

A Comparison of Verbal Skill and Cognitive Performance of Children Having High Educated Versus Low Educated Parents in Urban and Rural Context

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Submitted By

Ratan Kumar Sarkar

Ratanppg4@hotmail.com

Supervisor

Dr. M Quamrul Hassan

International Supervisor

Dr. Pia Rebello Britto

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TITLE

**A Comparison of Verbal Skill and Cognitive Performance
of Children Having High Educated Versus Low Educated
Parents in Urban and Rural Context**

Type of Thesis: This is a cross sectional comparative study.

Studied By

Ratan Kumar Sarkar

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Signature: 

DEDICATED

To my elder brother
Bimal Krishna Sarkar
Who provoked me to explore.

PREMEABLE

Early Childhood Development as a new concept that has grasped the attention and enthusiasm all over the world and has been roaming up in Bangladesh also. I had a keen inquisitiveness over this notion as it holds an imperative future implication in Bangladesh. Simultaneously I had a great thirst to get in touch with the international renowned teachers and facilitators. The MS in ECD course at BU-IED created the opportunity to have all the depicted areas in reality. So my first gratitude and thanks to all who contributed in creating the opportunity. Then I like to convey my love and gratitude to my two daughters and wife who sacrificed a lot in personal life to keep me in track of study.

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Executive Summary

Introduction

Parents' literacy levels are usually related to children's literacy development and parent-child engagement in literacy activities in the home has been found to help children develop oral language. The education level of parents denotes the capability of parents in providing deliberate support to their children. This study explored the relationship of the verbal skill and cognitive performance of children with the education level of parents in rural and urban residential context. The study targeted to know parents' level of education which is the base of the parent standpoint in providing deliberate inputs to the children for building verbal skill and developing cognitive performance. This endeavor would open the window focusing the depicted relationship between children development and parent education level.

Methodology

This is a cross sectional comparative study. Grasping the anticipated relationship the study compared the verbal skill and cognitive performance of children of low educated parents with that of high educated parents. The participants were 100 preschool age children, 49 from rural areas and 51 from urban areas. The participants were purposively selected from family of low and moderate level of socio-economic status in Dhaka city and Matlab sub-district. The WPPSI, an internationally renowned scale was used for measuring children's verbal skill and cognitive performance and a pre-tested questionnaire was used for getting socio-economic and demographic information. Data were collected by well trained data collectors and quality of data gathering was ensured. Anticipated correlation was explored through computing with data analysis tool SPSS.

Findings

The study children from the urban and rural areas were comparable in respect of age distribution, sex ratio, religion, parental education and also to a great extent in socio economic status. Children's mean (SD) score of verbal, performance and full scale IQ

were 83.13 (9), 80.23 (10.57) and 79.78 (10.46) respectively. The scores were 4-5 points higher ($p < 0.05$) among urban children than their rural counterparts. Children's IQ scores were found strongly correlated with fathers' and mothers' educational level individually. Fathers' education could predict 15.65%, 13% and 21% of Verbal IQ, performance and full scale IQ respectively. Mothers' education had stronger correlation with the IQ score than fathers' education. It contributed to 18.6% of variation in Verbal IQ, 15.6% of performance IQ and 23.5% of full scale IQ.

The impact of mothers' education on IQ scores is more prominent in rural areas than urban areas. The increase in IQ scores with increasing educational level is steeper in rural areas. Even Mothers' education of 5 years has significant effect on IQs compared to children of mothers with 0 year education. Again Education of 9 years + has also significant effect on enhancing IQs. Fathers' education has also linear relationship with IQ scores both in rural and in urban areas. The relation is more prominent in case of 0-5 years and again in 9 years + strata.

IQ scores also has significant linear relation with socio-economic status of parents, both in rural and in urban areas.

Children's verbal, performance and full scale IQ scores varied significantly with the duration of their pre-school study opportunity (p values were 0.001 – 0.004).

Conclusion

Parents' education level impacts on the development of children, particularly on verbal skill and cognitive development. Children acquire words and language from adults. Grasping the adult's tone and experiencing the situation, child become able to speak as per situation demands. Children from highly verbal professional families heard nearly three times as many words per week as children from low verbal welfare families. High level of education could enable the parents in providing inputs and making diversified examples. Children receiving high proportion of examples of language form gain knowledge of that form more rapidly than children who take delivery of ordinary input. Hence mothers' and fathers' education level have an effect on building verbal skill of children. Low socio-economic status is associated with lower language promoting experiences. Children living

in urban areas get more exposure to diversified situations, more learning opportunities than children from rural areas that affect their development.

The policy makers, educators and practitioners should think about raising parent education level to ensure scaffolding. Developmental opportunities for children in rural areas should be increased and interventions should be designed for ensuring child development. Children and parents should be raised up from poverty level. Nationwide parenting interventions should be initiated and development interventions have to begin from early years of life.

Key words

Verbal skill, cognitive performance, child development, high educated parent, low educated parent, rural area, urban area.

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Glossary of Terms

ARI – Acute Respiratory Illness

ECD – Early Childhood Development

ICDDRDB – International Centre for Diarrheal Disease Research in Bangladesh

IQ – Intelligence Quotient

SES – Socio Economic Status

SPSS – Statistical Package for Social Science

UNICEF – United Nations International Children Emergency Fund

WPPSI - Wechsler Preschool and Primary Scale of Intelligence

Chapter I : INTRODUCTION

1.1 Overview

1.1.1 General Overview

Development is the gradual acquisition of various skills on the part of growing child to adapt to the changing world so that he or she can contribute to self and the society. There are various aspects of child development, among which verbal and cognitive domains are crucial. For enhancing positive development in children, important elements include parents and environmental context. Parents' educational level seems to enable them to contribute to the child development. Also the environmental context including socio-economy, demography, residence etc. may create learning opportunity for the children to develop skills.

Parents are entrusted with the enduring task of getting their offspring ready for the next generation in which that generation, everything will eventually be fair and they can hopefully flourish (Bronstein, 2005). Parents' literacy levels are usually related to children's literacy development (Christian et al., 1998; Snow et al.1991). In addition, parent-child engagement in literacy activities in the home has been found to help children develop oral language (Burgess et al., 2002; Snow et al., 1998). As New York University Child Study Centre (NYU-CSC) denotes, the process of acquisition of cognition starts with exploration of the world by mouthing objects and gradually the exploratory techniques expands by imitating actions, manipulating objects, planning strategies to achieve something and gradually establishing more multifaceted cognitive accomplishments, where parent could play significant role in scaffolding and exploration. High level of education would make the parents capable in providing appropriate scaffolding.

1.1.2 Focus of the Study

Without knowing the parent perspective in providing inputs derived from parent level of education, for having development of language and cognition of children, the influencing factors of scaffolding by parents would not be comprehensible. Exploring the relationship among the verbal skill and cognitive development of children with parent level of education, the process of transferring skill would be explicit. This effort will open the window focusing the depicted relationship between language and cognitive performance of children and their parent education from urban rural areas.

1.1.3 Context of the Study Area

Bangladesh is a densely populated developing country where one third of the people are still under poverty line and children are dying of diseases such as diarrhea, acute respiratory illness (ARI), birth related complications, severe malnutrition, and neonatal tetanus. The hard reality is, the under- five mortality rate during 2002-2006 was 65 deaths per thousand live births and the infant mortality rate was 52. 36% of infants are projected as low birth weight and 77% of them suffer growth retardation. Children with low birth weight due to intrauterine growth retardation are more susceptible to illness, and less likely to begin school on time. They perform poorly in school and are more likely to be low-achievers in life. The parents are mostly illiterate and or low educated living in villages and are deprived form contemporary science and technological information. Breastfeeding in Bangladesh is almost universal, but the rate of exclusive breastfeeding among children under 6 months of age is only 43%. A lot of mothers do not start breastfeeding right after delivery even though the breastfeeding promoting campaign was extensive.

The food consumed by most children and adults is not sufficient to promote healthy intake of multiple micronutrients (vitamin-A, iron, iodine and zinc). Child malnutrition makes children vulnerable to frequent attacks of infectious diseases, which in turn is disadvantageous to child development. Numerous children in Bangladesh are still suffering in food-insufficiency those children have been found to have significantly lower intakes of folate, vitamin C, carotene, fiber, and carbohydrates and a higher prevalence of iron deficiency. Food-insecure children perform less well on academic achievement test and food insecurity is associated with iron deficiency anemia leads to poor attentiveness, memory problems, and poor academic performance in the areas of vocabulary, reading and

knowledge which is a general phenomenon in Bangladesh.

Bangladesh has been ranked 57 out of 100 countries in how young children below 5 years of age are prepared to succeed in school (Save the Children, 2009). The Knowledge, Attitude and Practices Survey of Caregivers (UNICEF, 2001), found that 50% of rural mothers do not know the importance of fostering curiosity and self-confidence in a child.

1.2 Background and Literature Review

1.2.1 Oral language and cognitive development of young children

Around the world babies use single word to label, inquire, demand, and insist; arrange and accumulate words together in novel combinations; and master the key elements of Grammar in a similar pattern and on a similar timeframes. Majority of children learn language in just three or four short years, to use words with specificity and keenness in all of these ways. The process of language development is predisposed by at least five fields of determining factors are social, perceptual, cognitive processing, conceptual and linguistic (Johnston, 2005). At the same time, the cognitive development proceeds during the first five years exceed that of any other phase of life. The cognitive capacity of children rapidly develops due to dramatic growth of brain that enables them to become intellectually curious and creative thinkers.

Children grow up in family environment and learn language proximally from parents and they explores environment with the support from parents that build cognition. Parents and caregivers engage babies in relationship-building communications and speak to them in ways that build language (Bardige & Bardige, 2008). All the children of age group 4 to 5 years are virtually have achieved an amazing language competence (Browne, 2001). The average 5 year old children had known a lot of vocabulary that has been revealed in studies of the vocabulary development. A child of this age knows at least 2000 words and may know over 10,000 (Crystal, 1987). While accumulating this extensive vocabulary, most of the young children could possess most of the phonemes or sound units of the speech used in their home or community. Having speaking competency simultaneously, young learners become competent listeners and with this ability they grasp new words from adults especially from parents as they spend most of the time around parents. Listening provide

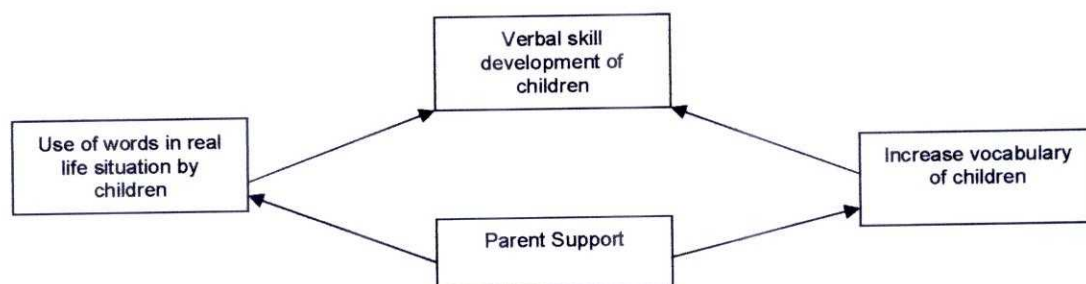
children clues about the sounds and sound combinations which are used to form acceptable words and provide children with an understanding of how sentences are formed.

So, parent's conversation with children, spend time with them would be significant in achieving verbal skill of children simultaneously it would help children in achieving their cognitive competence. There would be difference in child's language development if parents vary in the way they chat and amount and style of converse with the child about events and objects in the environment (Keown, Woodward & Field, 2002; Hart & Risley, 1995). In addition, there might be differences in using words and sentences by the children living in rural and urban context and their cognitive performance might vary also.

1.2.2 Influence of parents in forming words and accuracy

Children language development starts in family environment that help him or her to communicate with outside world. Children learn language mainly from their parents, so the language used by the parents influence the language development process of the children. Parent's vocabulary, trend of use of words, and scaffolding in constructing language shape up the language skill of children. The education level of parents could contribute to their children's vocabulary and framing words in sentence formation. As Wagner, Torgesen & Rashotte (1994) shown, mothers having fewer years of education read to their children less frequently (Scarborough & Dobrich, 1994). Mothers having low level of education exhibit less sophisticated language and literacy skills themselves (Rowe, Pan & Ayoub, 2005) and that influences the quantity and quality of mothers' verbal exchanges with their children (Hoff, 2003; Arriaga, Cronan, Fenson & Pethick, 1998). In addition to that parental education conversely relates to household income, and parents living in poverty have children who are at risk for cognitive, academic and social-emotional problems (Brooks-Gunn & Duncan 1997; Macloyed 1998). The way the adult especially parents and care givers responses provide a basis on which children can build vocabulary that sounds increasingly like that of adults. Gradually children begin with increasing accuracy, to imitate the articulation of sounds that they hear others use, especially by their parents. In course of time, children's communications increasingly resembles the words and phrases used by the adults around them. When children's utterances, that transmits meaning (Brown and Belugi, 1966), the typical adult response to an utterance is to acknowledge the meaning. In such context parent could play a vital role

in helping children build more meaningful phrases. As a consequence adults and more prominently parents interpret, repeat, support, extend and provide models of speech for children as they communicate with them (Browne, 2001). Evans et al. (2004) detected parents support in a study that revealed as ‘graphophonemic’, in which parents rated phonics, sounding out words, and using books with structured vocabulary and familiar spelling patterns were among the most important issues. Parents expose the child to full range of purposes and models of language that are used in the child’s environment. Children turn out to be increasingly proficient in their language use as they are exposed to more language and are supported in their production.



Keeping all these in view, the input provided by the parent to the children for language development of their children is prime importance and that input has been derived from their everyday life as well as driven by their education which encompasses the language enriching process of the parents.

1.2.3 Theoretical ground of language acquisition and support from parents

According to behaviorist theory, the process of learning is seen to be shaped and controlled from outside the learner by a process of reinforcement. As per this process the correct responses are rewarded and wrong ones are ignored or penalized in other ways and learning are achieved (Whitehead, 2004). But closer observations and reflections on the behavior of infants and adults indicate that there are serious limitations to the traditional behaviorist view. The actual truth of a child’s statements is more likely to be monitored and corrected by parents and adults than are grammatical or phonological accuracy. Parents and other adult care givers do not settle down at any point to teach young infants to speak, but let alone to understand the language system and majority of parents do not hold such capabilities in providing deliberate support (Whitehead, 2004). Chomsky (1957) challenges behaviorism and provokes Nativist approaches. As per the nativist view,

children are pre-programmed to learn a language and are highly sensitive to the linguistic features of their environment. Chomsky accentuates both the process of maturation in children's linguistic development and the essentially creative nature of all human language use. But cognitive psychologists criticized the Chomsky's preoccupation with the structures of language, and language development was seen from this perspective to be part of general cognitive development. In late 1970s and 1980s developmental psychologists begin to reassert the importance of the role played by adult and child relationship in learning. So, it is parent's responsibility to scaffold children for their language development that Vigotsky (1986) emphasized and as per social- interactionist approaches the interaction and support from adults enable children to acquire language competency. Bruner (1983) expounds this notion in an interesting way that the infant's language-learning capacities could not function without the help from adult who provide a language acquisition support system and scaffold the child's entrance in to a language. This detection amends the traditional cognitive view that denotes the prior general thinking and language skill. Actually children establish themselves as language users in close partnership and collaborations with compassionate adults and other children and primarily this is parent's responsibility to help them in acquisition of language competency.

1.2.4 Theoretical bases of cognitive development

As history illustrate, the cognitive development of children has been studied in a multiplicity of ways. The very first approach of mapping cognitive development through intelligence test pioneered by a French model in 1905 and from this model American psychologist Lewis Terman adopted widely used Stanford Binet Intelligence Quotient test for use in 1916. Moving up from this intelligence test, the learning theory evolves out of work by behaviorist researchers like John Watson and B. F. Skinner, who articulated that children are completely malleable. The most renowned and influential theory of cognitive development has been established by Swiss psychologist Jean Piaget. Piaget envisaged a child's knowledge as constructed of schemas, which are basic units of knowledge used to organize past experiences and serve as a basis for understanding new ones. Schemas are continually being modified by two harmonizing processes that Piaget termed assimilation and accommodation. The most important attribute of Piaget's theory is the principle that cognitive development occurs in a series of four distinct, universal stages, each

characterized by increasingly sophisticated and abstract levels of thought. The four stages are –

- Sensorimotor stage: There are six sub-stages of this period. In this period intelligence is demonstrated through motor activity without the use of symbols.
- Preoperational stage: Two sub-stages, intelligence is demonstrated through the use of symbols, but thinking is done in a non-logical, non-reversible manner.
- Concrete operational stage: intelligence is demonstrated through logical and systematic manipulation of symbols related to concrete objects.
- Formal operational stage: In this stage, intelligence is demonstrated through the logical use of symbols related to abstract concepts.

There are challenges in Piaget's theory, it is 'domain general', predicting that cognitive maturation occurs concurrently across different domains of knowledge. Recent cognitive developmentalists have been much predisposed by trends in cognitive science away from domain generality and towards domain specificity or modularity of mind, under which different cognitive faculties may be largely independent of one another and thus develop according to quite different time-tables. In addition to that Vigotsky and Bruner emphasized more on language differently from Piaget. Lev Vigotsky added social support naming with the term *Scaffolding* as per the development level of the child naming *Zone of Proximal Development*. Ecological Systems Theory is another recent challenge to Piaget's theory which is based on the contextual influences in the child's life like his/her immediate family, school, society and the world, and how these impact the child's development.

In contemporary world, the most noteworthy substitute to the work of Piaget has been the information-processing approach, which uses the computer as a model to provide new insight into how the human mind receives, stores, retrieves, and uses information. Recent research and theory in cognitive neuroscience have produced insights into how the development of the brain, especially the cerebral cortex, relates to thinking and learning (Fischer & Rose, 1996; Thatcher, 1994). Present work with the rich biological concept of a recurring growth cycle: both behavior and the brain change in repeating patterns that seem to involve common growth cycles (Case, 1991; & Fischer, 1980). Development involves a

long series of new levels, each constructed independently in parallel for each strand or domain (Fischer, 1980). Contemporary discoveries about the brain functioning have led to the first evidence of recurring cortical growth cycles. The striking parallels of these cortical cycles with the cognitive developmental cycles for levels and tiers are the amazing thing (Fischer & Rose, 1996; Matousek & Petersen, 1973). Another important factor environment plays a greater role than genetics, unlike the theory of Arnold Gesell suggested. According to Zigler, director of the Bush Center for Child Development and Social policy at Yale University, getting children to use their genetically determined intelligence optimally is the way to improve achievement.

1.2.5 Stages of speech and language development and parental involvement

Language acquisition is a continuous process and it could not be acquired overnight and consequently the development process evolved with stages. But obviously language is not accumulation of labels (Whitehead, 2004) and the complex interdependent elements of language are phonology, syntax, semantics and lexis. Enormous evidence record that, the stages of early development of speech and language and the process are remarkably similar for any language (Harris, 1992; Karmiloff and Karmiloff-Smith, 2001; Nelson, 1992).

Marian R. Whitehead (2004) states the following stages and aspects of early speech and language –

- The production of language
- The understanding of language
- The functions of language

The significant lesson while child's language learning is that, learning to do things with other people is the basis of learning to do things with words (Austin, 1962). These sorts of learning are essential parts of what it means to be involved in human social interactions, which are the best metaphor children have for early language acquisition that of a human conversation. In first stages of verbal skill acquisition, gesture is imperative and children imitate in communication that contribute in their verbal language acquisition and meanwhile parents hold the responsibility to support the process of communication with gesture. Throughout the first stages of verbal skill development, language always goes together with the child's play and gradually children dispose of their own gestures in favor

of the fashionable use of verbal language, when they can manage it in a more grown-up way (McCune, 1981; Meltzoff & Moore, 1977).

1.2.6 Variation of verbal skill and cognition in urban and rural areas

In different subculture like urban versus rural within same nation (Italy) mothers talk to their language-acquiring children in different ways, reflecting the ideologies of child rearing attributes of their particular culture (Camaioni, Longobardi, Venuti, & Borstein, 1988). In variety of cultures, including Japanese, Korean, Italian, and Israeli, the urban parents from academic and middle class use child-centered speech style; where as the parents in rural are more directive in speech style (Hoff-Ginsberg & Tradif, 1995). There are many examples of language variation due to cultural difference like rural and urban. In Samoa, during first six months infants are 'spoken to' in songs & adults do not simplify their speech towards infants as they are treated as low-ranking individuals (Ochs Schieffelin, 1984). Mothers and care givers of Kulali people in Papua New Guinea do not use "baby talk" lexicon with children as they consider it is not a good idea to teach children childish forms. In African rural societies like Senegal, mothers think that children should not be communicated like adults.

Urbanization influence in cognitive growth on a much broader scales (Greenfield, Reich & Oliver, 1966), so rural-urban contextual difference is significant in cognitive development of children. The factors which influence cognition in urban more than rural areas are derived from a differential exposure to problem solving and communication in situation (Entwisle, 1967). Bruner and his co-workers found strong rural-urban differences; and minimal differences between urban groups and inter-cultural differences appear small when degree of urbanization is held constant. Urbanization creates opportunity to exposure of many things significantly diversified communication and mass media (TV) that affect verbal skill (Entwisle, 1967).

1.3 Rationale

The general concept is, educated parents provide proper scaffolding in development of the children. But low educated parents may not scaffold effectively. High educated parents

could be rich in vocabulary, experience and information in problem solving and cognition. They may have skill in constructing diversified form of sentences, could grasp tools and techniques of cognitive development and thus they would help the child in learning new words and cognitive performance and use of it. But the fact is, both educated and non-educated parents in Bangladesh are not well informed about language and cognitive development of children. Among the literate person, very few people are conscious to know about contemporary issues or scientific information. So, the development of children particularly cognitive and language development is far beyond the interest of knowledge. Either the people in rural and urban or low and high educated parents do not know the process of language and cognitive development and how to support children in developing their verbal skill and cognitive performance. Hence, parent's education may affect the acquisition of verbal skill and cognitive performance of children and there might have difference of verbal skill and cognitive performance of children having high educated versus low educated parents. Simultaneously, there might have difference of verbal skill and cognitive performance of children living in urban and rural context.

Enormous studies on the relationship between parent education and children's language and cognitive development have been conducted in abroad but no such studies have so far been conducted in Bangladesh. The only organization which conducted researches in language and cognitive development of children in Bangladesh is International Centre for Diarrhoeal Disease in Bangladesh (ICDDR). But these are not enough to know about language development and cognitive performance of the children having parents of high versus low educated parents and living in urban and rural context.

This effort would explore the relationship of parent education and cognitive and language development of children. In Bangladesh perspective, such study has not been conducted so far and thus created a demand. Keeping this situation in mind, this research would add value in grasping the verbal skill and cognition of children and making comparison between home environments. The information for further scale up research for grasping the information in wider scale and thus it would be contributory in national level.

1.4 Operational Definition

Verbal skill – The oral expression capacity of a person is verbal skill. Gradually the process of gathering words and learning the formation of sentences enable themselves in

expressing their feelings and thoughts and thus the verbal skill develops. Verbal skill have been measured by computed verbal score through “Information” (34 questions), “Vocabulary” (25 questions) and “Comprehension” (20 questions) Sub-test of WPPSI. Score obtained per item (0, 1, 2) have been summed up and finally verbal score have been measured.

Cognitive performance – Due to acquisition of cognition, children could perform activities, solve problems and draw inference as per situation demands. Children could perform complex activities depends on how much the higher cognition has been gathered. So, the accomplishment of activities using the cognition is cognitive performance. Cognitive performance have been measured by computing cognitive score through “Block Design” (20 items), Matrix Reasoning” (29 items) and “Picture Completion” (32 items) Sub-test of WPPSI. Calculation of score obtained from items show the achieved Cognitive Performance of a particular child.

Education of parents – In this study, education of parents has been defined by year of schooling which is used as continuous data. Further, it has been segregated into educational classes to use as categorical data.

Urban – The selected areas of Dhaka city has been considered as urban areas.

Rural – The villages of Matlab sub-district has been considered as rural areas in this study.

1.5 Research Question

Whether the verbal skills and cognitive performance of children, has any association with education of parents; and whether the verbal skill and cognitive performance of urban children differ from those of rural children aged 5 – 6 years.

1.6 Objective of the Study

The objectives of the study are -

Objective 1: To find out any association between verbal skill of children with educational level of their parents.

Objective 2: To explore any relationship between cognitive performance of children with educational level of their parents.

Objective 3: To compare verbal skills of children living in urban and rural areas.

Objective 4: To compare cognitive performance of children living in urban and rural areas.

Chapter II : METHODOLOGY

2.1 Introduction

The aim of the study is an in-depth probe of relationship between education of parents and children's advancement in verbal and cognitive development. This chapter presents the research question, approach and methodology. This chapter also describes the development of the instruments, the sample design and the report preparation process.

2.2 Design of the study

This is a cross sectional comparative study.

2.3 Target population

There were 2 sets of target population –

1. Children aged 5-6 years living in urban area and having varied socio economic and educational background of parents
2. Children aged 5-6 years living in rural area and having varied socio economic and educational background of parents

2.4 Sample size

Intended sample size was approximately 50 children in each group from urban and rural. Hence total sample size is $50 \times 2 = 100$ children and their mothers and fathers.

2.5 Sampling strategy

Purposive convenience sampling has been used to meet the objectives of the study. To get desired samples in urban area, for comparatively better educated and better socio-economic group, two primary schools at Agargaon and Mohammadpur were selected purposively; 2 other schools in Vasantek area having play group was selected for lower socioeconomic group of children. As our intended age group is very narrow at 5-6 yrs, we had to take 4 schools.

In rural area, villages of Matlab sub-district and Municipal area have been selected purposively and children of 5 – 6 years age group have been identified. For better-off children, municipal area has been selected and for lower socio-economic group, 2 villages have been selected. Children of 5-6 years age group have been identified using ICDDR,B database.

Inclusion criteria: The children have been included from low to moderate socio-economic family status of urban and rural context.

Exclusion criteria: Obvious mentally retarded and short of hearing children have been excluded from the study. Very sick children who have not been able to take the WPPSI test have been excluded.

2.6 Data collection

In all study areas, information have been collected on the following variables -

- a. Family profile – Socio-Economic context, Mother's education.
- b. Child's verbal skill
- c. Child's cognitive performance

2.7 Data collection tool

For Family profile, a pre-tested structured questionnaire has been used. Before using this tool, it has been tested in the field and feedbacks have been collected from concern level. Accommodating the observations, the questionnaire has been modified and retested in the field. After getting the observation for second time and improving it, the tool was validated by concerned experts. Having all these suggestions and brushing up for third time the tool has been finalized for collecting data.

For verbal skill and Cognitive performance: The verbal skill and cognitive performance of children were measured using the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) developed by David Wechsler in 1967. The children were assessed on the Wechsler Preschool and Primary Scale of Intelligence 3rd edition (WPPSI) (Lichtenberger, Kaufman 2003). The WPPSI has been used in Bangladesh and is suitable for children from 2.5 years. It has two age bands, 2:6 to 3:11 years and 4:0 to 7:3 years. The scores form a performance and verbal quotient and a global IQ. The WPPSI-III is composed of 14 subtests. The measurement scale is internationally reputed and has been reliable and valid from community perspective (ICDDRDB used this tool in a project from 2007 to 2009). Measuring the verbal skill and cognitive performance using the scale, quantitative data have been collected and gathered for analysis. Mothers' and fathers' education level and other family information have been collected through questionnaire. Overall this design has been appeared more or less strong. The measurements showed good reliabilities for assessing the verbal skill of the children and making a comparison.

2.8 Data collection process

Two data collectors were hired for data collection. The collectors are well trained and experienced and well reputed regarding this field. The data collectors got theoretical as well as practical training from ICDDRDB. While participating in training they have to use WPPSI in collecting data under a direct supervision and facilitation of Psychologist, expert of WPPSI. After training they gathered experience using the same tool for two years. The information on verbal skill and cognitive performance of the children has been collected through individual interview and performance activity. Family information and information on parents' education level have been collected through interview with pre-tested structured questionnaire.

Frequent supervision and monitoring have been paid by the researcher throughout the data collection process.

2.9 Data management and analysis

Data were collected and gathered for analysis. Collected data were checked for normal distribution and statistically analyzed with relevant analytical tool (SPSS) and intended

comparisons were made. Anticipated relationship have been explored from data and interpreted with due discussion and clarification.

2.10 Quality control and quality assurance

A close supervision was maintained during the data collection process. 10% of data were re-checked and inter-rater reliability was measured. Proper documentation of data collection process was strictly maintained. Missing and wrong entry of data were corrected.

2.11 Ethical consideration

Objective, purpose and benefit of the study had been clarified to the participant in the study especially to the parents. Summary of research proposal had been communicated in Bangla. Process, time and involvement of children and parents have been depicted. A statement ensuring ethical issues written in Bangla had been shown and read out to them and finally verbal and written agreement had been collected for their participation.

Chapter III : RESULT

Residence

This study has been carried out in Urban and Rural areas on 100 children. Three areas in urban site were selected – namely, Mohammadpur, Vashantek and Agargaon. Three areas in rural site namely Khadergaon, Daspara and Poipara under Matlab Upazilla (sub-district) were selected. The distribution of children by areas is shown in Table 1.

Table -1: Distribution of study children by location

Residence	Subjects	
	Frequency	Percent
Rural	49	49.0
Matlab		
Urban	51	51.0
Mohammadpur	6	6
Agargaon	19	19
Vashantek	26	26
Total	100	100.0

Children from rural and urban areas were similar in proportion, 49% children from rural areas and 51% children from urban areas.

Demographic Characteristics

Table - 2: Distribution of study children by age, sex, religion and residence

Parameters	No (%)		
	Residence		
	Rural	Urban	Total
AGE			
60 – 64 months	33 (67.3)	28 (54.9)	61 (61)
65 – 69 months	12 (24.5)	19 (37.3)	31 (31)
70 months and more	04 (08)	04 (7.8)	08 (08)
Total	49 (100)	51 (100)	100 (100)
SEX			
Boy	18 (36.7)	23 (45.1)	41 (41)
Girl	31 (63.3)	28 (54.9)	59 (59)
Total	49 (100)	51 (100)	100 (100)
RELIGION			
Muslim	47(95.9)	49(96.1)	96 (96)
Hindu	02 (04.1)	02 (03.9)	04 (04)
Total	49 (100)	51 (100)	100 (100)

Among 100 study children, 49 were from rural areas and 51 from urban areas. Among 49 rural children, 33 (67.3%), 12 (24.5%) and 04 (08%) children were in age group 60-64 months, 65 -69 months and 70 months or more respectively. Similarly, among urban children, 28 (54.9%), 19 (37.3%) and 4 (7.8%) children were in age group 60-64 months, 65 -69 months and 70 months or more respectively. The mean age (SD) of children in rural and urban sites were 64.9 (2.2) and 64.4 (3.3) mo respectively

Eighteen (36.7%) boys and 31 (63.3.1%) girls participated from rural areas. In urban areas, 23 (45.1%) boys and 28 (54.9%) girls participated in the study.

Among 100 study children, 47 (95.9%) were Muslim and 02 (04.1%) were Hindu in rural areas. In urban areas, 49 (96.1%) were Muslim and 02 (03.9%) were Hindu.

Pre-school study

Table – 3: Duration of Pre-school study of children by Residence using Chi-squared analysis

Duration in months	Residence		
	Rural	Urban	Total
<i>Nil</i>	36 (73.5)	04(7.8)	40 (40)
<i>1 - 6 months</i>	06 (12.2)	05 (9.8)	11 (11)
<i>7-12 months</i>	07 (14.3)	40 (78.4)	47 (47)
<i>13 – 18 month</i>	00 (0)	00 (0)	00 (0)
<i>19 – 24 months</i>	00 (0)	02 (4)	02 (2)
Total	49	51	100

$\chi^2 = 50.84, df = 3, p < 0.001$ for difference in preschool attendance between rural and urban children

Among 49 children in rural areas, 36 (73.5%) children had no preschool experience, 6 (12.2%) and 07 (14.3%) children had 1 – 6 months and 7 - 12 months preschool experience respectively.

Similarly in urban areas, 4 (7.8%) children had no preschool experience. 5 (9.8%), 40 (78.4%) and 2 (4%) children had 1 – 6 months, 7 - 12 months and 19 – 24 months preschool experience respectively. There is significant difference in pre-school experience of children of rural and urban areas ($p < 0.001$).

Parent's education

Mean (SD) year of schooling of mothers were 5.6 (4.2) years. It ranged from 0-16 years and median value was 5 years. Similarly, mean (SD) year of schooling of fathers were 6.1 (5.1) years. It also ranged from 0-16 years and median value was 5 years.

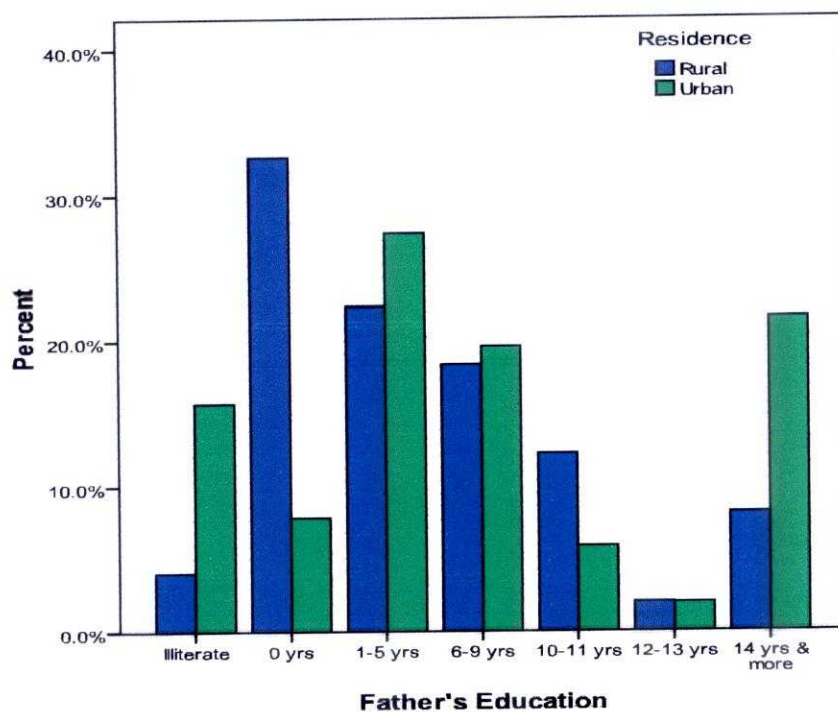


Fig 1 : Father's educational level and residence

Table 4 : Distribution of children by father's educational level and residence

Education level	Residence		
	Rural	Urban	Total
	No. (%)	No. (%)	No. (%)
<i>Illiterate</i>	02 (04.1)	08 (15.7)	10 (10)
<i>0 yrs</i>	16 (32.7)	04 (7.8)	20 (20)
<i>1 – 5 yrs</i>	11 (22.4)	14 (27.5)	25 (25)
<i>6 – 9 yrs</i>	09 (18.4)	10 (19.6)	19 (19)
<i>10 – 11 yrs</i>	06 (12.2)	03 (5.9)	09 (9)
<i>12 – 13 yrs</i>	01 (2)	01 (2)	02 (2)
<i>≥14 yrs</i>	04 (8.2)	11 (21.6)	15 (15)
Total	49	51	100

Fisher's Exact $\chi^2 = 16.4$, $df=6$, $p < 0.012$

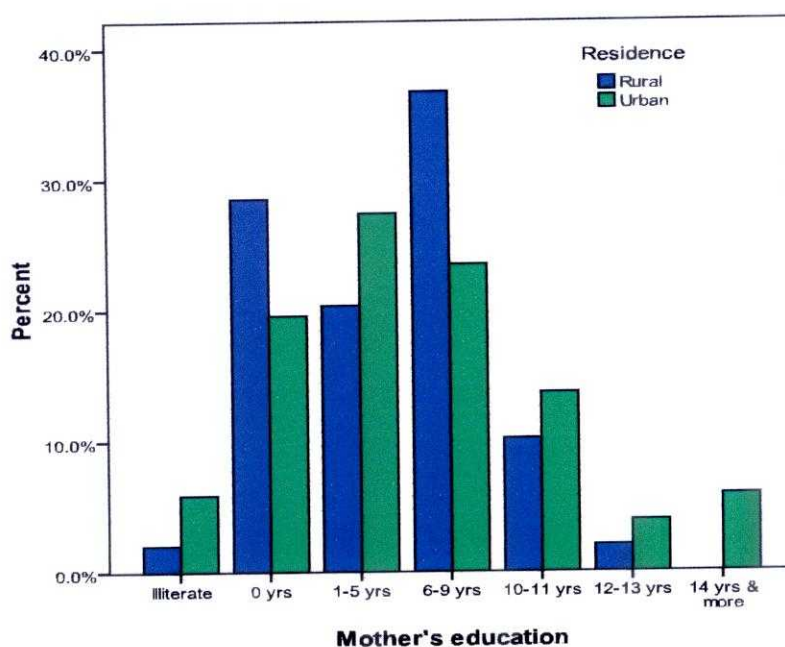


Fig 2 : Mothers' Educational Level by Residence

Table 5 : Distribution of children by Mothers' Educational Level by Residence

Education level	Residence		
	Rural	Urban	Total
	No. (%)	No. (%)	No. (%)
Illiterate	01 (2)	03 (5.9)	04 (4)
0 yrs	14 (28.6)	10 (19.6)	24 (24)
1 – 5 yrs	10 (20.4)	14 (27.5)	24 (24)
6 – 9 yrs	18 (36.7)	12 (23.5)	30 (30)
10 – 11 yrs	05 (10.2)	07 (13.7)	12 (12)
12 – 13 yrs	01 (2)	02 (3.9)	03 (3)
≥14 yrs	00 (0)	03 (5.9)	03 (3)
Total	49	51	100

Fisher's Exact $\chi^2 = 8.4$, $df=6$, $p < 0.211$

Socio Economic Status

Table 6: Family Income by residence

Residence	N	Std.		Median	Minimum	Maximum
		Mean	Deviation			
Rural	49	9990.00	9153	6500.00	3000	54000
Urban	51	7725.00	3683	7000.00	3000	20000
Total	100	8835.00	6983	7000.00	3000	54000

Table 7: Distribution of children by family income and residence

	Rural	Urban	P value
Mean (SD) Tk	9990 (9153)	7725 (3683)	
Median, Tk	6500	7000	
Up to Tk 4500	27%	22%	$\chi^2 = 5.2$, df=3 0.155
Tk 4501 to 7000	27%	31%	
Tk 7001 to 10700	16%	31%	
Tk > 10700	31%	16%	

Mean (SD) monthly family income were Tk.8835 (6983). It ranged from Tk 3000 - 54000 and median value was Tk.7000.

In rural areas, out of 49 families, 13 (26.5%), 13 (26.5%), 8 (16.3%) and 15 (30.6%) families had monthly income up to 4500, 4501-7000, 7001-10700 and > 10700 Tk. respectively. Among 51 urban children, 11 (21.6%), 16 (31.4%), 16 (31.4%) and 08 (15.7%) families had monthly income up to Tk. 4500, 4501-7000, 7001-10700 and above 10700 respectively.

Table - 8: Type of Housing materials

	Material	No. of Houses	Percentage
Roof			
	Tin	89	89%
	Cement	11	11%
Floor			
	Mud	62	62%
	Cement	37	37%
	Wood	01	01%
Wall			
	Tin	68	68%
	Brick	25	25%
	Bamboo	06	06%
	Others	01	01%

While observing table 7, we can assume the socio-economic status of the family. Among 100 families, 89 (89%) had tin shed roofs and 11 (11%) had cement made roofs. In 62 (62%) families floor was made of mud; in 37 (37%) and 01 (01%) it was made of cement and wood respectively. The wall was made of tin in 68 (68%) house; and of brick, bamboo and others in 25 (25%), 06 (6%) and 01 (01%) house respectively.

Table – 9: Mother's Profession by Residence

Mother's profession	No (%)		
	Residence		
	Rural	Urban	Total
House wife	46 (93.9)	46 (90.2)	92 (92)
Factory labor	01 (2)	01 (2)	2 (2)
Business	00 (0)	01 (2)	01 (1)
Day labor	00 (0)	02 (3.9)	02 (2)
Others	02 (4.1)	01 (2)	03 (3)
Total	49	51	100

In rural areas, 46 (93.9%) mothers' profession was house wife. 1 (2%) and 02 (4.1%) mothers' profession was factory labor and others respectively.

Similarly in urban areas, 46 (90.2%) mothers' profession was house wife. 1 (2%), 1 (2%), 2 (3.9%) and 1 (2%) mothers' profession was factory labor, business, day labor and others respectively.

Table – 10: Father's Profession by Residence

Father's profession	Residence		
	Rural	Urban	Total
House worker	02 (4.1)	00 (0)	02 (2)
Service	15 (30.6)	17 (33.3)	32 (32)
Teaching	01 (2)	00 (0)	01 (1)
Factory labor	01 (2)	02 (3.9)	03 (3)
Business	09 (18.4)	10 (19.6)	19 (19)
Day labor	06 (12.2)	14 (27.5)	20 (20)
Cultivate other's land	01 (2)	00 (0)	01 (1)
Others	14 (28.6)	08 (15.7)	22 (22)
Total	49	51	100

Among 49 fathers in rural areas, 2 (4.1%) fathers' profession was house worker and 15 (30.6%) fathers' profession was service. 1 (2%), 1 (2%), 9 (18.4%), 6 (12.2%), 1 (2%) and 14 (28.6%) father's profession was teaching, factory labor, business, day labor, cultivate other's land and others respectively.

Similarly among 51 fathers in urban areas, 17 (33.3%) fathers' profession was service. 2 (3.9%), 10 (19.6%), 14 (27.5%) and 8 (15.7%) father's profession was factory labor, business, day labor, cultivate other's land and others respectively.

Table – 11: Family Type by Residence

Family Type	Residence		
	Rural	Urban	Total
Nuclear	42 (85.7)	39 (76.5)	81 (81)
Joint	07 (14.3)	12 (23.5)	19 (19)
Total	49	51	100

$$\chi^2 = 1.39 \quad df=1 \quad p = 0.239$$

Out of 49 study children families in rural area, 42 (85.7%) families are nuclear family and 7 (14.3%) families are joint family.

Likewise in urban area, out of 51 families 39 (76.5%) families are nuclear family and 12 (23.5) families are joint families.

Table 12 : Socio-Economic Class by Residence

Socio-Economic Class	Residence		
	Rural No (%)	Urban No (%)	Total No (%)
<i>Class 1</i>	16 (32.7)	13 (25.5)	29 (29)
<i>Class 2</i>	13 (26.5)	11 (21.6)	24 (24)
<i>Class 3</i>	15 (30.6)	12 (23.5)	27 (27)
<i>Class 4</i>	05 (10.2)	15 (29.4)	20 (20)
Total	49 (100)	51 (100)	100 (100)

Socioeconomic class 1 is lowest quartile, 2 is 2nd quartile, 3 is 3rd and 4 is 4th quartile. Table 12 shows the distribution of families by socioeconomic class in rural and urban areas. Though purposively selected, there is no difference in distribution of socioeconomic classes in rural and urban samples in the study. ($\chi^2 = 5.8$, df 3, $p = 0.12$)

Children's IQ

Table 13: Verbal, Performance and Full scale IQ by Residence using t-test

	RESIDENCE			
	RURAL (n=49)	URBAN (n=51)	P value	ALL (n=100)
Verbal IQ, mean (SD)	81.2 (9.17)	84.98 (8.55)	0.036	83.13 (9.01)
Performance IQ, mean (SD)	78.04 (10.24)	82.33 (10.56)	0.042	80.23 (10.57)
Full Scale IQ, mean (SD)	77.24 (10.42)	82.22 (9.99)	0.017	79.78 (10.46)

Table 13 shows mean of different types of IQs by residence. Children's mean (SD) score of verbal, cognitive and full scale IQ were 83.13 (9), 80.23 (10.57) and 79.78(10.46) respectively.

Verbal IQ

Mean (and SD) of Verbal IQ of children from rural area is 81.2 (9.17), whereas urban children have 5 units higher IQ, 84.98 (8.55).

This difference is statistically significant ($t=2.13$, with $df=98$, $p=0.036$)

Performance IQ

Similarly, Mean (and SD) of Performance IQ of children from rural area is 78.04 (10.24), whereas urban children have above 4 units higher IQ, 82.33 (10.56).

This difference is statistically significant ($t=2.06$, with $df=98$, $p=0.042$)

Full Scale IQ

In full scale IQ, Mean (and SD) of children from rural area is 77.24 (10.42), whereas urban children possess IQ, 82.22 (9.99) which is approximately 5 units higher than that of rural children IQ.

This difference is statistically significant ($t=2.43$, with $df=98$, $p=0.017$)

There is strong Correlation among verbal, performance and full scale IQ levels of the study children indicating internal validity of the data. (table 14)

Children's IQ and Fathers' Education

Table- 15: Full scale IQ, Verbal IQ and Performance IQ of children by Father's educational level using ANOVA

Case Summaries				
Father's Education		Verbal IQ*	Performance IQ**	Full Scale IQ ^s
0 yrs	Mean	79.70	76.90	76.10
	Std. Deviation	7.699	11.634	11.276
1-5 yrs	Mean	83.84	81.24	79.96
	Std. Deviation	7.685	8.690	7.971
6-9 yrs	Mean	80.42	77.47	77.26
	Std. Deviation	7.358	7.982	7.964
10-11 yrs	Mean	85.44	82.44	82.33
	Std. Deviation	10.829	10.039	9.785
12-13 yrs	Mean	82.50	74.50	79.00
	Std. Deviation	17.678	13.435	11.314
14 yrs & more	Mean	91.13	89.27	90.47
	Std. Deviation	9.180	10.720	10.211
Total	Mean	83.13	80.23	79.78
	Std. Deviation	9.014	10.573	10.455

*F = 3.66 *p = 0.003 **F = 3.38, **p = 0.005 \$ F=4.87 \$p<0.001

The gradual increment of verbal IQ, performance IQ and full scale IQ with the increasing level of fathers' education is seen in table 15. The mean of verbal IQ, performance IQ and full scale IQ of the children were 79.70, 76.90 and 76.10 respectively when their fathers' level of education was '0' years.

Similarly the mean of verbal IQ, performance IQ and full scale IQ of the children were 91.13, 89.27 and 90.47 respectively when their fathers' level of education was 14 years or more.

ANOVA shows significant difference in variance of IQ Scores among fathers' educational levels.

Regression analysis shows that there is significant association between fathers' education year and children's verbal, performance and full scale IQ ($p < 0.001$).

Regression equation :

$$\text{VIQ} = 0.406 * \text{Education Year} + 78.8. \text{ Adjusted } R^2 \text{ is } 0.156$$

i.e 15.65% of variation in VIQ can be explained by Fathers' education.

Regression equation :

$$\text{PIQ} = 0.372 * \text{Education Year} + 75.6. \text{ Adjusted } R^2 \text{ is } 0.13$$

i.e 13% of variation in PIQ can be explained by Fathers' education.

Regression equation :

$$\text{FSIQ} = 0.476 * \text{Education Year} + 74. \text{ Adjusted } R^2 \text{ is } 0.21$$

i.e 21% of variation in PIQ can be explained by Fathers' education.

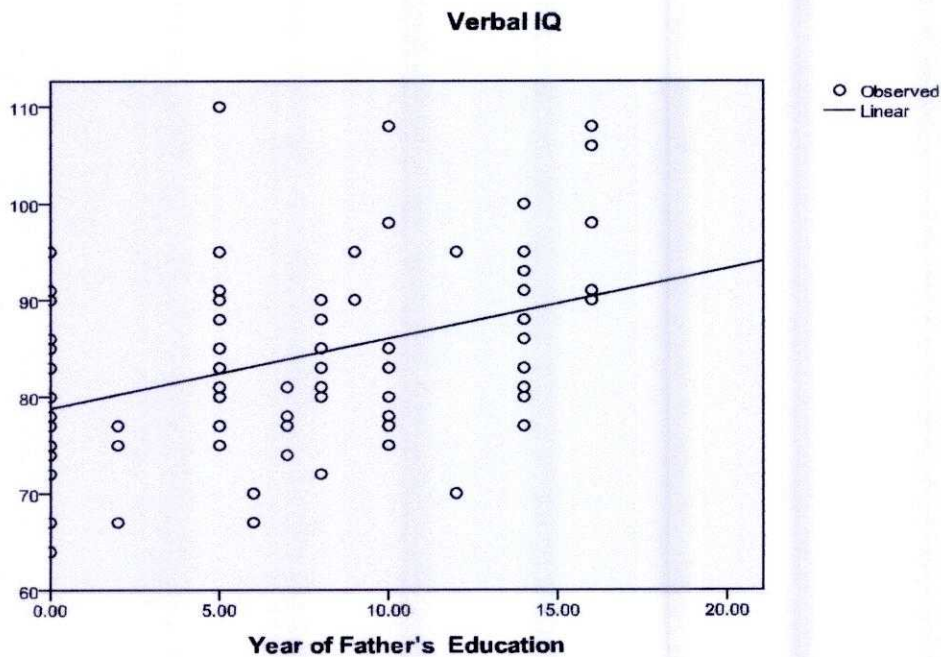


Fig 3 : Regression line of Verbal IQ vs. Fathers' year of education

Table 14 : Correlation among Verbal, Performance and Full scale IQ levels.

		Verbal IQ	Performance IQ	Full Scale IQ
Verbal IQ	Pearson Correlation	1	.728**	.888**
	Sig. (2-tailed)		.000	.000
Performance IQ	Pearson Correlation	.728**	1	.930**
	Sig. (2-tailed)	.000		.000
Full Scale IQ	Pearson Correlation	.888**	.930**	1
	Sig. (2-tailed)	.000	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

Correlation coefficient of verbal IQ versus performance IQ is 0.728 that of verbal versus full scale IQ is 0.888, performance IQ versus full scale IQ is 0.93. All these correlations are highly significant. (p=less than 0.001)

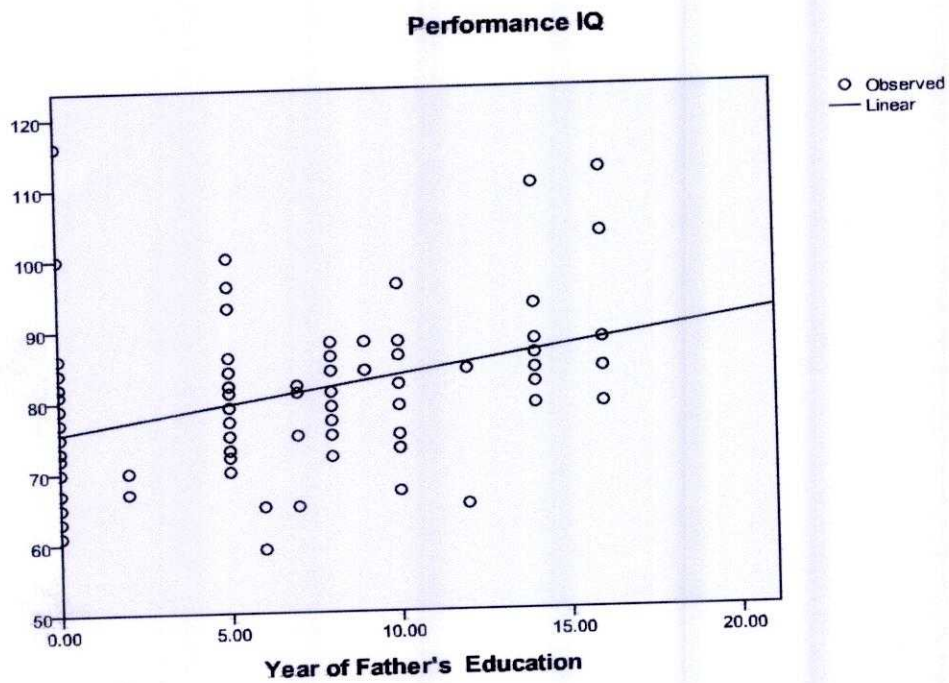


Fig 4 : Regression line of Performance IQ vs. Fathers' year of education

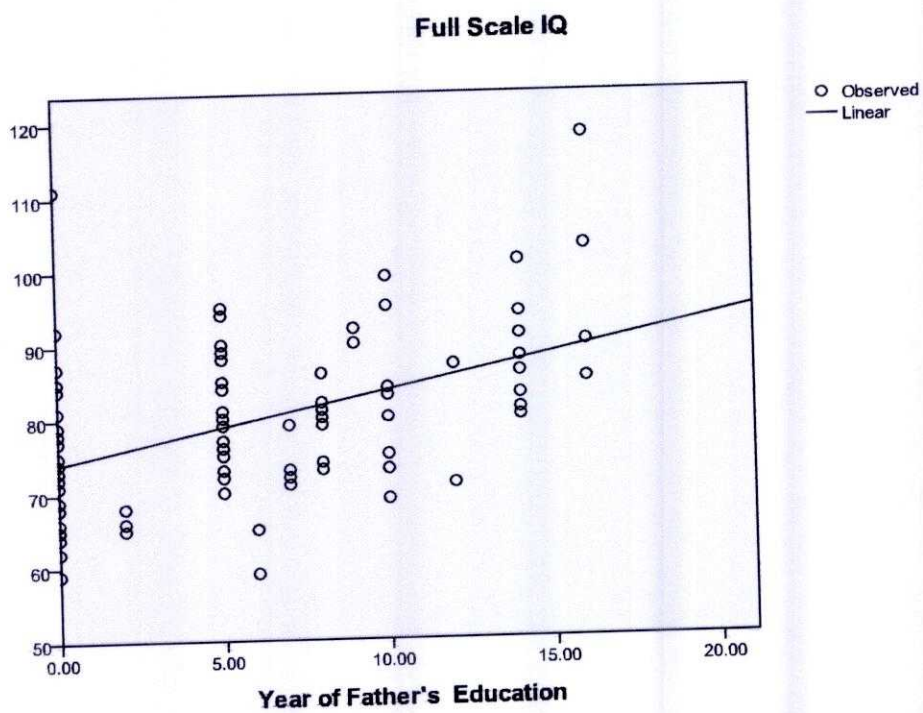


Fig 5 : Regression line of Full scale IQ vs. Fathers' year of education

Regression equation :

$$\text{VIQ} = 0.441 * \text{Education Year} + 77.9. \text{ Adjusted } R^2 \text{ is } 0.186$$

i.e 18.6% of variation in VIQ can be explained by Mothers' education.

Regression equation :

$$\text{PIQ} = 0.406 * \text{Education Year} + 74.6.$$

Adjusted R^2 is 0.156, i.e 15.6% of variation in PIQ can be explained by Mothers' education.

Regression equation :

$$\text{FSIQ} = 0.492 * \text{Education Year} + 73.$$

Adjusted R^2 is 0.235, i.e 23.5% of variation in PIQ can be explained by Mothers' education.

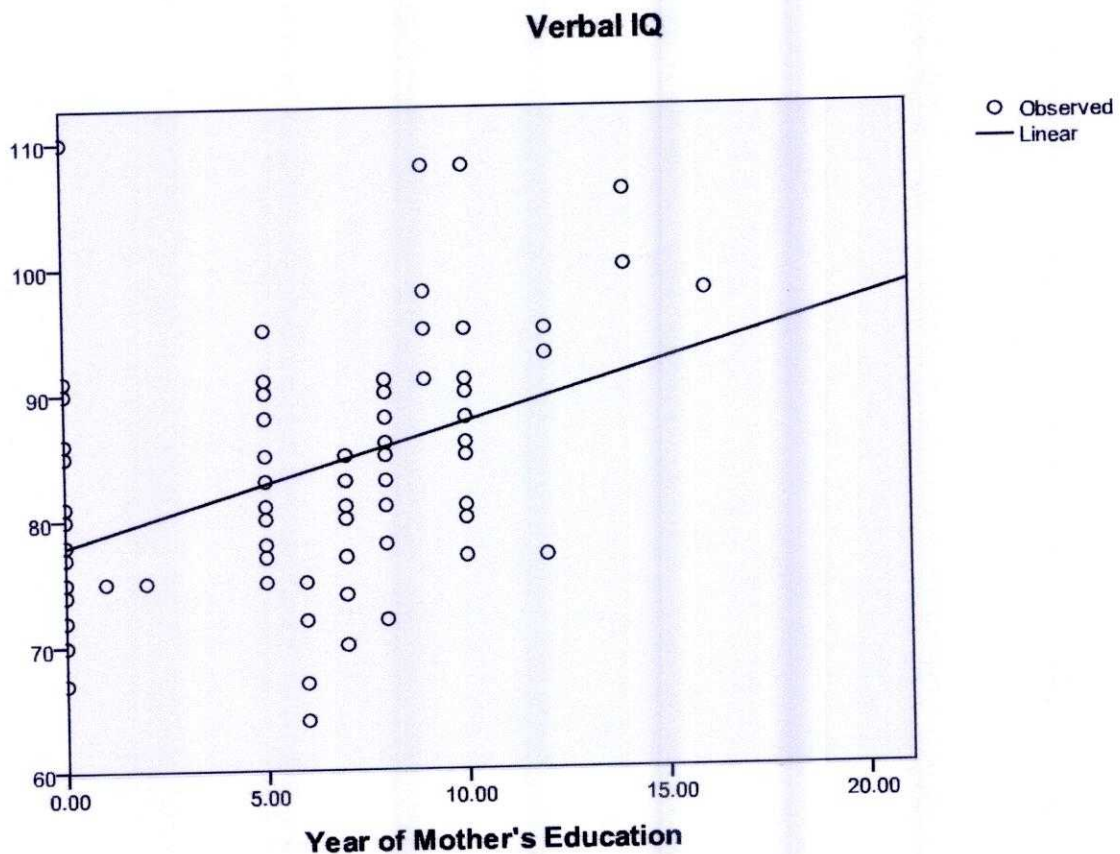


Fig 6 : Regression line of Verbal IQ vs. Mothers' year of education

Children's IQ and Mothers' Education

Table- 16: Full scale IQ, Verbal IQ and Performance IQ of children by Mother's educational level using ANOVA

Case Summaries				
Mother's education		Verbal IQ	Performance IQ	Full Scale IQ
0 yrs	Mean	79.88	74.79	74.04
	Std. Deviation	8.558	6.290	7.737
1-5 yrs	Mean	82.50	80.67	80.00
	Std. Deviation	5.469	11.173	9.601
6-9 yrs	Mean	82.00	80.60	79.50
	Std. Deviation	9.541	11.140	11.343
10-11 yrs	Mean	88.92	85.75	87.00
	Std. Deviation	8.295	10.297	8.410
12-13 yrs	Mean	88.33	83.00	85.33
	Std. Deviation	9.866	3.606	3.786
14 yrs & more	Mean	101.33	91.67	95.67
	Std. Deviation	4.163	12.055	6.658
Total	Mean	83.13	80.23	79.78
	Std. Deviation	9.014	10.573	10.455

Table 20 shows the gradual progression of verbal IQ, performance IQ and full scale IQ with the gradually increase level of mother education. The mean of verbal IQ, performance IQ and full scale IQ of the children is 79.88, 74.79 and 74.04 respectively when their mothers' level of education is '0' years.

Similarly the mean of verbal IQ, performance IQ and full scale IQ of the children is 101.33, 91.67 and 95.67 respectively when their mothers' level of education is 14 years or more.

Regression analysis shows that there is significant association between mothers' education year and children's verbal, performance and full scale IQ ($p < 0.001$).

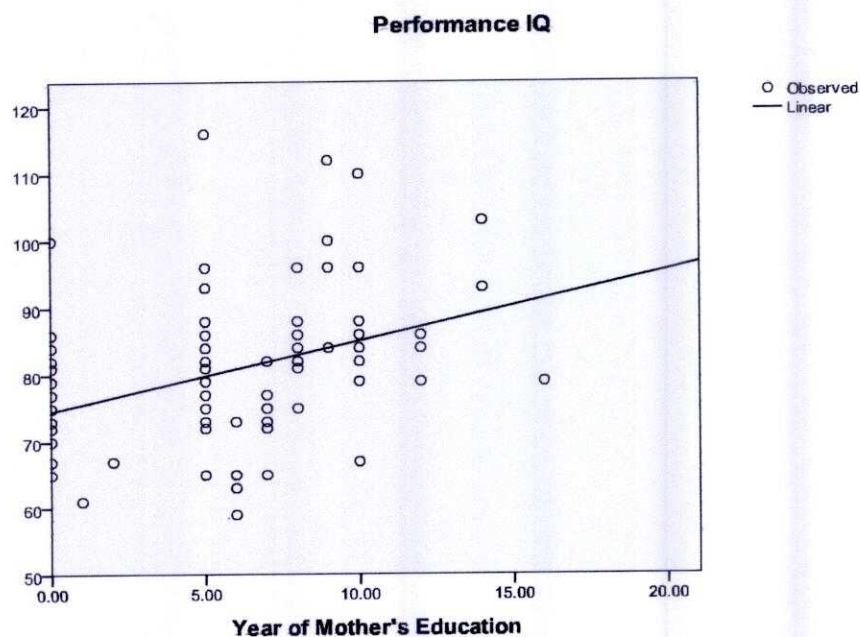


Fig 7 : Regression line of Performance IQ vs. Mothers' year of education

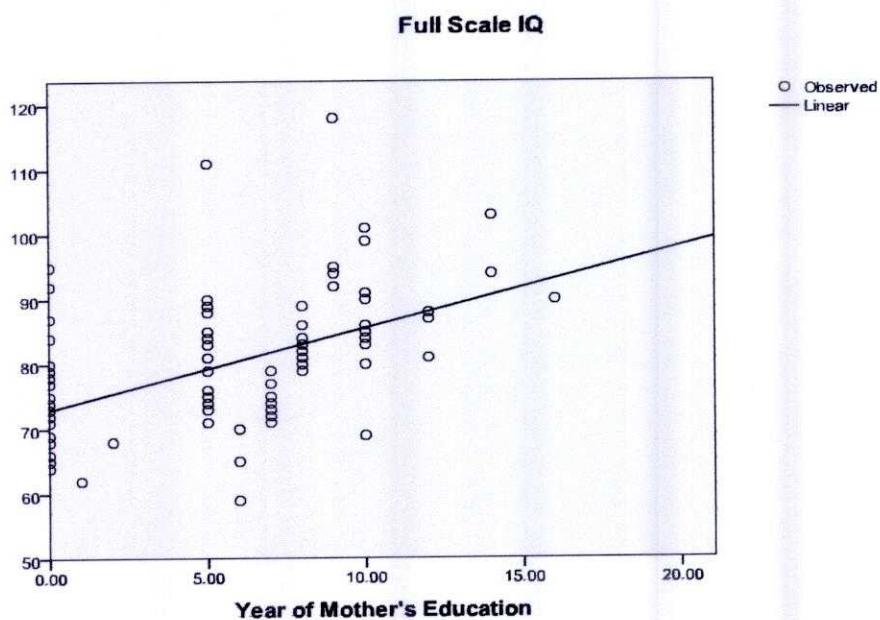


Fig 8 : Regression line of Full scale IQ vs. Mothers' year of education

Fig - 9: Children's Mean of Full Scale IQ and Mother's Education level

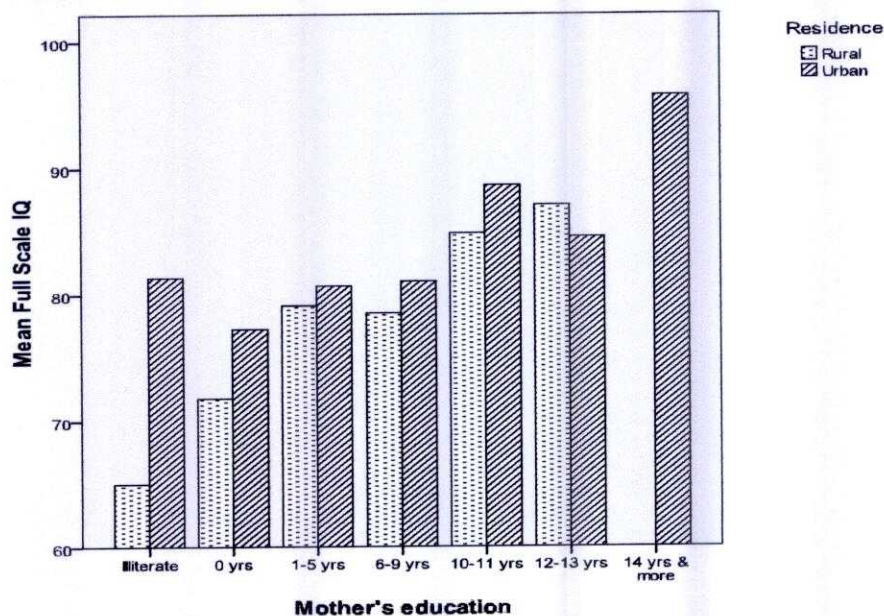


Fig - 9 shows the gradual increase of full scale IQ of children with the increase year of education of mother.

Simultaneously the graph shows the difference of children IQ between rural and urban. Urban children are comparatively higher than the rural children.

Fig - 10: Mean Verbal IQ by Mother's education category in rural and urban areas.

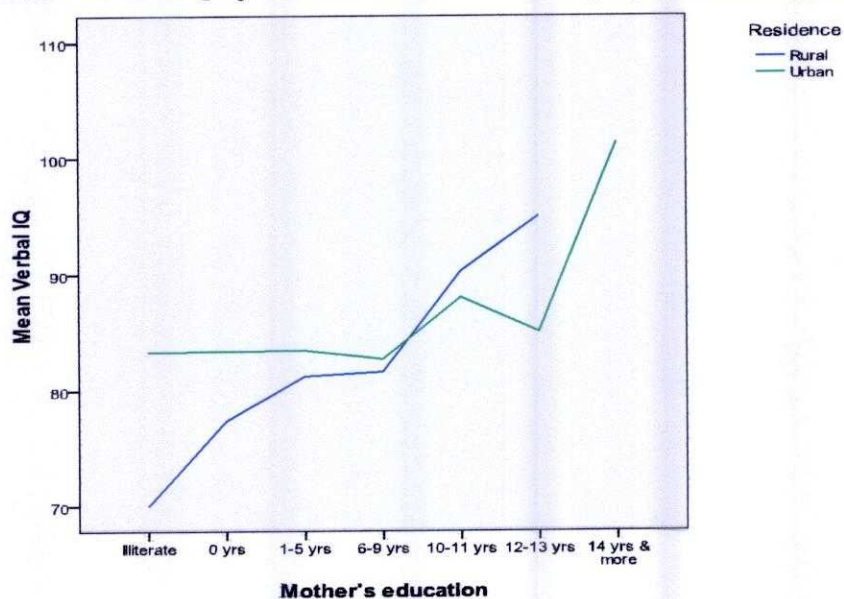


Fig 10: Mean of Verbal IQ by Mother's education category in rural and urban areas.

Figure shows consistently progression of mean of verbal IQ with increase of mothers' year of education in rural areas. In urban area, the mean is higher than rural area; but a bit inconsistent in 12-13 years of education of mother.

Graph -11: Mean of Children's Performance IQ and Mother's Level of Education

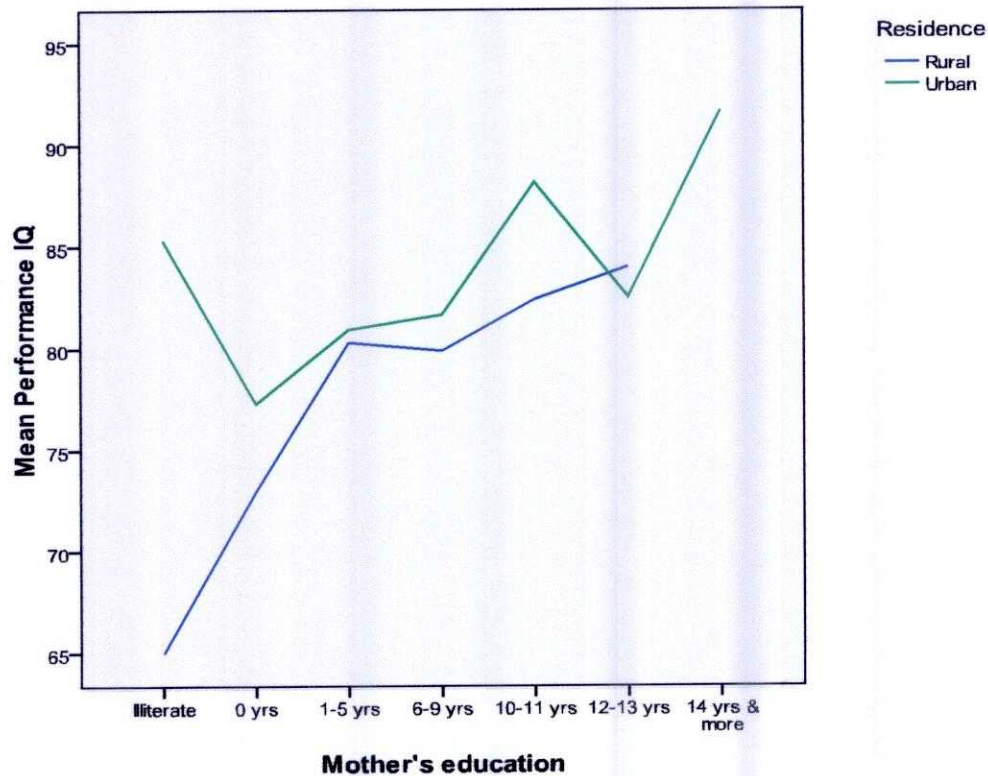


Fig : Mean of Performance IQ by Mother's education category in rural and urban areas.

Figure shows consistently progression of mean of performance IQ with increase of mothers' year of education in rural areas. In urban area, the mean is higher than rural area; but it is inconsistent in 12-13 years of education of mother.

Fig - 12: Mean of Children's Full Scale IQ and Mother's Level of Education

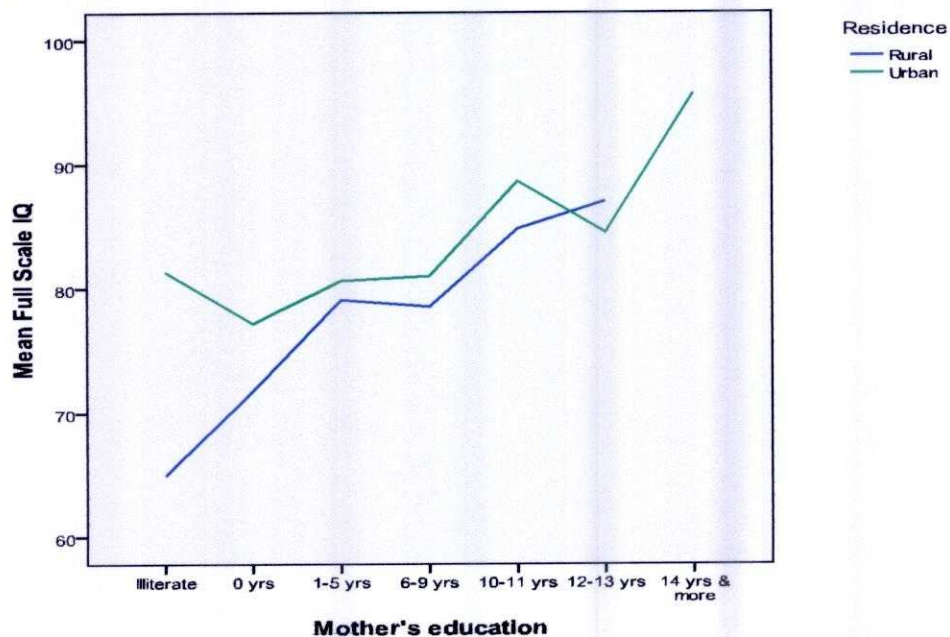


Fig : Mean of Full Scale IQ by Mother's education category in rural and urban areas.

Figure shows consistently progression of mean of full scale IQ with increase of mothers' year of education in rural areas. In urban area, the mean is higher than rural area; but a bit inconsistent in 12-13 years of education of mother.

Fig -13: Mean of Children's Full Scale IQ and Father's Level of Education

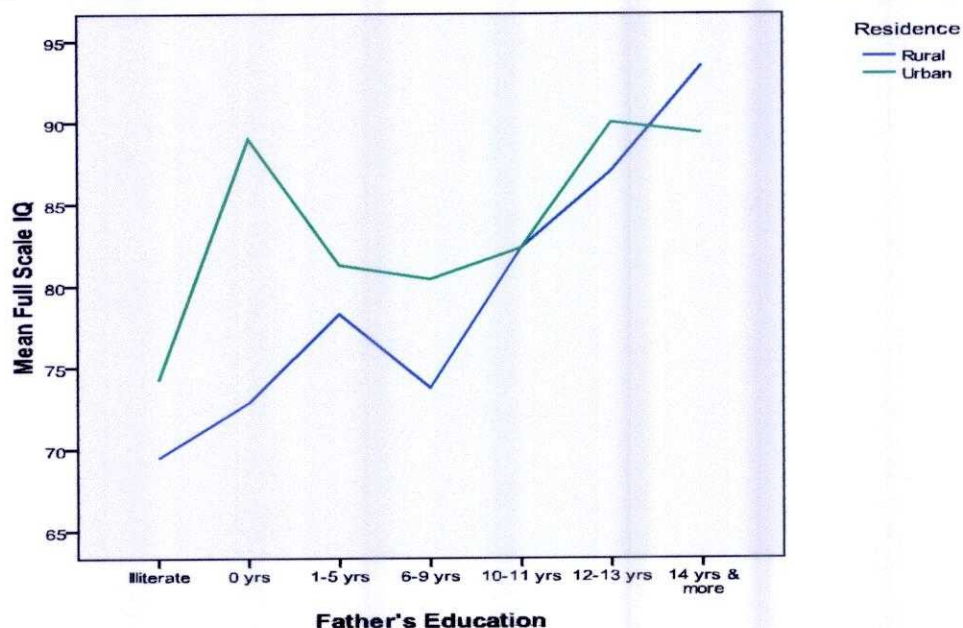


Figure shows consistently progression of mean of verbal IQ with increase of fathers' year of education in rural areas. In urban area, the mean is verbal IQ is inconsistent with increase years of education of father and in increase year of education the mean of verbal IQ is lower than rural area.

Fig -14: Mean of Children's Performance IQ and Father's Level of Education

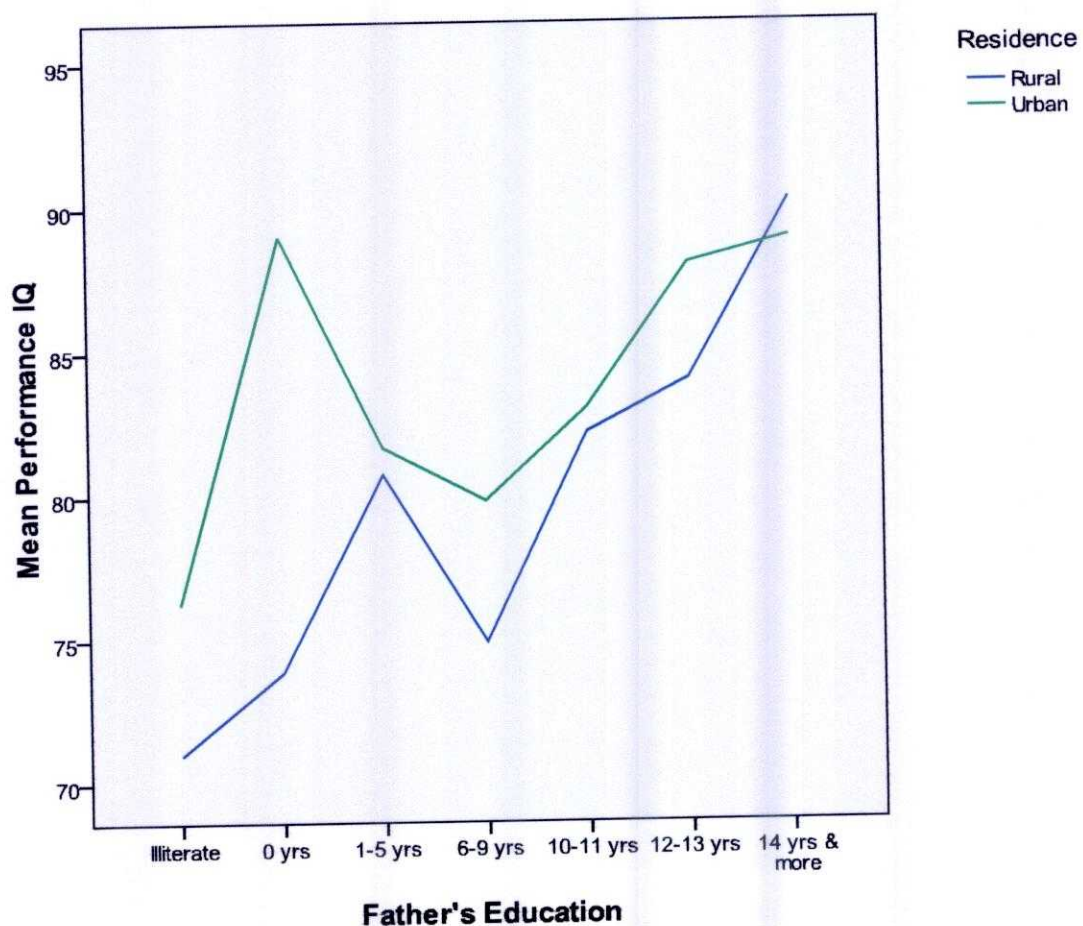


Figure shows consistently progression of mean of performance IQ with increase of fathers' year of education in rural areas. In urban area, the mean is performance IQ is inconsistent with 12-13 years of education of father.

Fig -15: Mean of Children's Mean Verbal IQ and Father's Level of Education

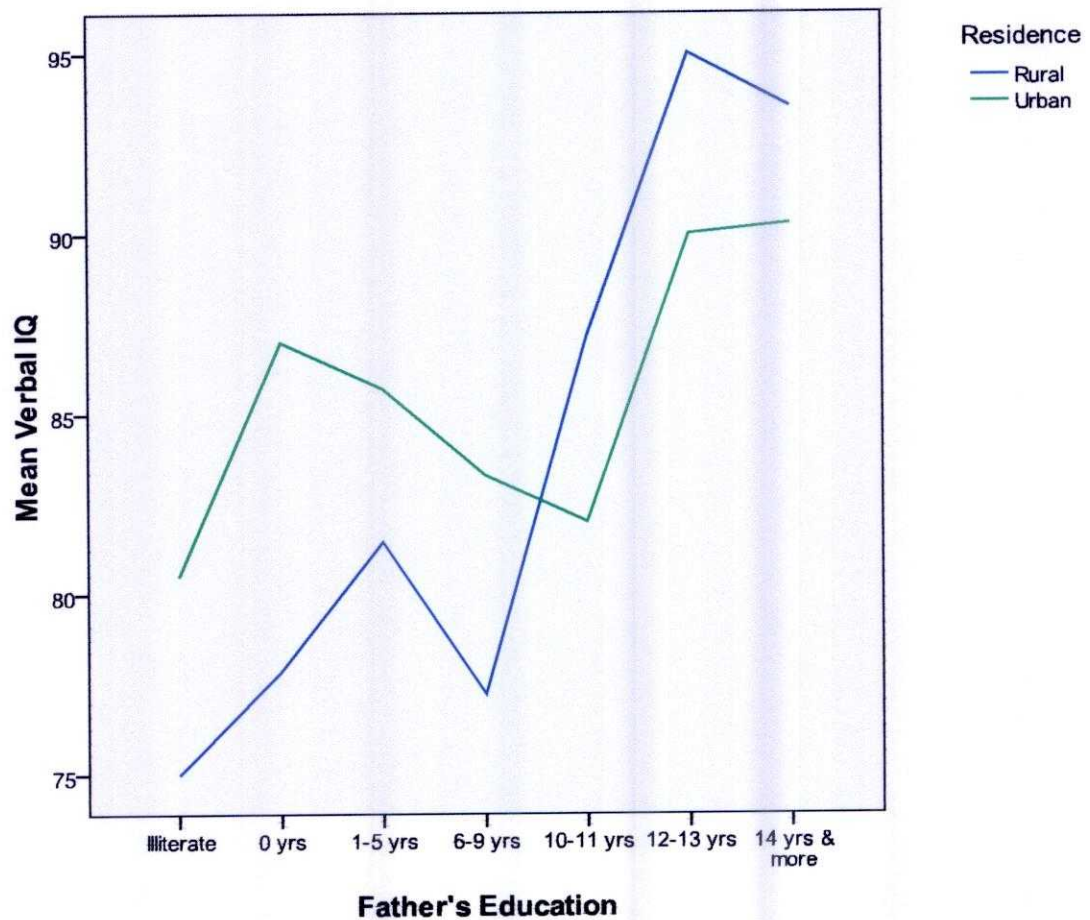


Figure shows consistently progression of mean of Verbal IQ with increase of fathers' year of education in rural areas. In urban area, the mean is Verbal IQ is inconsistent with 12-13 years of education of father.

Table- 16: Full scale IQ, Verbal IQ and Performance IQ of children by Socio Economic Classes

		Case Summaries		
SES classes		Full Scale IQ [#]	Verbal IQ ^{\$}	Performance IQ [*]
1.00	Mean	72.36	78.45	73.55
	Std. Deviation	8.164	7.076	7.699
2.00	Mean	77.27	81.12	78.04
	Std. Deviation	9.299	7.866	9.925
3.00	Mean	86.03	88.13	85.94
	Std. Deviation	10.728	9.566	11.021
4.00	Mean	82.83	83.33	82.00
	Std. Deviation	4.262	9.114	2.757
Total	Mean	79.78	83.13	80.23
	Std. Deviation	10.455	9.014	10.573

p = 0.001 \$ p = 0.002 * p = 0.14

The table 22 shows the gradual progression of verbal IQ, performance IQ and full scale IQ with the gradually increase level of Socio Economic Status (SES). The verbal IQ, performance IQ and full scale IQ of children from SES class- 1 is 72.36, 78.45 and 73.55 respectively. Whereas the verbal IQ, performance IQ and full scale IQ of children from SES class- 2 is 77.27, 81.12 and 78.04 respectively. The similar progression is seen in SES class – 3, but it is not consistent in SES class – 4.

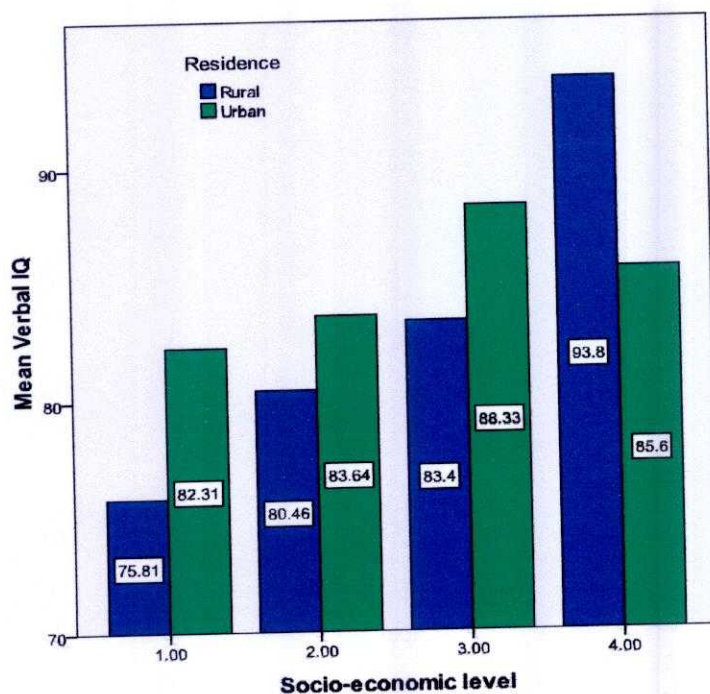


Fig16 : Mean Verbal IQ by Socio-economic level by residence

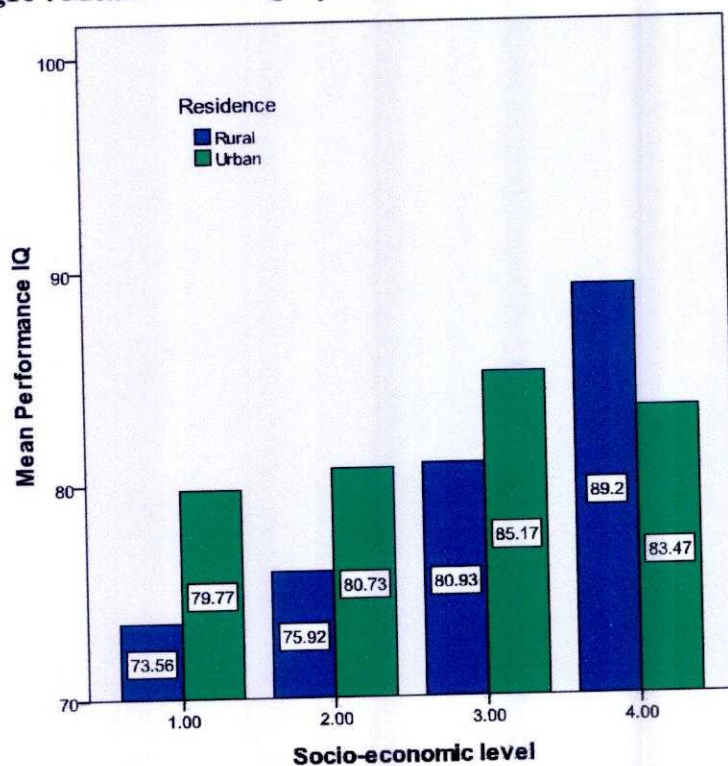


Fig17 : Mean Performance IQ by Socio-economic level by residence

Fig18 : Mean Full Scale IQ by Socio-economic level by residence

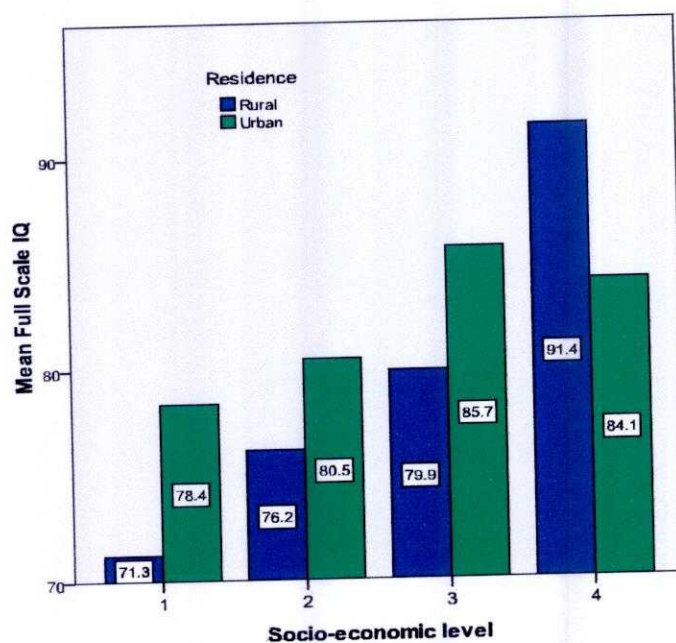


Table- 17: Full scale IQ, Verbal IQ and Performance IQ of Children by Sex

		Case Summaries		
Sex of the child		Full Scale IQ*	Verbal IQ**	Performance IQ\$
Boy	Mean	78.68	82.63	79.59
	Std. Deviation	9.989	8.336	10.712
Girl	Mean	80.54	83.47	80.68
	Std. Deviation	10.785	9.511	10.545
Total	Mean	79.78	83.13	80.23
	Std. Deviation	10.455	9.014	10.573

*p = 0.38 **p = 0.65 \$ p=0.61

The verbal IQ, performance IQ and full scale IQ of Boy is 82.63, 79.59 and 78.68 respectively. Whereas the verbal IQ, performance IQ and full scale IQ of Girl is 83.47, 80.68 and 80.54 respectively; this is a bit higher than Boy's. But the differences are not statistically significant.

Table- 18: Full scale IQ, Verbal IQ and Performance IQ of children by type of family

		Case Summaries		
Family Type		Full Scale IQ*	Verbal IQ**	Performance IQ ^s
Nuclear family	Mean	78.85	82.69	79.53
	Std. Deviation	10.051	9.111	10.675
Joint family	Mean	83.74	85.00	83.21
	Std. Deviation	11.479	8.563	9.841
Total	Mean	79.78	83.13	80.23
	Std. Deviation	10.455	9.014	10.573

$$*p = 0.067 \quad **p = 0.32 \quad \$p = 0.17$$

The verbal IQ, performance IQ and full scale IQ of children from nuclear family is 82.69, 79.53 and 78.85 respectively. Whereas the verbal IQ, performance IQ and full scale IQ of children from joint family is 85, 83.21 and 83.74 respectively; this is a bit higher than nuclear family. But the difference is not statistically significant.

Table - 19: Full scale IQ, Verbal IQ and Performance IQ of children by Pre-school study duration

		Case Summaries		
Pre-school study category		Full Scale IQ*	Verbal IQ**	Performance IQ***
0 month	Mean	76.50	81.08	76.95
	Std. Deviation	10.583	8.606	9.816
1 - 6 months	Mean	73.36	77.18	74.00
	Std. Deviation	5.334	4.813	5.727
7 - 12 months	Mean	83.74	86.00	84.32
	Std. Deviation	9.810	9.175	10.736
13 - 24 months	Mean	87.50	89.50	84.00
	Std. Deviation	0.707	4.950	2.828
Total	Mean	79.78	83.13	80.23
	Std. Deviation	0.455	9.014	10.573

$$* p = 0.001 \quad ** p = 0.004 \quad *** p = 0.001$$

Table 19 shows the gradual progression of verbal IQ, performance IQ and full scale IQ with the gradually increased preschool experience. The verbal IQ, performance IQ and full scale IQ of children who have no preschool experience is 81.08, 76.95 and 76.50 respectively. Whereas the verbal IQ, performance IQ and full scale IQ of children who have 13-24 months preschool experience is 89.50, 84.00 and 87.50 respectively; which is higher than children who have no preschool experience. ANOVA test shows there is significant relationship between different IQs among different pre-school study groups.

Chapter IV: DISCUSSION

4. Discussion

This small scale study has been conducted to see the relationship of verbal, performance and full scale IQ of children with parents' education and socioeconomic status.

Though the sampling has been done purposively for convenience, the composition of sample has served the purpose of the objectives of the study. There was comparability between study children of rural and urban areas with respect to age structure, sex distribution, mothers' education, family income and socio-economic condition. Pre-school experience was seen to be higher in rural area than in urban area. In the total sample there was a range of socio-economic and parental educational variability to test their association with verbal and cognitive quotients. Data collection was also done meticulously to reduce possible systematic error. The outcome variables – verbal, performance and full scale IQ scores have strong correlation among them indicating internal validity of the study.

First of all, residence (urban or rural) is an important determinant of children's IQ scores. Verbal Skill of urban children is higher than rural children; simultaneously the cognitive performance and full scale IQ are about 5 units higher in urban children than their rural counterparts. This may be because of opportunity differentials between urban and rural areas. Children in urban areas are more exposed to various stimulating environment than rural areas. Parents in urban areas are more aware, enlightened and can scaffold the development of children better. Another probability is opportunity to pre-school involvement. Children's peer level in urban areas is developmentally progressive than that of rural areas. Having interaction with verbally developed peers and facing diversified challenges in urban context children become more verbally and cognitively developed. Exposure to media in urban area might contribute to the difference in scores.

There is significant relationship with children's IQ scores and fathers' education (R^2 change = 0.248, $df_1=1$, $df_2=98$, significant F change = 0.000). Both verbal skill and cognitive performance scores of children shows increase with the increasing year of education of father. The verbal skill score of children has increased by 4 units with change in fathers' education category from 0 year to 1-5 yr category. Similar positive change has been found in case of cognitive performance of children. So fathers' educational level contributes to children's development particularly to their verbal skill, cognitive performance and the IQ as a whole. Overall, regression analysis showed that, fathers' education contributes to IQ scores by 15 – 21%.

The relationship of IQ scores with fathers' educational levels in rural and urban areas show a peculiar difference. In rural area, the relationship is almost linear and consistent. But in urban area, there is positive relation in lower years of education, then there is no correlation from 1- 10 years of schooling, and then again there is good positive correlation after 10 years of schooling. This might be because of struggle for earnings and lack of available time of father given to children.

Hence, fathers' education in rural area has better impact on children's verbal and cognitive scores than in urban area. This needs to be checked further with a study with larger sample size.

Significant relationship has been found between children's verbal skill, cognitive performance and full scale IQ scores and their mothers' year of education. Children verbal skill, cognitive performance and IQ scores increased by 3-5 units with change in mothers' educational level from 0 years to 1-5 years category (same as in fathers' education). The scores remained same in 1-5 years and 6-9 years educational categories, but the scores increased sharply from 10 years of education onward.

The result indicates that ensuring at least primary education among mothers will have good impact on children's verbal and cognitive skills. Again, higher secondary education of mothers will produce further dramatic increase in scores.

Data also shows that verbal skill benefits more from mothers' education compared to performance and full scale scores.

The reason behind contribution of parents' particularly mothers' education is obvious. Parents are the most intimate and closer adults around children and certainly children grasp new words and voice from their parents thus the word selection and expression of parents

become important for building verbal skill of children. So children from highly verbal professional families heard nearly three times as many words per week as children from low verbal welfare families. Hence mother and father education level have an effect on building verbal skill of children (Hart & Risely, 1995). Input from family especially from parents affects cognitive and linguistic development as well as rate of learning. High level of education could enable the parents in providing inputs and making diversified examples. Children receiving high proportion of examples of language form gain knowledge of that form more rapidly than children who take delivery of ordinary input (Nelson, Camarta, Welsh, Butkovsky & Camarta, 1996). So the rate of cognitive performance is directly correlated with the inputs from parents which are related to parent education level. Parents' level of education influences their scaffolding (Vigotsky, 1962) of their children to higher levels of thinking and acting. Educated mother and father consciously participate in shared book reading, storytelling, teaching letters and numbers and other learning activities which make the foundation (Parker, Boak, Griffin, Ripple & Peay, 1999) for early learning, language growth and emergent literacy (Saracho, 2002; Snow & Dickinson, 1990; Watson, 2002).

Good linear relationship has been found between Socio Economic Status and development of verbal skill, cognitive performance of children. In rural areas, there is consistent increase in Q scores with increasing socio-economic status. In urban areas, same trend has been found in lower 3 quartiles of population except in uppermost quartile. Difference in nutrition and development opportunity among socio-economic classes might explain relationship of IQ scores and socio-economic status. Low Socio-economic Status (SES) impacts negatively on children development. Parents living in poverty can not provide proper input to children and cause less cognitive development (McLoyd, 1998; Smith, Brooks-Gunn and Klebanov, 1997). Low socio-economic status is associated with lower language promoting experiences (Walker, Greenwood, Hart & Carta, 1994).

There is relationship between children's verbal skill, cognitive performance and IQ with involvement in preschool study. The relationship is statistically significant as in verbal skill ($p=0.004$), cognitive performance ($p=0.001$) and in IQ ($p=0.001$). The development progression is consistently higher with the increased months of involvement in preschool.

The study shows no significant difference in IQ scores by children's sex, and type of family (nuclear or joint).

Limitation of the Study

Though the study was rigorously and methodically conducted, assuring optimum quality, it has some limitations -

- Sample size could be larger to increase the power of the study
- Probability sampling could be adopted if enough time and resource could be ensured.
- Urban and rural samples could be better matched

Chapter V : Policy Implication and Recommendation

5.0 Introduction

This chapter presents the significance of the study findings and food for thought for the policy makers. The implications of the research findings could draw attention of the policy makers and could get change in policies for addressing the issues. In doing the change for development the presented recommendations could help the law makers for thinking about development initiatives. Thus the recommendations derived from the research could add value for sustainable development of the children and their families.

5.1 Policy implication

Research on children's verbal skill and cognitive performance as well as IQ is important for policy makers, educators and practitioners who search for promoting the development of children. Policy makers and educators have been ignored the family environment and inputs from parents that build the foundation of verbal skill and cognition. Parents' awareness on providing stimulations and interactions as well their level of education should be promoted through nation wide interventions. Research evidence suggests that mother and father education level affect the verbal skill as well as cognition just we have seen in our current study. Language acquisition should be treated as an important parameter of success in complex integrative task as it affects the development of other domains. Interventions and preventive efforts should target multiple aspects of verbal skill and cognitive development of young children. This endeavor should start from early in development, as children are likely to get advantage most from supportive home environments during the formative years for speedy language growth and cognition (Shonkoff & Phillips, 2000).

The performance difference of children from rural and urban areas causes due to difference of availability of opportunities. Policy makers have to concentrate on finding out the root causes of this variation of performance and expanding opportunities for the children. Simultaneously the standard of livelihood should be raised up through decreasing poverty level. Finally interventions with parents that aspire to prop up children's verbal skill and cognitive performance should think about the broader social context of parenting by attending the barriers created by poverty and low parental education.

5.2 Recommendation

The current study holds up the imperativeness of parental education as well as the difference of developmental opportunities for children in rural and urban areas. Grasping the findings, the following suggestions are recommended for the relevant stakeholders including parents, civil society activists, educators and policy makers.

- Parent education level should be raised up to ensure scaffolding.
- Developmental opportunities for children should be increased in rural areas.
- Children and parents should be raised up from poverty level.
- Nationwide parenting interventions should be initiated.
- Development interventions have to begin from early years of life.
- Interventions should target multiple aspects of verbal skill and cognitive development

Chapter VI: Conclusion

This cross sectional comparative study aiming to find out the relationship among verbal skill and cognitive performance of children with the education level of their parents in rural and urban settings shows significant relationship with children performance and their mother and father education level. A difference was observed in performance of children from rural and urban areas. Socio-economic status also affects children performance that reflected in the result.

The result of the study can be useful in designing interventions for awareness package, parenting, health and preschool interventions. The policy makers, educators and ECD practitioners could think about the ways and means for ensuring verbal skill and cognitive performance of children and further child development as a whole overcoming the pertinent challenges. The designing of interventions should be integrated way as the language development influence the development of other domains and the development issues are interrelated. In conclusion, the child development initiatives should begin as early as possible, for the reason that late commencement causes immense loss.

Future research should investigate the ways that parent support and multiple aspects of home environment jointly contribute to development of children especially to the verbal skill and cognition. Other investigation could be conducted to find out how available opportunities and socio-economic status affect the development of children in Bangladesh context especially in early childhood.

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Annexure

- a. Demographic questionnaire
- b. Participation consent paper
- c. WPPSI questionnaire

শিশু, মাতা ও পরিবার সংক্রান্ত তথ্যাদি

শিশুর নামঃ শিশুর কোডঃ

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শিশুর মায়ের নামঃ শিশুর বাবার নামঃ

.....

ঠিকানাঃ বাড়ি নংঃ, রাস্তাঃ, পাড়া/গ্রামঃ, পোষ্টঃ, জেলাঃ

১. শিশুর বয়সঃ বছর. মাস ২. লিঙ্গঃ ☐ ছেলে । মেয়ে ☐

৩. শিশুর ধর্মঃ মুসলিম । হিন্দু । বৌদ্ধ । খৃষ্টান । অন্যান্য। ৪. শিশু প্রিন্সিপলে কতদিন পড়েছেঃ বছর. মাস

৫. শিশুর মায়ের পেশাঃ গৃহকর্মী । চাকুরী । শিক্ষিকতা । কারখানা শ্রমিক । ব্যবসায়ী । দিনমজুর ।
অন্যের বাড়িতে কাজ করে অন্যান্যঃ

.....

৬. মায়ের শিক্ষাগত যোগ্যতাঃ নিরক্ষর । স্কুলে পড়ে নাই । প্রাইমারী । সেকেন্ডারি । এসএসসি পাশ ।
এইচএসসি পাশ । স্নাতক পাশ অন্যান্য ঃ

.....

৭. শিশুর বাবার পেশাঃ গৃহকর্মী । চাকুরী । শিক্ষিকতা । কারখানা শ্রমিক । ব্যবসায়ী । দিনমজুর ।
বর্গাচাষী । অন্যান্য ঃ

.....

৮. বাবার শিক্ষাগত যোগ্যতাঃ নিরক্ষর । স্কুলে পড়ে নাই । প্রাইমারী । সেকেন্ডারি । এসএসসি পাশ ।
এইচএসসি পাশ । স্নাতক পাশ । অন্যান্য ঃ

.....

পরিবারের তথ্যঃ

৯. শিশুর পরিবারের সদস্য সংখ্যাঃ

১২. পরিবারের ধরণঃ ☐ একক । ☐ যৌথ

১৩. শিশু কোথায় বসবাস করেঃ ☐ গ্রাম । শহর ☐

আর্থ-সামাজিক অবস্থাঃ

১৪. পরিবারের মোট মাসিক আয়ঃ টাকা (কথায়ঃ
.....)

১৫. পরিবারের ব্যবহৃত ঘর/কক্ষ কয়টিঃ ১৬. ঘরের চাল বা ছাদ কিসের তৈরিঃ

.....

১৭. পরিবারের সম্পদের তথ্যাবলীঃ ক) বাড়িতে বিদ্যুতের ব্যবস্থাঃ ☐ হ্যাঁ ☐ না
খ) বাড়িতে কি কি আছেঃ রেডিও । টেলিভিশন । বাইসাইকেল ।

গ) পরিবারের খাবার পানির প্রধান উৎসঃ পাইপলাইন বাড়ির মধ্যে । পাইপলাইন বাড়ির বাইরে । টিউবওয়েল । পুকুর । কুয়া । নদী । বৃষ্টির পানি । খোলা নালা-ডোবা । অন্যান্য উৎস ।

ঘ) ঘরের মেঝেঃ মাটির । কাঠ বা তক্তা । সিমেন্ট । অন্যান্য

ঙ) ঘরের বেড়াঃ বেতের । টিন । ইট । কাঠ । বাশ । অন্যান্য

চ) পরিবারের সদস্যদের ব্যবহৃত টয়লেট-এর ধরনঃ সেপটিক ট্যাংক । পিট ল্যাট্রিন । স্ল্যাভ ল্যাট্রিন । বুলন্ড ল্যাট্রিন । খোলা জায়গা । ঝোপ-ঝাড় । অন্যান্য ।

তথ্য সংগ্রহকারীর নাম, স্বাক্ষর ও তথ্য সংগ্রহের তারিখঃ

পরীক্ষক/তত্ত্বাবধায়কের নাম, স্বাক্ষর ও তারিখঃ

সম্মতিপত্র

ত্র্যাক বিশ্ববিদ্যালয়ের শিক্ষা উন্নয়ন ইনস্টিটিউটের পক্ষ থেকে আপনার এলাকায় একটি নতুন গবেষণা কর্মের উদ্যোগ নেওয়া হয়েছে। এই গবেষণা কর্মের উদ্দেশ্য হলো, ৪ বছর ৬ মাস হতে ৫ বছর ৬ মাস বয়সী শিশু যাদের বাবা-মা উচ্চশিক্ষা সম্পন্ন তাদের মৌখিক ও বৌদ্ধিক বিকাশের সাথে যাদের বাব-মা নিম্ন শিক্ষা সম্পন্ন তাদের মৌখিক ও বৌদ্ধিক বিকাশের তুলনা করা। সেই সাথে, শহরের শিশুদের সাথে গ্রামের শিশুদের মৌখিক ভাষা ও বৌদ্ধিক বিকাশের মধ্যে কোন পার্থক্য আছে কিনা তা যাচাই করাও এই গবেষণা কর্মের উদ্দেশ্য।

যদি আপনি এই গবেষণা কর্মে অংশগ্রহণ করতে চান এবং আপনার শিশুদের অংশগ্রহণের অনুমতি প্রদান করেন তবে অনুগ্রহ করে সম্মতিপত্রটি পড়ার পর অথবা গবেষণা কর্মটি কী বিষয়ে তা শোনার পর নিচের ফর্মে স্বাক্ষর করুন। গবেষণার প্রয়োজনে আপনার শিশুকে কিছু প্রশ্ন করা হবে এবং তাকে কিছু কাজে অংশগ্রহণ করতে হবে। এছাড়া আপনার কাছ থেকে পরিবারের আয়, পেশা, মায়ের শিক্ষা স্তর, পরিবারের সম্পদ ইত্যাদি সম্পর্কে তথ্য জানতে চাওয়া হবে। দুই জন সুপ্রশিক্ষিত ও অভিজ্ঞ নারী গবেষণা সহকারী এসকল তথ্য সংগ্রহে নিযুক্ত থাকবে। মৌখিক সাক্ষাতকার ও প্রশ্নপত্র অনুযায়ী তথ্য সংগ্রহের কাজে প্রায় দেড় ঘণ্টা সময় ব্যয় হবে।

আপনার প্রদত্ত তথ্যের বিষয়ে গোপনীয়তা রক্ষার জন্য কোথাও আপনার বা আপনার পরিবারের সদস্যদের নাম লেখা হবে না এবং শুধুমাত্র গবেষকের এই তথ্য ব্যবহারের অধিকার থাকবে। সকল তথ্য ও এ সংক্রান্ত দলিলাদির নিরাপত্তা ও গোপনীয়তা রক্ষা করা হবে এবং নিচে নাম উল্লেখকারী গবেষক এই তথ্যের নিরাপত্তার ব্যাপারে দায়ী থাকবেন। আপনি এই গবেষণা কর্মে অংশগ্রহণে আগ্রহ থাকলে এবং তথ্য প্রদানে সম্মত হলে আপনাকে নিচে স্বাক্ষর করার জন্য সবিনয় অনুরোধ করা হলো।

এই গবেষণায় অংশগ্রহণ সম্পূর্ণরূপে স্বেচ্ছাসেবামূলী় বিধায় আপনি যেকোন সময় গবেষণায় অংশগ্রহণ হতে বিরত হতে পারবেন এবং তথ্য সংগ্রহ ও বিশ্লেষণ চলাকালীন নিজেকে সরিয়ে নিতে পারবেন। আপনাকে একাজে অংশগ্রহণের জন্য কোনো প্রকার আর্থিক বা অন্যান্য সুবিধা প্রদান করা হবে না।

শিশুর নাম ১ :

শিশুর নাম ২ :

শিশুর নাম ৩ :

আমি এই সম্মতিপত্রটি পড়েছি বা আমাকে পড়ে শোনানো হয়েছে। আমি আমার সন্তান/সন্তানদের অংশগ্রহণের অধিকার সম্পর্কে সম্পূর্ণরূপে সচেতন এবং আমি এই গবেষণায় তাদের এবং আমার নিজের অংশগ্রহণ নিশ্চিত করতে ইচ্ছুক।

নাম (দয়া করে ছাপ দিন)..... স্বাক্ষরঃ.....

তারিখঃ.....

Name of Child: _____

Date of Birth: | | | | | | | | | |

Tester's: Name/Code _____ | |

Types of schooling: 0= no school,

Formal School: 1 = Primary school, 2= Madrasa, 3 = Kinder garden

Informal School: 4= Maktab, 5= Gonoshikha

Duration of schooling in months | | | |

Mother's Education (years of schooling): | | | |

WPPSI

Sub Scales	Test Raw Score	Scaled Score
Block Design		
Information		
Matrix Reasoning		
Vocabulary		
Coding		
Comprehension		
Picture Completion		

Sum of verbal score	VIQ	Sum of Performance score	PIQ	Coding scaled score	Sum of Scaled score	FSIQ

Performance Subtests = Block Design, Matrix reasoning, Picture Completion, Verbal Subtests = Information, Vocabulary, Comprehension, FSIQ= sum of verbal, performance and coding

Anthropometric Measurement

Child:

Height: / / / / / / / / / / Cm

Weight: / / / / / / / / / / Kg

MUAC: / / / / / / / / / / Cm

OFC: / / / / / / / / / / Cm

Mother:

Height: / / / / / / / / / / Cm Weight: / / / / / / / / / / Kg

2. Information (পর পর পাঁচটি না পারলে এই সাবটেস্টটি বন্ধ করে দিতে হবে)

Item	Response	Scoring
১) আমাকে দেখাও এখানে কোনটা দিয়ে কাটতে পার?	1 2 3 4 DK	0 1
২) আমাকে দেখাও এখানে কোনটা দিয়ে তুমি গোসল করতে পার?	1 2 3 4 DK	0 1
৩) আমাকে দেখাও এখানে কোনটা মিয়াও করে ডাকে?	1 2 3 4 DK	0 1
৪) আমাকে দেখাও এখানে কোনটা পানিতে চলে?	1 2 3 4 DK	0 1
৫) আমাকে দেখাও এখানে ছোট বাচ্চারা কোনটা দিয়ে খেতে পারে?	1 2 3 4 DK	0 1
৬) দেখাও এখানে কোনটা তুমি খেতে পার?	1 2 3 4 DK	0 1
৭) তোমার নাক দেখাও?		0 1
৮) মানুষ কি দিয়ে লিখে?		0 1
৯) মানুষ কি দিয়ে কাগজ কাটে?		0 1
১০) পাখির কয়টি পা থাকে?		0 1
১১) তোমার কান কয়টি?		0 1
১২) তোমার হাটু দেখাও?		0 1
১৩) বোতলের মধ্যে কি থাকে?		0 1
১৪) একটি তরিতরকারী নাম বল?		0 1
১৫) মানুষ খাবার কি কি দিয়ে চাবায়?		0 1
১৬) মানুষ বৃষ্টিতে ভিজে না যাওয়ার জন্য কি ব্যবহার করে?		0 1
১৭) রাতে আকাশে কি জলে?		0 1
১৮) এই আঙ্গুরের (বৃদ্ধাঙ্গুর) নাম কি?		0 1
১৯) দুধ দিয়ে কি বানানো যায়?		0 1
২০) কোন পশু বা প্রাণী দুধ দেয়?		0 1
২১) দুটি জিনিষের নাম বল যেগুলোতে চাকা থাকে?		0 1
২২) রঙটি কি দিয়ে বানায়		0 1
২৩) আমাকে কয়েকটি পশুপাখির নাম বল?		0 1
২৪) বৃহস্পতিবারের পর কি বার আসে?		0 1
২৫) জুতা কি দিয়ে বানায়?		0 1
২৬) তোমার বয়স কত?		0 1
২৭) পোস্ট করার আগে চিঠিতে কি থাকে?		0 1
২৮) ঘাসের রং কি?		0 1
২৯) রংধনুর সবকয়টি রংয়ের নাম বল?		0 1
৩০) কয় দিনে এক সপ্তাহ হয়?		0 1
৩১) দক্ষিণের উল্টাদিক কোনটি?/পশ্চিমের উল্টাদিক কোনটি?		0 1
৩২) বছরের ছয়টি ঋতুর নাম বল?		0 1
৩৩) পৃথিবীর সবচেয়ে বড় সমুদ্রের নাম কি?		0 1
৩৪) সূর্য কোন দিকে অস্ত/ডুবে যায়?		0 1
মোট স্কোর		

3. Matrix Reasoning (Sample আইটেমে পরপ পর দুটি না পারা পর্যন্ত প্র্যাকটিস করাতে হবে, সর্বোচ্চ প্রতিটি আইটেমে দুইবার করে প্র্যাকটিস কারানো যাবে। যদি ২য় প্র্যাকটিসে পরপর দুটি আইটেমে স্কোর না পায় তবে টেস্ট শুরু করে দিতে হবে। পর পর ৪টি না পারলে এই সাবটেস্টটি বন্ধ করে দিতে হবে)

Item						Response	Score	
A	1	<u>2</u>	3	4	DK		0	1
B	1	2	<u>3</u>	4	DK		0	1
C	<u>1</u>	2	3	4	DK		0	1
1	1	<u>2</u>	3	4	DK		0	1
2	<u>1</u>	2	3	4	DK		0	1
3	1	2	3	<u>4</u>	DK		0	1
4	1	2	<u>3</u>	4	DK		0	1
5	<u>1</u>	2	3	4	DK		0	1
6	1	<u>2</u>	3	4	DK		0	1
7	1	<u>2</u>	3	4	DK		0	1
8	1	2	3	<u>4</u>	DK		0	1
9	1	<u>2</u>	3	4	DK		0	1
10	1	2	<u>3</u>	4	DK		0	1
11	1	<u>2</u>	3	4	DK		0	1
12	1	2	<u>3</u>	4	DK		0	1
13	1	2	<u>3</u>	4	DK		0	1
14	1	2	3	<u>4</u>	DK		0	1
15	1	2	<u>3</u>	4	DK		0	1
16	1	<u>2</u>	3	4	DK		0	1
17	1	2	3	<u>4</u>	DK		0	1
18	1	2	<u>3</u>	4	5	DK	0	1
19	1	2	3	<u>4</u>	5	DK	0	1
20	1	2	3	4	<u>5</u>	DK	0	1
21	<u>1</u>	2	3	4	5	DK	0	1
22	1	<u>2</u>	3	4	5	DK	0	1
23	1	2	3	<u>4</u>	5	DK	0	1
24	1	2	3	<u>4</u>	5	DK	0	1
25	1	2	<u>3</u>	4	5	DK	0	1
26	1	2	<u>3</u>	4	5	DK	0	1
27	1	2	3	4	<u>5</u>	DK	0	1

28	<u>1</u>	2	3	4	5	DK	0	1
29	1	<u>2</u>	3	4	5	DK	0	1
মোট স্কোর								

4. Vocabulary পর পর পাঁচটি না পারলে এই সাবটেক্সটটি বন্ধ করে দিতে হবে

Item	Response	Scoring
১) গাড়ী: এটা কি?		0 1
২) চামচ: এটা কি?		0 1
৩) ঘড়ী: এটা কি?		0 1
৪) বেগুন: এটা কি?		0 1
৫) ব্যাঙ: এটা কি?		0 1
৬) জুতা কি? বা বলতে কি বুঝ?		0 1 2
৭) মোবাইলফোন কি? বা বলতে কি বুঝ?		0 1 2
৮) মিষ্টি কি? বা বলতে কি বুঝ?		0 1 2
৯) ছাতা কি? বা বলতে কি বুঝ?		0 1 2
১০) পাতা কি? বা বলতে কি বুঝ?		0 1 2
১১) কুকুর কি ? বা বলতে কি বুঝ?		0 1 2
১২) দোলনা মানে কি? বা বলতে কি বুঝ?		0 1 2
১৩) ভদ্রতা কি? বা বলতে কি বুঝ?		0 1 2
১৪) চিঠি কি? বা বলতে কি বুঝ?		0 1 2
১৫) ঝামেলা বা জালাতন কি? বা বলতে কি বুঝ?		0 1 2
১৬) ছুটির দিন কি? বা বলতে কি বুঝ?		0 1 2
১৭) সাইকেল কি? বা বলতে কি বুঝ?		0 1 2
১৮) ট্রেন কি? বা বলতে কি বুঝ?		0 1 2
১৯) রাজা কি? বা বলতে কি বুঝ?		0 1 2
২০) দূরবীন কি? বা বলতে কি বুঝ?		0 1 2

২১) রাজবাড়ী কি? বা বলতে কি বুঝ?		0	1	2
২২) জল জল কি? বা বলতে কি বুঝ?		0	1	2
২৩) সাহস কি? বা বলতে কি বুঝ?		0	1	2
২৪) দুইগুন কি? বা বলতে কি বুঝ?		0	1	2
২৫) প্রাচীনকাল বা আদিকাল কি? বা বলতে কি বুঝ?		0	1	2
মোট স্কোর				

6. Comprehension পর পর পাঁচটি না পারলে এই সাবটেক্সটটি বন্ধ করে দিতে হবে

১.	তুমি যদি গরম হাড়িতে হাত দাও তাহলে কি হবে?		0	1	
২.	বাচ্চারা কেন স্কুলে যায়?		0	1	2
৩.	গরুর গলায় দড়ি বাঁধে কেন?		0	1	2
৪.	আমরা কেন জুতা পরি?		0	1	2
৫.	ছোট বাচ্চাদের কে কেন ঘরে একা রাখা ঠিক না		0	1	2
৬.	রাস্তা পার হওয়ার আগে আমরা কেন এদিক ওদিক খেয়াল করি?		0	1	
৭.	বাসে বা লঞ্চে উঠার সময় আমরা কেন লাইনে দাড়াই?		0	1	2
৮.	আমরা কেন ধন্যবাদ বলি/দেই?		0	1	2
৯.	খাওয়ার আগে আমরা কেন হাত ধুই?		0	1	2
১০.	আমাদের নাম থাকে কেন?		0	1	2
১১.	গল্প বা কথা বলার সময় আমরা একজন একজন করে কথা বলি কেন?/ একসাথে কথা বলি না কেন?		0	1	2
১২.	অসুখ হলে তুমি বাসায় থাক কেন?		0	1	2
১৩.	কোথাও যেতে হলে বা কোন কাজ করতে হলে কেন সময়মত করতে হয়?		0	1	2
১৪.	কোন কোন শহরে কেন বাস ট্রেন থাকে		0	1	2
১৫.	মানুষ কেন জিনিসপত্র মিলেঝিলে বা বাটাবাটি করে নেয়?		0	1	2
১৬.	বাইরে কোথাও যাওয়ার জন্যে বা অচেনা কেউ কিছু		0	1	2

	দিলে বাচ্চারা কেন বাবা মাকে জিজ্ঞাসা করে?		
১৭.	কেন গাছ কাটা উচিত না?		0 1 2
১৮.	ছোট বাচ্চাদের কেন সুই দিতে হয়?		0 1 2
১৯.	অচেনা মানুষের সাথে কথা বলা ঠিক না কেন? যাদেরকে তুমি অথবা তোমার বাবা মা চিনে না তাদের সাথে কথা বলা ঠিক না কেন?		0 1 2
২০.	ভোট দেওয়ার জন্য কেন ১৮ বছরের হতে হয়?		0 1 2
মোট স্কোর			

7. Picture Completion Sample আইটেমে পরপ পর দুটি না পারা পর্যন্ত প্র্যাকটিস করতে হবে, সর্বোচ্চ প্রতিটি আইটেমে দুইবার করে প্র্যাকটিস কারানো যাবে। যদি ২য় প্র্যাকটিসে পরপর দুটি আইটেমে স্কোর না পায় তবে টেস্ট শুরু করে দিতে হবে। পর পর পাঁচটি না পারলে এই সাবটেক্সটটি বন্ধ করে দিতে হবে,

	Item	Response	Com. time	Scoring
A	গরু			0 1
B	রিকসা			0 1
C	চিরুনি			0 1
D	ভাল্লুক			0 1
১.	পুতুল			0 1
২.	জ্যাকেট			0 1
৩.	চেয়ার			0 1
৪.	গোলাপ			0 1
৫.	ছেলে			0 1
৬.	ইট			0 1
৭.	আপেল			0 1
৮.	সাইকেল			0 1
৯.	হাঁস			0 1
১০.	গ্লাভস			0 1
১১.	হাসি			0 1
১২.	স্কেল			0 1
১৩.	ঘুড়ী			0 1
১৪.	নৌকা			0 1
১৫.	দরজা			0 1
১৬.	দোলনা			0 1
১৭.	জু			0 1
১৮.	ডেস্ক			0 1
১৯.	কারেন্টের তার			0 1
২০.	কাপড় মেলার তার			0 1

২১.	ঘড়ি			0	1
২২.	মুরগীর পা			0	1
২৩.	ঝুটি			0	1
২৪.	বাক্স			0	1
২৫.	মাছ ধরা			0	1
২৬.	কোট			0	1
২৭.	জোকার			0	1
২৮.	বাড়ী			0	1
২৯.	রিবন			0	1
৩০.	স্কেটিং			0	1
৩১.	হাত			0	1
৩২.	গাড়ী			0	1
মোট					

Ravens Answer Sheet

A			AB			B			C			D		E			
C.A	Res	Score	C.A	Res	Score	C.A	Res	Score	C.A	Res	Score	C.A	Res	Score	C.A	Res	Score
4			4			2			8			3			7		
5			5			6			2			4			6		
1			1			1			3			3			8		
2			6			2			8			7			2		
6			2			1			7			8			1		
3			1			3			4			6			5		
6			3			5			5			5			1		
2			4			6			1			4			6		
1			6			4			7			1			3		
3			3			3			6			2			2		
4			5			4			1			5					
5			2			5			2			6					
Total A			Total AB			Total B			Total C			Total D		Total E			
Total Score																	