

**MATERNAL LINGUISTIC MEASURES OF CHILDREN WITH REPAIRED CLEFT
LIP PALATE AND TYPICALLY DEVELOPING CHILDREN**

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ALL INDIA INSTITUTE OF SPEECH AND HEARING

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April, 2018

CERTIFICATE

This is to certify that this dissertation titled “**Maternal linguistic measures of children with repaired cleft lip palate and typically developing children**” is a bonafide work submitted in part fulfillment for degree of Master of Science (Speech-Language Pathology) of the student Registration Number: 16SLP025. This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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CERTIFICATE

This is to certify that this dissertation entitled “**Maternal linguistic measures of children with repaired cleft lip palate and typically developing children**” has been prepared under my supervision and guidance. It is also been certified that this dissertation has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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Declaration

This dissertation entitled “**Maternal linguistic measures of children with repaired cleft lip palate and typically developing children**” is the result of my own study under the guidance of Dr. Pushpavathi M, Professor in speech-language pathology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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CHAPTER-I

INTRODUCTION

Cleft lip and palate (CLP) is the most common congenital birth defects forming malformation of the face and oral cavity that happens during the first trimester of pregnancy (Kummer, 2008).)Worldwide, oral clefts in any form (i.e., cleft lip, cleft lip, and palate, or isolated cleft palate) occur in about one in every 700 live births (World Health Organization, 2001). International estimates that are limited to cleft lip with or without cleft palate range from 7.94 to 9.92 per 10,000 live births (Tanaka et al., 2012).

Cleft lip with or without cleft palate is the second most common birth defect in the United States, affecting one in every 940 births and resulting in 4,437 cases every year (Parker et al., 2010). Reported prevalence estimates range from 7.75 to 10.63 per 10,000 live births (Parker et al., 2010; Tanaka et al., 2012). The isolated cleft palate is less common, presenting in one in every 1574 births (Parker et al., 2010).

In India, The birth rate of the cleft palate was found to be is 1.09 for every 1000 live births. It is been found that the 65% males were affected in which 33% had cleft lip only, 64% had cleft lip and palate, 2% had a cleft palate, 1% had rare craniofacial clefts and 79% had a unilateral cleft lip which 64% were left sided (Srinivas et al, 2010).

Various researchers (Bzoch,1956; Spriesterbach et al.,1958; Moris.,1962; Jocelyt et al.,1996; Broen et al.,1998) have highlighted on the speech and language skills of children with the RCLP and they found it as delayed or deviant and their speech and language is characterized by limited phonetic inventories, poor speech accuracy, presence of compensatory articulation, abnormality in resonance, delay in both comprehension,

delay in the first word acquisition, reduced vocabulary development, and shorter mean length of utterance.

Majority of the studies focuses on the speech development of the children with RCLP. But very few studies are done to investigate the language development of these children. Chapman, Graham, Gouch, and Visconti (2003) studied the conversational skills of preschool and school-age children and compared between the children with cleft lip and palate and non-cleft. They measured conversational skills by administering few tests such as Goldman-Fristoe Test of Articulation (Goldman and Fristoe, 1986), the receptive and expressive subtests and the cognitive screening of the Battelle Developmental Inventories (Newborg et al., 1984), and the Test of Pragmatic Skills (Shulman, 1985). In Addition to that, the spontaneous play was recorded using age-appropriate toys. They found that the preschool children with cleft lip and palate were producing fewer assertive utterances and more topic-maintaining utterances. The individual child comparison revealed less assertive profiles of conversational participation for 50% of the preschool and 20% of the school-age children with cleft lip and palate and these individual differences are seen because these children exhibit a pragmatic deficit and therefore experiences difficulty in learning and/or using rules of conversational interaction.

Chapman et al., (2006) extended the previous study and examined the conversational skills of children with cleft lip and palate. They took thirty-four children in the age range of 33 to 44 months i.e., 17 children with cleft lip and palate and 17 noncleft children and they found that the children with CLP produced fewer assertive utterances and topic extending utterances but more topic maintaining utterances. Whereas a recent

study done by Deepa and Pushpavathi (2014) reveals that the expressive language in the preschool children with repaired cleft lip and palate is impaired with respect to the adequate amount of vocabulary, a number of words and MLU and also the expressive skills are affected both in structure and complexity.

Few authors (Logemann,1990&Broen et al., 1996) reported that the language deficits in children with cleft lip palate are might be because of frequent hospitalization, history of hearing loss secondary to otitis media and other issues such as anxiety about their facial scarring which can impair their language abilities.

In addition to that they might exhibit deficits in receptive language,pragmatic deficits, and experiences difficulty in learning and/or using the rules of conversational interaction (Chapman et al., 1998), they are less willing to communicate secondary to their articulatory problems (e.g., Morris, 1968; Faircloth and Faircloth, 1972; Scherer and D'Antonio, 1995)i.e., they might be having knowledge of the rules of conversational interaction, but might not find communication to be easy or satisfying (See Fey,1986). They may be shy to interact with others or because of withdrawn personality style (Chapman et al., 1998).

Another possible reason for the delay could be the poor mother-child interaction where the primitive attempts of the children with CLP may be misinterpreted as jargon and will not be reinforced as well as shaped for meaningful language forms by the mother (Chapman et al., 2003, 2006).Wasserman et al. (1988)compared the interaction in the mothers of children with CLP and the mothers of noncleft children and found consistent different interaction patterns when comparing mothers and their children with speech-related anomalies with controls. In contrast, Chapman and Hardin (1991) did find more

similarities than differences between the two groups of mothers with respect to maternal language characteristics. Hence their results suggest that the differences in maternal behavior may be a response to the child's language delay.

Studies have been done to investigate the language output of the mothers while interacting with their children and the language development in children with CLP, as earlier discussed, the maternal input is one of the factors that play an important role in the development of speech and language skills.

Chapman et al., (1991) studied language input of mother's interaction with their young children with cleft lip and palate where they found the differences between the groups were in terms of only four maternal language variables. i.e., the mothers of children with CLP used more conversational devices and employed modeling and in addition to this these mothers used fewer total numbers of utterances and declarative than mothers of the noncleft children.

Murray et al., (2000) concluded that the early interaction difficulties between mothers and infants having late repair of cleft lip are associated with poor cognitive functioning at 18 months.

Scherer et al., (2008) found that the mothers of children without cleft lip palate used a greater number of total words, greater number different words, and higher MLU, suggesting that these mothers were using a greater complexity of language when addressing their children compared with the mothers of CLP group.

In an Indian context, Pushpavathi, Kavya, and Akshatha (2017) studied the maternal linguistic input by involving mothers in a parent-implemented early intervention program for toddlers with RCLP. The program involved 20 sessions of speech and

language therapy where the mothers were oriented and counseled for speech stimulation. The baseline was set up by measuring the parameters such as the total number of words, utterances, different words, mean length of utterance before the therapy and the post-therapy estimation was done after 20 sessions to analyze the linguistic output of the mothers. A total of six toddlers with RCLP in the age range of 2-3 years and their mothers served as participants for the program. The results revealed that the quantity of linguistic stimulation provided to toddlers by the mothers had vastly improved. They found that the frequency of utterance, words, and different words were increased between the baseline and the 20th session and MLU showed the reduction after 20th session. The increase in the frequency of utterance, words, and different words in the mother's speech showed a greater lexical diversity post-therapy and the decrease in MLU probably due to the tendency to use a simpler linguistic structure in order to elicit a better output from their children.

As mentioned above, only a few studies have attempted to study the maternal language input of mothers such as total utterances, total number of words, total number of different words, mean length of utterances and communicative functions including percentage of responsive labels, percentage of commands/requests, percentage of expansions with children with CLP and also to compare with the mothers of typically developing children. Since many studies (Wasserman,1988; Chapman,1997; Sheerer,2008 and Seunghee,2015) focuses on the linguistic input of the mothers of children below 3 years of age range and also there are very few Indian studies has been conducted that assess the linguistic input of the mothers of children with cleft lip palate the present study has been planned .

In that concern, it is essential that speech-language pathologist should have awareness about the language input in mothers of children with RCLP and to compare with mothers of typically developing. Hence the study is aimed to investigate the language input of the mothers of children with RCLP and to compare with mothers of typically developing children in the age range of 3-5 years in Kannada speaking population. The current study has a high clinical relevance as it provides the information on the linguistic input of mothers across the groups.

CHAPTER II

REVIEW OF LITERATURE

Cleft lip and palate (CLP) is the most common congenital birth defects forming malformation of the face and oral cavity that happens during pregnancy (Kummer, 2008). Worldwide, oral clefts in any form (i.e., cleft lip, cleft lip and palate, or isolated cleft palate) occur in about one in every 700 live births (World Health Organization, 2001). International estimates that are limited to cleft lip with or without cleft palate range from 7.94 to 9.92 per 10,000 live births (Tanaka et al., 2012). Cleft lip with or without cleft palate is the second most common birth defect in the United States, affecting one in every 940 births and resulting in 4,437 cases every year (Parker et al., 2010). Reported prevalence estimates range from 7.75 to 10.63 per 10,000 live births (Parker et al., 2010; Tanaka et al., 2012). Isolated cleft palate is less common, presenting in one in every 1574 births (Parker et al., 2010).

The occurrence rate of orofacial clefts varies by population. Overall, higher rates have been reported in Asians and American Indians (one in 500 births), and lower rates have been reported in African-derived populations (one in 2,500 births; Dixon et al., 2011). Isolated cleft palate is more frequently found in females than in males, at a ratio of 2:1. In contrast, there is a 2:1 male-to-female ratio for cleft lip with or without cleft palate (Mossey et al, 2009).

In India, The birth rate of the clefts was found to be is 1.09 for every 1000 live births. It is been found that the 65% males were affected in which 33% had cleft lip only,

64% had cleft lip and palate, 2% had a cleft palate, 1% had rare craniofacial clefts and 79% had a unilateral cleft lip which 64% were left sided (Srinivas et al, 2010).

The common problems faced by the children with Cleft Lip and Palate, includes difficulty in breathing or eating where the cleft palate usually makes breastfeeding difficult because the infant has difficulty in sucking properly also the palate prevents food and liquid from going up the nose when swallowing. They may also report frequent ear infections because the air and fluid cannot pass normally through the Eustachian tubes and it gets stored in the Eustachian tube and the germs gets trapped behind the eardrums and causes infection . In addition to that, the children with cleft lip palate may also exhibits dental problems, such as cavities and missing or malformed teeth.

Also, the children with cleft lip and palate may show delays in speech sound development , limited phonetic inventories, poor speech intelligibility with the lot of substitutions, omissions and distortion errors, presence of compensatory articulatory errors such as glottal stop, nasal snort and pharyngeal fricative for plosives, fricatives and affricates (Bzoch et al.,1965) and abnormality in resonances including hypernasality, hyponasality, mixed resonance, and cul-de-sac resonance (D'Antonio and Scherer, 2008).

Along with the speech difficulties, these children may also develop language problems such as delay in the both comprehensive and expressive language, reduced vocabulary, reduced lexical diversity, reduced mean length of utterance and smaller phonetic inventory (Philips& Harrison, 1969, Scherer, 1999).

Various studies have been conducted to study the language abilities of toddlers and the preschool going children with cleft lip and palate, Jocelyn et al., (1996)

conducted a longitudinal study, where they considered a group of 16 toddlers with cleft lip and palate (CLP) and a group of 16 typically developing toddlers in the age range of 12 and 24 months. The speech and language skills were measured using the Receptive-Expressive Emergent Language Scale, the Sequenced Inventory of Communication Development-Revised (SICD-R), the Preschool Language Scale-Revised (PLSR) and the mean length of utterance. They found that the children with cleft lip and palate had lower language comprehension scores on the SICD-R and PLS-R and lower expressive language scores on the Receptive-Expressive Emergent Language Scale, SICD-R, and PLS-R than the control group.

Priester and Brouwer (2008) studied the language development in toddlers with and without cleft lip palate, They considered 43 toddlers with cleft lip and/or palate and 32 toddlers without clefts in the age range of 2 to 2:6 years, Language comprehension was measured using Reynell Developmental Language Scales and spontaneous speech was analyzed was examined to assess the expression. They did find significant differences in the expression due to their articulatory problems but did not find any differences in comprehension.

Another study by Savitha et al., (2015) investigated to study the early language development in toddlers with unrepaired cleft lip and palate. They selected 5 children with CLP and 5 typically developing children, matched for age and gender. The mother-child interaction was audio-video taped to analyze their speech and language skills. The results revealed that the receptive and cognitive abilities of the children were age appropriate for both the groups but found a delay of 2-6 months in the expressive language among the children with cleft.

Few studies are also been done to study the language abilities in preschool children with cleft lip and palate, Chapman et al., (2003) studied the conversational skills of preschool and school-age children with cleft lip and palate and also compared the conversational skills between the children with cleft lip and palate and non-cleft. They considered 20 children with unilateral cleft lip and palate in that 10 Preschoolers and 10 school-age children were included and 20 non-cleft peers matched for gender, age, and socioeconomic status. They measured conversational skills by administering few tests such as Goldman-Fristoe Test of Articulation (Goldman and Fristoe, 1986), the receptive and expressive subtests and the cognitive screening of the Battelle Developmental Inventories (Newborg et al., 1984), and the Test of Pragmatic Skills (Shulman, 1985). In addition to that, the examiner engaged the child into a spontaneous play using age-appropriate toys (e.g., play house, toy hospital scene, kitchen set, transportation scene, etc.) and all these measures were audio- video recorded for the analysis and also separate comparisons were made for the preschool children with cleft lip and palate and their noncleft peers, and the school-age children with cleft lip and palate and their noncleft peers on eight measures of conversational Assertiveness/responsiveness and the standardized tests of pragmatics. The results revealed no statistically significant differences between the preschool and school-age children with cleft lip and palate and their noncleft peers in the level of conversational participation. However, there was a tendency for the preschool children with cleft lip and palate to produce fewer assertive utterances and more topic-maintaining utterances and this might be due to the deficits in receptive language.

Again Chapman et al., (2006) replicated and extended the previous study in order to examine the conversational skills of children with cleft lip and palate. They took thirty-four children in the age range of 33 to 44 months i.e., 17 children with cleft lip and palate and 17 noncleft children for their study. All these children were observed during an interaction with caregivers in their homes. A spontaneous language sample was elicited as the child and mother engaged in free play with age-appropriate toys for approximately for 20 minutes and all the samples of caregiver-child interactions were coded as assertive or responsive, for type of conversational act, and for discourse-level categories (e.g., initiate topic, maintain topic, extend topic) using Conversational Acts Profiling (CAP). In addition to that, the Sounds in Words subtest of the Goldman-Fristoe Test of Articulation (GFTA; Goldman and Fristoe, 1986) and the Preschool Language Scale-3 (Zimmerman et al., 1992) were administered. They found statistically significant differences between the cleft and noncleft children for a number of measures of conversational assertiveness and responsiveness i.e., the children with CLP produced fewer assertive utterances means they were less likely to respond adequately to comments by caregivers and fewer topic extending utterances but more topic maintaining utterances than did their noncleft peers during conversational interactions.

In Indian scenario, very limited studies have been done to study the language aspects in children with RCLP. Deepa and Pushpavathi (2014) aimed to study the language aspects in children with RCLP. They included 10; 5-6 years old children with RCLP. A conversation sample of free interaction with the researcher was audio recorded and then these samples were coded for the analysis. The utterances were rated qualitatively in terms of informativeness, interrogation, responsive labels, judgmental,

argument, hypothetical, intentional and composition. In order to quantify the utterances of the children in terms of total number of utterances, number of different words, type-token ratio, mean length of utterances, mean of five longest responses, percentage of commands/ requests, and percentage of responsive labels. Systematic Analysis of Language Transcripts (SALT) (Miller & Chapman, 2004) was used. The results showed that the conversation of children with RCLP lacked informativeness i.e., they found difficulty in providing adequate information to the conversation partner, Interrogative skills were absent in children with RCLP as they only involved in answering their turns rather than taking their turn for interrogation. The children with RCLP failed to use judgments as they did not pertain themselves in arguments and they would accept a particular conclusion in the conversation. With respect to repeatability children with RCLP were actively involved in repetitions but they produced partial utterances only, which resulted for reduced repetitive skills and that was rated as inadequate by the judges and the Heuristic skill was found to be reduced in children with RCLP. The Quantitative analysis of conversation samples revealed that the expressive language is impaired with respect to the adequate amount of vocabulary, a number of words and MLU and also expressive skills are affected both in structure and complexity.

Although many studies indicated language delay in children with cleft lip palate, the etiology of the language delay is not well understood. It has been suggested that these children are prone to middle ear effusion, which is often accompanied by mild to moderate hearing loss (Broen et al., 1996) and also the otitis media can cause central auditory deficits which would affect their receptive skills in turn hindering the expressive

skills, frequent hospitalization and anxiety issues among the children with RCLP about their facial scarring can affect their language development (Logemann, 1990).

In addition to that they might exhibit deficits in receptive language, pragmatic deficits and experience difficulty in learning and/or using the rules of conversational interaction (Chapman et al., 1998). They might be less willing to communicate secondary to their articulatory problems (e.g., Morris, 1968; Faircloth and Faircloth, 1972; Scherer and D'Antonio, 1995) i.e., they might be having knowledge of the rules of conversational interaction, but might not find communication to be easy or satisfying (See Fey, 1986), or maybe they are shy to interact with others or because of withdrawn personality style (Chapman et al., 1998).

Another possible reason for the delay could be the poor mother-child interaction where the primitive attempts of the children with CLP may be misinterpreted as jargon and will not be reinforced as well as shaped for meaningful language forms by the mother (Chapman et al., 2003, 2006).

Since poor mother-child interaction was considered as one of the possible cause of language delay, some studies have been done that focus on the mother-child interaction of children with cleft lip palate by comparing with their non cleft lip palate group. Wasserman et al., (1988) conducted a study to explore the relationship among maternal behavior, child language and the location of congenital anomaly in three groups of 24 month old children: Speech related anomalies group consisted of 21 children with either cleft palate, cleft lip, cleft lip and palate or nasal obstruction and the non speech related anomalies group included 13 children with various peripheral or facial anomalies

unrelated to the speech structures such as Goldenhar's syndrome, Vater syndrome, deformities of limbs/fingers, torticollis etc. And the control group consisted of 45 children. So all the children and their mothers were videotaped for a period of 10 minutes across various situations such as free play with mother, play with a stranger, and cleaning up the room under mother's supervision, 2 to 7 minutes of the video sample was coded using the Maternal Style Scale (Wasserman and Solomon,1980) and the following maternal related parameters considered were Attention management, Verbal teaching, Physical teaching, Control, Encouragement, Negatives, Initiating and Responsiveness. In results, they found that the mothers of both groups of handicapped children used significantly more attention management than did mothers of controls. In addition, mothers of speech related anomalies children showed significantly elevated scores for physical teaching and initiating, while Non-speech related anomalies mothers did not. And there was no significant difference found in verbal teaching, in control or in other maternal measures. This is because the mothers of children with speech-related anomalies are more likely to take charge of the flow of their free-play interactions with their children. That is, they are more initiating and make use of specific techniques that control the pacing and focus of the child's attention (Physical Teaching and Attention-Management). However, they do not increase their level of verbal teaching in an attempt to compensate for poorer child language performance.

Chapman et al., (1991) studied language input of mother's interaction with their young children with cleft lip and palate. The study consisted of 26 mother-child pair: 13 mother-cleft lip palate child dyad and 13 mothers-without cleft lip palate dyad. The subjects were 1, 2 and 3 years of age. In this study the mothers were instructed to engage

their children in the activities such as reading a story which consisted of reading the child two books provided by the examiners, Free play with the use of age-appropriate standard set of toys and teaching activity involves teaching the names of an unfamiliar objects to the child and all these activities were audio and video recorded. In order to analyze the sample, 5 minutes of the free play activity was considered which included the mother and the child utterances and observations concerning context. Each maternal utterance was coded for a number of language features includes: Utterance, turn, utterances/turn ration, Mean Length of utterance, sentence type (wh questions, yes/No questions, Declarative, Imperative, Single word utterances, Fragmented utterance and complete sentence), communicative functions (Requestive, Assertive, Directive, Responsive, Regulative) and discourse features (such as self repetitions, semantically contingent utterance, semantically non contingent utterance, conversational devices and modeling). The results showed more similarities than the differences between the two groups. The differences between the groups were apparent for only four maternal language variables. i.e., the mothers of CLP children used more conversational devices and employed modeling and in addition to this these mothers used fewer total numbers of utterances and declarative than mothers of the noncleft children. The conversational devices were employed more frequently to repair the conversational breakdowns due to the difficulties in production as a result of cleft and the modeling strategy was employed by parents to compensate for either expected or actual communication in competencies in these children.

Spletz (1997) compared mother-infant face-to-face interaction among 3-month-old infants with cleft lip and palate (CLP), infants with isolated cleft palate or non

impaired infant. They used Monadic Phase system (Tronick, Als, & Brazelton, 1980) to describe the patterns of laboratory face to face interaction in 116 mother-infant dyads. On group comparisons of percentages of monadic phases and infant-mother monadic phase, sequences revealed more similarities than differences. However, CLP group mothers appeared less involved in face to face interaction than mothers in the non CLP group. Low maternal involvement in the combined cleft groups was predicted by concurrent measures of infant characteristics including infant negative reactivity, whereas low maternal involvement in the comparison group was predicted by maternal characteristics including low psychological distress. There was little evidence to suggest that anomalous facial appearance is a significant factor influencing the quality of early mother-infant interaction.

Murray et al., (2000) studied the effect of cleft lip and palate, and the timing of lip repair on mother-infant interactions and infant development. They considered 94 infants with cleft lip (with and without cleft palate) and 96 non-affected control infants at 18 months; mother-infant interactions were assessed at 2, 6 and 12 months. The results reveal that infants with cleft did not differ from controls on measures of behavior problems or attachment, regardless of the timing of lip repair. However, infants having late lip repair performed worse on the Bayley Scales of Mental Development; the cognitive development of early repair infants was not impaired. Difficulties in early mother-infant interactions mediated the effects of late lip repair on infant cognitive outcome. So they concluded that the early interaction difficulties between mothers and infants having late repair of cleft lip are associated with poor cognitive functioning at 18

months. Interventions to facilitate mother-infant interactions prior to surgical lip repair should be explored.

There are some studies that focus on documenting the effectiveness of the parent-implemented speech therapy program, In that one of the objectives was to identify the maternal input. Scherer et al., (2008) conducted a study to explore the effectiveness of the parent-implemented therapy on the speech characteristics of the young children less than 3 years with cleft lip and palate. The study consisted of the 10 mother-child pair in which the child had cleft lip and palate and 10 mother-child pair in which they did not have a cleft palate. The children range from 14-36 months of the age and they were matched between the two groups based on their vocabulary size, age, and socioeconomic status. The results indicate that the mothers who participated in the study and who received the training used more number of words with their child, increased number of the different words and increased used of the expansions. Whereas the baseline assessment indicated that they used the higher percentage of commands/ requests and the lower percentage of responsive labels and expansions. When the data compared between the mothers of children in the CLP group and NCLP group shows that the mothers in the latter group were using a greater number of total words, greater number different words and higher MLU, suggesting that these mothers were using a greater complexity of language when addressing their children. On comparison of pre-therapy and the post, therapy measures show that the mothers of children in NCLP showed the decrease in the use of the responsive labels and increase in use of the percentage expansions, whereas the mothers of the children with CLP showed a greater use of responsive labels, expansions, and fewer commands/ requests.

Seunghye Ha (2015) investigated the effectiveness of a parent-implemented intervention on children's speech-language development and parent's interaction styles. He considered 17 children with cleft palate with their mothers as the experimental group and 9 children with Cleft palate and their mothers who did not receive training were considered as control group. The participated children's age range was 13- 29 months. The experimental group has participated in all sessions of a parent-implemented intervention program. Parent training consisted of a description of language-speech characteristics of children with CP, listening to audio samples of speech problems (i.e., Hypernasality and compensatory articulation errors) caused by CP and velopharyngeal dysfunction, and instruction of language stimulation skills and communication strategies. In particular, the researcher selected 11 communication strategies for the training, and parents could easily follow these strategies at home. The communication strategies included (1) face-to-face parent-child communication, (2) following a child's interests, (3) emphasizing the initial oral sound of words, (4) exaggerating lip movements, (5) speaking slowly, (6) repeating words, (7) using short and simple expressions, (8) waiting for the child's response, (9) listening to the child's speech, (10) responding to the child's speech immediately, and (11) providing immediate and appropriate verbal feedback that included modeling or expanding on the child's speech except for compensatory articulation. Using these communication strategies, mothers were taught to create episodes of joint attention and action to generate child-oriented responses and to optimize linguistic responsiveness. These strategies addressed the child's interests and delivered communicative attempts to stimulate language development. The program also considered the speech characteristics of children with CP (i.e., preferring posterior sounds)

and taught mothers to model oral anterior sounds by exaggerating lip movements. Mothers in the intervention group delivered a parent-implemented intervention program in their homes after the parent training over a 3-month period and the children's language and speech measures and maternal measures from pre- and post-intervention tests were compared between groups (intervention vs. no intervention). The results revealed that the mothers in the experimental group used few numbers of different words and the lower percentage of responding, whereas the mothers in control group used more number of different words at pre-therapy assessment. At post-therapy assessment the mothers in the experimental group had greater MLU, few different words, the high percentage of responding and the high percentage of corrective feedback compared to the mothers with the control group. The results of the study support the effectiveness of the parent-implemented early intervention on positive changes in children's speech-language development and mothers' use of communication strategies.

Pushpavathi, Kavya, and Akshatha (2017) studied the maternal linguistic output by involving mothers in a parent-implemented early intervention program for toddlers with RCLP. The program involved 20 sessions of speech and language therapy where the mothers were oriented and counseled for speech stimulation. The baseline was established by measuring the parameters such as the total number of words, utterances, different words, mean length of utterance before the session were given and the post-therapy measurement was done after 20 sessions to analyze the linguistic output of the mothers. A total of six toddlers with RCLP in the age range of 2-3 years and their mothers served as participants for the program. The results revealed that the quantity of linguistic stimulation provided to toddlers by the mothers had vastly improved. Where

they found that the frequency of utterance, words, and different words were increased between the baseline and the 20th session and MLU showed the reduction after 20th session. The increase in the frequency of utterance, words, and different words in the mother's speech showed a greater lexical diversity post-therapy and the decrease in MLU probably due to the tendency to use a simpler linguistic structure in order to elicit a better output from their children. The results highlight the importance of involving mothers as active participants in the early intervention program and also illustrate the improvement in the implementation of language stimulation with intensive counseling and training.

In the above review, only a few studies have attempted to study the maternal language input of mothers such as total utterances, total number of words, total number of different words, Mean length of utterances and communication functions include percentage of responsive labels, Percentage of commands/requests, percentage of expansions with children with CLP and also to compare in mothers with the children who did not have cleft lip palate. Thus, the main purpose of this study is to focus on the how the mothers with normal child interact with their child and how it is different from the mothers with CLP.

Need for the study

The need of the study is to investigate the language input of the mothers of children with RCLP and mothers of typically developing children in the age range of 3-5 years in Kannada speaking population. Since many studies focuses on the linguistic input of the mothers of children below 3 years (Wasserman,1988., Chapman,1997., Sheerer,2008 and Seunghee,2015) and there are very few Indian studies has been

conducted that assess the linguistic input of the mothers of children with CLP, the present study has been planned . In that concern, it is essential that speech language pathologist should have awareness about the language input in mothers with RCLP children and in mothers with normal children to gain knowledge about how their speech- languages skills are different from the mothers with normal children. Thus, supports in the treatment of CLP children in order to counsel the mother to correctly interact with their child.

Aim of the study

To investigate the different parameters of language input of the mothers of Kannada speaking children with RCLP and to compare the same with mothers of typically developing children in the age range of 3-5 years.

Objectives

- To investigate and compare the total number of utterances used by the mothers of children with RCLP and with mothers of typically developing children (TDC).
- To investigate and compare the total number of words and total number of different words used by the mothers of children with RCLP and with mothers of TDC.
- To investigate and compare mean length of utterances used by the mothers of RCLP and with mothers of TDC.
- To investigate and compare the communicative functions which includes speech acts, selection, maintenance and change of topic, parameters related to turn taking and non verbal aspects (physical proximity, body posture, eye gaze) across groups.

CHAPTER III

METHOD

Participants

A total of twenty children with repaired cleft lip and palate along with their mothers were participated in this study. These participants were further divided into two groups; Group A & Group B. Group 'A' included 10 Mothers of children with repaired cleft lip and palate (RCLP) and Group 'B' consisted of 10 Mothers with Typically Developing Children (TDC). The age and the gender of the 10 RCLP children were matched with 10 typically developing children. The age of the children considered for this study ranged from 3-5 years and the participated mother's age ranged from 25-35 years.

The inclusionary criterion for the children with RCLP was as follows:

- Children with RCLP without any syndrome.
- Children with RCLP without any neurological impairment.
- Children with RCLP without any history of hearing loss or any other associated problems.
- The native language of the parent-child dyads was Kannada.
- The educational level of mothers participated in the study ranged from VII grade to Post Graduate.
- The participants were belonging to middle socio economic status.

The inclusion criteria for the age and gender matched typically developing children was as follows

- Children with age adequate speech and language skills were selected, To rule out the presence of speech and language disorders, neurological, oromotor, psychological, physical and sensorimotor disorders the participants were screened using WHO Ten question disability screening checklist (Singhi, Kumar, Malhi,& kumar,2007). Children who passed this test were considered for the study.
- The educational level of mothers participated was VII grade to Post Graduate.
- The participants were belonging to middle socio economic status.

An informed consent was taken from the participants that outlined the details of the research procedure before the recording. The demographic details of the participants are depicted in Table 3.1 and 3.2.

Table 3.1

Details of the Group A participants

Group A	Age (years)	Gender	Cleft type
RCLP 1	5	M	Repaired Bilateral Cleft Lip and Palate
RCLP 2	5	F	Repaired Unilateral Cleft Lip and Palate
RCLP 3	3	F	Repaired Unilateral Cleft Lip and Palate
RCLP 4	4.5	M	Repaired Unilateral Cleft Lip and Palate
RCLP 5	5	M	Repaired Bilateral Cleft Lip and Palate
RCLP 6	4	M	Repaired Unilateral Cleft Lip and Palate

RCLP 7	5	F	Repaired Bilateral Cleft Lip and Palate
RCLP 8	4	M	Repaired Unilateral Cleft Lip and Palate
RCLP 9	5	M	Repaired Unilateral Cleft lip and Palate
RCLP 10	3	F	Repaired Bilateral Cleft Lip and Palate

**Note: [M-Male; F-Female]*

Table 3.2

Details of the Group B participants

Group B	Age (years)	Gender
TDC 1	3	F
TDC 2	3.5	F
TDC 3	4	F
TDC 4	5	F
TDC 5	4.5	M
TDC 6	4	M
TDC 7	3	M
TDC 8	4	F
TDC 9	4	F
TDC10	3	M

[M-Male; F-Female]

Procedure

The data collection was done individually. The mother child pair participated in the study, where the child was provided with toys, books.etc. the mother-child pair was seated in a quiet room and a handy camera was used to record the mother-child interaction. The recorder was placed on a tripod stand at a distance of approximately 8-10 feet from the child in such a way that the entire play area was captured and also making sure that the child was not distracted. Mothers were instructed to engage their children in the structured play activity.

The structured activity was carried out in Unit for Structural Oro Facial Anomalies(USOFA).For the structured play activity, toys that were suitable to the child's developmental level were used. The toys and the activities were selected based on the guidelines from 'Toy kit for children with developmental disabilities (Venkatesan, 2003).

The toys included were doll, Kitchen set, doctor Set, toy telephones and story charts. The same toys were used for all the participants in the study. The mothers were asked to carry out the play activity and also they were instructed to interact with their children in a natural way. The mothers were asked to play with their children and to elicit a speech sample from their children. All the activities were audio- video recorded. The duration of each recording was about 45 minutes when the child was cooperative. In instances where the child was not cooperative various strategies such as few trial recordings were carried out or environmental modifications were made. Only the sample where there was twenty to thirty sentences uttered by the mother was considered for analysis.

Analysis of the Data

Standard group comparison was used in this present study where the audio and the videotaped samples of each of 45 minutes of the mother's speech were transcribed using International phonetic alphabets (IPA) symbols in the Baraha 9.1 software (figure 1) and further analysis was done by using SALT software (figure 2). The software itself calculates the maternal measures including Total number of words, Total number of utterance, Total number of different words, and Mean length of utterances. The communicative functions including speech acts, selection, maintenance and change of topic. Apart from this parameters related to turn taking and non verbal aspects (physical proximity, body posture etc.) were also analyzed using the a clinical appraisal of pragmatic aspects of the language (pragmatic protocol), developed by Prutting, 1982 (Appendix 1), where each pragmatic aspect of language on the protocol was judged as appropriate, inappropriate, or not observed. The following parameters were derived from the analysis.

1. **Total number of words-** The number of words uttered by the mother.

Ex: nInU kempU bannada dodda sebu tintiyaa?- 6 words

2. **Number of different words** – Number of different words uttered by the mother.

Ex: E vastu eStU sundaravagide!- 4 words

3. **Total number of utterances-** Number of sentences uttered by the mother.

Ex: ninage yava tindi beku?- 1 utterance.

4. **Mean length of utterance-** Number of morphemes in each utterance by total number of utterance.

Ex: tarabeti admele a:ta a:dona-5 morphemes.

5. **Communicative functions** includes speech acts, selection, maintenance and change of topic, parameters related to turn taking and non verbal aspects (physical proximity, body posture.etc)

Speech act: The speech acts or what one can do with language such as comment, assert, request, promise, and so forth.

Selection: The selection of a topic appropriate to the multidimensional aspects of context.

Maintenance: Coherent maintenance of topic across the discourse.

Change: Change of topic in the discourse.

Parameters related to turn taking: Turn taking is a smooth interchanges between speaker/listener. It can be the initiation of speech acts. Responding as a listener to speech acts. Pause time that is too short or too long between words, in response to a question, or between sentences.

Nonverbal aspects: The distance that the speaker and listener sit or stand from one another.

Physical proximity: The number of times and placement of contacts between speaker and listener.

Body posture: Forward lean is when the speaker or listener moves away from a 90-degree angle toward the other person; recline is slouching down from waist and moving away from the partner; side to side is when a person moves to the right or left.

Eye gaze: One looks directly at the other's face; mutual gaze is when both members of the dyad look at the other.

The communicative functions of the mother were only analyzed and were judged as appropriate, inappropriate, or not observed.

Appropriate: Parameters are marked appropriate if they are judged to facilitate the communicative interaction or are neutral.

Inappropriate: Parameters are marked inappropriate if they are judged to detract from the communicative exchange and penalize the individual.

No opportunity to observe: If the evaluator does not have sufficient information to judge the behavior as appropriate or inappropriate, the clinician marks this column.

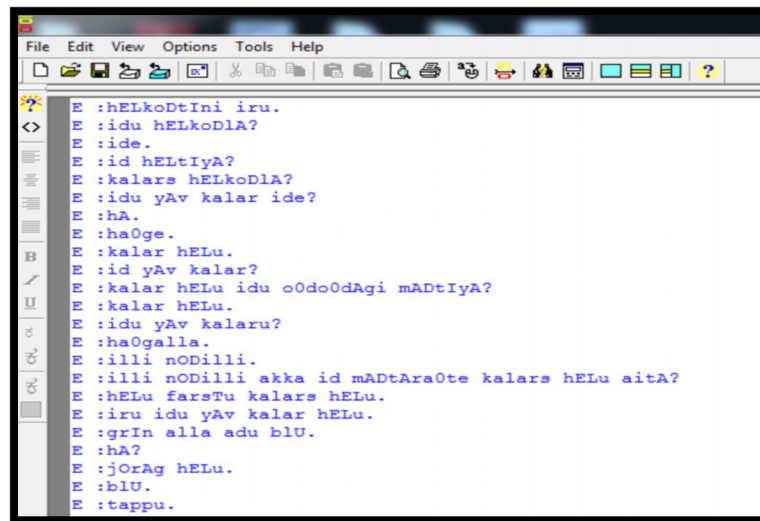


Figure 1: Transcribed sample-Baraha Software

STANDARD MEASURES		
	Child	Examiner

TRANSCRIPT LENGTH		
Total Utterances	0	227
# Analysis Set (C&I Verbal Utts)	0	218
Total Completed Words	0	464
Elapsed Time (0:00)	0.00	0.00

SYNTAX/MORPHOLOGY		
# MLU in Words	---	2.13

SEMANTICS		
# Number Different Words	0	220
# Number Total Words	0	464
# Type Token Ratio	---	0.47

Figure 2: Analyzed sample using SALT Software

Inter judge and intra judge reliability

To assess the inter judge reliability, 20 % of the subjects of the total participants (n=4, out of which 2 were mothers of children with RCLP and 2 were the mothers of age and gender matched TDC) were considered. Only the sample of mothers was considered in this study for analysis and it was given to two experienced Speech Language Pathologists (SLP's). These samples were re-transcribed by the SLP's who were familiar with SALT transcription and phonetic transcription of speech disorders in children. Cronbach's Alpha was used to assess the reliability of the data. Similarly, for intrajudge reliability the 20% of the subjects of the total participants (n=4 out of which 2 were mothers of children with RCLP and 2 were the mothers of age and gender matched TDC) were considered. Again the samples of mother-child interaction were collected after 1 week from the date of first analysis to check for the reliability.

Statistical analysis

The data was analyzed separately for both group A and group B and then compared for Total number of words, Total number of utterance, Total number of different words, Mean length of utterances and communicative functions including speech acts, selection, maintenance and change of topic, parameters related to turn taking and non verbal aspects (physical proximity, body posture..etc) across both the groups. Shapirowilk's test for normality was performed to check whether the data is following into normal distribution. The parametric test (Independent sample't' test) was carried out to compare the differences between the two groups in terms MLU, Total utterances, Total words and Number of different words used and cross tabulations were performed to analyze the communicative functions. The results of these will be discussed in their respective sections.

CHAPTER-IV

RESULTS AND DISCUSSIONS

The main aim of this study was to investigate the different parameters of language input from the mothers of Kannada speaking children with RCLP and to compare the same with mothers of typically developing. The specific objectives of the study were as follows:

- To investigate and compare the total number of utterances by the mothers of children with RCLP with mothers of typically developing children.
- To investigate and compare the total number of words and total number of different words by the mothers of children with RCLP with mothers of typically developing children.
- To investigate and compare the mean length of utterance used by the mothers of children with RCLP with mothers of typically developing children.
- To investigate and compare the communicative functions including speech acts, selection, maintenance and change of topic, parameters related to turn taking and non verbal aspects (physical proximity, body posture) across groups.

The data obtained for each parameter from mothers of children with RCLP and TDC were tabulated and analyzed using SPSS (version 20.0) software. The data obtained was further subjected to different statistical procedure such as:

- Test-retest reliability.

- Normality was checked using Shapiro-Wilk's test.
- Descriptive statistics was done to obtain mean and standard deviation.
- Independent sample 't' test was performed to check the significant difference, if any, in the total number of utterance, total words, number of different words, mean length of utterance between the two groups.
- Cross tabulations were performed to analyze the communicative functions of both the groups.

The results obtained from all the above statistical analyses have been presented under various subsections

I. Test Retest Reliability

The test retest reliability was computed for 20% of the total participants (4 participants, i.e., 2 mothers of children with RCLP with the mothers of 2 age and gender-matched TDC). The Cronbach's alpha for the total number of utterance, total words, number of different words, mean length of utterances and communicative functions was 0.96, 0.94, 0.92, 0.98 and 0.97 respectively. The ' α ' varied between 0.85 and 0.90, which indicated high test-retest reliability for the obtained data.

II. Test for Normality

To check whether the data followed the normal distribution, Shapiro-Wilk's test was performed and it revealed that the data followed normal distribution ($p > 0.05$) as shown in Table 4.1.

Table 4.1*Shapiro-Wilk's test for normality*

Parameters	Group A			Group B		
	Statistic	df	Sig.	Statistic	df	Sig.
Total utterances	885	10	.150	938	10	.536
Total words	930	10	.451	906	10	.255
Number of different words	865	10	.086	966	10	.850
Mean length of utterance	788	10	.010	920	10	.360

*($p > 0.05$ indicates normal distribution)***III. Comparison of total utterances across groups**

Descriptive statistics was carried out for this parameter and the mean and the standard deviation values of the study are given in the table 4.2. The total utterances for group 'A' ranged from 227 to 497 and for group 'B' it was ranged from 373 to 496 with mean values of 389.40 and 441.9 respectively. When the group A was analyzed, it was found that three participants i.e., 1, 3 and 6, were responded very less to their children and also they used few non verbal gestures along with the verbal gestures in order to maintain the interaction during the play activity. Whereas the remaining participants from the group 'A' did not show much difference when compared with group 'B' participants as their mothers produced more utterances due to the reduced ability of the children to respond to the comment spontaneously and few of them produced more utterances to elicit a correct production form their children. The parametric (Independent sample 't'

test) test was performed to check the significant difference across the group and the results revealed no significant differences in the total utterance ($p>0.05$) across the groups as depicted in the table 4.3.

Table 4.2

Mean and S.D of Total utterance for group A and group B

	Total utterance	
	Group A	Group B
1	227.00	496.00
2	494.00	456.00
3	285.00	373.00
4	374.00	386.00
5	397.00	456.00
6	309.00	475.00
7	445.00	485.00
8	408.00	445.00
9	458.00	456.00
10	497.00	391.00
Mean	389.40	441.90
	(S.D 43.39)	(SD 91.10)

Group A- Mothers of children with RCLP, Group B- Mothers of children with TDC.

Table 4.3*Independent sample t test*

t test for equality of mean			
Parameters	t value	df	P value
Total utterances	1.64	18	0.117
<i>p>0.05 indicates no significant difference</i>			

The results of the current study revealed that the mothers of children with RCLP (Group A) performed similarly as the mothers of age and gender matched typically developing children (Group B) in the production of total utterances. However, these findings are not supported by the conclusions of previous studies (Wasserman, 1988 and Chapman, 1991). These discrepancies could be due to the methodological variations and the individual differences in the groups of mother and children observed. However, the results supports the findings of Chapman (1991) & Murray et al., (2000) where they found that few parameters of language input was similar across mothers of TDC and RCLP.

In regard to methodological differences, Wasserman et al., 1988 had conducted a longitudinal study, where the mother's interacting with their young handicapped children including RCLP from the age of 9, 12, 18 and 24 months were compared.. The results indicated that the mothers of children with RCLP had fewer total utterances. This finding further revealed that they used more of physical teaching than the verbal teaching in order to get the child's attention.

Chapman et al., (1991) studied language input of mother's interaction with their young children with cleft lip and palate. The study consisted of 26 mother-child pair: 13 mother-cleft lip palate child dyad and 13 mothers-without cleft lip palate dyad. The subjects were 1, 2 and 3 years of age and the results that the mothers of cleft lip palate produced less number of utterances.

Since the above mentioned studies considered different age range and study designs, those conclusions are not supporting the results of the current study. However, the individual differences present in this study are supported by the same authors (Waserman, 1985 and Chapman, 1991) in their study reported that in order to elicit the correct production of sounds they might have used more utterance and also few of them would have adapted the teaching style during interaction as suggested by the SLP.

Other authors such as, Scherer et al., (2008) reported that the mothers who participated in the parent implemented program and who received the training used more number of utterances with their child. Whereas, Seunghee Ha, (2015) found the similar findings as in the Scherer et al.,(2008) study, where they found that the mothers of RCLP children produced more number of total utterances compared to the mothers of TDC. Another study done in an Indian context by Pushpavathi, Kavya, and Akshatha (2017) again reported the same findings as in the previous studies (Scherer et al.,2008 and Seunghee Ha,2015).Thus, the increase in the total utterance further revealed that the mothers of children with RCLP responded to their child's utterance and used higher percentage corrective feedback.

The findings of the current study add on to the existing literature that the mothers of children with RCLP produced similar number of utterance as compared to the mothers of age and gender matched typically developing children and this could be due to the presence of individual variations among the group.

IV. Comparison of total words and number of different words across groups

Descriptive statistics was carried for these variables and the mean and the standard deviation values are given in the Table 4.4. The total words for the group 'A' ranged from 464 to 1109 with the mean of 888.6 and the group B ranged from 962 to 1348 with the mean of 1194.4. When the data was analyzed, it was found that that the three participants from the group A i.e., 1, 3 and 6 exhibited reduced number of total words and this was because they used more of non verbal gesture to communicate with their children. The parametric (Independent sample 't' test) test was performed to check the significant difference across the groups and the results revealed significant differences ($p < 0.05$) for total words across the groups as depicted in the table 4.5.

The results of the current study revealed that the mothers of children with RCLP produced lesser number of total words as compared to the mothers of age and gender matched typically developing children. This finding supports the previous findings. (Chapman, 1991; Scherer et al., 2008; Seunghee Ha, 2005 and Pushpavathi et al., 2017).

Chapman et al., (1991) studied language input of mother's interaction with their young children with cleft lip and palate by considering 26 mother-child pair: 13 mother-cleft lip palate child dyad and 13 mothers-without cleft lip palate dyad in the age range of

1, 2 and 3 years and the results revealed that the mothers of cleft lip palate produced lesser number of total words to simplify their speech.

Scherer et al., (2008) investigated and compared the total number of words in mothers of typically developing children and the mothers of cleft lip palate children. They found that the mothers of typically developing children produced more number of words, suggesting that these mothers use greater complexity of language when addressing their children.

Seunghye Ha, (2015) investigated the total words produced by the mothers of RCLP and the mothers of TDC and found that the mothers of RCLP group produced lesser number of total words compared to the mothers of TDC. This finding revealed that the mothers of children with RCLP used lesser percentage of responding, where as the mothers of TDC used more number of words.

Whereas, in an Indian scenario Pushpavathi, Kavya, and Akshatha,(2017) also reported that the mothers of children with RCLP produced lesser number of total words compared to control group before attending the parent implemented therapy program.

Hence, the findings of the current study adds on to the literature that the mothers of RCLP children produced lesser number of words as compared to the mothers of typically developing children and this could be due to the decrease in the percentage of responding with their children with cleft .

When the data was analyzed for the number of different words produced, the values for group 'A' ranged from 220 to 422 with the mean of 371.3 and for the group B

the values ranged from 335 to 507 with the mean of 393.9. The mean and the standard deviation values for number of different words are given in the Table 4.4 and it was also found that the mothers of both the groups used repetition strategy i.e., they repeated the same question again and again to elicit an answer but the group 'A' participants repeated the same word again and again to elicit a correct production of sounds from their children. The parametric (Independent sample 't' test) revealed that no significant difference ($p > 0.05$) in the number of different words used across the groups as depicted in the table 4.5.

Hence, the results of the current study revealed no significant difference in the production of different words across the 2 groups. However these results are not supporting the previous studies (Scherer, 2008; Seunghee Ha, 2015 and Pushpavathi et al., 2017) where they have reported that the number of different words to be higher in the mothers of typically developing children than the mothers of children with RCLP.

These discrepancies in the results of the present study could be due to the variations exhibited by the participants such as use of communicative strategies like 'repeat words', 'Modeling the words' where they model the identical words within the same number of utterances and hence the fewer number of different words were found in their utterance.

Table 4.4

Mean and standard deviation value of TW and NDW for group A and group B

	Group A		Group B	
	TW	NDW	TW	NDW
1	464	220	1348	494
2	1109	422	1150	400
3	657	229	1043	335
4	844	368	1130	479
5	980	378	1327	507
6	752	288	1258	482
7	933	395	1288	446
8	1072	248	1298	486
9	994	369	1150	400
10	1081	327	962	382
Mean	888.60	371.30	1194.40	393.90
(SD)	(209.56)	(77.10)	(124.48)	(108.64)

Group A- Mothers of children with RCLP, Group B- Mothers of children with TDC.

Table 4.5*Independent sample t test*

t test for equality of mean			
Parameters	t value	df	P value
Total words	3.93	18	0.001
Number of different words	.54	18	0.595

P<0.01 indicates highly significant difference.

V. Comparison of mean length of utterances across groups

The mean and the standard deviation are given in the table 4.6. The mean length of utterance in the group A ranged from 2.13 - 2.56 and in group B it ranged from 2.2 - 3.02 with the mean values of 2.4 and 2.78 respectively. It is also been found that almost all the participants from the group 'A' used lot of naming strategies, where they named the objects shown and expanded using 1-2 word utterances, but the participants from the group B used more of expansions which resulted in the increase mean length of utterance. The parametric (Independent sample 't' test) test was performed to check the significant difference across the group and the results revealed significant difference ($p < 0.05$) across the groups as depicted in the table 4.7.

Table 4.6

Mean and S.D values of mean length of utterances for group A and group B

	Group A	Group B
1	2.13	2.77
2	2.32	2.6
3	2.46	3
4	2.51	2.96
5	2.53	3
6	2.56	2.2
7	2.5	2.69
8	2.7	3.02
9	2.2	2.6
10	2.19	2.6
Mean	2.411	2.78
(SD)	(.19)	(.19)

Group A- Mothers of children with RCLP, Group B- Mothers of children with TDC

Table 4.7

Independent sample t test

t test for equality of mean			
Parameters	t value	df	P value
Mean length of utterance	4.40	18	0.001**

P<0.01 indicates highly significant difference

The results of the current study revealed that the mothers of children with RCLP showed reduced MLU when compared to the mothers of age and gender matched typically developing children. This finding is in support with the previous studies (Chapman, 1991; Scherer et al., 2008; and Pushpavathi et al., 2017).

Chapman et al., (1991) studied the language input of mother's interaction with their young children with cleft lip and palate by considering 26 mother-child pair: 13 mother-cleft lip palate child dyad and 13 mothers-without cleft lip palate dyad in the age range of 1, 2 and 3 years and the results revealed that the mothers of cleft lip palate had reduced MLU. This is because of the better comprehensibility they simplified their speech. Scherer et al., (2008) investigated and compared the MLU in mothers of typically developing children and the mothers of cleft lip palate children. They found that the mothers of typically developing children produced higher MLU, suggesting that these mothers use greater complexity of language when addressing their children.

Pushpavathi, Kavya, and Akshatha,(2017) also reported that the mothers of children with RCLP showed decrease in the MLU compared to control group after attending the parent implemented therapy program. This is due to tendency to simplify their linguistic structure in order to elicit a better output from their children.

Hence, the findings of the current study adds on to the literature that the mothers of RCLP children had lower mean length of utterance as compared to the mothers of typically developing children and this could be due to the tendency to simplify their linguistic structure in order to elicit a better output from their children.

VI. Comparison of communicative functions across the groups

The communicative functions such as speech acts, selection, maintenance and change of topic, turn taking and non verbal aspects (physical proximity, body posture, eye gaze) were analysed across groups. Cross tabulations were performed and the percentage of appropriate pragmatic parameters are tabulated in the table 4.8 and the results showed that the group 'A' performed poorer than the group 'B' participants in Topic selection, Topic maintenance and non verbal behaviours such as body posture. However these children performed, speech acts(70%), Selection (50%), maintenance (20%), Change (80%), turn taking(100%), body posture (80%), physical proximity (80%) and eye gaze (100%). Amongst all selection, maintenance and speech acts were prominent in the group 'A'.

Three out of ten participants from the group 'A' showed inappropriate behaviors in the speech acts. This might be due to the inappropriate responses to their children speech; five out of ten participants showed inappropriate behaviors while selecting a topic for discussion, as these participants did not follow the child's interest and introduced too many topics within a specified time. Two out of ten participants showed inappropriate behaviors in maintaining topic and this is again due to the introduction of too many topics within a specified time and the parents used more of naming strategies and their main concern was to correct their child's production with the use of single words rather than expanding on a topic.

Table 4.8*Percentage of appropriate pragmatic behaviours across the groups*

Communicative functions	Group A(RCLP)	Group B(TDC)
Speech acts	70%	100%
Selection	50%	100%
Maintenance	20%	80%
Change	80%	80%
Turn taking	100%	100%
Body posture	80%	90%
Physical proximity	80%	90%
Eye gaze	100%	100%

Group A- Mothers of children with RCLP. Group B- Mothers of children with TDC.

The findings of the current study supports the findings of Chapman et al.,1991 where they studied the communicative functions such as speech acts, in 13 children with CLP and 13 without cleft and they did not find any differences between the groups.

In contrast, Seunghee Ha, (2015) reported that the mothers of children with cleft lip palate group had lower percentage of responding (speech acts) than the mothers in the control group. However the other communicative functions such as (selection, maintenance, change and non verbal behaviors) have not been studied. Hence further more studies are to be done with regard to the pragmatic behaviors of the mothers of RCLP children.

To summarise, the mothers of children with RCLP showed significant differences in the total words and mean length of utterances across the groups but no significant differences were seen in the total utterances and the number of different words used across the groups and also communicative functions of the mothers of RCLP children were found to be different compared to mothers of TDC.

CHAPTER-V

SUMMARY AND CONCLUSIONS

Cleft lip and palate (CLP) is a congenital malformation which are usually associated with speech, language, cognitive and psychological issues. The performance in these children with RCLP depend on factors of cleft type/severity, associated syndromes, age at which palate repair was done and its efficiency, unrepaired residual cleft, presence of fistula, status of velopharyngeal function, hearing status, amount and efficacy of communication interventions and socioeconomic status of the family.

The speech and language difficulties in children with repaired cleft lip and palate (RCLP) are characterized by limited phonetic inventories, poor speech accuracy, and presence of compensatory articulation, abnormality in resonance, delay in both comprehension, delay in the first word acquisition, reduced vocabulary development, and shorter mean length of utterance.

The delay can be due to the poor hearing, frequent hospitalizations, history of hearing loss secondary to otitis media and other issues such as anxiety about their facial scarring which can impair their language abilities, poor mother-child interaction where the primitive attempts of the children with CLP may be misinterpreted as jargon and will not be reinforced as well as shaped for meaningful language forms by the mother.

The present study aimed to investigate the language input of the mothers of children with RCLP and to compare with mothers of typically developing children in the age range of 3-5 years in Kannada speaking population and the specific objectives were

to investigate and compare the total number of utterances, Total words, Number of different words, Mean length of utterances and communicative functions used by the mothers of children with RCLP with mothers of typically developing children.

A total of twenty children with repaired cleft lip and palate along with their mothers were participated in this study. These participants were further divided into two groups; Group A & Group B. Group 'A' included 10 Mothers of children with repaired cleft lip and palate (RCLP) and Group 'B' consisted of 10 Mothers with Typically Developing Children (TDC). The age and the gender of the 10 RCLP children were matched with 10 typically developing children. The age of the children considered for this study ranged from 3-5 years and the participated mother's age ranged from 25-35 years. The participants were recruited based on specific inclusion and exclusion criteria.

The mother child pair participated in the study, where the child was provided with toys, books.etc. And the mothers were instructed to engage their children in the structured play activity. For the structured play activity the toys and the activities were selected based on the guidelines from 'Toy kit for children with developmental disabilities (Venkatesan, 2003). The mothers were asked to carry out the play activity and also they were instructed to interact with their children in a natural way. All the activities were audio- video recorded. The duration of each recording was about 45 minutes.

The audio and the videotaped samples of each of 45 minutes of the mother's speech were transcribed using International phonetic alphabets (IPA) symbols in the Baraha 9.1 software (figure 1) and further analysis was done by using SALT software. The software itself calculates the total number of words, total number of utterance, total

number of different words, and mean length of utterances. The communicative functions including speech acts, selection, maintenance ,change of topic, turn taking and non verbal aspects (physical proximity, body posture etc.) were also analyzed using the a clinical appraisal of pragmatic aspects of the language (pragmatic protocol), developed by Prutting(1982).

Further the test retest reliability and Inter-rater reliability were found to be adequate for both the groups. The results revealed that the mothers of children with RCLP group performed poorer than TDC group on the total utterance, total words, number of different words, mean length of utterance and communicative functions. But the significant difference was shown in total words and mean of utterance. These findings are further supported by the previous studies that due to the decrease in the percentage of responding with their children with cleft and due to the tendency to simplify their linguistic structure in order to elicit a better output from their children, the mothers of RCLP showed reduction in the frequency of total words and MLU. Thus it is clear from this study that, there are differences in the maternal language output between RCLP and TDC.

Clinical Implications

- Provides knowledge on how the mother with normal child interacts with their child, as well how it is different from the mother with cleft lip palate.
- This will help the Speech Language Pathologist to Counsel the parents regarding the importance of speech and language stimulation.

Limitations of the study

The main limitation of the study was the use of pragmatic protocol, this protocol does not define whether they have pragmatic deficits or not, it just gives information whether the behavior is appropriate, inappropriate and not observed within a specified time.

Future directions

- Similar research has to be carried on a larger sample with different types of cleft and longitudinal study across age range.
- More investigations have to be done in order to compare the pragmatic behaviors between the mothers of children RCLP and typically developing children.

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APPENDIX-I

Pragmatic protocol

<i>Communicative act</i>	<i>Appropriate</i>	<i>Inappropriate</i>	<i>No opportunity to observe</i>
A. Speech acts 1. Speech act pair analysis 2. Variety of speech acts B. Topic 3. Selection 4. Introduction 5. Maintenance 6. Change C. Turn taking 7. Initiation 8. Response 9. Repair/revision 10. Pause time 11. Interruption/overlap 12. Feedback to speakers D. Lexical selection/use across speech acts 16. Specificity/accuracy 17. Cohesion E. Stylistic variations 18. The varying of Communicative style <i>Paralinguistic aspects</i> F. Intelligibility and prosodies 19. Intelligibility 20. Vocal intensity 21. Vocal quality 22. Prosody			

23. Fluency <i>G. Nonverbal aspects</i> 24. Physical proximity 25. Physical contacts 26. Body posture 27. Foot/leg and hand/arm movements 28. Gestures 29. Facial expression 30. Eye gaze			
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Definitions for Communicative Parameters Assessed Using the Pragmatic Protocol

Verbal aspects

- a) **Speech act pair analysis:** The ability to take both speaker and listener role appropriate to the context. Types: Directive/ compliance--personal need, imperatives, permissions, directives, question directives, and hints.
- b) **Query/response:** request for confirmation, neutral requests for repetition, requests for specific constituent repetition. Request/response--direct requests, inferred requests, requests for clarification, acknowledgment of request for action. Comment/acknowledgment--description of ongoing activities; of immediate subsequent activity; of state or condition of objects or person; naming; acknowledgments that are positive, negative, expletive, or indicative.
- c) **Variety of speech acts:** The variety of speech acts or what one can do with language such as comment, assert, request, promise, and so forth.

Topic

- a. **Selection:** The selection of a topic appropriate to the multidimensional aspects of context.
- b. **Introduction:** Introduction of a new topic in the discourse.
- c. **Maintenance:** Coherent maintenance of topic across the discourse.
- d. **Change:** Change of topic in the discourse.

Turn taking: Smooth interchanges between speaker/listener.

- a. **Initiation** - Initiation of speech acts.
- b. **Response**- Responding as a listener to speech acts.
- c. **Repair/revision**- The ability to repair a conversation when a breakdown occurs, and the ability to ask for a repair when misunderstanding or ambiguity has occurred,
- d. **Pause time**- Pause time that is too short or too long between words, in response to a question, or between sentences- Interruptions between speaker and listener; overlap refers to two people talking at once.
- e. **Interruption/overlap**- Verbal behavior to give the listener feedback such as *yeah* and *really*; nonverbal behavior such as head nods to show positive reactions and side to side to express negative effects or disbelief.
- f. **Feedback to listener**- Utterances that occur immediately after the partner's utterance.

Lexical selection/use

- a) **Specificity/Accuracy**- Lexical items of best fit considering the text.
- b) **Cohesion**- The recognizable unity or connectedness of text. Types: Reference-- semantic relation whereby the information needed for interpretation of some item is found elsewhere in the text. Substitution--cohesive bond is established by the use of

substitute item of the same grammatical class. Ellipsis--substitution by zero and refers to sentences or clauses whose structure is such as to presuppose the missing information. Conjunction--logical relation between clauses. Lexical cohesion--achieved through vocabulary selection.

- c) **Stylistic variances-** Adaptations used by the speaker under various dyadic conditions (e.g., polite forms, different syntax, changes in vocal quality).

Paralinguistic aspects

- a) **Intelligibility-**The extent to which the message is understood.
- b) **Vocal intensity-**The loudness or softness of the message.
- c) **Vocal quality-** The resonance and/or laryngeal characteristics of the vocal tract.
- d) **Prosody-**The intonation and stress patterns of the message; variations of loudness, pitch, and duration.
- e) **Fluency-**The smoothness, consistency, and rate of the message

Nonverbal aspects

- a) **Physical proximity-** The distance that the speaker and listener sit or stand from one another.
- b) **Physical contacts-** The number of times and placement of contacts between speaker and listener.
- c) **Body posture-** Forward lean is when the speaker or listener moves away from a 90-degree angle toward the other person; recline is slouching down from waist and moving away from the partner; side to side is when a person moves to the right or left.
- d) **Foot/leg and hand/arm movements-** Any movement of the foot/leg or hand/arm (touching self or moving an object or touching part of the body, clothing, or self).
- e) **Gestures-** Any movements that support, complement, or replace verbal behavior,

- f) **Facial expression-** A positive expression as in the corners of the mouth turned upward; a negative expression is adownward turn; a neutral expression is the face in resting position.
- g) **Eye gaze-**One looks directly at the other's face; mutual gaze is when both members of the dyad look at the other.