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An Insight into the Repercussion of Mother Child Interaction in the Development of Speech and Language in Children

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ABSTRACT

Speech is the oral expression of language. The first three years of life, known as the Critical period is considered as the key era in the acquisition of speech and language skills. Maternal education is linked to mother's knowledge and her assumptions on child development and overt behaviour. Mother's educational status can affect the way in which she effectively communicates with the child. In an effort to better understand the significance of the role of maternal education and mother child interaction, a study was conceptualized among typically developing Kannada speaking children in the age range of 4-5 years. The participants were grouped into two on the basis of their maternal education, comprising of 50 children in each group. Semantic acquisition (vocabulary) and syntactic skill (MLU-Mean Length of Utterance) were assessed in both the groups. The obtained data was tabulated and statistically analyzed. The quality and quantity of mother-child interactions and maternal education were found to play a very important role in providing an enriching and stimulating environment necessary for language acquisition. This was reflected among children who had increased mother child interaction and higher levels of maternal education, which paved the way to significant increase in vocabulary score and improved MLU.

KEYWORDS: Maternal education, Interaction, Vocabulary, MLU.

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INTRODUCTION

Communication refers to the sending and receiving of messages, information, ideas, or feelings as per Hult and Howard, 2002. It is a comprehensive term which comprises the physical production of speech, symbolic nature of language and any behaviour or action that devolves a message.

According to Hult and Howard, 2002, speech is the oral expression of language. Bloom in 1988 stated that language is a code whereby ideas about the world are represented through a conventional system of arbitrary signals for communication.

The first three years of life, known as the Critical period is considered as the key era in the acquisition of speech and language skills, in which there is rapid development and maturation of the brain. These skills evolve elatedly when the child is consistently exposed to other people's speech and language. Inadequate exposure to language during the critical period paves the way to inapt acquisition of language.

The speech and language contributed by the people surrounding the child's environment plays a vital role on their language development. A myriad of factors attributes to the child/infant's language development such as the parental education level especially maternal, the extent and nature of language spoken to the child, the socio-economic status (SES) of the immediate family members including family income and race or ethnicity^{1,2,3}.

Research proposes that family income and parental educational level significantly contribute to language development than race or ethnicity. Studies provide notably large evidence that maternal education attributes to the variations in the environmental and language experiences of children⁴. Language development in children is a result of their interaction with their parents, siblings, and people in their immediate surroundings. Maternal education plays an important part in developing the child's language, cognition and academics⁵. Maternal education is connected to mother's knowledge and assumptions about child development and overt behavior⁶. It could therefore, be hypothesized that a mother's educational status can affect the way in which mother effectively communicates with the child^{7,8}.

Vocabulary is the body of words used in a particular language. A 20-year old longitudinal study conducted by Beitchman, et al in 2009 on the development of vocabulary in children from young age to early adulthood revealed that children who had exhibited language difficulty at 5 years of age, continued to exhibit language difficulty even at 25 years

of age⁹. Hence, there is a strong relationship between early vocabulary knowledge and language outcomes later in life.

There is a paucity of research data in India illustrating a correlation between a child's speech and language development and maternal education. Further extensive studies are needed to understand this correlation in an Indian setup which could in turn help in early diagnosis and counseling of children with speech and language disorders. The aim of the study was to evaluate the correlation between mother-child interactions and maternal education in the development of speech and language skills in children.

Every mother's interaction with their child plays a very important role in the development of child's speech and language skills. Maternal education has been found to correlate with a child's acquisition of language skills. Children whose mothers have only a high school diploma or basic primary education demonstrate lower scores on narrative and vocabulary language assessments. In contrast, children whose mothers have a minimum of a graduate degree or higher have been found to score better on narrative and vocabulary assessment^{3,10,11}. It is estimated that a four-year-old child from a family of graduates would have heard an average of 45 million words, while a child from non-graduate parents would have only heard 13 million words. Quality and quantity of vocabulary knowledge has a close relationship with verbal input early in life. Another analysis on the quantity and quality of mother's language input was examined by Meredith L Rowe in 2012 in 50 parent-child pairs to determine important maternal factors contributing to the development of children's vocabulary skill across the phase of early development. They asserted that maternal education contributes significantly to child's vocabulary¹². Rice ML, Zubrick SR, Taylor CL, Hoffman L, Gayan J, 2018 summarized in their study of 1,255 twins at four and six years of age, that children of mothers with higher levels of education had higher scores across multiple outcome measures (vocabulary and grammar)¹³.

MATERIALS & METHOD

The methodology was designed to assess the influence of maternal education on the development of child's language. The Subjects included in this study were typically developing children within the ages 4 to 5 years with normal speech and language skills, speaking Kannada as their first language. Children were grouped into two on the basis of their maternal education, comprising of 50 children in each group. A cross-sectional design along with a non-probability sampling procedure was employed in order to assess the language abilities.

Key emphasis on: -

1. Assessing the semantic acquisition (vocabulary) and their syntactic skill (MLU) in Kannada language among children of 4 to 5 years of age whose mothers have studied up to high school.
2. Assessing the semantic acquisition (vocabulary) and their syntactic skill (MLU) in Kannada language among children of 4 to 5 years of age whose mothers have a minimum of college degree.

The children were selected from urban schools (kindergarten, play school, and private pre-primary schools) and rural government schools. The information pertaining to maternal education, mother's working hours and the quality and quantity of maternal stimulation were collected through a questionnaire that was prepared and appropriately validated.

A Picture vocabulary test was developed using Kannada textbooks recommended by Karnataka State Board. Test material consisted of 30 picture cards, having 4 pictures (line drawings) in each card and were validated by 3 Kannada teachers and 3 speech language pathologists. The test was administered for each child separately in a single session of 45 minutes in Kannada language. Children were shown one set of pictures at a time from picture vocabulary test and the examiner expressed one word for the corresponding target picture. Child was expected to point at the picture for that particular word as told by the examiner. General conversation was carried out with all the children to elicit open ended responses to assess MLU. All responses were noted down in a note pad and video recorded.

SCORING AND ANALYSIS

The testing involved assessing two language skills: semantics (vocabulary) and syntax (MLU).

A score of "1" was given for every correct response and a "0" for incorrect response. Total score given of the picture vocabulary test was 30.

MLU was calculated using the formula:
$$\frac{\text{Total number of morphemes}}{\text{Total number of utterances}}$$

The obtained data was tabulated and was subjected to statistical analysis using SPSS 18.0 version. Mean scores and standard deviations were obtained for both vocabulary and MLU. The two groups comprising of maternal education up to high school and maternal education of minimum college degree were compared. t-test was used to find the difference between both the groups.

RESULTS AND DISCUSSION

T-test was administered to check the mean difference between the two groups for picture vocabulary test. The results of the Independent sample t test indicated a significant difference in vocabulary ($p < 0.05$) between children in **group1** (children belonging to group whose mothers have studied only up to high school) and children in **group 2** (children belonging to group whose mothers have a minimum of college degree). Children in **group 2** had a mean vocabulary score of 26.06 comparatively more than those in **group 1** with scores of 24.44, which was significant statistically ($p=0.008$).

Table 1.1 Mean scores of vocabulary of group 1 and group 2

Groups	N	Mean Vocabulary scores	SD	"t"	p value
Group 1	50	24.44	3.418	-2.707	0.008
Group 2	50	26.06	2.494		

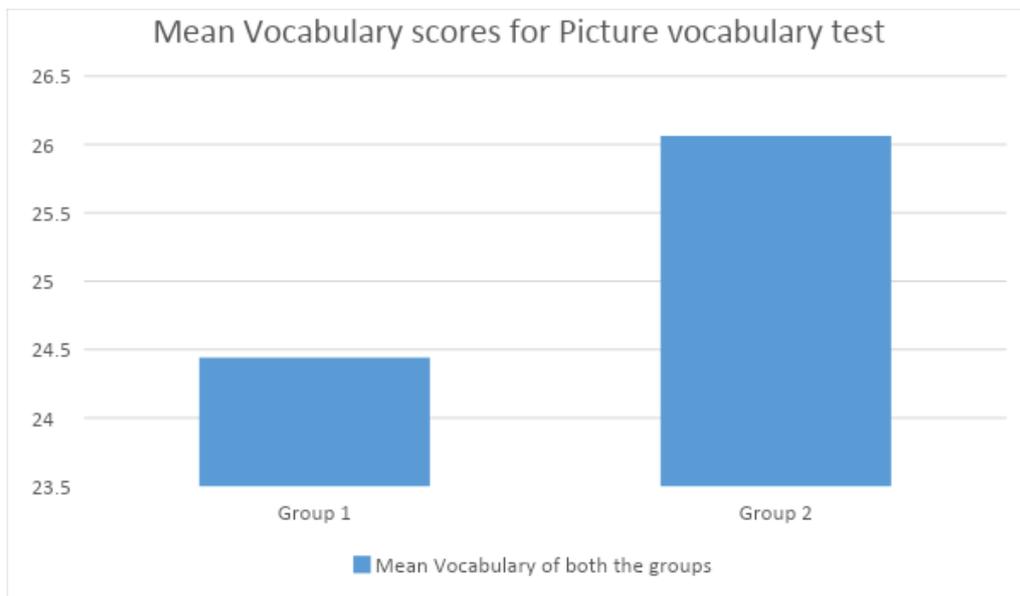


Fig 1.1 Graphical representation of comparison of mean scores of picture vocabulary test between group 1 and group 2

It was noted that children from urban schools, whose maternal education was high, used rare and various types of words along with abstract utterances, leading to greater vocabulary scores¹². On the contrary, children from rural schools, whose maternal education were up to high school exhibited less knowledge about concepts such as various lexical categories as assessed using picture vocabulary test. This finding can be supported by a study done by Manhas who states these differences could be attributed to the differences in teaching aids, amenities as well as the provision of fewer opportunities to encourage their creativity and intellectual growth in these set ups compared to urban set ups which stimulate the overall (motor, cognitive, linguistic, social, and creative) development of the child¹⁴.

Independent t-test was administered to check the difference in mean length of utterance between group 1(children whose mothers have studied only up to high school) and group 2 (children whose mothers have a minimum of college degree). Children in group 2 had a mean MLU scores of **4.730**, a bit more than **4.400** seen in group 1, however there was no much statistical difference in the scores.

Table 1.2 Mean scores of MLU of group 1 and group 2

Groups	N	Mean MLU scores	SD	"t"	p value
Group 1	50	4.400	0.903	-1.897	0.061
Group 2	50	4.730	0.334		

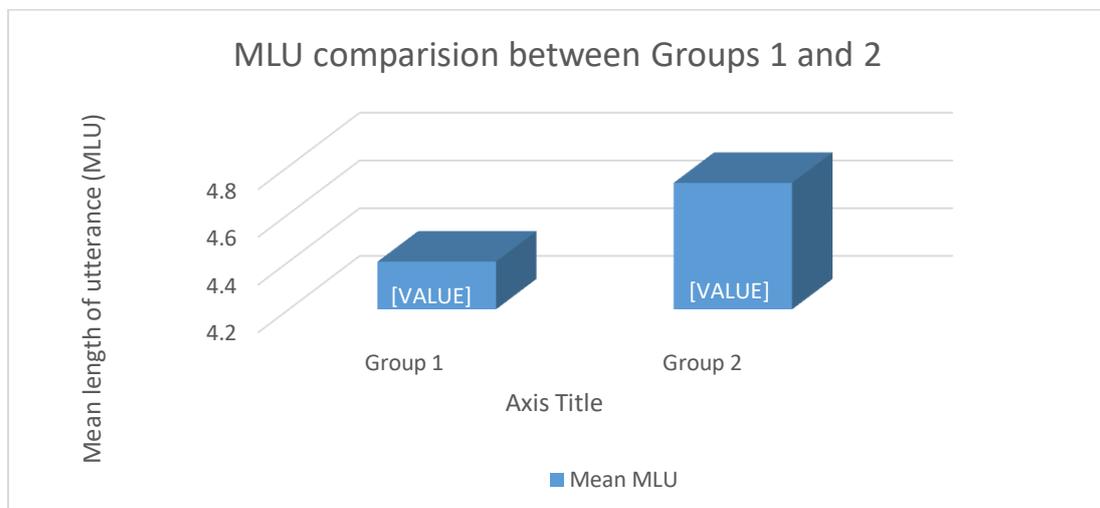


Figure 1.2- Graphical representation of comparison of MLU scores between group 1 and group 2

The results revealed similarity in syntactic skills (MLU) between both the groups. The raw scores for MLU between both the groups revealed some differences although not statistically significant. Various studies support this finding. Another study of MLU in 306 children ages 3 to 9 with SLI (170 children) and without SLI (136 children) found no evidence of an advantage in MLU growth for the children of higher educated mothers)¹⁵. Children’s acquisition of grammar, in the metrics of MLU in early childhood, appears to be unaffected by maternal education levels¹⁶. This is consistent with the observation that young children around the world, across diverse levels of maternal education, acquire their native languages usually without explicit teaching.

Mothers who spent more time with their child have demonstrated a better score in picture vocabulary test. This finding is same for all children of group 1 (children whose mothers have studied only up to high school) and group 2 (children s whose mothers have a minimum of college degree). Children whose mother had spent more than 5 hours had comparatively better vocabulary scores of **26.34** than who had spent less time. (**p<0.023**).

Table 1.3 Relationship between number of hours mothers spend with child and child’s vocabulary

Hours spent with child after work	N	Mean vocabulary scores	Std.deviation	"t"	p value
Less than 5 hours	71	24.80	3.124	-2.317	0.023
More than 5 hours	29	26.34	2.742		

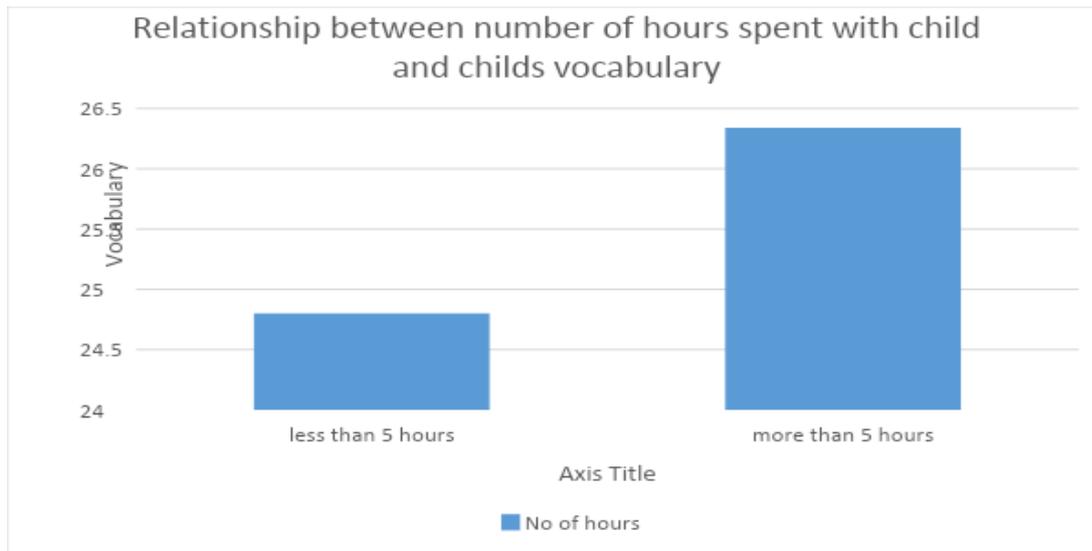


Figure 1.3- Graphical representation depicting relationship between number of hours mothers spent with child and child's vocabulary

It is seen in table 1.3 that irrespective of the mother's qualification and nature of their employment, the total number of hours they spent with their children everyday contributed majorly to child's vocabulary. 29 mothers spent more than 5 hours with their children per day and results showed a mean vocabulary score of **26.34** whereas 71 mothers spent less than 5 hours per day showing a mean vocabulary score of **24.80**. These results have a significant statistical difference ($p < 0.023$), indicating that the number of hours mothers spend interacting with their children is an important influencing factor in child's speech and language development. Marinella Majorano, Chiara Rainieri and Paola Corsano in 2013 conducted a study focusing on the characteristics of parent child-directed communication and its relationship with child language development. The characteristics of the maternal and paternal child-directed language (MLU and lexicon in Italian language) were analyzed. Significant differences between mothers and fathers in the quantitative characteristics of mean length of utterances (MLU) were noted. This indicates that children's MLU is majorly dependent on the quantitative and qualitative communication of mothers with them. Improved child's lexicon was seen because the number of words mother spoken to the child. This shows an establishment of clear relationship between the characteristics of maternal child-directed language and child language development¹⁷.

The finding of the present study reveal that the quality and quantity of mother-child interactions played a very important role in providing an enriching and stimulating

environment necessary for language acquisition, and this was reflected in the significant positive vocabulary score and improved MLU.

CONCLUSION

A significant statistical difference was seen in the mean scores between both the groups for picture vocabulary test. The children whose mothers have a minimum of college degree showed a better vocabulary score compared to children whose mothers have studied up to high school. No significant difference was seen in MLU between both the groups.

Another important finding from the present study is that the quality and quantity of mother-child interactions played a very important role in providing an enriching and stimulating environment necessary for language acquisition. So, it is important to recommend to the parents to spend more time interacting with their children, this could involve general conversation about daily routine, reading books together or simply playing with them.

REFERENCES

1. Hart B, Risley TR. The early catastrophe: The 30 million word gap by age 3. *American educator*. 2003 Apr;27(1):4-9.
2. Hoff E. How social contexts support and shape language development. *Developmental review*. 2006 Mar 1;26(1):55-88.
3. Van Kleeck A, Lange A, Schwarz AL. The effects of race and maternal education level on children's retells of the Renfrew Bus Story—North American Edition. *Journal of Speech, Language & Hearing Research*, 54(6), 1546-1561.
4. Burchinal MR, Campbell FA, Bryant DM, Wasik BH, Ramey CT. Early intervention and mediating processes in cognitive performance of children of low-income African American families. *Child development*. 1997 Oct 1:935-54.
5. Entwislea DR, Astone NM. Some practical guidelines for measuring youth's race/ethnicity and socioeconomic status. *Child development*. 1994 Dec;65(6):1521-40.
6. Benasich AA, Brooks-Gunn J. Maternal attitudes and knowledge of child-rearing: Associations with family and child outcomes. *Child development*. 1996 Jun;67(3):1186-205.
7. Morisset CE, Barnard KE, Booth CL. Toddlers' language development: Sex differences within social risk. *Developmental Psychology*. 1995 Sep;31(5):851.

8. Pine JM, Lieven EV, Rowland CF. Stylistic Variation at the “Single-Word” Stage: Relations between Maternal Speech Characteristics and Children's Vocabulary Composition and Usage. *Child Development*. 1997 Aug;68(5):807-19.
9. Johnson CJ, Beitchman JH, Brownlie EB. Twenty-year follow-up of children with and without speech-language impairments: family, educational, occupational, and quality of life outcomes. *Am J Speech Lang Pathol*. 2010 Feb;19(1):51-65. doi: 10.1044/1058-0360(2009/08-0083). Epub 2009 Jul 30. PMID: 19644128.
10. Dollaghan CA, Campbell TF, Paradise JL, Feldman HM, Janosky JE, Pitcairn DN, Kurs-Lasky M. Maternal education and measures of early speech and language. *Journal of Speech, Language, and Hearing Research*. 1999 Dec;42(6):1432-43.
11. Qi CH, Kaiser AP, Milan S, Hancock T. Language performance of low-income African American and European American preschool children on the PPVT–III.
12. Rowe ML. A longitudinal investigation of the role of quantity and quality of child-directed speech in vocabulary development. *Child development*. 2012 Sep;83(5):1762-74.
13. Rice ML, Zubrick SR, Taylor CL, Hoffman L, Gayán J. Longitudinal study of language and speech of twins at 4 and 6 years: twinning effects decrease, zygoty effects disappear, and heritability increases. *Journal of Speech, Language, and Hearing Research*. 2018 Jan 22;61(1):79-93.
14. Arora S, Bharti S, Mahajan A. Evaluation of non-formal pre-school educational services provided at Anganwadi Centres (Urban Slums of Jammu City). *Journal of Social Sciences*. 2006 Mar 1;12(2):135-7.
15. Rice ML, Smolik F, Perpich D, Thompson T, Rytting N, Blossom M. Mean length of utterance levels in 6-month intervals for children 3 to 9 years with and without language impairments.
16. Rice ML, Spitz RV, O'Brien M. Semantic and morphosyntactic language outcomes in biologically at-risk children. *Journal of Neurolinguistics*. 1999 Jul 1;12(3-4):213-34.
17. Majorano M, Rainieri C, Corsano P. Parents' child-directed communication and child language development: a longitudinal study with Italian toddlers. *Journal of Child Language*. 2013 Sep;40(4):836-59.