

**STORY STRUCTURE AND READING  
COMPREHENSION IN THE HEARING-IMPAIRED**

A MASTER'S DISSERTATION

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**CERTIFICATE**

This is to certify that the dissertation entitled "Story Structure and Reading Comprehension in the Hearing Impaired", is a bonafide work done in part fulfillment for the M.Sc (Speech and Hearing) Degree of the student with Register Number : M 9022.



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**CERTIFICATE**

This is to certify that the dissertation entitled "Story Structure and Reading Comprehension in the Hearing Impaired", has been prepared under my supervision and guidance.

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## **DECLARATION**

I hereby declare that the dissertation entitled "Story Structure and Reading Comprehension in the Hearing Impaired", is a result of my own study undertaken under the guidance of Dr. Pratibha Karanth, Professor and Head of the Department of Speech Pathology, All India Institute of Speech and Hearing, has not been submitted earlier at any University, for any other diploma or degree.

M 9022

Dedicated to . . . .

the foursome  
at "Prakrithi".

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## INTRODUCTION

Hearing loss, apart from affecting the speech, also affects the language of the hearing-impaired population. However, the speech and language skills vary in type and degree correspondingly with the degree and onset of hearing loss and various other factors.

One area of universal agreement in the education of hearing-impaired is that they should learn to read in the language of the larger community. But, inspite of dedicated and tireless efforts that date as far back as the 16th century, the overall results have been anything but spectacular.

Reading is a complex skill both to learn and to teach. There is a consensus that for hearing students, teaching of reading involves decoding and comprehension skills. While decoding is the translation of printed words into a representation of spoken language, comprehension is the actual understanding of that representation.

Reading and writing tasks which are introduced in later childhood to the hearing-impaired children are very difficult to acquire. Special techniques have been

introduced since a few decades to enhance the reading ability and comprehension in this population.

Basal reading materials have also been used. The basal materials are those which have an altered text in terms of length of the sentences, syntax and vocabulary of the sentences, with an aim to improve text coherence. The review of literature shows contradictory results on the usage of these materials with the hearing impaired in the western world.

There are no formal basal materials in Indian languages. This is an exploratory study to find the "effect of story-structure changes on comprehension (through reading) in hearing impaired children.

## REVIEW OF LITERATURE

Reading is a complex mental activity that takes place rapidly and privately within a person's mind. Not only are these activities unobservable to others, even the reader hardly knows what goes on in his/her mind during reading.

Reading is a complex skill both to learn and to teach. Nevertheless, some interesting data about the process are available. Researchers have carefully examined the acoustic, articulatory, phonetic, phonological and abstract phonological representation of words that are read (Wheeler 1970, Schwartz, 1977). They have also studied and continued to study the dynamic interaction between syntactic, semantic and pragmatic aspects of the reading processes.

Reading involves psycholinguistic and cognitive activities as well as visual ones. Similar to understanding speech, reading comprehension is an active psycholinguistic process which depends on an adequate base of syntactic and semantic rules to translate surface structure into meaningful information. Readers' psycholinguistic knowledge helps them to organize, process and predict meaning from the visual information presented in printed sentences. This information is integrated,

coordinated and given a meaningful structure by their linguistic rule system.

Readers develop strategies to relate what they read to their linguistic base, to rapidly predict or recognize meaning consistent with these rules and then to continue reading to ascertain that the prediction or recognition is an accurate reconstruction of the intended written message.

Metacognition plays a vital role in reading. In literal sense, metacognition means "transcending knowledge". Metacognition in reading involves the knowledge of four variables and the manner in which they interact to produce learning the variables include :

- a. Text - the features of the to-be-learned materials which influence comprehend and memory
- b. Task - the storage and retrieval requirements of the task to be performed by the learner as evidence of learning
- c. Strategies - the activities engaged in by the learner to store and retrieve information from the text
- d. Learner characteristics - ability, motivation and other personal attributes and states that influence learning.

Research findings of the study done by Armbruster B.B., Echols, C.H. and Brown, A.L. (1982) reveal that younger and poorer readers have a less adequate understanding of how the various factors in the learning situation (the characteristics of the text, the requirements of the task, applicable strategies and their own abilities and deficiencies) will affect their ability to learn from reading. The younger and poorer readers tend to be deficient in both components of metacognition: Knowledge and control. Yet another surprising finding is that, older individuals including high school and even college students show inadequacies in some areas of metacognitive knowledge or the use of this knowledge.

Based on the studies (Davies, 1944, 1968, Singer, 1965, Thurstone, 1946) that have shown a strong correlation between vocabulary knowledge and reading comprehension, it seems plausible to hypothesize that instruction that increases vocabulary knowledge will increase comprehension. However, studies which have attempted to improve comprehension through vocabulary training have brought equivocal results (Draper and Moeller, 1971; Kameenui, Carnine and Freschi, 1982). This could be because a difference exists between acquiring knowledge of a word's meaning and knowing the word well enough to aid comprehension of text.

Mc Keown, Beck, Omanson and Perfetti (1983) replicated and refined their own investigation, which hypothesized that, for vocabulary instruction to affect reading comprehension, the instructional strategies must not be limited to establishing an accurate association between a word and definition. Instead instruction needs to consider additional aspects of semantic processing such as fluent access to word meaning during reading and the richness of semantic network connections available to relate concepts.

The subjects were fourth-graders in 2 schools, from a small urban public school district.

This study found that intensive vocabulary instruction designed to promote deep and fluent word knowledge enhances text comprehension. The effect on comprehension of stories containing instructed words was shown in three ways :

- i) By an increased amount of recall
- ii) By the improved quality of the experimental groups' recall which provided a more coherent summary of the stories; and
- iii) By a greater proportion of correct responses to multiple-choice questions about the stories.

The relationship between word knowledge and reading comprehension is one of the best documented relationships in reading research. Though research has shown a strong correlation between vocabulary knowledge and reading comprehension, there has been little agreement as to the reason for this correlation.

Psychologists and linguists, whose disciplines recently merged into the new field of psycholinguistics provide significant information regarding the process by which children learn language. Their view of the reading process recognizes that speaking, listening, reading and writing are related abilities which rest on common bases of linguistic competence and conceptual skills.

Goodman (1973 b) defined reading as a dynamic psycholinguistic process by which a reader extracts meaning from a message presented in graphic form. Rather than processing each element of a written message, the reader samples selectively from the text and forms a hypothesis about its meaning. The readers' knowledge of syntactic and semantic constraints, alongwith the natural redundancy of language, help him or her formulate a viable prediction, which is confirmed or denied as the reader continues to process the written material. Smith (1978) suggested that two kinds of information facilitate the

reading process: the visual information which is the word; and the non-visual information, which is the knowledge already present in the reader's cognitive store.

The reader must learn to make full use of both forms of information in order to comprehend written language effectively.

Smith (1978) emphasized that non-visual information is an essential component of the reading process and the greater the amount of nonvisual information available, the less visual information is needed to comprehend a written message.

Children must bring a vast array of prior experience to the reading process. Expectations or hypotheses about experiments develop through experience. When a child reads about an event within his or her experimental realm that has been written in familiar language, the child's expectations and hypotheses are more accurate and comprehension is enhanced.

It has been shown that a close connection exists among reading, language and experience. The concepts that a child meets in written language must already be a part of his or her internalised language system. Reading specialists stress that beginning reading materials should be based on familiar experiences.



In recent years, focus has been on the relationship between prior knowledge and reading comprehension. Some of the findings suggest that the graphic representations depicted on a page of print are only symbols and do not carry meaning. Rather, it is the reader's prior knowledge that leads to the reader's comprehension and recall of text (Adams and Collins, 1979). New ideas and information are learned and retained most efficiently when relevant and related ideas are already available in the reader's memory. Comprehending a text requires readers to relate the elements in the text to the knowledge in their own memory structures. Information retrieval and the recall of text are affected by the manner in which prior knowledge has been organized in memory (Anderson, Pichert and Shirey, 1977; Anderson, Reynolds, Shallert and Goetz, 1977).

Person Hanser and Gordon (1979) suggest that comprehension involves the integration of the new information with the already existing schemata. And if the schemata are weakly developed, comprehension becomes difficult.

A large body of research related to the organization of memory in relation to comprehension and recall has been conducted. This has substantially

increased our understanding of how reader or text interactions may facilitate or impede comprehension and or recall.

The role of textual coherence in comprehension has also been a topic of interest in psycholinguistic research. However textual coherence is not a unitary concept. Texts cohere both locally and globally. Local coherence consists of simple intersentential ties like co-reference, while global coherence is commonly defined in terms of concepts like macrostructure.

During comprehension, the entities referred to, in the sentences comprising a text must be identified. And so referents must be separated or "given" referents must be separated from the "new" referants. If the referant is entirely new, it will either be encoded from scratch or connected to the rest of the text through a bridging inference. If the referent has occurred before, however, memory need only be searched for the earlier encoding of the referent such that the identity of the two can be represented. So, comprehensibility can be altered by altering the referential structure as lack of referential coherence makes comprehension difficult.

## MODELS OF READING

Reading models fall roughly into two major categories (1) Information-processing or stage models and (2) Analysis-by-synthesis models (Gibson and Levin, 1979).

An information-processing model assumes that reading can be analyzed into stages that proceed in a fixed order over time, beginning with sensory input and ending with a response. Feedback loops can be inserted at any point in the chain.

The analysis-by-synthesis model, starts with a hypothesis about the message, applies rules to find out what the input would be if the hypotheses were true and then checks to see if the input does indeed support the hypothesis (Smith, 1977). According to Goodman (1969) reader uses three cueing systems (semantic, syntactic and graphophonic) to comprehend or construct meaning from the text. However, Gough (1972) proposes that a reader peruses the text letter by letter or word by word.

Gibson and Levin (1979) stated that there is not one but many reading processes, ranging from cursory reading to intense studying of text. Nevertheless, their theoretical viewpoint does stem directly from a theory of perceptual learning. Central to their approach is the view that "higher-order structures" are essential to

perceiving patterns of distinctive features in written language and to comprehending oral and written language. These authors regard reading as "an active process, self-directed by the reader in many ways and for many purposes".

Researchers (Mandler and Johnson, 1977; Stein and Glen, 1979) have shown that when encoding stories, both children and adults use organized cognitive structures or schemata which enable them to engage in much top-down, or conceptually driven, processing in their interpretation of story materials. That is, readers come to the task of understanding discourse, such as stories and previously acquired knowledge about the way stories are structured. These schemata act as sets of expectations and guide the interpretation of what is read and influence how it is remembered as well. Consequently, they play an important role in determining the quality of comprehension and the accuracy of memory.

Some studies have shown that deaf children have poor sequencing ability than do hearing children (Pitner and Patterson, 1917; Conard, 1970). And also, Goetzinger and Hirber (1964) have suggested that deaf children have a more rapid rate of short-term memory decay than do hearing children. This combination of poorer sequencing ability

and more limited immediate retention could interfere either comprehension or memory storage or both.

However, a study done by Gaines, Mandler and Bryant (1981) gave a different explanation from the research findings mentioned earlier. Their research did not support the hypothesis that deaf readers would have difficulty in comprehending meaningful sequences and recalling stored prose. It showed that the sequential schematic organization of stories may be internalised despite the absence of early auditory experience in listening to stories. Furthermore, when semantically meaningful stories instead of word lists are used, deaf readers appear to recall as much as hearing readers and, under certain circumstances, recall more story content and more accuracy than do hearing children.

\* \* \* \*

Deficiencies in the reading skills of hearing impaired children have been documented in the literature over the past fifty years. Pitner and Patterson in 1917 reported that median reading scores of deaf people at any age never reaches the median of 8 year old hearing children and that deaf children of ages 14-16 had median reading scores equal to hearing children of age 7. Pugh (1946) reported that none of her groups got median scores at sixth grade level on the Iowa Silent Reading Test. She

also reported only limited improvement in reading achieving between the seventh and thirteenth years of schooling.

Hearing-impaired children rarely learn to read well. Studies of reading achievement indicate that they typically lag 3-4 years behind their hearing peers and rarely progress beyond the fifth grade reading level (Robbins and Hatcher, 1981). Perhaps the relationships between reading, writing and speaking would be similar to those of the hearing children, although these skills are retarded in the hearing-impaired children. Hearing children, however can talk fluently when they enter school, whilst a deaf child must continue to learn to speak at the same time as learning to read and write. This fact alone may influence the relationships between these language skills in profoundly and prelingually deaf children.

Wrightstone Arnow and Moskowitz (1962) did a study on the reading achievement of the deaf children which showed that deaf children of 10.5 and 11.5 years of age had a mean reading grade equivalent of 2.7, while 1075 deaf children of 15.5 to 16.5 years had a mean grade equivalent of 3.5. Furth states is Kananagh (1963) that 90% of deaf children do not learn to read above grade

four. Despite this seemingly poor performance in reading, recent research has shown that reading is the most efficient and effective method of obtaining information for the deaf (Stevenson, 1975).

Despite dedicated and - tireless efforts of educators of the deaf, early severe hearing loss persists as a promissory for reading failure. Not only do the hearing impaired students not progress in reading achievement according to grade level expectations, but the deficiency is cumulative.

During the teenage years, achievement gains obtained by hearing-impaired students begin to show a minimal growth level. Thus the discrepancy between the reading levels of normal hearing and hearing-impaired students becomes greater as their respective ages increase (Myklebust, 1964). In sum, not only do the hearing-impaired students have deficit in reading, but also the reading gains tend to plateau.

Young hearing-impaired readers appear to approach the beginning reading process by recoding. Hart (1967) suggested that most hearing impaired readers convert print to a strictly visual code. Graphic symbols are recoded as lip movements signs or fingerspelling, depending on the child's internalized language system. But the

hearing children who also recode and then decode, engage in silent reading, often subvocalize or overtly vocalize, thus recoding graphic symbols as auditory symbols before decoding the message. This difference in recoding styles has led researchers to conclude that there are concomitant differences in the beginning reading process. However, Ewoldt (1978) found that although hearing-impaired and hearing children recode graphic symbols into different internalized language systems they still use essentially similar strategies for processing written information.

The major survey of reading abilities among deaf children is that of Wrightstone et al (1962) in which 5307 deaf children between the ages of 10 and 16 years were tested on the elementary level of the metropolitan achievement test. At the age of 11 years, the mean reading score was mid-second grade; 5 years later at 16 years, the mean was only one grade higher, at mid-third grade.

Quigley and Thomore (1968) showed that even a slight hearing impairment could result in slow learning, especially in reading. Other studies (Hine, 1970; Wileox and Tobin, 1974) have since confirmed that minor fluctuating hearing losses affect linguistic performance.



### **WHY THIS PROBLEM IN READING?**

It is evident that much research attempting to discern the reasons for the general poor reading performance of the hearing-impaired has focussed on the pathology of deafness, implying there is something basically wrong within the hearing-impaired children that inhibits or precludes learning to read.

Many research findings have been proposed to explain the reading comprehension abilities in the hearing impaired children :

The difficulty of acquiring adequate reading skills has been attributed in part to inadequate language development. For example, Quigley, Wilbur, Power, Motanelli and Steinkamp (1976) have shown that the average 18 year old hearing impaired student cannot understand or use many of the syntactic structures (sentence patterns) that the average 10 year old hearing child understands and uses with ease. Even at the age of 5, although knowledge of the structure of language is not fully developed, the task of learning to read is that of learning another code (written or printed language) for the oral language the child has already acquired. If the child is able to "crack the code" comprehension is instantaneous.

The average deaf child usually does not have a basic knowledge of the language he or she is learning to

read. Both the code (printed symbols) and the language itself are unfamiliar. These children may learn to "crack the code" of the printed message and be able to identify each individual word, but without a solid language base, comprehension does not occur.

Hammermeister (1971) showed that although vocabulary improved, there was no appreciable change in reading comprehension.

Jensema (1975) used age deviation scores to account for differences in vocabulary and reading comprehension and found that performance for both vocabulary and comprehension tended to decline with more severe levels of hearing loss. Similarly prelinguistically hearing-impaired students performed less well than students deafened at an older age.

Reading is a psycholinguistic process (Goodman, 1968; Smith, 1973) and linguistic competence is a reading pre-requisite for both normally hearing and hearing-impaired children (Russel, Quigley and Power, 1976).

The poor reading performance of the hearing-impaired may be the result of conceptual misunderstandings about the linguistic requirements and processes in learning to read (Gormley and Franzen, 1978) .

Areas of linguistic competence which have been studied include phonology, morphology, syntax and semantics. Within these areas, hearing-impaired children obviously suffer phonological difficulties and reading instruction programmes for them seem to be based on the assumption that it is these difficulties which cause reading problems.

Most theorizing about the inability to read has been focussed on the role of audition in reading. For example, Liberman (1974) stated a belief that congenitally, profoundly hearing-impaired children cannot read because they have not had the cumulative experience of hearing language. Brooks (1978) speculated that learning the accents and rhythms of speech is as important in learning to read as the content of the input itself.

It was hypothesized that the reading retardation of the partially hearing is caused in part, by deficits in the area of visual perception. The relationship between reading deficiency and visual perceptual skills was first reported by Gates (1922) who showed that the detection of small differences in words correlated with reading skill. Phelan (1940) pointed to visual perceptual abilities as correlates of reading achievement.

This was further supported by Cooper and Arnold (1981) in their study done on 19 hearing-impaired students. They were aged from 1.9 years to 16.2 years. They found a developmental deficit in visual perceptual skills in the partially hearing unit children. The children showed deficits on all 'the visual sub-tests of the Marianne Frostig Developmental test of Visual Perception (1963) compared with the published norms of hearing children of the same age. They performed at the same level as the hearing controls who were on an average 3.5 years younger. A difficulty in any of the visual abilities measured by the Frostig test may produce a problem in reading a child who shows a disability in all five may therefore be at a considerable disadvantage when learning to read.

Only in the past decade has the role of cognitive processing in general begun to be factored into the investigation of reading within this population and the relationship between reading comprehension and specialized cognitive function has yet to be addressed.

Craig and Gordon (1988) conducted a study to find the cognitive profile of hearing-impaired high school students and to explore the linkage between cognitive profile and reading skills in these subjects. The results indicated that cognitive function was below average for

the verbal and sequential skills associated with the left hemisphere. Reading performance proved to be highly correlated with cognitive profile, as did mathematics performance, and, to a lesser extent speech and age of onset.

Bochnee (1978) was concerned with the hearing-impaired childrens' difficulties in reading syntactic structures and their inability to recognize grammatical anomalies. It may be that their poor reading abilities are manifested in syntactic errors in writing sentences. If a child is only able to actually read "horse eat" in the printed sentence "The horse is eating" then it is very likely that the child will write "horse eat".

Arnold et al (1982) suggest that if poor reading skills are the source of the syntactic errors in writing, then it follows that more effort should be made to teach reading and to increase the child's linguistic awareness of visible language (print) in reading and writing. It would also re-emphasize the integration of speaking, reading and writing in the class rooms.

Numerous studies of hearing-impaired children's reading problems initially attempted to assess their competence in English on purely syntactic grounds. That is, sentences were presented in isolation so that only the

structure of the test sentence could be used by the child in the task (Power, 1971; Brarel and Quigley, 1974). Presenting items in isolation makes for a more difficult, less natural comprehension situation than items presented in context (McGill-Franzen and Gormley, 1980). Thus, these studies may underestimate hearing-impaired students' capabilities, although the gap between hearing-impaired students and comparably aged normal hearing students will not disappear merely by adjusting testing conditions.

Numerous studies have reported on extensive investigation of comprehension and production of syntactic structures by deaf children and youth (Power and Quigley, 1973; Wilbur, Montanelli and Quigley, 1974; Quigley, Montanelli and Wilbur, 1976).

Quigley, Power and Steinkamp (1977) provided a synthesis of the earlier work done and discussed implications of the research for facilitating the development of language in deaf children. The order of difficulty of the various syntactic structures was similar, but not identical, for both deaf (10.0 years to 10.11 years) and hearing (8-12 years) children. Negation (76% correct), conjunction (73% correct) and question formation (66% correct) were the least difficult structures for deaf children, and the same structures -

question formation (98% correct), conjunction (92% correct) and negation (90% correct) were the three least difficult structures for hearing children. This kind of performance can be predicted from transformational generative grammar theory; they involve fewer transformations from deep structure to surface structure than do the others (McNeill, 1970).

For deaf children, more difficult structures were pronominalization (60% correct) the verb system (58% correct), complementation (55%) and relativization (54%). The hearing children too found these difficult, although the order for them was pronominalization (90%), complementation (88%), relativization (82%) and verbs (79%).

Deaf students found the disjunction and alteration tests to be the most difficult (36% correct), while hearing students (84%) and much less difficulty in them. This may be explained by the complex semantic nature of sentences having these structures.

The authors draw a tentative conclusion that syntactise structures develop similarly in deaf and hearing children, but at a greatly retarded rate in deaf children.

Scholes, Cohen and Brumfield (1978) presented a group of hearing-impaired subjects and sentences in a variety of syntactic forms and tested comprehension by having subjects indicate if the four similar pictures correctly represented the meaning of each test sentence. They found that the congenitally deaf showed a deficit in the acquisition of certain syntactic aspects of normal language. It seems clear that syntax contributed something to the comprehension difficulties of the subjects; simple active sentences being easy to understand, while other constructions being more difficult.

Robbins and Hatcher (1981) conducted a study on 36 hearing-impaired children of the age range between 9 and 12 years. They found that word recognition and word comprehension training did not affect subjects' comprehension of the test sentences. Instead, the comprehension difficulties seemed to be due to syntactic rather than morphological or semantic deficit. There is a hierarchy of syntactic difficulty for hearing-impaired children. Passives are most difficult, followed by relative clauses, conjunction and pronoun substitutions, and indirect objects. Simple active sentences of the subject-verb-object form are easiest to comprehend.



Since these researchers tested comprehension of sentences in isolation rather than in connected discourse, one cannot generalize concerning the effects of a conceptual framework on comprehension. Franzen and Gormley (1978) claimed to show that at least one syntactic form, the passive, was easier for hearing-impaired children to understand in context than in isolation. It may be, however, that unless the entire context is pretaught (or "prelearned" as Franzen and Gormley's "Little Red Riding Hood" may have been), the ambiguity of sentences cannot be reduced sufficiently to allow subjects to overcome their syntactic deficit.

Linguistic competence in the form of word recognition and word comprehension is not sufficient to disambiguate difficult syntax. The semantic schema of hearing-impaired children is either too limited or too idiosyncratic for simple word knowledge to improve comprehension. The hearing-impaired reader must have some syntactic knowledge to comprehend many standard English constructions.

Bellugi and Klima (1975), established that the hearing-impaired are not linguistically deficient but are linguistically different, somewhat like a bilingual child. The learning of written English may be thought of as a

second language for the hearing-impaired child whose first language is sign (Stroke, 1975) . But, this child, unlike the bilingual child will never have the opportunity to read written sign as there is no orthographic representation for sign language. Hence the hearing-impaired child may be described as a uniquely different reader.

In addition to the various possible reasons, there are some other factors that also contribute to the reading problem in the hearing-impaired:

Apart from the language development, reading materials too are very important. This is the second great need in reading for hearing-impaired children. Most currently available materials do not meet the needs of deaf children. The majority of beginning reading books include complex language patterns and vocabulary items unknown to hearing-impaired children. Research has shown the need for materials that provide gradual, systematic and repeated exposure to new language structures and vocabulary.

Familiarity has been cited as a salient factor in hearing-impaired (Gormley, 1981) and hearing (Gormely and Mare, 1979) students' understanding of written discourse. That is, readers are more likely to be able to comprehend a selection about a familiar topic than an unfamiliar one.

Gormley (1981) found that familiarity with selection content significantly facilitated third-grade-level reading ability of hearing-impaired students' comprehension. The readers showed better comprehension with familiar passages even though the paragraphs were structurally equivalent.

Davey, B Lasassoc and Macready, G (1983) conducted a study on 50 prelingually, profoundly hearing-impaired students and 50 hearing students to compare their performance on selected reading comprehension measures. While the deaf subjects were aged between 12-18 years with a mean age of 15.98 years, the hearing subjects were aged between 10-12 years with a mean age of 11.01 years. They found that :

(1) Deaf and hearing subjects did not differ appreciably in terms of the various task consistencies and variabilities on most of the task considered; (2) The composite mean score on all tasks (Comprehension tasks such as: multiple choice tasks, free response task, close task, modified cloze task) for hearing-impaired subjects was lower than for hearing subjects; (3) Differences were found between deaf and hearing subjects performance on question type tasks (multiple choice/free response) depending on lookback condition. For deaf subjects, differences between question types were found for both

lookback and no-lookback conditions. However, for hearing subjects, the differences were significant only in no-lookback condition.

Both the groups of subjects showed higher level of performance on question tasks when permitted to refer back to the text. However, it appears that looking back may increase hearing subjects scores (especially on freeresponse tasks) more than it increases hearing-impaired students' scores as the latter group appeared to utilize the lookback opportunity relatively lesser than did hearing subjects.

Deaf students' reading comprehension is typically measured by standardized informal measures designed for hearing students (Lasasso, 1978). Most of these measures use questions to assess comprehension and vary in terms of whether students are permitted to lookback (ie. reinspect the text) while answering questions or whether they recall the text without the benefit of the text.

It is generally recognized that the nature of the reading task changes considerably for hearing readers when a lookback task condition is employed. Lookback task conditions have also been found to influence deaf readers' performance on reading comprehension tasks.

In a follow-up study (Lasasso and Davey, 1983) findings suggested that deaf students' performance on reinspection tasks is not age-related but instead may be related to visual-matching test-taking strategies.

When Lasasso (1985) conducted yet another study on deaf subjects (ranged in age 14-18 years) the results showed an extensive use of visual matching test-taking strategies by the deaf readers in testing situations in which readers are permitted to refer back to the text while answering questions. However, the use of visual matching strategy did not appear to be related to overall reading comprehension test performance for deaf subjects. Subjects with overall better performance on the lookback task used visual matching as much as subjects with overall poorer performance on the task.

Research is needed to determine why visual matching strategies are used so extensively by deaf readers. It is conceivable that deaf students are reinforced for their use of this strategy by teachers who accept a response as correct, even if it is not completely meaningful, as long as it contains a few key words.

There have been studies that have shown that the hearing-impaired children do have previously unsuspected receptive control over written language in varying degree.

Gaeth (1967) showed that hearing-impaired children responded better when they were presented with written material than when they were presented with material using oral-aural communication. Stuckless and Pollard (1977) showed that children raised using finger-spelling could process the written form more readily than finger-spelled patterns and Blanton (1970) showed that hearing impaired students scored highest in comprehension for passages that were written in order of sign language. Marshall (1970) also found that cloze responses for hearing-impaired readers improved from phrases, to sentences, to paragraphs.

In the practised reader, comprehension rests, on well-established mechanical skills. The learner must, however, develop perceptual motor mechanical skills as the basis for full comprehension. At least 3 classes of abilities underlie reading: Perceptual, short-term memory and inferential. Such skills develop in the hearing between 3 and 7 years and around the age of 5 the ability to see the true size, shape and location develops.

A child with a damaged auditory system finds difficulty in discriminating between sounds and as a consequence finds the phonic method of instruction difficult. Children who rely to a large degree on a visual code are likely to have problems with reading.

Very little research is available on the actual abilities and motivation of hearing-impaired adolescents to learn to read and write. Demographic studies indicate that, deaf students attending special schools or classes demonstrate little growth in reading achievement between the ages of 13 and 20 years and that only about 10% of young deaf adults can read at or above the sixth grade level (Trybus and Karchmer, 1977), the level of many daily newspapers. However, Hammermeister (1977) and Crandall (1976) have demonstrated that when provided with suitable instruction, hearing-impaired young adults are able to achieve far greater gains in reading and writing skill development than evidenced in current demographic studies.

According to Lasasso (1978), approximately three-fourths of the programmes educating hearing-impaired children in the United States employ a basal reading series as either their primary or supplementary approach to teaching reading. Most of the times, teachers of the hearing impaired must modify the structure of the text to fit the needs of their students. They are forced to change linguistic structures and to develop an abundance of supplementary materials in order to aid their students' comprehension of the material.

During the past 15-20 years, considerable research has been conducted to explain why hearing-impaired

students do not perform as well as normal-hearing students on measures of reading comprehension. Most of these studies focus on variables in the reader, such as linguistic and cognitive variables. Relatively few studies examine instructional variables that might influence the develop of students reading abilities (for eg., types of instructional materials and specified instructional methods).

Educational programmes for the hearing-impaired continue to face an enormous, unresolved challenge.

The various methods of meeting this challenge have been classified into direct and indirect intervention system. Direct intervention method normally involve implementing specific reading instruction with students. While the indirect methods call for the improvement of the professional skills of the people who provide the educational environment of the student on the theory that such improvement leads to the desired gains in achievement.

Serwatka, Hesson and Graham (1984) found that the deaf students involved in the project on indirect intervention system on reading achievement showed significant improvements in reading.



There are few texts concerning methods of teaching reading to the hearing-impaired. Hart (1963) advocated starting with sight vocabulary and word recognition skills and proceeding to planned experiences designed to build language and concepts. She also noted that the deaf children usually show progress until III grade, at which point their reading ability levels off.

In the Clark School for the hearing-impaired children curriculum series on reading (1972) word attack skills and phonetic sight reading are emphasized. Comprehension is seen as "two processes - getting the facts and reading beyond these facts to make judgements".

Traux (1978) encouraged the teaching of grapheme-to-phoneme patterns, spelling patterns and whole-word configurations to enable decoding. She also recommended a group of strategies that relate to linguistic organization or the prosodic, syntactic and semantic relationships among word units.

Quigley, Power and Steinkamp (1977) concluded that research and instruction in reading with hearing-impaired children should concentrate on (a) the modification of reading materials for deaf children in the early stages of learning to read and (b) a greater understanding of the psychological processes involved in these childrens'

learning to read. There is a consensus that for hearing students teaching reading involves decoding and comprehension skills. While decoding is the translation of printed words into a representation of spoken language, comprehension is the actual understanding of that representation.

In this view (concerning the relationship of decoding comprehension to language development) reading is considered a second-order processes that stems from prior language competence. The teaching method with this view places emphasis on the relationship of graphic information to its parts - linguistic structures, words and letters. This is known as phonics approach (which emphasizes the phonetic structure of words).

Another view of reading emerged from Gestalt psychology, which was concerned with the meaningful whole, the familiar and the concrete in the learning situation. This is the look-say or whole-word approach.

These methods co-existed peacefully until Flesch (1955) published a "best seller" in which he advocated a move from teaching reading as a holistic, unitary processes to teaching first subskills and then the assimilation of these skills.

Inspite of all these methods, no single method is used successfully to teach reading to the hearing impaired population. The current state of instructional methodology is one of eclecticism.

A great need in reading for hearing-impaired children is that of special reading materials. Most currently available materials do not meet the needs of the deaf children. Majority of beginning reading books include complex language patterns and vocabulary items unknown to the hearing impaired children. It has been proposed that beginning materials for reading be modified to conform more closely to the language performance of deaf children. The vocabulary, syntax and inference levels of commonly used reading materials are too complex for most hearing-impaired children. Investigations (Vogel, 1975) have been interpreted as showing that when the syntax of written material does not match the syntax of a hearing child's internalized auditory language, he or shee alters the written syntax to correspond to hearing impaired, hence depends on which symbol system the child uses to recode reading (auditory words, signs, fingerspelling, visual words) and what language structure the child uses (ASL, Standard English).

The research on syntax in the language of deaf students by Quigley and Associates led to a standard form

of Test of Syntactic abilities (TSA) for clinical and classroom use. The TSA syntax program and leading milestones were also constructed. "Reading Milestones" is a reading series consisting of 8 levels of linguistically controlled reading books and workbooks specifically designed for the hearing-impaired population.

Other special materials are prepared by a number of individuals at various institutions such as Gallaudet College, the National Technical Institute for the Deaf and the University of Nebraska-Lincoln.

However, the instructional value of basal reading programs has been seriously questioned by the experts in the area of reading instruction.

Many basals, especially those at primer levels, use patterns of language which are inconsistent with the language that children use in their daily interactions. Structures such as pronouns, passives and contractions are often deleted (Gowley, 1978) even though these are included by children in their personal communication at an early age.

While researches (Barclay and Reid, 1974; Garred and Sanford, 1977) have shown that children and adults process texts as meaningful wholes, in basals, emphasis is

placed on elements such as letter and letter-sound relationships, words, phrases and single sentences (Goodman, 1986). Due to this both students and teachers pay more attention to the discrete elements and inadequate attention to understanding at the story level.

Several researches (Klare, 1975, Pearson et al, 1979/ E.Woldt, 1984) have shown poor performance in text coherence in basal readers. This was further confirmed by Israelite and Helfrich (1988). Their study investigated, through empirical research, the text coherence of selected stories from the Reading milestones basal series. The subjects were 30 students (15 hearing and 15 hearing-impaired students) aged 8 years 7 months to 9 years 2 months and 10 years 8 months to 13 years (of the 2 respective groups).

Two basal stories (i) Dad's helper and (ii) Garuaga, the lizard, were chosen. The students read both the original and the revised stories. Multiple choice questions were posed at the end of each story to find the comprehension ability of the students.

This study found that revised stories (revised versions of the basal stories to normal stories) which improved text coherence facilitated the comprehension process for hearing-impaired. Whereas this difference

between original and revised stories was not seen among normal hearing children.

The results support the position that efforts to control readability through manipulation of syntax, sentence length and vocabulary may result in texts that are more difficult, rather than less difficult, to understand due to their lack of coherence.

It may succinctly be said that numerous studies have been conducted regarding the reading materials for the hearing-impaired. This issue has been very debatable. While few researchers advocate the use of basal reading materials, few others have shown in their respective studies that the basal materials do not aid reading comprehension.

Similar kinds of studies have not been conducted in India as there are no basal materials available in Indian languages. However, the need for commercially/easily available teaching aids has been increasingly felt as a result of which attempts at producing these on a large scale are being initiated. At this juncture, it is appropriate to investigate some of the issues related to production of teaching materials for the hearing handicapped in our own context.

## METHODOLOGY

**Aim :** To find the effect of story structure alteration on reading comprehension in normal and hearing impaired populations.

**Subjects :** 36 students (18 normal hearing and 18 hearing-impaired with the degree of hearing loss ranging from bilateral moderately severe to bilateral profound SN) were selected from different Kannada medium schools. The details are given in Table-1.

The children aged between 8-11 years in both groups were selected. Subjects were selected from both the sexes. They were studying in the I, II, III, IV and V grades.

Social status of the subjects ranged between lower middle and upper middle classes. All the subjects chosen spoke kannada at home also.

These subjects did not have any medical or psychological problems. They were of average intelligence.

**Hearing Aid Usage :** The eighteen children had been using hearing aids (Mainly pseudobinaural amplification) since four years on an average.

**Speech Therapy :** Only one child had been attending formal speech therapy. Four others were given special attention in resource rooms in their integrated school.

**Mode of Communication :** Most of the hearing impaired children of the segregated school communicated via the auditory mode along with speech reading. In addition to this, few used gestural language at times. However, the students from the integrated school used cued speech.

TABLE-1 : Representing the Age, Sex, Hearing Loss and Hearing-Aid Usage of the Subjects (Normal and Hearing-Impaired)

	Age (in Years)	Mean Age (In Years )	Sex	Hearing Loss	Usage of Hearing Aid (Average Years)
Normals	8-9	8.3	3 Females 3 Males		Not applicable
	9-10	9.3	3 Females 3 Males		-do-
	10-11	10.4	3 Females 3 Males		-do-
Hearing- Impaired	8-9	8.4	3 Females 3 Males	Bil Sev-SN Bil Sev-SN	4.4
	9-10	9.5	3 Females 3 Males	Bil Mod-Sev-SN Bil Sev-SN Bil Prof-SN	4.4
	10-11	10.9	2 Females 4 Males	Bil Mod-Sev-SN Bil Sev-SN Bil Prof-SN	5.0



## MATERIALS

The original stories are:

- (i) RANGA mattu na:ji (Ranga and the dog)
- (ii) a:NE (The elephant)
- (iii) bi:YABA LLANA dza:nadu (The wise Birbal)
- (iv) KALLA mattu vANA ta:ji (The robber & his mother)

These were selected from the materials prepared by Rama (1980). They were then altered in terms of sentence structures, with reference to the information obtained in the review of literature. This was envisaged to use the new story formats as "basal stories" or "revised stories".

The following changes were done to the original stories:

- i) Decreasing the length of sentences
- ii) Simplifying the syntactic structures
- iii) Using simple sentences in place of compound and complex sentences
- iv) Using active voice in place of passive voice
- v) Using simpler vocabulary
- vi) Deleting sentences which are repeating in the original stories.

## Test Environment

The test rooms were such that they were free from auditory, visual, olfactory distractions. child was seated comfortably on a chair opposite the tape recorder.

Appropriate lighting arrangement to enable child to read without difficulty, was taken care of.

#### Procedure

Child is first instructed as to what he/she needs to do: -

- i) Read the stories loudly
- ii) Understand each sentence well
- iii) Read the questions and provide the answers.

Child is made to read each story twice. Any new words or vocabulary the child comes across is explained. For instance, words like gallu (Hang); a:gna:pisu (To command), etc.

Soon after this, he/she is asked to read the five questions (behind each story) and answer immediately.

Both the groups (normals and hearing impaired) were divided into two sub-groups each. That is, 3 children in one sub-group (Group A) and 3 in another (Group B) of each grade.

The group A subjects were given the original version of story-1 and revised version of another story-2 and the Group B subjects were given the revised version of story-1 and original version of story-2.

Children from grades I, II and III (ie. 8-9 years) were given only the first two stories, while children from grades III, IV and V (ie. 9-10 and 10-11 years) were given all four stories.

### Scoring

The responses of the children were rated on a 10 point rating scale. Correct answer was given 10 points and completely wrong answer-0 point. The details of the rating scale are given below :

- 10 : Complete sentence with correct answer.
- 9 : Correct answer but doesn't complete the sentence
- 8 : Correct answer is given but in a minimally grammatically wrong sentence.
- 7 : The child has the idea of the answer but is unable to put it in the syntactically correct sentence.
- 6 : The child misses out 1/3rd of the correct answer.
- 5 : Only half of the answer is provided.
- 4 : Half the answer is conveyed through content words.
- 3 : Child has the idea but answers using only the 2-3 main content word.
- 2 : Uses only 1-2 main content words [Eg. tc answer correctly.
- 1 : The uttered words are semantically related to the target response.
- 0 : No response/complete incorrect answer.

## RESULTS AND DISCUSSION

The data on eighteen normal subjects and eighteen hard of hearing subjects was analysed on both qualitative and quantitative parameters.

The quantitative parameters - age and story structure, indicated that normals performed better than hearing-impaired subjects in the original as well as the revised story tasks. While the normals did not show a significant difference in performance across age and original/revised version of the story, the hearing-impaired subjects performed better with original stories than with the revised stories. These subjects also showed an increasing developmental trend with both the stories.

TABLE-2 : Comparison of Mean Scores of Original Stories and Revised Stories between Normals and Hearing-impaired Subjects

Age (Years)	Max. Score	Normals		Hearing-Impaired	
		Mean Score	STD Devia- tion	Mean Score	STD Devia- tion
8-9	9	Original			
9-10	9	18.3	0.18	4.9	0.34
10-11	9	8.7	0.36	5.8	0.40
		Revised		Revised	
8-9	9	8.6	0.17	<b>1.8</b>	2.50
9-10	9	8.2	0.34	<b>1.8</b>	2.00
10-11	9	8.8	0.23	<b>3.2</b>	1.20

A test of significance of difference between means, the t-test was applied. The mean scores obtained on the original versus revised versions at all ages were compared between normals and hearing-impaired populations.

The mean scores across age of both original and revised stories were also compared in normals and hearing-impaired subjects.

### **Age**

The normals did not show significant difference across any age group in both original and revised stories (Table-2). They performed at near maximum levels from the youngest age level onwards (Graph 1). The results of this study are in agreement with the previous literature which has shown that normals master the ability to comprehend and narrate stories by 8-9 years. The hearing-impaired subjects however performed poorly in comparison with normals at all ages (Table-2). All the three age groups performed much below the maximum mean scores (Graph 1). The comprehension or performance became better with age in case of original stories; though the difference between age was not significant. However, the subjects did not maintain this kind of a developmental trend with the revised stories.

### **Story Structure**

In terms of story comprehension, the normals performed almost equally well on both original and revised stories (Table-2). Though the story structure changed, reading comprehension remained unaltered. The revisions of the stories neither aided nor took away from their ability to comprehend the stories. It was also observed that the extent of difference between original and revised stories decreased with increase in age (Graph 1). This may be due to the adequate language abilities in the normals. And also because they made appropriate usage of the minimum number of clues available.

Hence, the hypothesis that revised or simplified sentence structures improve comprehension in normals (Beck et al, 1984) is not supported.

However, the qualitative analysis discussed in length later, shows that their responses to the original stories were much better. The response got richer in language with increase in age.

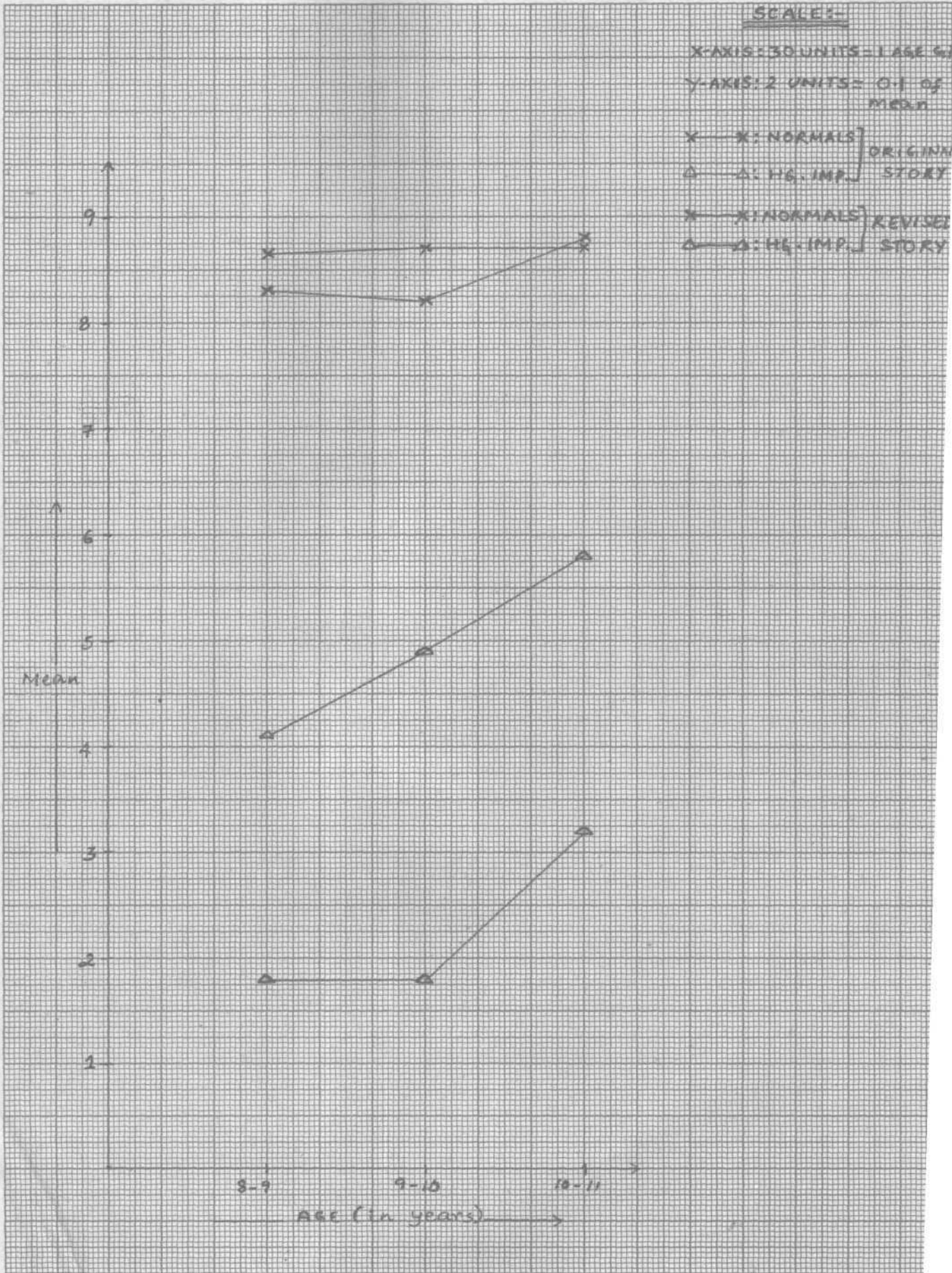
The altered story structure had a discernible negative impact on the comprehension of these stories in the hearing-impaired. A significant difference (4.76 at 1% and 5% levels) of the comprehension abilities was seen between original and revised stories in the 9-10 years age

group (Table-2) . That is, comprehension was better with original stories than with the revised stories (Graph 1). Restructured or simplified stories made an already difficult task (because of the hearing loss) even more difficult. However, the mean values showed a better comprehension score for original stories (Table-2).

The expected differences between normals and hearing-impaired subjects were seen among the children belonging to original and revised stories. All the three age groups showed significant differences (5.3, 15.3 and 8.4 at both 1% and 5% levels of 8-9 years, 9-10 years and 10-11 years respectively) between normals and hearing-impaired in comprehension of revised stories. However, the difference between normals and hearing-impaired for original stories was significant (3.76 at 5% level) only in the 8-9 years age group.

This shows that the difference between normals and hearing impaired is lesser with original stories than with revised stories (Graph 1).

This implies that hearing-impaired readers were better able to understand original stories, to organize and clarify events, even though the sentences were often more complex. The increased coherence of original text



GRAPH-1: REPRESENTATION OF THE MEAN PERFORMANCE OF NORMALS AND HEARING IMPAIRED GROUPS ON ORIGINAL AND REVISED STORY STRUCTURES.



allow hearing impaired readers, easier access to print/written materials at the meaning or semantic level.

The results also indicate that simplification of structure (in terms of syntax, sentence length and vocabulary) in the revised stories do not lead to clear expressions of relationships between ideas.

### **QUALITATIVE ANALYSIS :**

#### **Normals**

8-9 Years (Original): Production of complete sentences with a MLU of about 5-6 words is seen. The adjectives and conjunctions are used appropriately thereby presenting the original essence of the story. Eg. *raṅṅanna na:jiḡe hoṭṭe tumba: ha:lu koṭṭanna.*

(Ranga gave a lot of milk to the dog). The subjects have also shown compound and complex sentence constructions. Eg. *a:neḡe maḡanna suṭṭe ṅaṅṅa sonḡilānda suṭṭi nannaṅṅu me:lakketitu*

(The elephant put its trunk round the boy and lifted him up). They have used active voices in their answers and hence have given conversational answers. Eg. *ṅvaḡu a:neḡe,"ni:nu makkaḡanna kollu" endu ne:ḡidāḡu.*

(She told the elephant, "You kill the children).

Revised : The subjects of this group performed similar to those of the previous group in most of the items (complete sentence production, compound sentence construction, etc.)

2 of the three subjects however provided part of the answer for two questions. Eg. "ni:nu manujannu konde"

(You killed the man) for "ni:nu tandejannu konde, ivarannu: koll

(You killed the father, kill them also). Otherwise, the complexity of the sentences remained the same as that of the original group.

9-10 Years (Original) : Construction of lengthy (with approximate MLU of 7 words), complex/compound sentences are seen. The subjects were able to recite the conversational parts (such as the answers to questions - What did Birbal say or what did the thief say) of the stories which implies good understanding. They understood the abstract and logical issues of the stories, thereby answering questions like "What was Birbal's plan?" "How did Birbal find out who the thieves were", correctly.

Revised : The subjects of this group too constructed sentences of 7-8 words. Complex and compound sentence constructions are also seen. They too, like the previous group subjects, used active voice sentences in their response. However, all of them provided part of the answer. Eg. *kivijannu kadidannu [He bit the ear] for ta:ijannu bigidappi kivijannu kadidannu.* (He hugged his mother and bit her ear off). This was especially true of questions related to abstract thinking such as working out a plan or moral of the story, etc.

Eg. Birbal's plan and also how he gets to know who the thieves are.

10-11 Years (Original) : The sentences constructed were more complex and lengthier (ie. 8-10 words/sentence) than the previous age group. Eg. "ni:vu ilige baruvudakke muntse nimma mi:sege atiruvu hattijannu tegedu baraba:valittē," endu ke:lidannu.  
(Before coming here shouldn't you all have removed the cotton sticking to your moustaches? he asked)

The subjects of this group performed more accurately than the subjects of the previous age group, by using more precise grammar, vocabulary, sentence structure formation, etc.

Revised: The subjects of this group also constructed sentences MLU of about 8-10 words. The complexity of the responses was found to be the same as that of the previous group. And they used active voices in their responses wherever it was found to be useful. This may imply that there is good understanding of the sentence inspite of the change in the sentence structure.

### **Hearing-Impaired**

8-9 Years (Original) : The responses were syntactically wrong. Eg. ka:lu sattu (leg die) for-ka:lu ketage sattanu  
(He died underneath the leg). They also showed incomplete sentence production. However, all the three subjects

seemed to have an idea of the stories, which they expressed through minimally correct utterances. Eg.

Target response - *avudū a:nege "makkaḷannu sa:jisu" endu he:ḷidḷu*

(She told the elephant, you kill the children)

Subject response - *"makkaḷannu a:ne sattu."*

(Elephants die the children).

Revised : Two of the three subjects showed poor performance. There were either no responses or wrong responses. And the correct responses once again were incomplete (as in the previous group). Post-positions were not used correctly. Also the incomplete sentences had minimal semantic relationship with the target response.

Eg. Target response - *ka:ḷḷindaḷ tuḷidu sa:jisitu*

(It stamped by its leg and killed him)

Subject response - *ka:ḷu (Leg)*

9-10 Years (Original) : All three subjects constructed complete and correct sentences most of the time. They related their answers to the questions thereby using the latter as a frame to utter complete sentences. Lengthier sentences with an average MLU of 4-5 words as against the 2-3 word MLU of the previous group, were constructed. But some were syntactically wrong. Eg. *olḷe keḷasa ma:diḷḷu* (She did a good thing) for *"olḷe keḷasa ma:diḷe," endu he:ḷi* (She said "you did a good thing"), and while others were

wrong responses. No responses were obtained for the fourth question of the first story (na:ji raggana manejanu e:nu ma:ditu?) (What did the dog do to Ranga's house).

Even the incomplete and grammatically wrong sentences had the important content words. And these sentences tended to have semantic relations with the target response.

Eg. Target response -avnu avnu hallininda kistidanu  
(He bit with his teeth)

Subject response - kistisi ma:didanu.  
(He did biting).

Revised : The overall number of responses is lesser (both correct and incorrect) than the subjects of the original group. Among the correct responses there are a few complete sentence production and few other incomplete and/or syntactically wrong sentences. It is noticed in this group also that all three subjects have failed to answer the fourth question of the first story and the questions involving conversations, regarding plans, or in other words the abstract aspects of the stories, Eg. Birbal's plan, conversation between thief and minister, etc.

Their answers were less lengthier (MLU of 3 words) and were simpler than that of the previous group.

Eg. Response of previous group : *aduttidda ta:jige avanu kivijannu kadi dnu.*  
 (He bit the ear of the weeping mother).  
 Response of this group: *avanu kivijannu kadi dnu*  
 (He bit the ear).

10-11 Years (Original) : All the three subjects answered more accurately than the other groups (with respect to age group and type of story groups) in complete sentences which has an approximate MLU of 5-6 words. However, two of them failed to answer, the question concerning a conversation, abstract thinking and comprehension of complex or compound sentences. Eg. "*ni:vu illige baruvamu-ntse nimma mi:sege antiruvu hattijannu tegedu barabairaditte?*"  
 (Before coming here shouldn't you all have removed the cotton sticking to your moustaches?). While the remaining one got the gist of the story and was able to answer the related answer.

Revised : All the three subjects performed better than the children from the age groups 8-9 and 9-10 years (of the revised category) in terms of syntax, number of correct responses, sentence length. But as compared to the original group of this age (10-11 years), the overall number of responses is lesser and the number of wrong responses in terms of syntax, meaning sentence completion, is more. Here all the three subjects failed to answer the questions which two subjects of the original group did not answer.

A better performance was expected by the group A and B subjects, aged between 10-11 years. However, the analysis showed it to be otherwise. This is because four of the 6 subjects (2 out of 3 in each group) performed at lower levels than the remaining two subjects. These 4 subjects were selected from the integrated school while the 2 subjects were selected from the segregated school. The subjects of these two groups differed in terms of overall story comprehension, receptive vocabulary (ie. the 4 children found a larger number of words to be unfamiliar or new).

This however is contradictory to the reported literature which shows that integration has an advantage over segregation for language abilities. Hence an eclectic approach (of cued sp, oral aural approach, lip reading is preferred for better expression and comprehension by hearing-impaired).

The present study clearly shows that the mode of communication and training contributes to a large extent for adequate language acquisition.

### **SUMMARY OF DESCRIPTIVE ANALYSIS**

It may be observed from this qualitative analysis of responses of normals that comprehension and text coherence is not affected much inspite of the change in story structure. The gap or difference between the original and revised text coherence gradually narrows down with increase in age. However, the responses of the children belonging to the original group appeared to be more richer in content, than that of children belonging to the revised group. They used almost the same sentence structures, words or similar vocabulary, as that of the story text which may indicate better and clearer comprehension.

The hearing-impaired group showed a significant difference in their responses between the original and revised groups. The children of the original group performed better than those of the revised group in terms of accuracy of response, content of response, sentence formation and vocabulary.

Like the normals, even this group showed a positive developmental trend in both the original and revised stories, thereby narrowing the gap between the 2 populations.



## SUMMARY AND CONCLUSIONS

The aim of this dissertation is to find the effect of story structure change on reading comprehension in normals and hearing-impaired.

So as to accomplish this, thirtysix subjects (18 normals and 18 hearing impaired) were taken for the study. They are of the ages 8-9, 9-10 and 10-11 years. The degree of the hearing loss ranged from moderately severe to profound SN loss.

Four stories were selected from the stories prepared by Rama (1980) . These are considered as the original stories. The revised versions of these are the stories with the change of sentence structure.

Each group was divided into two sub-groups in both normals and hearing-impaired subjects. While one sub-group was given an original story-1 and a revised story-2, the other sub-group of the same age was given the revised version of the original story-1 and the original story-2. The reading comprehension was tapped through questions.

The results showed that normals had minimum differences between the original and revised versions of the stories in all age groups. However, the hearing-

impaired subjects performed significantly better in the original stories as compared to the revised stories.

This clearly implies that reading comprehension is not affected in the normals inspite of the change in story structure, while story structures do affect the reading comprehension in the hearing-impaired. That is, changing the sentence structure in terms of length, simplified syntax and vocabulary, hinders the reading comprehension.

Hence, this study also implies that the hearing-impaired subjects should be reading well-written stories/materials which are naturally cohesive instead of basal materials which are developed to meet a pre-determined set of rules for syntax, sentence length or vocabulary.

#### **Limitations of the Study**

1. Small data of 6 subjects was used in the study. Better generalization may be obtained with the use of larger data.

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YANGA MATTU NA:JIORIGINAL

YANGANA MANEJA BA:GILN HATTIRA ONDU  
 NA:JI ITTU. ADU KIRUTSIKOLUTTITTU. YANGANU  
 ADKKE HOTTETUMBA: HA:LU HA:KIDANNU.  
 NA:JIGE SANTO:SAVA:JITU. ADU BA:LVANNU  
 ALLA:DISITU. ADU I:GN YANGANA MANEJANNU  
 NO:DIKOLUTTIDE.

REVISED

NA:JI MANJONDU YANGANA MANEJA  
 BA:GILN HATTIRA KIRUTSIKOLUTTITTU.  
 YANGANU ADKKE HOTTETUMBA: HA:LU  
 HA:KIDANNU. NA:JI SANTO:SDINDN BA:LVN  
 ALLA:DISITU. I:GN ADU YANGANA MANE-  
 JANNU NO:DIKOLUTTIDE.

A:NEORIGINAL

OBBA MANUSJANA BA:JI ONDU A:NE  
 ITTU. VANNU ADKKE SA:KASTU A:HA:RVANNE:  
 KODUTTIRALILU. A:DNNU: ADVINDN BE:KA:DNSTU  
 KELSN MA:DISIKOLUTTIDDANNU. A:NEGE TUMBA:  
 KO:PN BANTU. OMME TANNA JADZAMA:NNANNU  
 KALN KELIGE. HA:KI TUPIJITU. VANNU SATTUHA:-  
 DANNU. VANNA HENQALI NANTODANGIDANU. TANNA

makkalannu tandu ainejn ka:ln kelage  
 ha:ki, "a:ne! ni:nu tandejannu konde. i:  
 makkalannu: kollu." endu he:lidanlu.  
 a:ne makkalntta: no:ditu. dodan  
 magannu sutta tanna sondilannu suttitu.  
 avannnu me:lkettti, tanna kattinn  
 me:le ku:risikonditu. andininda adu a:  
 ba:lkn he:lidannte nadedukollntodng-  
 itu. avniga:gi kelasn ma:dntodngitu.

### REVISED

obba manujannidda. avann hattinn  
 ondu a:ne ittu. adakke avannu sa:ka:-  
 distu a:haravannu koduttirnililla.  
 a:duru: tumba: kelasn ma:disikollutt-  
 iddinnu. a:nege tumba: ko:pa bntu.  
 adu tanna jadzama:nnannnu, ka:ln  
 kelage ha:ki tulidu, sa:jisitu.  
 avann henditi ntodngidnlu. avalla  
 makkalannu a:inejn ka:lnkelage ha:ki  
 "ni:nu tandejannu konde. ivannnu:  
 kollu," endu he:lidanlu, a:ne dodan  
 magannnu sondilinda me:lkettti  
 tanna kattinn me:le ku:risikonditu.  
 andininda adu a: ba:lknannnu tanna  
 jadzama:nnante kanditu.



bi:rnballann dza:natann.

ORIGINAL

akbarann ra:dza<sup>h</sup>a:nijalli  
hattijn vja:pa:rijobbn iddnu. avnige  
aidu hattijnnu tumbuvn mnegnl-  
liddnu. ivugnlinn prtidinnu:  
hatti kaluva:iguttittu. vja:pa:rijn  
bnli hatta:ru dzann a:lugn<sup>l</sup>iddnu.  
"hatti kadduvru ja:ru?" endu  
ke:liddre "na:valln sva:mi" ende:  
ellnu: annuttiddnu.

vja:pa:ri enu: ma:dnlu gott-  
a:gn<sup>e</sup> bi:rnballann bnlig<sup>e</sup> bndu  
tann kalluvannu to:dikondnu.  
bi:rnbnl svnlpn hottu jo:tlisi "na:le  
be:ngge hinn se:vakrnnella: nann  
mnege tsnha:kke kaluhisu" endnu.  
vja:pa:ri "a:gnli" endoppidnu.

tsnha:dn suddi ke:li a:lugn<sup>l</sup>  
snnto:sgondnu. mrvudinn be:ngge  
a:lugnlella: bi:rnballann mnege  
ho:dnru. "banni, banni" endu bi:rnbnl  
sva:gn<sup>t</sup>isidn. nantnn kalluvannu  
patt<sup>e</sup>htstsvn sluva:gi ondu  
upa:ijn ma:didnu. avnu ngutta:  
"vja: hatti kalluvra: illige

baruvudakke muntse nimma mi:sege  
 antiruvu hattijannu tegeduha:ki barn-  
 ba:nda:gitte?" endu summa summane  
 ke:lidannu taksan ibbaru a:lugaflu  
 ga:barijinda tamma mi:segalannu  
 mutti no:dikondaru. idarinda bi:rn-  
 ballenige avre: kaliru endu tilijitu  
 avnu avri kai hididukondu "ni:ve:  
 kaliru, olleja mastinalli nimma jndz-  
 nma:nnige ni:vu kndda hattijannella:  
 va:passu ma:di" endannu. va:pa:ri birn-  
 ballann bud<sup>h</sup>isaktige a:starijn pat:thu.

REVISED

Akbaran va:dznd<sup>a</sup>:nijalli hatti  
 vja:pa:rijobba idda. avnige idu  
 hatti tumbuvu mnegalliddivu. illin-  
 da prtidivuvu: hatti kaluva:guttittu.  
 vja:pa:ri tanna a:lugaflannu "hatti  
 knddavaru ja:ru?" endu ke:lidannu.  
 aiga ellaru: "nainu nlla" endu he:lidannu.

aiga avnu bi:rnballinn hattin  
 ho:gi idannu he:lidannu. bi:rnball, avn-  
 ige, "nafe be:ngge nimma se:vakannella:  
 nanna mnenge tsha:kke kaluhisu,"  
 endannu.

mirudina belege a:lugula: bi:ra-  
 ballana manege ho:drau. bi:raba  
 sva:gtisida. bi:raba ondu upa:ja ma:-  
 didanu. vanna ngutta: "hatti kallirira,  
 ni:vu manege baruvudakke madalu  
 nimma mi:sege antiruvu hattijannu teg-  
 edu baraba:nditte?" endu ke:lidanu.  
 takraa ibbaru a:lugula tamma  
 me:segalannu muttikondaru. bi:raba  
 nige ivre: kalliru endu tilijitu.  
 vanna hidi "nimma jadzama:na-  
 rige ni:vu kadda hattijanella: va:passu  
 ma:di" endanu. kalliru ndugutta:  
 ku:ndale: oppikondaru.

idella:vannu no:di va:pa:rige  
 a:stirjva:jitu.

### Kalla mattu vanna ta:ji

#### ORIGINAL

onda:nodu ka:ladalli ondu:rinnalli  
 obba:lu heggasiddalu. vanna igobba maghi-  
 danna. vanna ondu dinn sa:lejinda  
 pustakavondannu kaddutandannu. ta:ji  
 vanna ba:juva baddu "olleja kelasa  
 ma:dide magne" endu hogalidalu.  
 idarinda a: hudagnige kallanna

ma:duvude: ołłejnde: no: ennisitu.  
 andininda sanna putta kallatnngalannu  
 ma:dnatodgidanu.

hudegn doddavana: dnuu. a:mele  
 avanu doddn kallatnngalannu ma:-  
 dnu pra:ramb<sup>h</sup> isidannu. a:dnre  
 avanu ondu diin ra:dzab<sup>h</sup> n<sup>h</sup> t<sup>h</sup> n<sup>h</sup> kaige  
 sikkibiddanu. avannnu vitsa:rane  
 ma:dida nra, "i: kallannnu gallige  
 ha:ki" endu a: gna: pisidanu. gallige  
 ha:kilu kallannnu ra:dzn bi:dijalli  
 karedukonda ho:guttidda:gn, avannnu  
 no:dnu u:ra dzannrellaru: se:ridaru.  
 ellaru: avannnu n<sup>h</sup> p<sup>h</sup> ha:sjn ma:di nakk-  
 nu, gallige ha:kun munna ra:dzn b<sup>h</sup> n<sup>h</sup> t<sup>h</sup>  
 nu "ninn konejn a:seje:nu?" endu  
 ke:tidanu. "nanna tai:ijn hattira  
 ma:tna: dabe:ku" endu kalla. nlu-  
 ttidda vavna tai:ji hattira bandnu.  
 kalla avannnu bigidppi avala kivija  
 bali e: no: guttu he:lvavannante  
 nntisutta: avala kivijannu halli-  
 ninda kadidnu. muduki "njo:, njo:"  
 endu tsi:ridnu. "kallann ma:diddu  
 sa:ndu nnta ninn tai:ijn kivianne:  
 kadidu bittejnlla: . ni:nent<sup>h</sup> d<sup>h</sup> n<sup>h</sup> t<sup>h</sup> n<sup>h</sup>"

endu hi:ja:ʃi:si:da:ru b<sup>h</sup>ntaru.

"na:nu duʃa ni:da, a:da:re na:-  
nu he:ge a:ga:ru nana ta:je: ka:r-  
na. na:nu tʃikkandinnalli kadda:ga  
bajjuva badi:lu hogalidalu. ndarind-  
le: na:nu kallana:de. i:ga hi:ge  
sa:juva haiga:ji:tu. illididdare  
na:nu: nimma ha:ge ollejuvna:gi  
bdukuttide" endu dukidinda  
he:ʃidannu.

#### REVISED

endu u:rinalli obba he:gasid-  
alu. avalege obba maganiddannu. avanu  
endu dina sa:lejinda pustakavannu  
kaddu tannannu. ja:ji avannannu bajjalilla,  
avalu, "ni:nu olleja kelasa ma:di:de"  
endu hogalidalu. adakke avanu kall-  
tanna ma:duvudu olleja kelasavendu  
ti:ʃidukondinu. avanu kalltanna ma:di-  
atodagidannu. avanu doddavna:danu.  
endu dina avanu dadda kalltanna  
ma:di:da. a:ga ra:da b<sup>h</sup>ntaru avannannu  
hididaru. avasa vi:ʃa:ra:ge ma:di,  
"i: kallannannu gallige ha:ki."  
Endu a:ga:pisidannu. u:rinalli ellaru:  
avannannu no:ʃidaru. avaru avannannu

npaha:sjn ma:di unkkaru. gallige ha:kun  
muntse, "ninn konejn a:sejeinu" endu  
ke:lidaru.

"nainu tai:ijn hattira ma:tinaid-  
abe:ku" endanu. nunn tai:ijnnu  
bigidappi nuna kivijnnu hallininda  
kndidannu. nuna "njo: njo:" endu  
kiritsikondanu. "knttannu: ma:di,  
ninn tai:ijn kivijnnu: kndidejnlla:  
ent<sup>h</sup>n dusta" endaru b<sup>h</sup>ntaru.

"nainu dusta nidza:adare,  
nainu nunn tai:ijnindale: kntt-  
na:de. nuna nainu kndda:gn  
bijjurn bndnu hognidanu. i:gn  
hi:ge sa:jnbe:ku. illndiddare nainu:  
ollejnanna:gi iruttidde" endanu kntt.

## Ranga and the Dog

### Original

A dog was near Ranga's house door. It was screaming. Ranga gave a lot of milk to it. It drank the milk and felt very happy. It shook its tail. It is now watching Ranga's house.

### Revised

A puppy was screaming near Ranga's house door. Ranga gave a lot of milk to it. It felt happy and shook its tail. It is now watching Ranga's house.

## The Elephant

### Original

A man had an elephant with him. He was not giving it adequate food. In spite of it, he was getting a lot of work done from it. The elephant got very angry. Once it stamped its master underneath its feet. He died. His wife began crying. She brought her children and put them at the elephant's feet and said "Elephant! you killed the father, kill the children also". The elephant looked towards the children. It put its trunk around the eldest son. It lifted him up and made him sit on its neck. Since that day it began to listen to the boy.

**Revised**

There was a man. He had an elephant with him. He was not giving it adequate food. In spite of this, he was making it to do a lot of work. The elephant got very angry. It stamped its master underneath its feet and killed him. His wife began crying. She put her children at the elephant's feet and said "You have killed the father, kill them also". The elephant looked towards the children. It put its trunk around the eldest son. It lifted him up and made him sit on its neck. Since that day it considered the boy as its master.

**The Wise Birbal****Original**

There was a cotton merchant in Akbar's kingdom. He had five houses to load cotton. Everyday theft used to take place from these. The merchant had many servants with him. When asked "Who stole the cotton?" every one used to say "Not me, sir".

Not knowing what to do, the merchant went to Birbal and told his problem. Birbal thought for some time and said "Send your servants tomorrow morning to my house for tea".

The merchant agreed. The servants felt happy at hearing the news of tea. They went to Birbal's house, the



next day morning. "Come in, come in", Birbal welcomed them. Later, so as to find the thief, he set up a plan.

He teasingly said "Oh cotton robbers, couldn't you remove the cotton sticking to your moustaches, before coming here?" Immediately two servants touched their moustaches. From this, Birbal came to know that they were the thieves. He caught their hands and said "You are the thieves. Be good and return back the stolen cotton to your master". The merchant was surprised by Birbal's cleverness.

### **Revised**

A cotton merchant was in Akbar's kingdom. He had five houses to load cotton. Everyday the cotton used to get stolen from here. The merchant asked his servants "Who stole the cotton", then everyone said "Not me, sir".

He then went to Birbal and told this to him. Birbal told him "send your servants for tea tomorrow morning to my house".

The next morning all the servants went to Birbal's house. He set up a plan. He teasingly said "cotton robbers; couldn't you remove the cotton sticking to your moustache before coming here?". Immediately, two servants touched their moustaches. Birbal came to know that they were the robbers. He caught them and said "You return all

the stolen cotton back to your master". The servants agreed. The merchant was surprised seeing all these.

### **The Thief and his Mother**

#### **Original**

Once upon a time there was a woman. She had a son. One day, he stole a book from his school. The mother instead of scolding praised him saying "You did a good thing, my son". So the son thought that stealing is good. Since then he began stealing small things.

The boy grew up. He then began to steal bigger things. However, one day the State police caught him. After doing the enquiries, the king commanded "Hang this robber". Before hanging the robber, he was taken around the city. Everyone had come to see him and made fun of him. The State police asked him before hanging him "What is your last wish?" The robber said "I want to talk to my mother". The weeping mother came. The robber hugged her tightly and pretending to tell some secret at her ear, he bit her ear from his teeth. "Alas, alas", the old woman cried. The police said "Not being satisfied with thieving, you even bit your mother's ear off. What a cruel man you are".

"Yes, I am cruel man. But my mother is the cause of me being like this. Instead of scolding, she praised

me for thieving when I was young. That is why I am a robber. And I have to die like this now. If not even I would lead a good life like you", said the robber.

### **Revised**

There was a woman in a city. She had a son. One day, he stole a book from his school. The mother did not scold him. She praised him saying "You have done a good thing, my son". So he thought that stealing is a good thing. He began to steal. He grew up. One day, he did a big robbery. He then got caught by the State police. After doing the enquiries, the king commanded "Hang this robber". Everybody gathered to see him. They made fun of him. Before hanging him he was asked "What is your last wish?" He said "I want to talk to my mother". The weeping mother came. He hugged his mother tightly and bit her ear from his teeth. "Alas, alas", she cried. The police said "Having done robbery, you have also bit your mother's ear off. What a cruel man you are".

"Yes, I am cruel man. But I became a robber because of my mother. When I stole, she praised me instead of scolding me. Now I have to die like this. If not, even I would be a good man" said the robber.

raṅga mattu na:ji (Ranga and the Dog)

1. na:ji māri eḷli kiruṣikoḷḷutittu?  
Where was the puppy screaming?
2. raṅganu adakke e:nu koṭṭānu?  
What did Ranga give?
3. hoṭṭe tumida na:ji e:nu ma:ditu?  
What did the dog do?
4. na:ji i:ga raṅganu manejānu e:nu ma:duttide?  
What is the dog doing to Ranga's house?

a:ne (The Elephant)

1. a:nege manuṣjānu me:ḷe e:ke ko:pa bāntu?  
Why did the elephant get angry on the man?
2. a: manuṣjānu he:ge sattu ho:dānu?  
What did the man give to the elephant?
3. ānā hēndati a:neja bāli e:nu he:ḷidānu?  
What did his wife tell the elephant?
4. a:ne doḍa māgānānu e:nu ma:ditu?  
What did the elephant do to the eldest son?
5. a:ne ja:riga:gi kēḷa ma:dātodaḅgitu?  
For whom did the elephant begin to work?

bi:raḅallina dza:nāna (The Wise Birbal)

1. hatti vja:pa:ri eḷḷiddānu?  
Where was the cotton merchant?

2. vja:pa:ri ja:ra ba:li ho:danu?  
Whom did the merchant meet?
3. a:luga:lu bi:raballanu manege e:ke ho:danu?  
Why did the servants go to Birbal's house?
4. bi:raballanu ma:dida: upa:jve:nu?  
What did Birbal plan?
5. hatti kallaru ja:ru endu bi:raballannige he:ge tilijitu?  
How did Birbal come to know who the robbers were?

Kalla mattu anna ta:ji (The Robber and his Mother)

1. huduga kallatannu ma:dida:gn anna ta:ji einu ma:dida:lu?  
When the boy did thieving, what did his mother do?
2. annu dodda kallatannannu ma:dida:gn einu a:ji:tu?  
What happened when he did a big robbery?
3. ra:dzannu kallannige entha siksejannu kottaru?  
What punishment did the king give to the robber?
4. kallannu anna ta:jige einu ma:dida:nu?  
What did the robber do to his mother?
5. kallannu ra:dza:bnatavige einu he:lidannu?  
What did the robber tell the police?