STANDARDIZATION OF LINGUISTIC PROFILE TEST (LPT) IN TAMIL

Funding agency: AIISH Research Fund – 2018
Reference: SH/CDN/ARF-SLS-8/2018-19

Project period: 01 year 01month (03-12-2018 to 02-01-2020)
Sanctioned amount: Rs. 5,28,000 (4,88,000 + 40,000)

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ABSTRACT

Children are the future of our society. To make them as effective communicators and active members in the society, Speech language pathologists (SLP) also play an important role. SLP has important responsibility in rehabilitation of children with language delay or disorders. There is no language test to assess Tamil speaking children above seven years of age. Hence there is a need to develop a language test for school going children in Tamil language. Linguistic Profile Test (LPT) assesses major components of language and it covers a wide age range from 6 to 15 years. Sunanda & Jayakumar (2017) adapted the Linguistic Profile Test (LPT) in Tamil language. Hence, this project aims to standardize the Linguistic Profile Test (LPT) in Tamil language.

Five fifty-four (554) typically developing children (TDC) from 6+ years to 15+ years (from grade I to grade X) from both Tamil Medium (274 Children) and English Medium (280 Children) were tested using adapted LPT-Tamil test. The test was also administered on 52 children, who are clinically diagnosed with Spoken Language Disorder. LPT was administered individually to each participant. The result showed that all the sections in LPT-Tamil showed clear developmental trend. The developmental trend was same for Tamil medium children as well as English medium children except for syntax section. For children with language disorder (Clinical Population), LPT score was well below their peers in TDC group. The cut of score ROC curve clearly separates the TDC group from clinical population. Hence, the normative score established through this research for LPT-Tamil can be used to identify the language disorder and to assess the language delay in Tamil language effectively.

Chapter – I

INTRODUCTION

Speech language pathologists play a major role in the assessment and treatment of children with communication disorders. Accurate assessment of language disorders / delay plays a major role in treating children with communication disorders. The goal of a speech language pathologist is to identify, assess, diagnose and intervene language delay or language disorders in children to make them the best communicators with improved quality of life and to become the active members in the society.

Censuses taken during the year 2011 states that 26.8 million people reside in our country are with disability. Day by day the percentage of person with disability are increasing in both rural and urban population. According to NSSO, 2011 report 0.58 - 0.75% of the people in India have speech and hearing disability (Speech disability & Hearing disability). Identifying children with language disorders is a big task and challenging for speech language pathologists. SLP should aware of the typical developmental pattern and their language acquisition to differentiate their language delay to arrive the diagnosis of the communication disorder.

The speech language pathologists should be able to differentiate the typically developing children from the children with language delay due to associated pathological conditions. These language delays in children are identified through various standardized assessment tools. They should select appropriate language test depending on the purpose of assessment. Reference value based language tests served as useful tool for many decades and till date used as a method in assessment of children with language delay. This also useful for identification, classification, evaluation, remediation and certification and research purposes related to language assessment.

Based on standardized language tool, SLP can diagnosis language disorder effectively and estimate baseline score of the children language abilities. This assessment helps the clinician to select the appropriate intervention plan to improve their effective communication. India being a multicultural and multilingual country, many languages are spoken in the land. Indian languages have vast and varied structures. Hence a test developed in one language cannot be used in the other.

There are many language test materials developed to assess children in Indian languages such as Linguistic Profile Test (LPT) in Kannada (Karanth, 1980), Hindi (Monika, 1995), Malayalam (Asha M.M., 1997), Telugu (Suhasini, G., 1997) developed as part of dissertation at All India Institute of Speech and Hearing, Test For Assessing Syntax In Kannada (Vijayalakshmi, 1981), A Syntax Screening Test in Tamil (Sudha, 1981), Kannada Language Test (RRTC and AYJNIHH, 1990), Malayalam Language Test (Rukmini, 1994), Kannada Diagnostic Photo Articulation Test (Ram Mohan Babu, Rathna et al. 1972), Test of Articulation in Tamil (Usha, 1986), Test of Pragmatics in Tamil (Priya, 1994), KPVT- A Screening Picture Vocabulary Test in Kannada (Sreedevi, 1988) and many more.

All the above said language tests were standardized and hence they are used widely to assess the language delay in children with language disorders. Currently linguistic profile test in Tamil language is much needed one to assess the language profile of native speakers of Tamil language to get the normative data and to match with the language delay in disordered population of native Tamil speakers. This test will be useful during assessment and intervention of language disordered population.

Tamil is a major Dravidian Languages spoken in different parts of the world and is native language of Tamil Nadu (a state in India) and Sri Lanka. It is an official language of Singapore and

Sri Lanka and also holds an official position in India (In the state of Tamil Nadu and Puducherry (Union Territory of India), as well and in the Andaman and Nicobar Islands. Tamil is used as an academic / language of education also in Malaysia. The Tamil diasporas is found in almost all the parts of the world.

The vowels in Tamil language are classified into short and long vowels and there are five long and five short vowels and two diphthongs. The long is called /*nedil/* and they are about twice as long as the short vowels which are called /*kuRil/*. The diphthongs are usually pronounced about one and a half times as long as the short vowels. Most grammatical texts place diphthongs with the long vowels. Tamil has two diphthongs /aɪ/ ஐ and /aʊ/ ஔ, the latter of which is restricted to a few lexical items.

Tamil is unique from the other south Indian languages for instance, there is no phonological distinction between voiced and unvoiced consonants, phonetically, voicing is assigned depending on a consonant's position in a word; Tamil phonology permits few consonant clusters, which can never be word initial; Aspiration is allophonic in Tamil; There is no fricatives and affricates in Tamil. Hence mere translation of the test materials from other south Indian languages to Tamil is possible but, needs a greater modification.

NEED FOR THE STUDY

Tamil is one of the oldest languages among top 30 languages (by number of native speakers – L1) in the world with population count of 67,832,790 native L1 speakers and 8,000,000 L2 speakers all over the world and India is their primary country (Paul, Gary and Charles, 2016). The prevalence of Communication disorders increases year by year and the availability of language test material to assess Tamil speaking children are limited. There is no language test material to assess Tamil speaking children above seven years of age. Assessing the language is very important & very crucial in order to make a diagnosis, to know the functioning level of the child and to provide effective intervention. Hence there is a need to develop or standardize language test for school going children in Tamil.

AIM

Assessing language in growing children is more crucial and it requires very specific tools, according to child development age. Linguistic Profile Test (LPT) assesses major components of language and it covers a wide age range from 6 to 15 years. Hence this project aims to standardize the Linguistic Profile Test (LPT) in Tamil language, which is adapted in Tamil by Sunada and Jayakumar, 2017.

OBJECTIVES

1. Collection of LPT-Tamil score from children studying in Tamil Medium schools from grade I to grade X [Typically Developing Children (TDC)]
2. Collection of LPT-Tamil score from children studying in English Medium schools from grade I to grade X [Typically Developing Children (TDC)]
3. Collection of LPT-Tamil score from children with Spoken Language Disorder (SLD)
4. Standardization of the Linguistic Profile Test (LPT) -Tamil Test.

Chapter – II

REVIEW OF LITERATURE

The children's speech and language development is a fascinating process. The language acquisition is unique to children in their creativity to generate and organize innumerable words and sentences from limited set of symbols. This process is so spontaneous in a typically developing child that makes one rarely think about its development. As speech language pathologist (SLPs') one has to understand this language acquisition process in treating children with impairments of speech and language. Language is a part of communication i.e. verbal communication or speech interferes with it. To have a better understanding about a language it has to be looked into its definition and its components such as phonology, syntax, semantics and discourse. This knowledge helps us to understand the developmental trend of typically developing children and their language acquisition.

Communication is the process of exchanging information, ideas, needs and desires. There are various human communications using various modalities like verbal, written, gesture, pantomime, drawing or sign language. Communication requires processing of both linguistic (language related information) and paralinguistic (emotional and attitudinal information) cues in order to comprehend the intention of the message conveyed. Thus "communication is a social event, it is action that affects other persons. Therefore, communication may be simply defined as a form of social behaviour" (Hegde, 1991).

Language is a shared code representing concepts through the use of arbitrary symbols and rules that govern those symbols. Language is a social tool, defined as a socially shared code or

conventional (agreement) system for representing concepts through the use of arbitrary (random choice) symbols and rules governed combinations of those symbols (Owens, 1998). Language can also be defined as a formalized code that a group of people use to communicate (Heward, 2006).

Language is a code: code represents one thing with another. Language is means of representation. For example, Picture of table - written word "table". Code helps to maintain uniformity.

Language represents ideas about the world: It represents knowledge about the objects, words, events, development of mental concepts and ideas. It perceives different patterns of structure and invariance in the environment, associations, similarities or differences across two events.

Language is a system: It consists of linguistic rules. Sounds combine to form words, words to sentences and sentences to paragraphs and so on. For example, letters combine to form the word pencil.

Language is a convention: linguistic facts exist by virtue of a social rather than a logical constrain. There is an agreement among persons using language. It is accepted by the members of the community. And it is used in a specific way.

Components of Language: There are five major components. They are form (phonology, morphology and syntax), content (semantics) and use (pragmatics).

Phonology: Each language has specific speech sounds or phonemes & sound combinations, characteristic of that language. Phoneme is the smallest unit of speech sound. Phonological rules govern the distribution and sequencing of phonemes within a language.

Morphology: It can be considered as a sub category of the syntax. It relates with the internal organization of the words. Morphology enables the language users to modify the word meanings

and produce semantic distinctions such as number (cat, cats), verb tense (speak, spoke) and possessions (Mummy, Mummy's); extend word meaning (dislike, uninterested); derive word classes (quick, quickness, quickly).

Semantics: It refers to the meaning. It is concerned with the relationship of language form to objects, events and relationship with words and word combinations. Semantic features characterize the word.

Syntax: the rules of the syntax govern the form or structure of a sentence. They specify the word order (SVO/ SOV), sentence organization (verb/ noun-phrase), relationship between words, word classes or types and other sentence constituents (types). Syntax specifies which word combinations are accepted or grammatical and which is not. Knowledge of language rules enables language users to understand and generate language. Thus, there is a link between language form and cognitive processing (Chomsky, 1965).

Pragmatics: Pragmatic rules govern sequential organization and coherence of conversation, repair of errors, role of the speaker or the listener and the speech acts.

Speech is an oral production of language or speech can be defined as a form of communication through language which may be thought of as systematized code of arbitrary symbols basically vocal, but reinforced by the visible bodily activities (Gary & Wise, 1976)

Diagnosing children with language disorders is not an easy task and it is the most challenging for the clinicians. As clinicians' one should know the typical developmental pattern and accepted variations which serves as necessary backdrop in arriving at the diagnosis of the communication disorder. The information from developmental psycholinguistics is useful for this purpose. 'The vast research on language acquisition has been through case studies both longitudinal and cross-sectional

(McCarthy, 1930; Day, 1932; Davis, 1937; Templin, 1957; Winitz, 1959; Spriesterbach, Darely and Morris, 1962; Miller, 1962).

Communication begins with the birth cry of the child and becomes more sophisticated as children's language skills develop over a period of time. Speech like communication begins when three-months-old produce speech-like sounds in response to adults' vocalizations (Gleason & Ratner, 2009). Children focus on a speaker's eye region as early as two months of age, showing recognition that the eyes convey social information connected with verbal and non-verbal communication (Carter, Davis, Klin & Volkmar, 2005). Speech production begins with the impulses or signals in the brain (Cavallo, 2011). These neural impulses result in muscular contractions that move structures called the articulators, which leads to the production of speech sounds that intern forms words, phrases etc.

Looking at acquisition of language there are two major traditional views/ approaches that is Chomskyan Model and the Behaviorist model. The model proposed by Chomsky and others is that the child is born with an innate capacity for language acquisition; that the human being are in some way pre-structured towards the acquisition of language, so that when the child is exposed to language, certain language structuring principles automatically begin to operate with the help of innate capacity.

The Behaviorist Model explains language learning as essentially a process of imitation and reinforcement. The child learns to speak by copying the noise patterns heard around them, and

through stimulus and response, trial and error, reinforcement and reward, they would refine their own production until it matches the language of adult models (Crystal, 1976).

A number of studies in a variety of disciplines have been done in the area of language acquisition. Psychologists, linguists, educators, parents, neurologists and speech-pathologists have contributed to the knowledge of language acquisition in children. Hence much of the focus has been dedicated to study the acquisition of language in preschool children. The comparative speed of language learning and the efficiency in learning a language has been considered as an important justification to support the innate theory of language acquisition. It has been mostly said that the language acquisition is virtually completed in the children when they start their schooling. However, this concept is not completely accepted as children language development takes place even after 5 years due to demands on the children formal education. A review of literature on language acquisition reveals that language is an on-going process which is active even during the school years.

The tri-city MacArthur foundation study (Bates et al., 1992), was conducted on 1,800 typically developing children using the Communicative Development Inventory, (1) generally between 6 and 10 months the canonical babbling begins (2) during 8 to 10 months the word understanding ability emerges, (3) At 12 to 13 months, the production of words often develops and (4) By 14 to 24 months the combination of words begins with an immense link between the development of vocabulary and the combination of words (Rapin et al., 1992). Telegraphic or the monotonous speech is noted in the beginning, that is 2-3 content words are present without any elements of grammar (for e.g., “Mommy hat” instead of “Mommy’s hat”); there is an increase in grammatical development noticed by 24 to 30 months of age, and this is the time for the grammatical

words to emerge (Brown, 1973; Fenson et al., 1994). The early emergence of Grammar is noticed on the content words like, nouns such as objects, people, and actions (Brown, 1973). By the age of 3 years, many of the typically developing children have achieved the preliminary morphosyntactic structures commonly in their mother tongue. This uniformity in the acquisition and the speed with which it occurs disprove the early view that the acquisition of language is just a learning process and this view again supports the innate theory of language acquisition through the concept of Universal Grammars (Pinker, 1991). It was put forth by Pinker (1991) that a union between the learning process and the innateness. Fenson and colleagues (1994) argued that there is a strong order of language acquisition but there exists a large difference in the timing of acquisition in more number of children. Out of 1,800 children studied, there were very few late talkers, especially the late comprehenders, was referred for a detailed specific language impairment diagnosis. Therefore the acquisition and development of language across different aspects are taken place beyond childhood and also into late adulthood.

By the time the child enters formal schooling, the child is stepping into most challenging situation. The demands that are placed on the child's language skills change and the environment is widened such that family and home are no longer the only considerations. For the child with difficulty in language development the transition to school can be a considerable hurdle. Language problems may be accompanied by problems of social interaction which can further impede progress at school. In such conditions problems are concentrated in language skills. All learning involves language to some extent. Thus, the child's difficulty becomes more diffuse, involving abstract concepts, manipulation of vocabulary as well as poor auditory memory and attention. A thorough

assessment of school going children, that determines strengths and needs in which information is shared between parents and professionals, are thus required.

There has been a lot of work done abroad on problems of language acquisition in school going children. Durkin (1987) claims that, the language learning at a later period undergoes a rapid change qualitatively and quantitatively. Hence it is very vast and tough to maintain under single theoretical framework.

A number of studies have been done to seek the pattern of language development in school going children. These studies are either longitudinal studies i.e., studying a subject over a long period of time or cross-sectional studies i.e., studying a number of participants' ever short duration of time. Then there are studies which have focused their main attention on only one aspect of language for e.g. it can be a study only on one component of language like syntax or on semantics and so on. Whereas, there are some studies also which study language as a whole i.e. focusing their attention to all the aspects of language, whether it be syntax, semantics or discourse. A few studies have taken a combination of some aspects of language. Consequently, based on these studies done, a number of tests for assessing language development have been developed on the same pattern.

Studies on Older Children (above 5 years)

Gregory, Shanahan, Walberg (1985) did a comprehensive analysis of students in high school having speech disabilities. Survey data was collected for 26,000 students, of which 278 were identified as having speech disabilities. These students who had speech difficulties were found to be

older, and lived in a linguistic minority group. They were found to be at a disadvantage in achievement, self-image, motivation, career aspirations when compared to their peers.

Stewart (1935) studied incidence and prevalence communicative disorders in a mid-southern public school system in USA in grades K through 12. Results indicate an average prevalence of 2.95% for primary communicative disorders in school population. Stewart (1985) in another study determined number and prevalence of communicative disorders in minority preschool and school age children in USA. Result indicates out of 3827 children seen from 1973 to 1977, 38.5% were diagnosed as with communicative disorders. Distribution of population for hearing, speech, language and learning disabilities was 4.88%, 1.63%, 0.84% and 0.33% respectively. Distribution for preschool, elementary, junior high school was 39.2%, 38.9% and 21.9% respectively. Hill and Hayner (1992) compared the language performance of low achieving (LA) elementary school students and typically developing achieving students. Results show over half of LA group scored low on language measures.

Studies on Phonology:

Grunwell (1981) explains various aspects of phonetic and phonological development in children. He states that children acquire the foundation of the phonetic system by the age of 5 years, but the adult like phonological system does not refine until about 10 years of age. Hoffman Norris (1989) studied spelling errors of 45 elementary school children (1st, 2nd and 3rd grade) which were analysed for phonological process patterns. A considerable proportion involved both syllabic reduction and features changes similar to those seen in normal spelling development.

Roberts, Burchinal and Footo (1990) studies the development of phonology in 145 children in the age range of 2 ½ to 5 years of age. The children's speech was assessed yearly using a standardized articulation test and the occurrence of common and uncommon phonological processes were analysed. There was a marked decrease in the usage of process between the age range of 2 ½ - 4 years and infrequent processes were seen after the age of 4 years. The processes that were uncommon processes were also used inconsistently even at the age of 2 ½ years.

Lewis and Freebairn (1992) examined the individuals in grade school, adolescence and adulthood for the residual effects of preschool phonology disorders in their speech. Age ranges were 4 to 6 (preschool), 7 to 11 (grade school) 12-17 (adolescence), 18-45 (adulthood). Results indicated that individuals showed increased performance on measures between preschool to grade school and has showed finer but a stable improvement between adolescence to adulthood.

Oerlemans and Dodd (1993) studied the primary school children for the progress of spelling ability and letter sound orientation. Schonell graded spelling test modified version (1956) was administered on 1372 children in the grades between 2 – 6 and was found that children who belonged to the higher socio-economic status groups had better spelling ability than the rest. Children who had blameless spelling ability inclined to produce more phonologically reasonable misspellings. Results indicated that phonological awareness is related with the acquisition and development of acceptable spelling ability in individuals.

Studies on Syntax

Fujiki, Brinton and Dunton (1987) examined the effectiveness of a grammatical judgement screening test in separating linguistically typically developing and children with language disorder in 1st grade (6.6 - 7.6 years), 2nd grade (7.6 - 8.6 years), 3rd grade (8.6 - 9.6 years) children. Ten children with language disorders and ten typically developing children were selected from each grade, for a total of sixty. Results indicated that there were statistically significant differences between performance of typically developing and children with language disorder at the first and second grade levels.

Fujiki, Brinton and Dunten (1987) inspected the competence of typically developing children and language impaired children to correct syntactic defilements of word order. Ten children from both the groups were experimented from the age levels of 6 – 10 years with 100 participants in total. Results specify that the typically developing 6-, 7-, 8 year old children executed the task significantly better than their age matched language impaired peers. The execution of tasks by the language impaired 9 and 10 year old children were found to be better than that of the younger group. In typically developing children age level difference were documented by 6 year old, who performed significantly poorer than two other older age groups (8- and 10- years.)

Tyler and Nagy (1989), conducted 3 paper and pencil measures for students in 4th, 6th and 8th grade (total 100 children) to measure their varied aspects of knowledge of English derivational suffixes. Children seem to develop an elementary knowledge of derivational morphology before grade 4. Expertise in grammatical properties of derivational suffixes seems to upsurge through grade 8. Expertise in the distributional properties of suffixes also showed improvement, within the grade

6 students indicating an increase in the over generalization errors similar to inflectional suffixes that were found in much younger age group.

Masterson and Kamhi (1992) reviewed the linguistic trade-offs in school age children in the presence and absence of language disorder. Quite a lot of linguistic measures were adapted to characterize the syntactic productions and phonological productions to verify the presence of variability in interrelationship patterns across measures. Linguistic interactions existing in the copied speech was equated with the spontaneous speech. Results indicate that the trade-offs are present more in copied speech than in instinctive speech, in both the groups and the interrelationship patterns did not vary across groups.

Windsor (1994) studied children's ability to comprehend and produce derivational suffixes. 21 derivational suffixes which conveyed 6 different meanings were inspected with 120 children from grade 3 to 8 and also with 40 adults. 10 children to represent each grade were taken within the age range of 8 to 14 years. Results from nonsense word template concluded that suffixes were understood with better accuracy than when it was produced, especially by children, Children in grade 5 through 8 had more accuracy than children in grade 3 and 4 in both the context of comprehension and production and adults established greatest accuracy similarly in both comprehension and production of suffixes.

Studies on Semantics

Durkin, Crowther and Shire (1981) dealt with vocabulary of children, especially how they manage with polysemy. They looked in to the usage and comprehension of particular relational terms that are acquired initially by children in the framework of spatial reference but then drawn out to describe mathematical or musical relations e.g.-Lower, up etc. The proof suggests that children

acquire the elementary sense of spatial reference of the items quite earlier than it takes for them to learn the derived and more internalized meanings.

Brinton, Fujiki and Mackey (1985) surveyed the ability of children of elementary school age to realize six idiomatic expressions. 80 children who were linguistically typically developing, 20 in each with four different grade levels (Kindergarten, grade 2, grade 4 and grade 6) underwent the assessment. Results indicated that when the group was considered, comprehension of the target idioms improved with increasing age. However, when inspected individually the comprehension of the idioms was greatly variable between the chosen idioms.

Clark and Berman (1987) scrutinised the type of linguistic knowledge that affects the ability of children to appreciate and generate novel compounds in Hebrew. 60 children aged between 3.0 to 9.0 years and 12 adults were requested to infer and to produce noun and noun compounds. Their ability to comprehend was well in advance of their production. In the ability to comprehend, morphological form of head nouns had less marked effect from the age of 4 years, children did correspondingly well on a variety of compound forms verified and were able to identify head nouns and a possible relationship between the heads and their modifiers. In fabricating the response, the knowledge of morphological form was critical. The lesser the modifications the children had to make in the head nouns, the sooner they conquered the compound patterns. Finally, the children who were able to produce novel compounds appropriately were also able to interpret them, but the same was not found the other way round.

Coates (1988) tested children ability to comprehend modal meaning at ages of 8 and 12 years. The outcome of this test by children was then compared with the outcome of the same test on adult participants. Cluster analysis of documents disclosed that the primary patterns - 8 year olds have are only basic system of modal meaning and even by 12 years of age, the child's system will not be compatible as the adult system.

Evans and Gamble (1988) examined children of school age for the liaison between attribute saliency and metaphor interpretation. 2 types of metaphors-predicate-promoting (PP) and predicate introducing (PI) were designated. Adult samples were employed to designate metaphors of each type which then was presented to 24 children of 3rd, 5th and 7th grades (mean ages 8.5, 10.6, 12.8 years). More metaphors were correctly identified by the older children younger children and within each grade level there was no noteworthy difference observed between the number of acceptable interpretations of PP and PI metaphors. Attribute saliency for the individual distinguishing the metaphor plays a crucial role in the interpretation process.

Nippold, Schwarz and Undlin (1992) had done a developmental experiment on adolescents and young adults relating to the practice and comprehension of adverbial conjuncts. 2 types of adverbial conjuncts - concordant (e.g. similarly, more over) and disconcordant (e.g. contrastively, rather) were investigated in 120 adolescents and young adults. The mean ages of the groups were 12.9, 15.10, 19.2, and 23.8 years. The end product of the study indicated a rising ability to practice and comprehend the words in the orthographic mode.

Studies on Narratives

Liles, (1985) studied children's use of cohesion of spoken narratives which was compared across three groups; typically developing, language disordered with good story comprehension and language disordered with poor story comprehension. Participant's age ranged from 7.6 to 10.6. Results indicate that good comprehending language disordered children and typically developing children used similar linguistic cohesive structures, but both groups differed from poor comprehending language disordered children. Both groups of language disordered children used less adequate cohesion than typically developing children.

McCabe and Peterson (1985) analysed naturalistic production of because and so by 96 children, aged 3.6 to 9.6 while narrating real, personal events. Results indicate that semantic errors could be construed as evidence of confused thinking of semantically correct casual uses, 81% encode psychological causality, mostly statements of other people's intentions. Virtually all causality occurred prior to the time of narration. Age trends were remarkably absent. 'Because' and 'So' are used in significantly different ways even by the youngest children.

Scott (1988) evaluated school children's narratives. Two typically developing children and two children with languages disorder were taken in the age range between 7-10 years. Samples demonstrated line between narratives judged as adequate or inadequate. Clear cut differences between stories told by children with language disorder and typically developing children have not emerged and there can be wide variations in the narratives produced by any one child in different contexts and with different levels of motivation.

Edmonds and Haynes (1988) investigated the topic manipulation skills and conversational participation of school-age language impaired children in interaction with typically developing language peers. The subject's age ranged from 5.11 to 7.11 years. No significant differences between two groups for the number and proportion of topics maintained, topic introduced or topic shaded. However children with language impairment did produce significantly mere topic reintroductions than typically developing children.

Verrall (1989) compared oral and written narrative skills of primary school aged children. Ten typically developing children from each age group 8 year (3^{rd} grade) and l0 year (5^{th} grade) were taken. Similarities and differences between Oral and written narratives at the two age levels were examined. Data indicated that the Oral and written narratives at both age levels differed significantly only in grammatical analysis.

Strong and Shaver (1991) studied stability of cohesion in the spoken narratives of children with languages impairment and typically developing school-aged children, 39 children in the age range 8-10 years were taken in each of the two groups. Results showed that stability increased after children had experienced telling stories.

German and Simon (1991) analysed children's word finding skills in discourse. Sixteen children each were selected in the two groups. One group of children with word finding problems and other group of typically developing children from grades 1 to 6. Participant's narratives produced in response to 3 pictures and 5 probes were analysed with respect to following word - finding indices, languages productivity, incidence of word finding characteristics (repetitions,

reformulations, substitutions, delays, empty words, insertions). Group comparisons were made with respect to these indices. Children with word finding disorders did not differ from typically developing children in language productivity but manifested significantly more word finding characteristics in their narratives.

Purcell and Liles (1992) studied cohesion repairs in the narratives of typically developing language and children with language disorder of school age (ranging from 8.6 to 12.6, 3 to 6 grade). Self- initiated repairs during story retelling task were seen. No group differences found for either repair type, when grammatical repair and repairs to text meaning were analysed. Both groups initiated significantly more repairs to text meaning. No group differences for frequency or types of cohesive repairs initiated. However, differences for success and cohesive repair attempts and location of repairs seen.

Gilliam and Johnston (1992) studied spoken and written language relationships in children with language/ learning impairment (LLI) and typically developing school-age children. The two groups were matched for age, spoken language and reading abilities. Ten LLI of 9-12 years and forty school age children of same age were taken. Results show spoken narratives to be linguistically superior to written narratives in both groups.

Language Tests

In assessment, comparison of performance measures of any one child with same-aged peers contributes simultaneously to identification of impairment, description of the nature of the difficulty, and formulation of treatment objectives (Nelson, 1998; Paul, 1995). A number of tests have been developed abroad to assess the language skills of school-going children. Those tests which test a

particular language skill are grouped together Comprehension Tests and Expression Test. Tests testing the comprehension of child are grouped together under "Comprehension Tests", test testing expression are grouped together under “Tests of Expression”. The common main purpose of the grouped tests is given, a few examples under each group are listed and one test out of them is described to give a general idea about the group.

1. Comprehension Tests

Purpose: These tests aim to measure auditory comprehension of language; word classes and relations, grammatical morphemes and elaborated sentence constructions and to determine areas of receptive linguistic difficulty.

Age range: These tests are efficient in testing children in age range 3 to 18 + years.

For e.g.,

- Test for auditory comprehension (Carrow, 1985)
- British picture vocabulary scale (Dunn, 1982)
- Test for Reception of Grammar (Bishop, 1989).

For e.g. Test for Reception of Grammar (TROG) assess children's understanding of grammatical contrasts in English and compares their comprehension of individual structures with that of their peers. It is a useful test in assessment of children with speech and language disorders, deafness, severe moderate learning difficulties and cerebral palsy and adults with acquired dysphasia. It aims to pinpoint areas of specific difficulties and to provide a profile pattern of errors.

2. Expression Tests

Purpose: These tests obtain short samples of spoken language which may then be evaluated in terms of information given and the grammatical forms used.

Age range: These tests may be used with children in the age range 3-16 years.

For e.g.,

- Action picture test (Renfrew, l989)
- The Bus story - A test of continuous speech (Renfrew.l991)
- Carrow Elicited Language Inventory (Carrow-Woolfolk, 1974)

For e.g. Carlow Elicited Language Inventory (CELI) measures the child's production control of grammar. It helps to diagnose language disabilities and to identify specific linguistic structures with which the child has difficulty.

3. Comprehension and Expression Tests

Purpose: These tests provide a quantitative and qualitative analysis of a child's receptive and expressive language skills in order to;

l. Distinguish between typically developing and language impaired children.

2. Indicate where language problems may be

3. Suggest possible approaches to remediation.

Age range: These tests can test children in the age range 2 - 18 Years.

For e.g.,

- Test of Adolescent Language -2 (Hammill, I987),
- Illinois Test for psycholinguistic Abilities (kirk, 1968)
- Reynell Developmental Language Scale (Reynell, 1985).

- Porch Index of Communicative ability in children (Porch, 1974).

- Reynell developmental language scales (RDLS) assess, as independently as possible expressive language and verbal comprehension (VC 'A' and VC 'B') during the years most important for language development. VC B scale allows assessment of verbal comprehension in severely physically handicapped or withdrawn children.

4. Phonology tests

Purpose: To elicit spontaneous and representative speech samples of the child's habitual speech patterns which may be used for screening / assessment purposes.

Age range: Children of any age can be tested.

For e.g.

- Metaphor Resource Pack (Dean, 1990).
- Phonologica1 Assessment of Child Speech (Grunwell, 1985)
- South Tyneside Assessment of Phonology (Armstrong and Ainley, 1988)

South Tyneside Assessment of Phonology (STAP) for instance is used to obtain a profile of child's phonological system. It aims at eliciting consonant phonemes and consonant clusters within the contexts of word initial, medial (i.e., all intervocalic) and final positions.

5. Pragmatics and Social Skills Tests

Purpose: These tests are used with children whose use of conversational intentions are limited or are impaired. They aim to provide a standardised norm referenced assessment measuring a specific set of conversational behaviours and intentions.

Age range: These tests are intended for children in the age range 3-16 years.

For e.g.,

- Test of pragmatic skills (Shulman, 1985).
- Progress assessment charts of social and personal development Gunzburg, 1963)
- Social skills training with children and adolescents (Spencer, 1980).

Progress assessment charts of social and personal development (PAC) for example describes qualitatively the strengths and weaknesses of an individual with learning difficulties in relation to others with similar difficulties over 4 areas of social competence and provides a basis for appropriate remedial action to be planned.

6. Language-Written Tests

Purpose: These tests provide a profile of child's ability to cope with vital skills that written language requires. They can be used as screening procedure for early diagnosis of potential reading / writing problems and as diagnostic procedure for children over 7 years who are not showing expected progress.

Age range: Can be used with children in age range 5-14 and also with adults having reading and writing difficulties.

For e.g.,

- The Aston Index (Newton and Thomson, 1976).
- Test of Reading-spelling patterns (Boder and Jarrico,1982).
- MacMillan individual reading analysis (Vincent and Marse, 1990)
- Neale Analysis of Reading ability (Neale, 1989)

Test of Reading-spelling patterns is used as screening device to identify normal/abnormal reading spelling patterns. It enables abnormal patterns to be classified into subtypes, thus providing painters for remediation,

7. Bilingual Tests

Purpose: The aim of these tests is to differentiate between the child who has impaired acquisition of both languages (i.e., first and second language) and the child who has difficulty only in the acquisition of second language.

Age range: These tests test children ranging from 3-15 years.

For e.g.,

- Sentence comprehension test (Wheldall, 1987)
- Sandwell Bilingual screening assessment (Duncan, 1987)

The former test in its revised edition (Wheldall, 1987) assesses child's ability to comprehend language in the absence of contextual clues which may accompany conversation. In its Punjabi edition (Gibbs, 1987) it tries to establish whether the child's difficulties are specific to acquisition of English as a second language or are pathological.

In contrast to the number of foreign tests, there are only handfuls on Indian tests in use today. These tests are limited in number and the areas they assess. Even though it is necessary to have an estimate of both expression and reception capacities, a vast majority of the currently available tests evaluate only the receptive modality. Also, these tests are mainly focused at assessing the language of pre-school children; Very little attention has been paid to the language assessment of older age group children. This will become clear as one goes through the available list of Indian tests.

1. **Vocabulary Tests**

Purpose: The aims of these tests are to asses and provide intervention in children.

Age range: These tests test children ranging from 3 years.

For e.g.,

- A screening picture vocabulary test in Kannada (Sreedevi, N.1988)
- A screening picture vocabulary test in Tamil (Bhubaneshwari, C.S.1993).

A Screening Picture vocabulary Test in Kannada (KPVT) Sreedevi, N l988, is a useful tool in,

1. Screening language acquisition of Kannada speaking children,
2. Identifying those children with comprehension deficiencies,
3. Aiding in therapy planning for such children.

The test is applicable to children between the age ranges of 3-6 years. The test material consists of 30 picture plates with each plate containing four black and white drawings. One among the four pictures is the target picture. The test plates are arranged in order of increasing difficulty.

Advantages

1. Helps in identifying children with delayed or deviant language.

2. Helps in planning therapy programme.

Limitations

1. It is only a screening test and so descriptive information is not obtained.
2. It is applicable to only those children whose mother tongue is Kannada.
3. The test considers only the receptive aspect of vocabulary.
4. The age range considered is limited.

2. Syntax tests

For e.g.,

- Test for acquisition of syntax in Kannada (TASK) (Basavaraj, A. R. 1981)
- Screening test for the acquisition of Syntax in Kannada (Basavaraj .A.R l981)
- A syntax screening Test in Tamil (SSTT) (Sudha. K.M. 1981)

Test for Acquisition of syntax in Kannada (TASK) (Basavaraj. A. R., l98l). This test assesses the syntactic aspects of language acquisition in Kannada speaking children between 1-5 years of age, through performance. It yields the acquisition profiles from one to five years of normal language development. Its applications extend to linguistically deviant populations of any age. The test comprises of 19 subtests and 323 items in all. It tests the comprehension and expression of a wide spectrum of grammatical categories and sentences types. It is a power test (no time limit imposed for completion). Toys and pictures are used a complementary material to the test sentence.

Advantages

1. The test assesses both the receptive and expressive aspects of a wide spectrum of grammatical categories.

2. It is applicable to deviant populations of any age.

Limitations

1. It is applicable only to a limited age range.

2. The test is valid only when administered to children whose mother tongue is Kannada and who reside in Kannada speaking environment.

3. **Tests for Assessing Languages:**

For e.g.,

- Linguistic Profile Test (LPT) (Karanth, l980)
- A language test in Kannada for expression in children (Kathyayani, 1984).
- Three Dimensional Language Acquisition Test (3D-LAT) (Geeta, H. l986).
- Language and Articulation Test (RRTC and AYJNIHH, 1990)
- Malayalam Language Test (Rukmini .A.R.1994)
- Kannada Language Test (RRTC and AYJNIHH, 1990)

A Language Test in Kannada for Expression in Children (Kathyayani, 1984), is to evaluate the use of various concepts in expression in terms of nouns, verbs, numbers, genders, tenses, place markers and persons. The testing material consists of picture stimuli depicting daily activities and has 30 picture cards in all. It was administered to 30 normal children (5-8 years), 6 hearing impaired and 2 mentally retarded and the responses of these groups with respect to the categories mentioned

are given. It gives no cut-off point for differentiating the deviant, or scoring procedure as such for the test.

Advantages:

1. It helps in testing various aspects of expression.

Limitations

1. Age range is limited.
2. Validity is poor
3. No receptive skills are tested.
4. The scoring procedure is not clearly defined and hence it is difficult to differentiate normal and abnormal.

Languages Acquisition Test (RRTC and AYJNIHH, 1990). This test was developed in eight Indian languages namely Bengali, Gujarati, Hindi, Kannada, Marathi, Malayalam, Oriya, and Tamil.

The test was developed to assist in;

1. To identify potential delay and deviance in language and articulation acquisition.
2. To identify those who need further detailed evaluation.
3. To specify behaviour needing remediation.
4. To establish baseline functioning prior to therapeutic intervention.
5. To measure behavioural change during the process of therapy.
6. To serve as an indicator for termination of therapy.

The test format was based on LPT (Karanth, 1980) but was posturized for use with children. The test has 2 parts.

Part one - Semantics

Part two - Syntax.

I. **Semantics**

1. Semantic discrimination
2. Naming
3. Lexical category
4. Synonymy
5. Antonymy
6. Homonymy
7. Polar questions
8. Semantic anomaly
9. Paradigmatic relations
10. Syntagmatic relations
11. Semantic contiguity
12. Semantic similarity

II. **Syntax**

1. Morphophonemic structures
2. Plurals
3. Tenses
4. PNG markers
5. Case markers.

6. Transitive, intransitives, causatives
7. Sentence types
8. Predicates
9. Conjunctives, Comparatives and Quotatives
10. Conditional clauses
11. Participal construction

The age group tested is 3-7 years. The scoring is done section wise and it tests both expressive and comprehensive modalities.

Advantages

1. It tests both comprehension and expression
2. It serves as a baseline and monitor for therapy
3. The test assesses a wide spectrum of linguistic structures.

Limitations

1. Age group tested is very limited.
2. The population on whom the test can be used is language dependent.

4. Tests of Pragmatics

For e.g.,

- Test of pragmatics in Tamil (Priya. K.S. 1994)

This test serves as a clinical tool to identify the pragmatically disordered children. This test is based on test design given by Shulman (1986) in the "Test of pragmatic skills" which consists of 4 tasks with examiner probes.

Test design: The test assess 3-8 years old children's use of language to signify conversational intent. A set of 4 guided play interactions (tasks) serve as the medium through which these pragmatic behaviours are assessed. Each task is administered using the materials and dialogue (examiner probes) provided. The test is designed to provide information on 10 categories of communicative intentions expressed by the children.

They are:

1. Requesting information
2. Requesting action
3. Rejection or denial
4. Naming / Labelling
5. Answering/ Responding
6. Informing
7. Reasoning
8. Summoning/Calling
9. Greeting
10. Closing conversation

The responses are scored on a rating scale ranging from 0 to 5 according to the appropriateness and linguistic sophistication of the child's responses to probes.

Advantages:

1. The test assesses pragmatic skills in different contexts and as the materials and probes used are constant, it makes the test more objective and reliable.

2. Test uses a five point rating scale to give more accurate and quantitative outcome. This contributes to better inter-professional communication which is essential for successful rehabilitation of the child

3. Helps to quantify the improvement seen after therapy, in pragmatic skills. Thus, evaluating the efficacy of therapy-

4. Since it is more objective, it has better face validity.

Limitations:

1. It is applicable to only those children whose mother tongue is Tamil and reside in Tamil speaking environment.

2. Age range is limited.

3. Number of subjects under each age group is only 5 i.e., small sample size.

It can be easily seen in the above section that the tests available in Indian languages are insufficient in the variety of purposes and age ranges they test.

In a study by Suchithra and Karanth (1990) Linguistic Profile Test was found to be effective in testing the language disorders in children above 6 years, as it gives sufficient information of different areas of language tested, over a wide age range.

The Linguistic Profile Test, henceforth referred as LPT was designed with the objective of evaluating and analyzing adequate linguistic samples at the phonological, syntax and semantic levels. The test was designed originally a decade ago (Karanth, 1980a) in Kannada and was called as the "Test of psycholinguistic abilities in Kannada. The framework of the test is such that, it can

be easily constructed in any language. Over the last ten years, the test has been extensively used with clinical populations (both adults and children) and has been found clinically useful, both for evaluation and as a basis for rehabilitation and linguistic retraining of communicatively disabled (Karanth, 1980a and b, 1981, 1984, 1988; 1990; 1991). During this period the test has undergone some revisions. A parallel version of the test was developed in Hindi (Karanth, Pandit, Gandhi, 1986). Data on 200 normal adults and 123 stroke patients including aphasics and non-aphasics. (Karanth, Ahuja, Nagaraj, Pandit and Shivshankar, 1991) has been collected and analysed. A pictured version of the test for young children of 3 - 7 years of age has been constructed and field tested (UNICEF funded project RRTC', Madras and NIHH, (Bombay) in seven Indian Languages including Kannada, Hindi, Tamil, Oriya, Gujarati, Marathi and Bengali. Though the test was developed for adult aphasics but recently it has also formed the basis for Language acquisition Test. Normative data on 150 children in the age range of 6 to 11 years has already been collected in Kannada (Suchithra and Karanth, 1990).

The LPT has 3 major sections including phonology, syntax and semantics respectively, with discourse forming the tail end of the third section. The choice of methods within these sections covers a wide range of tasks such as pointing, repetitions, naming, indication of grammatical and semantic acceptability, listing of lexical categories, sentence completion, matching synonyms and antonyms etc. (Karanth, 1980 a and b).

Though there are many language test materials developed to assess children in Indian languages, there are very limited test materials available in Tamil. The available test materials in Tamil includes the following-

1) **Test of Language in Tamil or Languages Acquisition Test** (RRTC and AYJNIHH, 1990). This test was developed in eight Indian languages including Tamil. This test covers age range from 3 years to 7 years. It is designed to assess receptive skills and expressive skills under the domains semantics and syntax. Though this test contains two major categories (semantics and syntax) that are very essential to identify the language disorder, it does not include phonology. However, this test is not commonly used as a diagnostic tool to assess the language. This is because the children have difficulty in following the language as more of infrequent words are used rather than the commonly used ones.
2) **Test of Articulation in Tamil** (Usha, 1986). This test is a widely used clinic for assessing phonology in Tamil speaking children.
3) **A Syntax Screening Test in Tamil** (Sudha, 1981). This is a screening test to assess Syntax in Tamil speakers.
4) **Test of Pragmatics** (Priya, 1994). It is used to assess the pragmatic skills in Tamil speakers. This test assesses the pragmatic skills of Tamil speaking children between three and eight years.
5) **A Screening Picture Vocabulary Test in Tamil** (SPVT) (Bhubaneshwari, 1993). It is used to assess the vocabulary in three to six years old Tamil speaking children.

Problems in language are among the most common issues in the clinical presentation of children between ages 3 and 16 years, regardless of diagnosis (Shapiro, 1989). Then these available assessment materials in Tamil is very limited to measure language performance and there is no language test material to assess Tamil speaking children above seven years of age. The speech and language professionals should be in a position to differentiate the typically developing population from that of the disordered group even in the older group children. This can be achieved through the

assessment using appropriate test materials. The clinician should select the suitable test depending on the purpose of the testing and that should reveal all the required information about that individual being tested. Language tests based on the developmental norms has been served useful from many decades and still is used as a good measure in identification, classification, evaluation, remediation and certification and research purposes.

Since the 1960s, researchers have looked for general indicators of spoken and written language performance in older children and adolescents (e.g., Hunt, 1965, 1970; Loban, 1963, 1976; O'Donnell, Griffin, & Norris, 1967). Language can be described by an extensive list of performance measures that characterize the productivity, fluency, complexity and grammaticality of a speaker during a particular language task. Such measures represent characteristics of an entire language sample at a general level.

Linguistic Profile Test (LPT) (Karanth, 1980) in Kannada is also a norm based comprehensive performance test that helps to assess children from 6+ years to 15+ years. As this test assess several components of language and covers a wide age range, This LPT test was adapted to Tamil language by Sunanda and Jayakumar, 2017. The current study aims at standardizing this test for Tamil speaking children.

Chapter – III

METHOD

Linguistic Profile Test in Tamil: LPT in Tamil was adopted from the Linguistic Profile Test in Kannada, developed by Karanth, in 1980**. This test includes the sections on Phonology, Syntax, Semantics and Discourse. It was translated from LPT Kannada and adapted to Tamil Language, as a Dissertation work by Sunanda in the year 2017.

The test material is divided into four sections i.e. Phonology, Syntax, Semantics and Discourse. Since phonology has a major difference between Kannada and Tamil language, this section has totally new words with phonological rules of Tamil language. The first section phonology contains two sub sections such as Phonemic Discrimination (PD) and Phonetic Expression (PE). In phonemic discrimination; there are 24 minimal pairs and 96 pictures related to that minimal pair words. Those 96 pictures include 24 pair's i.e 48 target pictures and the other 48 pictures act as distracters. Each plate / page contains four pictures i.e. 2 pictures related to the target minimal pair along with two more pictures as distracters. All 96 pictures were prepared as black and white line drawings. The distracters were phonemically, pictorially or semantically ambiguous from the target stimuli. The distractors were relatively ambiguous (for example, only the initial or final syllable match with the target) or closely ambiguous (for example, distractor is another minimal pair to the targets) to have different levels of difficulty in testing. The stimulus words were also given for the phonetic expression task. This subsection represents the same test stimuli in the pictorial form. Hence totally it has 52 picture stimuli.

Under Section – 2, Syntax has eleven (11) subsections such as morphophonemic structures, plural forms, tenses, PNG markers, case markers, transitive's, intransitives & causatives, sentence types, predicates, conjunctions, comparatives & Quotatives, conditional clauses and participal construction.

Under Section – 3, Semantics has two subsections such as Semantic Discrimination (SD) and Semantic Expression (SE). The first subsection was the semantic discrimination, contains the items under three different categories, i.e. the colors, the furniture and the body parts. Under colors there are five target pictures and one distracter. For furniture's the target items are represented in the pictures. For body parts the child will be asked to show it when the related word is spelled out verbally.

The second subsection semantic expression includes the naming task. For this the real objects / miniature models were used and the participant has to name the objects.

(For Test stimuli refer appendix -1 & for picture stimuli refer appendix - 2)

Scoring Criteria and Answer Key Construction: The scoring criterion followed in the LPT Kannada was adapted. An answer key was developed to avoid any discrepancies in scoring.

(For Answer Key refer appendix - 3)

****Note:** An informed consent from the author Dr.Prathiba Karanth was obtained for adapting and standardization of the test material in Tamil.

1. Standardization of The Test:

Six hundred and six children were participated in the present study. They were divided into two groups such as, typically developing children and children with language delay.

Typically Developing Children

Participants: Five fifty-four (554) typically developing children from 6+ years to 15+ years (from grade I to grade X) from both Tamil Medium (274 Children) and English Medium (280 Children) were included in this study. They were from government schools, government aided and private schools from Chennai & Vellore Districts. An informed consent from the head of the schools were obtained before administering the test.

Inclusion Criteria for Typically Developing Children:

- Typically developing with no history of physical or sensory difficulties.
- Native Tamil speakers (with Tamil as Mother tongue and primary language (L1)
- Studying in Tamil Medium Schools (274 children) or English Medium Schools (280 children)
- Studying in state board syllabus schools
- Everyone completed Kindergarten before joining the first grade
- Not having any history of academic failure to be retained in the same grade.
- All the participants were from the middle socioeconomic status as assessed by the revised NIMH Socio Economic Status Scale (Venkatesan, 2011).
- The participants were grouped based on academic grade

Procedure:

Permission from the Commissioner of Education from Chennai Corporation was sought to collect data's from children studying in Chennai Corporation Schools for both Tamil Medium and English Medium and similarly to collect data's from children studying in Government Higher Secondary Schools and Government Aided Schools, permission was sought from Chief Educational Officer (CEO) at Egmore, Chennai.

After seeking permission from Commissioner of Education and CEO, the permitted school correspondent / head was contacted and fixed the appointments for data collection. Initially the data collection was started in a Private English Medium School i.e. SATYA Matriculation Higher Secondary School, at Puraisaiwalkkam, Chennai during the month of February and March – 2019. Then at the end of March and April Month started collecting data's from Panchayath Union Government Middle School (Tamil Medium School), from Nemili Village, Vellore District.

From July to September 2019, data collection from Chennai Corporation Higher Secondary Schools, (Both Tamil Medium & English Medium) was done. The entire data collection was completed from Feb – Sep, 2019. The participants were grouped into ten age groups and the details are given in the table 1 for children studying in Tamil Medium Schools and English Medium Schools.

Table 1: Details of the participant's age, gender and medium

Age groups (in years) (Grades)	No. of Participants In Tamil Medium Schools		No. of Participants In English Medium Schools		Total
	Males	Females	Males	Females	
6+ (Grade I)	11	09	11	11	42
7+ (Grade II)	12	13	14	12	51
8+ (Grade III)	11	11	13	16	51
9+ (Grade IV)	13	13	12	13	51
10+ (Grade V)	13	13	13	13	52
11+ (Grade VI)	15	15	15	15	60
12+ (Grade VII)	16	16	17	15	64
13+(Grade VIII)	15	14	14	14	57
14+ (Grade IX)	15	15	15	15	60
15+ (Grade X)	15	19	15	17	66
Total	**136**	**138**	**139**	**141**	**554**

Test Administration:

Procedure:

The participants were made to sit comfortably in a quiet room and the test was administered on each participant independently. Consent from the head of the school was taken before administering the test. The LPT Tamil contains four sections such as phonology, syntax, semantics and discourse. The fourth section (Discourse) was not subjected for scoring.

Phonology:

In Section 1, Phonology, the first subsection phonemic discrimination, has 24 pairs of Minimal Pairs. The participants were instructed to listen to the minimal pair of stimuli presented through the verbal mode. On hearing this, the participants have to point to the picture out of a set of four stimuli. The second subsection is the phonetic expression, where the participant has to listen to the verbal stimuli spelled by the clinician/researcher and the participant has to repeat the same as clinician said. This subsection contains 52 items.

The third Subsection (running speech) under Phonology section is not considered for objective scoring. Therefore, this subsection was not discussed in this project (study).

Scoring:

Phonemic discrimination is scored for 48 items i.e. Score of one (1) for each correctly pointed item (or 24 minimal pairs) and the phonetic expression contains 52 items i.e. Score of one (1) for each correct response and hence the total score of section phonology was 100.

Syntax:

There are 11 subsections under the section syntax i.e. (A) Morphophonemic Structures (B) Plural Forms (C) Tenses (D) PNG Markers (E) Case Markers (F) Transitive's, Intransitives & Causatives (G) Sentence Types (H) Predicates (I) Conjunctions, Comparatives & Quotatives (J) Conditional Clauses (K) Participal Construction. In those section the participants were asked to listen carefully to the stimuli presented in the verbal mode and the participants should make a grammatical judgement i.e. they have to tell if the sentence is grammatically correct or incorrect. Participants will be asked to reason it out for their responses. Clinician /researcher use "why" question on regular bases to make sure participant is giving answer with his knowledge not as chance factor. Adequate intervals between the stimuli were given for the participants to respond.

Scoring:

The first subsection is the morphophonemic structures and the fourth subsection contains twenty items each and a score of 0.5 is given for each item and hence it has a total score of 10. The subsections plural forms and tenses have 10 items each and every item is given a score of 0.5, thus they have a maximum score of 5. The other subsections such as case

markers, transitive's, intransitives and causatives, sentence types, predicates, conjunctions, comparatives & Quotatives, conditional clauses and participal construction have ten items each and a score of 1 is given for each item. Hence they have a maximum score of 10 in these subsections. Thus the total score of the section syntax was 100.

Semantics:

This section consists of two major subsections, the semantic discrimination and semantic expression. The first subsection i.e. semantic discrimination, is a discrimination task of colours, furniture and body parts. Here the participants are instructed to point to the colours, furniture by seeing the picture stimuli and the child has to show the body parts such as nose, tongue, right hand left eye and right ear that are named by the tester in Tamil language.

In second subsection of semantics, the semantic expression is tested under eleven tasks such as naming, lexical category, synonymy, antonymy, homonymy, polar questions, semantic anomaly, paradigmatic relations, Syntagmatic relations, semantic contiguity and semantic similarity. In the first task naming, the model objects of the stimuli words were shown to the child to name the object name in Tamil language. In the second task lexical category the child was instructed to spell out the animal names either domestic or wild animals as quick as possible within one minute through verbal (or) graphic modality. The children can mix both domestic and wild animals while expressing. Once the given one-minute time is over then the child's response was not taken into consideration. In third and fourth tasks i.e. synonymy and antonymy were given and the children were asked to match the correct answers from the given questions. For each of these two tasks, there was one extra item in response items. For

higher grade children i.e. from grade VI to X these two tasks verbal responses were taken without any choices and for lower grades from grade I to V choices were given i.e. from the given six correct responses three choices were given and then the participants responses were scored based on their accuracy of the response. The fifth task was homonymy, where one word (homonym) was given to the child and the child has to tell the relation between words with identical forms but different meanings. In polar questions the child has to respond whether the answer for the given question was 'Yes' (correct) or 'No' (wrong). In seventh task semantic anomaly, when the stimuli sentence was read the child has to say whether the given question is correct or not and also they have to tell the correct answer as response. In task eight and nine i.e. paradigmatic relations and Syntagmatic relations the participants filled the semantic judgement for the given task. In tenth and eleventh task such as semantic contiguity and semantic similarity the participants were responding to the correct semantic judgement from the given six choices for five. For each of these two tasks, there was one extra item in response items. For higher grade children i.e. from grade VI to X these two tasks verbal responses were taken without any choices and for lower grades from grade I to V choices were given i.e. from the given six correct responses three choices were given and then the participants responses were scored based on their accuracy of the response.

Scoring:

This subsection contains a total of 15 items in it and they are given a score of 1 each.

The naming task has 20 items in it and each item is given a score of 1. The lexical category task is scored based on the number of items that the individual is able to name in one minute. The maximum score given is 15 (even if they were able to name more than 15 items). The

other sections except polar questions have a maximum score of 5. The sixth task polar question contains 10 questions and score of 1 was given for each correct answer or responses. The maximum score given was 10. The total score under this subsection is 85. Thus, the total score of the section semantics was 100 (i.e. for Subsection semantic discrimination the maximum score was 15 and for subsection semantic expression it was 85).

Discourse:

The fourth section in LPT in Tamil is Discourse. To elicit the discourse from participants, few general questions were listed in that test material itself, along with that there is picture scene is displayed in front of the participants and ask to describe in verbal. The picture scene is change based on the age group. The entire LPT –Tamil test is repeated for 30 participants with the interval on one day.

Children with Spoken Language Disorders

The test was administered on 52 children, who are clinically diagnosed to Spoken Language Disorder (SLD) Secondary to Intellectual Disability (ID), Learning Disability (LD), Specific Language Impairment (SLI), Autism Spectrum Disorder (ASD), Down's syndrome (DS) and Cerebral Palsy (CP), both males and females. This participant's samples were collected from Balavekar special school Chennai and NIPMED, Chennai by obtaining consent from head of the organization. The LPT-Tamil test was administered and scored as described in the typically developing children.

Inclusion criteria for Children with Language Delay:

- Native Tamil speakers (with Tamil as Mother tongue and the primary language (L1)
- Children diagnosed with Spoken Language Disorder Secondary to Intellectual Disability (ID), Learning Disability (LD), Specific Language Impairment (SLI), Autism Spectrum Disorder (ASD), Down's syndrome (DS) and Cerebral Palsy (CP), both males and females.
- All the participants were from the middle socioeconomic status as assessed by the revised NIMH Socio Economic Status Scale (Venkatesan, 2011).

Analysis:

The obtained participant responses were recorded on score sheets and the mean, median and the standard deviation was compared with that of the typically developing children and language delayed children.

Statistical Analysis:

As the data's were normally distributed for typically developing children group, Parametric Tests were used for analysis. The test-retest reliability correlation coefficient for the grand total of LPT-Tamil was 0.82 with $p<0.05$. For comparison across medium, grade and gender MANOVA and ANOVA was carried out. Since children with language delay group showed non-normal distribution, the comparison between the Typically Developing Children (TDC) and children with language delay was tested using non parametric statistics (Mann-Whitney U Test).

Chapter – IV

RESULTS

The aim of the current study was to standardize the Linguistic Profile Test (LPT) in Tamil. The results are divided two parts.

Part 1: Results of Typically Developing Children

Part 2: Results of Children with Spoken language Disorders

PART 1: Results of Typically Developing Children

The data obtained from the typically developing children was subjected to the following statistical analysis.

- Normality check of the data
- Descriptive statistics
- Comparison across medium, grade and gender for TDC (MANOVA and ANOVA)

Normality check of the data

All collected data were subjected to normality test using SPSS 20 Version. Shapiro –Wilk test was used to check the normality. Marjory of the parameters showed normal distribution. Hence, parametric test were selected for further analysis.

Typically Developing Tamil Medium Male Children

Table 2 – 5 shows the Normality Check for typically developing children across medium and gender. The p value showed that most of the groups across the grade showed normal distribution of the data except for few grades in some groups as specified in the above tables. Hence Parametric Statistics was carried out for further data analysis

Table 2: Normality check for typically developing Tamil medium male children

Shapiro –Wilk Normality Test						
GRADE	PHONOLOGY TOTAL	SYNTAX TOTAL	SEMANTIC DISCRIMINATION	SEMANTIC EXPRESION	SEMANTIC TOTAL	GRAND TOTAL
	p-value	p-value	p-value	p-value	p-value	p-value
I	0.985	-	0.025	0.239	0.277	0.508
II	0.107	0.006	0.433	0.573	0.390	0.371
III	0.194	0.073	0.019	0.610	0.725	0.990
IV	0.249	0.952	0.056	0.401	0.791	0.223
V	0.230	0.662	0.006	0.345	0.222	0.715
VI	0.003	0.257	0.161	0.221	0.141	0.336
VII	0.067	0.544	0.050	0.259	0.139	0.901
VIII	0.198	0.212	0.165	0.829	0.439	0.870
IX	0.005	0.079	0.509	0.051	0.029	0.287
X	0.004	0.035	0.042	0.145	0.414	0.327

Typically Developing Tamil Medium Female Children

Table 3: Normality check for typically developing Tamil medium female children

	Shapiro –Wilk Normality Test					
GRADE	PHONOLOGY TOTAL	SYNTAX TOTAL	SEMANTIC DISCRIMINATION	SEMANTIC EXPRESION	SEMANTIC TOTAL	GRAND TOTAL
	p-value	p-value	p-value	p-value	p-value	p-value
I	0.577	-	0.338	0.456	0.280	0.126
II	0.891	0.000	0.194	0.207	0.369	0.486
III	0.536	0.007	0.007	0.760	0.789	0.846
IV	0.000	0.533	0.334	0.200	0.054	0.364
V	0.177	0.240	0.148	0.585	0.546	0.261
VI	0.068	0.245	0.682	0.127	0.149	0.133
VII	0.108	0.733	0.045	0.968	0.627	0.968
VIII	0.127	0.916	0.077	0.921	0.277	0.120
IX	0.155	0.547	0.034	0.023	0.191	0.559
X	0.019	0.306	0.002	0.814	0.382	0.436

Typically Developing English Medium Male Children

Table 4: Normality check for typically developing English medium male children

	Shapiro –Wilk Normality Test					
GRADE	PHONOLOGY TOTAL	SYNTAX TOTAL	SEMANTIC DISCRIMINATION	SEMANTIC EXPRESION	SEMANTIC TOTAL	GRAND TOTAL
	p-value	p-value	p-value	p-value	p-value	p-value
I	0.964	-	0.023	0.925	0.995	0.166
II	0.957	0.000	0.120	0.666	0.728	0.929
III	0.581	0.001	0.051	0.512	0.169	0.292
IV	0.628	0.433	0.013	0.312	0.495	0.274
V	0.332	0.026	0.005	0.962	0.799	0.050
VI	0.064	0.064	0.060	0.080	0.166	0.008
VII	0.384	0.962	0.034	0.617	0.652	0.775
VIII	0.006	0.142	0.062	0.960	0.458	0.972
IX	0.005	0.286	0.082	0.439	0.609	0.488
X	0.000	0.414	0.015	0.262	0.215	0.324

Typically Developing English Medium Female Children

Table 5: Normality check for typically developing English medium female children

Shapiro –Wilk Normality Test						
GRADE	PHONOLOGY TOTAL	SYNTAX TOTAL	SEMANTIC DISCRIMINATION	SEMANTIC EXPRESION	SEMANTIC TOTAL	GRAND TOTAL
	p-value	p-value	p-value	p-value	p-value	p-value
I	0.761	-	0.498	0.978	0.921	0.798
II	0.328	0.001	0.080	0.106	0.113	0.021
III	0.267	0.004	0.036	0.531	0.766	0.125
IV	0.294	0.040	0.040	0.968	0.989	0.159
V	0.175	0.227	0.050	0.170	0.049	0.058
VI	0.000	0.831	0.160	0.318	0.409	0.219
VII	0.004	0.369	0.429	0.311	0.554	0.498
VIII	0.078	0.821	0.090	0.523	0.884	0.642
IX	0.064	0.641	0.016	0.697	0.244	0.522
X	0.000	0.323	0.004	0.263	0.607	0.158

Descriptive Statistics for Typically Developing Children (TDC):

The mean and standard deviation of typically developing Tamil medium male children for the LPT scores are given in the table 6. The results indicated that the mean scores of sections Phonology Total ranged from 83.54 to 98.80, Syntax Total ranged from 0.00 to 75.26, Semantics ranged from 46.22 to 89.73 and Grand Total ranged from 129.77 to 263.80 for typically developing Tamil medium male children across grade I to X. The scores for phonology, syntax and semantics showed increasing trend from grade I to grade X. The mean and standard deviation of typically developing Tamil medium male children LPT scores were graphed in graph 1.

Table 6: Mean and Standard Deviation of Phonology total, Syntax total, Semantics total and Grand total for typically developing Tamil medium male children

Grade	Phonology Total		Syntax Total		Semantics Total		Grand Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
I	83.54	4.20	0.00	0.00	46.22	3.71	129.77	6.33
II	89.83	4.06	1.79	0.89	52.41	2.72	144.04	3.38
III	93.00	1.41	3.27	1.16	60.86	4.56	157.13	5.92
IV	95.46	1.76	41.92	4.92	70.00	5.58	207.38	9.44
V	95.15	1.14	47.92	4.52	72.30	3.79	215.38	6.46
VI	95.80	1.32	52.40	5.30	74.26	8.83	222.46	13.51
VII	97.31	1.53	65.90	8.16	80.03	5.44	243.25	12.87
VIII	97.46	1.92	68.76	2.50	82.00	7.18	248.23	9.63
IX	97.86	1.12	77.30	5.24	85.56	4.48	260.73	8.75
X	98.80	1.42	75.26	6.52	89.73	4.61	263.80	10.36

NOTE: Maximum score for each section is 100 and Grand Total Score is 300

The mean and standard deviation of typically developing Tamil medium female children for the LPT scores are given in the table 7. The results indicated that the mean scores of sections Phonology Total ranged from 85.11to 98.78, Syntax Total ranged from 0.00 to 78.52, Semantics ranged from 44.00 to 91.42 and Grand Total ranged from 129.11 to 268.73 for typically developing Tamil medium female children across grade I to X. The scores for phonology, syntax and semantics showed increasing trend from grade I to grade X. The mean and standard deviation of typically developing Tamil medium female children LPT scores were graphed in graph 1.

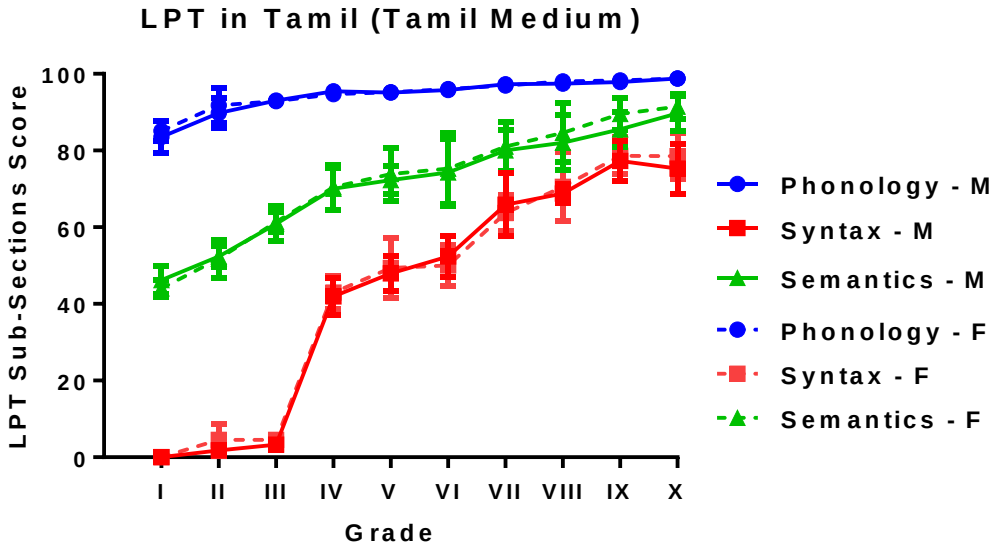
Table 7: Mean and Standard Deviation of Phonology total, Syntax total, Semantics total and Grand total for typically developing Tamil medium female children

Grade	Phonology Total		Syntax Total		Semantics Total		Grand Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
I	85.11	2.57	0.00	0.00	44.00	2.31	129.11	4.07
II	91.76	4.56	4.50	4.33	51.76	5.07	148.03	7.11
III	92.90	1.97	4.54	1.33	61.36	2.61	158.81	3.78

IV	94.69	0.48	42.96	4.29	70.46	5.85	208.11	9.24
V	95.23	1.83	49.38	7.91	73.84	6.98	218.46	13.83
VI	96.06	1.83	50.00	5.38	75.26	9.24	221.33	14.70
VII	96.93	1.52	63.68	4.62	81.06	6.49	241.68	10.51
VIII	98.00	1.41	70.57	9.03	84.64	7.70	253.21	16.82
IX	98.26	1.33	78.66	4.83	89.56	4.09	266.50	9.27
X	98.78	0.85	78.52	5.92	91.42	3.29	268.73	7.92

NOTE: Maximum score for each section is 100 and Grand Total Score is 300

Graph 1: Mean scores of Phonology total, Syntax total and Semantics total across Grade and with respect to Medium and Gender for typically developing Tamil medium male and female children



The mean and standard deviation of typically developing English medium male children for the LPT scores are given in the table 8. The results indicated that the mean scores of sections Phonology Total ranged from 84.00 to 99.46, Syntax Total ranged from 0.00 to 82.93, Semantics Total ranged from 43.63 to 91.46 and Grand Total ranged from 127.63 to 273.86 for typically developing English medium male children across grade I to X. The scores for phonology, syntax

and semantics showed increasing trend from grade I to grade X. The mean and standard deviation of typically developing English medium male children LPT scores were graphed in graph 2.

Table 8: Mean and Standard Deviation of Phonology total, Syntax total, Semantics total and Grand total for typically developing English medium male children

Grade	Phonology Total		Syntax Total		Semantics Total		Grand Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
I	84.00	4.98	0.00	0.00	43.63	3.91	127.63	7.67
II	89.50	4.57	2.50	1.86	48.92	5.18	140.92	9.11
III	91.92	3.49	11.03	11.53	63.19	6.68	166.15	15.94
IV	94.16	1.85	42.54	4.29	69.00	6.49	205.70	10.74
V	95.23	1.64	56.07	10.74	72.61	4.73	223.92	15.08
VI	95.40	1.35	57.70	11.25	77.26	7.83	230.36	18.23
VII	95.82	1.94	63.05	7.04	80.02	5.88	238.91	11.77
VIII	97.07	1.77	67.03	8.14	80.82	4.95	244.92	12.56
IX	98.53	1.30	78.63	7.62	86.26	7.15	263.43	14.62
X	99.46	0.74	82.93	7.67	91.46	4.58	273.86	11.66

NOTE: Maximum score for each section is 100 and Grand Total Score is 300

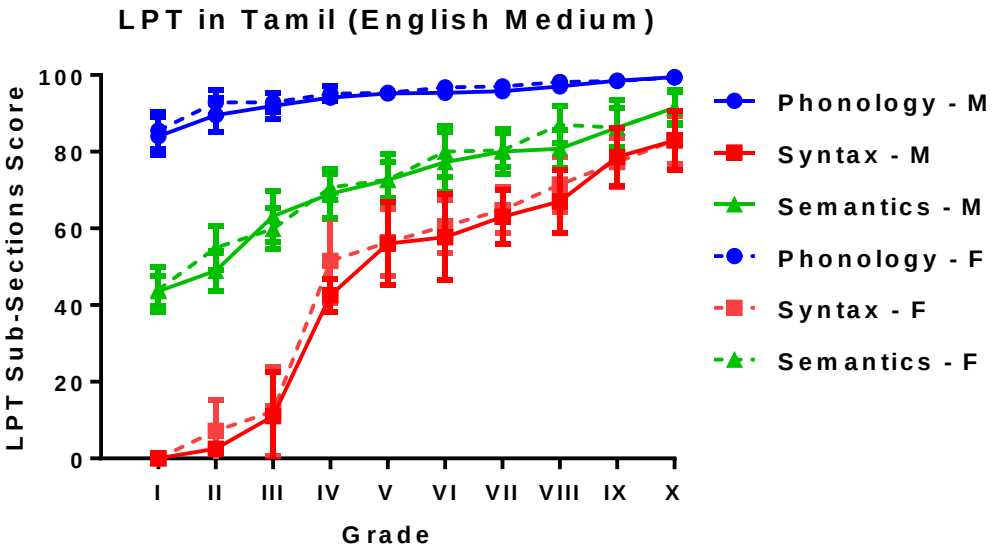
The mean and standard deviation of typically developing English medium female children for the LPT scores are given in the table 9. The results indicated that the mean scores of sections Phonology Total ranged from 85.54 to 99.435, Syntax Total ranged from 0.00 to 83.08, Semantics Total ranged from 44.00 to 91.44 and Grand Total ranged from 129.54 to 273.88 for typically developing English medium female children across grade I to X. The scores for phonology, syntax and semantics showed increasing trend from grade I to grade X. The mean and standard deviation of typically developing English medium female children LPT scores were graphed in graph 2.

Table 9: Mean and Standard Deviation of Phonology total, Syntax total, Semantics total and Grand total for typically developing English medium female children

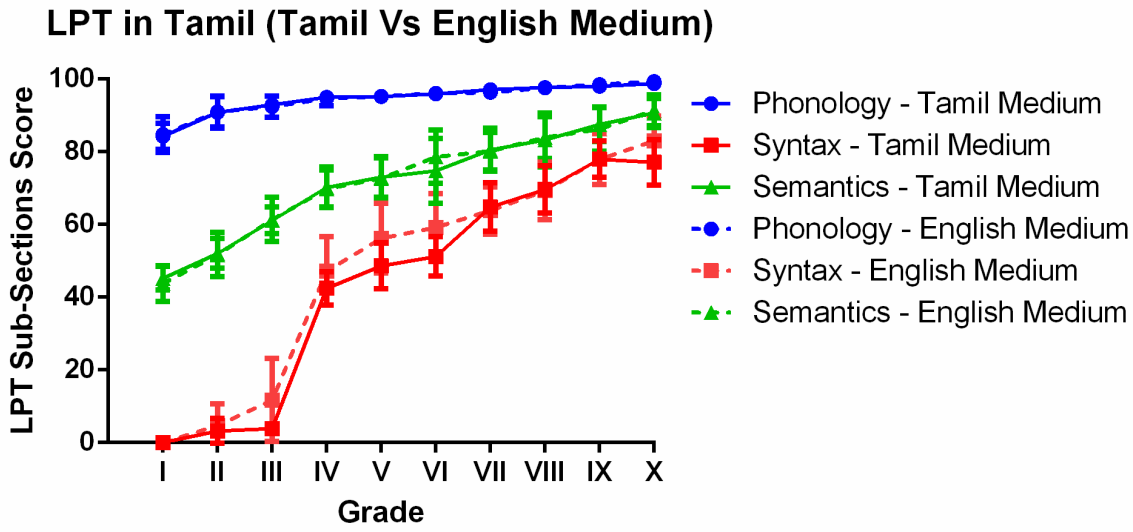
Grade	Phonology Total		Syntax Total		Semantics Total		Grand Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
I	85.54	4.92	0.00	0.00	44.00	5.94	129.54	10.20
II	92.91	3.17	7.20	7.95	54.95	5.65	155.08	15.31
III	92.87	2.47	12.31	11.62	59.90	5.33	165.09	15.34
IV	95.15	1.99	51.57	10.98	70.69	3.43	217.42	13.92
V	95.38	1.89	56.34	8.76	72.73	6.73	224.46	16.28
VI	96.80	0.67	60.63	6.96	80.00	6.78	237.43	11.96
VII	97.00	1.19	64.80	5.96	80.36	4.43	242.16	8.48
VIII	98.21	0.97	71.46	7.19	87.07	4.88	256.75	11.86
IX	98.46	1.06	77.33	6.48	86.26	5.10	262.06	10.19
X	99.35	0.78	83.08	6.29	91.44	4.05	273.88	9.82

NOTE: Maximum score for each section is 100 and Grand Total Score is 300

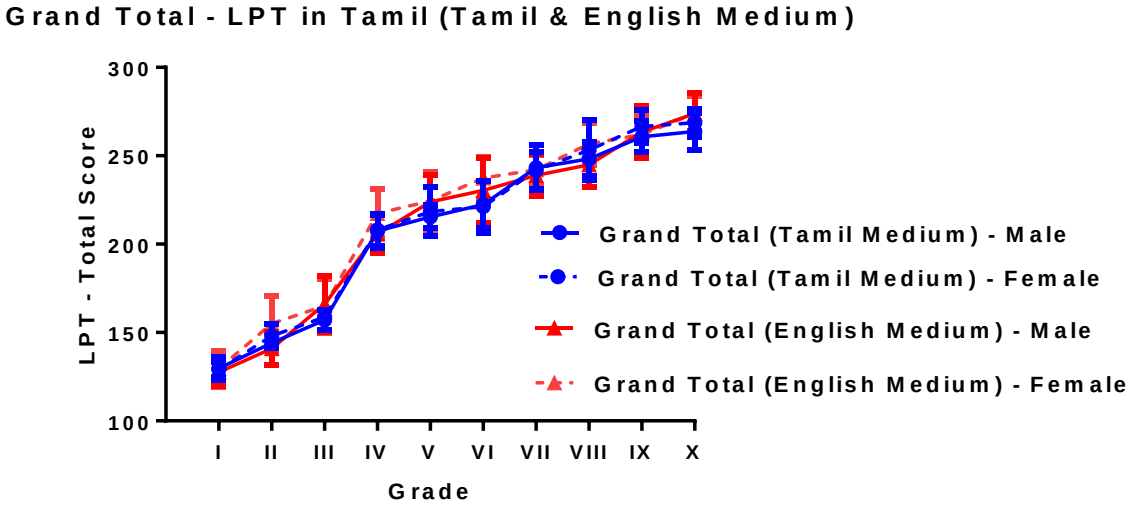
Graph 2: Mean scores of Phonology total, Syntax total and Semantics total across Grade and with respect to Medium and Gender for typically developing English medium male and female children



Graph 3: Mean scores of Phonology total, Syntax total and Semantics total across Grade and with respect to Medium for typically developing Tamil medium and English medium children



Graph 4: Mean scores of Grand total across Grade and with respect to Medium and Gender for typically developing Tamil medium and English medium, male and female children



Comparison across medium, grade and gender in TDC

MANOVA was carried out for typically developing children data across different sections of LPT in Tamil. The results showed that in medium (Tamil vs English) did not show significant difference for Phonology and Semantics section. However Syntax showed significant difference with low R^2 value (0.064). Grade (Grade I - Grade X) shows significant difference across Phonology, Syntax and Semantics wit high R^2 value (0.755, 0.950, 0.867) respectively. Gender (Male vs Female) showed significant difference across Phonology, Syntax and Semantics with low R^2 value (0.025, 0.007, 0.012) respectively. Interaction effect was noticed for medium vs gender for only Syntax with low R^2 value (0.069). However there was no any other interaction effect was observed from MANOVA results of Typically Developing Children (TDC).

Table 10: Results of MANOVA for typically developing children for Phonology, Syntax and Semantics Sections total of LPT in Tamil

Sl. No.	Variables	Phonology Total			Syntax Total			Semantics Total		
		F	Sig	R^2	F	Sig	R^2	F	Sig	R^2
1	Medium	0.04	0.83	0.00	35.24	0.00	0.06	0.15	0.69	0.00
2	Grade	175.8	0.00	0.75	1079	0.00	0.95	371	0.00	0.86
3	Gender	13.28	0.00	0.02	7.38	0.00	0.01	6.19	0.01	0.01
4	Medium * Grades	0.60	0.79	0.01	4.24	0.00	0.06	0.98	0.44	0.01
5	Medium * Gender	3.32	0.06	0.00	1.66	0.19	0.00	0.18	0.66	0.00
6	Grade * Gender	1.80	0.06	0.03	0.95	0.47	0.01	1.15	0.32	0.02
7	Medium * Grades* Gender	0.43	0.91	0.00	0.99	0.44	0.01	1.19	0.29	0.02

The Grand total of LPT score was sum of Phonology section, Syntax section and Semantic section. Since Grand total is not a related to all the sections. Separate ANOVA was carried out for typically developing children data of LPT in Tamil. The results showed that in medium (Tamil vs English) showed significant difference for Grand Total (Overall Score of LPT in Tamil) with low R^2 value (0.026). Grade showed significant difference with low R^2 value (0.943). Similarly Gender showed significant difference with low R^2 value (0.023). Interaction effect noticed for medium vs grade with low R^2 value (0.040) for Typically Developing Children (TDC). However there was no any other interaction effect was observed from ANOVA results of Typically Developing Children (TDC).

Table 11: Results of ANOVA for typically developing children for Grand Total of LPT in Tamil

Sl. No.	Variables	Grand Total		
		F	Sig	R^2
1	Medium	13.586	.000	.026
2	Grade	946.494	.000	.943
3	Gender	12.260	.001	.023
4	Medium * Grades	2.387	.012	.040
5	Medium * Gender	1.729	.189	.003
6	Grade * Gender	1.022	.421	.018
7	Medium * Grades *Gender	1.126	.342	.019

Comparison across the grades

The MANOVA and ANOVA results of Typically Developing Children (TDC) showed significant difference for Medium, Grade and Gender. Specifically Medium and Gender has only two levels.

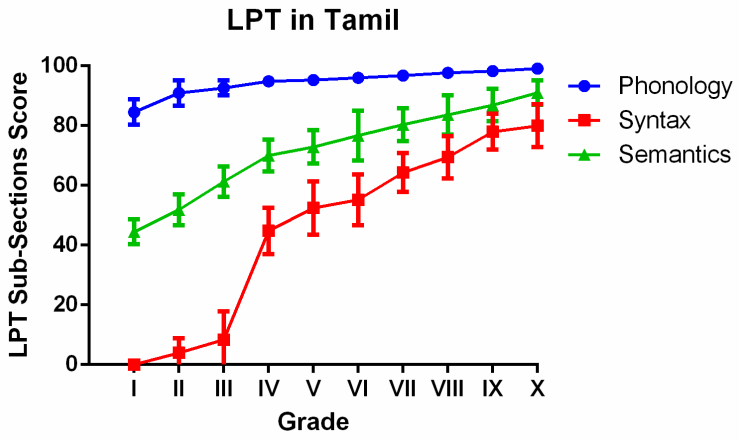
Hence Post Hoc was not carried out. Since grade has ten levels, Post Hoc was carried out. The results of the MANOVA and ANOVA Post Hoc Test are showed in table 12.

Table 12: Results of MANOVA and ANOVA Post Hoc for typically developing children

Grade / Sections	I	II	III	IV	V	VI	VII	VIII	IX	X
Phonology	84.52	90.96	92.66	**94.88***	**95.25***	**96.01***	**96.75#**	**97.68#**	**98.28$**	**99.09$**
Syntax	**0.000***	**3.951***	8.363	44.79	**52.43#**	**55.18#**	64.33	69.44	**77.98$**	**79.96$**
Semantics	44.48	51.89	61.26	**70.05***	**72.87***	76.70	**80.36$**	**83.60$**	86.91	91.05
Grand Total	129.01	146.80	162.29	209.73	220.55	227.90	241.45	250.73	**263.18***	**270.10***

NOTE: Maximum score for each section is 100 and Grand Total Score is 300

Graph 5: Mean scores of Phonology total, Syntax total and Semantics total across section for typically developing children



Descriptive Statistics for Typically Developing Children (TDC) and Children with Language Disorder (Clinical Population):

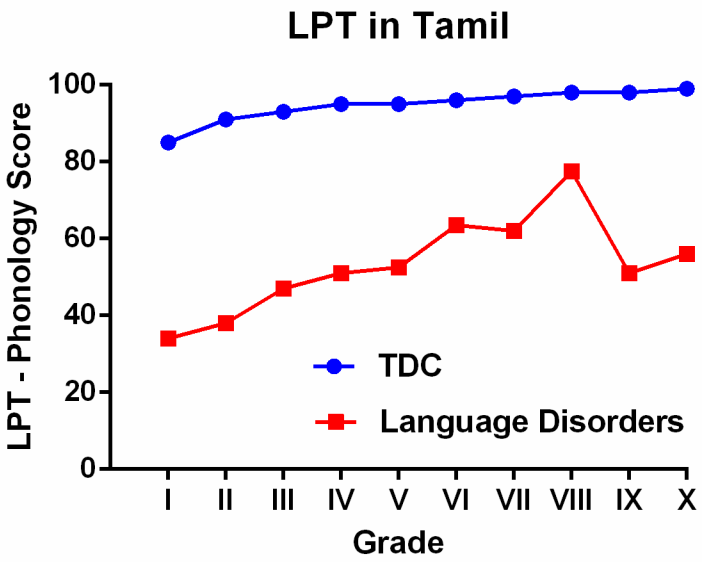
The mean, standard deviation and median of typically developing children (TDC) and children with language disorder (Clinical Population) for the LPT in Tamil scores are given in the

table 13. The results indicated that the mean scores of Phonology section for typically developing children ranged from 84.52 to 99.09 and for children with language disorder the mean score ranged from 27.66 to 66.44 across grade I to X. The standard deviation for language disorder was more compared to typically developing children. The scores for phonology showed increasing trend from grade I to grade X. The median scores of typically developing children (TDC) and children with language disorder (Clinical Population) for phonology scores of LPT in Tamil were graphed in graph 6.

Table 13: Mean, Standard Deviation and Median of Phonology section for typically developing children (TDC) and Children with Language Disorder

	PHONOLOGY					
GRADES	**GROUP – 1**			**GROUP – 2**		
	Mean	**SD**	**Median**	**Mean**	**SD**	**Median**
I	84.52	4.27	85.00	27.66	18.33	34.00
II	90.96	4.27	91.00	47.00	21.00	38.00
III	92.66	2.47	93.00	47.00	04.24	47.00
IV	94.88	1.65	95.00	53.00	11.13	51.00
V	95.25	1.60	95.00	52.50	07.77	52.50
VI	96.01	1.42	96.00	59.83	13.89	63.50
VII	96.75	1.65	97.00	61.00	23.43	62.00
VIII	97.68	1.59	98.00	71.70	13.84	77.50
IX	98.28	1.20	98.00	49.14	24.72	51.00
X	99.09	1.00	99.00	66.44	19.74	56.00

Graph 6: Median scores of Phonology total, across Grade for typically developing children (TDC) and Children with Language Disorder



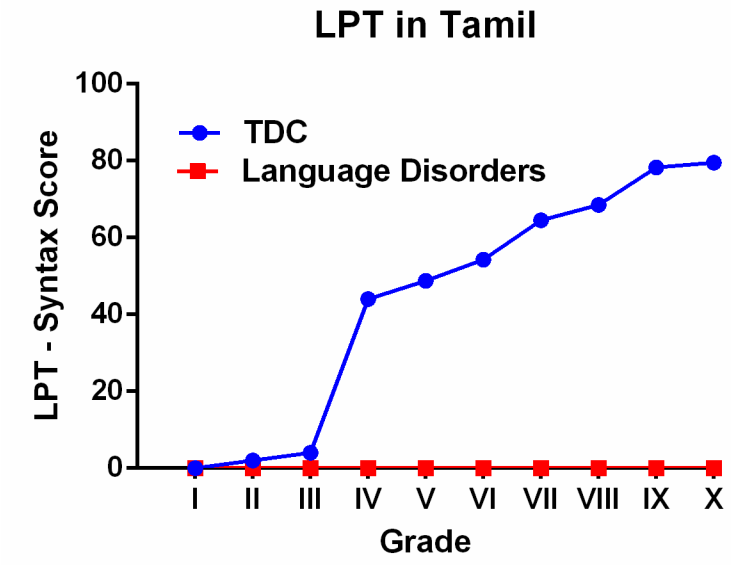
The mean, standard deviation and median of typically developing children (TDC) and children with language disorder (Clinical Population) for the LPT scores are given in the table 14. The results indicated that the mean scores of syntax section for typically developing children ranged from 0.00 to 79.96 and for children with language disorder the mean score ranged from 0.00 to 10.50 across grade I to X. The scores for syntax showed increasing trend from grade I to grade X. The scores for phonology showed increasing trend from grade I to grade X. The median scores of typically developing children (TDC) and children with language disorder (Clinical Population) for Syntax scores of LPT in Tamil were graphed in graph 7.

.

Table 14: Mean, Standard Deviation and Median of Syntax section for typically developing children (TDC) and Children with Language Disorder

GRADE	SYNTAX					
	GROUP – 1			GROUP – 2		
	Mean	SD	Median	Mean	SD	Median
I	0.00	0.00	0.00	0.00	0.00	0.00
II	3.95	4.88	2.00	0.00	0.00	0.00
III	8.36	9.42	4.00	0.00	0.00	0.00
IV	44.79	7.71	44.00	0.00	0.00	0.00
V	52.43	8.92	48.75	0.00	0.00	0.00
VI	55.18	8.54	54.25	0.83	1.60	0.00
VII	64.33	6.53	64.50	1.21	3.21	0.00
VIII	69.44	7.12	68.50	3.15	8.64	0.00
IX	77.98	6.02	78.25	0.00	0.00	0.00
X	79.96	7.18	79.50	10.50	17.57	0.00

Graph 7: Median scores of Syntax total, across Grade for typically developing children (TDC) and Children with Language Disorder

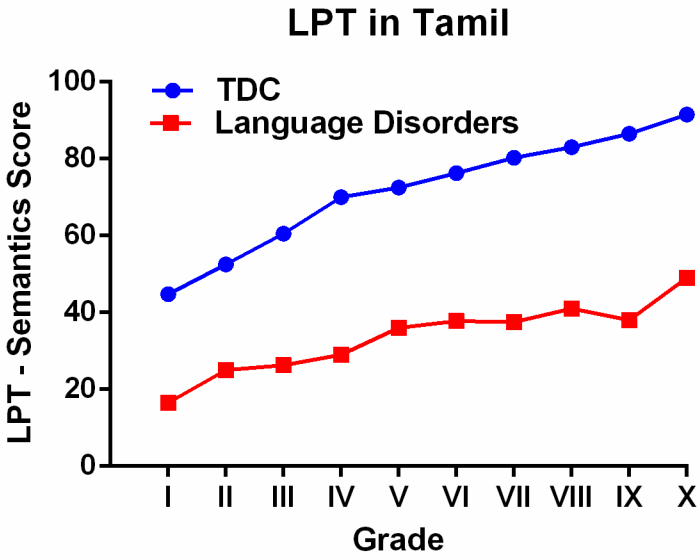


The mean, standard deviation and median of typically developing children (TDC) and children with language disorder (Clinical Population) for the LPT scores are given in the table 15. The results indicated that the mean scores of Semantics section for typically developing children ranged from 44.48 to 91.05 and for children with language disorder the mean score ranged from 17.00 to 47.27 across grade I to X. The scores for semantics showed increasing trend from grade I to grade X. The scores for phonology showed increasing trend from grade I to grade X The mean and standard deviation of typically developing children (TDC) and children with language disorder (Clinical Population) the LPT scores were graphed in graph 8.

Table 15: Mean, Standard Deviation and Median of Semantics section for typically developing children (TDC) and Children with Language Disorder

	SEMANTICS					
GRADE	**GROUP – 1**			**GROUP – 2**		
	Mean	**SD**	**Median**	**Mean**	**SD**	**Median**
I	44.48	4.23	44.75	17.00	05.26	16.50
II	51.89	5.15	52.50	31.83	15.89	25.00
III	61.26	5.13	60.50	26.25	06.71	26.25
IV	70.05	5.31	70.00	25.50	07.85	29.00
V	72.87	5.58	72.50	36.00	01.41	36.00
VI	76.70	8.31	76.25	33.16	12.73	37.75
VII	80.36	5.52	80.25	34.64	12.27	37.50
VIII	83.60	6.61	83.00	45.35	13.85	41.00
IX	86.91	5.43	86.50	35.28	14.34	38.00
X	91.05	4.08	91.50	47.27	19.01	49.00

Graph 8: Median scores of Semantics total, across Grade for typically developing children (TDC) and Children with Language Disorder

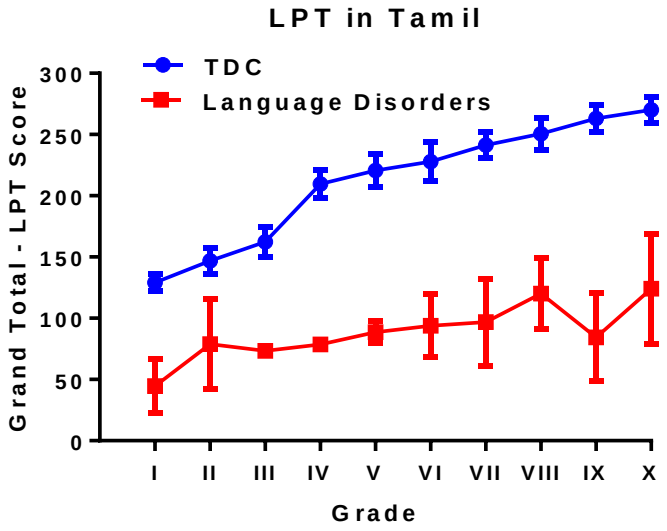


The mean, standard deviation and median of typically developing children (TDC) and children with language disorder (Clinical Population) for the LPT scores are given in the table 16. The results indicated that the mean scores of Grand Total for typically developing children ranged from 129.01 to 270.10 and for children with language disorder the mean score ranged from 44.66 to 124.22 across grade I to X. The scores for phonology, syntax and semantics showed increasing trend from grade I to grade X. The scores for phonology showed increasing trend from grade I to grade X. The mean and standard deviation of typically developing children (TDC) and children with language disorder (Clinical Population) the LPT scores were graphed in graph 9.

Table 16: Mean, Standard Deviation and Median of Grand Total for typically developing children (TDC) and Children with Language Disorder

GRADE	GRAND TOTAL					
	GROUP – 1			GROUP – 2		
	Mean	SD	Median	Mean	SD	Median
I	129.01	7.31	128.50	44.66	22.25	56.50
II	146.80	10.77	144.50	78.83	36.89	63.00
III	162.29	12.50	159.50	73.25	02.47	73.25
IV	209.73	11.63	208.00	78.50	03.96	80.00
V	220.55	13.61	216.50	88.50	09.19	88.50
VI	227.90	15.83	224.25	93.83	25.84	97.75
VII	241.45	10.94	240.50	96.85	35.45	99.50
VIII	250.73	13.37	249.00	120.20	29.32	119.00
IX	263.18	10.89	262.25	84.42	36.15	89.00
X	270.10	10.50	269.25	124.22	44.76	126.00

Graph 9: Median scores of Grand total, across Grade for typically developing children (TDC) and Children with Language Disorder



ROC CURVE

The Cut-off score criteria are taken from the co-ordinates of the ROC curve. The area under the ROC curve is not discussed because of the small number of subjects. The Sensitivity and 1- Specificity is 100 %. Table 17 shows the cut-off Score of ROC curve across grade I to grade X of Children with Language Disorders.

Table 17: Cut-off Score of ROC curve across grade I to grade X of Children with Language Disorders

GRADE	CUT OFF SCORE
I	85.00
II	123.5
III	107.5
IV	134.75
V	148.00
VI	161.25
VII	176.50
VIII	196.25
IX	183.50
X	210.50

Normative Score for Linguist Profile Test (LPT) – Tamil

The above result from the TDC group showed that there was significant difference for medium, grade and gender. But the power of the significant difference was negligible for gender, hence normative score was not categorized based on gender. The medium of education (Tamil Vs English) did show significant difference with less power of significance only for syntax section. Hence, only syntax score was separately shown for Tamil medium children and English medium children. Grade of school showed significant difference with high power of significance. Hence normative score was clearly separated based on grade of the school children. Table 18 shows the normative score for linguistic profile test in Tamil.

Table 18: Normative score for linguistic profile test in Tamil

NORMATIVE SCORE FOR LINGUIST PROFILE TEST (LPT) - TAMIL									
AGE	**SCHOOL GRADE**	**Phonology Score Out of 100**		**Syntax ** Score Out of 100**		**Semantics Score Out of 100**		**Grand Total Score Out of 300**	
		Mean	SD	**Mean**	SD	**Mean**	SD	**Mean**	SD
6+ Years	**I**	**84.5**	4.27	**0.00**	0.00	**44.4**	4.23	**129**	7.92
7+ Years	**II**	**90.9**	4.27	**3.95**	4.88	**51.8**	5.15	**147**	10.99
8+ Years	**III**	**92.6**	2.47	**8.36**	9.42	**61.2**	5.13	**162**	12.74
9+ Years	**IV**	**94.8**	1.65	**44.7**	7.71	**70.0**	5.31	**211**	14.66
10+ Years	**V**	**95.2**	1.60	**52.4**	8.92	**72.8**	5.58	**220**	14.67
11+ Years	**VI**	**96.0**	1.42	**55.1**	8.54	**76.7**	8.31	**228**	16.28
12+ Years	**VII**	**96.7**	1.65	**64.3**	6.53	**80.3**	5.52	**242**	11.65
13+ Years	**VIII**	**97.6**	1.59	**69.4**	7.12	**83.6**	6.61	**251**	13.45
14+ Years	**IX**	**98.2**	1.20	**77.9**	6.02	**86.9**	5.43	**263**	11.96
15+ Years	**X**	**99.0**	1.00	**79.9**	7.18	**91.0**	4.08	**270**	10.84

**Syntax score is different for Tamil medium & English medium children. Hence scores are given separately below:

Syntax Score for Tamil Medium Vs English Medium in School going children

Grade	**Syntax Score**			
	Tamil Medium		**English Medium**	
	Mean	**SD**	**Mean**	**SD**
I	**0.00**	0.00	**0.00**	0.00
II	**3.20**	3.41	**4.67**	5.94
III	**3.90**	1.38	**11.7**	11.3
IV	**42.4**	4.56	**47.2**	9.48
V	**48.6**	6.36	**56.2**	9.60
VI	**51.2**	5.39	**59.1**	9.31
VII	**64.7**	6.62	**63.8**	6.51
VIII	**69.6**	6.46	**69.2**	7.86
IX	**77.9**	5.00	**77.9**	6.98
X	**77.0**	6.31	**83.0**	6.85

Chapter – V

DISCUSSION

Phonology: Tamil Medium

The findings from Graph 1 revealed that the phonology in Tamil medium children showed developmental trend from grade I (6^+ years) to grade VI (11^+ years). Phonological development was almost complete by the time the child reaches grade VI (11^+ Years of age) and beyond. This observation in the phonology is in agreement with the findings of the earlier studies done by Suchitra and Karanth (1990) in Kannada, Monika Sharma (1995) in Hindi, Asha (1997) in Malayalam and Suhasini (1997) in Telugu. If the scores were compared; it could be seen that children in the present study had similar scores in the phonology section from grade VI (11^+ years of age) compared to Monika Sharma (1995) and had higher scores when compared to the studies of Suchitra and Karanth (1990), Asha (1997) and Suhasini (1997). A constant progress was maintained in the phonology section till grade VI (11^+ years) after which it reached a ceiling level. This finding was relatively similar to that of earlier study done in Kannada, by Suchitra and Karanth (1990), where maximum constant score was reached by 11^+ years of age.

Gender Difference:

Present research also shows gender difference in Phonology section. Female children had higher score compared to male across grade. This was consistent from grade I (6^+ years) to grade X (15^+ years). However, the power of the significance was very less.

Phonology: English Medium

The findings from Graph 2 revealed that the phonology in English medium children showed developmental trend from grade I (6^+ years) to grade VI (11^+ years). Phonological development was almost complete by the time the child reaches grade VI (11^+ Years of age) and beyond. This observation in the phonology is in agreement with the findings of the earlier studies done by Suchitra and Karanth (1990) in Kannada, Monika Sharma (1995) in Hindi, Asha (1997) in Malayalam and Suhasini (1997) in Telugu. A constant progress was maintained in the phonology section till grade VI (11^+ years) after which it reached a ceiling level. This finding was relatively similar to that of earlier study done in Kannada, by Suchitra and Karanth (1990), where maximum constant score was reached by 11^+ years of age.

Gender Difference:

Present research shows gender difference in Phonology section. Female children had higher score compared to male across grade. This was consistent from grade I (6^+ years) to grade X (15^+ years). However, the power of the significant was very less.

Syntax: Tamil Medium

The findings from Graph 1 revealed that the syntax section showed marginal improvement from grade I (6+ years) to grade III (8^+ years) and significant increase from grade III (8^+ years) to grade V (10^+ years). There after gradual improvement in syntax ability of the children was distinctly seen. The maximum score for syntax was 78 % by X^{th} grade female students. This range was in agreement with reported by Bohannor (1976), Karmiloff - Smith (1979), Hakes (1980), and Vanleek (1982).

Tunmer and Bowey (1982), Suchitra and Karanth (1990) and Monika Sharma (1995); who reported that in the syntax section, there was a significant improvement from 8+ years of age onwards

In the present study, from grade I (6^+ years) to grade III (8^+ years) the scores were comparatively lower than the other studies by Suchitra and Karanth1990, Monika Sharma 1995, Asha, 1997 and Suhasini, G (1997). The findings in this study showed a gradual increase till 8+ years and after which there was a more significant increase in score.

Gender Difference:

Present research shows gender difference in Syntax. Female children had higher score compared to male across grade. This was consistent from grade I (6^+ years) to grade X (15^+ years). However, the power of the significant was very less.

Syntax: English Medium

The findings from Graph 2 revealed that the syntax section showed marginal improvement from grade I (6+ years) to grade III (8^+ years) and significant increase from grade III (8^+ years) to grade V (10^+ years). There after gradual improvement in syntax ability of the children was markedly seen. The maximum score for syntax was 83 % by X^{th} grade female students. This was in agreement with that reported by Bohannor (1976), Karmiloff - Smith (1979), Hakes (1980), Vanleek (1982).

Tunmer and Bowey (1982), Suchitra and Karanth (1990) and Monika Sharma (1995); who reported that in the syntax section there was a significant improvement from 8+ years of age onwards.

In the present study, from grade I (6^+ years) to grade III (8^+ years) the scores were comparatively lower than the other studies by Suchitra and Karanth1990, Monika Sharma 1995, Asha, 1997 and Suhasini, G (1997). The findings in this study showed a gradual increase till 8+ years and after which there was a more significant increase in score.

Gender Difference:

Present research shows gender difference in Syntax section. Female children had higher score compared to male across grade. This was consistent from grade I (6^+ years) to grade X (15^+ years). However, the power of the significant was very less.

Semantics: Tamil Medium

The findings from graph 1 revealed that the semantic in Tamil medium children showed developmental trend from grade I (6^+ years) to grade X (15^+ years). This is supported by the earlier findings from the study done by Asha (1997) and Suhasini (1997). The minimum score for semantics was 44 % by grade I (6+ years) male and female children and the maximum score was almost 91.5 % by grade X (15+ years) male and female children.

Monika Sharma (1995) reported that the scores on body parts do not reach maximum even by 15 years of age. The error was seen mostly in left – right identification. This is in accordance with the studies in Kannada by Suchitra and Karanth (1990), and in Hindi by Monika Sharma (1995).

Gender Difference:

Present research shows gender difference in Semantics section. The female children studying in Tamil medium performed slightly better comparing to their counter parts i.e. male children studying in Tamil medium from grade V (10^+ years) to grade X (15^+ years).

The female children studying in Tamil medium performed slightly better comparing to their counter parts i.e. male children studying in Tamil medium from grade IV (9^+ years) to grade X (15^+ years).

Semantics: English Medium

The findings from graph 2 revealed that the semantic in English medium children showed developmental trend from grade I (6^+ years) to grade X (15^+ years). This is supported by the earlier findings from the study done by Asha (1997) and Suhasini (1997). The minimum score for semantics was almost 44 % by grade I (6+ years) male and female children and the maximum score was almost 91.5 % by grade X (15+ years) male and female children.

Gender Difference:

Present research shows gender difference in Syntax section. Children studying in grade X (Both male and female children) studying in English medium showed similar scores. The female children studying in Tamil medium performed slightly better comparing to their counter parts i.e. male children studying in Tamil medium from grade V (10^+ years) to grade X (15^+ years).

The female children studying in English medium performed slightly better comparing to their counter parts i.e. male children studying in Tamil medium from grade I (6^+ years) to grade IX (14^+ years).

Grand Total: Tamil Medium:

The grand total of all sections in LPT Tamil in typically developing children (TDC) showed a developmental trend from grade I (6+ years) to grade X (15+ years). The increment in the score is relatively high from grade III to Grade IV compare to other grade. This suggests that langauge development is in greater acceleration during that period. The minimum mean score for grand total was 129 out of 300 by grade I (6^+ years) participants and the maximum mean score was 269 out of 300 by grade X (15^+ years) participants in typically developing children (TDC).

Grand Total: English Medium:

The overall grand total i.e. total of all sections in LPT Tamil in typically developing children (TDC) showed a typical developmental trend from grade I (6+ years) to grade X (15+ years). The minimum mean score for overall grand total was almost 128 for the maximum score of 300 by grade I (6^+ years) and the maximum mean score was almost 274 for the maximum score of 300 by grade X (15^+ years) in typically developing children (TDC).

Comparing typically developing children with SpokenLanguage Disorder

By comparing the participants with spoken language disorder (SLD) with typically developing children (TDC) irrespective of medium and gender, all the children with SLD

secondary to LD, ASD, ID and CP obtained lower scores compared to their chronological age matched with typically developing peers. This indicates that the current test is able to differentiate the disordered group from typically developing children.

The overall score of phonology section in typically developing children (TDC) showed a developmental trend from grade I (6+ years) to grade X (15+ years). The minimum mean score for phonology section grand total was almost 85 % by grade I (6^+ years) and the maximum mean score was almost 99 % by grade X (15^+ years) in typically developing children (TDC). Whereas the minimum mean score for language disorder children (Clinical Population) in phonology was 28 % and the maximum score was 66 % only. This clearly shows the demarcated gap between the language delays in language disordered children (SLD) in phonology compared with their counterparts typically developing children (TDC).

The overall score of syntax section in typically developing children (TDC) showed developmental trend from grade I (6+ years) to grade X (15+ years). The minimum mean score for syntax section was 0 % by grade I (6^+ years) the maximum mean score was almost 80 % by grade X (15^+ years) in typically developing children (TDC). Whereas the minimum mean score for language disorder children (Clinical Population) in syntax section was 0 % and the maximum score was 11 % only. This clearly shows the demarcated gap between the language delays in language disordered children (SLD) in syntax compared with their counterparts typically developing children (TDC).

The overall score of semantics section in typically developing children (TDC) showed a developmental trend from grade I (6+ years) to grade X (15+ years). The minimum mean score for semantics section grand total was almost 44 % by grade I (6^+ years) and the maximum mean score was almost 91 % by grade X (15^+ years) in typically developing

children (TDC). Whereas the minimum mean score for language disorder children (Clinical Population) in semantics, was 17 % and the maximum score was 47 % only. This clearly shows the demarcated gap between the language delays in language disordered children (SLD) in semantics compared with their counterparts typically developing children (TDC).

The grand total of LPT Tamil in typically developing children (TDC) showed a developmental trend from grade I (6+ years) to grade X (15+ years). The minimum mean score for overall total was 129 out of 300 by grade I (6^{+} years) and the maximum mean score was almost 270 out of 300 by grade X (15^{+} years) in typically developing children (TDC). Whereas the minimum mean score for language disorder children (Clinical Population) in overall grand total, was almost 45 out of 300 and the maximum score was 124 out of 300. This clearly shows the difference in the language delay in children with language disorder compared with typically developing children (TDC).

The present study showed gender significant difference across grade; however the power of significance of difference was minimal. Hence the gender difference was not considered for the estimation of normative data for LPT in Tamil. The result also showed no significant difference across medium (Tamil Medium Vs English Medium) for phonology and semantics section, however in syntax section, children studying in English medium showed better performed than Tamil medium. Hence the medium difference was considered only for syntax.

The above said results indicates that the current test is able to differentiate the language disordered group from typically developing children to demarcate the language delay in children

with spoken language disordered children with their counterparts, typically developing children (TDC). Hence, the normative score established through this research for LPT-Tamil can be used to identify the language disorder and to assess the language delay in Tamil language effectively.

Summary of discussion:

All the sections in LPT-Tamil showed developmental trend. The developmental trend was same for Tamil medium children as well as English medium children except for syntax section. Children showed increasing trend in phonology from grade I (6^+ years) to grade VI (11^+ years). Phonological development was almost complete by the time the child reaches grade VI (11^+ Years of age). Female children had higher score compared to male across grade

Syntax section showed marginal improvement from grade I (6+ years) to grade III (8^+ years) and significant increase from grade III (8^+ years) to grade V (10^+ years). There after gradual improvement in syntax ability of the children was distinctly seen for both Tamil medium and English medium children. Female children had higher score compared to male across grade The maximum score for syntax was 78 % by X^{th} grade in Tamil medium students however the maximum score for syntax was 83 % by X^{th} grade in English medium students.

In semantics section children showed developmental trend from grade I (6^+ years) to grade X (15^+ years). The minimum score for semantics was 44 % by grade I (6+ years) children and the maximum score was almost 91.5 % by grade X (15+ years) both the gender performed almost similarly in semantics. The overall grand total i.e. total of all sections in LPT Tamil in typically

developing children (TDC) showed minimum mean score was almost 128 for the maximum score of 300 for grade I and the maximum mean score was 270 for grade X (15^{+} years) in typically developing children (TDC).

The minimum mean score for language disorder children (Clinical Population) in overall grand total was 45 out of 300 and the maximum score was 124 out of 300. This clearly shows that the test is able to differentiate the language delay in children with language disorder compared with typically developing children (TDC). The cut of score ROC curve clearly separates the TDC group from clinical population. Hence, the normative score established through this research for LPT-Tamil can be used to identify the language disorder and to assess the language delay in Tamil language effectively.

SUMMARY OF THE STUDY

Children are the future of our society. To make them as effective communicators and active members in the society, Speech language pathologists (SLP) also play an important role. The SLP are professionally responsible for identifying, assessing, diagnosing and treating children with language delay or disorders. These language delays in children are identified through various standardized assessment tools. The SLP should select appropriate language test depending on profile of the client and the purpose of assessment. The availability of language test material to assess Tamil speaking children are limited and no language test material to assess Tamil speaking children above seven years of age. Hence there is a need to develop a language test for school going children in Tamil language. Sunanda & Jayakumar (2017) adapted the Linguistic Profile Test (LPT) in Tamil language which was initially developed and standardized in Kannada language by Karanth P (1980). Linguistic Profile Test (LPT) assesses major components of language and it covers a wide age range from 6 to 15 years. Hence, this project aims to standardize the Linguistic Profile Test (LPT) in Tamil language

Total of 606 children were participated in the study. They were divided into two groups such as, typically developing children and language delay children. Five fifty-four (554) typically developing children from 6+ years to 15+ years (from grade I to grade X) from both Tamil Medium (274 Children) and English Medium (280 Children) were included. The test was administered on 52 children, who are clinically diagnosed with Spoken Language Disorder Secondary to Intellectual Disability (ID), Learning Disability (LD), Specific Language Impairment (SLI), Autism Spectrum Disorder (ASD), Down's syndrome (DS) and Cerebral Palsy (CP), both males and females.

Normality Check for typically developing children across medium and gender was done. Which showed normal distribution for majority of the data. The mean and standard deviation of

typically developing children across medium (Tamil Vs English), school grade (I to X standard) and gender (Male Vs Female) was tableted. The statistical test showed that the Grand total of LPT score was sum of Phonology section, Syntax section and Semantic section and the results showed that in medium (Tamil vs English) showed significant difference for Grand Total (Overall Score of LPT in Tamil) with low R^2 value (0.026). Grade showed significant difference with low R^2 value (0.943). Similarly, Gender showed significant difference with low R^2 value (0.023). Interaction effect noticed for medium vs grade with low R^2 value (0.040) for Typically Developing Children (TDC). There was no any other interaction effect was observed from ANOVA results of Typically Developing Children (TDC).

All the sections in LPT-Tamil showed clear developmental trend. The developmental trend was same for Tamil medium children as well as English medium children except for syntax section. Female children had higher score compared to male across grade. The maximum score for syntax was 78 % by X^{th} grade in Tamil medium students and the maximum score for syntax was 83 % by X^{th} grade in English medium students. The overall grand total i.e. total of all sections in LPT Tamil in typically developing children (TDC) showed minimum mean score was almost 128 for the maximum score of 300 for grade I and the maximum mean score was 270 for grade X (15^{+} years) in typically developing children (TDC). The minimum mean score for language disorder children (Clinical Population) in overall grand total was 45 out of 300 and the maximum score was 124 out of 300. This clearly shows that the test is able to differentiate the language delay in children with language disorder compared with typically developing children (TDC). The cut of score ROC curve clearly separates the TDC group from clinical population. Hence, the normative score established through this research for LPT-Tamil can be used to identify the language disorder and to assess the language delay in Tamil language effectively.

Appendix 1, Appendix 2, & Appendix 3 has been given as separately in pdf file

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