfluencies occurring 'before-on-after' grammatical categories were also analysed. Most of the disfluencies occurred 'before' the grammatical categories followed by 'after' and 'on' grammatical categories. Most of the disfluencies occurred, 'before-on-after' the content words (nouns, pronouns, and verbs) and conjunctions, and minimal 'before-on-after' other grammatical categories viz adverbs adjectives, prepositions and interjections. Most of the clusters consists of AI and UFP and most of the AI occurred in initial position.

A comparison of the results of this study has been made with four other studies in Kannada speaking normal

children (Nagapoomima, 1990; Indu, 1990; Yamini, 1990; and Rajendraswamy, 1991) in the age range 3-4 years? 4-5 years; 5-6 years? and 6-7 years respectively . The comparison revealed that, the filled pauses showed an increase from 3-5 years and then declined. UFP declined from 3-5 years and increased beyond this. Repetition also showed an increase from 5 to 7 years. PR and FS showed increase in 3-6 years and then declined in 6-7 years. Prolongation and audible inspiration were not seen in 3-4 years, but it increased from 4-7 years.

Comparison between types of analysis were also made. It was observed that in type II analysis only FP, PR and R were affected. It was noticed that there was a marked reduction in the overall percentage of disfluencies. But this reduction in the percentage of disfluencies was not as low as 5% which was given by Hegde (1990). Thus the type of analysis has a minimal effect on the overall percentage of disfluency in Hindi language.

On the basis of findings of this study scores and ranges in a story telling task has been proposed for the age range 6-7 years, and The purpose of this is to help the clinicians in identifying dysfluency in children and further to aid in an early management.

## BIBLIOGRAPHY

- Adams, M.R. (1982): "Fluency, non-fluency, and stuttering in children". *Journal of Fluency Disorders*, 7, 171-165.
- Adams, S.A. (1932): cited in "Disfluencies of normally speaking two-year-old children" by Yairi, E., (1981). *Journal of speech and Hearing Research*, 24(4), 490-495.
- Atkinson-King, K. (1973): "cited in "Speech fluency and its development in normal children" by Starkweather, C.W. (1980) in *Speech and Language, Advances in Basic Research and Practice*, Vol.4, Lass, N.J., Academic Press, New York.
- Bernstein, N. (1981): cited in "The Development of fluency in children" (73-113) in 'Fluency and Stuttering' by Starkweather, C.W. (1987). Prentice Hall Inc, Englewood Cliffs, New Jersey.
- Bhargava's Concise English Dictionary: Angllo-Hindi by Pathak, R.C., Publisher - Bhargava Book Depet, Varanasi, India.
- Bjerkan, B. (1980): "Word fragmentations and repetitions in the spontaneous speech of 2-6 years old children". *Journal of Fluency Disorders*, 5, 137-48.
- Brandenburg, G. (1915): cited in "Disfluencies of normally speaking two-year-old children" by Yairi, E., (1981). *Journal of Speech and Hearing Research*, 24(4), 490-495.
- Branscom, M.E., Hughes, J., and Oxtoby, E.T. (1955): "Studies of nonfluency in the speech of preschool children" in *Stuttering in children and adults*. Ed. Johnson, W., University of Minnesota Press, Minneapolis.
- Broadbent, D. (1974): cited in "The physiological and acoustical bases of fluency" (49-72) in 'Fluency and stuttering' by Starkweather, C.W. (1987). Prentice Hall Inc, Englewood Cliffs, New Jersey.

(ii)

- Brogan, P. (1968): cited in "Fluency effects of increased utterance complexity" by Ratner, N.B. and Sin, C.C. (1987). *JSHD*, 52, 278-287.
- Brown, W.S., and Brandt, J.F. (1971): cited in "Speech fluency and its development in normal children" by Starkweather, C.W. (1980) in *Speech and Language, Advances in Basic research and practice, Vol.4*, Ed. Lass, N.J. Academic Press, New York.
- Caldwell, A. (1971): cited in "The development of fluency in children" (73-113) in 'Fluency and Stuttering' by Starkweather, C.W. (1987). Prentice Hall Inc, Englewood Cliffs, New Jersey.
- Carrell, J., and Tiffany, W. (1960): cited in "Fluent and hesitation pauses as a function of syntactic complexity" by Ruder, K.F. and Jensen, P.J. (1972). *Journal of Speech and Hearing Research*, 15(1), 49-60.
- Clark, H. (1971): cited in "The dimension of fluency" (15-47) in 'Fluency and Stuttering' by Starkweather, C.W. (1987). Prentice Hall Inc, Englewood Cliffs, New Jersey.
- Colburn, N. (1985): "Clustering of disfluency in non-stuttering children's early utterances". *Journal of Fluency Disorders*, 10, 51-58.
- Conradi, E. (1904): cited in "Disfluencies of normally speaking two-year-old children" by Yairi, E. (1981). *Journal of Speech and Hearing Research*, 24(4), 490-495.
- Cook, M. (1971): cited in "Speech fluency and its development in normal children" by Starkweather, C. W., (1980), in *Speech and Language series - Advances in Basic Research and Practice*, Eds. Lass, N.J. 4, 143-200, Academic Press, New York.
- Dalton, P., and Hardeastle, W.J. (1977): "Disorders of fluency and their effects on communication". Edward Arnold (Publishers) Ltd., London.

(iii)

- Davis, D.M. (1940a): cited in "Word fragmentation and repetition in the spontaneous speech of 2-6 year-old children" by Bjerkan, B. (1980). *Journal of Fluency Disorders*, 5, 137-148.
- Dawson, L.O. (1929): cited in "Speech fluency and its development in normal children" by Starkweather, C.W. (1980) in *speech and Language -advances in Basic Research and Practice*, Vol.4, Ed. Lass, N.J., Academic Press, New York.
- DeJoy, D.A., and Gregory, H.H. (1985): "The relationship between age and frequency of disfluency in preschool children". *Journal of Fluency Disorders*, 10, 107-122.
- Disimoni, F.G. (1974a): cited in "Speech fluency and its development in normal children" by Starkweather, C.W. (1980) in *speech and Language - Advances in Basic Research and Practice*, Vol.4, Ed. Lass, N.J., Academic Press, New York.
- Disimoni, F.G. (1974b): cited in "Speech Fluency and its development in normal children" by Starkweather, C.W. (1980) in *Speech and Language - Advances in basic research and practice*, Vol.4, Ed. Lass, N.J., Academic Press, New York.
- Egland, G.O. (1955): "Repetitions and prolongations in the speech of stuttering and non-stuttering children" in 'stuttering in children and adults'. Ed. Johnson, W., University of Minnesota Press, Minneapolis.
- Eiltrs, R.E. (1975) cited in "The development of fluency in children" in 'Fluency and stuttering' Ed. Starkweather, C.W. (1987). Prentice Hall Inc, Englewood Cliffs, New Jersey.
- Fisher, M. (1932): cited in "Disfluencies of normally speaking two-year-old children" by Yairi, E. (1981). *Journal of Speech and Hearing Research*, 24(4), 490-495.

- Freeman, F., and Ushijima, T. (1975): cited in "Issues to consider in the differential diagnosis of normal childhood non-fluencies and stuttering" by Myers, F.C. and Wall, M.J. (1981). *Journal of Fluency Disorders*, 6, 189-195.
- Froeschels, E. (1969)? cited in "The relationship between normal dysfluency and stuttering": An old question revisited" by Shapiro, A.I. and DeCicco, B.A., (1982). *Journal of Fluency Disorders*, 7, 109-121.
- Goldman-Eisler, F., (1968): cited in "Fluent and hesitation pauses as a function of syntactic complexity" by Ruder, K.F., and Jensen, P.J. (1972). *Journal of Speech and Hearing Research*, 15(1), 49-60.
- Gordon, P.A., and Luper, H.L. (1989): "Speech disfluencies in non-stutterers: syntactic complexity and production task-effects". *Journal of Fluency Disorders*, 14(6), 429-444.
- Gordon, P.A., Luper, H.L. and Peterson, H.A. (1986): cited in "Speech disfluencies in non-stutterers: syntactic complexity and production task effects" by Gordon, P.A., and Luper, H.L., (1989). *Journal of Fluency Disorders*, 14(6), 429-446.
- Hanley, T.D., and Steer, M.D. (1949): cited in "Speech fluency and its development in normal children" by Starkweather, C.W. (1980) in *Speech and Language - Advances in Basic Research and Practice*, Vol.4, Ed. Lass, N.J. Academic Press, New York.
- Haynes, W.O. and Hood, S.B. (1977): cited in "The relationship between age and frequency of disfluency in preschool children" by DeJoy, D.A., and Gregory., and Gregory, H.H. (1985). *Journal of fluency Disorders*, 10, 107-122.
- Haynes, W.O., and Hood, S.B., (1978): cited in "Disfluencies, utterance length, and linguistic complexity in non-stuttering children" by McLaughlin, S.F., and Cullian, W.L. (1989). *Journal of Fluency Disorders*, 14(1), 17-36.



- Hamburger, H., and Crain, S. (1982): cited in "Fluency Effects of increased utterance complexity" by Ratner, N.B., and Sih, C.c. (1987) JSHD, 52, 278-287.
- Hawkins, P. (1971): cited in "The dimensions of fluent speech" (15-47) in 'Fluency and Stuttering' by Starkweather, C.W. (1987). Prentice Hall Inc, Englewood Cliffs, New Jersey.
- Hegde, M.N. (1990): "Indian Speech, Language and Hearing Tests: The ISHA Battery (1990)? 5ds. Kacker, C.K., and Vijayalakshmi, V. Pp.211.
- Helmreich, H., and Bloodstein, O. (1973): "The grammatical factor in childhood disfluency in relation to the continuity hypothesis", Journal of Speech and Hearing Research, 16, 731-738.
- Indu, V. (1990): "Some aspects of fluency in children (4-5 years)". Unpublished dissertation submitted to the Mysore University in part-fulfilment of Masters Degree in Speech and Hearing.
- Janssen, P., and Kraaimaat, F. (1980): cited in "Reading ability and disfluency in stuttering children and non-stuttering elementary school children" by Janssen, P., Kraaimaat, F., and Van der Keulen, S. (1983). Journal of Fluency Disorders, 8, 39-53.
- Johnson, W. (1942): cited in "Disfluencies of normally speaking two-year-old children" by Yairi, E. (1981). Journal of Speech and Hearing Research, 24(4), 490-495.
- Johnson, W. (1948): cited in "Disfluent speech behaviour of preschool children, high school seniors and geriatric person" by Yairi, E., and Clifton, N.F. (1972). Journal of Speech and Hearing Research, 15(4), 714-719.
- Johnson, W., (1959): vited in "Age and disfluency in pre-school children" by DeJoy, D.A. and Gregory, H.H. (1985). Journal of Fluency Disorders, 10, 107-122.

- Johnson, W. (1961): "Measurement of oral reading and speaking rate and disfluency of adult male and female stutterers". *Journal of Speech and Hearing disorders. Monograph Supplement*, 7, 1-20.
- Johnson, W., and Associates, (1959): cited in "Word fragmentations and repetitions in the spontaneous speech of 2-6 year old children" by Bjerkan, B. (1980). *Journal of Fluency Disorders*, 5, 137-148.
- Kirpatrick, E. (1891): cited in "Disfluencies of normally speaking two-year-old children" by Yairi, E. (1981). *Journal of Speech and Hearing Research*, 24(4), 490-495.
- Klima, E., and Bellugi, U. (1966): cited in "Fluency Effects of Increased Utterance complexity" by Ratner, N.B. and Sih, C.C. (1987), *JSHD*, 52, 278-287.
- Kools, J., and Berryman, J. (1971): cited in "Disfluency characteristics of 2-, 4-, and 6 year old males" by Wexler, K.B. and Mysak, E.D. (1982). *Journal of Fluency Disorders*, ?, 37-46.
- Kowal, S., O'Connell, D.G. and Sabin, E.F. (1975): cited in "The development of fluency in children" (71-136) in 'Fluency and stuttering' by Starkweather, C.W. (1987).
- Lee, L. (1974): cited in "The relationship between age and frequency of disfluency in preschool children" by bejoy, D.A., and Gregory, H.H. (1985). *Journal of Fluency Disorders*, 10, 107-122.
- Lieberman, P. (1967): cited in "Fluent and hesitation pauses as a function of syntactic complexity" by Ruder, K.F. and Jensen, P.J., (1972). *Journal of Speech and Hearing Research*, 15(1), 49-60.
- Lindsay, J.S. (1989): " Relationship of developmental disfluency and episodes of stuttering to the emergence of cognitive stages in children" *Journal of Fluency Disorders*, 14, 271-284.

- Longhurst, T.M., and Siegel, G.M. (1973): cited In "Speech fluency and its development in normal children" (143-200) by Starkweather, C.W. (1980) in 'Speech and Language-Advances in Basic Research and Practice', Vol.4, Ed. Lass, N.J. Academic Press, New York.
- Lust, B., and Mervis, C. (1980): cited in "Fluency effects of increased utterance complexity" by Ratner, N.B., and Sih, C.C. (1987), JSHD, 52, 278-287.
- MacLay, H. and Osgood, C.E. (1959): cited in "Speech fluency and its development in normal children" (143-200) by Starkweather, C.W. (1980) in Speech and Language - Advances in Basic Research and Practice, Vol.4, Ed. Lass, N.J. Academic Press, New York.
- Malecot, A. Johnston, R., and Klzziar, P.A. (1972): Cited in "Speech fluency and its development in normal children" by starkweather, C.W. (1980) in Speech and Language - Advances in Basic Research and Practice, Vol.4, Ed. Lass, N.J. Academic Press, New York.
- Manning, W., and Monte, K. (1979): cited in "Disfluencies of normally speaking two-year-old children" by Yairi, E. (1981). Journal of Speech and Hearing Research, 24(4), 490-495.
- Martin, J., and strange, W. (1968a): cited in "Fluent and hesitation pauses as a function of syntactic complexity" by Ruder, K.F., and Jensen, P.J., (1972). Journal of Speech and Hearing Research, 15(1), 49-60.
- McLaughlin, S.F., and Cullian, W.L. (1989): "Disfluencies, utterances length, and linguistic complexity in non-stuttering children". Journal of Fluency Disorder\*, 14(1), 17-36
- Menyuk, P. (1977): cited in "Fluency effects of increased utterance complexity" by Ratner, N.B., and Sih, C.C. (1987), JSHD, 52, 278-287.
- Menyuk, P., and Klatt, M. (1975): cited in "Speech Fluency and its development in normal children" by Starkweather, C.W. (1980) in Speech and Language-Advances in Basic Research and practice, Vol.4, Ed. Lass, N.J., Academic Press, New York.

- Meyers, F. (1977): "Relationship between eight physiological variables and severity of stuttering".  
Journal of Fluency Disorders, 2, 181-191.
- Minifie, F.D., and Cooker, H.s. (1964): "A disfluency index".  
Journal of Speech and Hearing Disorders,  
29(2), 189-192.
- Muma, J. (1971): "Syntax of preschool fluent and disfluent ' speech: A transformational analysis".  
Journal of Speech and Hearing Research,  
14(2), 428-441.
- Mysak, K.B. (1978): cited in "Disfluency characteristics of 2-4 - and 6-year old males" by Wexler, K.B. and Mysak, E.D. (1982). Journal of Fluency Disorders, 7, 37-46.
- Nagapoonima, M.N. (1990): "Disfluencies in children (3-4 years)". Unpublished Dissertation submitted to the Mysore University in partial fulfilment of Masters Degree in Speech and Hearing.
- Nice, M. (1920): cited in "Disfluencies of normally speaking two-year-old children" by Yairi, E.(1981).  
Journal of Speech and Hearing Research,  
24(4), 490-495.
- Oiler, D.K., and Smith, B.L.(1977): cited in "Speech fluency and its development in normal children" by Starkweather, C.W. (1980) in Speech and Language-Advances in Basic Research and practice, Vol.4, Ed. Lass, N.J., Academic Press, New York.
- Oxtoby, E.T. (1943): cited in "Studies of nonfluency in the speech of preschool children" (157-180) in stuttering in children and adult by Johnson, W. (1955), University of Minnesota Press, Minneapolis.
- Parell, M., Amerman, J.D., and Wells, G.B. (1977): cited in "Speech fluency and its development in normal children" by starkweather, C.W. (1980), in Speech and Language - Advances in Basic Research and Practice, Vol.4, Ed. Lass, N.J. Academic Press, New York.

- Pearl, S.Z., and Bernthal, J.E. (1980): "The effect of grammatical complexity upon disfluency behaviour of non-stuttering preschool children". *Journal of Fluency Disorders*, 5, 55-68.
- Parkins, W. (1977): cited in "Fluency, non-fluency and stuttering in children" by Adams, M.R. (1982). *Journal of Fluency Disorders*, 7, 171-185.
- Rajendraswamy, H. (1991): "Some aspects of fluency in children - 6-7 years". Unpublished Dissertation submitted to the Mysore University in part-fulfilment of Masters Degree in Speech and Hearing
- Ratner, B.N., and Sih, C.C. (1987): "Effects of gradual increases in sentence length and complexity in children's disfluency". *Journal of Speech and Hearing Disorders*, 52, 278-287.
- Ringel, R.L., and Steer, M.D. (1963): cited in "Speech fluency and its development in normal children", by Starkweather, C.W. (1980) in *Speech and Language - Advances in Basic Research and Practice*, Vol.4, Ed. Lass, N.J., Academic Press, New York.
- Rudmin, F. (1984): "Parent's report of stress and articulation oscillation as factors in a preschooler's disfluencies". *Journal of fluency Disorders*, 9(1), 85-37.
- Scholes, R.J. (1968): cited in "Fluent and hesitation pauses as a function of synthetic complexity" by Ruder, K.F., and Jensen, P.J., (1972). *Journal of Speech and Hearing Research*, 15(1), 49-60.
- Sharkey, S.G., and Folkins, J.F. (1985): cited in "Stuttering throughout life" by Peters, H.M. and starkweather, C.W. (1989). *Journal of Fluency Disorders*, 14, 303-321.
- Silverman, E.M. (1969): cited in "Disfluency characteristics of 2-, 4-, and 6-year old males" by Wexler, K.B., and Mysak, E.D. (1982). *Journal of Fluency Disorders*, 7, 37-46.

(x)

- Silverman, E.M. (1972): cited in "Disfluencies, utterance length and linguistic complexity in non-stuttering children" by McLaughlin, S.F. and Cullian, W.L. (1989). *Journal of Fluency Disorders*, 14(1), 17-36.
- Silverman, E.M. (1973): "Clustering: A characteristic of preschoolers' speech disfluency". *Journal of Speech and Hearing Research*, 16(4), 578-583.
- Smith, M. (1926): cited in "Disfluencies of normally speaking two-year-old children" by Yairi, E. (1981). *Journal of Speech and Hearing Research*, 24(4), 490-495.
- Spring, D.R., and Dale, P.s. (1977): "Discrimination of linguistic stress in early infancy". *Journal of Speech and Hearing Research*, 20, 224-232.
- Starkweather, C.w. (1980): "speech fluency and its development in normal children" (143-200) in *speech and Language - Advances in Basic Research and Practice*. Ed. Lass, N.J., 4, Academic Press, New York.
- Starkweather, C.W. (1981): (SIC) (1980): cited in "The dimensions of fluent speech (15-17) by Starkweather, C.W. (1987) in 'Fluency and Stuttering' by Starkweather, C.W. (1987), Prentice Hall Inc, Englewood Cliff\*, New Jersey.
- Starkweather, C.W. (1982): cited in "The dimension of fluent speech" (15-47) by starkweather, C.W. (1987) in 'Fluency and Stuttering' by Starkweather, C.W. (1987). Prentice Hall, Inc, Englewood Cliffs, New Jersey.
- Starkweather, C.W. Gorden, P.(1983): cited in "The physiological and acoustical bases of fluency" (49-72) in 'Fluency and stuttering' by Starkweather, C.W. (1987). Prentice Hall Inc, Englewood Cliffs, New Jersey.

- Starkweather, C.W. (1987): "Fluency and stuttering". Prentice Hall Inc, Englewood Cliffs, New Jersey.
- Stromsta, C. (1965): cited in "Stuttering: what it is and is not" (119) in 'Fluency and Stuttering' by Starkweather, C.W. (1987), Prentice Hall Inc, Englewood, Cliffs, New Jersey.
- Stromsta, C, and Fibigers S. (1930): cited in "Issues to consider in the differential diagnosis of normal childhood non-fluencies and stuttering" by Myers and Wall (1981). Journal of Fluency Disorders, 6, 189-195.
- Subtelny, J.D., Worth, J.H., and Sakuda, M. (1966): cited in "Speech fluency and its development in normal children" by Starkweather, C.W. (1980) in Speech and Language, Advances in Basic research and practice, Vol.4, Ed. Lass, N.J. Academic Press, New York.
- Susan, C.M. (1989): "Non-fluencies of preschool stutterers and conversational patterns: Observing reciprocal relationships". Journal of Speech and Hearing Disorders, 54(2), 106-110.
- Tingley, B.M., and Allen, G.D. (1975): cited in "Speech fluency and its development in normal children" by Starkweather, C.W. (1980) in Speech and Language, -Advances in Basic Research and Practice, Vol.4, Ed. Lass, N.J. Academic Press, New York.
- Tlager - Flushberg: (1982): cited in 'Fluency effects of increased utterance complexity' by Ratner, N.B., and Sih, C.C. (1987), JSHD, 52, 278-287.
- Umeda, N. (1975): cited in "Speech fluency and its development in normal children" by starkweather, C.W. (1980) in Speech and Language - Advances in Basic Research and Practice, Vol.4, Ed. Lass\* N.J., Academic Press, New York.
- Van Riper, C. (1971): "The nature of stuttering". Prentice Hall Inc, Englewood Cliffs, New Jersey.

- Wexler, K.B., and Mysak, E.D. (1982): "Disfluency characteristics of 2-, 4- and 6- year old males". *Journal of Fluency Disorders*, 7, 37-46.
- Wells, G. (1985): cited in "Fluency effects of increased utterance complexity" by Ratner, N.B., and Sih, C.C. (1987), *JSHD*, 52, 278-287.
- Williams, D.E. (1968): cited in "The relationship between age and frequency of disfluency in preschool children" by Dejoy, D.A. and Gregory, H.H. (1985). *Journal of Fluency Disorders*, 10, 197-122.
- Williams, D.E., Darley, F.L., and Spriesterbach, D.C. (1978): "Appraisal of rate and fluency" (256-283) in *diagnostic methods in speech pathology*. Eds. Darley, F.L. and spriesterbach, D.C. Second edition. Harper and Row Publishers, New York.
- Williams, D.E., Silverman, F.H., and Kools, J.A. (1968): "Disfluency behaviour of elementary school stutterers and non-stutterers: The adaptation affect". *Journal of Speech and Hearing Research*, 11(3), 622-630
- Winchester, R.A., and Gibbons, E.W. (1958): cited in "Speech fluency and its development in normal children" by Starkweather, C.w. (1980) in *Speech and Language - Advances in Basic research and practice*. Vol.4, Ed. Lass, N.J., Academic Press, New York.
- Yairi, E. (1972): cited in "Word fragmentation and repetition in the spontaneous speech of 2-6 year old children" by Bjerkan, B.(1980). *Journal of Fluency Disorders*, 5, 137-148.
- Yairi, E. (1981): "Disfluencies of normally speaking two-year old children". *Journal of Speech arid Hearing Research*, 24(4), 490-495.
- Yairi, E., and Clifton, N. (1972): Disfluent speech behaviour of preschool children, high school seniors and geriatric person. *Journal of Speech and Hearing Research*, 1972, 4, 714-719.



(xiii)

Yairi, E., and Lewis, B. (1984): "Disfluencies at the onset of stuttering". *Journal of Speech and Hearing Research*, 27, 155-159.

Yamini, (1990): "Disfluencies in children (5-6 years)"  
Dissertation submitted to the Mysore University  
in part-fulfilment of Masters Degree in Speech  
and Hearing.

APPENDIX I

STORY - 1

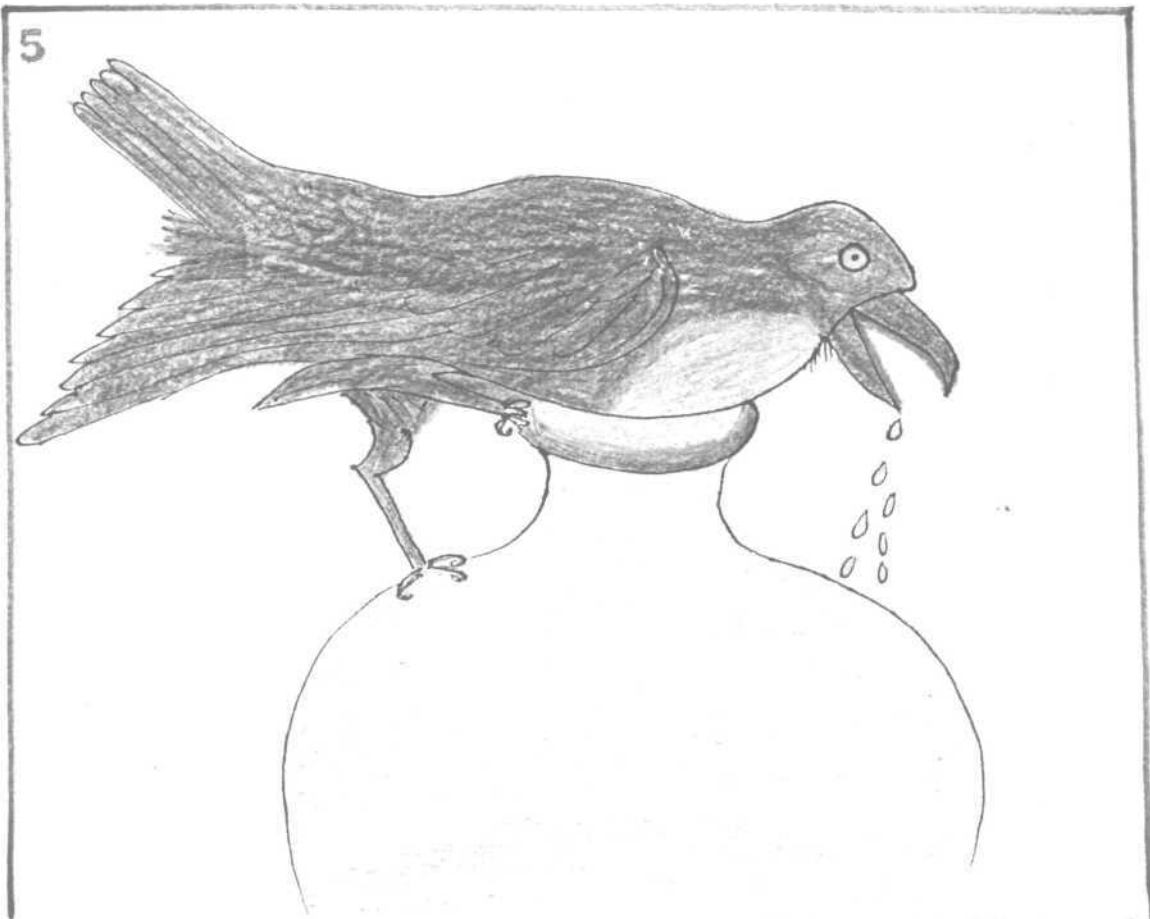


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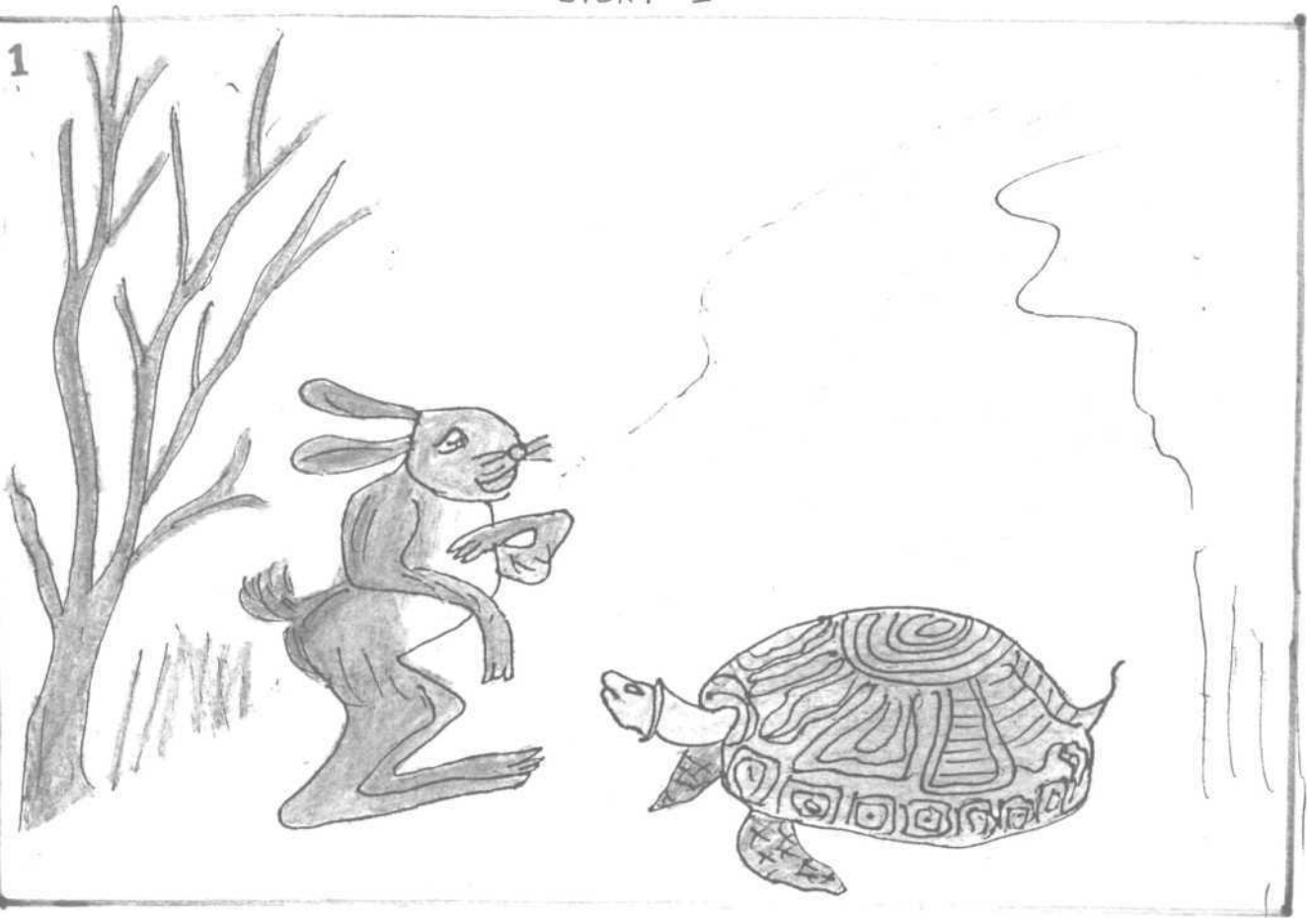


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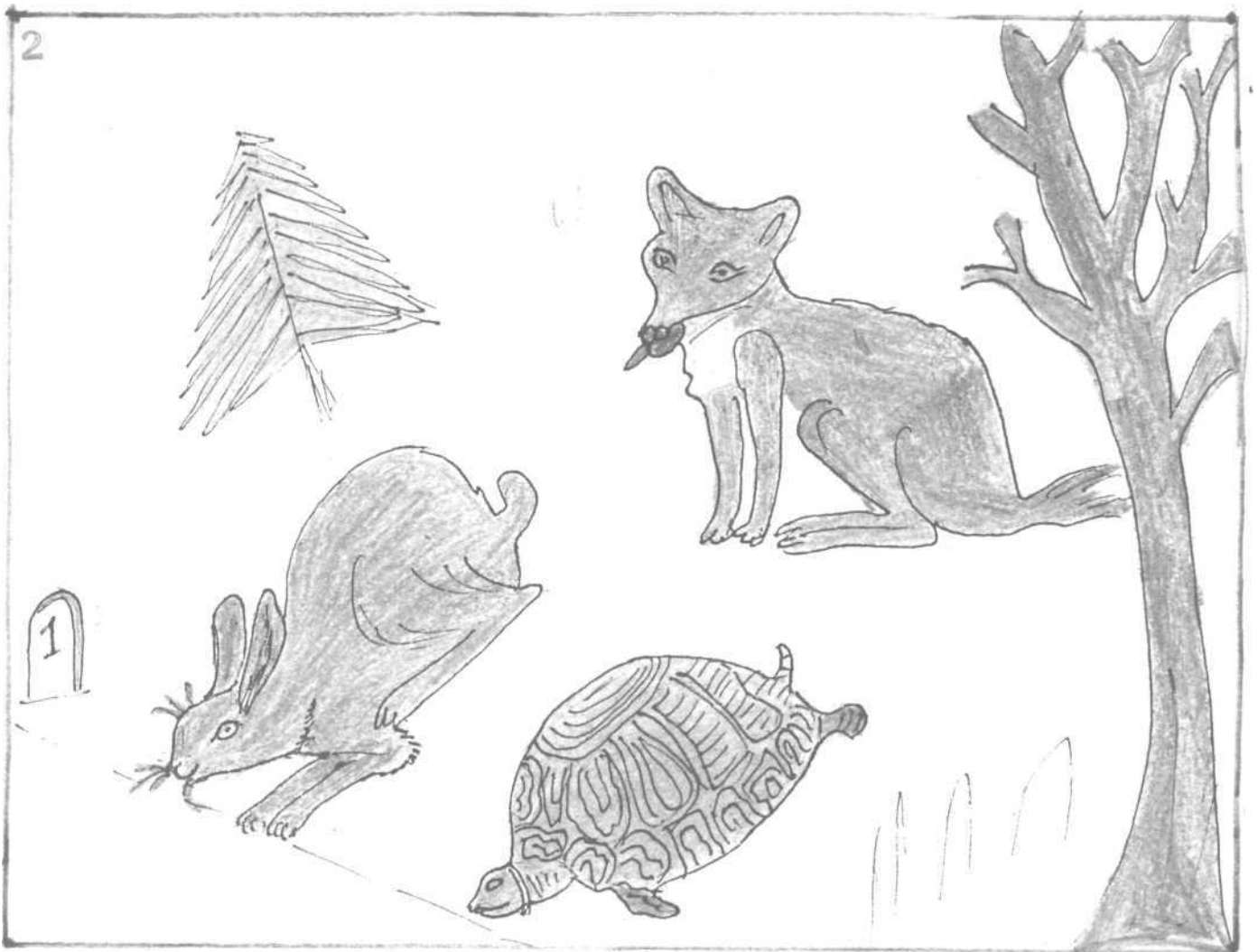


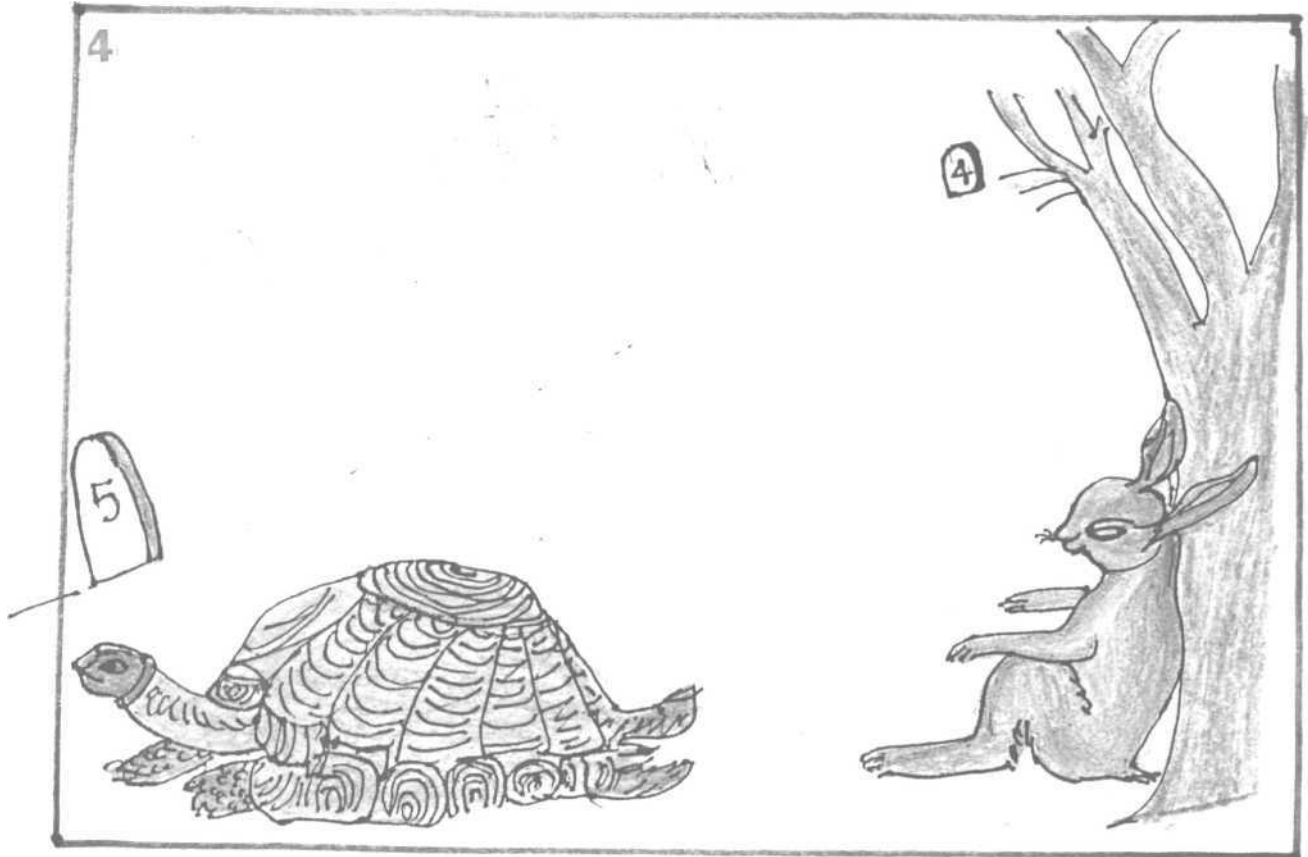


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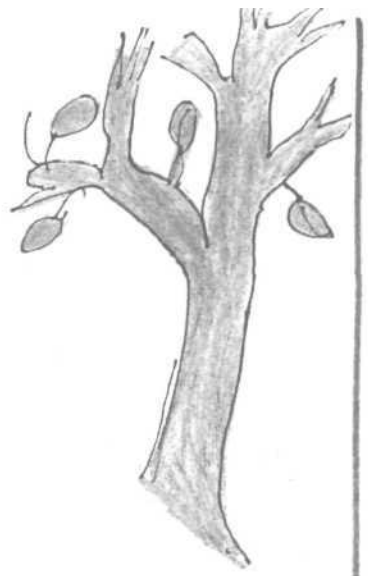


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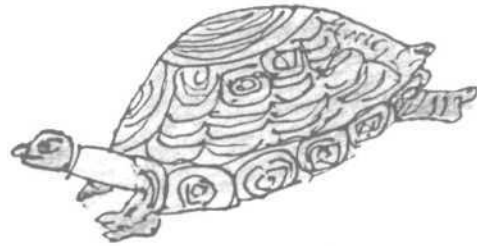




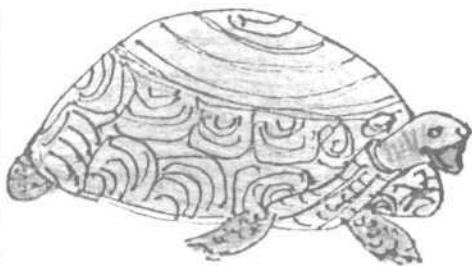
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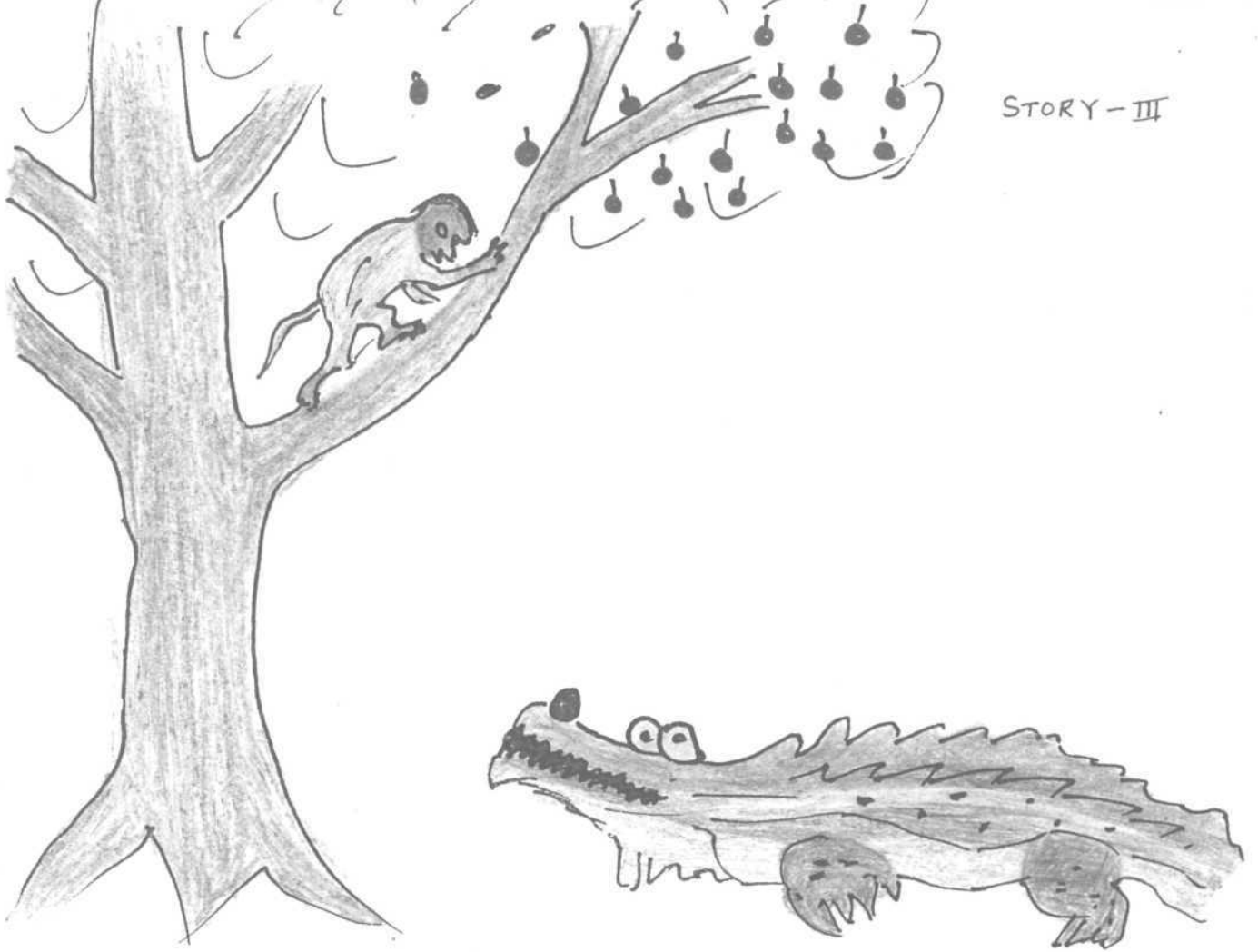


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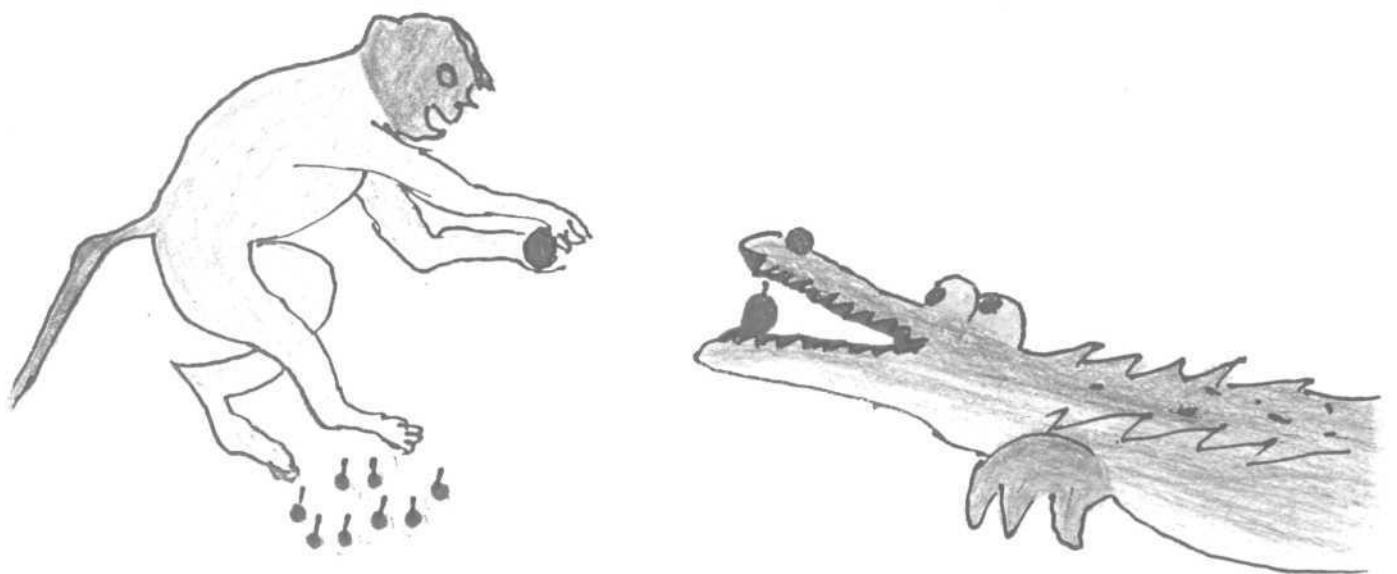


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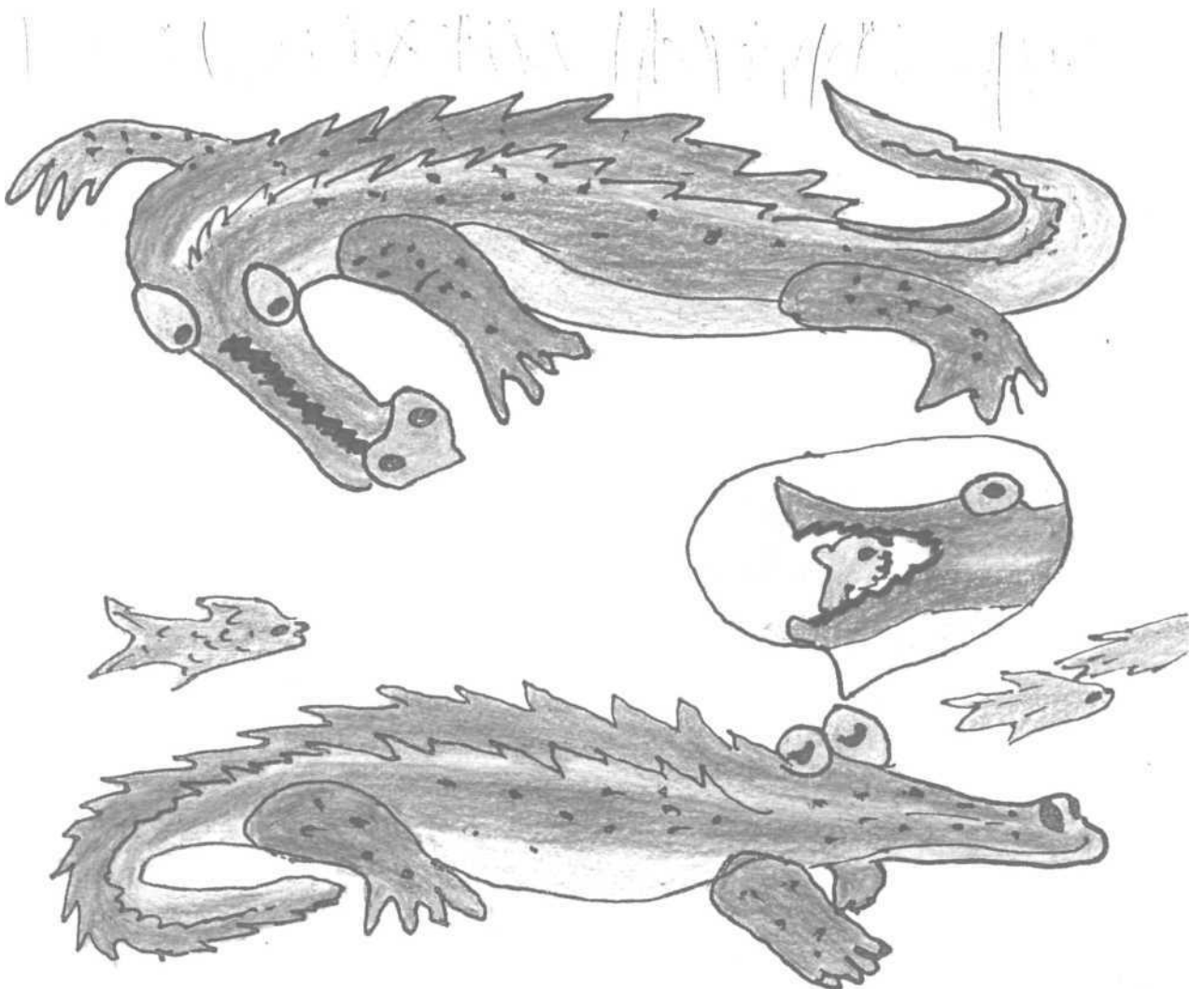
STORY - III



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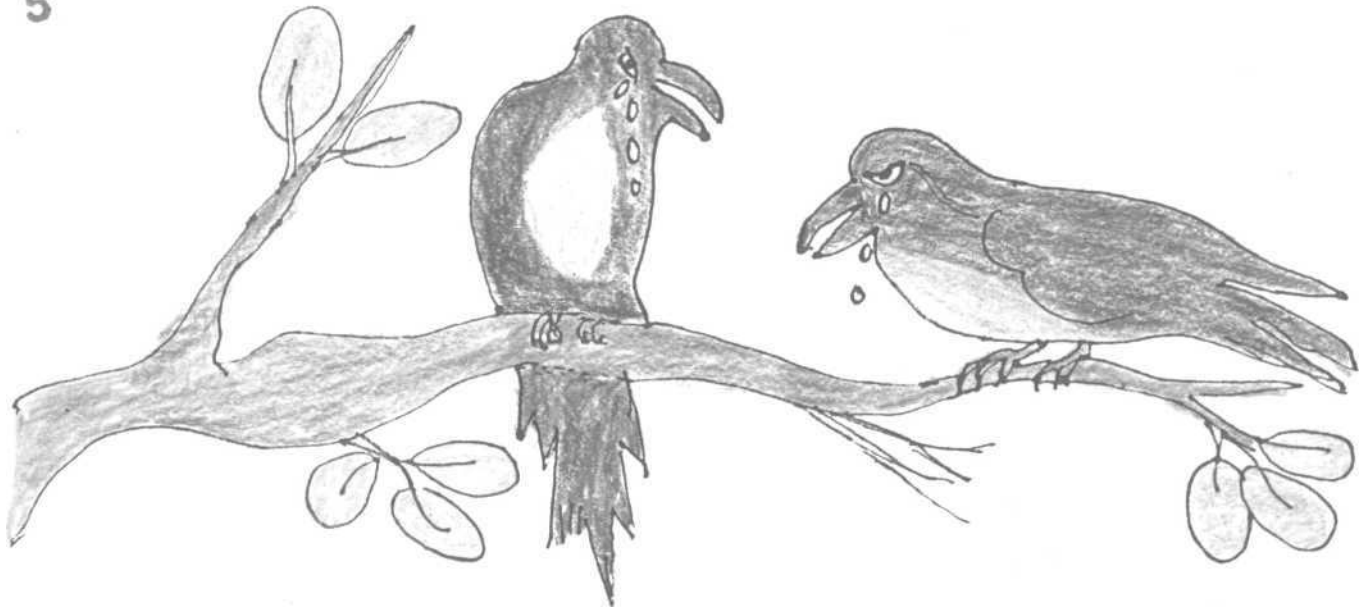
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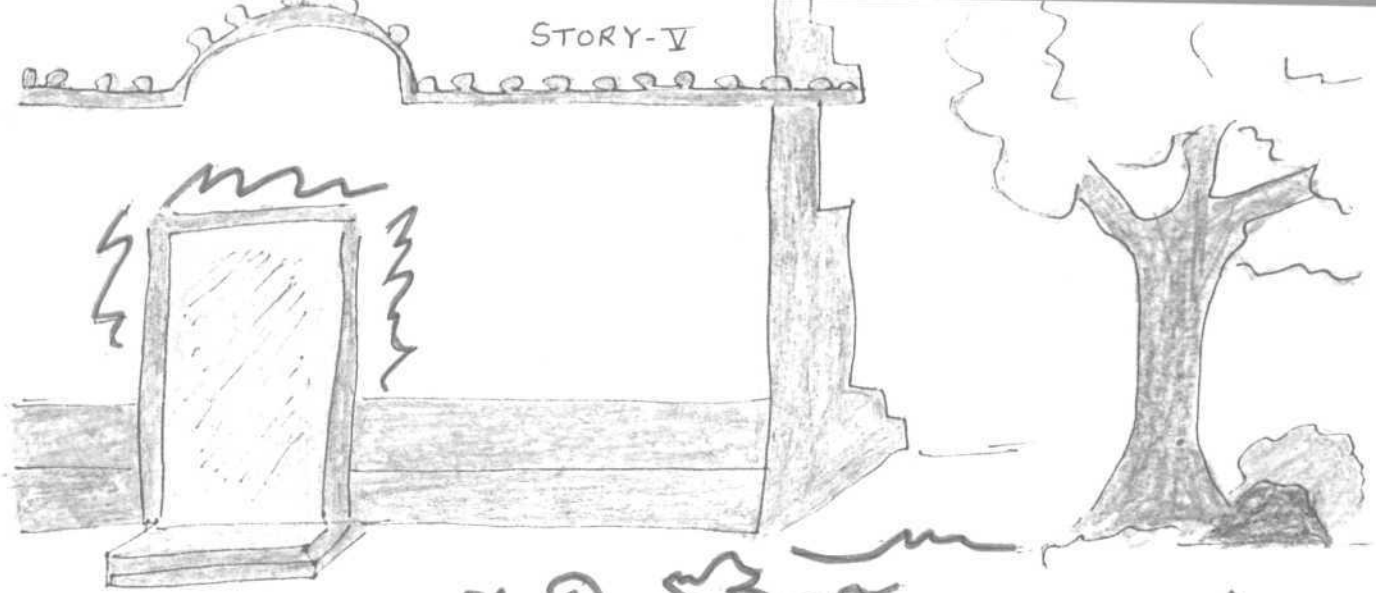


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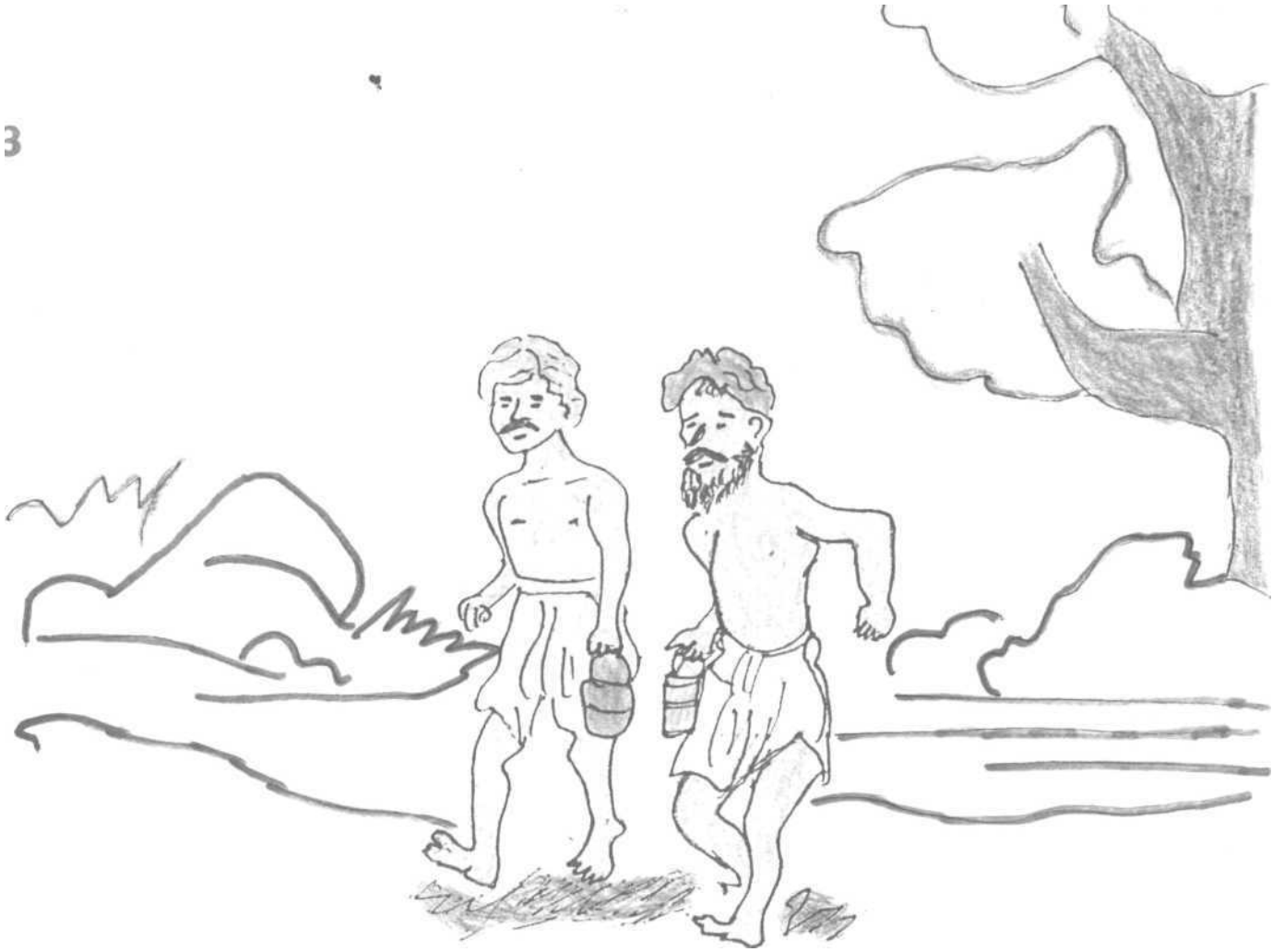
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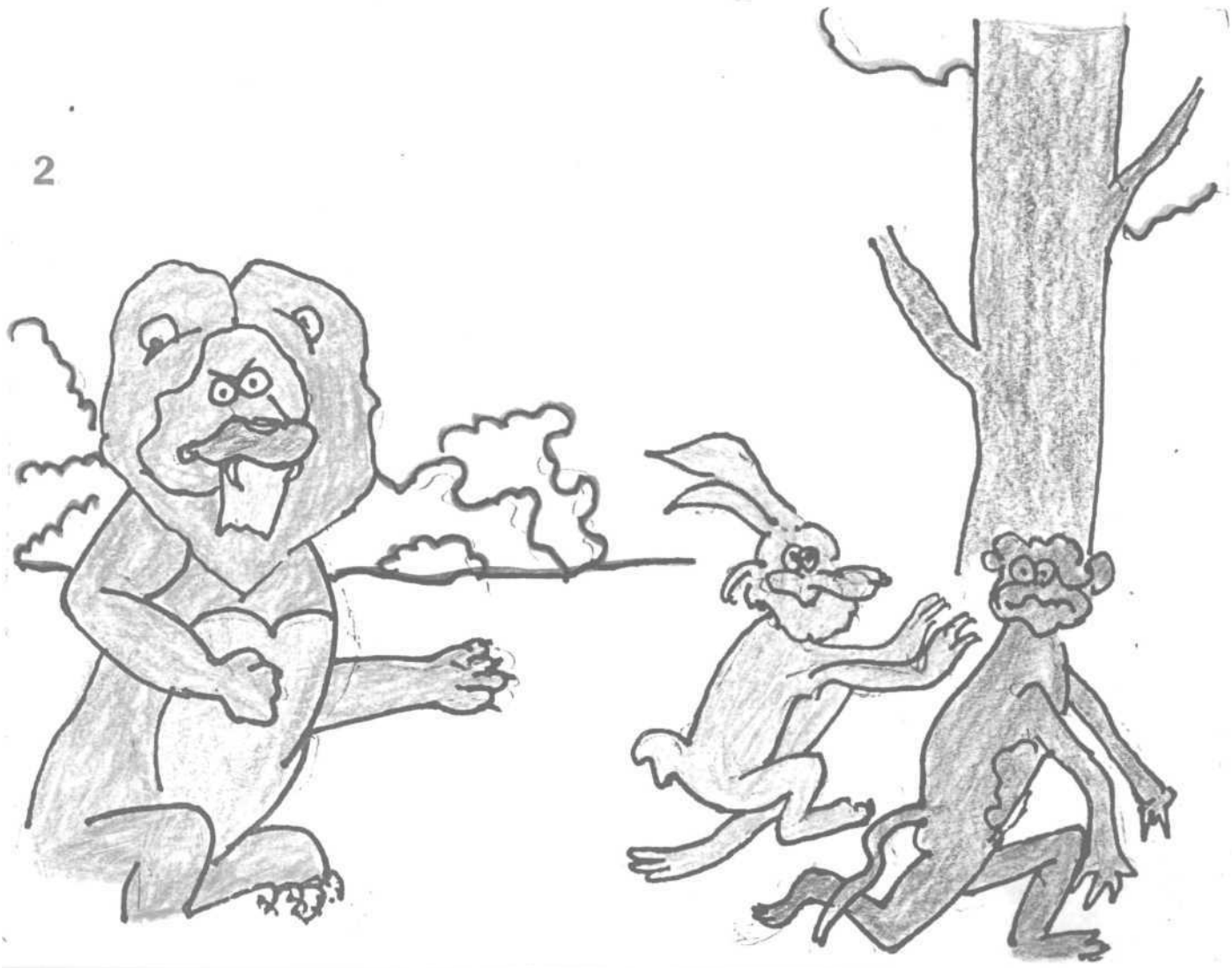
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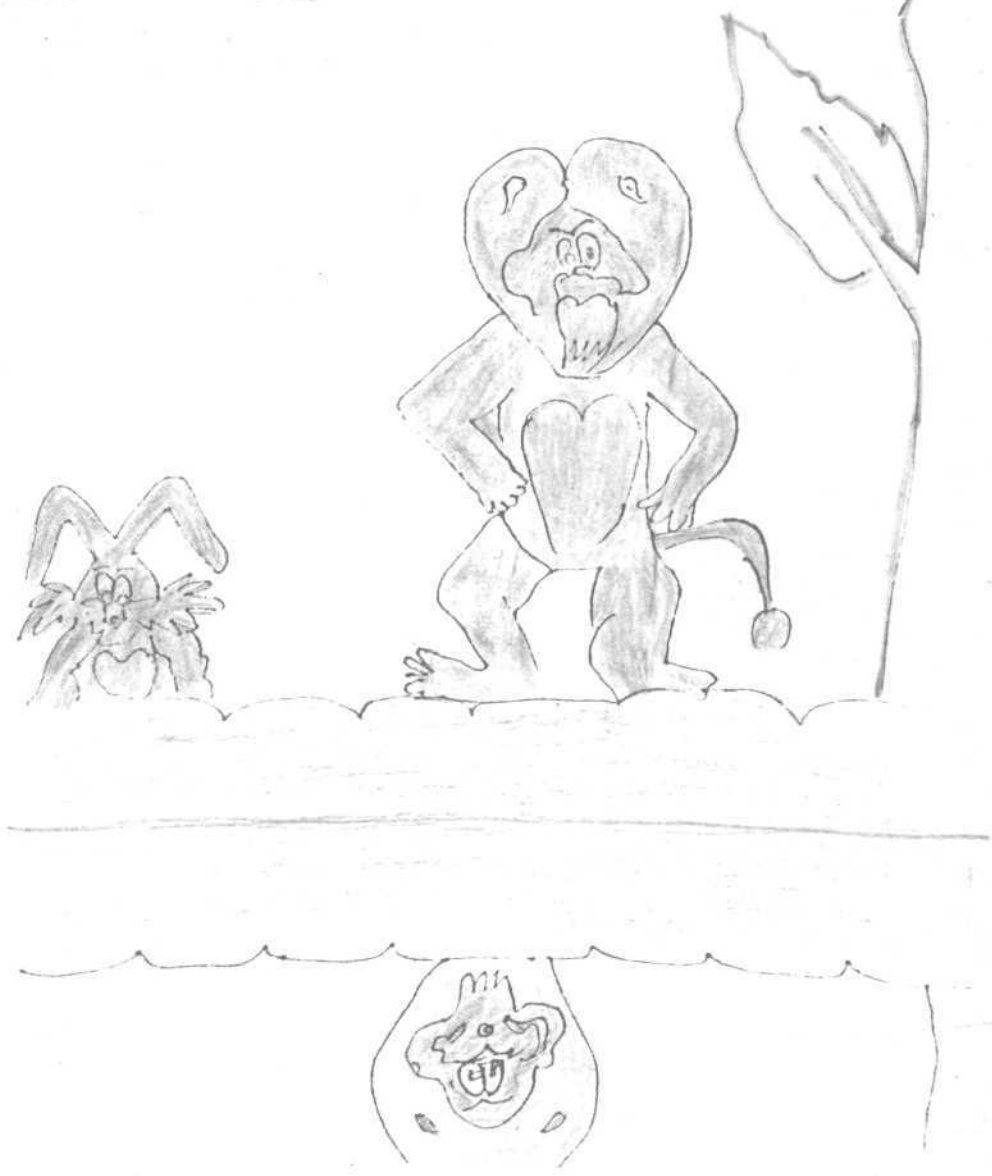
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