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Lexical development in Tamil-speaking preschool and primary school children – development and validation of a vocabulary checklist

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Abstract

Vocabulary is key to language learning and communication. It is essential for reading, writing, and forming sentences. Vocabulary also reflects intelligence and word knowledge. To accurately assess a child's language skills, a culturally fair vocabulary checklist is needed. This tool can help predict cognitive abilities and support language development, which is crucial for academic success. Since there are limited studies on Tamil vocabulary assessment, the current study aimed at developing and validating a vocabulary checklist for Tamil-speaking children. The study included development and validation of the lexical inventory checklist, and administration of the checklist on 60 primary school Tamil speaking children. From the results obtained it is inferred that vocabulary knowledge increases as age increases. The study highlights the importance to track the developmental trend with the help of vocabulary checklist.

Keywords: vocabulary, checklist, Tamil speaking children, development, validation

1. Introduction

Lexical inventory refers to the collection of words known by an individual or by a Group of people. By the age of eighteen months, children typically attain a vocabulary of 50 words in production (Doughty & Long, 2008). Vocabulary spurt is defined as a shift from slow vocabulary growth to a faster growth. A vocabulary spurt occurs over time as the number of words learning accelerates. It is believed that most children learn about 10 to 20 words a week (Ganger & Brent, 2004). Vocabulary is classified into four types: i) Listening Vocabulary, ii) Speaking Vocabulary, iii) Reading Vocabulary, iv) Writing Vocabulary (Biemiller, 2001; Manzo & Thomas, 2006; Cohen & Steinberg 1983; Xu & Yapanel et al., 1999). The vocabulary is also

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referred to as lexicon/ lemma. Mental lexicon is the processes involved in language use, such as language acquisition, perception, comprehension, and production. The mental lexicon (or the internal lexicon) is a field of psycholinguistics that focuses on the organization of word knowledge in one's permanent memory (Briscoe & Carroll, 2002).

Lexicon is the total set of word and word elements that carry meaning and it is the bridge between the language and knowledge (Sowa, 2005). Every language has a different vocabulary and grammatical structure.

Reading comprehension relies on vocabulary. Readers cannot comprehend what they are reading unless they are familiar with the meaning of the terms (Miller, Anglin & Wakefield, 1993). Listening, speaking, reading, and writing are all made easier with a large vocabulary (Nation, 2015). The process of acquiring words is known as vocabulary development which begins with babbling and progresses to meaningful speech as infants grow. Children continue to expand their vocabulary throughout their school years (Ghassabian et al., 2013; Bishop et al., 2012).

Neuman and Celano (2001) in their study on vocabulary development found that children's language proficiency is dependent on their capacity to perceive sounds throughout infancy. Children between the ages of six and ten months can distinguish sounds used in various languages around the world. Between the ages of 18 months to 7 years, phonological register is completed and there is a relationship between phonetic skills and lexical progress in children.

Failure to develop the pre-requisite phonetic skills in the pre-linguistic phase results in delay in acquiring word. It is also stated that the amount of speech input given to the children and the richness of the vocabulary is a positive predictor of language development (Bornstein, Haynes, & Painter, 1998; Hart & Risley, 1995; Hoff & Naigles, 2002; Huttenlocher, & Lyons et al., 1991; Weizman & Snow, 2001).

In an account to document the vocabulary development in children, many checklists were developed in western population such as Expressive Vocabulary Test (EVT-2), Peabody Picture Vocabulary Test (PPVT), Preschool Language scale PLS-5, Receptive and Expressive One Word Picture Vocabulary Test (ROWPVT-4).

Similarly, vocabulary checklist was also developed in Indian context namely Classroom Vocabulary Assessment for Indian Children (CVA-3), Clinical Practice Guidelines for Children (CPGC) and Assessment in Early Childhood Education (AECE-8) are the few well know Test material for the vocabulary assessment. It gives a complete review on all areas of early childhood skills and provides baseline for the child's academic knowledge. The domains of this tool include (i) Physical well- being and motor development (ii) Approaches towards learning (iii) Language development and cognition (iv) general knowledge.

Lee (2011) inferred vocabulary development of two-year old children, that helps in predicting early language and literacy skills. Study included 1,071 children, they were further categorized into large and small vocabulary Groups with the help of their Communicative Developmental Inventory (CDI) score. Results revealed that children with a larger vocabulary size at age 2 were observed to be advanced in language and literacy development than

their peers with a smaller vocabulary size. The development of early expressive vocabulary emerges in the form of babbling to the meaningful utterances (Nott & Cowan et al., 2009).

Benedict (1979) analyzed the acquisition of first 50 comprehended and produced words among eight children between 0.9 to 1.8 months and reported that the age of acquiring 10 to 50 words was 2.7 months in the receptive lexicon, while the expressive lexicon was 4.8 months. Caselli et al., (1995) studied the both receptive and expressive vocabulary in a total of 659 English and 195 Italian children between 8 months to 1.4 years using the MacArthur communicative inventory and reported that the acquisition order of the words belonging to different adult- like vocabulary was highly parallel in both the languages.

Jones et al., (2020) have done a study on developing vocabulary checklist for young children in multilingual region, where they included 20 categories and scoring was determined as early, mid and late acquired. From this study we can conclude that the noun categories, action words are attained early in the development while time words, pronoun, quantifier, question, locations acquire late during development. Kern et al (2007) explored the early lexicon development of 548 French-speaking infants aged 8.0–16.0 months of age. French adaptation of MacArthur-Bates Communicative Development was used and result revealed individual variations both in terms of onset and rate of lexical growth. The total vocabulary scores increased in all sections with chronological age. Noun was observed early in the production and comprehension of vocabulary between 8 to 16 months regardless of the lexicon size.

Caselli et al., (1995) observed the sequence of grammatical development, within and across natural languages. They measured the onset and rate of growth in lexical categories such as nouns, verbs, adjectives and grammatical function words. This study focusses on the parental report data on the first stages of expressive and receptive lexical development for 659 English infants and 195 Italian infants between 8 and 16 months of age. There was a growth in the proportion of vocabulary particularly in nouns. Grammatical function words, verbs and adjectives are rare in earlier vocabulary production, although verbs are reported earlier for receptive vocabulary.

Dixon (1982) recommended the hierarchy of development for adjectives such as value, dimension, physical property, speed, color, human propensity, age. Bever (1970) also conducted a study to identify the age of acquisition of adjectives across two to five years of age and found that children around two to three years performed better on repeating unnatural adjective and stable adjective production by five years of age.

Ching & Collyer et al., (2020) carried out a study to develop a checklist that was assessed in 33 parents to estimate vocabulary development in Indigenous Australian children among pre-school and primary school children. Results revealed, positive vocabulary development with increasing

age and positive effects in word combination around 3 years of age. Study concluded that the vocabulary development is more prominent in primary school children.

There are many factors that influence the development of vocabulary such as i) Environment, ii) bilingualism iii) speech and language disorders (Arriag & Fenson et al., 1998). Stevenson and Richman (1976) did a study on epidemiological survey of vocabulary development for three-year old children. They concluded that there was an influence of language disorder over vocabulary development.

Silva (1980) examined the age of acquisition of vocabulary in children with mental retardation. This study included 937 children with mental retardation, with the age range of three years having borderline Intelligence Quotient (IQ). Results revealed 85% of the children had poor acquisition of both receptive and expressive vocabulary.

Luyster et al, (2008) conducted a study to investigate language in toddlers who are at risk of Autism Spectrum Disorder (ASD) and to identify early correlates of receptive and expressive vocabulary. The study included 164 toddlers who are at risk of Autism Spectrum Disorder (ASD) between the ages of 18 and 33 months. Several languages, cognitive and behavioral measures were administered. Results suggested that children who are at risk of Autism spectrum Disorder (ASD) yield significantly poorer score both in receptive and expressive vocabulary.

Stork et al., (2009) conducted a study in which they explored the factors that influence vocabulary development in children, they explored the relative impact of demographic, cognitive, behavioral, and psycholinguistic factors on vocabulary development in two-year-old children. A total of 232 children between 24–30 months were tested on expressive and receptive vocabulary, cognitive development, word learning and working memory skills.

Fenson et al., (1993) explored the impact of demographic, behavioral, cognitive and psycholinguistic factors on vocabulary development in two-year-old children. A total of 232 children with the age range of 24-30 months were included in this study and tested the expressive vocabulary, receptive vocabulary, cognitive development, word learning and working memory skills. They have concluded children with cognitive and behavioral problem exhibit poor acquisition of receptive and expressive vocabulary along with poor scores in word learning and working memory skills.

Ebert el al (2013) studied the internal and external influence on vocabulary development in pre-school children. The internal aspect of phonological working memory and external aspect as exposure to the school and home was considered. The study included 547 children from 97 German preschools. Children's vocabulary was assessed at the ages of three, four and five years. They have concluded that the phonological working memory has a strong impact on vocabulary development and there is no influence of environment in vocabulary development.

It is postulated that girls develop vocabulary at a more accelerated rate compared to boys (Bornstien et al., 1998; Huttenlocher et al., 1991). Some research suggest that gender differences are minimal and is typically observed between the ages of three and four years that usually lasts for four to six months beyond which vocabulary attain exponential growth

(Huttenlocher, Haight et al., 1991). Hyde and Linn (1988) found that, there is no significant gender difference with respect to vocabulary development. According to Bornstien et al., (1998) sensitive period for vocabulary growth occurs between the ages of three and four.

Hoff et al., (2014) studied the course of language development among children from bilingual homes and monolingual homes. 31 children from monolingual-English homes and 11 children from bilingual home were participated in the study. The finding suggested that native language vocabulary is developed faster than the non-native language with respect to bilingual and monolingual homes. There is also an influence of migration over vocabulary development.

It is warranted to develop vocabulary checklist to avoid cultural bias, to estimate the child's linguistic ability and its correlation with concurrent measures of language development. It is essential to predict the cognitive ability, as it facilitates in development of functional language and an important prerequisite for pre-academic skill.

Vocabulary is the basis for language learning and is considered as a critical element to acquire language (Sothan,2015). It is essential for communication, reading, writing and to form grammatically appropriate sentences (Nation, 2001). It also relates to intelligence and is the base for word knowledge (Nation, 1990; Schmitt & McCarthy, 1997). It is warranted to develop vocabulary checklist to avoid cultural bias, to estimate the child's linguistic ability and its correlation with concurrent measures of language development. It is essential to predict the cognitive ability, as it facilitates in development of functional language and an important prerequisite for pre-academic skill. There are only minimal studies available to assess vocabulary in Tamil. Thus, there is a need to develop and validate vocabulary checklist/lexical inventory for Tamil speaking childrenthe introduction part, the study should be introduced, literature should be reviewed and discussed on the narrow line of the research topic in relation to relevant theories and the gap filled by your research should be stated clearly.

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2. Methodology

The aim of the study is to adapt and validate lexical inventory for Tamil speaking preschool and primary school children age ranged from three years to six years eleven months.

2.1. Material Development and Validation

The test tool was developed in Tamil, by adapting the categories of the lexicons from Mac Arthur Communicative Development Inventory, Tamil text books from first to third standard. The words were categorized into 20

categories based on the Mac Arthur communicative development inventory and few added categories with words including Nouns such as colours, vegetables, fruits, animals, birds. Verbs such as action words; prepositions and adjectives such as colours, vegetables, fruits, animals, birds, body parts, vehicles, food items, small household things and toys, house appliances and rooms, outside things and places, nature, people, action words, words denoting time, adjectives, pronouns, questioning words, location words and quantifiers.

The words were validated by arranging it according to Likert's scale, which is a five-point rating scale and the rating was based on the familiarity of the words, where 1 represents very unfamiliar and 5 represents very familiar. The unfamiliar words were revised and new words were adapted. Picture stimulus was also arranged accordingly to the words. It was validated by five speech and language pathologists with more than two years of experience and 10 pre-school and primary school teachers with experience of greater than five years and are native speakers of Tamil.

2.2. Participants

A total of 60 Tamil speaking children between the age range of three to six years eleven months were included in the study. Participants were further divided into four Groups according to the age. Group I included 15 participants with the age range of 3.0 to 3.11 years; Group II included 15 participants with the age range of 4.0 to 4.11 years; Group III included 15 participants with the age range of 5.0 to 5.11 years; Group IV included 15 participants with the age range of 6.0 to 6.11 years. The participants were selected from a school in a rural place in Tamil Nadu. Informed consent was received from the parents of the children who participated in the study. Speech and Language screening was done for all the participants prior to the administration of the checklist developed.

2.3. Data collection and processing

The procedure was explained through zoom sessions to the volunteers and the volunteers assessed the material on children. The internet connectivity was made sure to be stable during the training session. The volunteers assessed the children in a quiet and distraction free environment. The children were asked to name the picture stimuli and respond to the words which was provided. There were no time restrictions given for the response and prompts were not provided. Verbal praises were given for each correct response and each child was provided with a tangible reinforcement at the end of the assessment.

Scoring sheets were used individually for each child which had 'Yes' or 'No' response in it against each word. For each correct response a score of 1 was given and 0 for each incorrect response.

Table 1

Mean and standard deviation of all four Groups

Categories	Group I		Group II		Group III		Group IV	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Category 1	6.4	1.3522	11.4	2.1314	16.267	2.4339	17.333	1.633
Category 2	7.467	0.9155	11.667	2.1931	18.667	1.9518	19.333	2.82
Category 3	5.8	0.9411	10.667	1.633	14.8	1.5213	15.933	1.3345
Category 4	13.067	1.1629	14.733	0.7988	20.867	1.2459	23.467	2.3258
Category 5	6.267	0.5936	10.867	2.774	13.733	1.1629	14.6	1.1832
Category 6	12.867	0.9155	15.133	0.9904	21.2	1.9712	24.00	1.3628
Category 7	6.00	0.5345	7.533	0.9155	9.933	0.9612	10.8	1.0142
Category 8	12.4	0.9103	14.533	0.9904	16.2	1.5213	18.733	0.9612
Category 9	14.533	1.302	19.00	1.4142	23.467	1.4573	25.867	1.8848
Category 10	13.467	0.9904	15.667	1.1751	21.2	1.9712	24.00	0.9258
Category 11	7.333	0.7237	9.667	0.8997	11.000	0.000	11.00	0.000
Category 12	8.4	0.9103	9.8	0.7746	10.667	0.488	11.00	0.000
Category 13	11.00	1.1952	12.467	1.6417	16.00	1.5119	17.2	1.0142
Category 14	25.067	3.8816	34.6	1.6388	38.8	1.8205	40.533	1.3558
Category 15	6.333	0.488	8.333	0.9759	9.4	1.0556	11.00	1.4639
Category 16	16.333	0.8997	23.867	1.8848	29.267	2.1865	32.2	0.8619
Category 17	4.333	0.488	8.4	0.5071	15	0.000	15	0.000
Category 18	7.4	0.6325	8	0.000	8	0.000	8	0.000
Category 19	8.267	0.9612	10	0.000	10	0.000	9.333	2.582
Category 20	6.133	0.3519	7	0.000	7	0.000	7	0.000

2.4. Data analysis

The collected data was tabulated and descriptive statistics was applied based on the mean of "correct "responses for each stimulus presented. The responses were ordered according to the age range from 3.0 - 3.11 to 6.0 -

6.11 years which was determined from 60 participants. The mean and standard deviation was calculated for all the categories between the groups. The Statistical Package for Social Science (SPSS) version 21 was used for statistical analysis, all the variables were subjected to nonparametric test to estimate the significant difference between the groups. From the study it can be concluded that there is a statistically significant difference ($p<0.05$) between the age groups on all categories. Pair wise Comparison was estimated with the help of Dunn's pair wise tests. P values <0.05 were considered as statistically significant.

3. Findings

Descriptive statistics was estimated for all the categories between the Groups. The statistical analysis was carried out using SPSS (Statistical Package for Social Science) version 21. All the variables were subjected to nonparametric test to estimate the significant difference between the Groups. The significant difference were found between the Groups ($p < 0.05$).

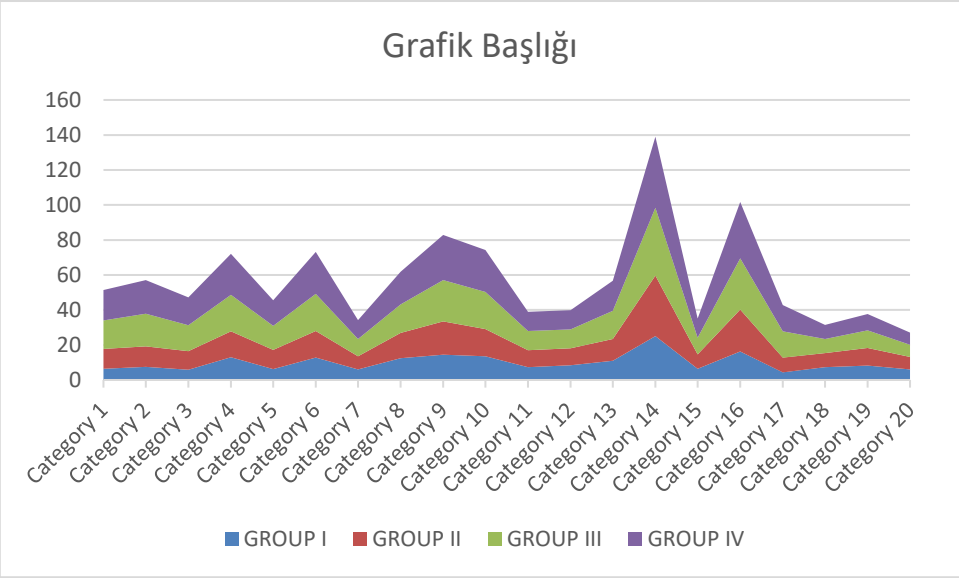

Figure 1. Denotes the mean and standard deviation of all four Groups

From Table 1, we could infer the mean and standard deviation of four Groups across all the 20 categories and figure 3.1 represent the linear increase in the mean scores for all 20 categories across age range of Group I scoring with least and Group IV performing with highest. This finding is supported by the inference of Nation and Warring (1997), where they suggested that vocabulary increases as age increases. Similarly, Huttenlocher, Haight, Bryk, Seltzer and Lyons (1991) suggested that, the increase in mean scores on varied categories is dependent on the exposure to the lexical category. The highest scores were significantly obtained for category 4 (animals), category 6 (body parts), category 9 (small household things and toys), category 10 (house appliances and rooms), category 14 (action words) and category 16 (adjectives) which attributes to literacy, where it is inferred that literacy have an influence over vocabulary development

(Richa, Sujatha & Premlatha, 2013). In addition to the current findings Ghassabian et al., 2013; Bishop et al., 2012; Jones, 2020 suggested that children learn more word at primary school age when compared to pre-school age. Kern et al (2007) explored the early lexicon development and found that the total vocabulary scores increased in all sections with chronological age.

Table 2

(*P) value comparison between the first Group with other Groups (Group I with Group II, Group III, Group IV)*

Categories	Group II	Group III	Group IV
Category 1	0.106	.000	.000
Category 2	0.221	.000	.000
Category 3	0.091	.000	.000
Category 4	0.453	.000	.000
Category 5	0.091	.000	.000
Category 6	0.231	.000	.000
Category 7	0.16	.000	.000
Category 8	0.096	.000	.000
Category 9	0.106	.000	.000
Category 10	0.275	.000	.000
Category 11	0.015	.000	.000
Category 12	0.056	.000	.000
Category 13	0.955	.000	.000
Category 14	0.079	.000	.000
Category 15	0.007	.000	.000
Category 16	0.068	.000	.000
Category 17	0.069	.000	.000
Category 18	.000	.000	.000
Category 19	.000	.000	.000
Category 20	.000	.000	.000

Note: p<0.05 – significant value.

Table 2 denotes the significance table of Group I with Group II, Group III and Group IV respectively. When comparing Group I with other Groups, significant difference obtained between Group I and Group II, Group I and Group IV in all 20 categories. The current finding is supported by the inference of Nation and Warring (1997), where they suggested that vocabulary increases as age increases. Nieminen (1991) also inferred that children between 0.8 months to two years acquired receptive lexicons four to five times faster than expressive lexicon.

Similarly, Jones et al., (2020) have done a study on developing vocabulary checklist for young children in multilingual region, where he included 20 categories and scoring was determined as early, mid and late acquired. From this study we can conclude that the action words are attained early in the development while words denoting time, pronoun, quantifier, question, and locations are acquired late during development.

Inferences on specific categories, Group I children were observed to have significant differences on all categories when compared with Group III and Group IV. This finding is supported by Gentner, (1982); Bornstein et al., (2004) that nouns are acquired early compare to that of verbs. It is also suggested that the noun dominance is observed in early lexical acquisition than verbs (Borodiskey, 2001).

The grammatical function words such as prepositions, pronouns, question words and quantifiers are very rare in early lexicon, however it starts to develop around two to three years (Marchman & Bates et al., 1994; Caselli et al., 1995).

The hierarchy of development was suggested by Brown, (1973); Laubscher and Light (2020), where nouns and action words develop early followed by adjectives and adverbs. It does not contain preposition, conjunctions articles or auxiliary verbs during early development. Similarly, with respect to the development of adjectives, Martin and Molfese, (1972) have observed that younger children tend to produce adjective orders that are less adult-like and as children get older, they attain adult pattern of adjectives.

Dixon (1982) recommended the hierarchy of development for adjectives such as value, dimension, physical property, speed, color, human propensity, age.

Bever (1970) also conducted a study to identify the age of acquisition of adjectives across two to five years of age and found that children around two to three years performed better on repeating unnatural adjective and stable adjective production by five years of age.

The concept of time is dependent on dimension of speed, distance and spatial orientation. All these dimensions are mastered only after eight years (Richards& Siegler, 1979; Richards, 1982; Matthews & Meck, 2016). The temporal representation starts as early as 18 to 24 months of age, where it begins with the usage of past tense and at age two to three years children mainly relate to temporal concepts that are related to location or distance (Shirai & Andersen,1995; Nelson & Fivush, 2004; Shirai & Miyata, 2006). By three years, children can distinguish between past and future events, however spatial time concepts develop between six to eight years (Nelson & Fivush, 2004).

One of the significant categories is quantifiers which denote syntactically numerical logic events (Noveck, 2001). Children by three years of age begin to use quantifiers rather than numbers and children by age of five years start to use complex quantifiers that are relevant to context (Papafrago, 2003). Number of appropriate answers to question and asking question develops as age increases (Salamo et al., 2012). Children around three to four years uses variety of "wh" question and the development of "why" question is acquired only between the age of five to six years (Nicolosi, 2004).

Significant difference between three years and four years was observed only for category 15 (time concept) which is supported by the study done by Nelson & Fivush (2004) where they suggest that, by three years of age children can distinguish between past and future events, however spatial time concepts develop adult pattern between five to eight years of age.

Table 3
(P) value comparison of the second Group with other Groups (Group II with Group I, Group III, Group IV)

	Age range		
	Group	Group	Group
Categories	I	III	IV
Category 1	0.106	0.016	0.001
Category 2	0.221	0.003	0.001
Category 3	0.091	0.022	.000
Category 4	0.453	0.014	.000
Category 5	0.091	0.089	0.002
Category 6	0.231	0.034	.000
Category 7	0.16	0.019	.000
Category 8	0.096	0.409	.000
Category 9	0.106	0.037	.000
Category 10	0.275	0.036	.000
Category 11	0.015	0.01	0.01
Category 12	0.056	0.09	0.003
Category 13	0.955	0.005	.000
Category 14	0.079	0.041	.000
Category 15	0.007	0.797	.000
Category 16	0.068	0.1	.000

Category 17	0.069	0.001	0.001
Category 18	.000	1.000	1.000
Category 19	.000	1.000	1.000
Category 20	.000	1.000	1.000

Table 3 denotes statistical significance of Group II when compared with other age Groups. Significant difference were obtained between Group II and Group III in following categories, category 1 (colours), category 2 (vegetables), category 3 (fruits), category 4 (animals), category 6 (body parts), category 7 (vehicles), category 9 (small house hold things & toys), category10 (house appliances), category 11 (outside things and places), category 13 (people), category 14 (action words). These findings are supported by Jones et al., (2020) have done a study on developing vocabulary checklist for young children in multilingual region, where he included 20 categories and scoring was determined as early, mid and late acquired. From this study we can conclude that the noun categories, verb categories are attained early in the development while time words, pronoun, quantifier, question, locations acquire late during development.

Similarly, Gentner, (1982); Bornstein et al., (2004) reported that nouns are acquired early compare to that of verbs. It is also suggested that the noun dominance is observed in early lexical acquisition than verbs (Borodiskey, 2001). It is also suggested that, grammatical function words such as prepositions, pronouns, question words and quantifiers are very rare in early lexicon, however it starts to develop around two to three years (Bates et al., 1994; Caselli et al., 1995). Bates (2000) concluded that there are noun bias observed with respect to productive lexicon such as animals, game routine and place. The receptive lexicon of the categories are observed as early as 16 months, however expression was reported to be delayed. Development of colours was studied by Pitch ford and Mullen (2010) where they reported that children between the age of two to three years respond better on five primary colours. Children by age four respond even better for complex colours without any error, however colours such as brown and grey are acquired only after five years of age (Johnson, 1977).

Similarly significant difference between four years and six years were obtained in all these categories category 1 (colours), category 2 (vegetables), category 3 (fruits), category 4 (animals), category 5 (birds), category 6 (body parts), category 7 (vehicles), category 8 (food items), category 9 (small household things and toys), category 10 (house appliances), category 11 (outside things and rooms), category 13 (people), category 14 (action words), category 15 (words denoted time), category 16 (adjectives) and category 17 (pronouns).

This finding was supported by Gentner, (1982); Bornstein et al., (2004) reported that nouns are acquired early compare to that of verbs. It is also suggested that the noun dominance is observed in early lexical acquisition than verbs (Borodiskey, 2001). Few categories were reported to have good receptive vocabulary than expressive vocabulary Caselli et al., (1995) observed the sequence of grammatical development and found that grammatical function words, verbs and adjectives are rare in earlier

vocabulary production, although verb are reported earlier for receptive vocabulary.

Bates (2000) concluded that there is noun bias observed with respect to productive lexicon such as animals, game routine and place. The receptive lexicon of the categories is observed as early as 16 months; however expression was reported to be delayed. It is also suggested that, grammatical function words such as prepositions, pronouns, question words and quantifiers are very rare in early lexicon, however it starts to develop around two to three years (Bates et al., 1994; Caselli et al., 1995).

Nelson and Fivush (2004) found that children by the age of three years can distinguish between past and future events, however spatial time concepts develop between six to eight years. With respect to questions, Nicolosi (2004) found that the children around three to four years uses variety of "wh" question and the development of "why" question is acquired only between the age of five to six years.

Significant difference between three years and four years is observed only for category 15 (time concept) which is supported by the study done by Nelson & Fivush (2004) where they suggest that, by three years of age children can distinguish between past and future events, however spatial time concepts develop adult pattern between five to eight years of age.

Table 4
(P) value comparison of the third Group with other Groups (Group III with Group I, Group II, Group 1V)

Categories	Group I	Group II	Group IV
Category 1	.000	0.016	1.000
Category 2	.000	0.003	1.000
Category 3	.000	0.022	1.000
Category4	.000	0.014	0.659
Category5	.000	0.089	1.000
Category6	.000	0.034	0.387
Category7	.000	0.019	1.000
Category8	.000	0.409	0.066
Category9	.000	0.037	0.693
Category 10	.000	0.036	0.319
Category 11	.000	0.01	1.000
Category 12	.000	0.09	1.000

Category 13	.000	0.005	1.000
Category 14	.000	0.041	1.000
Category 15	.000	0.797	0.449
Category 16	.000	0.1	0.235
Category 17	.000	0.001	1.000
Category 18	.000	1.000	1.000
Category 19	.000	1.000	1.000
Category 20	.000	1.000	1.000s

Table 4 indicates statistical significance of Group III. Statistically significant difference between Group III with Group I was obtained for all 20 categories. The current finding is supported by the inference of Nation and Warring (1997), where they suggested that vocabulary increases as age increases.

Similarly, Jones et al., (2020) have done a study on developing vocabulary checklist for young children in multilingual region, where he included 20 categories and scoring was determined as early, mid and late acquired. From this study we can conclude that the action words are attained early in the development while time words, pronoun, quantifier, question, locations acquire late during development.

Inference of statistical significance on specific categories suggest that nouns are acquired early compare to that of verbs (Gentner, 1982; Bornstein et al., 2004). It is also suggested that the noun dominance is observed in early lexical acquisition than verbs (Borodiskey, 2001). Authors recommend that grammatical function words such as prepositions, pronouns, question words and quantifiers are very rare in early lexicon, however it starts to develop around two to three years (Bates et al., 1994; Caselli et al., 1995).

For Group III when compared with Group II significant difference were obtained for the following categories, category 1 (colours), category 2 (vegetables), category 3 (fruits), category 4 (animals), category 6 (body parts), category 7 (vehicles), category 9 (small house hold things & toys), category10 (house appliances), category 11 (outside things and places), category 13 (people), category 14 (action words). These findings are supported by Jones et al., (2020) have done a study on developing vocabulary checklist for young children in multilingual region, where he included 20 categories and scoring was determined as early, mid and late acquired. From this study we can conclude that the noun categories, verb categories are attained early in the development while time words, pronoun, quantifier, question, locations acquire late during development.

Similarly, Gentner, (1982); Bornstein et al., (2004) reported that nouns are acquired early compare to that of verbs. It is also suggested that the noun dominance is observed in early lexical acquisition than verbs (Borodiskey, 2001). It is also suggested that, grammatical function words such as prepositions, pronouns, question words and quantifiers are very

rare in early lexicon, however it starts to develop around two to three years (Bates et al., 1994; Caselli et al., 1995).

Bates (2000) concluded that there is noun bias observed with respect to productive lexicon such as animals, game routine and place. The receptive lexicon of the categories is observed as early as 16 months; however, expression was reported to be delayed. Development of colours was studied by Pitchford and Mullen (2010) where they reported that children between the age of two to three years respond better on five primary colours. Children by age four respond even better for complex colours without any error, however colours such as brown and grey are acquired only after five years of age (Johnson, 1977).

Significant differences were not obtained between Group III and Group IV. In contrast to the current findings, Nelson and Fivush (2004) reported that, by three years of age children can distinguish between past and future events, however spatial time concepts develop adult pattern between five to eight years of age.

Table 5
(P) Value comparison on forth Group with other Groups (Group IV with Group I, Group II, Group III)

	Age range		
	Group	Group	Group
Categories	I	II	III
Category 1	.000	0.001	1.000
Category 2	.000	0.001	1.000
Category 3	.000	.000	1.000
Category 4	.000	.000	0.659
Category 5	.000	0.002	1.000
Category 6	.000	.000	0.387
Category 7	.000	.000	1.000
Category 8	.000	.000	0.066
Category 9	.000	.000	0.693
Category 10	.000	.000	0.319
Category 11	.000	0.01	1.000
Category 12	.000	0.003	1.000

Category 13	.000	.000	1.000
Category 14	.000	.000	1.000
Category 15	.000	.000	0.449
Category 16	.000	.000	0.235
Category 17	.000	0.001	1.000
Category 18	.000	1.000	1.000
Category 19	.000	1.000	1.000
Category 20	.000	1.000	1.000

Note: p<0.05 – significant value.

Table 5 denotes statistical significance of Group IV with other age Groups. When comparing Group IV with Group I. The current finding is supported by the inference of Nation and Warring (1997), where they suggested that vocabulary increases as age increases. Similarly, Jones et al., (2020) have done a study on developing vocabulary checklist for young children in multilingual region, where he included 20 categories and scoring was determined as early, mid and late acquired. From this study we can conclude that the action words are attained early in the development while time words, pronoun, quantifier, question, locations acquire late during development.

Statistically significant difference was obtained for each category when compared between Group IV with Group I. Many studies supported the finding Gentner, (1982); Bornstein et al., (2004) found that nouns are acquired early compare to that of verbs. It is also suggested that the noun dominance is observed in early lexical acquisition than verbs (Borodiskey, 2001). The grammatical function words such as prepositions, pronouns, question words and quantifiers are very rare in early lexicon, however it starts to develop around two to three years (Bates et al., 1994; Caselli et al., 1995). The hierarchy of development was suggested by Brown, (1973); Laubscher and Light (2020), where nouns and action words develop early followed by adjectives and adverbs. It does not contain preposition, conjunctions articles or auxiliary verbs during early development. Similarly, with respect to the development of adjectives, Martin and Molfese, (1972) have observed that younger children tend to produce adjective orders that are less adult-like and as children get older, they attain adult pattern of adjectives. Dixon (1982) recommended the hierarchy of development for adjectives such as value, dimension, physical property, speed, color, human propensity, age. Bever (1970) also conducted a study to identify the age of acquisition of adjectives across two to five years of age and found that children around two to three years performed better on repeating unnatural adjective and stable adjective production by five years of age.

The concept of time is dependent on dimension of speed, distance and spatial orientation. All these dimensions are mastered only after eight years (Richards& Siegler, 1979; Richards, 1982; Matthews & Meck, 2016). The temporal representation starts as early as 18 to 24 months of age, where it

begins with the usage of past tense and at age two to three years children mainly relate to temporal concepts that are related to location or distance (Shirai & Andersen,1995; Shirai & Miyata, 2006; Nelson & Fivush, 2004). By three years children can distinguish between past and future events, however spatial time concepts develop between six to eight years (Nelson & Fivush, 2004). One of the significant categories is quantifiers which denote syntactically numerical logic events (Noveck, 2001). Children by three years of age begin to use quantifiers rather than numbers and children by age of five years start to use complex quantifiers that are relevant to context (Papafrago, 2003). Number of appropriate answers to question and asking question develops as age increases (Salamo et al., 2012). Children around three to four years uses variety of "wh" question and the development of "why" question is acquired only between the age of five to six years (Nicolosi, 2004).

Similarly significant difference between Group IV and Group II were obtained in the following categories, category 1 (colours), category 2 (vegetables), category 3 (fruits), category 4 (animals), category 5 (birds), category 6 (body parts), category 7 (vehicles), category 8 (food items), category 9 (small household things and toys), category 10 (house appliances), category 11 (outside things and rooms), category 13 (people), category 14 (action words), category 15 (words denoted time), category 16 (adjectives) and category 17 (pronouns). This finding was supported by Gentner, (1982); Bornstein et al., (2004) reported that nouns are acquired early compare to that of verbs. It is also suggested that the noun dominance is observed in early lexical acquisition than verbs (Borodiskey, 2001). Bates (2000) concluded that there is noun bias observed with respect to productive lexicon such as animals, game routine and place. The receptive lexicon of the categories is observed as early as 16 months; however, expression was reported to be delayed. It is also suggested that, grammatical function words such as prepositions, pronouns, question words and quantifiers are very rare in early lexicon, however it starts to develop around two to three years (Bates et al., 1994; Caselli et al., 1995).

Nelson and Fivush (2004) found that children by the age of three years can distinguish between past and future events, however spatial time concepts develop between six to eight years. With respect to questions, Nicolosi (2004) found that the children around three to four years uses variety of "wh" question and the development of "why" question is acquired only between the age of five to six years.

Significant differences were not obtained between Group IV and Group III. In contrast to the current findings, Nelson and Fivush (2004) reported that, by three years of age children can distinguish between past and future events, however spatial time concepts develop adult pattern between five to eight years of age.

4. Discussion and conclusion

Lexicon is the total set of word and word elements that carry meaning. The lexicon is the bridge between language and knowledge (Sowa, 2005). Lexeme is a set of related word forms. The study of meaning of words within language is referred to as lexical semantics. The lexicon contains set of link between signs and codes of semantic attributes (Osgood, 1980). In terms of speech production, a lexicon represents a list of conceptual condition to convey relevant message.

Vocabulary/Lexicon is considered as a critical element to acquire language. It is essential for communication, reading, writing and to form grammatically appropriate sentences (Nation, 2011). The need for developing vocabulary checklist is to avoid cultural bias, to estimate the child's current linguistic ability, its correlation with other concurrent measures of language development and to predict the cognitive ability. It is also important to assess the child's ability to develop literacy skills. Thus, the aim of the present study is to adapt and validate lexical inventory in preschool and primary school Tamil speaking children. The study included development and validation of the lexical inventory checklist, and administration of the checklist on 60 preschool and primary school Tamil speaking children.

The mean and standard deviation was calculated for all the categories between the Groups. The Statistical Package for Social Science (SPSS) version 21 was used for statistical analysis, all the variables were subjected to nonparametric test to estimate the significant difference between the Groups. From the study it can be concluded that there is a statistically significant difference ($p<0.05$) between the age Groups on all categories. Pair wise Comparison was estimated with the help of Dunn's pair wise tests which revealed,

i) Group I when compared with other age Groups, significant difference obtained between Group I and Group III; Group I and Group IV in all 20 categories, however significant differences between Group I and Group IV was observed only for category 15.

ii) Group II when compared with other age Groups significant difference were obtained between Group II and Group III in all categories except category 5, category 8, category 12, category 15, category 16, category 17, category 18, category 19 and category 20, similarly significant difference between Group II and Group IV were obtained in all the categories except category 12, category 18, category 19 and category 20.

iii) Group III when compared with Group IV significant difference were not observed in any of the category.

From the current study, it is inferred that vocabulary knowledge increases as age increases. It is also essential to track the developmental trend with the help of vocabulary checklist. Hence vocabulary checklist can be administered to track the development and academic skills.indings should be discussed here with reference to the findings in the related literature.

Limitation of the study

Gender effects could not be studied as the participants in the Group were not equal in the number. The developmental trend of word in each category were not analyzed. Varied grammatical categories were not included.

Future direction

To administer the vocabulary checklist on a large scale to estimate the sensitivity of the developed material. It can also be administered on a variety of clinical population. Gender effects can also be studied to estimate the difference on the age of acquisition between male and female.

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