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The Early Word Forms and Their Emergence in Typically Developing Malayalam Speaking Children in the Age Range of 12-36 Months

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Abstract

The vocabulary of a child is a storehouse of its knowledge. It can be either in the form of concepts or in the form of words, in which the child assumes to have a certain meaning. Although there are many studies on the child language acquisition, no studies have focused in the development of early word forms within the critical age group in Indian languages. Thus, the main aim of this study is to provide a data regarding the emergence of protoword and truewords in typically developing Malayalam speaking children, within the age range of 12-36 months. A total of 80 participants were taken for the study. The participants were divided in to 4 equal groups, with 20 participants each in the groups (equally divided in to 10 girls and 10 boys). All the participants were audio recorded on the basis of their expressive vocabulary. Speech like utterances was obtained from various free-play sessions. Based on the data analysis and transcription using IPA (International Phonetic Alphabet) utterances were then categorized in to protowords and truewords. SPSS software (version 18.0) was used to carry out the statistical analysis of the study. The study provides significant information in the child language development and this would be helpful to identify children with communication disorders in the early years of toddlers.

Keywords: Early words, Truewords, Protowords, Malayalam, child language development.

1. Introduction

The vocabulary of a child is a storehouse of its knowledge. The rate of vocabulary growth increases as the children get older. It can be either in the form of Concepts or in the form of words, in which the child assumes to have a certain meaning. The development of infant's language repertoire can be segregated into progressive stages. This process of child language acquisition is gradual and developmental. The child continually works out how to use the

linguistic system by actively using it for communication (Sinha, 2018). The initial communications of neonates are mostly reflexive cries, facial expressions and body movements. Then cooing stage comes where basic varieties of speech sounds are produced. Most of the productions during this period are unintentional. Slowly the child attains the speech sounds of the native language by the continuous enactment and reciprocation to reinforcement.

A protoword is a preliminary step that a child makes, to communicate to their parents for fulfilling his/her needs and desires which has words with no referential linguistic meaning. It acts as a bridge in between the pre-linguistic and linguistic communication between the ages of 12 – 15- months, where 1 to 2 syllabic words are uttered by the child which is fully a non-word but makes a meaning to the child. It is an important phase in development of child's language as it helps the child to attain more and more vocabulary. Like words protowords are relatively stable forms that can be used to serve specific communication intentions (Barrett, 1985); unlike babbling. It comprises of one or a few articulatory gestures, such as tongue closing the airway and the tongue often approaching to certain oral structures consistently (Menn, 1983).

More extensively a study done by Laakso (2010); stated that the children's pointing and proto-word expressions, and the working out of their reference, are embedded within larger sequential structures, where the children make their initiations also to restructure on-going sequences and to alter the course of the projected parental actions.

By one year of age, children start developing association between the words spoken and its meaning. This is the stage when the true first words are produced. A first word is usually defined as an entity of relatively stable form that is produced consistently by the child in a particular context and is recognizably related to the adult like word form of a particular language (Owens, 1996).

In the second half of the second year of life, by around 30 months the typically developing children go through the vocabulary spurt stage, where there is a sudden increase in vocabulary and becomes more than it was before (Dandurand & Shultz, 2011; Nazzi & Bertoncini, 2003). This correlates with the true word production stage, which pursues the proto-word phase of child vocabulary development. At this stage there is no babbling at all; utterances have communicative intent and the child seems to understand everything said within hearing and directed to them.

One of the important stages of child language acquisition, the protoword stage has been recognized and divided into three categories by Conklin (2010). Firstly, the phonetically consistent form has a standard sound pattern, but is not referentially stable, nor based on adult

language. Secondly, the pre-word is phonetically consistent and referentially stable, yet not based on adult language. It is accurate in its categorization, according to adult model, yet the child has found an individual way of communicating meaning. Lastly, the sensorimotor morpheme is phonetically and referentially stable, and it is based on adult language, but cannot be communicated without the use of a supporting gesture and is sometimes part of routine.

The transition of protowords to true words in a single subject was studied by Carter (1979). The subject's productions were termed as "sensori-motormorphemes". She reported between the age range of 1 year 1 month, and 1 year 2 months, the subject produced vocalizations that differed from babbling, it also had some phonetic consistency and were frequently accompanied by a gesture.

A study which examined protoword and true word productions was in a Kurdish speaking child of 9-36 months by Yousofi and Ashtarian (2015). The results indicated that most of the protowords were produced during the first half of the child's second year but continued articulating protowords up to 29 months alongside using true words which were more frequent at this age.

In the Indian Context

A study in native Kannada speaking children from the age range of 12 to 18 months was carried out by Shishira (2013). In the study, the holophrastic words were found to be present in all the participants with a mean percentage of frequency of occurrence of 25.8%. Protowords existed in abundance, with the mean percentage of frequency of 41.6%. True word productions exhibited a reverse trend as that of holophrastic and protowords productions. The participants exhibited a mean percentage of 32.6% frequency of occurrence for true words and later showed a gradual increase of truewords in the participants nearing 16-18 months

In addition to this another study was conducted by Bharadwaj, Shridar, & Sreedevi (2015) on the emergence of True words, Protowords and Holophrastic words in typically developing Kannada speaking children in the age range of 12-24 months. They reported that the true word production showed the opposite trend of that of the holophrastic and protowords, with their frequency being greater in the older age group compared to the younger age.

Reeny and Sreedevi (2015) have done a study on the emergence of early word forms in Malayalam and Hindi speaking children in the age range of 10-12 months. They observed a greater frequency of protoword productions as well as true word productions in Hindi as compared to Malayalam language. Protowords were found to exhibit a higher mean percentage as compared to that of true words in both the languages justifying the transition period from

babbling to the first fifty word stage. The study suggests the presence of variety of utterances as early as 4 months, though un-meaningful but leading to a meaningful production to their first words in their native languages which is also an indicative of an emergence in the complexity of syllabic patterns.

A study focused on the appearances of words in 8-12-month-old infants of native Hindi-speaking families were conducted by Reeny and Sreedevi (2019). The participants in the study included 20 infants, 10 in each of 2 age groups from native Hindi speaking families. The results of the study revealed no significant difference across age for proto words for Group III (8 to 10 months) and Group IV (10 to 12-months) in Hindi. Group III, i.e.; 8 to 10 -months was lower in production of proto words (eight words) compared to the 10 to 12-month age group, having produced 50 proto words. Thus, in this study the hypothesis that there is no significant difference in the phonetic behavior of protowords and true words across age in Hindi was accepted.

There are many studies on child language acquisition and their acquisition of words in different age groups and in various languages; most of the studies available are not on the Indian context or languages. Very little has been written and known about the children's early word forms and how its serves as a step in sequencing the conversation in Malayalam. Hence the emergence of the early word forms in the critical age group of 1 to 3 years was investigated in Malayalam language as a preliminary attempt to provide norms for the early word forms and their emergence as the dearth of research in this area demands so.

2. Methodology

2.1 Participants

A total of 80 participants were taken for the study. The participants were divided in to four equal groups with 10 participants in each group (with 10 boys and 10 girls). Group I comprised of children in the age range of <12- >18 -months. Group II comprised of <18->24-month old children. The two older age groups, Group III and IV consisted of children in the age range of <24->30 -months and <30->36 -month- old children respectively.

The parents were informed about the study and a written consent was obtained, before the participants are recruited for the study (AIISH ethical guidelines for Bio- Behavioral Research, 2009). The participants were obtained from the Pathanamthitta district of Kerala and the subjects were randomly selected from the Hospitals, neighboring home and from pediatric clinics. Each child was assessed for their receptive language skills, expressive language skills, auditory, motor and cognitive skills using Developmental Screening Checklist (Swapna, Jayaram, Prema and Geetha, 2010). The children with any history of speech, language, cognition and hearing problems were excluded from the study and were recommended for further evaluation. All the

children participating in this study had Malayalam as their primary language of communication. The children exposed to any other languages were excluded from the study. An obligatory factor in this study was that, all the parents were educated a minimum of 7th grade for the inclusion of participants and were predominantly monolingual. The Socio-Economic status of the parents/caregiver and the family members were accounted using the Kuppuswamy Socio-Economic scale (2018) and the children under middle class socio-economic status were included for the study. The children included in the study should have qualitative and quantitative parent child interaction and were assessed informally by parental interview and observations. The proficiency of native language among parents was assessed using Language Proficiency Questionnaire: An adaptation of LEAP-Q in Indian context by Ramya Maitreyee and Goswami (2009).

2.2. Data Collection and Processing

All the participants were audio recorded on the basis of their expressive vocabulary in a relatively quiet room in their respective homes, using a digital audio recorder (Sony M55) of high quality and were analyzed using the VLC media player software by transferring the collected recordings to the computer. The natural way of interaction between the parent/caregiver and child were recorded. A minimum of 40 to 50 speech like utterances were secured from various free play sessions, of the parent/caregiver-child interaction by providing the child with suitable toys of their respective ages.

2.3. Analysis of Data

The reviewed audio recordings and the child's speech utterances are transcribed in IPA (International Phonetic Alphabet, 2015) using narrow & broad transcription. Only the verbal utterances produced by the child were transcribed. All other sounds like grunts, whisper, crying, cooing, gurgles, laughs etc. are excluded while transcribing. These utterances will be then categorized in to protowords and true words accordingly based on McCune and Vihman's procedure (1994), which comprises of the observations and the guidance provided by the parents. The sum of frequency of occurrences of each word types (Protowords and true words) are divided by the total number of words produced by the child, multiplied by 100 to calculate the percentage of occurrences (Velleman,1998).

$$\text{Number of Protowords/ True words} = \frac{\text{PW/ TW}}{\text{Total no: of PW/TW}} \times 100$$

Results and Discussion

Although there are many studies on the child language acquisition, no studies have focused in the development of early word forms within the critical age group in Indian

languages. Thus, the main aim of this study is to provide a data regarding the emergence of protoword and truewords in typically developing Malayalam speaking children, within the age range of 12-36 months.

The main objectives of the study were:

1. To investigate the emergence of protowords and true words in across four age groups of Group I **(>**1.0≤1.5 years), Group II (>1.6≤2.0 years), Group III (>2.1≤2.5 years) and Group IV (>2.6≤3.0 years) in Malayalam language.
2. To investigate protoword and true word occurrences across the gender.

A descriptive statistical analysis of Mean frequency of protoword and trueword productions and Standard Deviation (S.D) were calculated for each of the early words for all the age groups and across genders. SPSS 18.0 software (Statistical Package for Social Sciences, Version 18.0) was utilized to carry out the statistical analysis of the study.

1. To investigate the emergence of protowords and truewords in across four age groups of Group I (>1.0≤1.5 years), Group II (>1.6≤2.0 years), Group III (>2.1≤2.5 years) and Group IV (>2.6≤3.0 years) in Malayalam language.

The mean and standard deviation for early word forms such as protowords and true words for each age group, (Group I, Group II, Group III and Group IV) are presented in the Table 1.

Table1
Descriptive statistics (Mean and Standard deviation) of early words across the age groups.

Early word forms	**Age range (in years)**							
	Group I (>1.0≤1.5)		**Group II (>1.6≤2.0)**		**Group III (>2.1≤2.5)**		**Group IV (>2.6≤3.0)**	
N=80	**PW**	**TW**	**PW**	**TW**	**PW**	**TW**	**PW**	**TW**
Mean SD	56.85 (24.81)	15.40 (13.64)	76.45 (54.19)	53.50 (31.04)	66.35 (25.01)	129.70 (37.43)	31.85 (15.19)	156.85 (52.07)

Note: N-Total number of population, PW-Protoword, TW- Trueword, S.D- Standard deviation.

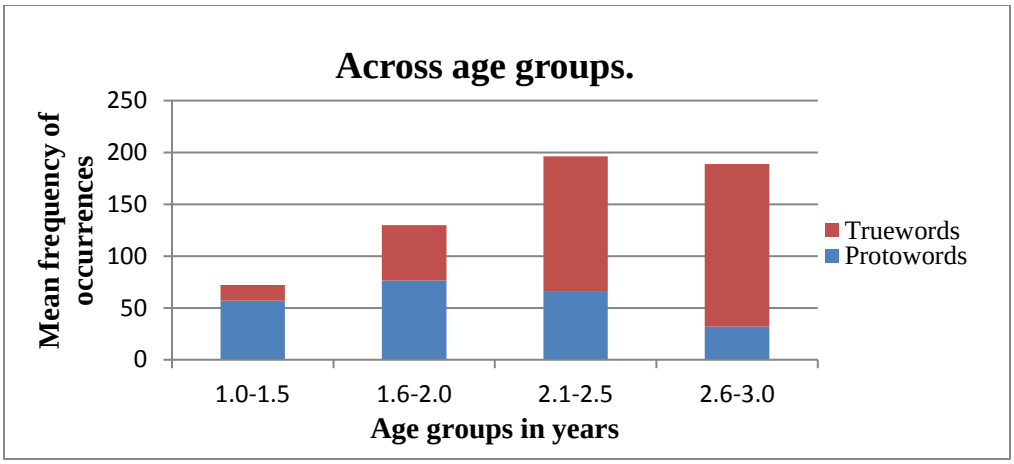

Figure1: The mean frequency of occurrence of true words and protowords

Table 1 contains the descriptive statistics of early word forms in each age group, Group I **(**>1.0≤1.5 years), Group II (>1.6≤2.0 years), Group III (>2.1≤2.5 years) and Group IV (>2.6≤3.0 years). As seen in the Table 1 and Fig.1, the protoword productions in the two younger age groups, Group I (Mean=56.85) (SD=24.818) and Group II (Mean=76.45) (SD=54.19) were higher compared to trueword productions (Mean=15.40) (SD=13.64) and (Mean=53.50) (SD=31.04) of Group I and Group II respectively. The two older age groups, Group III (Mean=66.35) (SD=25.010) and Group IV (Mean=31.85) (SD=15.194) the protoword productions decreased compared to trueword productions of Group III (Mean=129.70) (SD=37.43) and Group IV (Mean=156.85) (SD=52.07) indicating a decrement of protowords with increase in age. Hence the study is in line with the other Dravidian studies of Reeny and Sreedevi (2015) [Hindi and Malayalam]; Shishira (2013) [Kannada]; Irfana (2012) [Malayalam]; Bharadwaj, Shridar and Sreedevi, (2015) [Kannada]; Yousofi and Ashtarian (2015) [Kurdish], which represented a decrement in the protoword productions with age advancement. This finding thus stated that the frequencies of protoword productions can be seen prevalently in the younger age group than in older age group.

As per the Table 1 and Fig.1, the trueword productions in the Group I, Group II, Group III and Group IV have revealed a significant increase in their mean values, indicated a linear progression with age increasing. The study done by Kauschke and Hofmeister (2002); Irfana (2012); Reeny and Sreedevi (2015, 2019); Yousofi and Ashtarian (2015); Bharadwaj, Shridar and Sreedevi (2015) also reported similar results, that the trueword occurrences is higher comparatively to protowords, in older age.

Although both protowords and truewords emerged at 1 year of age it was evident that there was a transition of protowords to truewords with the progression in age as observed in the Table 1 and Fig. 1, indicating a vocabulary spurt stage directing to abrupt progression of

trueword vocabulary after the age of 2 years (Nazzi & Bertoncini, 2003; Dandurand & Shultz, 2011; Karousou & Ornat, 2013). In agreement to these findings, Kauschke and Hofmeister (2002) study reported an exponential increase in vocabulary production in the second year, followed by a further expansion. Most of the true word occurrences produced initially contained nouns and relational words (Goldfield & Reznick, 1990) and then slowly these occurrences were seen balanced with more nouns, verbs, functional words and other words by the year of three.

The present results of the study showed congruence with the literature of Gammon and Cooper (1984); Zinober and Martlew (1985) where they observed a gradual progression in vocabulary from babbling to protowords to single syllabic utterances and then to multisyllabic utterances with the increase in age. Another finding of the present study was that when age increases there was a high production of multisyllabic patterns that reflected the ambient language of the adult productions (Anjana & Sreedevi, 2008; De Boysson –Bardies et.al 1989).

2. To investigate protoword and true word occurrences across the gender

Table 2
Descriptive statistics (Mean and Standard deviation) of early words across the gender.

Early word forms		**Age range (in years)**							
		Group I (>1.0≤1.5)		**Group II (>1.6≤2.0)**		**Group III (>2.1≤2.5)**		**Group IV (>2.6≤3.0)**	
N=80		**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
PW	**Mean SD**	63.10 (31.66)	50.60 (14.62)	83.00 (68.55)	69.90 (37.48)	69.30 (33.24)	63.40 (14.01)	25.20 (7.30)	38.50 (18.32)
TW	**Mean SD**	21.30 (17.07)	9.50 (4.93)	68.70 (26.52)	38.30 (28.58)	111.60 (42.75)	147.80 (20.03)	118.30 (18.41)	195.40 (45.64)

Note: N= Total number of participants, PW= protowords, TW= truewords, SD= Standard Deviation.

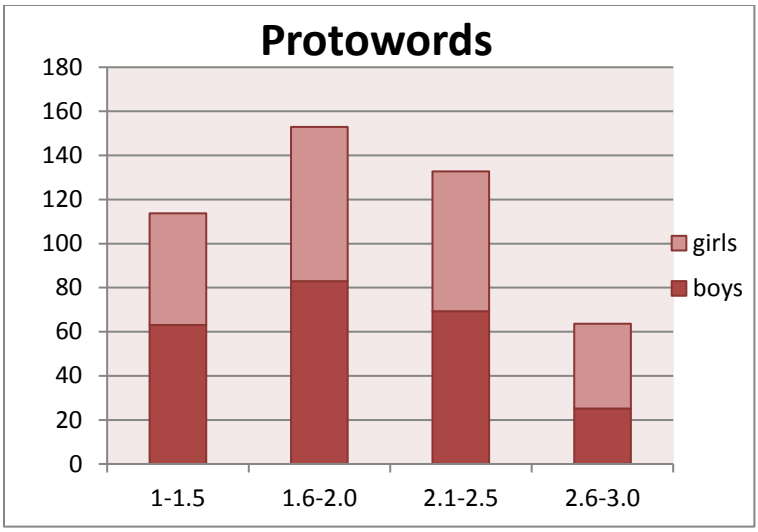

Figure 2 The protoword occurrences in boys and girls.

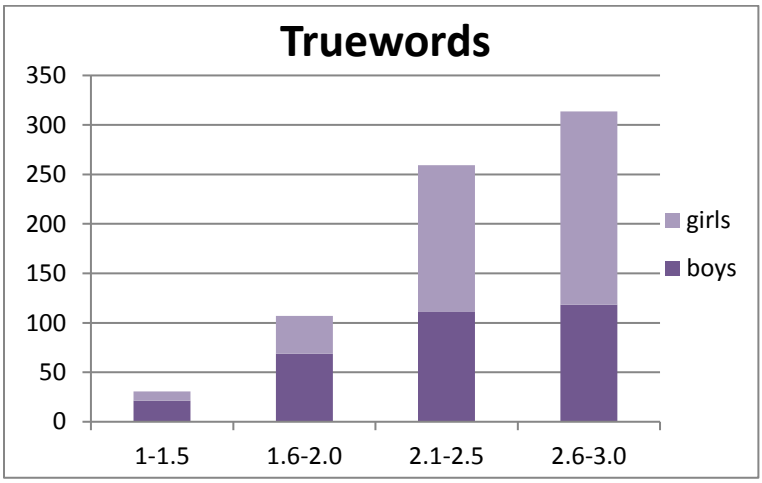

Figure 3 Trueword occurrences in boys and girls.

Comparison of Protowords and Trueword Production across Gender

The mean and standard deviation for the occurrences of protowords and true words for each age group, (Group I, Group II, Group III and Group IV) across the gender are presented in the Table 2, Fig.2 and Fig.3. In Group I, the boys showed higher mean values (Mean= 63.10; SD=31.617) for protowords compared to girls' (Mean=50.60; SD=14.623) which represented in Fig.2 and Table 2. In Fig.3 and Table 2, boys showed higher mean values, (Mean=21.30; SD=17.075) for true word productions compared to girls, (Mean= 9.50; SD=4.927). Likewise, in Group II, the mean values of protoword for boys showed higher mean values, (Mean=83.00; SD=68.555) compared to girls, (Mean=69.90; SD=37.489) similarly, true word productions were higher in boys (Mean=68.70; SD=26.521) compared to girls, (Mean=38.30; SD=28.589) as seen in Table 2, Fig.2 and Fig.3.

The older age Group III, the mean values across the gender for boys (Mean=69.30; SD=33.240) and girls (Mean=63.40; SD=14.010) showed a slight significance in their protoword occurrences as observed in Table 2 and Fig.2. Although, there was a high production of true word for girls; (Mean=147.80; SD=20.032) than boys (Mean=111.60; SD=42.753) which could be seen in Table 2 and Fig.3. Lastly, in the oldest age Group IV, contrary to the protoword productions in the younger groups, the Group IV have shown a significant increase in protowords (Mean=38.50; SD=18.326) and true words, (Mean=195.40; SD=45.644) in girls compared to boys protoword productions, (Mean=25.20; SD=7.300) and true words, (Mean=118.30; SD=18.409) respectively. This indicates that girls acquire language vocabulary faster than boys. The results of the present study are in agreement with one of the cross-linguistic and cross-cultural studies on early language acquisition in relation to gender differences which reported that girls aged 1.08 had larger vocabularies than boys of the same age across languages as well as in urban and rural settings. The study was conducted in three countries comparing children from the United States, Argentina, and Italy (Bornstein & Cote, 2005). Another reason could be of parental expectations about the gender roles, the social environment and cultural differences contributing to the difference in language ability of gender (Wallentin, 2008). The girls acquire language vocabulary faster than boys; can be due to less parental interaction with their sons compared to daughters (Gleason, 1987; Leaper, Anderson & Sanders, 1998). Apart from the above mentioned factors there are few other criterions drawn from the current study and they are; socioeconomic, contextual and language exposure.

Overall findings from Table 2 and Fig. 3 suggested that, when compared to boys, girls have shown higher true word productions in the older age groups. This could be because of increased language exposure and input from parent/caretaker-child interaction for girls when compared to boys (Leaper, 2002). The current study consisted of participants those belongs from middle-class society who also had good educational background, which aligns with earlier literature findings on parents talkativeness during infancy and toddler years(Leaper et al., 1998) where intensive stimulation also found to be the most significant factor in language acquisition (Rowe, 2012). Thereby, it is concluded that during the developmental period one should always keep in mind the influential factor which contribute to the acquisition of language at different age. Although most of the research concerning the middle-class families (Leaper et al., 1998), yet the question of a differential treatment of girls and boys across socioeconomic groups remains same, especially in the Indian context.

Conclusion and Summary

The critical age period plays a very vital role in the development of language acquisition. Thus, this study investigated the emergence of protoword and true word occurrences in the typically developing Malayalam speaking children in the age range of 1 year to 3 years. As there

are very few studies been investigated in this topic, this was the preliminary attempt to do the study in critical age group of 1 to 3 years in Malayalam language. The emergence of protowords and truewords were audio recorded within a time span of 30 minutes to 1 hour. Each utterances of the child were transcribed in IPA and these utterances were then calculated statistically to look for the significance of protowords and truewords across all four age groups (Group I, Group II, Group III & Group IV) and gender (boys & girls).

The results based on the statistical analysis using SPSS software (Version 18.0), revealed across the age groups protowords showed a significant declination with age advancement and truewords manifested a linear pattern of progression with increase in age. Protoword occurrences in the present study emerged from 12 months and the complexity decreased until 36 months which then lead to more truewords multi syllabic utterance.

The study also revealed that the protoword production for boys had a higher mean value in the younger two age groups than the females and vice versa for noticed for trueword productions. Thus, indicating females have faster language development and better vocabulary compared to that of males as age increases (Gleason, 1987; Leaper, Anderson & Sanders, 1998)

Another observed finding was that when age increases there was a high production of multisyllabic patterns that reflected the ambient language of the adult productions (Anjana & Sreedevi, 2008; De Boysson –Bardies, Halle, Sagart & Durand, 1989)

The findings of the study will provide information regarding the development of expressive vocabulary in typical developing children between the age ranges of 1-3 years, wherein it helps creating awareness among the parents regarding the child's language development. The obtained hierarchy of emergence of early words in the age ranges of 1-3 years can be used for screening and assessing the children who are at a risk of communication delays and can also help in identification of children with communication disorders.

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Appendices

Appendix A: Protoword and Trueword productions across age.

Age	PROTOWORDS	TRUEWORDS
>1.0≤1.5 years	/ʈaː/,/mæ/,/mmaː/,/baU/,/Λm/, /ʈoɳ/,/ʈaː/,/mː/,/eʱ/,/Λmæ/,/ʈˢ/,/bɔ/,/Ikˢ/,/ubba/,/ΛkΛ/,/ ΛbbΛ /, /bo/,/miːkI/,/Λʈaː/,/kaːkˢ/, /Λmmama/,/tʃeːtʃa/ ,/aʈˢ/,/bΛbu/,/bupa/,/eːʈa/,/aʱ/,/al/,/Λjˢ/,/ Λmmeːɲa/,//veːnda/,/evaːje/,/aː ʈˢ/, /Λj/, /aːja/,/kaːj/,/katʃI/,/n ʈˢ/,/aːɖˢ/,/kaːla/,/aːjˢ/,/eːtʃI /,/aʈaː ʈa/,/paːpa/,/iːpuje:/,/beː/,/beːbeː/,/kadikˢ/,/dzoːleːli/,/duːdi/,/aːjakaːke/,/ ɖeːɖo //paːpam/,/kaitʃapo/,/veːnam/,/i ʈI/,/udup/,/ʈaː/,/ba/,/ma/,/aː/, /bao/,/bo/,/papu/,/ʈˢ/,/ikˢ/,/ubbˢ/,/ΛkΛ/,/ΛpΛ/,/ Λʈˢ/,/bˢ/,/tatata/,/dada/,/da/, //ʈaʈa/,//illapi/,/annu/,/bæbI/,/baː/,/daːʈ/,/ΛɾIpΛ/,/ΛʈΛ/,/beːvΛ/,/mΛlΛ/,/baɲɲu/,/oː/,/ meːmI/, /uː/,/miːkI/,/ΛtʃΛtʃˢ/,/aːtˢ/,/aːvˢ/,/kaːkˢ/,/Λʱ /,/ʈaːjˢ/,/Λʈaːjˢ/,/eθΛ/,/veːkˢ/,/ajaːja/,/akˢkˢ/, /kɛk/,/ʈaːjΛ/,/Λmmej/,/Λʈaːʈˢ/,/Λjˢ/,/Λŋoːt/ ,/Λmmeːɲʌ/,/IʧΛ/, /aloː/, /umbaːji/	/ΛmmΛ/- mom , /peːɾˢ/- name, /Inte/- mine, /giːʈa/- Geetha, /ΛʧaΛ/- father, /eːta/- brother, /Λmmeː/- mom, /ummi/- mom /kaːka/- crow, /ɖe/- here,
>1.6≤2.0 years	/naːn/, /deʃjΛm/-anger,/paːpu/,/aʱ/, /po/,/ʈɛmbaːʈI/,/aːɳdˢ/,/Im/, /po/,/vaː/, /θiːʧΛr/,/bao/,/bo/,/papu/,/ʈˢ/,/ikˢ/,/ubbˢ/,/ΛkΛ/,/ΛpΛ/,/ Λʈˢ/,/bˢ/,/tatata/,/dada/,/da/, //ʈaʈa/,//illapi/,/annu/,/bæbI/,/baː/,/daːʈ/,/ΛɾIpΛ/,/ΛʈΛ/,/beːvΛ/,/mΛlΛ/,/baɲɲu/,/oː/,/ meːmI/, /uː/,/miːkI/,/ΛtʃΛtʃˢ/,/aːtˢ/,/aːvˢ/,/kaːkˢ/,/Λʱ /,/ʈaːjˢ/,/Λʈaːjˢ/,/eθΛ/,/veːkˢ/,/ajaːja/,/akˢkˢ/, /kɛk/,/ʈaːjΛ/,/Λmmej/,/Λʈaːʈˢ/,/Λjˢ/,/Λŋoːt/ ,/Λmmeːɲʌ/, /IʧIʧi/, /kuʧˢ/, /ʧeʧo/, /ʧUɳda/, /kajikaɳda/, /naːn/, /θaːθa/, /kəIjama/, /mInu/, /upuːpa/, /ʧuːθa/,	,/aːntI/-aunty,/paːʃ/-purse,/ʈaːkol/-key, /aːnΛkɔmbˢ/-elephant tusk, /dɔɳtΛtʃ/-don't touch,/ɛnnΛ/-what,/bɔbɔ dɔg/-dog,/beːbI/-baby,/deːvU beːbI/-devu baby,/kUɳdI/-ass,/Inna/-here,/aːlapuɻΛ/-alappuzha,/tɔmaːtɔ/-tomato, /kaaɳaɳam/- want to see, /muθΛʃI/- grandmother, /veːɳΛm/-want, /paːtˢ/- song, /muːkˢ/- nose, /kaːlˢ/- leg, /foːɳˢ/- phone, /kaːka/-crow,/aŋkIl/- uncle, /dʒoːlI/- job, /Λʈˢ/- that, /iʈˢ/- this.

	/pe:pe/, /o:ʧI/, /su:ʧɛ/, /Ijɛnθa/, /kajiʧa:lə/, /kΛnam/, /ʧu:ro:ɳdᵊ/, /pidijum/, /kΛruve/, /ma:te:θᵊ/, /i:mbaθᵊ/, /θam/, /IθΛk/, /u:θapapa/, /apappa/, /pa:mbapa/, /o:dI/, /ɛdᵊ/, /o:papa/, /e:θI/, /ʧIpap/, /Im/,/muɖ̯I/, /θIɳ̯Um/, /ka:sᵊka:ɾᵊ/,/u:la/, /be:nam/, /vaa/, /mijau/, /bobo/,/u:/, /abade/, /pIja:/, /na:n/, /apaθᵊ/./kaɳI/,/ajjo/, /abde/, /ijjo/, /de:ʃam/, /amma:ve/, /kumbili/, /lla/, /ɛnIʧᵊ/, /ba:bakum/, /ambili/, /ba:ja/,/muttugo:da/, /kaɳama:la/, /θIɳΛm/, /ɖ̯u:ɾi/, /ɖ̯e/.	
>2.0≤2.6 years	/fUt/,/baɳ̯U/,/ɛɳ̯Ita/,/kajikᵊ/,/kajikum/, /um/, /kajitʃU/, /kΛjΛlI/,/bɛʃΛkUɳ̯U/,/bɛʃΛɳ̯ᵊ/,/pojo:/abidɛ/,/pa:pΛm/,/vi:ti/,/ʧe:ja/,/a:/, /aʱ/, /e:/, /po:/, /va:/,/ho/,/jjo:/, /a:ti:va/	/a:jI/- done,/oɳ̯Um/- nothing, /kadalᵊ/- sea, /muŋI/- dipped,/po:jIllɛ/- went,/ma:ŋa/- mango,/nakʱΛm/-nail,/θɔlIjo/- skin?,/vIlIkɳdΛ/- don't call, /po:ɳΛm/-want to go, /vi:tIla/- at home, /koɳdUvΛɳ̯Ila/- didn't bring, /va:ŋIʧU/-bought, /a:na/-elephant,/ɛnne:m/-me also, /baIkila/-in bike, /me:dIka:n/-to buy,/Illa/-no, /apu:pa/-grandfather, /ku:de/-along, /ve:rɛ/-another, /vaɳ̯U/- came, /ɛvde/- where, /po:jo/- gone?, /kaɳdo:/-saw?, /ku:tuka:ɾΛn/- friend, /θΛθΛmme/- parrot, /a:ɳde/-there, /vi:ɻum/-will fall, /UllI/-onion, /θΛvΛɭa/-frog, /kΛdIkum/-will bite, /o:duɳ̯u/- running, /ve:gam/- fast, /po:va:m/- go, /ɛŋΛne/- how, /Λdikum/- I will beat, /ku:d/- nest, /ɛvIde/- where, /ku:tIlᵊ/- in the nest, /kuŋᵊ/-baby, /pattIʧo:/- cheat, /paʃu/- cow, /ka:dᵊ/- forest, /vaɳdI/- vehicle, /aʧa:/- father, /ɾaɳdᵊ/- two, /kaliʧu/-played, /puraθᵊ/- outside, /Illa/- no, /vaikItᵊ/- evening, /ke:rI/-

		entered, /ka:rIlᵊ/- in the car, /Λppo/- that time, /vi:ɳu/- fallen, /poti/- burst, /vɛʧu/-kept, /udupᵊ/- dress, /bægum/- bag and, /kaɭIpa:tam/- toys, /vΛɻIjilᵊ/- on the way, /θΛɾIlle/- will not give, /ka:ɾIjam/- matter, /kutI/- kid, /orakam/- sleep
>2.6≤3.0 years	/a:/, /aʱ/, /e:/, /po:/, /va:/,/ho/,/jjo:/, /ɛntubabja/,/ʧamma:pa/, /ʧuʧo:f/, /umma:ja/, /ʧo:vᵊ/, /enda/, /kokoko/, /bobo/	/pa:vΛ/-doll, /ammaji/-mothers sister,/ma:man/- uncle,/mΛɾIʧᵊ/- dead,/pa:mbᵊ/- snake,/pallᵊ/- teeth, /pΛʈᵊ/- ten, /oɳda:kI/- made, /θaɲ̊U/- gave, /kuθI/- poked,/ka:ttᵊ/- wind, /ku:tuka:ɾᵊ/- friends, /saIkIlᵊ/- cycle, /ma:la/- chain, /paɭɻi:lᵊ/-at church, /vi:dInte/-house's, /arIju:lla/- don't know, /aθɔɲ̊um/- that and all, /vaɾum/- will come, /IdalI/- idli, /na:je/- dog, /oɲ̊e:/- one, /daɳde:/- there, /pInne:/- then, /paθe/- ten, /kuɲunde/-baby there, /ʃɛɾI/- okay, /ɲ̊ΛmmΛkᵊ/- we, /ʧΛvItum/- kick, /vɛka:m/- will keep, /Λmme:de/- mom's, /vɛɭΛm/- water, /ɛdukkaɳΛm/- should take, /pInnIle:/- behind, /pΛnI/- fever, /ΛvΛn/- he, /a:mΛkᵊ/- for tortoise, /vΛɭΛɾe/- very, /kΛɖ̊a/- story, /pΛrΛja:m/- will say, /orΛŋΛɳda/- don't sleep, /ΛʧaːI/- father, /sa:mba:rum/- and sambar, /ʧo:ruɳŋΛɳam/- want to eat rice, /ɛduθIlla:/- didn't take, /ΛvΛɭᵊ/- she , /kΛɾΛjua/- crying, /mi:na:ʃIjum/- and meenakshi, /do:ʃΛ/- dosa, /ʧe:ʧI/- sister, /ʧe:ta/- brother, /oɳdo:/- is it there, /pi:lI/- feather, /pe:ɾᵊ/- name, /ɛnʈ̊ua/- what, /ɛntɛja:/- mine, /ɲ̊ΛllΛ/- good,

		/ʧo:rᵊ/- rice, /ke:tIllΛ/- didn't hear, /θΛɾΛθIlla/- will not give, /kɔda/- umberalla, /pu:ʃa/- cat, /va:pa/- father, /Uppa/- father, /ɛlla:ɾem/- everyone, /θaɳ̆u/- gave, /kΛllᵊ/- stone, /ta:ta/- bye, /nΛdΛkᵊ/- walk, /kuḷIkum/- will take bath, /vΛdI/- stick, /me:dIʧu/- bought, /ɛnIkᵊ/-for me, /a:ɾude:/- whose, /pa:lᵊ/- milk, /ΛmmΛʧI/- grandmom, /Λṯ̆Ina:θᵊ/- inside that, /ΛʧaːʧΛn/- grandfather, /Iɾi/- sit, /Ipo/- now, /ma:θrΛm/- only, /murIjum/- will cut, /o:dIʧu/- ride,/ti:ʧΛrᵊ/- teacher, /va:pΛʧI/- father, /oɾa:ḷᵊ/- one person, /a:ɳᵊ/- yes, /Iʃtam/- love, /ʧɛrIja/- small, /lo:rI/- lorry, /ʧIɾIjA/- smile, /θa:ra:vᵊ/- duck, /oɾIdaθoɾu/- at one place, /buka:ɳo/- is it book?, /kΛɳa:di/- mirror, Λmma/- mother,/ḍ̆e:/-here,/Inna/-take,/iṯ̆ᵊ/- this,/Λ ṯ̆ᵊ/-that, /a:dᵊ/-goat,/appa:tʃI/- father, / tʃe:tʃI /-sister,/a:na/- elephant,/vandija:/-vehicle, /kalikᵊ/-play,/va:va/-baby,/bægᵊ/- bag,/ka:ka/-crow,/pu:va:ɳe/-going,