

## Dyslexic Characteristics among Jaffna Students

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### Abstract

*Learning disability is a cognitive problem that is not seen as a disability among students, unless the teachers or parents have awareness about it. In the case of Jaffna peninsula it is much worse that students are not given special care which affects their education and future and they are labelled as “lazy” students who don’t like to study and are being punished as well. To overcome this situation and to bring a better future for the poor children who have this disability, this research is to give support as well as awareness about this disability in the Jaffna peninsula. This research is focused at the linguistic level of the disability of dyslexia, the data collected and analysed through questionnaires given to the parents and teachers who deal with children, interviews and reading activities for the children were given to identify the difficulties. This research examines the problems of learning disability in a linguistic view as the analysis mainly focuses on linguistic characteristics based on Tamil language, in which linguistic level the children are having difficulties so that it would be easy to explain to the teachers as well as parents, how they should be able to find out the problems so that it will be easy to correct the children and give repetitive exercises to drill them little by little to bring them up. This thesis will also help both parents and teachers to cope with children of learning disability.*

### Background of the Study

Linguistics is a scientific study of a language as a whole which has two aspects such as theoretical and applied.

**Theoretical linguistics** is the branch of linguistics that is most concerned with developing models of linguistic knowledge. The fields that are generally considered the core of theoretical linguistics are syntax, phonology, morphology, and semantics. Theoretical linguistics also involves the search for an explanation of linguistic universals, that is, properties all languages have in common.

**Applied Linguistics** is concerned with the systematic study of language structure, the acquisition of first and subsequent languages, the role of language in communication, and the status of language as the product of particular cultures and other social groups. A background in linguistics is essential for language teachers, translators, speech-language pathologists, audiologists, and many other language professionals. Applied Linguistics examines the structure of language and its role in communication, explores how children acquire language, studies how the skills of second-language speakers develop, and investigates how the social or cultural environment interacts with language.

**Clinical Linguistics** is a sub-discipline of linguistics which involves the application of linguistic theory to the field of Speech-Language Pathology. Clinical linguistics, a branch of applied linguistics, is the use of linguistics to describe, analyze, and treat language disabilities. The study of linguistic aspect of communication disorders is of relevance to a broader understanding of language and linguistic theory. Since Learning Disability (LD) is a challenge to learn a language which is a primary function of communication. Now more care and special education systems had been introduced worldwide to enhance the learning process of those who are suffering from LD.

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In Sri Lanka the National Institute of Education (NIE) had considered LD of children who have given more attention to those who are physically challenged. But the awareness about LD is increasing among the teachers as it is taught in their teacher training programs but more care is given to those who are physically challenged. It is observed that there aren't any special classes allotted for students with dysgraphia and dyslexia in any of the schools in Jaffna peninsula and are not given separate care but they are put in a separate class categorized as low marks obtained and given care and punishments thinking they are poor in their studies and not categorized according to their cognitive ability.

The above condition is observed that it prevails in almost in many parts of Sri Lanka and much more worse in the Jaffna Peninsula as it was affected by war for many decades and it has not been developed in technology as in other places. LD has been taken into consideration among the western part of Sri Lanka as more educated and high sophisticated people live, and also language therapists who are available. This is a primary and a pilot research done in Jaffna peninsula to identify LD and the area of problems in the level of linguistics so that it would help the teachers to identify the problems and handle properly to teach the children with LD.

A secondary research has also had been done in addition to the primary research to help out with the primary research and to find the awareness among the parents and teachers who are dealing with children from the research sampling class group, from the 300 structured questionnaires were equally distributed among them, while unstructured interviews were conducted to gather more information about the role played by parents and teachers. As parents and teachers having been dealing with students in experiences, they might better know the experienced they faced and in particular who are the children with learning disabilities. Instead of interviewing children with LD, the interview was held among teachers who work with students with disabilities. The pilot research included 150 teachers (teach form grade 1-5) and 150 parents who have children learning from grade 1-5. In-depth unstructured interviews were administered to 20 teachers. The sampling was done through a convenience sampling technique. The research was done in stratified random sampling techniques to draw up the sample. This research is more focused to achieve qualitative results rather than quantitative output because it is not possible to rely on quantities given by relevant personnel. Questionnaire distributed for teachers and parents included informations that could help out in the research to get the idea about the LD among them.<sup>1</sup>

Out of 300 questionnaires distributed, to parents and teachers in Jaffna district, 140 teachers and 118 parents had successfully filled and returned, that is the response rate was 93% from teachers and 79% from parents. The sample consisted of respondents above, representing both genders and of age below 60 years old. Teachers representing international, national, government and private schools located in Jaffna who teachers were teaching from grade 1-5. In the case of parents, the interview was with parents who had children learning from grade 1-5 in Jaffna schools, in order to identify any learning disabilities which child or children are experiencing. The age group was categorized in to four levels. The majority of the sample was 31-40 years of age. From the teachers 39% and from the parents 47% were in the age category of 31-40 years. According to sex, it seems exactly 47% is male and the balance 53% is female in the sample of parents and 11% is male and the balance 89% is female in the sample of teachers. Among the parents interviewed, 38 % of respondents of the sample have two children. 23% of the respondents have three children which only 2% of the respondents have 6 children. According to the parents' response, 60% of the children are going to the government schools and 20 % of the children learn in private schools while another 10% each studying in national and international schools. When analyzing the teachers' sample, it was clear that 49 % of teachers were attached to the government schools, 26% to the private schools, 10% and 15 % were attached to the international and national schools. Teachers awareness level of learning disabilities among the children was by 137 out of 140 (98%) were aware of the learning disabilities. When analyzing the parent's respondents out of 118 respondents only 77 (65%) were aware of the learning disabilities about the children in their learning process.

<sup>2</sup>The questions from the questionnaire: 1- 6 were about the background information about the teachers and parents, questions from 6-12 consisted questions related to identify the role played by teachers as well as parents on assisting children with learning difficulties, questions from 13-16 were to identify types of learning disabilities and to classify linguistic levels such as phonological and morphological difficulties in LD and questions from 16 - 20 were to identify the contribution teacher and parent can make towards disabled students and treat them through linguistic therapy.

It was surprising that the research findings from the questionnaire, nearly 98% of the teachers were aware of the LD but couldn't categorize them under linguistic level and help them according to their LD. Only 65% of the parents were aware of it but couldn't actually figure out what was their problem. The exact reason why I have done this research is to identify the linguistic characteristics of their problem. Since this is a pilot research, many researches can be done based on this to enhance the learning ability of the poor children who are suffering from LD and take off their labels of 'laziness' and 'not interested'.

### ***Teachers' and parents' awareness of the characteristics of children with dyslexia***

Majority of the teachers who had responded mentioned the **phonological problems** of dyslexia such as unable to identify letters; unable to pronounce correctly; difficulties in pronouncing words and commit mistakes in letters (spelling); substantial number of teachers also had risen the issues such as unable to identify [n], [ŋ], [l], [ɫ] and [ʃ] sounds such as in the words like -'gdk;' - 'palmyrah' - / pənəm/ 'gzk;' - 'money' - / pənəm / ; 'thy;' - 'tail' - / va:l / , 'ths;' - 'sword' - / va:l / 'tho;' - 'live' - / va:l / ; problems in learning long & short sounds; errors in pronouncing the vowel symbols [a:] , [e] , [e:] as in 'fhfk;' - 'crow' - /ka:kam/ the child reads as 'ffk;' - /kakam/ ; for the word 'Nty;' - 'spear' /ve:l/ reads as 'nty;' - 'win' /vel/ or vice versa; difficult in using the vowel symbol [a:] = 'h', reads the sounds of [t] , [r] without any differences such as for the word 'kuk;' - 'tree' - /mɛtam/ he / she reads as 'kwk;' which gives the meaning opposite to charity ; doesn't spell the last letter sound of the word; careless in spelling words and vowel symbols etc connected the dyslexia problem among the students . However less number of teachers had also mentioned phonemic problems of dyslexia such as errors in spelling while reading, having difficulty while reading the sounds [tu] = 'U', [ʃa] = 'o', [mu] = 'K', reads without noticing the vowel symbols among the students for whom they were teaching.

When analysing the **morphological problems** of dyslexia among the children based on the teachers responses, issues such as: read words which are not in the text, tries to split the words if it is difficult to spell, difficult to read words with juncture rules Ks; /mu l / + jhs; / t a: l / = Kl;lhs; /muɫa: l / but they make it as Ks;jhs;/mu l t a: l / had been mentioned by many of the teachers. Less number of teachers mentioned the issues like contracted words, doesn't care about contextual usage etc.

**Common problems** related to dyslexia were also recorded based on the teachers responses, majority of them had highlighted the common problems such as skip line when reading, ignore punctuations while reading, long pause when reading, speed defects, repetitive reading as they frequently noticed . Several teachers mentioned common problems relating to dyslexia such as no reading practise, dislike in reading, unable to read quickly, attain low marks, rarely answers correctly, submit after memorising etc.

**Problems in tone** relationship with dyslexia were examined based on the teacher's views. Many teachers responded mentioning issues such as reads in low tone, cannot remember / revision is not done at home, doesn't know letters, unable to read in high tone, spells the word and reads aloud, and doesn't consider about the tone variation.

Majority of the parents who responded had mentioned the **phonological problems** of dyslexia such as take long time for pronouncing ,unable to understand the meaning of the read word, finding difficult while reading the sounds of the letters [l],[t], and [m] and mistakes while pronouncing. substantial number of parents also had risen the issues such as having trouble while reading long sounds, unable to pronounce letters accurately, problems in reading [l],[ɫ], and [ʃ] sounds, unable to pronounce letters correctly, errors in spelling while reading etc. however less number of parents had also mentioned such as having difficulty while reading the sounds [tu] = 'U', [ʃa] = 'o', [mu] = 'K', reads without noticing the vowel symbols among their children.

When analysing the **morphological problems** of dyslexia among the children based on the parents responses, issues such as meaning is not clear after reading, unable to read words by coining, omit words while reading, unable to read by combing words, unable to understand the meaning of the sentence been mentioned many of the parents. Less number of teachers mentioned the issues like ignore full stop and combine sentence while reading etc.

**Common problems** relating to dyslexia were also recorded based on the parent's responses. majority of them had highlighted the common problems such as flow less reading, unable to read quickly, problems in punctuation while reading, should observe way of holding books / keeping books, punctuation / sign, unable to identify letters, slow learning, remain without reading, sudden memory loss as they frequently noticed. Several parents mentioned common problems relating to dyslexia such as child gets scared while reading, unable to understand questions easily, unable to complete exercises in allotted time, barriers while reading, etc.

**Problem in tone** related with dyslexia was examined based on the parents' views. Many parents responded mentioning issues such as can't read aloud, doesn't get the correct tone of the letter etc. Therefore it can be concluded that dyslexia as a learning disability showed more positive phonological problems, morphological problems, common problems and problem in tone as teachers experienced in the class room as well as parents at home.

### **Research Problem**

A child with a learning disability cannot try harder, pay closer attention, or improve motivation on their own; they need help to learn how to do those things. A learning disability, or learning disorder, is not a problem with intelligence. Learning disorders are caused by a difference in the brain that affects how information is received, processed, or communicated. Children and adults with learning disabilities have trouble processing sensory information because they see, hear, and understand things differently. As information's given about LD in the background of the research, in general a research problem can arise such as, 'What are the linguistic problems faced by children with LD in Jaffna Peninsula?'

### **Research Questions**

1. What are the types of LD that are found among children in Jaffna peninsula?
2. What are the problems found in the linguistic areas/ levels that affect the children of LD?

### **Objectives**

1. Identify the types of learning Disabilities.
2. Identify the problems found in the linguistic areas/levels such as phonological, morphological, syntactic and semantics in each level.

### **Research Methodology**

A description of the method and data used in the study is given below. Research approach, methods and data, sampling, data collection methods and data analysis methods will be discussed. This research is focused on children from grade 1-5 who are studying in government, private, national and international schools located in Jaffna district. The collection of data on individuals with learning disabilities can be a challenge, since LD is an invisible disability and the teachers or parents can't directly identify the children as they have learning disabilities. Few children (around 50) through teachers were identified as the weakest students and administrated to understand the type of learning disabilities they were experiencing. Through the test, only 10 were identified as LDs according to the recurrent pattern of the errors that they were making. Individuals may have a learning disability and may not know that they have one. Also, school students with LD are able to hide or distance themselves from their learning disability. Therefore the research did not directly involve in identifying students with learning disabilities. Parents and teachers having been dealing with students in experiences, they might better know the experienced they faced and in particular who are the children with learning disabilities. Instead of interviewing children with LD, parents and teachers who work with students with disabilities were interviewed.

The purpose of interviewing teachers and parents was to gain a sense of the larger population of students they work with and some of the issues the organization of learning disability in the school or home setting and to know their knowledge of linguistics or the way they had approached linguistically with children of LD. Teachers are familiar with the experiences of a broad range of individuals with learning disabilities. The structured interviews lasted around thirty minutes. In-depth open interview with 20 teachers also were conducted. The respondents in the in-depth open interviews spoke at length about their experiences and thoughts about some interesting conversation related to their age.

The interview with teachers and parents were done to get a better sense of the procedures used at the school issues facing students with learning disabilities. It was also a way to get a broader picture of the students with learning disabilities. Finally, for this research project, a qualitative research was conducted through interviews (Cresswell 1998<sup>1</sup>; Michelle 1996<sup>2</sup>) with few children (around 10) with a specific learning disability. Children were given some exercises to identify their ability in phonological, morphological level through dictation, copy writing and reading. The sampling was done through a convenience sampling technique by using the stratified random sampling techniques to draw up the sample. Since the research is focused only on dyslexia two types of tests were given based on the research.

1. Reading
2. Speaking

Under the reading test a passage was randomly selected from their own text and unknown passages were given according to their age and class. Interesting conversation was made with the children mainly focusing based on for the research purpose. Tests consisted all the vowels and consonants used in Tamil language. Their errors were checked whether it is in a regular pattern and were classified according to the linguistic area. All the weakest students were identified by their respective class teachers through their class works and from their previous term tests held. Marks ranged from 0-30 in all the subjects were only taken for sample. While they were reading as well as speaking the errors were marked and then categorized under different levels of linguistics.

The main focus in this research in terms of secondary data lies on books written by researchers as well as scientific articles and questionnaire data collected from the parents and teachers in order to help with the primary research was used which had been discussed in the background of the study. To a lesser extent internet sources were used, in order to get access to scientific articles, search engines as *EBSCO*, *Emerald* and *Google Scholar* have been used. Apart from the secondary data collection for the theoretical part, an extensive literature search was carried out to find scientific articles and textbooks, which enriched the other parts of the master thesis as well. To this end, it is important to mention that the extensive review of books and scientific articles focused on linguistic literature. Primary literature in terms of journals, research documents collected was used to complement the analysis of the empirical findings.

Although collected for other purposes, secondary data may be helpful in a project. In general, secondary data can be obtained more quickly and with less cost than primary data. Secondary data also can sometimes offer insights in situations where can't collect primary data in every aspects of learning disabilities and roles of parents and teachers. Tabulated data will be analyzed to identify the main types of learning disabilities among the children. This research is more focused to achieve qualitative results rather than quantitative output because it is not possible to rely on quantities given by relevant personnel. Finally look for making some recommendation and treatment that could be given to children and to help teachers to teach in an easier way through the knowledge with linguistics and guide lines to improve the role which teachers and parents can play in the school and home environment in order to cope better with children who demonstrate learning disabilities. This is a pilot research done in Jaffna peninsula and the aim was to identify whether children are suffering from LD and in which linguistic area they have problems. This chapter in it's over view, tells about why the research had been done in its background of the study as well as how it was organized.

### ***Literature Review***

The word **Language** can be used as a general concept about the specifically human capacity for acquiring and using complex systems of communication, or as a specific instance of such a system of complex communication. The scientific study of language in any of its senses is called linguistics. Whereas **communication** includes speech (articulation, intonation, rate, intensity, voice, resonance, fluency), language (phonology, morphology, syntax, semantics, pragmatics), both receptive and expressive language (including reading and writing), and non-verbal communication such as facial expression, posture and gesture. To communicate, the process of language learning is important.

**Learning** is acquiring new knowledge, behaviors, skills, values, preferences or understanding, and may involve synthesizing different types of information. The ability to learn is possessed by humans, animals and some machines. Progress over time tends to follow learning curves. The concept of **learning disabilities** was first "discovered" in the 1900s.

Learning disability was originally assumed to be caused by a brain injury in early childhood. In the 1960s, the concept of learning disabilities gained popularity among middle-class parents as an explanation for learning difficulties among their children. Literatures clearly say that learning disabilities are a common problem among the children. However rather than ignoring such children, parents and teachers have key role to play to overcome learning disabilities.

### ***Common Types of Learning Disabilities***

The term learning disability is an overarching label for a variety of neurological conditions that interfere with a person's ability to store, process or produce information which makes suffering in their cognitive abilities. Here is an overview of the various types of learning disabilities.

The table below shows the main types of learning disabilities and detail discussion of dyslexia, dysgraphia.

**Common Types of Learning Disabilities**

<b>Dyslexia</b>	Difficulty processing language	Problems reading, writing, spelling, speaking
<b>Dysgraphia</b>	Difficulty with writing	Problems with handwriting, spelling, organizing ideas
<b>Dyscalculia</b>	Difficulty with math	Problems doing math problems, understanding time, using money
<b>Dyspraxia (Sensory Integration Disorder)</b>	Difficulty with fine motor skills	Problems with hand-eye coordination, balance, manual dexterity
<b>Auditory Processing Disorder</b>	Difficulty hearing differences between sounds	Problems with reading, comprehension, language
<b>Visual Processing Disorder</b>	Difficulty interpreting visual information	Problems with reading, math, maps, charts, symbols, pictures

### ***Dyslexia***

Dyslexia is a learning disability that impairs a person's ability to read and which can manifest itself as a difficulty with phonological awareness, phonological decoding, orthographic coding, auditory short-term memory, and/or rapid naming. Dyslexia is separate and distinct from reading difficulties resulting from other causes, such as a non-neurological deficiency with vision or hearing, or from poor or inadequate reading instruction. Dyslexia is the most common learning disability in children and persists throughout life. The severity of dyslexia can vary from mild to severe. The sooner dyslexia is treated, the more favorable the outcome; however, it is never too late for people with dyslexia to learn to improve their language skills.

Dyslexia is a learning disability (Morton, J, and Frith, 1995)<sup>1</sup> that impairs a person's ability to read and which can manifest itself as a difficulty with phonological awareness, phonological decoding, orthographic coding, auditory short-term memory, and/or rapid naming. Dyslexia is separate and distinct from reading difficulties resulting from other causes, such as a non-neurological deficiency with vision or hearing, or from poor or inadequate reading instruction. It is estimated that dyslexia affects between 5 and 17 percent of the population.

### ***Causes for dyslexia and types of dyslexia***

There are several types of dyslexia that can affect the child's ability to spell as well as read. "Trauma dyslexia" usually occurs after some form of brain trauma or injury to the area of the brain that controls reading and writing. It is rarely seen in today's school-age population. According to Frith, U. (1997) second type of dyslexia is referred to as "primary dyslexia." This type of dyslexia is a dysfunction of, rather than damage to, the left side of the brain (cerebral cortex) and does not change with age. Individuals with this type are rarely able to read above a fourth-grade level and may struggle with reading, spelling, and writing as adults. Primary dyslexia is passed in family lines through their genes (hereditary). It is found more often in boys than in girls. A third type of dyslexia is referred to as "secondary" or "developmental dyslexia" and is felt to be caused by hormonal development during the early stages of fetal development. Developmental dyslexia diminishes as the child matures.

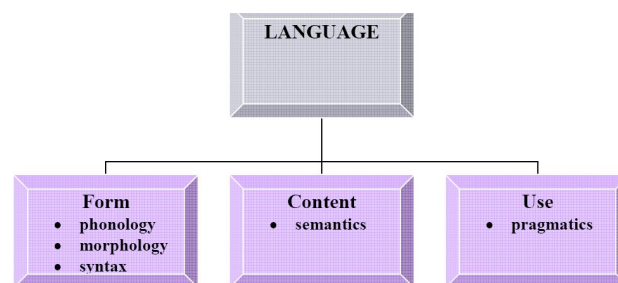
### ***Signs and symptoms of dyslexia***

Classroom teachers may not be able to determine if a child has dyslexia. They may detect early signs that suggest further assessment by a psychologist or other health professional in order to actually diagnose the disorder. Letter and number reversals are the most common warning sign. Such reversals are fairly common up to the age of 7 or 8 and usually diminish by that time. If they do not, it may be appropriate to test for dyslexia or other learning problems. Difficulty copying from the board or a book can also suggest problems. There may be a general disorganization of written work. A child may not be able to remember content, even if it involves a favorite video or storybook. Problems with spatial relationships can extend beyond the classroom and be observed on the playground. The child may appear to be uncoordinated and have difficulty with organized sports or games. Difficulty with left and right is common, and often dominance for either hand has not been established. In the early grades, music and dance are often used to enhance academic learning. Children with dyslexia can have difficulty moving to the rhythm of the music.

### ***Linguistic characteristics of dyslexia***

The main concept underlying the interpretation of the phenomenon dyslexia in the development of some children is the incompatibility between their abilities and their real achievements. Linguistic characteristics of dyslexia can be explained as below.

**Figure: Linguistics characteristics**



**Source: Bloom & Lahey (1978)<sup>1</sup>**

#### **a. Morphological and syntax language characteristics of Dyslexia**

Dyslexia has been defined as a “fine-tuned disorder of the written form of language, caused by deficiencies in the phonology coding, difficulties in the analysis of phonemes, poor vocabulary and difficulties in distinguishing the grammatical (morphological) differences between words” (Stanovich, 1991)<sup>1</sup>.

#### **b. Phonological characteristics – dyslexia**

The term phonological dyslexia is used by neuropsychologists to describe reading deficits that affect non-words (nep, cabe) more severely than familiar words. The understanding of phonological dyslexia not only has obvious clinical consequences, but also has implications for the current debate on reading processing. Current models of reading offer different accounts of phonological dyslexia. Because a better knowledge of this deficit can severely constrain such models, it is of primary theoretical significance. The dual-route model proposes that two types of mechanisms, which are in part neuro-anatomically distinct, support reading aloud (Sacks, O. 2010)<sup>2</sup>, for a recent instantiation of this account and a discussion of its variants. One series of mechanisms, the lexical route, is implicated in the retrieval of stored information about the orthography, semantics, and phonology of familiar words. An alternate route, the non-lexical route, allows readers to derive the sounds of written words by means of mechanisms that convert letters or letter clusters into their corresponding sounds. The non-lexical route is functionally limited in that it does not provide information about word meaning; nor, in a language like English or Italian, does it guarantee the correct pronunciation of a number of words. Nevertheless, the non-lexical route is responsible for deriving the sounds of non-words; its selective damage would result in phonological dyslexia (Stanovitch, 1991)

#### **c. Semantic dyslexia**

Semantic dyslexia is, as the name suggests, a subtype of the group of cognitive disorders known as Alexia (acquired dyslexia).

Those who suffer from semantic dyslexia are unable to properly attach words to their meanings in reading and/or speech. When confronted with the word "diamond", they may understand it as "sapphire", "shiny" or "diamonds"; when asking for a bus ticket, they may ask for some paper or simply "a thing". (John C. M, and Freda N, 2001)<sup>1</sup>,

### ***Available treatment for dyslexia***

Before any treatment is started, an evaluation must be done to determine the child's specific area of disability. While there are many theories about successful treatment for dyslexia, there is no actual cure for it. The school will develop a plan with the parent to meet the child's needs. If the child's current school is unprepared to address this condition, the child will need to be transferred to a school, if available in the area, which can appropriately educate the dyslexic child. The plan may be implemented in a Special Education setting or in the regular classroom. An appropriate treatment plan will focus on strengthening the child's weaknesses while utilizing the strengths. A direct approach may include a systematic study of phonics. Techniques designed to help all the senses work together efficiently can also be used. Specific reading approaches that require a child to hear, see, say, and do something (multisensory), such as the Slingerland Method, the Orton-Gillingham Method, or Project READ can be used. Computers are powerful tools for these children and should be utilized as much as possible. The child should be taught compensation and coping skills. Attention should be given to optimum learning conditions and alternative avenues for student performance.

Perhaps the most important aspect of any treatment plan is attitude. The child will be influenced by the attitudes of the adults around him. Dyslexia should not become an excuse for a child to avoid written work. Because the academic demands on a child with dyslexia may be great and the child may tire easily, work increments should be broken down into appropriate chunks. Teachers are learning to deliver information to students in a variety of ways that are not only more interesting but helpful to students who may learn best by different techniques. Interactive technology is providing interesting ways for students to feedback on what they have learned, in contrast to traditional paper-pencil tasks.

### ***Past research findings***

Developmental dyslexia was first described in 1886, in the case of a 14 year old boy who was unable to learn to read. A further study in 1917 attributed such difficulties to "congenital word blindness". It was not until the 1960s that research moved from the area of medicine into the area of education, with studies into what factors, if any, discriminated between "dyslexic" and "backward readers" (Nicholson, 2001). The term "dyslexia" has been generally used within medical/biological research and remains the term preferred by the voluntary groups in this field. However, as Nicholson (2001) points out, this implies that "there is a single relatively uniform syndrome". Current research indicates that this is not the case. Educationalists, in particular educational psychologists, preferred the term "specific learning difficulties", indicating that the person had a deficit in *some* of the processes of learning, but not all. Within the USA, during the 1980s, the term dyslexia was replaced with the term "reading disability". The consequence of this was a shift from an analysis of the process of *learning*, to that of the process of *reading*.

One of the difficulties in considering the research into various aspects of dyslexia has been that the studies arise from and are driven by the various models adhered to by the researchers. Results have at times been unconnected, or even conflicting, and led to different understandings of the nature of dyslexia. Morton and Frith (1995), and Frith (1997) proposed a Causal Modeling Framework, which permitted these theories to be considered within a common framework. The framework indicates three levels of an individual's functioning, together with a consideration of relevant environmental factors e.g. language system, social and emotional factors etc.

### ***Jaffna Tamil***

The research is concerned about the linguistic characteristics of dyslexia and dysgraphia, which is related to the problems faced in speech and writing of the children of the Jaffna Tamil community. So it is essential to know about the Tamil consonants and vowel and their occurrences so that it would be easier to understand the research. Below given are for the references.

### ***Vowels***

There are phonemes and allophone used in the speech of the Tamil speaking community.



**a. Vowel phonemes**

There are ten vowel phonemes used in Jaffna Tamil. They are five short vowels and five long vowels.

**Vowel phonemes used in Jaffna spoken Tamil**

	FRONT Rounded Unrounded	CENTRAL Rounded Unrounded	BACK Rounded Unrounded
High	/i/,/i:/		/u/,/u:/
Mean mid	/e/,/e:/		/o/,/o:/
Low		/a/,/a:/	

**b. Allophones of the vowels:**

The following are the allophones of some phonemes used by the Jaffna Tamil Speech community.

**Vowel allophones**

Vowels	Allophones
High front unrounded short and long vowel /i/ and /i:/	High central unrounded short vowel [i] occurs before retroflex consonants, [s] and before a single [r] and the long vowel [i:] occurs before retroflex consonants and [r] before a vowel. High front unrounded short and long vowel [i] and [i:] occurs in other environments.
High back rounded long and short vowel /u/ and /u:/	High back rounded short vowel [u] occurs in the first syllable of a word and the long vowel [u:] occurs in the initial, medial and final position of the word. High central unrounded short vowel [i] occurs in other environments.
Mean mid front unrounded short and long vowel /e/ and /e:/	Lower mid central unrounded short vowel [ə] occurs before retroflex consonants, [p],[m],[k],[v],[r] and [ŋ] followed by a vowel and the long vowel [ə:] occurs before retroflex consonants, [p],[m],[k],[v],[r],[s] and [ŋ] followed by a vowel. Mean mid front unrounded short and long vowel [e] and [e:] occurs in other environments.
Low central unrounded long and short vowel /a/ and /a:/	Higher low front unrounded short vowel [ɛ] occurs before alveolar consonants, palatal consonants and before [r] when it is doubled or followed immediately by another consonant and long vowel [ɛ:] occurs before [y] and [r]. Low central unrounded long and short vowel [a] and [a:] occurs in other environments.

Below given are the positions of the vowel sounds that occur in Jaffna spoken Tamil.

**Positions of the vowel sounds that occur in Jaffna Tamil with examples**

VowelSound	Word Initial	Word medial	Word final
[i]	[ilɛ] 'leaf'	[v i ʔiya] 'morning'	[k i li] 'tear'
[i:]	[i:tam] 'wet'	[vi: t̪ i] 'road'	[va:si] 'luck'
[i]	[i ʔiyappam] 'string hoppers'	[viŋ] 'space'	[u ʔippi] 'cloth'
[i:]	[i: ʔi] 'pawn'	[vi: ʔi] 'house'	-----
[u]	[ulaxam] 'world'	[puxa:] 'fame'	[a ɔu] 'that'
[u:]	[u: ɔ i] 'blow'	[ku: ʔi] 'nest'	[pu:] 'flower'
[e]	[eli] 'rat'	[keli] 'greedy'	-----
[e:]	[e: t̪ i] 'river'	[ke:li] 'tease'	[pe:] 'ghost'
[ə]	[ə t̪ t̪ i] 'eight'	[m ə t̪ t̪ i] 'toe ring'	-----
[ə:]	[ə: ɔ i] 'from where'	[v ə: ʔan] 'hunter'	-----
[o]	[o l i] 'light'	[ko ʔi] 'line'	-----
[o:]	[o: ʔi] 'run'	[ko: ʔi] 'line'	[po:] 'go'
[ɛ]	[ɛtisi] 'rice'	[nɛti] 'fox'	[kule] 'bark'
[ɛ:]	-----	[nɛ:ti] 'hip'	[nɛ:] 'dog'
[a]	[amb̪i] 'arrow'	[kalam] 'vessel'	[nɛlla] 'good'
[a:]	[a: ʔi] 'dance'	[ka:lam] 'period'	[va:] 'come'

## Consonants

As same as the vowels, the Jaffna Tamil speech community has consonant phonemes as well as allophones.

### Consonant phonemes

In Jaffna spoken Tamil there are fourteen consonant phonemes used.

#### Consonant phonemes used in Jaffna spoken Tamil

	Bilabial	Labio-dentals	Inter-dental	Alveolar	Apico-dorsal	Palatal	Velar
Stops	[p]		[t̪]	[t]	[t̪]		[k]
Affricates						[t͡ʃ]	
Fricatives		[v]					
Nasals	[m]			[n]	[ɳ]		
Laterals				[l]	[ɭ]		
Trill				[r]			
Semivowel						[y]	

#### a. Consonant allophones:

The following are the allophones of some phonemes used by the Jaffna Tamil Speech community.

#### Consonant Allophones

Consonant phonemes	Allophones
Voiceless velar stop /k/	Voiceless velar stop [k] occurs in the initial and medial position of a word after [r] and [s]. Voiceless velar fricative [x] occurs in the intervocalic position Voiced velar stop [g] occurs medially in the sequence [-ŋk-]
Voiceless palatal affricate /t͡ʃ/	Voiceless palatal affricate [t͡ʃ] occurs in other environments. Voiceless alveolar fricative [s] occurs medially between vowels. Voiced palatal affricate [d͡ʒ] occurs medially after [ɲ]
Voiceless retroflex plosive /t̪/	Voiceless retroflex plosive [t̪] occurs in other environments Voiced apico-dorsal flap [ɳ̆] occurs in the intervocalic position. Voiced retroflex stop [ɖ] occurs in the sequence of [-ɳ̆-]
Voiceless inter-dental stop /t̪/	Voiceless inter-dental stop [t̪] occurs in other environments Voiced inter-dental fricative [ð̪] occurs in the intervocalic position Voiced inter-dental stop [ɖ̪] occurs in the sequence of [-y̆t̪-] and [-r̆t̪-]
Voiceless bilabial stop /p/	Voiceless bilabial stop [p] occurs in other environments Voiced bilabial fricative [ɸ] occurs intervocalically and in the sequence of [-rp-] and [-lp-] Voiced bilabial stop [b] occurs in the sequence of [-mp-], [-np-] and [-ɳp-]

**Table: Positions of the consonants sounds that occur in Jaffna spoken Tamil with examples**

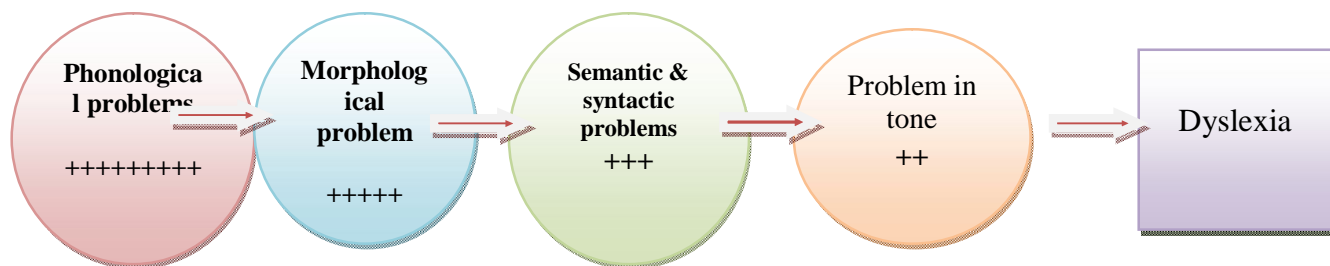
Consonant sound	Word initial	Word medial	Word final
[p]	[paṇḍi] 'ball'	[appa:] 'father'	-----
[b]	-----	[ambi] 'arrow'	-----
[t]	[ta:] 'give'	[va:tti] 'goose'	-----
[d]	-----	[vaṇḍi] 'come'	-----
[t]	-----	[matam] 'tree'	-----
[ʈ]	-----	[ka: ʈi] 'show'	-----
[d]	-----	[va ṇḍi] 'bug'	-----
[k]	[ka:xam] 'crow'	[pakkam] 'page'	-----
[g]	-----	[va: ŋgi] 'bench'	-----
[č]	[ča ʈ ʈi] 'pan'	[p ε č č ε] 'green'	-----
[j]	-----	[pa ṇ ji] 'cotton'	-----
[φ]	-----	[a:φatti] 'danger'	-----
[v]	[va ṇḍi] 'bug'	[av εr] 'he'	-----
[ð]	-----	[pa: ðam] 'toe'	-----
[s]	[s etam] 'garland'	[va:sam] 'fragrance'	-----
[x]	-----	[pa:xam] 'share'	-----
[m]	[matam] 'tree'	[amma:] 'mother'	-----
[ṇ]	-----	[paṇḍi] 'ball'	-----
[n]	[n ε:] 'dog'	[εnbi] 'love'	[na:n] 'me'
[ṇ]	-----	[va ṇḍi] 'bug'	[pa:n] 'bread'
[ṇ]	[ṇa:yiri] 'Sunday'	[pa ṇ ji] 'cotton'	-----
[ṇ]	-----	[paṅgi] 'share'	-----
[l]	[la: φam] 'cheap'	[p εlam] 'strong'	[pa:l] 'milk'
[l]	-----	[va: l k ε] 'life'	[va: l] 'sword'
[r]	-----	[urε] 'cover'	[u: r] 'place'
[ʎ]	-----	[pa ʎam] 'picture'	-----
[y]	-----	[muy εl] 'rabbit'	[pa:y] 'jump'

We have discussed about language and the types of LD that prevails among the children with its symptoms, characters and especially focused on dyslexia from the literature review and also had discussed about the Jaffna Tamil vowels and consonants, its occurrence and its functions to help out with the next chapter, where we will be discussing about the linguistic levels of Jaffna Tamil children who are suffering from dyslexia.

**Linguistic Characteristics of Dyslexia among Children with Learning Disability**

This analyses from the data collected from the questionnaire given to the teachers and parents, based on the data which had been given in the background of this research. Among the identified students with dyslexia by the teachers and parents it was remarkably shown all 4 categories of problems were identified, while phonological and morphological problems were very much prominent in dyslexia. This can be shown in the flow chart below

**Identified dyslexic problems by teachers and parents**



This part is the most important presentation that gives the analysis of the linguistics characteristics of the Tamil speaking students who are suffering from LD.

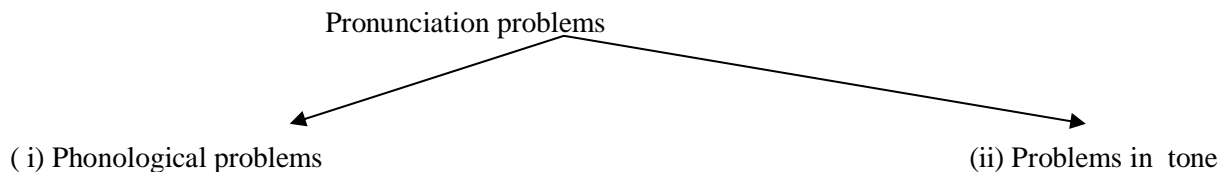
### Identified dyslexic problems among children

Research was done among selected children of severe LD, who were been identified by their teachers, from grade 1 to grade to 5 to ensure their disability, tests were given to them. 10 students were identified as dyslexics. The data was analysed according to the linguistic characteristics. The research had been analyzed within three main problems among the dyslexic students:

1. Pronunciation/ reading problems of dyslexics
2. Morphological and syntactic problems of dyslexics
3. Semantics and pragmatic problems of dyslexics

### Pronunciation / reading problems in dyslexics

Children of dyslexics have problems in their pronunciation while reading. A tree diagram is shown to give a clear idea how the findings have been analysed within pronunciation. Diagram below shows the divisions of the analysis.



#### 1. Phonological problems of dyslexics

Under this section two main categories are taken into account.

- a. Problems related to phonemes
- b. Problems related to allophonic variation

##### a. Problems related to phonemes

There were problems noticed when children of dyslexia while using vowel and consonants phonemes in Jaffna Tamil whereas they make vast difference in meaning of the context.

##### i. Vowel phonemes

Data below shows that children of dyslexia have problems in pronouncing long vowel phonemes. Table shows the phonemic variation of the pronunciation of the long and short vowels that differ the meanings.

**Problems in pronouncing long vowel phonemes by dyslexics**

Sound of the vowel phoneme	Actual pronunciation of the word	pronunciation of the dyslexics
/i:/	[i: ri] 'gum of the teeth'	[iru] 'sit'
/u:/	[u:ri] 'soak'	[uri] 'pot tied up in a rope that hangs on the roof'
/o:/	[o: Y'i] 'run'	[oY'i] 'to break'
/a:/	[a: ri] 'cool'	[ari] 'to know'
/e:/	[ve:l] 'spear'	[vel] 'to win'

The above table shows the short vowels pronounced instead of long vowels and the meaning differences in the Jaffna Tamil context.

##### ii. Consonant phonemes

The children of dyslexics among Tamil students don't have much problem in pronouncing most of the consonant phonemes. They have problems in using the consonant phonemes such as /ŋ/, /l/, /t/. The /ŋ/ and /l/ phonemes occur in the medial and final position of a word. The actual words pronounced of these phonemes are [va: l] 'sword', [v ə l lam] 'flood', [maŋam] 'smell', [na: ŋ] 'arrow' which are pronounced by the dyslexics as [va:l] 'tail', [vellam] 'sweet', [manam] 'mind', [na:n] 'I' which had given different meaning.

The /t/ phoneme is pronounced only in the medial position in the spoken Tamil in Jaffna. The word [matam] 'tree' is pronounced as [maram] by the dyslexics which gives the meaning as 'not legal'.

## b. Problems related to allophonic variations

The data shows that the children with dyslexia have difficulties in pronouncing some vowel and consonant sounds in some position of the word. They are given below.

### i. Allophonic variation of the vowels

From the data collected and analysed, children with dyslexics didn't have problems in pronouncing the short vowels except for the higher mid central short vowel [ɛ] which is substituted by the lower central vowel [a] in the initial position for e.g the word [ɛtisi] 'rice' was pronounced as [arisi], where the allophonic variation of the sound [ɛ] of the sound [a] is not produced. And they also have problems in pronouncing long vowels in the initial position. The problematic pronunciations are given in the table below

#### Problems in pronouncing the long vowel sounds in the initial position of the word by dyslexics

Vowel sound	Actual pronunciation of the word	Word pronounced by dyslexics
[i:]	[i:sɛl] 'termite', [i:tam] 'wet'	[isal] , [iram]
[e:]	[e:ɪ] 'from where?'	[e ri]
[i:]	[i:Yi] 'pawn'	[iri]
[ə:]	[ə:Yi] 'scripture'	[əri]
[o:]	[o:Yi] 'run'	[ori]
[a:]	[a:Yi] 'dance'	[ari]
[u:]	[u: ð i] 'blow'	[uvi]

From the data taken it was observed that children didn't have problems in pronouncing the short vowels in the medial position except for the higher mid central short and long vowel [ɛ] was substituted by the lower central vowel [a] for e.g. the word [nɛti] 'fox' was pronounced as [nari] and also the long vowel [ɛ:] in the word [nɛ:ti] 'hip' was substituted by its phoneme [a] as [nari]. All the children with dyslexics have problems in pronouncing all the long vowel sound; instead of long vowels they have substituted the short vowel of the same long vowel. Table below shows the problematic vowels.

#### Problems in pronouncing the vowel sounds in the medial position of the word by dyslexics

Vowel sound	Actual pronunciation of the word	Word pronounced by dyslexics
[i:]	[v i:tam] 'brave'	[v iram]
[e:]	[ve:r] 'root'	[ve r]
[i:]	[vi:Yi] 'house'	[viri]
[ə:]	[və:Yam] 'act'	[v əram]
[o:]	[ko:Yi] 'line'	[kori]
[a:]	[ka:Yi] 'forset'	[kari]
[u:]	[ku:Yi] 'nest'	[kuri]

The data collected showed that the long vowels as well as the short vowels are pronounced by the dyslexics in the final position of the word except the short vowel [i] which is substituted by the high front unrounded vowel [i]. E.g. The words [vi:Yi] 'house', [ka:Yi] 'forest', [ku:Yi] 'nest', of the Jaffna spoken Tamil are pronounced as [viri], [kari], [kuri] among the dyslexic students. In general if we consider the vowel allophonic variations among the dyslexic students, the table below could be a summarization of their inability and ability of their pronunciations.

### Generalized problematic pronunciations of the vowels

Vowel features	Initial position	Substitutions used by the dyslexics	Medial position	Substitutions used by the dyslexics	Final position	Substitutions used by the dyslexics
Short Vowels	All are pronounced except [ɛ]	Substitution of [a]	All are pronounced except [ɛ]	Substitution of [a]	All are pronounced except [i]	Substitution of [i]
Long vowels	None of the vowels are pronounced	Short vowels of the same long vowels.	None of the vowels are pronounced	Short vowels of the same long vowels. except [ɛ:] Substitution of [a]	All the vowels are pronounced	

According to the above table it is clear that children of dyslexia have problems in lengthening the vowel sounds and also they have problems in producing the sounds such as higher low front unrounded and the high central unrounded vowels.

#### ii. Allophonic variation of the consonants

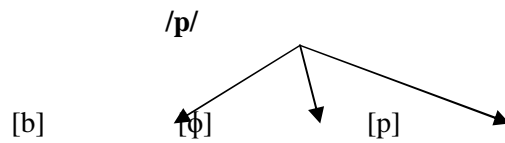
Data collected and analysed showed that children of dyslexics didn't have problems in producing the consonant sounds in the initial position, problems with ten consonant sounds in the medial position and three consonant sounds in the final position. The problematic sounds by the dyslexia students are given in the table 3.5. With examples.

#### Problems in producing consonant sounds in the initial, medial and final position by dyslexics

Sound of the Consonant	Actual pronunciation of the word	Problem pronouncing the sound in the initial position of the word	Problem pronouncing the sound in the medial position of the word	Problem pronouncing the sound in the final position of the word
[b]	[ambi] 'arrow'	-----	[avvi]	-----
[t]	[matam] 'tree'	-----	[maram]	-----
[g]	[pangi] 'share'	-----	[pakki]	-----
[ð]	[paðam] 'texture'	-----	[param]	-----
[x]	[pa:xam] 'share'	-----	[pakam]	-----
[l]	[va: l k ɛ] 'life' [va: l] sword'	-----	[val k a]	[val]
[ʎ]	[paʎam] 'picture'	-----	[param]	-----
[y]	[muy ɛl] 'rabbit' [pa:y] 'jump'	-----	[musal]	[pa]
[ɸ]	[a:ɸatti] 'danger'	-----	[apatti]	-----
[ŋ]	[va ŋdi] 'bug' [pa:ŋ] 'bread'	-----	[vanni]	[pan]

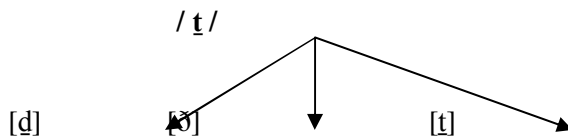
Above data from the table shows that children of dyslexics have problems in pronouncing the voiced bilabial stop and substitute with voiced labio dental fricative, the voiceless alveolar stop is substituted by voiceless alveolar trill, the voiced velar stop is substituted with its voiceless. When we consider fricatives for e.g. the voiceless bilabial fricative is substituted by voiceless bilabial stop, voiced inter-dental fricative is substituted by voiced alveolar trill which is very different from its manner, and the voiced velar fricative is substituted by its same place of articulation of the voiceless velar stop. The voiceless apico-dorsal lateral is switched to the alveolar with its same manner in production. Semi vowel in the medial position is replaced by the voiceless alveolar fricative and in the final position it is not pronounced at all. The voiceless apico-dorsal nasal is switched to its place of articulation of alveolar. According to the data collected it has been found out that the children of dyslexics don't have many problems but some in exception. The following data shows the problematic allophones of the phoneme.

**1. The phoneme /p/ has three allophones in its usage in Jaffna spoken Tamil.**



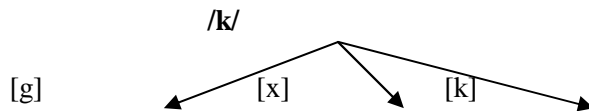
Most of the children substitute the [v] voiced labiodentals fricative instead of the voiced bilabial stop [b]. They also use the phoneme [p] instead of the allophone [p̥] the voiceless bilabial fricative. E.g. The words [ambi] ‘arrow’, [t̥ambi] ‘younger brother’, [a:ɸa t̥ t̥ i] ‘danger’ are pronounced as [avvi], [tavvi] and [a:patt̥ i]. We can come to a conclusion that the sequence of [-mb-] cluster is substituted by [-vv-] cluster.

**2. The phoneme /t̥/ has three allophones in its usage in Jaffna spoken Tamil.**



Children of dyslexic have problems only with the allophone [ð] which occurs in between two vowels in Jaffna spoken Tamil. The children of dyslexics substitute the [r] voiceless apico alveolar trill instead of the voiced apico dental fricative [ð]. E.g. The words [paðam] ‘texture’ and [puð im ε] ‘unusual’ are pronounced as [param] and [pur im a]. The voiced inter-dental fricative is replaced by totally different manner and articulation of a voiceless alveolar trill.

**3. The phoneme /k/ has three allophones in its usage in Jaffna spoken Tamil.**



The voiced velar stop [g] occurs after a voiced sound and the voiced velar fricative [x] occurs in between two vowels. Children of dyslexics have problem in pronouncing [g] and [x]. They substitute the phoneme [k] where ever these sounds occur. E.g. The words [pa ŋ gi] ‘share’ and [pa:xam] ‘share’ are pronounced as [pakki] and [pakam]. In general it is identified from the data that the voiced velar fricative is replaced by only changing the manner of articulation to the voiceless stop. Jaffna spoken Tamil have consonant clusters in its usage. There are four kinds of patterns that the consonant clusters occur. They are:

1. C<sub>1</sub> C<sub>1</sub>
2. C<sub>1</sub> C<sub>2</sub>
3. C<sub>1</sub> C<sub>2</sub> C<sub>2</sub>
4. C<sub>1</sub> C<sub>2</sub> C<sub>3</sub>

It was identified from the data that children with dyslexia had problems in producing the consonant clusters in their speech.

**Problems in pronouncing C<sub>1</sub>, C<sub>1</sub> in dyslexics**

Sounds of problematic Consonant clusters	Actual pronunciation of the Word	Pronounced by dyslexics	substitutes used by the dyslexics	
			Deletion	Substitution
[-tt-]	[patt̥i] ‘like’	[pari]	C <sub>1</sub> C <sub>1</sub> [-tt-]	C <sub>2</sub> [-r-]
[-ŋ ŋ-]	[aŋŋa:] ‘brother’	[anna:]	C <sub>1</sub> C <sub>1</sub> [-ŋ ŋ-]	C <sub>2</sub> C <sub>2</sub> [-nn-]
[-ñ ñ-]	[viñña:nam] ‘science’	[vianam]	C <sub>1</sub> C <sub>1</sub> [-ñ ñ-]	
[-l̥ l̥-]	[v ə l̥ l̥ am] ‘flood’	[vellam]	C <sub>1</sub> C <sub>1</sub> [-l̥ l̥-]	C <sub>2</sub> C <sub>2</sub> [-ll-]
[-yy-]	[veyyil] ‘sun’	[veil]	C <sub>1</sub> C <sub>1</sub> [-yy-]	

The summary of the above table shows that children of dyslexics shows the deletion of C<sub>1</sub> C<sub>1</sub> and in some situations, substitution of C<sub>2</sub> or C<sub>2</sub> C<sub>2</sub> can be identified.

### Problems in pronouncing C<sub>1</sub>, C<sub>2</sub> in dyslexics

Sounds of problematic Consonant clusters	Actual pronunciation of the Word	Pronounced by dyslexics	Substitutes used by the dyslexics	
			Deletion	Substitution
[-tp-]	[etpuðam] 'wonder'	[arpuram]	C <sub>1</sub> [-t-]	C <sub>3</sub> [-r-]
[-tk-]	[vetkam] 'shy'	[varkam]	C <sub>1</sub> [-t-]	C <sub>3</sub> [-r-]
[-t č-]	[muyatči] 'try'	[muači]	C <sub>1</sub> [-t-]	
[-nb-]	[enbi] 'love'	[anpi]	C <sub>2</sub> [-b-]	C <sub>3</sub> [-p-]
[-nt-]	[entε] 'mine'	[enra]	C <sub>2</sub> [-t-]	C <sub>3</sub> [-r-]
[-nb-]	[nanban] 'friend'	[nanpan]	C <sub>2</sub> [-b-]	C <sub>3</sub> [-p-]
[-nm-]	[unmε] 'truth'	[ume]	C <sub>1</sub> [-n-]	
[-yt-]	[ceyð i] 'news'	[ce t i]	C <sub>1</sub> C <sub>2</sub> [-yt-]	C <sub>3</sub> [-t-]
[-yt-]	[vayram] 'hard'	[varam]	C <sub>2</sub> [-t-]	
[-yx-]	[vayxa:si] 'may'	[vakasi]	C <sub>1</sub> C <sub>2</sub> [-yx-]	C <sub>3</sub> [-k-]
[-ym-]	[t u:ymε] 'pure'	[t ume]	C <sub>1</sub> [-y-]	
[-yv-]	[teyvam] 'God'	[tevam]	C <sub>1</sub> [-y-]	

Table shows that in most situations C<sub>1</sub> or C<sub>2</sub> is deleted and a C<sub>3</sub> is substituted.

### Problems in pronouncing C<sub>1</sub>, C<sub>2</sub>, C<sub>2</sub> in dyslexics

Sounds of problematic Consonant clusters	Actual pronunciation of the Word	Pronounced by dyslexics	Remedies used by the dyslexics	
			Deletion	Substitution
[-tpp-]	[e:tp̩ i] 'accept'	[erpi]	C <sub>1</sub> C <sub>2</sub> [-tp-]	C <sub>3</sub> [-r-]
[-l pp-]	[ta: l̩ ppam] 'deep'	[talpam]	C <sub>1</sub> C <sub>2</sub> [-l p-]	C <sub>3</sub> [-l-]
[-l̩ t̩ t̩-]	[va: l̩ t̩ t̩ i] 'praise'	[valri]	C <sub>1</sub> C <sub>2</sub> C <sub>2</sub> [-l̩ t̩ t̩-]	C <sub>3</sub> C <sub>4</sub> [-lr-]
[-l̩ č č-]	[max i l̩ č č i] 'happiness'	[makils̩i]	C <sub>1</sub> C <sub>2</sub> C <sub>2</sub> [-l̩ č č-]	C <sub>3</sub> C <sub>4</sub> [-ls-]
[-lkk-]	[va: lkkε] 'life'	[valka]	C <sub>1</sub> C <sub>2</sub> [-lkk-]	C <sub>3</sub> [-l-]
[-y č č-]	[t̩o:yč č i] 'wash'	[t̩o č i]	C <sub>1</sub> C <sub>2</sub> [-y č -]	
[-ykk-]	[va:ykka:l̩] 'cannel'	[vakkal]	C <sub>1</sub> [-y-]	
[-ytt-]	[po:ytt̩ i] 'go'	[potti]	C <sub>1</sub> [-y-]	

Table above shows that in the C<sub>1</sub> C<sub>2</sub> C<sub>2</sub> cluster combination, the first two consonants are deleted and C<sub>3</sub> consonant is substituted, in some situation all three consonants are deleted and C<sub>3</sub> C<sub>4</sub> are substituted. The replacement of a new consonant was for the deletion of the first consonant in the clusters.

### Problems in pronouncing C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub> by dyslexics

Sounds of problematic Consonant clusters	Actual pronunciation of the word	Pronounced by dyslexics	Remedies used by the dyslexics	
			Deletion	Substitution
[-l̩nt-]	[puxa l̩nt̩ i] 'prasiad'	[pakali]	C <sub>1</sub> C <sub>2</sub> C <sub>3</sub> [-l̩nt-]	C <sub>4</sub> [-l-]
[-y ñj-]	[ma: y ñ j i] 'with hectic'	[ma j̩i]	C <sub>1</sub> C <sub>2</sub> [-y ñ -]	

According to the table the consonant clusters C<sub>1</sub> C<sub>2</sub> C<sub>3</sub> are deleted and C<sub>4</sub> is substituted. In a situation where the [y] is in the initial position in the cluster it is deleted.



**Problematic consonant sounds generalized.**

Sound of the Consonant	Remedy used by the dyslexics	
	Substitutions	Deletion
[mb]	[-vv-]	
[t],[ð],[Y]	[-r-]	
[ŋg],[x]	[-kk-], [-k-]	
[y]		√ Both in the medial and final position
[ϕ]	[-p-] shows no allophonic variation	
[ŋ]	[-n-]	
[l]	[-l-]	
[-ñ ñ-]		√

**2. Problems in tone among the dyslexic students.**

In Jaffna spoken Tamil, tone variation doesn't make much difference in contexts but except variations to make a question and to stress on the subject or verb or the object. Examples are given below. A normal statement can be made as a question by raising the tone in spoken Tamil. [na:n][vaŋde:n]'I came' is a statement. If this has to be made question the tone will be high at the verb. As, [na:n] [vaŋde:n] 'did I come?' It was noticed that children of dyslexics had problems in tone that they didn't consider whether they are to read a statement or a question. Spoken Tamil also have word stress in their statement to emphasis what they mean e.g.[naan]<sup>1</sup> [vaŋde:n]<sup>2</sup> is 'I came' here the importance had been given to 'I' and if the primary stress had been given to the second word, the important sense here would be 'came'. But children of dyslexics did not consider about the above tone variation or stress in their speech or reading.

**Morphological and syntactic problems among dyslexics**

Difficulties are found in children of dyslexia in their word formation, as well as sentence formation which is categorized and analysed through data collected.

**I. Morphological problems**

Children with dyslexic have problems while reading. Not only that they had problems in pronunciation but also in morphology. Data below shows that the dyslexic students find difficult in forming words with:

- i. Problems with inflexions
- ii. Word formations

**i. Problems with inflexions**

Under inflexions the children had problems with cases of 1<sup>st</sup> person singular and plural according to the research and also children of dyslexics had problems with inflexions in plural forms, empty morphs

**a. Problems with the subjective case /na:n/ of the 1<sup>st</sup> person singular**

In Jaffna spoken Tamil /na:n/ ∞ /en/ is used to refer to the 1<sup>st</sup> person singular form. /na:n/ is the first case used as subject of a sentence and the objective /en/ is used before inflexional affixes. But children of dyslexics don't use /en/ instead; they use /na:n/ within flexional suffixes for the grammatical purposes.

**Below examples shows how the grammatical inflexions had taken place**

Object	Case	Inflexions by the normal Tamil speakers	Meaning	Inflexions by the dyslexics
/en/ +	/uYa iyə/ → Genitive case	/enuYa iyə/	Mine	/na:ninde/
/en/ +	/a:l/ → Ablative case	/ena:l/	by me	/na:na:l/
/en/ +	/akku/ → Dative case	/enakku/	to me	/na:nai/
/en/ +	/ai/ → Accusative case	/enai/	Me	/na:nukku/

### b. Problems with the subjective case / na:ŋgaḷ / of the 1<sup>st</sup> person plural

In Jaffna spoken Tamil / na:ŋgaḷ / ∞ / eŋgaḷ / is used to refer to the 1<sup>st</sup> person plural form. / na:ŋgaḷ / is the first case used as subject of a sentence and the objective / eŋgaḷ / is used before inflexional affixes. But children of dyslexics don't use /eŋgaḷ/ instead; they use /na:ŋgaḷ/ and uses with suffixes for the grammatical purposes.

Below examples shows how the grammatical inflexions had taken place

Object	Case	Inflexions by the normal Tamil speakers	Meaning	Inflexions by the dyslexics
/eŋgaḷ/ +	/uYaiyə/ → Genitive case	/ eŋgaḷuYaiyə /	Ours	/na:ŋgaḷuYaiyə /
/eŋgaḷ/ +	/a:l/ → Ablative case	/ eŋgaḷa:l /	by us	/ na:ŋgaḷa:l /
/eŋgaḷ/ +	/akku/ → Dative case	/ eŋgaḷakku /	to us	/ na:ŋgaḷakku /
/eŋgaḷ/ +	/ai/ → Accusative case	/ eŋgaḷai /	Us	/ na:ŋgaḷai /

According to the data collected it was seen that children didn't have problems in the second or third person singular and plural.

### c. Problems in using plural forms.

In Tamil the plural forms of suffixes are /-kaḷ/, /-mɛ:r/, /-avɛ/. The /-kaḷ/ is the common form of plural suffix in Jaffna spoken Tamil. E.g. words such as /pu:/ + /-kaḷ/ = /pu:kkaḷ/ 'flowers', /kopi/ + /-kaḷ/ = /kopiyaḷ/ 'notebooks', /i:/ + /-kaḷ/ = /i:kkaḷ/ 'house flies' but most of the suffixes when they join with the word, they will double the first consonant of the affix or they might change their initial consonant according to the word that they are going to be affixed. But children of dyslexic pronounce without any changes when they are affixed to. E.g. they pronounce as /pukaḷ/, /kopikaḷ/, /ikaḷ/. In spoken Tamil /-mɛ:r/ ∞ /-avɛ/. This is used for the plural forms to indicate human beings. Such as /aŋŋaŋmɛ:r/ and /aŋŋaŋavɛ/ which gives the meaning of brothers. But the children of dyslexics have a complicated pronunciation that they use the common form of affix [-kaḷ] and /-mɛ:r/ or /-avɛ/ together to form the plural of the word, such as /aŋŋaŋkamar/ 'brothers', /ma:mankalavɛ/ 'uncles'. In general it is identified that children of dyslexics have problems in gemination as the gemmination of consonants in the word medial is not used.

### d. Problems in empty morph

In spoken Tamil some morphs can be used as an affix directly. Some cannot be used as that. So we should use two morphs for the affixation. For e.g. the word /marattai/ is an affixation of two morph such as /maram/ + /atti/ + /ai/ but children of dyslexics omit /-atti -/ and spell it as /maramai/. They had followed the same rule for the other words such as /va:ŋattai/, /paŋattai/ etc are spelt as /va:ŋamai/, /paŋamai/. If we generalize according to the linguistic feature, when the case suffix is affixed with the words ending with /-m/,

### ii. Problems in word formation

To form new words, words can undergo morphophonemic changes which happen in four ways.

Kinds of word formations	Examples with meanings	Description of the word formation	Word formation of the dyslexics
Addition of a new phoneme	/pu:/ + /kottɪ/ = /pu:ŋkottɪ/ 'bunch of flowers'	/-ŋ-/ is added	/pu: kottɪ/ (absence of the new phoneme)
Deletion of a new phoneme	/maram/ + /ve:r/ = /marave:r/ 'root of a tree'	/-m/ sound is deleted	/maramve:r/ (deletion is not identified)
Assimilation	/maŋ/ + /kuYam/ = /maŋkudam/ 'clay pot'	/-ŋ/ has changed as /-d-/	/maŋkuYam/ (no changes made)
Dissimilation	/mul/ + /ti:ti/ = /muxri:ti/	/-l/ has changed as /-x-/ and /-t/ has changed as /-r/	/mul ti:ti/ (no changes made)

According to the above data analyzed it could be generalized that children of dyslexics don't use the kinds of word formation when they are to be affixed instead those two words are pronounced as it is. Where as it is identified that sandhi rule is not applied in the normal pronunciation among the dyslexia children. In Jaffna Tamil the usual gender suffix for female ends with /-ti/ but some words ends up with unusual female suffixes. These types of suffixes give problem for the dyslexics as they use the usual suffixes for all the female gender words.

For example: /uļven/ is the male gender word for a farmer and /uļatti/ is a female gender word for farmer. This is a normal way of the suffix that applies. But word such as /va:lipen/ 'lad' and the opposite word 'lass' is in Tamil /va:lai/ which has an unusual ending. The dyslexic children had given as /va:lipaṭi/ .

## II. Problems in syntax among dyslexics

Any language is conscious about punctuation, as it plays an important role to identify the meaning in a correct way. Children of dyslexics find it very hard to follow the punctuation as they read a text without considering the punctuation marks which identifies them as they are not particular about what they read. When sentences are read, they should be read according to the meaning of the text. But children of dyslexics are unable to follow the sense of the text as they don't read with sense. For e.g. if the statement is as '/ma:/ /kappɛl/ /vaṇḍiḍḍaḍi/' gives two meanings when it is read with a pause after the first word it gives the sense as [ma:] the meaning 'big' as 'The big ship has come'. If the pause is given after the first two words, the meaning of /ma:/ is as 'flour', so the meaning becomes as 'The ship that carries flour has come'. So according to the context the statement should be read with meaningful. But the reading consideration is not concerned by the children of dyslexics which gives problems in syntactic approach.

### Semantics and pragmatic problems in dyslexics

Children with dyslexics have problems in word meanings as how the words should appear according to their context.

#### a. Problems in synonyms and antonyms

Children who are suffering from dyslexia have problems in saying the synonyms or their antonyms. When analyzing their exercises it was found that they have given the explanation for the words instead giving the answer in one word. For e.g. in Tamil the word /poykai/ meaning 'pond' is the synonym of /kulam/. But children of dyslexic try to explain what it is, as / pu:kkaḷ niraṇḍa ṭaṇṇir uļə iYam/ other than giving the proper one word. Some times while talking they find difficult to give proper word for their conversation and that they try to explain that particular word with its meaning. The word /paxal/ 'day' is the opposite of /iravu/ 'night' when asked, two children found difficult in giving the appropriate word and gave the answer with explanation such as /veliyil karuppa itukkum/ 'outside it will be black.'

#### b. Problems in describing word pairs

In Tamil there are words with phonetics similarity which gives different meaning. So children know very well about the words. If there is a mistake in the phoneme the meaning would differ. So, when the children are asked to make sentences with given word pairs they find it difficult.

As children of dyslexics have problems in using some phonemes, which gives them wrong meaning such as: If the word is /kiļi/ 'parrot', the dyslexics have problem in using the /-l-/ phoneme so they pronounce as /kili/ which give the meaning as 'fright'. /atai/ 'half' the dyslexic children have spelt as /arai/ 'room'.

## Conclusion

The research as a whole, discusses about linguistic levels of LD and the unawareness about the LD as a cognitive inability among children in the Jaffna peninsula, whereas the physical inability of the school students are identified and given special care. Even though teachers and parents know that their children have some kind of problem, they couldn't make sure it as a cognitive inability which can be given special care by identifying it through linguistic levels which can help the children to enhance their studies. The literature review describes about the types of LD and details about dyslexia, past researches and the Jaffna Tamil vowel and consonants to support the research. The most important section of this research gives the identified linguistics problems with children of dyslexia in the Jaffna peninsula so as it would be easier for the teachers to identify and teach children according to their inability.

Since great numbers of children with speech-linguistic impairments attend regular schools, the issues regarding their successfulness in performing school tasks and their position in the school are of great importance. The research dealt with the most common problems related to language disorders, especially focused on dyslexia and its influence on adaptation and school attainments of the children, and the measures for surpassing the difficulties in their development. Speech-linguistic impairments significantly affect general development of children and the functioning of their families. They require professional engagement of school pedagogues and psychologists, additional activities of teachers, educational system and society in general, whereas this is a pilot research done to make awareness among the society of the Tamil speaking community in the Jaffna peninsula to help out with children who are suffering from LD. And also speech therapy is necessary in order to eliminate or reduce the consequences of speech-linguistic impairments, which can be very grave.

Whereas classroom teachers may detect early signs of dyslexia that suggest further assessment by a psychologist or other health professional in order to actually diagnose the disorder. Letter and number reversals are the most common warning sign. Such reversals are fairly common up to the age of 7 or 8 and usually diminish by that time. If they do not, it may be appropriate to test for dyslexia or other learning problems. Difficulty in copying from the board or a book can also suggest problems. There may be a general disorganization of written work. A child may not be able to remember content, even if it involves a favorite video or storybook. Problems with spatial relationships can extend beyond the classroom and be observed on the playground. The child may appear to be uncoordinated and have difficulty with organized sports or games. Difficulty with left and right is common, and often dominance for either hand has not been established. In the early grades, music and dance are often used to enhance academic learning. Children with dyslexia can have difficulty moving to the rhythm of the music. A teacher is expected to get detailed information on the nature of the problem and early detection of the causes of the student's learning difficulties as it is possible to reduce or eliminate them. If the existing capabilities of the child are emphasized and put to a proper use, and if negative peer reactions are avoided, then the conditions can be created which will prevent the impairment to affect emotional and social development of the child. The teacher is the one who should recognize a student's abilities and act accordingly in order to foster his/her general development. Relations of partnership between the teacher, speech therapist and parents are crucial if any success is to be achieved.

### ***Recommendations***

Good relations between the teacher and the parents are essential for reducing the consequences of speech-linguistic impairments the parents may worry about the child's adaptation and have fears that the child will be rejected by other children, or that the teacher will not be ready or able to pay proper attention to their child. The relief of such feelings and anxiety can be realistically expected if good teacher-parent relations are established. *Talks with family members* are an efficient means for both establishing good relations and gathering additional data about the student. The parents are in position to provide key information on the capabilities, character, specific needs, experience and health of their child. In addition, family members know best what the child likes or not, what he /she are able or unable to do and what his/her position in the family and wider environment is like.

Additionally, since these parents have already established some relations with the professionals and services in the local community they can be a valuable source of information for other parents who have children with similar problems. Many parents are already well trained for individual work with a child; they know how the child learns, at what rate he/she is able to progress, how he/she can be motivated for work. On the other hand, they themselves need information about the school, about the child's behavior and progress, and how he/she functions in his /her peer group. Finally, based on the findings of this research and relevant literature, it is need to emphasized that Children with learning disabilities often need extra support at home from their families, Good relations between the teacher and the parents are essential for reducing the consequences of learning disability impairments The parents may worry about the child's adaptation and have fears that the child will be rejected by other children, or that the teacher will not be ready or able to pay proper attention to their child. The relief of such feelings and anxiety can be realistically expected if good teacher-parent relations are established.

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