NARRATIVE DISCOURSE SKILLS OF CHILDREN WITH LEARNING DISABILITY

Devika, S.

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ALL INDIA INSTITUTE OF SPEECH AND HEARING

MANASAGANGOTHRI, MYSORE-570 006

May, 2017

CERTIFICATE

This is to certify that the dissertation entitled ***Narrative discourse skills of children with Learning Disability*** is the bonafide work submitted in part fulfillment for the degree of Master of Science (Speech-Language Pathology) of the student (Registration No. 15SLP011). This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysore

May, 2017

Dr. S. R. Savithri

Director

All India Institute of Speech and Hearing

Manasagangothri, Mysuru-570006

CERTIFICATE

This is to certify that the dissertation entitled ***Narrative discourse skills of children with Learning Disability*** has been prepared under my supervision and guidance. It is also certified that this has not been submitted earlier in any other University for the award of any Diploma or Degree.

Mysore

May, 2017

Dr. Hema. N
Lecturer in Speech Sciences
Department of Speech-Language Sciences
All India Institute of Speech and Hearing
Manasagangothri, Mysuru.

DECLARATION

This is to certify that this dissertation entitled ***Narrative discourse skills of children with Learning Disability*** is the result of my own study under the guidance of Dr. Hema. N, Department of Speech-Language Sciences, All India Institute of Speech and Hearing, Mysore and has not been submitted earlier in any other University for the award of any Diploma or Degree.

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Dedicated to God Almighty and to

My Acha, Amma and Shals

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CHAPTER 1

INTRODUCTION

Learning disability/ disorders are neurobiological in origin and lead to problems with reading, writing, math or a combination of these three skills in children with average or above average intelligence. Dyslexia is a specific learning disability in which the child exhibits difficulties with word recognition along with poor spelling and decoding abilities. However, in majority of children with learning disability, the reception and expression of spoken language seems to be compromised, particularly in childhood. Studies on children with dyslexia and preschool children at risk of dyslexia have shown that vocabulary development and morphosyntactic skill is quite delayed when compared with typical children (Van Alphen et al., 2004; Joannisse, Manis, Keating, & Seidenberg, 2000: Koster, Been, Krikhaar, & Zwarts, 2005; McArthur, Hogben, Edwards, Heath & Mengler, 2000: Rispens, Roeleven, & Koster, 2003; Scarborough, 1990). Therefore, they exhibit some deficits at the linguistic aspect of communication.

Language is a human communication system that makes use of a set of arbitrary symbols. Since several decades, language has always been defined with reference to content (semantics) and form (syntax, morphology) with little emphasis on use (pragmatics). However, recent research is aiming to understand the pragmatic aspects of language. Pragmatic analysis is essential as it can provide details on the dynamic aspects of everyday communication faced by an individual.

Pragmatics includes the study of discourse production and it forms an essential part of communication. With reference to linguistics, discourse implies units of language which are longer than a sentence. Thus, discourse analysis refers to the study of relationship between spoken or written sentences. Discourse may be spoken, written or multimodal forms of communication, and is not found only in "non-fictional" or verbal materials (Coelho, 2002). Discourse is socially conditioned and will have a communicative aim, whether in the form of spoken or written text, or monologue or dialogues between individuals. Thus, there are several types of discourse like procedural (describes the procedure in performing an activity), expository (information on a single topic by one speaker), conversational (sharing information between listeners and speakers) and narrative (vivid description of events). The characteristic way of organization and content of each discourse type places varying cognitive- linguistic demands on the communicator (Ulatowska & Chapman, 1989).

There are various discourse types and one among them is narrative discourse. Narrative discourse comprises of an account of events, generally in the past, by using different verbs of speech, motion, and action in order to vividly describe a series of events. These series of events are typically related to one another, and that is centered on one or more doers of actions. Narrative task needs skill in manipulating language, whether telling a fictional story, or providing a narration of past experiences or story retelling (Paul& Smith, 1993). Narrative skills therefore, reflect the communicative competence of children and when assessed provides the much needed information on pragmatic, cognitive and linguistic functioning in the child. More focus is being shed upon oral narrative discourse for the past three decades. There exists a strong relation

between children's oral narrative skills and academic performance. Cain (2003) conducted a longitudinal study in primary school children in the age range of 7-9 years old. The study aimed to find out if there exists any relation between higher level language skills (inference, story structure) and reading skills. One main task in this study included arranging a set of jumbled pictures in the correct order and generate a logical sequential story. Better narration skills strongly correlated with higher reading comprehension level, even after other measures of verbal ability and language skill had been taken into account. This knowledge facilitates memory and understanding through organizing and relating events in the text. This study outlines the link between oral narration and academic performance in young school going children.

However, routine assessments of Learning disability typically check the performance in reading, writing and arithmetic skills with a greater emphasis on phoneme grapheme correspondence skills. During these assessments, narrative language is often overlooked and not assessed thoroughly. From previous studies it can be inferred that narration needs to be assessed in children with learning disability. Hence narrative discourse can be used along with other standardized tests for LD, to screen children at risk of learning disability. LD cases exhibit deficiency at the narrative discourse level along with the phoneme grapheme level of linguistic aspects. As LD can be diagnosed based on the PGC tests, the narrative discourse is another task which can be used to assess learning disability or symptoms of LD.

To be more specific, narrative analysis is very useful in pinpointing even subtle discourse deficiencies. In any narrative task, in order to produce a coherent narrative, an individual speaker must plan and generate the linguistic content into an acceptable

form while identifying the social rules that are built in into the narratives. Thus, narrative discourse needs more advanced linguistic knowledge when compared to a conversation task. Hence, narration skills need to be tapped upon during clinical assessments to get an idea of the child's overall language abilities (Westerveld, Gillon, & Miller, 2004). According to McCabe (1991), narrative discourse involves recalling a series of events in a sequential manner. In order to narrate, the child must possess the ability to understand and produce large chunks of text well organized according to listener perception, topic and also convey meaning (Ewing-Cobbs, Brookshire, Scott, & Fletcher, 1998).

Story generation and story retelling are the commonly used oral narration elicitation tasks (Pearce, 2003; Justice, Bowles, Kaderavek, Ukrainetz, Eisenberg, & Gillam, 2006). Crovetti (1998) studied narrative discourse skills in children with learning disability, both in terms of comprehension and narrative production. On a task of story retelling, the children with learning disability exhibited fewer clauses, lesser usage of core propositions and inferences reflecting the content of the stories. Literature has also revealed that children with Learning Disability have poor performance on narration of stories with a new topic (Rourke, 1989, 1995). Other studies have claimed that children with learning disability produce less cohesive narratives than typical peers, especially with differences in the usage of pronouns during story generation (Strong & Shaver, 1991; Liles, Duffy, Merritt & Purcell, 1995).

These differences in oral narration performance across different contexts could probably be explained by a limited capacity working memory model (Baddeley, 2003). Majority of learning-disabled poor readers have the abilities needed to retrieve

necessary information from long-term memory, and to correctly represent and elaborate ongoing syntactic and semantic schemas (Catts & Kamhi, 2005). Indeed, evidence suggests that poor readers with 'classic' dyslexic profiles (poor reading ability and at least average reasoning skills) are likely to draw from exactly those intellectual resources and stored information sources in LTM to compensate for difficulties in verbal STM (Jackson & Doellinger, 2002; Nation & Snowling, 1998).In order to narrate well, a child should get a story content schema activated, organize the content sequentially and logically, and use complex syntactic linguistic units to convey the intended meaning (Westby, 2005). However, most studies on oral narrative language skills of children with language and/or reading impairment have used fictional story retelling (Fey, Catts, Proctor- Williams, Tomblin, & Zhang, 2004; Paul, Hernandez, Taylor, & Johnson, 1996; Snyder & Downey, 1991). In another study, oral narrative discourse in children with learning disability was studied using personal narratives (Westerveld, Gillon, & Miller, 2004). All these studies have studied oral discourse deficits at macrostructure level. Westerveld and Gillon (2008) conducted a study on narrative production in children with learning disability and found that they have deficits in discourse at microstructure level also, especially with reference to grammatical complexity and usage of different semantic vocabularies.

Thus, it can be highlighted that oral discourse has the potential to predict language and cognitive functioning of a child. Literature on narrative skills of monolingual children with LD revealed significant differences in oral narrative production and comprehension, producing fewer clauses and reduced content upon story retelling task (Wright & Newhoff, 2001; Westerveld et al, 2008). Mohana and

Chengappa (2010) studied the spoken discourse aspects in Tamil- English bilingual children with learning disability on conversation, picture description and story narration tasks. Their results indicated significant differences in propositional and non propositional discourse across groups and across languages for tasks of picture description and story narration. Studies clearly pinpoint that discourse deficit is one of the persisting subclinical features in children with learning disability.

Previous literature has highlighted that oral discourse has the potential to predict language and cognitive functioning of a child. Literature on narrative skills of monolingual children with LD revealed significant differences in oral narrative production and comprehension, producing fewer clauses and reduced content upon story retelling task (Wright & Newhoff, 2001; Westerveld et al, 2008). Mohana and Chengappa (2010) studied the spoken discourse aspects in Tamil- English bilingual children with learning disability on conversation, picture description and story narration tasks. Their results indicated significant differences in propositional and non propositional discourse across groups and across languages for tasks of picture description and story narration. Studies clearly pinpoint that discourse deficit is one of the persisting subclinical features in children with learning disability.

Oral narrative discourse has been widely studied in several clinical population. Narrating a story requires the ability to plan, sequence and generate sentences with cohesion. Hence story generation task can be used as a measure to elicit spoken narratives. In literature, there is a dearth of studies done on oral discourse skills in native languages, especially in LD population. Hence, the current study is an attempt to

understand the oral narrative discourse production in native Malayalam speaking children with learning disability.

CHAPTER 2

REVIEW OF LITERATURE

Learning disability (LD) can be defined as "a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia and developmental aphasia. "Learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance or of environmental, cultural, or economic disadvantage" do not include learning disabilities (IDEA, 2006).

According to Hallahan and Kauffman(1994), the prevalence of LD is 4-5% in children within 6-17 years of age. There is a higher prevalence of LD in males than in females, with males being twice as likely to get the disorder. In India the prevalence is estimated to be between 3-10% (Ramaa, 2000). Among the several distinct learning disabilities, dyslexia is one type. It is a specific, language–based disorder of constitutional origin characterized by difficulties in single word decoding, usually reflecting insufficient phonological abilities (Orton Dyslexia Society Research Committee, 1994)

The direct etiology of learning disability is still unclear. Some theories attribute the differences in brain structure as the reason behind the learning deficits, whereas other theories attempt to explain learning disability in terms of genetic predisposition. It has been found that persons with LD have structural differences in planum temporale. It

is larger in the left temporal lobe in typical individuals whereas this asymmetry is absent in persons with LD. Familial studies also indicate that genetic predisposition is strongly linked with Learning Disability.

2.1 Characteristic features of LD

Learning disability is a broad term that encompasses several forms of problems with reading, writing, spelling, arithmetic or a combination of these three skills in children with average or above average intelligence. Learning disability/ disorders are neurobiological in origin. The most evident deficits in LD as outlined in literature hints at problems in phonemic awareness, single word decoding, reading fluency and spelling. Difficulties in reading comprehension and writing may arise as a secondary consequence. Often learning disability is not identified until the child starts exhibiting lot of difficulties in academic setup. Dyslexia is a specific learning disability in which the child exhibits difficulties with word recognition and poor spelling and decoding abilities.

Of all the children with learning disability around 80% have problems with reading. Children with dyslexia have deficits mainly with phoneme awareness and in phoneme- grapheme correspondence. These aspects have been well studied in past literature. Usually all aspects of language, spoken and written are affected to an extent in children with learning disability (Wallach & Butler, 1994). Studies on children with dyslexia and preschool children at risk of dyslexia have shown that vocabulary development and morphosyntactic skill is quite delayed when compared with typical children (Scarborough, 1990; Joannisse, Manis, Keating, & Seidenberg, 2000;

McArthur, Hogben, Edwards, Heath & Mengler, 2000; Rispens, Roeleven, & Koster, 2003; Van Alphen et al., 2004; Koster, Been, Krikhaar, & Zwarts, 2005;).

It has been well established that good mastery over oral language underpins development of literacy skills (Bishop & Snowling, 2004). Several reports in the literature have suggested that reading comprehension skills are associated with good oral and/or written narratives because all of these tasks involve the same underlying cognitive processes (Berninger et al., 2006). Similar to the above mentioned oral language production tasks, studies examine the written discourse abilities in children with learning disability in the past (Puranik, Lombardino & Altmann, 2007; Chung, Lo, Ho, Xiao & Chan, 2014). However, studies on oral narrative discourse in this population are limited. Since there is a strong link between academic achievements and oral language skills, oral language needs to be examined as well.

2.2 Narrative development in typical children

Children typically master language from parents and siblings, especially in the first three years of life, before they are surrounded by peers (Hart & Risley, 1995; Apel & Masterson, 2001).Hart and Risley (1995) found that children have established patterns in the amount they talk, the amount their vocabulary grows, and their style of interaction by 3 years of age; all of which parallel the child's parents in these areas. Once conversational patterns are established, children are successful communication partners with adults, learning new vocabulary, grammar and using the learnt ones in conversation (Apel & Masterson, 2001).

Developmentally, narratives are the first form of language use that urges a person to produce a monologue rather than a conversation or dialogue (Simon, 1985). When children start storytelling, they often retell natural incidents centered around their everyday life and hence the listener is quite familiar with the content and context of the story (Owens, 2005). Similarly, when children begin reading books with their parents or cargivers, they are able to use ambiguous terms since combined reading by adult and child supplies the contextual meaning (Simon, 1985). Identification of participants or settings of the story is unnecessary at this stage. This informational requirement changes sequentially as children begin attending daycare, play groups, and school. As they grow older, children develop the skills to recognize key parts of stories and describe events orally (Owens, 2005; Simon, 1985). Around the age of four, children are able to accurately recount events sequentially because of their growing ability to manage linguistic complexity (Owens, 2005). Eventually, children begin to visualize stories from listener's perspective and then narrate (Simon, 1985). By the time children begin school, they have mastered the skill to include the major elements of a narrative, enhancing the foundation for conversational skills as they grow. These elements of narrative discourse continue to become more refined (Owens, 2005). Hence by around 7-8 years of age, a typical child will be able to narrate a story in a sequential and logical manner. Their ability in terms of planning organinising, formulating episodes, and theme of the story improves with age. A *complex episode* level that involves elaboration of a complete episode, by including multiple plans and trials, or consequences within an episode as well as an obstacle to the attainment of a goal is attainable by eleven years. Further development of narratives include *embedded episodes* (one episode is included in another) or *interactive episodes* (narratives which

have two perspectives). These types of story narration are also developed by11- 12 years(Hughes, 1997)

Clear developmental patterns have been shown in terms of narrative length (Reilly, Losh, Bellugi & Wulfeck, 2004;Tilstra& McMaster,2007) meaning that as children grow older, they are able to narrate longer stories. Lexical diversity also improves with age with older children using more specific vocabulary and better organized episodes during narration. Besides, accuracy and complexity of utterances and cohesion (with respect of frequency and diversity of cohesive markers) have been found to improve with age.

2.3 Relation between oral language and reading comprehension

The relationship between the academic achievements in terms of reading comprehension could be studied in relation to the story comprehension and production ability using a narrative task. For example, the Constructionist theories of reading comprehension highlights the links between story comprehension and storytelling ability and reading comprehension performance. As per constructionist theories of reading comprehension, during text comprehension the reader comprehends the meaning of the read text by constructing knowledge based inferences (Kintsch, 1988). These knowledge-based inferences get activated based on background knowledge structures in long-term memory. Vocabulary, morpho-syntactic knowledge, story structure knowledge, and more general world knowledge constitute background knowledge structures. In other words, proficient readers utilise their linguistic knowledge at word- and sentence-level, in combination with their knowledge of the story structure to create a mental model of a fictional story. Story structure knowledge

acts as a foundation for building a mental model, by providing means to segregate and relate the events in a story which thereby aids in better understanding and retention of the story. Besides comprehension of written and spoken stories, mental models of stories also facilitate story retelling abilities. When they have a mental model which is quite stable, children get quick access to the desired content and structural outline need for story retelling, which influences the overall quality of the story the child produces. However, story telling also taps on the linguistic skills of the child (such as morpho-syntactic and semantic skills) at word-, sentence-, and text-level. The same principal holds good for the narration task consisting a sequences of pictures as stimulus.

2.4 Narrative macrostructure and microstructure

Narration is an oral language skill, which is often assessed at discourse level. Discourse can also be broadly defined as language use "in the large", or as extended activities that are carried out via language (Clark, 1994). Discourse comprehension and production in various disorders have been studied widely. Discourse can be examined in written text or in oral productions. Under comprehension or expression level it can be differentiated into microstructure and macrostructure levels for conversational discourse, narrative discourse and for picture description task (Ulatowska, North, & Macaluso-Haynes, 1981; Glosser & Deser, 1990; Cannizzaro & Coelho, 2002).

Macrostructure deals with the maintenance of conceptual, semantic, and pragmatic organization at the suprasentential level. There are many approaches to narrative macrostructure analysis of narration; most widely used being Story Grammar (SG) analysis developed by Stein and Glenn(1979). According to SG model, a story contains both setting statements and episodes. The setting statements include the

introduction of main characters, and description of the social/temporal context of the story. Episode involves an account of an influencing event, character's response to event, plan to solve the occurred event, consequence and reaction. Adults and children's stories do not always include episodes due to varying reasons. Some components may be omitted due to poor story narration abilities or the meaning must be inferred from embedded statements in the narrated story or through the listeners world knowledge (Hughes & McCarthy,1998). A simple story contains one episode;complex stories often contain two or more episodes which are related to each other.SG model applies mainly to fictional narratives.

Another approach to narrative macrostructure analysis is High Point Analysis given by Labov and Waletzky (1967, 1997). This approach is used mainly for analyzing personal narratives. In this approach, narration should consist of: *opening appendage, orientation, complicating action, evaluation, resolution and closing appendage*. The *evaluation* is of prime importance in this form of analysis as it conveys information on why the narrative was told, the main goal of the narrative, and how the person or event should be assessed by the receiver. These *evaluation*s may be conveyed through the usage of repetitions, stress, metaphors, negatives, causal explanations, dialogue, subjective and objective judgments etc (Ukrainetz & Gillam, 2009).

Narrative microstructure refers to smaller units within the text. This typically includes word level indices such as lexical diversity, lexical richness, language style (Fey, Catts,Procter-Williams, Tomblin &Zhang,2004). Grammaticality (mainly mean length of utterance, types of conjunctions, complex utterances) are also often assessed in microstructure. Cohesive ties often reflect the person's skill in storytelling as these

help in “sticking” units of the story into a whole connected one. Traditional categorization of cohesive markers as given by Halliday and Hasan (1976) includes reference, conjunction, lexical cohesion, substitution and ellipsis. Other common measures of narrative microstructure includes indices of productivity in terms of total number of words, clauses, words per clause etc (Norbury & Bishop, 2003; Pearce, McCormack &James, 2003; Tilstra & McMaster,2007). Such measures are generally studied using T-Unit analysis.

Relatively less studies have been done to analyze the relation between narrative macrostructure and microstructure. A good narration should have good narrative microstructure and macrostructure, and hence a complete narrative analysis including both macro and microstructure aspects can provide better insight on the narrative ability of an individual. Narrative structure analysis has been shown to be an excellent tool for examining linguistic and cognitive abilities (Hudson & Shapiro, 1991; Norbury & Bishop, 2003). This is because it makes use of both language and cognition to produce a narrative wherein temporal sequencing and causal relationships are well organized. Thus, at macrolinguistic level or the microlinguistic level, the narrative discourse may therefore be used to understand the oral language skills of any individual,even for children.

2.4.1 Tasks for eliciting oral narrative discourse

In children, the linguistic discourse ability is assessed with reference to three major discourse genres like conversation, narration and picture description. Among these three, narrative analysis is very useful in pinpointing even subtle discourse deficiencies because, in order to produce a coherent

narrative, the speaker must plan and generate the linguistic content into an acceptable form while also identifying the social rules that are built in into the narratives. Thus, narrative discourse needs more advanced linguistic knowledge in comparison to conversational discourse. Hence, narration skills need to be tapped upon during clinical assessments to get an idea of the overall language ability of the child (Westerveld, Gillon, & Miller, 2004).

Studies reveal that children with LD have some amount of deficits in spoken language, primarily with respect to grammatical complexity besides deficits in phonology (Snowling, Gallagher & Firth, 2003).Narrative discourse involves recalling a series of events in a sequential manner (McCabe, 1991). In order to narrate, the child must possess the ability to understand and produce large chunks of text well organized according to listener perception, topic and also convey meaning (Ewing-Cobbs, Brookshire, Scott, & Fletcher, 1998). Gilmore, Klecan-Aker and Owen (1999) has studied the relation between storytelling ability to reading comprehension in children with learning disability, between 5- 10 years old. An oral fictional narrative was obtained using story generation task, then subjected to T-unit analysis and was assigned a developmental level of complexity based on the number and organization of grammar components in the story. Reading comprehension was assessed using formal, standardized passage. Results of this study indicated that for the LD group, developmental level of story was significantly related to and predicted performance on the passage comprehension task. Fictional narratives however, may not fetch and adequate number of words for analysis. Wordless picture

books can be used for eliciting narration especially among children. This helps examiners to get an adequate discourse sample as child would narrate for each and every picture given in the book. It also provides visual support unlike in fictional story telling. Thus children would feel more at ease to narrate.

2.4.2 Oral narrative discourse in LD population

Paul (2001) describes three narrative features that are typically limited for children with LD when compared with their typically developing peers: (1) maturity of the narrative, characterized by organization and type of story grammar; (2) use of pronouns, prepositions, and articles, all of which tie the narrative into a cohesive structure; and (3) use of vocabulary, language style, and story structure. Story generation and story retelling are the commonly used oral narration elicitation tasks, according to Pearce (2003) and Justice, Bowles, Kaderavek, Ukrainetz, Eisenberg and Gillam (2006). Literature has revealed that children with Learning Disability have poor performance on narration of stories with a new topic (Rourke, 1989, 1995). Other studies have claimed that children with learning disability produce less cohesive narratives than typical peers, especially with differences in the usage of pronouns during story generation (Strong & Shaver, 1991; Liles, Duffy, Merritt & Purcell, 1995). Using story retelling task, Crovetti (1998) studied narrative discourse skills in children with learning disability, both in terms of comprehension and narrative production. The children with learning disability exhibited fewer clauses, lesser usage of core propositions and inferences reflecting the content of the stories. These differences in micro-linguistic and macro-linguistic aspects of oral

narration performance across different contexts could probably be explained by a limited capacity working memory model (Baddeley, 2003). In order to narrate well, a child should get a story content schema activated, plan and organize the contents in a logical and sequential manner, and use complex syntactic linguistic units to convey the intended meaning of the story. In both story generation and retelling activities, children with LD showed a basic, but not fully developed, idea of narrative prose and a less efficient usage of story grammar than their typically developing peers (Montague, Maddux, and Dereshiwsky, 1990).

Merritt and Liles (1989) stated that children may find it easier to access their story content schema knowledge during story retelling, as evidenced by the longer samples in the story retelling condition, because of the structural support the model story provides. Hence they opined that fictional story can be considered a better measure of spoken narratives than story retelling. This was due to the fact that the formulation of a fictional story may be cognitively more loaded than the retelling of a fictional story or a personal experience. Less complex language use and lower grammatical accuracy would arise due to limited available resources for word choice and syntactic structures. However in few studies, oral narrative discourse in children with learning disability was studied using personal narratives (Celinska, 2004; Westerveld, Gillon, & Miller, 2004). The results revealed that the children with typical reading development performed significantly better on microstructural aspects of oral narrative discourse than the group of children with reading disability, with significant

differences in measures of verbal productivity, number of different words, and percent complex sentences. Westerveld and Gillon (2008) conducted another study on narrative production in children with learning disability and found that they have deficits in discourse at microstructure level also, especially with reference to grammatical complexity and usage of different semantic vocabularies. They carried out a longitudinal investigation on oral narrative ability in a group of children with mixed reading disability. Their study revealed that children with mixed reading disability had inferior oral narratives on story narration and story retelling tasks when compared to normal counterparts.

Narrative skills of monolingual children with LD revealed significant differences in oral narrative production and comprehension, producing fewer clauses and reduced content upon story retelling task (Wright & Newhoff, 2001; Westerveld et al, 2008). In addition, these studies explored how, when telling narratives, bilingual individuals express verbal notions through the use of the tense, aspect, and voice forms available in each of their two languages. For instance, the present tense/past continuous tense is often used in script narratives, specifying the typical series of events taking place in a particular activity such as going to a restaurant or going to a birthday party.

In picture-book narrations, if the task is viewed as a narrative activity (i.e., recounting of events spatially as well as temporally distant from the speaker), the past tense may be predominantly used. And the past tense is often used in oral narratives, specifying the typical series of events taking place in a particular sequence such as going on a trip or

journey to a place. In this, the narrator ensures tenses are used in a systematic manner whenever he or she refers to the events and temporally relates them to one another. These tenses convey the narrator's attitude towards the event.

2.5 Need for the study

From the detailed review, it is important to consider certain aspects related to the narrative discourse in LD. They are as follows: (1) The narrative skill being enhanced by the foundation of good conversational skill, (2) The strong relationship between oral language and reading comprehension (3) Narrative discourse being assessed at microstructural and macrostructural level, (4) Importance of various narrative tasks and (5) Justification of narrative discourse being affected in LD. Thus, narration draws on some of the most sophisticated language skills in a person's repertoire like the use of an array of temporal, spatial and logical relationships; the use of complex linguistic elements to refer to objects, characters and situations already mentioned or new in the story; and the use of varied linguistic mechanisms revealing the narrator's personal point of view (Labov, 1972; Hickman, 1990; Bamberg & Damrad-Frye, 1991). Narrative discourse also lends itself well to the study of the ways in which subjects use the formal linguistic devices in their repertoire to serve specific functions in communication (Karmiloff-Smith, 1981; Hickman, 1990, 1991; Berman, 1993).

With reference to qualitative analysis of narrative discourse, Mohana and Chengappa (2010) studied the spoken narrative skills of 30 bilingual children with dyslexia. The authors studied the spoken discourse aspects in bilingual (Tamil- English) children with learning disability on conversation, picture description and story narration

tasks. Their results indicated significant differences in propositional and non propositional discourse across groups and across languages for tasks of picture description and story narration. These studies clearly pinpoint that discourse deficit is one of the persisting subclinical features in children with learning disability. From all these studies it can be inferred that deficits in narrative discourse are present across children with Learning disability, in both monolingual and bilingual population.

In most of these studies, one main area of narrative called the syntactic complexity was examined. The basic unit for segmenting the data is the T-unit, which is characteristically defined as one independent clause along with the dependent modifiers of that clause (Hunt, 1970). A part of a sentence is referred to as clause. Clauses are of two types: independent (main clause) and dependent clause (subordinate clause). An independent clause is a complete sentence, containing a subject and a verb and conveys a defined meaning (e. g., the police said). Independent clauses when joined by coordinating conjunction form complex or compound sentences. A dependent (subordinate) clause is part of a sentence, containing a subject and a verb but does not convey a meaning in entirety. They are dependent on the rest of the sentence for conveying meaning (e. g., to the one that can do it). Various measures can be analyzed using T-unit analysis such as number of T-units (NTU), number of words per T-unit (NWPTU), number of clauses (NC) and so on. This is called the T-unit analysis or the quantitative analysis in discourse studies.

Roth and Spekman (1989) assessed syntactic complexity of children with learning disabilities and typical peers in age group of 8-11 years, using T-unit analysis. The results revealed almost identical rates of correct usage and extremely similar

patterns of usage between the LD and typical subjects on all measures. However there was a greater performance on correct usage of complex sentences by typical peer group than the group with LD. In this study, T-unit analysis did not reveal any significant difference between LD group and typical peers. Green and Aker (2012) reported efficacy of a group intervention for children with learning disability. They reported significant changes in narrative skills, pre and post intervention, mainly with reference to number of T-Units.

Shenoy (2015) used oral narrative task and Clinical Evaluation of Language Fundamentals (CELF-5) screening test to identify bilingual (Kannada-English) children who are at risk of learning disability. Stimulus used in the study was "Frog story" (Mayer, 1969) and the task given was story retelling. The same story retelling samples of 104 participants in grades 2-5 were recorded and analyzed for various parameters including introduction, character development, referencing, cohesion and conclusion. The narratives were scored using Narrative Scoring Scheme. Based on the narrative ratings, narratives of all the participants were rated. Of these, seven participants had "emerging" narrative skills and one participant had minimal narrative skills, but none of them were identified as "at risk" by their teachers or by CELF 5 screening test. These findings clearly indicated that narrative assessment is a good predictor of students at risk of LD. Even if basic language screening tests miss out such students, a detailed analysis of their narration at discourse level as an extended linguistic analysis can help to identify children with LD.

Thus, studies exploring discourse deficits in children with learning disabilities are scarce. The same in Indian context is very much limited. Hence the present study is

to investigate and document the oral narrative discourse in children with LD both quantitatively as well as qualitatively and compare it with typical peers.

CHAPTER 3

METHOD

Aim

The present study aimed to investigate the narrative discourse abilities in children with learning disability and typically developing children in the native language (Malayalam).

Objectives of the study

The objectives of the study were,

1. To investigate and compare the narrative discourse parameters of children with learning disability and typically developing children qualitatively in Malayalam language.
2. To investigate and compare the narrative discourse parameters in children with learning disability and typically developing children quantitatively in Malayalam language.

Hypothesis

There is no significant difference in the narrative discourse performance of typically developing children and children with learning disability qualitatively and quantitatively in Malayalam language (L1).

Research Design

A standard two group comparison research design was employed to compare clinical group (consisting of children with LD) and control group (typically developing children) and it followed 2x2 research design

3.1 Participants

The participants chosen for the study were ten children with the diagnosis of learning disability and ten typically developing children, both within the age range of 8-12 years. A total of twenty participants who were native speakers of Malayalam language participated in the study. The children with learning disability constituted the clinical group and the typically developing children constituted the non-clinical/normal/control group. All the participants from the clinical group were chosen from two integrated schools having a dedicated unit for children with learning disability in Trivandrum district, Kerala. The participants from the typically developing group were drawn from a residential area, in Trivandrum district, Kerala.

Inclusion criteria for the clinical group

Participants were selected from units within mainstream schools that support children with learning disability. Only those participants diagnosed as LD on evaluation by Psychologist/Speech Language Pathologist using tests like Early Reading Skills (Gwaeneth Rae & Thomas Potter, 1981) or Dyslexia Screening Test-Junior- Indian version (Anand, 2012) were included in this group. Only those participants with no history of obvious oral language issues were selected. None of the participants had any history of oral language training

at the time of study. All selected participants were exposed to English as medium of instruction at school with no change in medium of instruction. Participants with normal visual and hearing acuity with right handedness, irrespective of socio economic status (SES) were considered. Table 1 depicts the demographic details of clinical group; mean age of participants in the group=10.08 years

Table 1
Demographic details of clinical group

Sl. No	Age(years)	Gender	Grade	Diagnosis
1.	8	Male	III	LD
2.	8.5	Male	III	LD
3.	9	Male	III	Dyslexia
4.	9.5	Female	IV	LD
5.	10	Male	IV	LD
6.	10.6	Male	V	Dyslexia
7.	10.6	Female	V	Dyslexia
8.	11	Female	VI	LD
9.	11.5	Female	VI	LD
10.	12	Male	VI	LD

Inclusion criteria for the control group

The participants of control group had to be free of any neurological (such as seizure disorder, oromotor weakness etc) or psychological illness (such as, depression, anxiety disorders etc) and were ruled out for all other sensory motor/communication deficits by using ICF-CY checklist (WHO version,

2004). The demographic details of control group have been listed in Table 2; mean age of participants = 10.07 years

Table 2

Demographic details of control group

Sl. No	Age(years)	Gender	Grade
1.	8	Male	III
2.	8.5	Male	III
3.	9	Male	III
4.	9.5	Female	IV
5.	10	Male	IV
6.	10.6	Male	V
7.	10.6	Female	V
8.	11	Female	VI
9.	11.6	Female	VI
10.	12	Male	VI

3.2 Procedure

3.2.1 Data collection

Informed consent form

Informed consent proposed by AIISH (All India Institute of Speech and Hearing) Ethical committee (2009) was used to obtain consent from each of the participants (Appendix A).

General information sheet

General history included name, age/sex, address and contact, languages known, handedness, education grade, information about hearing and vision, history of neurological/psychological illness, presenting illness, and address and contact number. Detailed medical history (if any) which included presenting symptoms, details of medical and non-medical treatments etc were noted. The ICF-CY checklist (WHO version, 2004) was also administrated for all the participants of normal group.

3.2.2 Material

The material used was picture stimuli of 'Frog, where are you? Story' (Mayer, 1969) (Appendix B). The pictures were printed in sheets of 8.27 × 11.69 inches (A4 size) and made into a picture book and child was asked to generate a story according to the picture sequence.

3.2.3 Recording

All the participants were provided prior notice that their narration will be audio recorded. Initially, 4 to 5 minutes of casual interaction was carried out with all the individuals that aimed to improve interaction and build rapport between the investigator and the participants.

This was followed by recording of discourse samples of all the participants, the recordings were done in one or two sessions according to the convenience of the participants. The participants showed less

inhibition in their discourse, since they became quite accustomed to the investigator. All the recordings were carried out in a quiet room, with no distraction during the recordings done at school/ other institutes or residential places of the participants. In some instances, neutral prompts like ‘okay/yes’ and ‘what happened next’ was used during the narration task. An audio recording software Wavesurfer (1.5.7 version) was used along with headphones with mic to audio record each session. This narrative task was recorded for a duration of about 15-20 minutes allowing as much time as required to collect at least 400-600 words of narration from each participant using the specific instructions as mentioned below. The instructions were given in the native language. Thus, narrative discourse sample was collected from the participants in Malayalam language.

3.2.4 Instructions

All the participants were instructed in native language. The instruction was “*I will be presenting the wordless picture book, a story about a boy, a dog and a frog (experimenter pointing at the protagonists on the first page). First, I want you to look at all the pictures, and then I want you to tell me the story as you look through them in a sequence.”*

3.3 Scoring and Analysis of narrative discourse

The recorded discourse samples of narration were then transcribed verbatim. Discourse involving the story narration of each participant in both the

groups was transcribed (Appendix C & D). The discourse samples in the native language were then analyzed qualitatively and quantitatively for the narration task. Qualitative rating of discourse was done using Discourse Analysis Scale for narration task (Hema & Shyamala, 2008) and quantitative T-unit based analysis was employed for the same.

3.3.1 Qualitative analysis of discourse samples:

Discourse Analysis Scale (Hema & Shyamala, 2008) was used for the present study (Appendix E). This is a perceptual rating scale developed on the basis of the standardized Clinical Discourse Analysis, Damico (1985) and Cooperative Principles for conversation, Grice (1975). The scale has separate ratings for conversation, narration and picture description. For the present study the narrative scale alone was used. The major measures are propositional and non-propositional aspects of discourse samples obtained for narration task. The propositional aspects of discourse includes discourse structure, communication intent, coherence, information adequacy, information content, message accuracy, temporal and causal relationship, topic management, vocabulary specificity, linguistic fluency, speech styles, intonation, gaze efficiency (through live monitoring) and response time. The non-propositional aspect of communication includes revision behaviors and repair strategy. These parameters have been described and statements are framed to rate them. The (three point perceptual) rating scale consisted of uniform rating of 0, 1 and 2 where '0' represented the

behaviors that are poor, '1' represented behaviors that are fair (at least 50% of the time there is positive response) and ‘2’ when the behaviors are good. This same rating scale will be used for scoring. Thus, total scores of the Discourse Analysis Scale (DAS) for narration could be obtained. The total score included scores of both propositional and non-propositional discourse.

3.3.2 Quantitative analysis using T-unit based analysis:

For the T-unit based analysis the audio recorded data was transcribed verbatim, with verification for accuracy. The basic unit for segmenting the data was T-unit, which is characteristically defined as one independent clause along with the dependent modifiers of that clause (Hunt, 1970). A part of a sentence is referred to as clause. Clauses are of two types: independent (main clause) and dependent clause (subordinate clause). An independent clause is a complete sentence, containing a subject and a verb and conveys a defined meaning (e. g., the police said). Independent clauses when joined by coordinating conjunction form complex or compound sentences. A dependent (subordinate) clause is part of a sentence, containing a subject and a verb but does not convey a meaning in entirety. They are dependent on the rest of the sentence for conveying meaning (e. g., to the one that can do it). The narrative discourse tasks in the study was analyzed using T-unit analysis in terms of number of T-units (NTU), number of words per T-

unit (NWPTU), number of clauses (NC) and number of words per clause (NWPC).

The obtained data was analyzed using appropriate statistical measures in Statistical Package for the Social Sciences (SPSS) software package (Version 20.0). Descriptive statistics was done to compute mean, median and standard deviation (SD). Non parametric test, Mann Whitney U test was done for comparison of qualitative and quantitative parameters across the two groups (LD and TDC). Spearman's correlation analysis was done to find correlation between qualitative and quantitative parameters across group and for within group comparison.

CHAPTER 4

RESULTS

The aim of the present study is to investigate the narrative discourse abilities in children with learning disability and typically developing children in the native language (Malayalam).

Objectives of the study

1. To compare the narrative discourse parameters of children with learning disability and typically developing children qualitatively in Malayalam
2. To compare the narrative discourse parameters in children with learning disability and typically developing children quantitatively in Malayalam

The data was statistically analysed to compare the performance of LD (Learning Disability) group across qualitative and quantitative measures and also to compare their performance with TDC (Typically Developing Children) group. The qualitative parameters were obtained based on Discourse Analysis Scale; the quantitative parameters considered are total number of T-units, Number of Words per T-Unit (NWTU), Number of clause (NC) and number of words per clause (NWC).

The results are discussed under the following headings:

4.1 Inter Judge Reliability Measures Using Cronbach's Alpha Co-Efficient for Qualitative and Quantitative Data

4.2 Results on Qualitative analysis of Oral Narrative Discourse among learning disability individuals and controls.

4.3 Results on Quantitative analysis of Oral Narrative Discourse among learning disability individuals and controls.

4.4 Correlation analysis- Qualitative Analysis and Quantitative Analysis.

4.1 Inter Judge Reliability Measures Using Cronbach's Alpha Co-Efficient for Qualitative and Quantitative Data

There were three judges including the researcher who participated for the qualitative rating of the discourse samples. These judges were speech language pathologists. All the three judges rated 10% of the samples. The qualitative ratings obtained from the three judges were subjected to inter judge reliability tests using Cronbach's Alpha Reliability, tests were performed separately for individuals with Learning Disability and typically developing individuals. Under quantitative analysis, initially the complete discourse samples were verbatim transcribed and later the T-unit based division was performed by the researcher and 10% of the data was re-checked for correct transcription and re-divided for T-unit based analysis by a linguist. The judgments on the division of number of T-unit (NTU), number of words per T-unit (NWPTU), number of clauses (NC) and number of words per clauses (NWPC) were performed by three judges (clinical linguist and two speech language pathologists) and the entire data was subjected to inter-judge reliability measures using Cronbach's alpha coefficient. Thus, the reliability measures were carried out using Cronbach's alpha co-efficient for the qualitative and quantitative analysis of the discourse samples. All the parameters showed >0.7 scores on these reliability measures. This suggested that, the data was reliable for the qualitative analysis. Hence for qualitative the *majority rating* by the three judges was subjected to further statistical analyses. Similarly, the results of

Cronbach's Alpha co-efficient for parameters related to T-unit based analysis showed >0.7 scores on these reliability measures suggesting that the data was reliable for the quantitative analysis. Hence for quantitative analysis the *average* of the judges was considered for further statistical analysis.

4.2 Results on Qualitative analysis of Oral Narrative Discourse among learning disability individuals and controls.

4.2.1. Mean, median and standard deviation of propositional and non-propositional parameters of narrative discourse of children with Learning Disability (LD) and typically developing children (TDC).

The statistical analysis was carried out using SPSS (PASW) Version 20. The mean, median, standard deviation and quartile deviation of propositional and non-propositional parameters of *children with Learning Disability and typically developing children* on narration task in Malayalam language were calculated as shown in Table 3. Since ratings were considered, median was also given. This suggested lower mean and median for children with Learning Disability compared to typically developing children.

Table 3

Mean, SD and Median for the propositional of narrative discourse of LD group (n=10) and TDC group (n=10) on qualitative analysis.

	LD group					TDC group				
Parameters	**N**	**Mean**	**SD**	**Median**	**QD**	**N**	**Mean**	**SD**	**Median**	**QD**
DS	10	1.93	0.51	2.0	0.50	10	2.50	1.00	2.0	0.75
CI	10	3.66	1.03	4.0	0.75	10	3.85	0.50	4.0	0.75
COH	10	2.16	0.41	2.0	1.0	10	2.75	0.50	3.0	0.75
TM	10	7.33	1.75	8.0	1.0	10	9.25	0.95	9.50	1.75
IA	10	1.16	0.41	1.0	0.12	10	1.75	0.50	2.0	0.75
IC	10	1.33	0.51	1.0	0.50	10	1.50	0.57	1.50	0.5
MA	10	1.25	0.54	1.5	0.50	10	1.50	0.50	1.0	0.37
TCR	10	1.50	0.57	1.5	0.50	10	1.83	0.41	2.0	0.12
VS	10	1.75	0.50	2.0	0.37	10	1.9	0.41	2.0	0.12
LF	10	1.75	0.50	2.0	0.37	10	2.0	0.00	2.0	0.00
SS	10	1.83	0.41	2.0	0.12	10	1.75	0.50	2.0	0.37
INT	10	2.0	0.00	2.0	0.00	10	2.0	0.00	2.0	0
PROPSCORE	10	29.0	3.34	28.50	2.38	10	31.50	2.38	30.5	2

Note: Discourse Structure(DS),Communication Intent(CI), Coherence(COH), Topic Management(TM), Information Adequacy(IA), IC- Information content, MA- Message accuracy, TCR- Temporal causal relation, VS- Vocabulary specificity, LF- Linguistic fluency, SS- Speech style, INT- Intonation, Propositional score (PROPSCORE)

From Table 3 it is clear that TDC group has slightly better scores for the parameters of propositional discourse such as Discourse Structure (mean=2.50; SD=1.0), Coherence (mean=2.75; SD=0.50) and Topic Management (mean=9.25; SD=0.95) when compared to LD group. The same has been depicted in Figure 1.

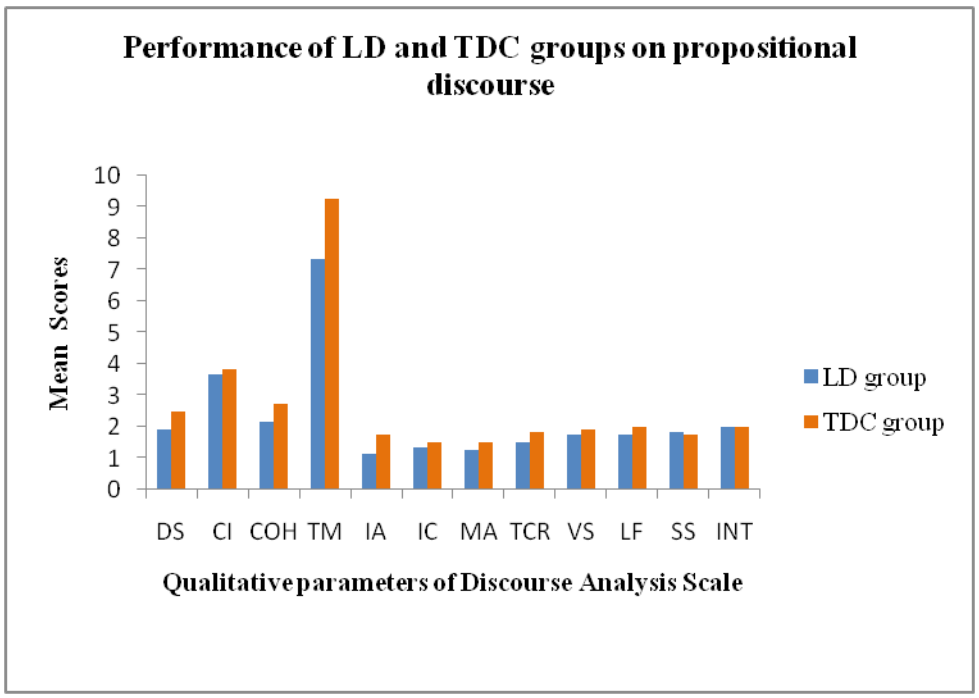


Figure 1. Mean scores of the propositional discourse parameters of qualitative analysis of narrative discourse of LD group (n=10) and TDC group (n=10).

Table 4

Mean, SD and Median for the Non propositional parameters of narrative discourse of LD group (n=10) and TDC group (n=10) on qualitative analysis

	LD group					TDC group				
Parameters	**N**	**Mean**	**SD**	**Median**	**QD**	**N**	**Mean**	**SD**	**Median**	**QD**
REVISION	10	1.91	0.20	2	0.06	10	1.62	0.52	1.63	0.44
REPAIR	10	5.66	1.75	5.5	1.69	10	6.45	0.73	6.45	0.69

The Table 4 depicts that LD group has higher scores for Revision behaviors (mean= 1.91, SD= 0.20) and TDC group has higher mean scores for Repair strategies (mean= 6.45, SD= 0.73). The same has been depicted graphically in Figure2.

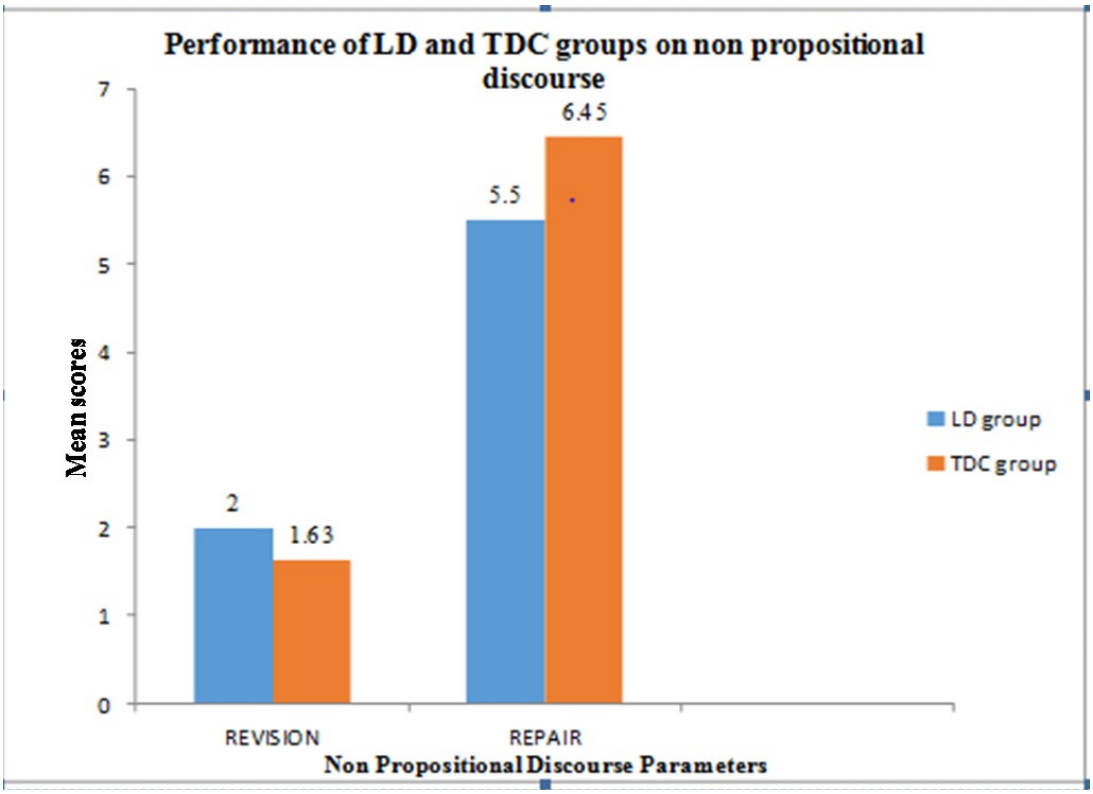


Figure 2. Mean scores of non propositional discourse parameters of qualitative analysis of narrative discourse of LD group (n=10) and TDC group (n=10).

Table 5

Mean, SD and Median for Discourse quotient of narrative discourse of LD group (n=10) and TDC group (n=10) on qualitative analysis.

	LD group					TDC group				
PARAMETER	**N**	**Mean**	**SD**	**Median**	**QD**	**N**	**Mean**	**SD**	**Median**	**QD**
DQ	10	73.40	6.45	74.03	4.75	10	86.76	4.85	86.76	4.44

Note: Discourse quotient (DQ), Standard Deviation (SD), Quartile Deviation (QD)

The overall Discourse Quotient was also noted to be of higher value for TDC group (mean=86.75, SD=4.85) as shown in Table 5. The graphical representation is shown in Figure 3.

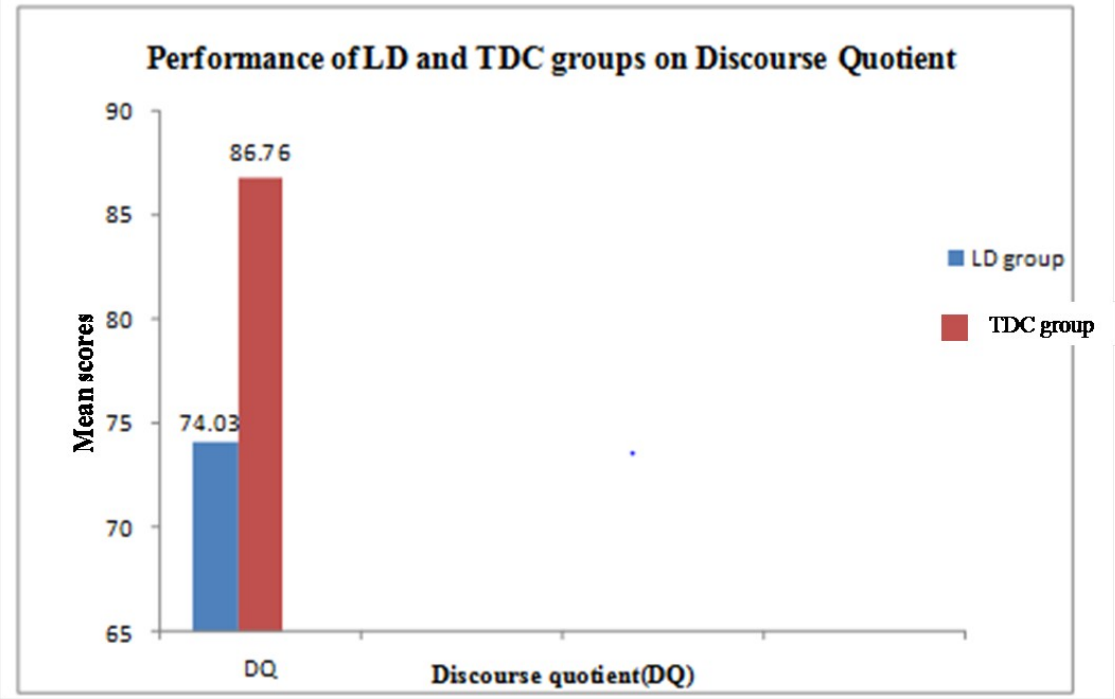


Figure 3. Mean scores of discourse quotient of qualitative analysis of narrative discourse of LD group (n=10) and TDC group (n=10).

4.2.2 Comparison between the children with Learning Disability and typically developing children for propositional and non-propositional aspects.

Mann-Whitney U test was administered to examine the difference in narrative discourse sample between the children with Learning Disability and typically developing children. The results of propositional and non-propositional aspects of narrative discourse are represented in Table 6. There was a significant difference between the groups for the sub parameter 'discourse structure', 'coherence', 'topic management', 'information content', 'propositional total' and 'discourse quotient'. There was also significant difference with reference to Discourse Quotient.

Table 6

Results of Mann-Whitney Test for the propositional & non-propositional aspects of DAS of narration task in Malayalam language.

Parameters	/Z/	p value (2-tailed)
Discourse structure	3.086	0.002*
Communication intent	1.509	0.131
Coherence	3.894	0.000*
Topic management	2.866	0.004*
Information accuracy	1.314	0.189
Information content	2.285	0.022*
Message accuracy	1.314	0.189
Vocabulary specificity	0.610	0.542
Temporal causal relation	0.457	0.648
Linguistic fluency	1.510	0.131
Speech style	0.503	0.615
Intonation	1.000	0.317
Propositional score	3.416	0.001*
Revision	1.510	0.131
Repair	1.219	0.223
Non propositional score	0.897	0.370
Discourse quotient	3.297	0.001*

Note. * $p < 0.05$

4.3 Results on Quantitative analysis of Oral Narrative Discourse among learning disability individuals and controls.

4.3.1. Mean and standard deviation for the parameters of T-unit based analysis for narrative discourse of the Learning Disability Group and Typically Developing Children Group.

The parameters of T-unit based analysis includes number of T-units (NTU), number of words per T-unit (NWPTU), number of clauses (NC) and number of words per clause (NWPC). Table 7, illustrates the results of descriptive statistics of the Learning Disability Group and Typically Developing Children Group in Malayalam language for the parameters (NWPTU, NC,

NWPC and NTU) of T-unit based analysis. This Table 7 shows the mean and standard deviation for the parameters of T-unit based analysis for narration task.

Table 7

Results of descriptive statistics for the parameters of T-unit based analysis of narrative discourse of LD group (n=10) and TDC group (n=10) on quantitative analysis.

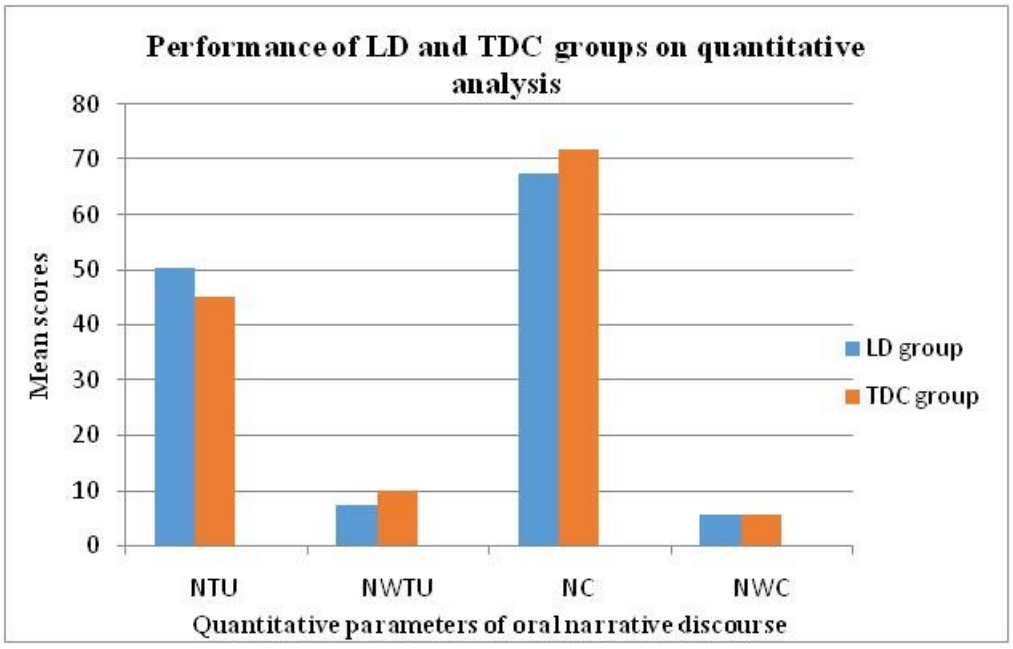
Parameters of T-units	**LD Group**			**TDC Group**		
	Mean	**Median**	**SD**	**Mean**	**Median**	**SD**
NTU	50.21	50.5	2.34	45	45	1.90
NWTU	7.22	7.19	1.29	9.99	9.90	1.22
NC	67.50	68	7.17	71.91	72.75	4.32
NWC	5.44	5.43	0.49	5.59	5.54	0.58

Note. Number of T-Units (NTU), Number of Words per T-unit (NWTU), Number of Clause (NC), Number of Words per Clause (NWC).

From the Table 7, the results revealed that LD group had greater mean value for the parameter number of T-units, than TDC group. Whereas, with reference to the parameter number of words per T-unit, number of clauses, number of words per clauses the typically developing children had higher mean values when compared to Children with Learning Disability.

The Figure 4 illustrates the performance of the two groups on quantitative analysis of narrative discourse with reference to the descriptive statistics of each parameter of T-unit analysis of Malayalam language. The figure shows lower mean value for the parameter number of words per clauses followed by number of words per T-unit, number of T-unit and number of clauses for children with Learning Disability group and Typically Developing

Children. Figure 4 illustrates the performance on quantitative analysis of narrative discourse of both the groups.



Note: Number of T-Units (NTU), Number of Words per T-unit (NWTU), Number of Clause (NC), Number of Words per Clause (NWC)

Figure 4. Performance of LD group (n=10) and TDC group (n=10) on quantitative analysis of oral narrative discourse

4.3.2 Comparison between the children with Learning Disability and typically developing children for the parameters of T-unit analysis.

Mann-Whitney U test was administered to examine the difference in narrative discourse sample between the children with Learning Disability and typically developing children. The results of the parameter of T-unit analysis of narrative discourse are represented in Table 8. There was significant difference for the parameter Number of T-unit and number of words per T-unit only.

Table 8

Between group comparisons on quantitative analysis of oral narrative discourse

Parameters of T-unit	/Z/	p value (2-tailed)
NTU	3.463	*0.001
NWTU	2.306	*0.021
NC	1.401	0.161
NWC	0.416	0.677

*p<0.05

Note. NTU-number of T-units, NWTU- number of words per T-unit, NC- number of clauses, NWPC- number of words per clauses

4.4 Correlation analysis- Qualitative Analysis and Quantitative Analysis.

Spearman correlation analysis was done to find correlation between Discourse Quotient of qualitative analysis and number of T-units (NTU), number of words per T-unit (NWPTU), number of clauses (NC) and number of words per clause (NWPC) of quantitative analysis of oral narrative discourse across (1) Irrespective of the group Learning Disability (LD) Group and Typically Developing Children (TDC) Group and (2) Within LD group and (3) Within TDC group.

4.4.1 Correlation irrespective of the group- Learning Disability (LD) Group and Typically Developing Children (TDC) Group

The results of non- parametric correlation analysis in Table 9 reveal that Number of T-units (NTU) has significant negative correlation with NWTU and DQ. The parameter NWTU had significant positive correlation with NC, NWC, and DQ; negative correlation with NTU. The parameter NC had significant positive correlation with NWTU, NWC, and DQ. The parameter NWC had significant positive correlation had with NWTC, NWC, and DQ. The parameter DQ had significant positive correlation with NWTU and NC; negative

correlation with NTU. The same which is significant at the 0.01 level and 0.05 levels is represented in Table 9.

Table 9

Correlation between qualitative and quantitative parameters irrespective of groups

Parameters		***N***	***P***	***p value (2-tailed)***
NTU	NTU	20	1.000	0.000
	NWTU	20	-0.481*	0.032
	NC	20	-0.228	0.334
	NWC	20	-0.123	0.604
	DQ	20	-0.701**	0.001
NWTU	NTU	20	-0.481*	0.032
	NWTU	20	1.000	0.000
	NC	20	0.845**	0.000
	NWC	20	0.722**	0.000
	DQ	20	0.899**	0.000
NC	NTU	20	-0.228	0.334
	NWTU	20	0.845**	0.000
	NC	20	1.000	0.000
	NWC	20	0.510*	0.022
	DQ	20	0.746**	0.000
NWC	NTU	20	-0.123	0.604
	NWTU	20	0.722**	0.000
	NC	20	0.510*	0.022
	NWC	20	1.000	0.000
	DQ	20	0.502*	0.024
DQ	NTU	20	-0.677**	0.001
	NWTU	20	0.899**	0.000
	NC	20	0.746**	0.000
	NWC	20	0.502	0.024
	DQ	20	1.00	0.000

Note: **. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Note: Number of T-Units (NTU), Number of Words per T-unit (NWTU), Number of Clause (NC), Number of Words per Clause (NWC), Discourse Quotient (DQ)

4.4.2 Correlation within Learning Disability (LD) Group

The results of non- parametric correlation analysis in Table 10 reveal that Number of T-units (NTU) did not show any significant positive correlation

with the any other parameters of quantitative analysis and the discourse quotient of qualitative analysis. The parameter NWTU had significant positive correlation with NC, NWC, and DQ. The parameter NC had significant positive correlation with NWTU, NWC and DQ. The parameter NWC significant positive correlation had with NWTU, NC, DQ. The parameter DQ had significant positive correlation with NWTU, NC, NWC. The same which is significant at p value= 0.01 and p=0.05 is represented in Table 10.

Table 10
Correlation between qualitative and quantitative parameters within LD group

Parameters		***N***	***ρ***	***p value (2-tailed)***
NTU	NTU	10	1.000	0.000
	NWTU	10	-0.448	0.194
	NC	10	-0.215	0.551
	NWC	10	-0.423	0.223
	DQ	10	-0.371	0.292
NWTU	NTU	10	- 0.448	0.194
	NWTU	10	1.000	0.000
	NC	10	0.927**	0.000
	NWC	10	0.818**	0.004
	DQ	10	0.868**	0.001
NC	NTU	10	-0.215	0.551
	NWTU	10	0.927**	0.000
	NC	10	1.000	0.000
	NWC	10	0.709*	0.022
	DQ	10	0.843**	0.002
NWC	NTU	10	-0.423	0.223
	NWTU	10	0.818**	0.004
	NC	10	0.709*	0.022
	NWC	10	1.000	0.000
	DQ	10	0.714*	0.020
DQ	NTU	10	-0.371	0.292
	NWTU	10	0.868**	0.001
	NC	10	0.843**	0.002
	NWC	10	0.714*	0.020
	DQ	10	1.000	0.000

Note: **. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Note: Number of T-Units (NTU), Number of Words per T-unit (NWTU), Number of Clause (NC), Number of Words per Clause (NWC), Discourse Quotient (DQ)

4.4.3 Correlation within Typically Developing Children (TDC) Group

The results of non- parametric correlation analysis in Table 11 reveal that Number of T-units (NTU) did not show any significant positive correlation with the any other parameters of quantitative analysis and the discourse quotient of qualitative analysis. The parameter NWTU had significant positive correlation with NC, NWC, and DQ. The parameter NC had significant positive correlation with NWTU and DQ. The parameter NWC significant positive correlation had with NWTU and DQ. The parameter DQ had significant positive correlation with NWTU, NC, NWC. The same which is significant at the 0.01 level and 0.05 levels is represented in Table 11.

Table 11
Correlation between qualitative and quantitative parameters within TDC group

Parameters		***N***	***ρ***	***p value (2-tailed)***
NTU	NTU	10	1.000	0.000
	NWTU	10	0.098	0.787
	NC	10	0.312	0.381
	NWC	10	0.406	0.244
	DQ	10	0.000	1.000
NWTU	NTU	10	0.098	0.787
	NWTU	10	1.000	0.000
	NC	10	0.657*	0.039
	NWC	10	0.770**	0.009
	DQ	10	0.924**	0.000
NC	NTU	10	0.312	0.381
	NWTU	10	0.657*	0.039
	NC	10	1.000	0.000
	NWC	10	0.237	0.510
	DQ	10	0.655*	0.040
NWC	NTU	10	0.406	0.244
	NWTU	10	0.770**	0.009
	NC	10	0.237	0.510
	NWC	10	1.000	0.000
	DQ	10	0.657*	0.039
DQ	NTU	10	0.000	1.000

NWTU	10	0.924**	0.000
NC	10	0.655*	0.040
NWC	10	0.657*	0.039
DQ	10	1.000	0.000

Note: **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Note: Number of T-Units (NTU), Number of Words per T-unit (NWTU), Number of Clause (NC), Number of Words per Clause (NWC)

Also, Mann Whitney U-test was done for gender comparisons, but results revealed no significant differences across gender in both the groups.

Summary:

Thus overall it can be stated that among the qualitative narrative discourse parameters, higher scores were obtained in TDC group for parameters such as Discourse structure, Coherence, Topic Management, Information content and Discourse quotient. There were no significant differences observed in non-propositional discourse. Among quantitative parameters Number of T-units and Number of words per T-unit were found to be significantly different across groups. The results of non- parametric correlation analysis irrespective of groups, reveals that Number of T-units (NTU) has significant negative correlation with NWTU and DQ. The parameter NWTU had significant positive correlation with NC, NWC, and DQ; negative correlation with NTU. The parameter NC had significant positive correlation with NWTU, NWC, and DQ. The parameter NWC had significant positive correlation had with NWTC, NWC, and DQ. The parameter DQ had significant positive correlation with NWTU, NC; negative correlation with NTU. For correlation within parameters in LD group, the results of non- parametric correlation analysis reveal that Number of T-units (NTU) did not show any significant positive correlation with the any other parameters of

quantitative analysis and the discourse quotient of qualitative analysis. The parameter NWTU had significant positive correlation with NC, NWC, and DQ. The parameter NC had significant positive correlation with NWTU, NWC and DQ. The parameter NWC significant positive correlation had with NWTU, NC, DQ. The parameter DQ had significant positive correlation with NWTU, NC, NWC. For parameters within TDC group, the results of non- parametric correlation analysis reveal that Number of T-units (NTU) did not show any significant positive correlation with the any other parameters of quantitative analysis and the discourse quotient of qualitative analysis. The parameter NWTU had significant positive correlation with NC, NWC, and DQ. The parameter NC had significant positive correlation with NWTU and DQ. The parameter NWC significant positive correlation had with NWTU and DQ. The parameter DQ had significant positive correlation with NWTU, NC, NWC.

CHAPTER 5

DISCUSSION

The results of the present study are discussed under qualitative, quantitative and the correlation between qualitative and quantitative analysis.

5.1 Qualitative analysis of oral narrative discourse

5.2 Quantitative analysis of oral narrative discourse

5.3 Correlation between qualitative and quantitative analysis

5.1 Qualitative analysis of oral narrative discourse

The qualitative analysis of oral narrative discourse was carried out using Discourse Analysis Scale in order to study the performance of Learning Disability (LD) group and Typically Developing Children (TDC) group and thus compared across the group. The parameters called 'Discourse Structure', 'Coherence', 'Topic Management', 'Information content' and 'Discourse Quotient' were found to have significant difference between the two groups ($p<0.05$). With reference to the mean score the LD group had poorer scores when compared to TDC group on the above mentioned parameters.

These limitations in narrative production of LD children can be attributed to several different underlying mechanisms as reported by Kornev and Aleksander's study (2015) on children with dyslexia (9-10 years old). One of them is inefficient formulation of temporal causal relations in a story (Kornev & Aleksander, 2015). Another reason is their difficulties in structuring an episode description. The episode is

the central unit in majority of story grammar models (e.g., Stein, Glenn 1979, Thorndyke & Yakovitch, 1980). Episode components are defined as statements portraying about some characters' goal, their attempts to solve the problem, and subsequent consequences (Liles et al. 1989). The production, organization and connectivity in story telling are thought to involve processes that are not solely linguistic (Coelho et al. 1994). As per the resource deficit hypothesis, the core limitations in dyslexics are caused by non-linguistic factors, namely by a cognitive resource deficit than any other linguistic factor (Van der Schoot, Licht, Horsley & Sergeant, 2000; Kibby et al. 2004). Theoretically, limitations in oral narration among dyslexics might be a consequence of their low reasoning capacity. This explains the poorer performance of LD group on parameters like Discourse Structure (DS), Topic Management (TM) and Coherence (COH), which require good reasoning and thinking abilities to plan and organize contents logically.

Kornev and Aleksander (2015) have also reported that children with dyslexia did not differ from TDC group in their performance on a task of story retelling. This is because retelling task probably activates a cerebral network underlying the story production process and enables structural composition much easily. This effect was extremely evident when the more complex picture sequence was presented for retelling initial sessions and followed by narration of the less complex story. Hence story generation task was chosen over retelling to check for discourse deficits in spoken narratives.

Another difficulty faced by dyslexics is at the level of topic management. Following van Dijk and Kintsch (1983), they have recognized episodes in narratives, as

macro-propositions that form the plot. While narrating a story, children have to recognize each of the propositions, to relate them into a logical sequence, and to verbalize the sequence. The results of the current study indicated that children with dyslexia generally attempted to produce more structurally incomplete episodes in narration when compared to their TD peers. This explains their poorer scores in topic management. These studies suggest that story generation is a more sensitive measure to tap discourse deficits in LD population rather than story retelling.

Swets, Jacovina and Gerrig (2014) reported that more cognitive resources are utilized when longer utterances are explored while discourse planning. Consequently, the cognitive resource deficit explains the production of simple and short phrases as well as structurally less complex oral narratives in LD group, due to their limitations in cognitive resources. Apart from these, there could also be some subtle underlying linguistic limitations which add on to their discourse deficits. This explains why the LD group had poor score on the parameter information content of narrative discourse. On observation it was noticed that, the children with LD would complete the picture description with smaller phrases and shorter sentences than typically developing counterparts.

Thus, for the parameter 'Information content' (IC) there was difference between LD and TDC group, with LD group having poorer scores. It was interesting to note that participants of TDC group described even slight differences in setting/background in the story with the use of appropriate modifiers and conjunctions. Children with LD however failed to notice such details and focused mainly on stating the main events in the story. The same is shown in Appendix C. Coherence was also affected in the LD

group. Coherence in terms of global and local coherence were affected. Due to the reduced usage of conjunctions and the poor organization of sentences, local coherence was affected. Thereby global coherence was also affected but to a much lesser extent as the major story outline was preserved by all the LD participants.

When children do not narrate adequately during conversation, they are perceived as being less effectual, both academically and socially (Bloome et al., 2003). A cognitive view is widely accepted in understanding the reasons for apparent deficits in narration. Accordingly, these children do not actually lack the abilities to produce narrative accounts but rather, lack the strategies for planning, organizing and delivering narratives. Most of these children with LD possess deficient strategies or exhibit poor use of strategies for accomplishing many tasks including academic tasks (Deshler & Schumaker, 1993). Wiig (1993) has attempted to relate metacognition and narration, stating that limitations in language describing past events is due to lack of strategies for recall of these events. Fivush (1993) also suggested that children's narratives are often impoverished due to limited strategies for attention, retrieval, and retention of event facts. In summation, children with learning disabilities often lack appropriate cognitive strategies and thereby experience difficulty evolving into competent academic individuals.

5.2 Quantitative analysis of oral narrative discourse

The quantitative analysis of oral narrative discourse was carried out using T-unit based analysis in order to study the performance of Learning Disability (LD) group and Typically Developing Children (TDC) group and thus compared across the group. The parameters 'Number of T-units' (NTU) and 'Number of words per T-Unit' (NWTU)

were found to have significant difference between the groups ($p<0.05$). LD group produced more number of T-units but with lesser words per T-unit, when compared to TDC group. On the contrary, TDC group produced lesser number of T-unit, but with more number of words per T-unit.

Typically written discourse is analyzed using T-units and spoken discourse is analyzed using C-units (Communication units). Most literature on spoken discourse have made use of quantitative parameters linked to C-units. C-units are synonymous to T-units. However, T-units can also be used to study oral as well as written discourse. Davenport et al. (1986) compared the spoken narratives of thirty dyslexics with typical peers and analyzed the sample quantitatively using C-unit analysis. The dyslexics used shorter communication units (independent clauses with all their modifiers), and a higher percentage of their words were non communications (words which are extraneous to the speaker's intended meaning). Similar findings have been reported by Westerveld and Gillon (2008) wherein C-unit analysis revealed oral narratives of the children with learning disability, being characterized by relatively short, but grammatically correct sentences. Shorter C-units indirectly mean lesser words per utterance. In the current study also LD group had lesser words per utterance.

In a study by Roth, Spekman and Fye (1995), LD children demonstrated greater difficulty with cohesive ties and their stories were significantly shorter than that of typical peers (i.e., T-units per story: 24 for LD; 36 for typical peers). In the current study, however LD group produced more number of T-units (mean=50.21) when compared to typical peers (mean=45). This could be because, they produced shorter stories but with more number of shorter sentences. Hence they have more Number of T-

Units (NTU). These sentences however lacked appropriate usage of conjunctions thereby resulting in lesser Number of words per T-Unit (NWTU). On the other hand, the TDC group produced longer stories with longer sentences linked by appropriate conjunctions. Every independent clause with all its modifiers and dependent clauses would constitute one T-Unit. Most often conjunctions like 'and',' 'so' lead to two independent clauses connected by the conjunction. Hence it would be counted as two T-Units. Conjunctions like 'because' often result in a dependent clause after the conjunction. Hence the entire sentence would be considered as one T-Unit. In Malayalam, conjunctions like 'karanam=because', 'enaalum=still', 'shesham=after', were used frequently used by participants of TDC group along with other conjunctions like'um=and', 'pinne=then'. All these conjunctions, when used in an utterance, often lead to production of dependent clauses after the conjunction. Thus, more number of dependent clauses in turn led to lesser NTU with more NWTU in TDC group. On the contrary, conjunctions like 'um=and', 'pakshe=but', and 'apol=then' were predominantly used by LD group which lead to independent clauses after the conjunction. More number of independent clauses in LD narration sample explains the higher NTU and lack of appropriate terms led to lesser NWTU.

According to a study by Plaza (2000), children with dyslexia used significantly lesser conjunction types and lesser number of conjunctions than typical peers. They associated propositions by juxtaposing subject-verb-complement sentences or through usage of specific commonly used conjunction like 'and'. These findings also indirectly support the present study and thus explain the reason for shorter length of utterance among children with LD.

Thus, oral discourse deficits are present in LD population and the overall differences in propositional discourse in LD population can be attributed to resource deficit hypothesis. Their inability to use appropriate strategies to plan and organize their utterance with appropriate cohesive ties and conjunctions lead to poor cohesion. Differences in quantitative analysis in LD population can be attributed to differences in production of clauses. Children with LD tend to produce more independent clauses without using appropriate conjunctions. Hence, differences in number of T-units and number of words per T-unit can be explained. It is therefore essential to also monitor oral discourse apart from written discourse, as the children with LD have deficits in both the domains.

5.3 Correlation between qualitative and quantitative analysis

There was a strong correlation between certain parameters in qualitative and quantitative analysis of oral discourse. Differences in oral narrative performance within LD groups or within TDC groups were not very evident. However, differences in performance for oral narrative discourse task existed between the two groups. The differences existed mainly for propositional discourse. It was found that the qualitative parameter, Discourse Quotient (DQ) was having strong positive correlation with quantitative parameters of T-units such as Number of words per T-unit (NWTU), Number of Clauses (NC) and Number of Words per Clause (NWC). This indicates that qualitative ratings have good association with quantitative aspects of discourse. Qualitative ratings were based on measures of coherence, information content, message accuracy, discourse structure etc. All of these parameters are indirectly scored on the basis of utterance length and content. Hence when a T-unit analysis is performed on the

narration of each participant, it would correlate with these ratings based on the same participants' narration.

Literature investigating qualitative and quantitative discourse simultaneously in LD population is scarce. From the current study it can be inferred that a combination of both qualitative and quantitative analysis of oral narrations is much more sensitive to identifying children with LD and is in support to each other. Within group correlation the results showed significant correlations only for few parameters. However, correlation irrespective of groups revealed that significant correlation was present between most quantitative and qualitative parameters of discourse. Thus overall it can be stated that a combination of qualitative and quantitative analysis hold good for comparison of discourse performance of any individuals.

To summarize, the differences in discourse of LD population qualitatively and quantitatively have to be documented separately. In view of children with LD, some oral narrative discourse deficits, which might go undetected during routine qualitative assessments, may be traced objectively in the quantitative assessment. Such findings are obtained in the current study which recommends the need to carry out qualitative and the quantitative analysis of discourse of individuals with learning disability. Thus, discourse analysis should be done to strengthen the existing diagnostic assessment procedures and subsequent intervention for this clinical group.

CHAPTER 6

SUMMARY AND CONCLUSIONS

The present study was aimed at investigating the narrative discourse abilities in children with learning disability and typically developing children in the native language (Malayalam). There were certain objectives considered for the present study.

Objectives of the study

- To compare the narrative discourse parameters of children with learning disability and typically developing children qualitatively in Malayalam language.
- To compare the narrative discourse parameters in children with learning disability and typically developing children quantitatively in Malayalam language.

Studies related to children with learning disability in Western and Indian scenario concentrated on measuring specific characteristics of oral discourse. There are very few studies which profile the narrative discourse abilities in children with learning disability. Understanding the linguistic impairments in children with learning disability is necessary to develop new approaches to diagnose and plan appropriate management strategies to help and maintain their narrative discourse abilities despite their academic difficulties. The current study focused on the profiling the narrative discourse abilities in L1 (Malayalam) language of children with learning disability and was compared with typically developing individuals.

A standard group comparison was made by considering children with learning disability and typically developing children (8-12 years) as participants. A total of 20 children participated in the study which comprised of 10 children with learning

disability (LD) and 10 typically developing children (TDC). All the participants had English language as medium of instruction in school. They also had vision and hearing acuity within normal limits and the handedness was right according to their self report. The clinical and non-clinical group participants were separated based on a set of criteria. General histories with demographic details were taken from all the participants along with the consent for agreeing to participate in the study.

The data collection involved two phases: Phase-I to build rapport and Phase-II to obtain narrative discourse samples of all the participants using "Frog Where are you" as the stimulus. A standard group comparison with two by two research design was used for the study. Audio recorded narrative discourse genres were transcribed verbatim. The results obtain from discourse samples were subjected to the statistical analysis. The discourse samples were analyzed both qualitatively and quantitatively. Qualitative and quantitative analyses of the narrative discourse sample were performed using Discourse Analysis Scale (DAS) by Hema and Shyamala (2008) and T-unit analysis respectively. Each sample was rated by three judges including the experimenter. Inter-judge reliability was measured for qualitative and quantitative analysis using Cronbach's Apha co-efficient. An experienced statistician conducted the analysis using SPSS 20 (Statistical Package for Social Science, 20^{th} version).

The significant findings of the present study are discussed under three sections qualitative analysis, quantitative analysis and correlation between the qualitative and quantitative analysis. Qualitative analysis of oral discourse between LD and TDC group revealed significant differences in parameters such as Discourse Structure (DS), Coherence (COH), Topic Management (TM), Information content (IC) and Discourse

Quotient (DQ). The TDC group also showed higher scores for overall propositional discourse and non propositional discourse. The total Discourse quotient (DQ) was also noted to be greater for TDC group, indicating that the TDC group produced more coherent, connected and organized oral narration at discourse level when compared to LD group. There was significant difference across the two groups primarily on propositional discourse. No significant differences were noted for non propositional discourse across groups.

Quantitative analysis of oral discourse between LD and TDC group revealed Number of T-units (NTU) and Number of words per T-Unit (NWTU) having significant difference across both the groups. The results revealed that LD group had greater number of T-units with lesser NWTU, than TDC group. However, NWTU was greater in TDC group indicating that participants in TDC group produced longer sentences during discourse with appropriate usage of conjunctions and connecting words, thereby producing more number of words per T-unit. This also suggests that even though LD group produced more NTU .i.e., more sentences; their utterances were probably short and therefore led to decrease NWTU. The TDC group produced more Number of Clauses (NC) during narrative discourse compared to LD group. For NWC, no significant differences were observed between TDC group and LD group. Thus quantitative and qualitative analysis of oral narration clearly hints at the discourse deficits in LD population.

Oral narrative skills form the foundation for subsequent academic learning. Traditional assessments of Learning Disability often do not assess their narrative skills at discourse level. Narrative analysis at both microstructure and macrostructure analysis

may be used to improve the assessment and intervention for children with LD. Rahmani (2011) mentioned the significant role of narrative therapy to reduce reading errors in dyslexics. This kind of Narrative therapy (storytelling with felt material), by using the multi-sensory approach may facilitate better reading skills in children with LD. Therefore, through narrative intervention their narrative discourse deficits and reading errors can be tackled simultaneously.

The present study aimed to investigate the narrative discourse abilities in children with learning disability in the native language (Malayalam) qualitatively and quantitatively. It can therefore be concluded that a combination of qualitative and quantitative analysis of oral discourse can provide information about narration skills in LD population, in terms of narrative microstructure as well as macrostructure. Oral discourse in terms of cohesion, sequencing, temporal causal relations often go undetected during routine formal assessments of LD. Detailed assessments of oral narrative discourse can be very useful during assessment and intervention for such children.

Implications of the study

- The current study will provide an understanding of oral narrative discourse in children with LD when compared to typical peers in Malayalam language.
- Since the present study includes combination of qualitative and quantitative discourse analysis, it may shed light on which form of discourse analysis is a more sensitive tool for assessing narration in LD population.

- The present study could also contribute to an understanding of language specific discourse deficits (Malayalam) and whether oral discourse could be considered as an essential part of assessment to confirm reading/writing problems in children.
- Besides this, deficits in oral narrative production if identified at an early age can be considered during intervention, thereby improving the overall spoken narrative ability. Oral narrative discourse intervened in this manner, may enhance written discourse skills in children with LD. Henceforth, their overall social and academic well being can be ensured.

Limitations of the study

- The present study was limited to a small sample size of clinical participants which probably restricts the generalization of the findings.
- Study incorporated narrative discourse assessed in only one task (story generation task)
- Qualitative and quantitative analysis done in the study were both subjective in nature.
- Narration was checked only in the native language(Malayalam), even though the children were bilingual

Future directions

- Larger sample size can be considered in future studies
- Future studies can compare oral and written discourse in children with LD

- Differences in discourse across tasks can be studied (story retelling vs narration).
- The study could be replicated using other methods of discourse analysis such as Computerized Language Analysis Program (CLAN), Systematic Analysis of Language Transcript (SALT), cohesion analysis, critical discourse analysis, socio-cognitive discourse analysis, etc.
- Further research investigating the way L1 and L2 of bilinguals' affects their linguistic performance in relation with the academic performance.

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APPENDIX A

All India Institute of Speech and Hearing, Naimisham Campus, Manasagangothri, Mysore-570006.

CONSENT FORM

Dissertation on

Narrative discourse skills in children with learning disability

Information to the participants

I, Ms. Devika S, II MSc student at AIISH for my dissertation titled- "Narrative discourse skills in children with learning disability" with the Principal Investigator Dr. Hema N., Lecturer, Department of Speech – Language Sciences, AIISH, Mysore – 6. The aim of the research is to study the narrative skills in children with learning disability in Malayalam language. I need to collect data from 10 children with learning disability in the age range of 8-12 years. Information will be collected through an interview and audio recording for the overall duration of around 30-40 minutes each under one or two recording conditions. I assure you that this data will be kept confidential. There is no influence or pressure of any kind by us or the investigating institute to your participation and the research procedure is different from routine medical or therapeutic care activities. There is no risk involved to the participants, but your cooperation in the study will go a long way in helping us to understand the narrative skills in children with learning disability and thereby help in identifying any deficits in this domain which can be trained during intervention.

Informed Consent

I have been informed about the aims, objectives and the procedure of the study. I understand that I have a right to refuse participation as participant or withdraw my consent at any time. I have the freedom to write to Chairman, AEC in case of any risk associated with the study.

I, _____, the undersigned, give my consent to be participant of this investigation/study/program.

Signature of participant Signature of investigator

(Name and Address) Date

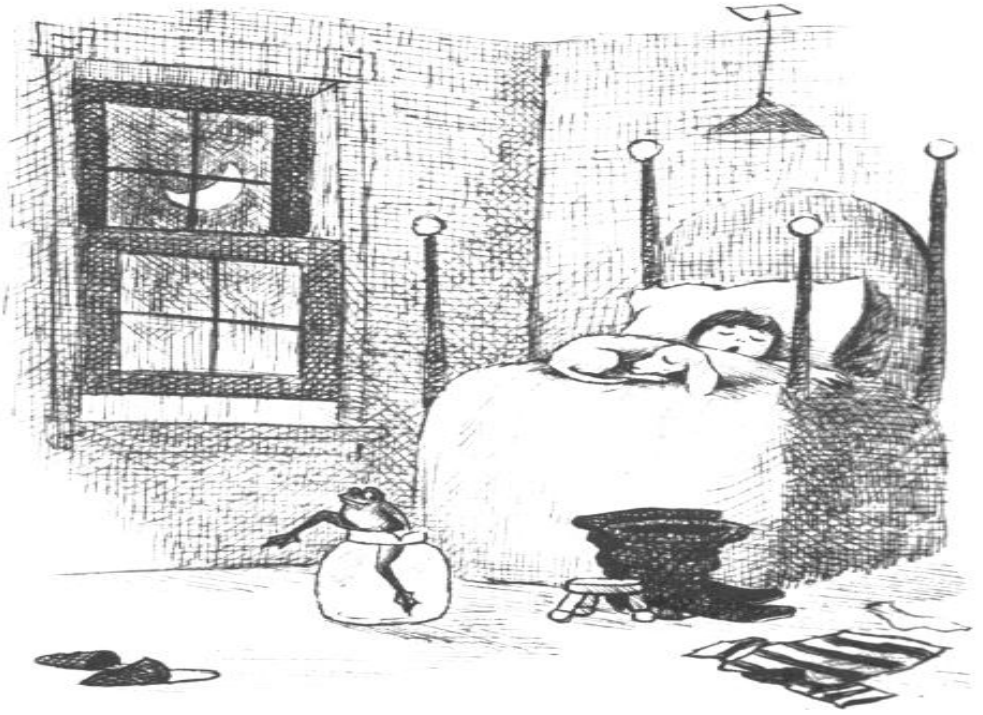
_____

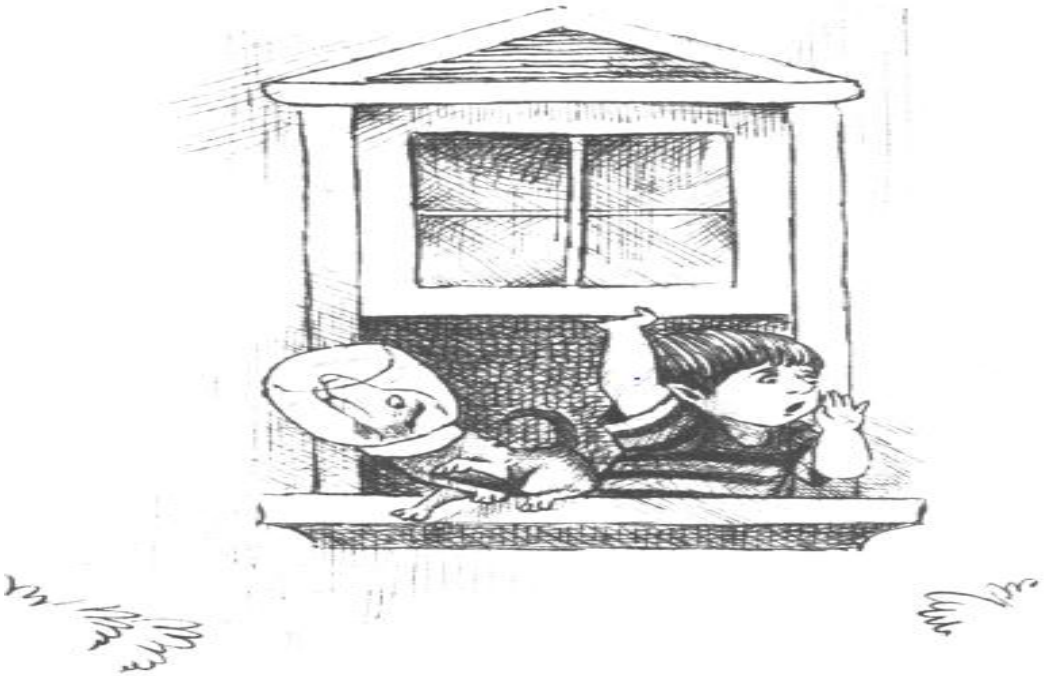
_____

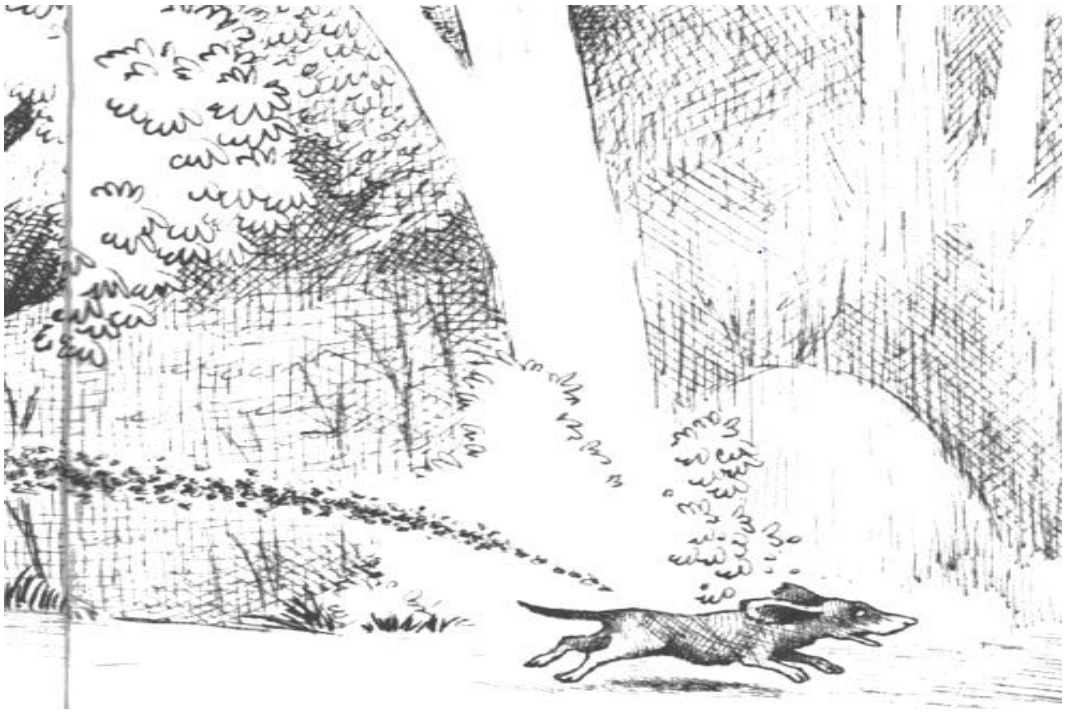
APPENDIX B

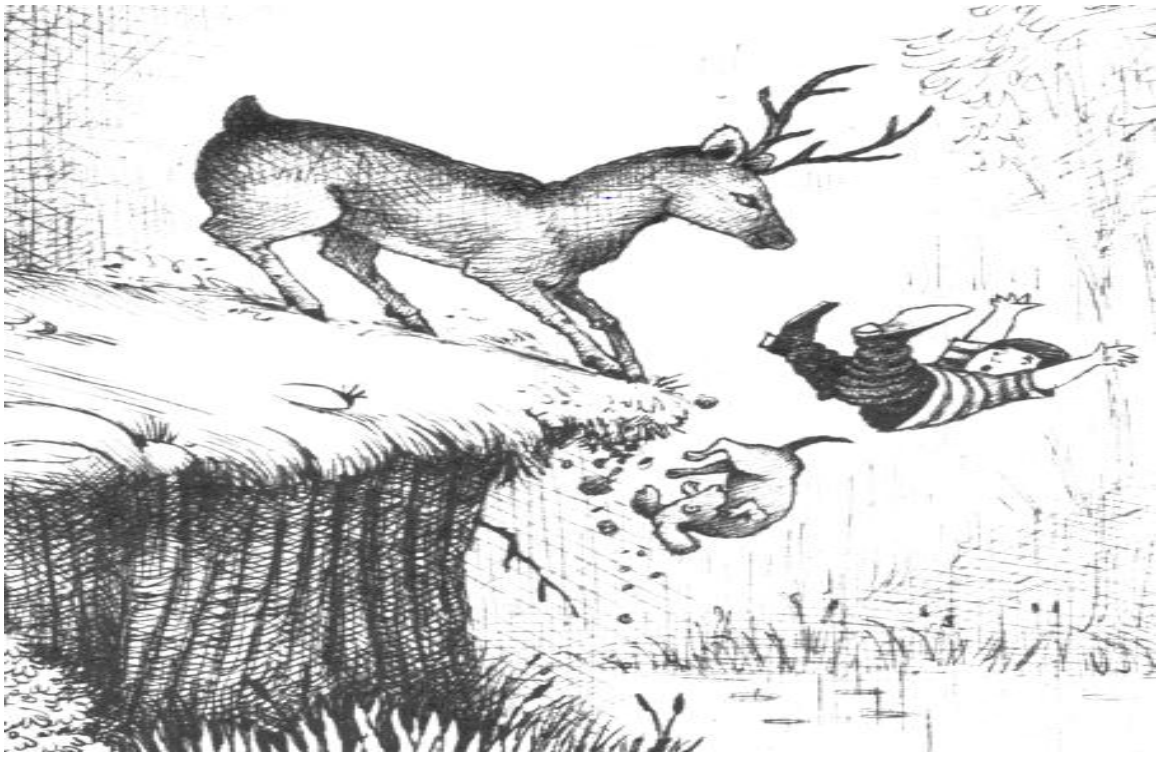
“The Frog Where are you”

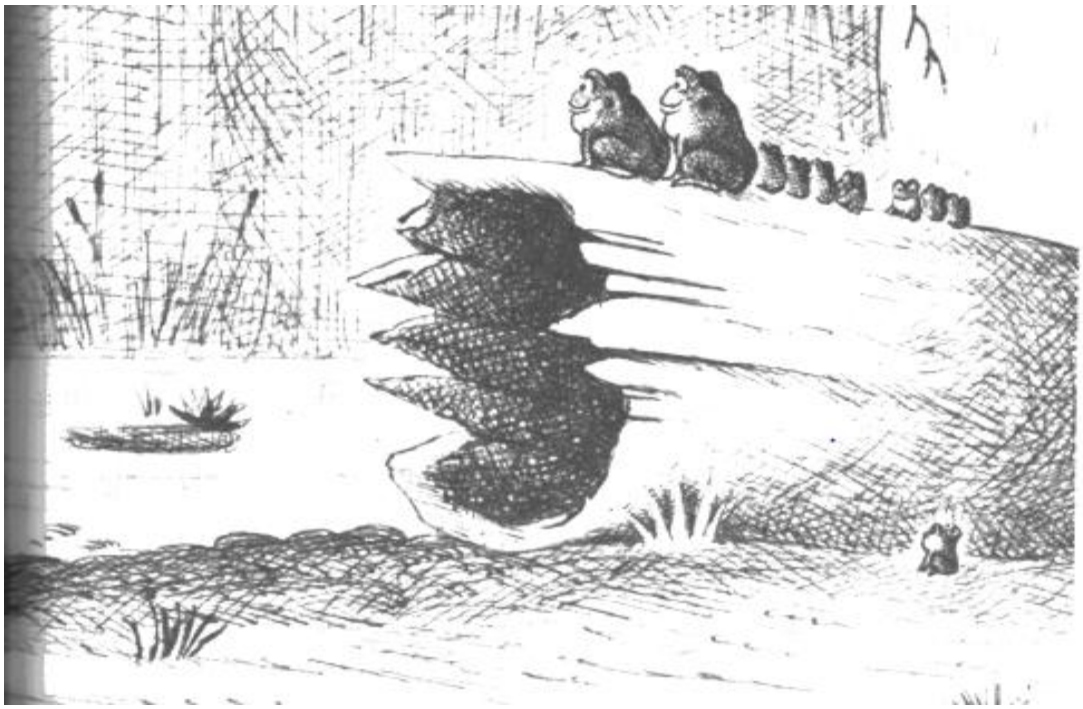
(Mayer, 1969)











Description of the picture stimulus "Frog where are you" by Mayer(1969)

There once was a boy who had a dog and a pet frog. He kept the frog in a large jar in his bedroom.

One night while he and his dog were sleeping, the frog climbed out of the jar. He jumped out of an open window.

When the boy and the dog woke up the next morning, they saw that the jar was empty.

The boy looked everywhere for the frog. The dog looked for the frog too. When the dog tried to look in the jar, he got his head stuck.

The boy called out the open window, "Frog, where are you?" The dog leaned out the window with the jar still stuck on his head.

The jar was so heavy that the dog fell out of the window headfirst! The boy picked up the dog to make sure he was ok. The dog wasn‟t hurt but the jar was smashed.

The boy and the dog looked outside for the frog. The boy called for the frog.

He called down a hole in the ground while the dog barked at some bees in a beehive.

A gopher popped out of the hole and bit the boy on right on his nose. Meanwhile, the dog was still bothering the bees, jumping up on the tree and barking at them.

The beehive fell down and all of the bees flew out. The bees were angry at the dog for ruining their home.

The boy wasn‟t paying any attention to the dog. He had noticed a large hole in a tree. So he climbed up the tree and called down the hole.

All of a sudden an owl swooped out of the hole and knocked the boy to the ground.

The dog ran past the boy as fast as he could because the bees were chasing him.The owl chased the boy all the way to a large rock.

The boy climbed up on the rock and called again for his frog.He held onto some branches so he wouldn‟t fall.

But the branches weren‟t really branches! They were deer antlers. The deer picked up the boy on his head.

The deer started running with the boy still on his head. The dog ran along too. They were getting close to a cliff.

The deer stopped suddenly and the boy and the dog fell over the edge of the cliff.

There was a pond below the cliff. They landed with a splash right on top of one another.

They heard a familiar sound.

The boy told the dog to be very quiet.

They crept up and looked behind a big log.

There they found the boy‟s pet frog. He had a mother frog with him.

They had some baby frogs and one of them jumped towards the boy.

The baby frog liked the boy and wanted to be his new pet. The boy and the dog were happy to have a new pet frog to take home. As they walked away the boy waved and said “goodbye” to his old frog and his family looked for the frog too.

APPENDIX –C

Narrative discourse sample in Malayalam language with the quantitative and qualitative analysis

Example from LD participant no. 8, the verbatim transcription is given according to each picture in the "Frog story" English translation in brackets and the narrative discourse analysis.

1- oru divasam oru thavala botilinte agath iripund. Oru kutiyum oru patikutim athine nokikone irikuvarnu, pati botilil tala itt nokuvarnu.(one day a frog was there in a bottle. One boy and dog were sitting watching it, dog looked inside)

2-avar urangiyapol tavala veliyil chadi irangi pakshe kutti arinjila (when they slept, frog jumped out of jar but the child id not know it)

3-ravile avar eneet noki.engum frogine kanunila. Evideyum kanunila(when they woke up in the mornig, they did not see the frog anywhere)

4- Avan shovinte agath okke noki. Apo pati botilinte agath kudungi poi.tala anakaan patathe nikunu(he looked in his shoe. Then dog got stuck inside bottle. He could not move his head)

5- ennit avar janal turan purathek noki. Patiyude talayil botili kudungi poyi pakshe kutti anerami aneram frogine vilikuvarnu(then he opened window and looked out. Dog's head was stuck inside but child was calling for frog)

6-jannal vazhi patti tarayil veen poyi apol Kutti ath kandu. Avan nokinikua patti veezhunne kandit(from window the dog fell down and he saw it. Then he was looking)

7-kutti purath vanna patikutiye eduthu. Pati avane nakki tudachu.apo botil tarel veen potti avde kuppi chill aii (he came out and picked up the dog. Dog licked then bottle had broken into pieces)

8-avar ennit purathek nadanu apol kuti tavalaye vilichond nadakunund. Kuray then ichakal parakunatum kandu(then they walked out calling the frog on the way. They saw many honeybees flying)

9-avar nadan nadan oru kaatil ethi pakshe avde frogine kandila. Valiya kaad arnu ath. Kurey marangal undarnu(walking walking they reached a forest, but there was no frog. It was a big forest. Many trees were there)

10- nadann etiyapol kuti oru hol kandu. Athil avan nokunund. Pati anengil apo then ichayude kood marathil thungi kidakane kandu. Athil chadi kuraykuvarnu(when he reached he saw a pit. He looked inside pit. Dog was looking at the beehive hanging from tree)

11- apo eli irangi vann kutiyude mukil kadichu koduthu. Pati anengi marathil aneram keri. Then ichakal kutil kurakkunundarnu aa pati(then rat came out of hole and bit him. Dog was climbing tree at that time. dog started barking at the beehive)

12- then icha kud tazhe veenu. Pati ath noki nikunund. Then ichakal paranu vannu purathek.(beehive fell down. Dog was looking at it. Bees started flying out)

13- apo kuti oru marathil keri ethi nokunundarnu. Athil oru hol pole kandu ethi noki. Holil frog undonn noki(then child started climbing a tree . he saw a hole like opening there. He started peeping in to check if frog is hiding inside that)

14- peten oru munga holeen purathek paran vann.ath kand kuti pedich poyi tale veen. Then ichakal mothom parakan tudangi. Parane paranne then ichakal kuthan vannu(suddenly an owl cam flying out. Seeing that the dog got scared. All bees started flying around) they flew and came to injure him.)

15- then ichakal elaam pattine odichu(bees were chasing the dog)

16-mungaye pedichu kuti parayude adiyil olichu irikuvarnu munga avane kandila(afraid of the owl, boy hid under a rock but owl did not see him)

17- kuti parayude purath keri tavalaye vilichond ninnu. Oru kambil pidich vilichond nikuvarnu(he climed on a rock and started calling the frog. He was holding a stick and calling the frog)

18- ath oru kambalarnu. maante kombarnu. Oru maan arnu parayude purakil maranje ninnath, Maan eneetathum avan kudungi poyi(that was not a stick. It was deer horns. A deer was hiding behind the rock.when it stood up he got trapped)

19-maan odan tudangi. Mante talayila kudungiye e kuti pakshe maan vegam oduva. Pati nokikkond munil odunund. Speedilan elarum odunat(it started running. He got trapped on its head. Dog was running in front. They are running fast)

20-odi odi ninapo kutim patiyum tazhe veenu. Taazhek terich veenu(when they ran and stopped, dog and boy fell down. They fell down with force)

21- a katil oru kulam undarnu(there was a pond in that forest)

22- avar aa kulathil poyi veenu(they fell into that pond)

23- kuti vellathine pongiyapol pati talayil irikunu. Kuti savund ket sredikunudarnu(when the boy came up from water the dog was on his head. He was listening to a sound carefully)

24-kuti karayil keri . oru tadiyude aduth irunn patiyod ocha vekkale enn kanichu. Pati karayilek neenthi varunu(child came to shore. He went near a wooden piece asking dog not to make noise. Dog also swam to shore)

25- apo tadiyude aparth aaro olich iripundenn toni(he felt someone was hiding behind the wood)

26-aparth nokiyapo rand tavalakale kandu(when he looked on the other side, he saw two frogs)

27-pineed nokiyapo kanam kurey tavala irikunu(later when he looked many frogs came)

28- enit oru tavalaye eduth tata kanichu tata paranju madangi veetil(he picked one from it and said bye returned home)

29- baaki frogsum elam noki irikunund (other frogs were watching them)

Quantitative T-unit analysis:

No.of T units(NTU)=60

No. of words per T-unit(NWTU)=7.2(436/60)

No.of clauses(NC)=71

No of words per clause(NWC)=6.1(436/71)

Qualitative analysis:

Sl. No.	**Aspect**	**Rate**
1.	Discourse structure	
	a) Discourse forethought	1
	b) Organizational Planning	1
2.	Communication Intent	
	a. Initiation of narration	2
	b. Asks for assistance	2
	c. Imagines events	1
3.	Coherence	
	a. Global	1
	b. Local	1
4.	Topic Management	
	a) Introducing topic	2
	b) Topic shifts	2
	c) Topic changes	1
	d) Perseverations	2
	e) Minimal elaborations	1
	f) Topic elaboration	1
5.	Information adequacy	1
6.	Information content	1
7.	Message accuracy	1
8.	Temporal and causal relation (TCR)	1
9.	Vocabulary specificity	1
10.	Linguistic fluency	1
11.	Speech style	2
12.	Intonation	2
13.	Revision behavior	2
14.	Repair strategy	
	a. Self-correction	2
	b. Repair through repetition	1
	c. Initiated correction	2
	d. Request for clarification	2
	Total	**36**
	DQ	**69.23**

APPENDIX –D

Narrative discourse sample in Malayalam language with the quantitative and qualitative analysis

Example from TDC participant no.8, the verbatim transcription is given according to each picture in the "Frog story" English translation in brackets and the narrative discourse analysis.

1- oru divasam oru veetil oru kuttiyundayirunu. Rathriyil avan avante pet ayit valartan oru frogine kond vannu. Frogine oru jaril itit irikuvarnu. Pattikutti undayirunitum avanu frogine pet aakan venamarunu. Apo avante kutukaranaaya pattikutim jaril nokikond nikuva
(One day there was a child in a house. At night he brought a frog home for raising as his pet.Although he had a dog, he wanted a pet frog too. Frog was kept inside a jar.The his friend puppy also started watching the jar)

2-ath kazhinj kuti kidan urangi avante kude aa pattiyum urangi. Apo tavala jariinte agathune irangi veliyil poyi(after that child slept with his dog. Then frog jumped out of the jar)

3-ravile kuttiyum pattiyum enitapo jarinte agath tavalaye kanunila. Avan alochichu evide poyi tavala enn(morning when the boy and dog woke up, the frog was missing from the jar.He started thinking where it could have gone)

4-rand shoes undarnu. Avan shovinte agath noki. Patikuti jarinte agath nokan vendi tala itt aneram tala kudungi poyi.(two shoes were there. He searched inside his shoes. Dog put his head inside jar to search but his head got trapped inside it)

5- kuti jannal turan a tavalaye aneshich vilichuninapol patiyude talayil jar kudungi.ath tala angotum ingotum itt aati kond irunu karanam kudungi kuppi talayil(when the boy opened window to search for frog, then dog;s head got trapped. It was shaking its head because the jar got trapped on its head)

6-kutti ingane veliyil nokikond ninapol pati veliyilek chaadi(while the child was looking out,dog jumped out)

7-kuti irangi vann nokiyapol patiyude talayil kudungiya jar poti. Kuti deshyathil patiye poki eduthapo pati avane nakkan tudangi(when he came out and looked, the jar trapped on its head had broken into pieces. When he picked up the dog, it started licking him)

8-kuti ath kazhinj veetine purath irangi oru mara chuvattil poya shesham vilichu noki frogine. Pati taen ichakale pidikan nokunu(then the child went out of his house to a tree and started calling for frog. Dog was trying to catch some honeybees flying around)

9-avar nadan nadan oru kaatil ethi. Avde hanibeesde kud kandu(they walked and reached a forest. There they saw a beehive)

10- kuti nokiyapo oru kuzhi kandu. Athilek nokikond irunapo pati ten icha kutil noki kurachu. Path ath engnelum talli idan chinthikuvarnu.(then child saw a pit. He was looking inside pit when dog started barking at the beehive.The dog was thinking of ways to push it down)

11- aa kuzhine eli irangi vanatum avante mookil maanti koduthu. Avan vedanich urakke karanju. Apo patikuti marathil keri tudangi a hanibeede kud talli idan vendi(when rat came out of the pit it scratched his nose. He started crying in pain. Then dog started climbing to push the beehive down from the tree)

12- aati aati kud taazhe veen kuti apo avden odi poyi. Othirim bees kudine purathek paranu.(shaking shaking ,the beehive fell down. Boy fled from there. Lots of bees started c\flying out of it)

13- kuti odi odi oru marathinte mandak keri. Atile holil sukshich noki frog avide undonn(he ran and ran and climbed a tree.he looked in that hole if frog was there)

14- athinagathun oru owl paranne vannapo kutti pedichu tazhe veenu. Hanibees oke paran vari ayit pokunundarnu.(from inside an owl flew out and child got scared. All honeybees were flying in a straight line)

15- hanibees elam patikutiye kuthan poyi karanam patiyaan avarude kud talli itat enn mansilayi(the bees chased the dog because they understood it was the dog who destroyed their beehive)

16-ee owlune rekshapeadan vendi kuti oru parayude tale poyi ninnu(to save himself from the owl, he hid under a big rock)

17- enit parayude etom uyarna nilayil vannit oru kamb kiti. Atil pidich frogine vilichu(reaching the highest point on the rock by holding onto a twig, he started calling for the frog)

18- ath oru maante kombarnu. Maan eneetathum avan maante mandayil ayi poyi(but that was a deer's horn. When deer rose he fell on top of it)

19-maan odan tudangi. Pati munnil odunu.pati nokiyapo athinte muthalaali mante purath kudungi kidakunu. Apo pati ath kandit kurachond oduvarunu(deer started running. Dog running in front.when dog looked up it saw its master trapped on the deer's head. Then seeing that it started barking while running)

20-maan ninatum kutim patiyum tazhe veenu(when the deer stopped,boy and dog fell down)

21- kuti veenat oru kaadinte ull bhaagathayirunu(child fell into a deeply forested area)

22- rand perum orumich aa kulathil veenu. Maan nokunundarnu(both of them fell together into a pond. Deer was looking)

23- kuti eneetapo entho shabdam ketu. Tavalayude shabdham ketu. Tavalayude shabdam kekuna pole thoni(when the child stood up, he heard some sound. He heard a frog sound. He felt like he was hearing a frog sound)

24-kutiyum patiyum marakashanathinte aduthek neengi vanna shesham karayil keri patiyod mindathirikaan paranju. (dog and boy came near a wooden piece,then he came to shore while telling the dog to stop barking and be silent)

25- kuti marathinte kambil keriyapo keri patiyum pinaale(when child climbed on the piece of wood, dog also climbed)

26- nokiyapo rand tavalakale irikanae kandu(on looking they found two frogs)

27-kure kazhinje kurey tavala kutikalum vannu.kutti athishayich noki. Ithil eente eythan alochichu(afterwards lots of baby frogs also came. Which one of these is mine he started thinking)

28- avan oru tavalaye eduth elarkum tata kanichu(he picked up one frog waved bye)

29- baaki frogsum bai paranju(all other frogs said bye)

Quantitative T-unit analysis:
No.of T units(NTU)=52

No. of words per T-unit(NWTU)=9.61 (500/52)

No.of clauses(NC)=77

No of words per clause(NWC)=6.4 (500/77)

Qualitative analysis:

Sl. No.	**Aspect**	**Rate**
1.	Discourse structure	
	a) Discourse forethought	2
	b) Organizational Planning	2
2.	Communication Intent	
	a. Initiation of narration	2
	b. Asks for assistance	1
	c. Imagines events	2
3.	Coherence	
	a. Global	2
	b. Local	2
4.	Topic Management	
	a) Introducing topic	2
	b) Topic shifts	2
	c) Topic changes	2
	d) Perseverations	2
	e) Minimal elaborations	1
	f) Topic elaboration	2
5.	Information adequacy	2
6.	Information content	2
7.	Message accuracy	2
8.	Temporal and causal relation (TCR)	2
9.	Vocabulary specificity	2
10.	Linguistic fluency	2
11.	Speech style	2
12.	Intonation	2
13.	Revision behavior	2
14.	Repair strategy	
	a. Self-correction	1
	b. Repair through repetition	1
	c. Initiated correction	1
	d. Request for clarification	1
	Total	**46**
	DQ	**88.46**

APPENDIX E

DISCOURSE ANALYSIS SCALE

Discourse Analysis Scale for narration task

(Hema & Shyamala, 2008)

Points to be considered while using Discourse Analysis Scale:

The parameters of propositional and non-propositional aspect of narration can be quantified with few general instructions to the evaluator as follows:

1. Initially read the keys provided in the sub headings which explain the exact meaning of the parameters to be scored as good, fair and poor with respect to the particular context of narration.
2. Scoring procedure involves the use of rating scale. Three points perceptual rating scale is used to evaluate each parameters.
3. Each appropriate behavior *(normal)* is given a *higher score* and the inappropriate behavior *(abnormal)* is scored *low*.

Propositional aspects of communication.

This includes the notion of relevancy, clarity of reference and coherence of information. It deals with how discourse is organized with respect to overall plan, theme or topic and how individual utterances are conceptually linked to main theme/topic.

1) Discourse Structure

Good- The discourse is organized with respect to overall plan, theme or topic and how events occurring earlier in time being described before events occurring later, and causative events preceding their consequences. The narrative discourse is never confusing in terms of logically and chronologically.

Fair- The discourse is partially confusing even if it's partially organized with respect to overall plan, theme or topic and how events occurring earlier in time being described before events occurring later, and causative events preceding their consequences, logically and chronologically making the narratives confusing.

Poor- The discourse is completely confusing since it is unorganized with respect to overall plan, theme or topic and how events occurring earlier in time being described before events occurring later, and causative events preceding their consequences. Thus the narrative is completely confusing in terms of logically and chronologically.

a) Discourse forethought----------→( )

[Score: 0-Poor, 1-Fair, 2-Good]

b) Organizational planning ----------→( )

[Score: 0-Poor, 1-Fair, 2-Good]

2) Communication intent

This parameter can be evaluated using frequency count, so check for the presence or absence. If present, make a note whether an individual use this parameter only in required circumstances or in all the circumstances.

Good- Individuals using this parameter in all required circumstances.

Fair- Individuals using this parameter inconsistently in the required circumstances.

Poor- This parameter is absent in the entire context of narration.

a) Initiation of narration----------→( )

[Score: 0-Poor, 1-Fair, 2-Good]

b) Asks for assistance during narration----------→( )

[Score: 0-Poor, 1-Fair, 2-Good]

c) Imagines events correctly----------→( )

[Score: 0-Poor, 1-Fair, 2-Good]

3) Coherence

a). Global coherence----------→( )

Good- Presence of good relationship between the meaning and context of verbalization with respect to the general topic of narration.

Fair- Presence of partial relationship between the meaning and context of verbalization with respect to the general topic of narration.

Poor- Relationship between the meaning and context of verbalization with respect to the general topic of narration is completely absent.

[Score: 0-Poor, 1-Fair, 2-Good]

b). Local coherence----------→( )

Good- Presence of good relationship between the meaning and context of verbalization with that of the immediately preceding utterance produced by the participant.

Fair- Presence of partial relationship between the meaning and context of verbalization with that of the immediately preceding utterance produced by the participant.

Poor- Relationship between the meaning and context of verbalization with that of the immediately preceding utterance produced by the participant is completely absent.

[Score: 0-Poor, 1-Fair, 2-Good]

4) Topic management

a) Introducing topic----------→( )

Good- Correctly introducing the topic.

Fair- Partial but correct introduction to topic.

Poor- Irrelevantly introducing topic or no response.

[Score: 0-Poor, 1-Fair, 2-Good]

b) Topic shift----------→( )

Good- Staying within the given topic.

Fair- Gradual shift from the given topic.

Poor- Rapid shift from the given topic.

[Score: 0-Poor, 1-Fair, 2-Good]

c) Topic changes----------→( )

Good- Coherent topic change where the topic is within the context of verbalization in terms of when and where the narrating event occurred.

Fair- Partially inappropriate topic change but still the topic is within the main context of verbalization in terms of when and where the narrating event occurred.

Poor- Non coherent topic change where the topic is decontextualized.

[Score: 0-Poor, 1-Fair, 2-Good]

d) Perseveration in the topics----------→( )

Good- Perseveration not present.

Fair- Perseveration partially present.

Poor- Perseveration continuously present.

[Score: 0-Poor, 1-Fair, 2-Good]

e) Minimal elaboration----------→( )

In presence of prompts from the investigator, the participants attempting to give yes/no responses along with very few sentential level discourse to elaborate the topic.

Good- Minimal elaboration appropriately present in all required circumstances

Fair- Minimal elaboration partially present in all required circumstances.

Poor- Minimal elaboration absent in required circumstances or minimal elaboration only present throughout the context of narration.

[Score: 0-Poor, 1-Fair, 2-Good]

f) Elaboration of topics----------→( )

Good- Adequate elaboration of topic.

Fair- Partial elaboration of topic.

Poor- Extra elaboration of topic.

[Score: 0-Poor, 1-Fair, 2-Good]

5) Information adequacy

Good- Completely adequate narration at word level/ single sentence level/ multiple sentence level without any prompts from the investigator.

Fair- Partially adequate narration at word level/ single sentence level/ multiple sentence level in the presence of few prompts from the investigator.

Poor- No narration at word level/ single sentence level/ multiple sentence level despite several prompts from the investigator.

a). Word level/ Single sentence level/ Multiple sentence level-----→( )

Underline the level at which the participant is positioned.

[Score: 0-Poor, 1-Fair, 2-Good]

6) Information content

Good- Completely correct description of people, locations, objects, activities and attributes that played a role in the events being narrated about. Good narratives pointing a detailed linguistic picture of the events they are describing.

Fair- Partially correct description of people, locations, objects, activities and attributes that played a role in the events being narrated about; Good narratives pointing more than half a linguistic picture of the events they are describing.

Poor- Incorrect description of people, locations, objects, activities and attributes that played a role in the events being narrated about. Good narratives pointing less than half a linguistic picture of the events they are describing.

a). Meaningful and adequate information----------→( )

[Score: 0-Poor, 1-Fair, 2-Good]

7) Message Accuracy ----------→( )

Good- An attempted narration involving correct narration without any confabulation or any inaccurate information within the same context of narration.

Fair- An attempted narration involving correct narration and few accurate information without any confabulation within the same context of narration.

Poor- An attempted narration involving incorrect narration with confabulation within the same context of narration with all inaccurate information.

[Score: 0-Poor, 1-Fair, 2-Good]

8) Temporal and causal relation (TCR)----------→( )

Good- Presence of all the temporal terms like then, and then, first, next, before, and after; causal terms like because, when, if, while, and until.

Fair- Presence of few temporal terms like then, and then, first, next, before, and after; causal terms like because, when, if, while, and until.

Poor- Absence of all the temporal terms like then, and then, first, next, before, and after; causal terms like because, when, if, while, and until.

[Score: 0-Poor, 1-Fair, 2-Good]

9) Vocabulary specificity----------→( )

Good- Using specific vocabulary when specific information is required.

Fair- Partially using specific vocabulary when specific information is required.

Poor- Overuse of generic terms such as "thing" and “stuff" when more specific information is required.

[Score: 0-Poor, 1-Fair, 2-Good]

10) Linguistic fluency ----------→( )

Good- Fluent discourse without any repetition, unusual pauses or hesitations.

Fair- Partially fluent discourse with very few repetitions, unusual pauses or hesitations.

Poor- Presence of repetition, unusual pauses, hesitations

[Score: 0-Poor, 1-Fair, 2-Good]

11) Speech Style ----------→( )

Good- Appropriate use of any dialectal structural forms, code switching and style-shifting.

Fair- Inappropriate use of dialectal structural forms, code switching, style-shifting is partially present.

Poor- Presence of totally inappropriate dialectal structural forms, code switching, style-shifting.

[Score: 0-Poor, 1-Fair, 2-Good]

12) Intonation ----------→( )

Good- Absence of any inappropriate or abnormal rising, falling, flat intonation with respect to a particular context of narration.

Fair- Inappropriate or abnormal rising, falling, flat intonation with respect to a particular context of narration is partially present.

Poor- Presence of inappropriate or abnormal rising, falling, flat intonation with respect to a particular context of narration.

[Score: 0-Poor, 1-Fair, 2-Good]

<u>Non propositional or Interactional aspects of communication</u>

This is one of the important categories of social communication behavior. These behaviors reflect the reciprocal nature of conversation and the joint co-operation required of the participant. *(Note: In narration it is only from participants' point of view)*

The following subcategories are considered:

1) Revision behaviors ----------→( )

Good- Absence of false starts and self interruptions in the entire context of narration.

Fair- Presence of false starts and self interruptions in some contexts of narration.

Poor- Continuous presence of false starts and self-interruptions in the entire context of narration.

[Score: 0-Poor, 1-Fair, 2-Good]

2) Repair strategy

This parameter can be evaluated using frequency count, so check for the presence or absence. If present, make a note whether an individual use this parameter only in required circumstances or in all the circumstances.

Good- Individuals using this parameter in all required circumstances.

Fair- Individuals using this parameter inconsistently in the required circumstances.

Poor- Individuals not using this parameter at all in the entire context of narration.

a) Use of self correction ----------→( )

Participants find a word or sentence after giving a small pause and continue the topic of narration.

[Score: 0-Poor, 1-Fair, 2-Good]

b) Use of repair through repetition/revision----------→( )

Repeating themselves and correcting the discourse without the investigators help.

[Score: 0-Poor, 1-Fair, 2-Good]

c) Use of other initiated correction----------→( )

Participants not able to find the right word, so the investigator fills it with the correct word to continue the topic of narration.

[Score: 0-Poor, 1-Fair, 2-Good]

d) Use of request for clarification ----------→( )

Requesting the investigator to modify the discourse and use the corrected version of discourse to continue the topic of narration.

[Score: 0-Poor, 1-Fair, 2-Good]

Finally, one can find discourse quotient, using the total score on propositional and non propositional aspects of communication which should be divided by total scores of all the features of propositional and non propositional aspects of communication. This must be multiplied with hundred to get the score in percentage. *Example*: if the participant's score is 32

Discourse Quotient = 32/ (42+10) = 32/52 x 100= 61.54