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## Role of Households' Wealth and Maternal Education in Early Child Development: A Case Study of Punjab, Pakistan

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## **Role of Households' Wealth and Maternal Education in Early Child Development: A Case Study of Punjab, Pakistan**

*Hafiz Ghulam Mujaddad, Wajeeha Ashraf and Muhammad Hassan Danish\**

### **ABSTRACT**

*Children under the age of five are exposed to several hazards in developing countries, such as poverty, inadequate housing, and unstimulating home environments, which have an adverse influence on their cognitive and socio-emotional development. Since learning during adulthood is influenced by earlier developmental stages, these formative years are crucial in shaping a successful adult life. Therefore, the study intends to investigate what causes some children to perform worse than other children of the same age. It utilises data from the Multiple Indicator Cluster Survey (MICS) 2017-18 of 4,043 children from Punjab, Pakistan. Binary Logistic Regression was used for analysis and it demonstrated a positive relationship between early child development, wealth, maternal education, and home stimulating activities with all three measures of child development which include child identification of alphabets, reading at least four popular words, and recognition of numbers or shapes. The result of the study suggests that it is an urgent need of the hour to focus to women's education and take steps to mitigate poverty in order to enable parents to provide their children with a better learning environment.*

**Keywords:** Early Child Development, Wealth, Maternal Education, Home Stimulating Activities.

**JEL Classification Codes:** I250, H75, P36, J13

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## **1. INTRODUCTION**

Developing countries face a variety of challenges, including a low standard of living. People in these countries have low wages, poor health, inadequate housing, a low level of education, and a lower life expectancy. According to the Asian Development Bank's report (April 2022), nearly 21.9% of Pakistan's population lived below the national poverty line in 2018, and nearly 37% of people earned less than USD 1.9 Purchasing Power Parity per day in 2021 (Citaristi 2022). This results in low socioeconomic status, which is frequently quantified using parents' income, education, and occupation. In terms of learning resources, these factors are critical in the early years of child development.

Education is an important factor in breaking the cycle of poverty, empowering women's activism, economic growth, and the protection of children from hazardous labour. Early childhood is a systematic and complex process of development that includes motor and cognitive development, as well as the regulation of linguistic skills and social and emotional development in the formative years of life. Furthermore, education takes into account the child's physical development, as well as their mathematical and analytical skills, which are fundamental for learning and school readiness. This foundation is also pivotal for future achievements.

Education is a key goal of sustainable development, and some elements are considered the backbone of the educational system in this process, where children's early development is more important. It is a basic assumption that a mother is a primary agent as a motivator of children, assisting in the achievement of specific age goals and educational attainment. Family wealth and parents' educational qualifications are also regarded as important factors in children's development. The distribution of parental resources towards learning and stimulating activities also serves as a method to connect parental education with child development (Zhang 2012; Islam et al., 2021).

Mother's education plays a crucial role in a child's early development, especially in low-income countries where it is considered more significant compared to overall parental education. There is a strong correlation between the level of a mother's education and the developmental milestones of a child. The availability of learning resources and support, such as access to books and stimulating activities, is a way through which parental education, especially maternal education, relates to child development. Maternal education is vital not only for higher levels of investment in a child's upbringing but also for adapting to contemporary changes in the developmental needs of children, fostering their optimal growth. Agüero and Ramachandran (2020) found a positive relation between the mother, years of schooling and modeling interaction, cognitive language skills, knowledge, and in the transmission of cultural rules and values.

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Based on the Human Capital Index estimations in the World Bank's (n.d.) discussion focusing on early years as critical to human capital development, it is indicated that only 56% of children born globally today will reach their full potential for productivity in adulthood. Due to malnutrition, a dull learning environment, the manifestation of stress and indigence, and other factors, the remaining 44% children are unlikely to develop to their full potential. Furthermore, it is anticipated that COVID-19's effects may worsen these issues due to an increase in poverty. In fact, according to the World Bank, more than 40% of children under primary school age spend their formative years in unsafe and uninspiring learning conditions, which have a significant negative impact on their development which gets worse with time.

The Multiple Indicator Cluster Survey (MICS) (Bureau of Statistics 2018) reveals that in Pakistan's poorest quintile, merely 3% of parents participate in school meetings, whereas 14% are involved with the school's governing body. For children aged 7 to 14 years in Punjab, 47% of parents provide home support for assignments, in contrast to only 22% in the poorer quintile. This data underscores that household wealth significantly influences the extent of home-based parental involvement. Higher-income parents actively support academic excellence. Students from low-income households face a shortage of educational resources, such as reading materials and other home-stimulating learning tools, resulting in an uneven journey through educational life and development. However, it is expected that this issue could be resolved if income levels rise with parental education since family income has a significant influence on children's academic performance (Lin and Lv 2017).

Nature, nurture, and interaction between mother and child can all have an influence on children's academic results. Inherited factors can sometimes be a source of human resource connection and participation. In the context of nurture, mothers with a certain level of education may be able to create a more interactive and hygienic environment in the home for children's development, such as more stimulating items for information processing and efficient investment in human resource (Kalil et al., 2012; Kornrich and Furstenberg 2013). Carneiro et al. (2013) examined the regional variation in a mother's school costs over the course of her youth and found that mother's education improved test scores, reduced prevalence of behavioural problems and score repetition. Test results of children and their attendance in school improve as mothers' education levels rise (Grepin and Bharadwaj 2015; Agüero and Ramachandran 2020).

The educational level of a mother and family's financial situation both have an impact on child development. Grantham-McGregor et al. (2007) reveal that family poverty has a detrimental effect on child development, parental behaviour, and educational aspirations, particularly for those who originate from low- and middle-income countries. This contrasts with children from high-income nations. Previous studies also reveal that

parents' incomes are insufficient to buy them a substantial number of reading materials and picture books. There is a robust relationship between family income and parental education, particularly in child development, since rising living standards have a spillover effect on investment decisions, which in turn have an impact on a child's cognitive growth and academic performance (Moulton et al., 2021). Therefore, the objective of this study is to examine the impact of maternal education and parental wealth on children's early development.

The Sustainable Development Goals (SDGs) emphasise quality education as a cornerstone of economic growth. Despite this focus, many students in developing countries struggle with basic literacy and numeracy skills after six years of schooling. According to the World Bank's 2019 Learning Poverty report, over 53% of students in low and middle-income countries cannot read and understand a simple story by the end of primary school. The situation is most dire in developing nations, where up to 80% of children face difficulties in reading and comprehension, likely due to underdeveloped motor, sensory, and cognitive abilities.

This study narrows its focus to two pivotal factors influencing early childhood development: maternal education and family wealth. These factors are critical, as psychological theories suggest that a significant portion of child development occurs within the first 3 to 4 years of life, profoundly affecting later life achievements. Hence, the aim here to evaluate the impact of parental income and maternal education on early childhood development, as well as the role of stimulating home activities. The findings of this study are vital, as they will highlight how various conditions impact early development and demonstrate that improving children's educational outcomes can have a lasting positive effect on economic growth.

## **2. LITERATURE REVIEW**

Beyond the walls of the classroom, education must exist in the family. Families with educated members and strong traditions are crucial in fostering the conditions for any nation and country's growth as well as fostering peace in the community. Families are frequently thought of as a child's first classroom, which is why parents are seen as a child's first instructor. Early life stages have an influence on the development of human capital, which has an impact on later life outcomes, including individual incomes and national economic growth.

Early childhood development is influenced by maternal education, which has been shown to be more significant in low-income nations than paternal education. Mother education and child development scores are strongly correlated. Highly educated mothers also have different preferences and viewpoints on investing in children because of the economic benefits in later life (Heckman 2011). This point of view supports the idea that highly

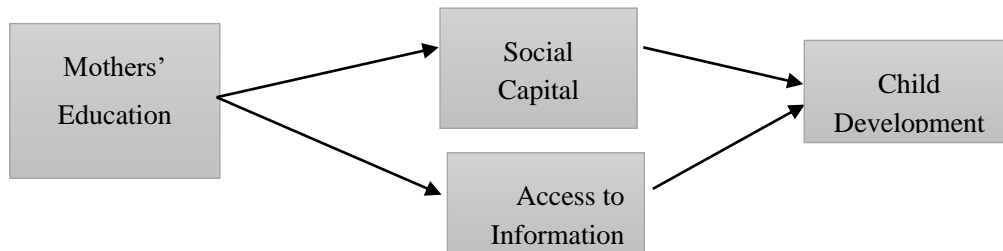
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qualified parents actively foster their child's development in order to maximise his/her potential for long-term work efficiency. The findings of a study by Bugental and Grusec (2006) and McCoy et al. (2015) demonstrate a significant and positive relationship between maternal education and early child development. They demonstrate that the route of mother education and interactive home environment comprises subscales such as the availability of reading materials, linguistic zeal, surrounding environment, and learning encouragement which support the development of children's cognitive skills. In their 2023 study, Lim et al. explored early childhood development in Ghana and found that children of mothers with tertiary-level education tend to exhibit higher skills and greater development compared to children of mothers with lower levels of education.

The literature from low- and middle-income nations shows that maternal education protects children and fosters their growth. Additionally, there is a correlation between parental education, particularly maternal education, and a decline in fertility rates, as well as better physical and mental health, which affects children's odds of surviving and their ability to complete their schooling (Carneiro et al., 2013; Grantham-McGregor et al., 2007; Harding 2015). The research conducted by Bornstein et al. (2015) and Cuartas (2022) highlights the significance of caregiver education and the detrimental impact on children's eagerness to learn when faced with a scarcity of educated caregivers and limited family resources. Additionally, their findings indicate a positive correlation between caregiver qualifications, family resources, and child development in low to middle-income countries. Moreover, Agüero and Ramachandran (2020) find a positive association between the mother's years of schooling and cognitive skills, knowledge, and the dissemination of cultural laws and values. In addition to previous studies, Martinez et al. (2022) assert that parental education significantly influences child education in two key ways. Firstly, they suggest that approximately 40% of a child's intelligence is mediated through the education level of their parents. Secondly, educated parents are more likely to establish regular routines at home, which are beneficial for nurturing cognitive and emotional development. This practice is linked with higher academic achievements in children and plays a role in reducing disparities in school performance.

Social Capital theory also suggests that mothers with higher level of education have more social capital and access to information which lead to a bonding with their children and eventually to child development.

**Figure 1: Framework of the Relationship between Mothers' Education and Child Development**



Source: Authors' own.

## 2.1 Role of Wealth in Child Development

The value of the assets that a person, a group, or a nation possesses is what is referred to as wealth. After a person's debts have been paid off, it comprises all of their assets, both tangible and intangible (Karagiannaki 2017). Wealth is significant because it is used to assess economic well-being in addition to being a factor in determining adult achievement. The direct transmission of physical assets from one generation to the next might boost wealth and raise the likelihood that people will pick up new skills (Rumberger 1983). Walker et al. (1994) found that maternal education, family income, and occupational status are all strongly associated with language scores in a diverse sample.

Previous studies have also linked children's intellectual and social well-being to socioeconomic situations and the physical quality of their home environment. Poor children frequently live in homes with cracked floors, insufficient heat, pests, open heating appliances, unprotected stairwells, lead paint, and leaking ceilings. These unsanitary physical conditions increase the chances of injuries and illness, which affect a child's mental development and cause problems in the attainment of education and skills, which impact later-life earnings (Bradley et al., 2000; Guo and Harris 2000; Fernald et al., 2012). Bradley and Corwyn (2002) explored the association between the home inventory and children's cognitive and language competencies during pre-school years. It continues to predict measures of academic achievement including reading, language arts, and spelling. Findings of Massaro (2015) and Singer (2010) indicate that by age three, a child from a less economically affluent family tends to use a more limited range of words in their monthly vocabulary compared to children from more economically stable families, observed over the same period.

A global review on early child development identified four key protective mechanisms that link mothers' education with the development of their children, primarily enhancing

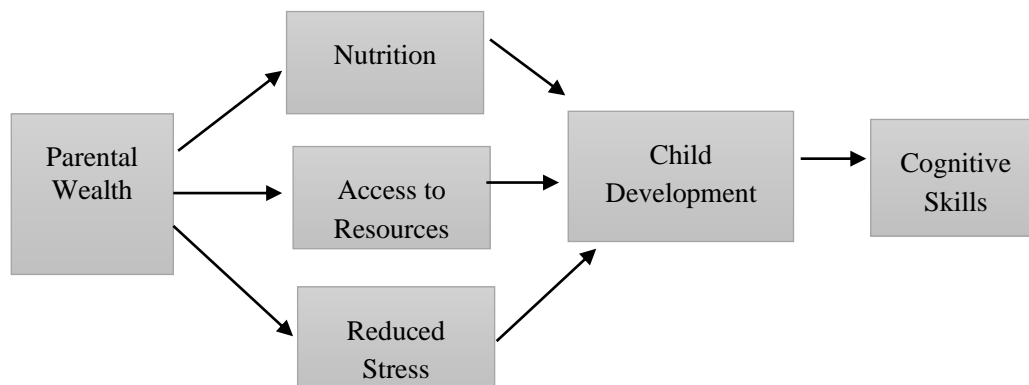
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learning support. The review delved into factors that foster an overall improvement in the home environment. These factors include the absence of maternal depression, the maintenance of standard nutritional levels for children, and increased opportunities for children to access and benefit from various interventions (Walker et al., 2011). Families with sufficient funds are likely to buy more items for their offsprings and provide them with a decent education. Families with greater financial resources often have children who excel in academic environments and are adept at acquiring new skills demanded by the market. This advantage is largely attributed to their access to higher-caliber elementary and secondary schools. As a result, children from wealthier families tend to have a significant edge over their peers from less affluent backgrounds (Heckman 2000; Kornrich and Furstenberg 2013).

In their 2022 study, Victora et al., illustrate that early-age poverty has enduring effects on child health, impacting cognitive development and consequently affecting human capital formation over the lifespan. They emphasise the need for multisectoral anti-poverty policies that ensure better nutrition at an individual level. This is particularly crucial in light of the economic disruptions caused by COVID-19, which have significantly impacted educational objectives globally. The results of Miller et al. (2021) demonstrated that wealth is uniquely tied to both academic and behavioural development in early childhood, middle childhood, and teenage years, controlling for income level and volatility. However, research indicates that wealth might serve as a buffer to shield childhood development from the negative impacts of low family income, notably when they grow older.

In conclusion, high socioeconomic status and parental wealth lead to children's development due to access to greater resources, quality education, good health and well-being, proper intake of nutrients and a good living environment. Moreover, high level of parental income also reduces stress among children and improves their cognitive skills which lead to childhood development.



**Figure 2: Framework of the Relationship between Wealth and Child Development**

**Source:** Authors' own.

The literature reviewed thus far underscores that maternal education and family wealth play crucial roles in child development. Prior research has typically focused either on the influence of maternal or parental education on child development, or on the impact of household wealth in both developing and developed countries. Additionally, there is some research exploring the connection between home stimulating activities and child development. However, a noticeable gap in the literature is the individual effect of home stimulating activities, combined with maternal education and household wealth, specifically in relation to early childhood development in the context of Pakistan. This study aims to fill this gap, offering insights that could not only inform policymakers and readers about early childhood development but also contribute to sustainable long-term development in the country.

### 3. RESEARCH DESIGN AND METHODOLOGY

This study employs secondary data, primarily sourced from the UNICEF MICS (Multiple Indicator Cluster Surveys) programme. The data was collected through questionnaires and subsequently interpreted with assistance from the Punjab Statistics Bureau, covering the period of 2017-18. Specifically, this research utilises the MICS questionnaire pertaining to children under the age of five.

The sample for the MICS Punjab, 2017-18 was designed to provide estimates for a large number of indicators on the status of children and women in Punjab, for urban and rural areas across all 36 districts. The main sampling strata were the urban and rural segments within each district, and the household sample was selected in two stages. In each

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stratum, a certain number of census enumeration areas were systematically chosen based on their size proportionality. Utilising the household listings from the 2017 Census provided by the Pakistan Bureau of Statistics, a systematic sample of 20 households was selected from each enumeration area. The total sample encompassed 53,840 households across 2,692 clusters. Fieldwork involved visits to all selected enumeration areas, achieving a household response rate of 97.9%.

Although the survey employed six distinct questionnaires, the researchers in this study specifically focused on the household questionnaire to collect essential demographic data about the households and their dwellings. Furthermore, they utilised the under-five questionnaire, which was administered to mothers or caretakers of all children under the age of five residing in these households, for the purpose of gathering pertinent information for analysis.

### 3.1 Variable Measurement

The explained variable of the study is Early Child Development while the explanatory variables of the study are Maternal Education and Parental Wealth, with Home Stimulation Activities used as control variable. Table 1 represents how these variables are measured:

**Table 1: Variable Description**

Variable	Definition	Measurement	Coding
<b>Dependent</b> Early Child Development	Multidimensional process completed at the age of 3-4 years and sometimes at the age of five. It is a process that aligns cognitive and motor skills. It is considered on track when children can perform different tasks as per the requirement of that age (Grantham-McGregor al., 2007).	Measured by recognition of different shapes/numbers, alphabets, and speaking different words.	For recognition and speaking if No=0 Yes=1

.....Continued

Variable	Definition	Measurement	Coding
<b>Independent</b>			
Maternal Education	Described as a certain level of education, which includes any degree, certification, or diploma obtained by the mother (Carneiro et al., 2013).	Measured in terms of years of schooling.	None\ Pre-school=0 Primary=1 Middle=2 Secondary=3 Higher=4
Wealth	Accumulated assets over time by any family which includes any dwelling, agricultural land, means of transport, and animal. If a family owns certain items, it considers expensive which categorise according to the number of possessions (Karagiannaki 2017).	Measured in terms of possession of assets.	Poorest Quintile=1 Second Quintile=2 Middle Quintile=3 Fourth Quintile=4 Richest Quintile=5
<b>Control Variable</b>			
Home Stimulation Activities	Defined as such activities that stimulate thinking, learning, and analytical approach (Raviv et al., 2004).	Measured in terms of engagement in specific activities by any family member like playing, reading, counting, singing, and storytelling activities which help the child to explore more.	Doing Activity No=0 Yes=1

Source: Authors' own.

### 3.2 Methodology

Proportions and probabilities, distinct from continuous variables, are bounded between 0 and 1. As outlined by Cameron and Trivedi (2005), when dealing with a proportion as a response variable, a logistic or logit transformation is often employed. This transformation is used to link the dependent variable to a set of explanatory variables, providing a suitable analytical framework for such bounded data

The logit link has the form:

$$\text{Logit}(P) = \text{Log}[P / (1-P)]$$

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The term within the square brackets represents the odds of an event occurring. In this case, it would be the odds of the children whose early child development is on the right path.

The model can be expressed as follows:

$$\text{Log}(p/1 - p) = \text{logit} = (P) = \beta_0 + \beta_1 \kappa_1 + \beta_2 \kappa_2$$

Where  $P$  represents the probability of a child's early development being on the right path;  $\kappa_1$  denotes the wealth quintile, and  $\kappa_2$  signifies maternal education. In this model, the parameter  $\beta_0$  indicates the *Log* odds of a child's early development not being on the right path for children from the poorest quintile (poorest quintile=1) and with an uneducated mother (none/preschool education=0); and  $\beta_1$  show these odds change for children whose early development is on the right path, considering variations in wealth quintiles and different levels of maternal education. The model can be expressed in terms of odds as:

$$P/(1-P) = \exp(\beta_0 + \beta_1 \kappa_1 + \beta_2 \kappa_2)$$

## 4. RESULTS AND DISCUSSION

### 4.1 Descriptive Statistics

Descriptive statistics play a role in summarising and organising data to make them easily comprehensible. In this context, descriptive statistics are focused solely on the dependent variables. This approach is adopted to underscore the significance of a child's early development (Table 2):

**Table 2: Descriptive Stats of Dependent Variables**

Variable	Frequency		Percentage	
	Yes	No	Yes	No
The child identifies at least ten letters of the alphabet.	1,728	2,315	42.74	57.26
The child reads at least four simple, popular words	1,573	2,470	38.91	61.09
The child knows the name and recognises the symbol of all numbers from 1-10.	1,871	2,172	46.28	53.72

*Source:* Authors' own estimations using Stata 15.0.

The total number of observations in Table 2 for the variable child identifies at least ten alphabets is 4,043 from which the frequency for yes is 1,728 which is 42.74% and the frequency for no is 2,315 and it is 57.26 % which represents that most of the children are

unable to identify alphabets when under five years of age. The same is the case with other variables where less than 50% of children were unable to show a positive response. All three measures of child development show that many children are unable to read, identify and recognise numbers, alphabets, and words which means that children are suffering from a delay in cognitive development.

#### 4.2 Binary Logistic Regression

Binary Logistic Regression was run on 4,043 observations in which the predicted variable was child identification of at least ten alphabets and predictor variables was wealth and maternal education along with home stimulation activities:

**Table 3: Regression Results When Child Identifies at least Ten Alphabets**

Number of Observations			4,043	
LR chi2(14)			182	
Prob > chi2			0	
Pseudo R2			0	
Log-likelihood			-2,669	
A child identifies at least ten alphabets	Odds Ratio	Std. Err.	Z	P>z
<b>Wealth Quintile</b>				
Second	1.6201	0.3015	2.5900	0.0100
Middle	1.8413	0.3275	3.4300	0.0010
Fourth	1.7987	0.3176	3.3200	0.0010
Richest	2.5024	0.4546	5.0500	0.0000
<b>Maternal Education</b>				
Primary	1.1496	0.1254	1.2800	0.2010
Middle	1.4678	0.1768	3.1900	0.0010
Secondary	1.4231	0.1600	3.1400	0.0020
Higher	1.7307	0.1955	4.8600	0.0000
<b>Home Stimulating Activities</b>				
Reading	0.847	0.278	-0.510	0.613
Stories	1.049	0.095	0.530	0.599
Outside	0.809	0.074	-2.310	0.021
Song	0.895	0.071	-1.390	0.163
Play	1.246	0.111	2.480	0.013
Count	1.4479	0.1049	5.1100	0.0000
_cons	0.2785	0.1022	-3.4800	0.0000

Source: Authors' own estimations using Stata 15.0.

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Table 3 presents the relationship between maternal education, wealth and child development. Both wealth and education are positively related to children identifying capabilities of alphabets. The richest quintile odd ratio is 2.502 times which means it is 2.502 times more likely than the poor quintile. The odds ratios suggest that children from wealthier quantiles are more likely to recognise the alphabet compared to those from poorer families. This advantage is attributed to wealthier families having more resources to invest in their children's early development, thereby laying a foundation for success later in life.

The level of a mother's education shows a positive and significant correlation with a child's ability to identify alphabets, except for primary education, which appears insignificant. Children of mothers with higher education levels are 1.73 times more likely to identify alphabets compared to those whose mothers have no education. Analysing these odds ratios leads to the conclusion that maternal education positively impacts a child's ability to recognise the alphabet. This is likely because more educated mothers engage their children in activities that enhance learning. These findings align with the research of Carneiro et al. (2013) and McCoy et al. (2015), who found that maternal education improves test scores, reduces behavioural problems, and enhances early child development.

The study finds an insignificant impact of activities like reading, storytelling, and singing songs on child development. However, taking children outside shows a significant but limited effect, with a 0.19 times lower likelihood of recognising the alphabet. This outcome may be attributed to the influence of surroundings on cognitive ability. It is possible that these children are exposed to unhygienic or unstimulating environments, or they face a risk of injury. Therefore, the activity of going outside may negatively impact their ability to identify alphabets.

The odds ratio for playing with children is 1.245, indicating that children whose parents engage in play with them have 1.245 times higher chances of identifying the alphabet compared to those whose parents do not. Similarly, the odds ratio for counting activities with children is 1.447, suggesting these children have a 1.447 times greater likelihood of recognising the alphabet than the baseline. This indicates a positive influence on a child's ability to recognise the alphabet. In such activities, children are often given tasks that involve counting various objects and identifying their starting alphabet, among other challenges. These tasks not only help in recalling previous learning but also enhance cognitive skills. This finding is supported by Skene et al. (2022), who also observed that guided play enhanced children's cognitive abilities, particularly in vocabulary development and knowledge shaping.

Binary Logistic Regression was run on 4,043 observations in which the predicted variable was child pronunciation of at least four simple popular words and predictor variables wealth and maternal education along with other variables of home stimulation activities.

**Table 4: Regression Results When Child Pronounces at least Four Simple Popular Words**

Number of Observations				4,043
LR chi2(14)				98.89
Prob > chi2				0
Pseudo R2				0.0183
Log-likelihood				-2652.611
A child pronounces at least four simple popular words	Odds Ratio	Std. Err.	Z	P> z
<b>Wealth Quintile</b>				
Second	1.2608	0.2281	1.2800	0.2000
Middle	1.4434	0.2485	2.1300	0.0330
Fourth	1.4763	0.2519	2.2800	0.0220
Richest	1.7489	0.3079	3.1800	0.0010
<b>Maternal Education</b>				
Primary	1.1355	0.1238	1.1700	0.2440
Middle	1.2298	0.1493	1.7000	0.0880
Secondary	1.1727	0.1329	1.4100	0.1600
Higher	1.3756	0.1560	2.8100	0.0050
<b>Home Stimulating Activities</b>				
Reading	0.38771	0.12587	-2.92000	0.00400
Stories	1.09328	0.10094	0.97000	0.33400
Song	1.13996	0.09155	1.63000	0.10300
Outside	1.03644	0.09694	0.38000	0.70200
Play	1.26406	0.11387	2.60000	0.00900
Counted	1.18305	0.08605	2.31000	0.02100
_cons	0.5730	0.2063	-1.5500	0.1220

Source: Authors' own estimations using Stata 15.0.

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The influence of wealth on children's ability to recognise four popular words was found to be both positive and significant. For children in the richest wealth quintile, the odds ratio is 1.748. This implies that children from the highest wealth quintile have a 1.748 times greater likelihood of recognising these words compared to those from the poorest quintile. These odds ratios suggest that children from wealthier families are more likely to pronounce popular words than those from less affluent backgrounds. Singer (2010) also found that children from economically weaker families use a less diverse range of words in their monthly vocabulary at the age of three compared to their peers from more financially stable families.

In comparison to children living in borderline communities, children living in concentrated poverty were more likely to encounter language with less complexity and variety in both the home and the kindergarten setting (Neuman et al., 2018). Results of this study are also consistent with previous studies which found that households' and parental wealth strongly and positively influence the childhood development and improve their cognitive skills (Islam et al., 2021; Moulton et al., 2021) while poor wealth conditions and inequality in a country adversely affect childhood development (Victora et al., 2022).

The study indicates that primary and secondary education levels of mothers do not significantly impact a child's ability to pronounce popular words. However, middle education shows significance at the 10% level, and higher education has a notably significant impact. The results demonstrate that higher maternal education levels positively influence a child's ability to pronounce popular words, with odds of 1.38 greater than children of mothers with no education. This suggests that more educated mothers are better able to engage their children in activities that enhance learning. Supporting this finding, Lim et al. (2023) also discovered that mothers with higher levels of education are more adept at fostering cognitive skills in their children.

The study found no significant impact from storytelling, singing songs, or taking children outside on their ability to pronounce words. The odds ratio for reading activities is 0.387, suggesting that children who engage in reading activities facilitated by their families are 0.62 times less likely to pronounce words correctly compared to those who do not participate in such activities. This counterintuitive result might be attributed to factors such as the reader's rapid pace or inaccurate pronunciation of words. Considering that the children in this study are under five years old, a critical period where visual stimuli are more influential than verbal communication, the method of reading and interaction with visual elements could play a significant role in this outcome.

The odds ratio for playing with children is 1.264, indicating that the likelihood of correct pronunciation increases by an odds ratio of 1.26 among children who engaged in outdoor play, compared to those who did not. This enhancement in pronunciation skills can be



attributed to the development of motor skills during outdoor activities like throwing a ball, jumping, and catching. Additionally, indoor games such as puzzle and block making, as well as activities that involve finding objects or matching alphabets, not only reinforce knowledge but also enhance learning through recall and cognitive engagement.

The odds ratio for counting activities with children is 1.183, suggesting that children whose parents engage them in these activities are 1.183 times more likely to demonstrate proficiency in pronunciation. A Binary Logistic Regression analysis was conducted on 4,043 observations, where the dependent variable was the child's ability to know and recognise names and all numbers from 1-10. The independent variables in this analysis included wealth, maternal education, and various home stimulation activities. Supporting these findings, international research, such as the study by Niklas et al. (2016), identified a strong correlation between children's cognitive outcomes and the Home Learning Environment (HLE) provided by their parents.

Table 4 shows that wealth and maternal education have a positive influence on children's early development. It means that children who grow up under the supervision of highly educated mothers and belong to wealthy families can utter popular words in comparison to others who are not wealthy and whose caregivers are not educated. Previous studies also concluded that maternal education and wealth are important factors in child development at the early stages of life (Magnuson et al., 2009; Bornstein et al., 2015; Kalil and Corey 2012; Prickett and Augustine 2016).

**Table 5: Regression Results when Child Knows and Recognises Names and All Numbers from 1-10**

Number of Observations		4,403		
LR chi2(14)		249.53		
Prob > chi2		0		
Pseudo R2		0.0447		
Log-likelihood		-2666.4152		
<b>A Child knows and recognises names and all numbers from 1-10</b>	<b>Odds Ratio</b>	<b>Std. Err.</b>	<b>Z</b>	<b>P&gt;z</b>
<b>Wealth Quintile</b>				
Second	1.6870	0.3170	2.7800	0.0050
Middle	2.1081	0.3782	4.1600	0.0000
Fourth	2.2136	0.3940	4.4600	0.0000
Richest	3.1617	0.5795	6.2800	0.0000

.....Continued

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<b>Maternal Education</b>				
Primary	1.0697	0.1160	0.6200	0.5340
Middle	1.4419	0.1723	3.0600	0.0020
Secondary	1.5063	0.1679	3.6700	0.0000
Higher	1.8587	0.2089	5.5100	0.0000
<b>Home Stimulating Activities</b>				
Reading	0.6236	0.2034	-1.4500	0.1480
Stories	1.0056	0.0912	0.0600	0.9510
Song	0.8711	0.0695	-1.7300	0.0840
Outside	0.9466	0.0870	-0.6000	0.5500
Play	1.1332	0.0999	1.4200	0.1560
Counted	1.4326	0.1034	4.9800	0.0000
_cons	0.3643	0.1330	-2.7700	0.0060

Source: Authors' own estimation using Stata 15.0.

Table 5 presents the impact of maternal education and wealth on child recognition of numbers. The odds ratio is greater than one which means that wealth has a positive effect on the ability of a child to know and recognises names and all numbers from 1-10, these ratios predict that children who belong to wealthier quantile have more chances to recognise the number and shapes than those who belong to poor families by odds of 3.16. Their families have more resources to spend on their development at an early age which lays the foundations for a later successful life.

Maternal education was also found to be positively and significantly associated with a child's cognitive skills. The study reveals that children of mothers with higher education levels are 1.86 times more likely to possess cognitive skills in identifying numbers than children whose mothers have no education. This increased ability to recognise names and numbers can be attributed to the fact that more educated mothers are likely to engage their children in activities that enhance learning. These findings align with the research conducted by Kelley and Bueno (2022), which indicated that preschool children from lower socio-economic backgrounds and with mothers having lower levels of education exhibit more incorrect responses in number recognition compared to their counterparts from higher socioeconomic status.

The study indicates no significant impact from activities such as reading, storytelling, taking children outside, and playing with children on their ability to recognise names and numbers from 1-10. The odds ratio for the activity of singing songs to children is 0.871, suggesting a negative effect on a child's ability to recognise numbers and shapes. This finding means that children who engage in singing activities are 0.13 times less likely to

identify names and numbers compared to those who do not participate in such activities. This could be attributed to the fact that in the early years of life, a child's brain may not be sufficiently developed to understand verbal communication effectively without the support of visual aids.

The odds ratio for counting activities with children is 1.432, indicating that parental involvement in such activities enhances a child's ability to recognise numbers and shapes by 0.432 times more than if they were not involved. This activity typically requires children to count various items, understand sequencing (what comes before and after a number), identify shapes, and describe objects. These tasks not only facilitate recall of previous learning but also aid in transferring knowledge from short-term to long-term memory. Supporting this, previous studies by Kornrich and Furstenberg (2013), Magnuson et al. (2009), and Pem (2015) have shown that factors like wealth, maternal education, and home stimulation activities have a positive influence on a child's ability to recognise numbers and names from 1 to 10, especially in children under the age of five.

Above results show that maternal education, wealth, and home stimulating activities are positively and significantly associated with a child's ability to identify, pronounce, and count. These elements are key factors in child development.

## **5. CONCLUSION**

This research aimed to assess the impact of maternal education and household wealth on early childhood development for children under five years of age. The data analysis clearly indicates that both a mother's education level and family wealth are crucial in shaping a child's development. The results reveal that a mother's education, along with her involvement in various home stimulating activities, positively affects all three assessed dimensions of early childhood development. Similarly, wealth positively influences these developmental outcomes. Therefore, this study aligns with prior research suggesting that child development is a multidimensional process influenced by various factors, with maternal education and household wealth being among the most significant.

According to the different psychological theories, this age is crucial because many operational and cognitive skills are developed, and it lays the foundations for later life outcomes. Therefore, developing countries must pay attention to early child development programmes because in the long run it eliminates the gap between rich and poor through more skilled labour which accelerates the GDP and helps to maintain a sustained growth rate. This can only be achieved if programmes for women's education work effectively and are strictly monitored. In many developing countries, mothers often serve as primary caretakers, molding their children's mental behaviour in alignment with modern requirements. This nurturing approach leads to a future workforce equipped with high-level skills, contributing not only to individuals' financial stability but also bolstering the

country's economy. Additionally, there is a pressing need for the introduction of poverty reduction programmes to empower parents to provide resources for cognitive-stimulating activities.

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