Factors relating to Memory, Social Skill, Language Acquisition, Logical Reasoning, and Problem Solving Skills of Pre-school Children

Ananta Kumar Jena[1]

Abstract

The cognitive development of child is a natural phenomenona characterized by the development of memory, social skill, language acquisition, logical reasoning, and problem solving skills. The study aimed to find out the relationship among the socio-economic status, anthropometric status, and home environmental status on memory, social skill, language acquisition, logical reasoning, and problem solving aspects of cognitive development of pre-school children. Sixty pre-schoolers of two preschools of Assam, India participated in this exploratory research. SPSS version 21 used to calculate the Pearson's product moment correlation to find out the relations among the variables. It resulted that the socio-economic status; anthropometric status and home environmental status has significant positive relationship with memory, social skill, language acquisition, logical reasoning, and problem solving aspects of cognitive development of preschoolers. Parental socioeconomic status, anthropometry, and family environment of children have the relationship with the cognitive development.

Key words: language acquisition, logical reasoning, memory, problem solving, social skill

[1] Assist. Prof. Dr., Assam University. akjenaaus@gmail.com

Introduction

Infants follow all the social, moral, emotional activities from the locality and from the home environment, and try to apply all these. They don't know how rich or poor their parents are, but they try to engage themselves in linking objects, and incidents. Earlier, the researchers investigated that socio-economic status, anthropometric status, and home environmental status are responsible for cognitive development of children (Blau, Klein, 2010; Bradley, Caldwell, Richard,1979; Cabrera,Fagan, Wight, Schadler, 2011). But, in recently, it's in question, whether memory, social skill, language acquisition, logical reasoning, and problem solving skills of children do influence by any other factors, if so, then what are these factors, and what extent these factors do relate to the development of the children. To get the answer of these questions, the study aimed to find out the impact of socio-economic status, anthropometric status, and home environmental status on memory, social skill, language acquisition, logical reasoning, and problem solving aspects of cognitive development of pre-school children. Especially, socioeconomic status is the combination of education, income, and occupation of the individual. Literature also found that socio-economic status and cognitive development of pre-school children was significantly related Cabrera, Fagan, Wight, Schadler, 2011). Contrast to that, a study investigated that socio-economic status has no relationship with the cognitive development of child (Adler & Ostrove,1999). However, the relationship between socio-economic status of the parents and child development has a positive and statistically significant relationship (Eilertsen, Thorsen, Holm, Bøe, Sørensen, Lundervold,2016; Noble, Frank, Farah, 2005). Similarly, three empirical studies experienced with the 120 students assessed the relationship between parental socio-economic status and children's memory, social-skill, language-acquisition aspects found significant and positive relationship as well (Farah, Shera, Savage, Betancourt, Giannetta, Brodsky, 2006; Karp, Martin, Sewell, Manni, Heller, 1992; Li, Atkins, Stanton, 2006). Cognitive development among the children of low-income families has low reciprocal influences of maternal language on the development of children's language (Noble, Houston, Brito, Bartsch, Kan, Kuperman, Akshoomoff, Amaral, Bloss, Libiger, Schork, Murray, Casey, Chang, Ernst, Frazier, Gruen, Kennedy, Van, Mostofsky, Kaufmann, Kenet, Dale, Jernigan, Sowell, 2015).

Anthropometric status is an account of size, shape, and the composition of the human body (Gunstad, Paul, Cohen, 2007). Relating to the anthropometry and cognitive development, a survey type research conducted among the pre-school children found positive relationship (Kuczaj & Lederberg, 1997). In addition to that, in a study it was claimed that anthropometry of children was natural, and it was the product of gene action (Karp, Martin, Sewell, Manni, Heller, 1992). However, it was found no significant relationship between anthropometry and cognitive development of pre-school children (Rosenblum & Lewis, 2003). Not only was that but also there was a significant positive relationship between cognitive development and anthropometry (Richards, Hardy, Kuh, Wedsworth, 2000). but exceptionally, it was found in two studies a negative relationship with the development of child (Sandjaja, Poh, Rojroonwasinkul, Le, Nyugen, Budiman, Ng, Soonthorndhada, Xuyen, Deurenberg, Parikh, SEANUTS, 2013; Sturman, de Leon, Bienias, Morris, Wilson, Evans, 2008). However, anthropometry is a factor could help to assess the cognitive development of children (Nasir, Norimah, Hazizi, Suraya, 2012). Not only anthropometry does help to assess the physical changes (Malmberg, Mwaura, Sylva, 2011; Manna, De, Bera, Chatterjee, and Ghosh, 2011). but also it assume the genetic relationship with the development (Tucker-Drob & Harden, 2012). In a study, 4746 samples used to predict the cognitive developmental phenomena in relation to anthropometry, resulted no significant relationship with the development (Bose, Bisai & Mukherjee, 2015; Moussaoui & Braster, 2011). However, studies conducted in Europe and American countries found that anthropometric status is genetic, and it has significant role in

child development (Evans, Ricciuti, Hope, Schoon, Bradley, Corwyn, Hazan, 2010; Pal & Bose, 2017).

The relationship between the home environmental status and cognitive developmental phenomena among preschool children was positive (Carr, Kurtz, Schneider, Turner, Borkowski, 1989; Fish, Li, McCarrick, Butler, Stanton, Brumitt, Partridge, 2008). Three longitudinal studies were conducted in Canada and USA on 50-100 children of three schools and their respective parents, aimed to find out the relationship between home environmental status and cognitive development, found statically significant and positive as well (Bradley & Caldwell, 1976; Bradley, Caldwell, Rock, Barnard, Gray, Hammond, Mitchell, Ontario, Ramey, Gottfried, Johnson, 1989; Mitchell, Croy, Spicer, Frankel, Emde, 2011). In addition to these, other studies investigated that there was also a positive relationship between home environment and the cognitive development of pre-school children (Biedinger, 2011; Espy, Molfese, DiLalla, 2001). The home environmental of American, Indian, Turkish, and Canadian families have a significant role on the cognitive development of the pre-schoolers (Andrade, Santos, Bastos, Pedromônico, de Almeida-Filho, Barreto, 2005; Bradley & Cardwell, 1980; Ronfani, Brumatti, Mariuz, Tognin, Bin, Ferluga, Knowles, Montico, and Fabio, 2015, Slaughter & Epps, 1987). After going through the literatures, the present study assumed that socio-economic status, anthropometric status, and home environmental status has a hierarchical significant relationship with memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of cognitive development of pre-school children.

Methodology

Participants and procedure

Exploratory research predicted the potential relations among variables through hierarchical multiple regression models. Here, all these factors of cognitive development such as memory, social skill, language acquisition, logical reasoning, and problem solving aspects are dependent variables, and the socio-economic status, anthropometric status and home environmental status of the child was the independent variables. 20 girls and 40 boys were participated in this study, after the consent of the principals, the parents, and the approval of ethical committee of Assam University, Silchar, Assam, India. Socio-Economic Status Scale, Anthropometric Checklist, Home Environment Schedule, and Cognitive Development Scale administered among these sixty preschoolers (20 girls, 40 boys), range of aged from 4 to 6 yr, mean age 5, and SD = .04 of two pre-schools of Cachar district in Assam, India. The details of the inclusion and exclusion criteria of the sample are given in box 1.

Box 1 Inclusion criteria and exclusion criteria of the sample

Inclusion Criteria
Age: Above 4-6 years
Educational Qualification: preschoolers
Gender: Both male and female
Religion: Muslims, Christians and Hindus
Sample: Students resided only in Cachar district of Assam, India were selected Size of the samples:60
Ethical consent form : provided and signed
Exclusion Criteria
Residing outside the study area
Students who enrolled in the schools but had dropped out/ transferred
Student with physical disability, and chronic illness

Socio-Economic Status Scale (Jena, & Paul, 2014) used to know the participants' parental educational, occupational, and educational status. This scale has three sub-areas (i.e. educational status, occupational status and family income status) and each area has 6-10 items. In sub-area, one (i.e. educational status) six options rated range 1 to 6. In occupational status sub-area, ten options rated from 1 to 10, and the monthly family income was the third sub area of the scale has seven categories of family income. SESS is a standardized test of academic potential. The normative group for the SESS randomized among the cross-cultural group of Indian who accurately reflect the diversity of that group of respondents of the test. In psychology, the normative group for a test used to assess SESS among the parents of 4- to -6year-olds in India was the sample of parents of 4- to 6-year-olds from various demographic groups in India. Content Validity Ratio (CVR) and Cronbach α was .61 and .86 respectively.

Anthropometric checklist (Jena, & Paul, 2014) has two parts; one is Part I, related to personal profile of the child and Part II assessed child's bodily status (i.e. Gender, High, weight, B.M.I., wrist circumference, and daily activity pattern of the child). In Part I, the response collected about child's name, age, and class. In Part II, the child responded about Gender, Height, Weight, B.M.I. Wrist circumference and daily activity pattern. The formula to calculate the B.M.I. was the height of the child converted in meters and then squared it. Anthropometric checklist is a standardized test of academic potential and so far, during standardization, the normative group randomized from cross-cultural group of Indian pre-schoolers who accurately reflect the diversity of that group of test takers. In psychology, the normative group for a test assessed the anthropometric status in 4- to -6year-olds in India would be a sample of 4- to 6-year-olds from various demographic groups in India. The Content Validity Ratio was .60 and the test-retest(r) and Split-half (r) was 0.67 and .65 respectively.

Home Environment Schedule (Jena, & Paul, 2014) used to know the child's home-environment, parent-child relationship, family, sibling relationship, and daily habit of the child. The schedule has two parts as Part I and Part II. The part one needs to fill with the name of the child, father's name, mother's name of the child, age of the child, gender, class, name of the school and mobile no of the parent. The Part-II has twelve items and every item was optional type. The sample and their parents respond each item. Home Environment Schedule is a standardized test of academic potential, used randomized and cross-cultural group of Indian parents of pre-schoolers, the subjects of normative group, who accurately reflect the diversity of that group of participants. Normative group participants used Home Environment Schedule responded the items about their family status, habitation status, parent child relationship, parental attitude towards gender, noise in the home environment, activities in the home and transport facilities in the home. C.V.R. found .61, the reliability of the tool established through KR20 found 0.69, and Split-half (r) was .67.

Cognitive Development Scale (Jena, & Paul, 2014) was a standardized scale has six subscales. Sub-area memory has five categories of dichotomous type of items assess listening comprehension, oral expression, reading comprehension, phonological processing, and object naming. In social-skill sub-scale, there are five short types of items regarding morning assembly, respect to teachers, and way of living, obedience, and peer group relation. The language acquisition sub-area assesses grammatical error, associational fluency, identifying language error and adopting language. The language acquisition has five subject areas (i.e., children learning to speak never to make grammatical errors such as getting their subjects, verbs, and objects. The sub-area logical reasoning contains letter naming faculty, word recognition fluency, numerical analysis, and calculation. Maximum 10-12 minutes necessary to response the whole items, and the respondents get maximum five marks for each correct response and zero mark for no or wrong response. Normative sample was the sample of the present study, the pre-schoolers around India randomized from the cross-cultural group who accurately reflect the diversity of that group of test takers. Especially, in this study, the normative group for this test assesses developmental process in 4- to -6year-olds in India was

the sample of 4- to 6-year-olds from various demographic groups in India. The content validity ratio was 0.75 while the reliability of the scale was established by using Kuder-Richardson KR_{20} = 0.86 and Test-Retest method = 0.89. The researchers visited the house of the children to administer the socio-economic status scale among the parents and motivated the parents to take the child's anthropometry to fill up the anthropometric checklist. By that time, the information regarding the home environment status of the child collected through the personal interview with the parents. Because it was to know how frequent and how often the child was nearer and dearer to their parents and other family members and it was not neglected to assess on how long the child expended his/her time with co-curricular activities in the home.

Analysis and results

SPSS version 21 used to calculate Pearson's product moment correlation for socio economic status, anthropometric status and home environmental status in relations to memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children. In statistics, the correlation coefficient *r* measures the strength and direction of a linear relationship between two variables. The value of *r* is always between +1 and –1. Pearson product-moment correlation reported the value of the correlation coefficient, *r*, as well as the degrees of freedom (df). The degrees of freedom (df) is the number of data points minus 2 (N – 2).

H_1 There is no significant positive relationship between socio-economic status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children

Table 1.1 Mean and SD of socio-economic status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children.

	N	Mean	SD
Socio economic status	60	18.63	3.875
Memory	60	18.65	3.844
Social skill	60	19.35	4.046
Language acquisition	60	18.65	3.844
Logical reasoning	60	18.65	3.844
Problem solving	60	13.52	3.476

Table 1.1 depicts the descriptive analysis resulted that the mean ± standard deviation of socio-economic status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children. The mean and SD of problem solving (m=13.52 ± 3.47) was smaller than memory (m=18.65±3.84), social skill (m=19.35±4.04), and language acquisition (m=18.65±3.84), logical reasoning (m=18.65±3.84), and socioeconomic status (m=18.63±3.87).

Table 1.2 Pearson's product moment correlation(r) of socio-economic status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children

		Memory	Social skill	Language acquisition	Logical reasoning	Problem solving
	Pearson Correlation	.995[**]	.796[**]	.995[**]	.995[**]	.862[**]
Socio economic status	Sig. (2-tailed)	.000	.000	.000	.000	.000
	df	58	58	58	58	58
	N	60	60	60	60	60

Table 2 depicts the Pearson product-moment correlation coefficient measured of the strength of the linear relationship between two variables. Here, socio-economic status is an independent variable while memory, social skill, and language acquisition, logical reasoning, and problem

solving aspects of pre-school children were the dependent variables. Results of the Pearson correlation indicated that there was a significant positive association between Socio economic status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of cognitive development of pre-schoolers. It resulted statistically positive correlation between the socio economic status and memory $[r(58)=.995, n=60, p=.000 <.05]$, socio economic status and social skill $[r(58)=.796 \ n=60, p=.000 <.05]$, socio economic status and language acquisition $[r(58)=.995, n=60, p=.000 <.05]$, socio economic status and logical reasoning $[r(58)=.995, n=60, p=.000 <.05]$, socio economic status and problem solving $[r(58)=.862, n=60, p=.000 <.05]$. This indicated that the strength of association between the variables and the correlation coefficient is highly significantly different from zero $(0< .995, 0<.796, 0<.995, 0<.995$ and $0<.862)$. Hence, the hypothesis was rejected, and there was significant positive relationship between socio-economic status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children.
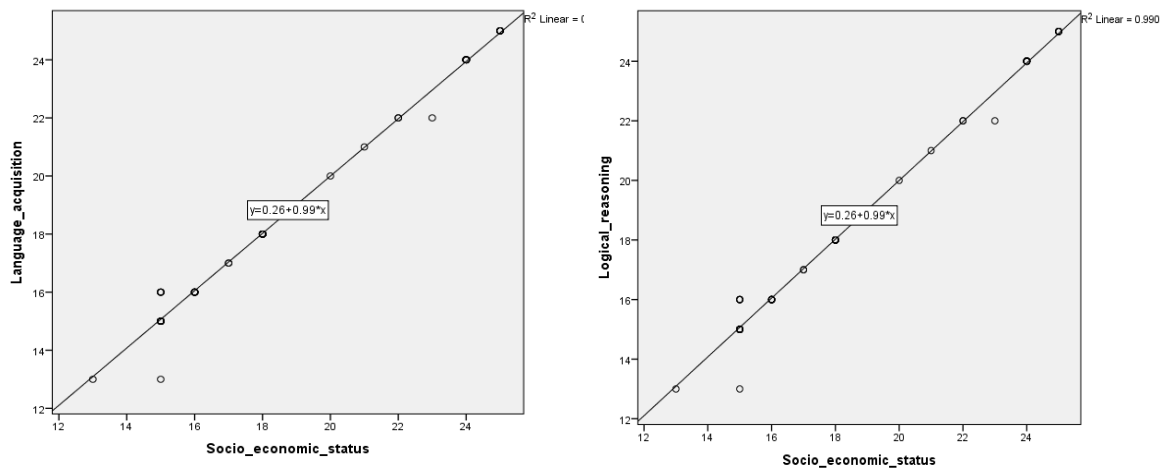
A scatterplot summarizes the results (Figure 1a,b,c,d & e).

Fig 1a correlation between Socio economic   Fig 1b correlation between Socio economic

Fig 1c correlation between Socio economic status   Fig 1d correlation between Socio economic status

Fig 1e correlation between Socio economic status and problem solving $(r) = \ + .862^{**}$
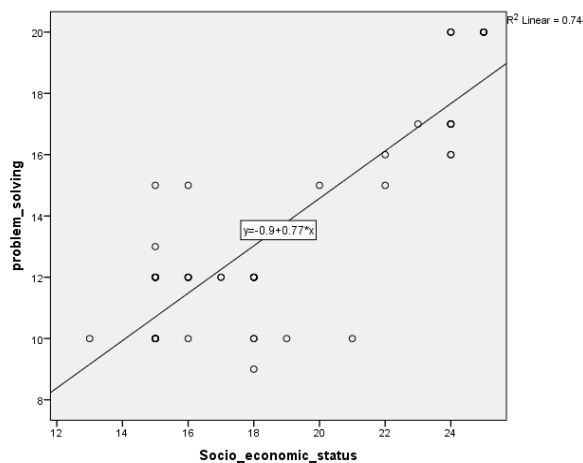
The above figures showed about various correlations in terms of the strength and direction of the relationship. Figure (1a) shows a correlation of nearly +.995, figure (1b) shows a correlation of .796, figure (1c) shows a correlation of +.995, Figure (1d) shows a correlation of +.995 and figure (1d) shows a correlation of +. 862. Comparing figures (1a), (1c), and (1d), you see figure (a) is nearly a perfect uphill straight line, and figure (1c) shows a very strong uphill linear pattern. Figure (1b) and figure (1d) is going downhill but the points are somewhat scattered in a wider band, showing a linear relationship is present, but as strong as in figures (1a), (1c) and (1d).

H_2 There is significant positive relationship between anthropometric status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children

Table 2.1 Mean and SD of anthropometric status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children

	N	Mean	SD
Anthropometric status	60	18.75	3.956
Memory	60	18.65	3.844
Social skill	60	19.35	4.046
Language acquisition	60	18.65	3.844
Logical reasoning	60	18.65	3.844
Problem solving	60	13.52	3.476

Table 2.1 reveals the descriptive analysis resulted that the mean ± standard deviation of socio-economic status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children. The mean and SD of anthropometric status (m=18.75 + 3.95), memory (m=18.65±3.84), social skill (m=19.35±4.04), and language acquisition (m=18.65±3.84), and logical reasoning (m=18.65±3.84) was greater than the problem solving (m=13.52±3.47).

Table 2.2 Pearson's product moment correlation(r) of anthropometric status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children

		Memory	Social skill	Language acquisition	Logical reasoning	Problem solving
Anthropometric status	Pearson Correlation	.973**	.800**	.973**	.973**	.822**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	df	58	58	58	58	58
	N	60	60	60	60	60

Table 2.2 depicts the Pearson's product moment correlation(r) of anthropometric status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children. The results of the Pearson correlation indicated that there was a significant positive association between anthropometric status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of cognitive development of pre-schoolers. It resulted that there was positive correlation between the anthropometric status, and memory [r(58)=.973, n=60, p=.001 <.05], socio economic status and social skill [r(58)=.800 n=60, p=.002 <.05], anthropometric status and language acquisition [r(58)=.973, n=60, p=.001 <.05], anthropometric status and logical reasoning [r(58)=.973, n=60, p=.000 <.05], anthropometric status and problem solving [r(58)=.822, n=60, p=.004 <.05]. This indicated that the strength of association between the variables and the correlation coefficient is highly significantly different from zero. Hence, the hypothesis was rejected, and there is significant positive relationship between anthropometric status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children.

A scatterplot summarizes the results (Figure 1a, b, c, d & e). The above figures showed about various correlations in terms of the strength and direction of the relationship. Figure (1a) shows a correlation of nearly +.973, figure (1b) shows a correlation of +.800, figure (1c) shows a correlation of +.973, figure (1d) shows a correlation of +.973 and figure (1d) shows a correlation of +. 822.

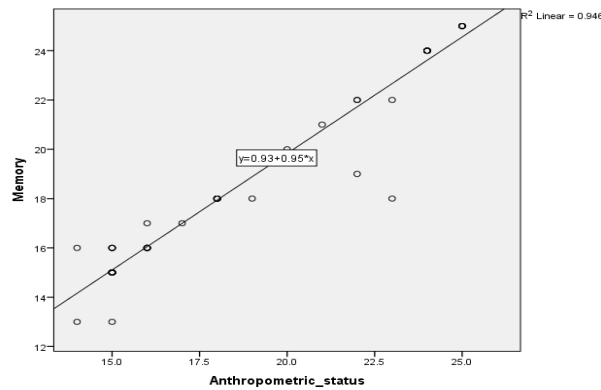Fig 2a correlation between anthropometric status and memory   (r) = + .973[**]

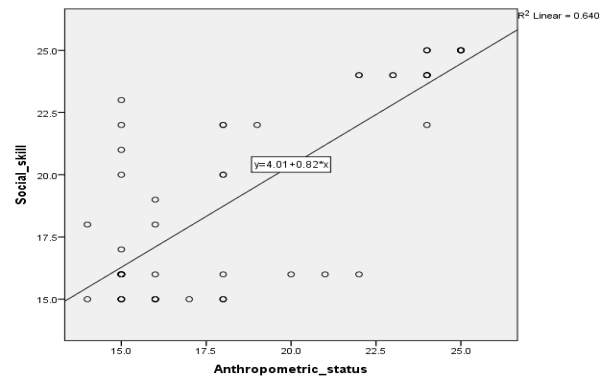Fig 2b correlation between anthropometric status and social skill   (r) = + .800[**]

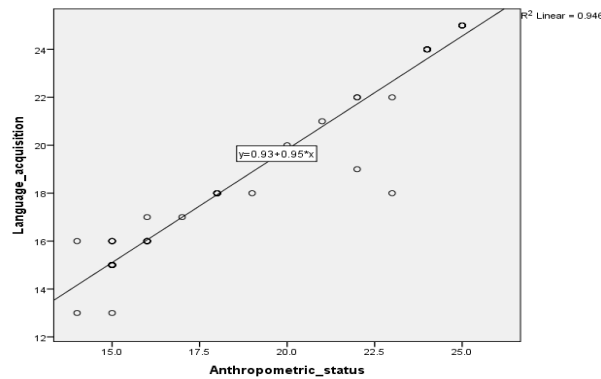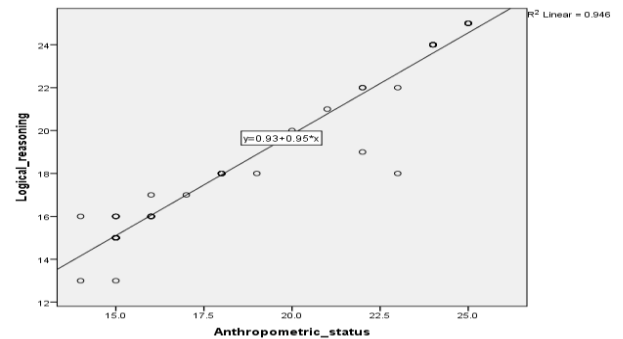Fig 2c correlation between anthropometric status and language acquisition   (r) = + .973[**]

Fig 2d correlation between anthropometric status and logical reasoning   (r) = + .973[**]

Fig 2e correlation between anthropometric status and problem solving (r) = + .822[**]
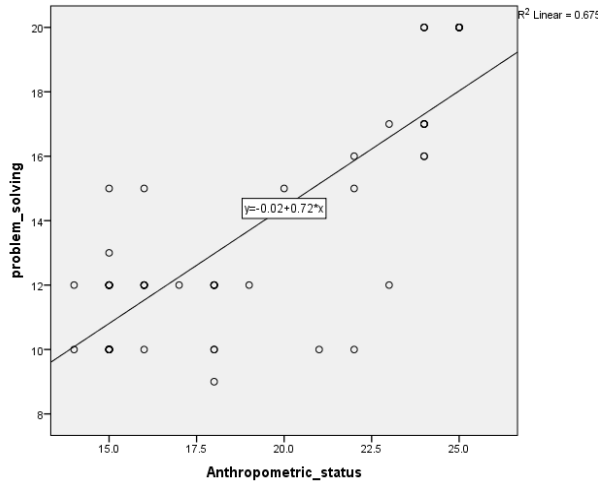
Comparing figures (1a), (1c), and (1d), you see figure (1a) is nearly a perfect uphill straight line, and figure (1c) shows a very strong uphill linear pattern. Figure (1b) and figure (1d) is going downhill but the points are somewhat scattered in a wider band, showing a linear relationship is present, but as strong as in figures (1a), (1c) and (1d).

H₃ There is significant positive relationship between home environmental status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children

Table 3.1 mean and SD of home environmental status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children

	N	Mean	SD
Home environmental status	60	18.77	3.779
Memory	60	18.65	3.844
Social skill	60	19.35	4.046
Language acquisition	60	18.65	3.844
Logical reasoning	60	18.65	3.844
Problem solving	60	13.52	3.476

Table 3.1 depicts the descriptive analysis resulted that the mean ± standard deviation of home environmental status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children. The mean and SD of problem solving (m=13.52±3.47) was smaller than the home environmental status (m=18.77 + 3.77), memory (m=18.65 ±3.84), social skill (m=19.35±4.04), and language acquisition (m=18.65±3.84), logical reasoning (m=18.65± 3.84).

Table 3.2 Pearson's product moment correlation(r) of home environmental status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children

		Memory	Social skill	Language acquisition	Logical reasoning	Problem solving
Home-environmental status	Pearson Correlation	.993[**]	.783[**]	.993[**]	.993[**]	.866[**]
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	df	58	58	58	58	58
	N	60	60	60	60	60

Table 3.2 reveals the Pearson product-moment correlation coefficient measured of the strength of the linear relationship between home environmental status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children. The results of the Pearson correlation indicated that there was a significant positive association between home environmental status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of cognitive development of pre-schoolers. There was a positive correlation between the home environmental status, and memory [$r(58)=.819$, $n=60$, $p=.001 < .05$], home environmental status and social skill [$r(58)=.993$ $n=60$, $p=.002 < .05$], home environmental status and language acquisition [$r(58)=.993$, $n=60$, $p=.001 < .05$], home environmental status and logical reasoning [$r(58)=.993$, $n=60$, $p=.000 < .05$], home environmental status and problem solving [$r(58)=.866$, $n=60$, $p=.004 < .05$].

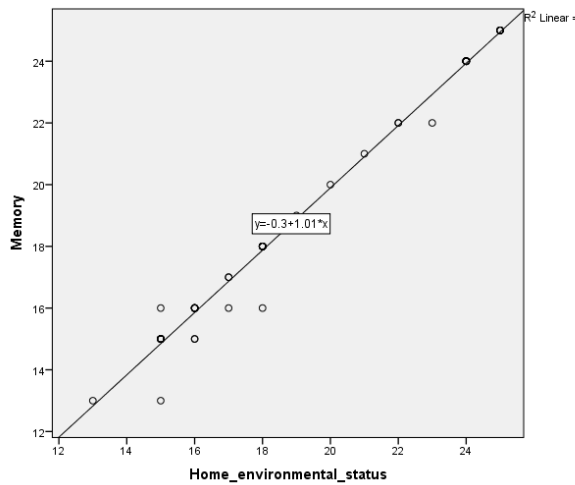Fig 3a correlation between home environmental status and memory (r) = + .993**

Fig 3b correlation between home environmental status and social skill (r) = + .783**

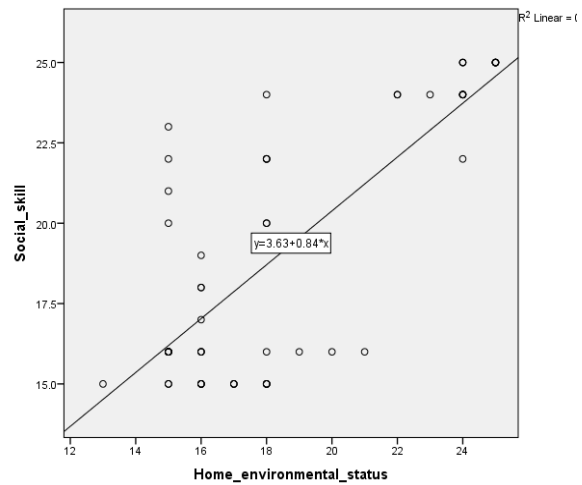

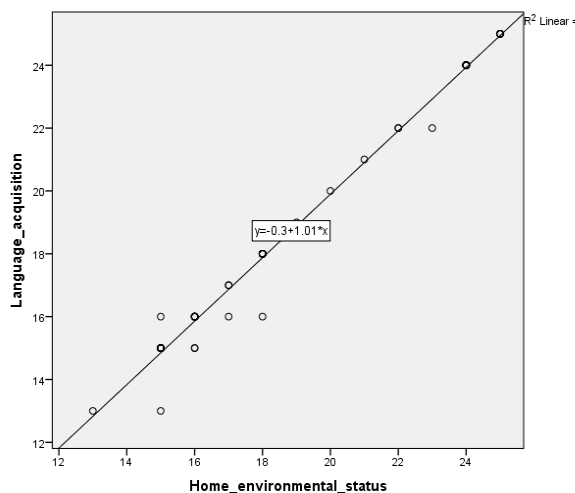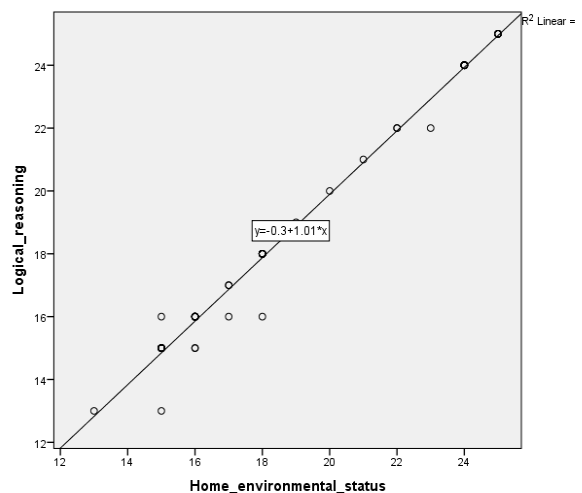Fig 3c correlation between home environmental status and language acquisition (r) = + .993**

Fig 3d correlation between home environmental status and logical reasoning (r) = + .993**

Fig 3e correlation between home environmental status and problem solving $(r) = +.866^{**}$

This indicated that the strength of association between the variables and the correlation coefficient is highly significantly different from zero. Hence, the hypothesis was rejected, and there is significant positive relationship between home environmental status and memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children. A scatterplot summarizes the results (Figure 1a, b, c, d & e). The above figures showed about various correlations in terms of the strength and direction of the relationship. Figure (1a) shows a correlation of nearly +.993, figure (1b) shows a correlation of +.783, figure (1c) shows a correlation of +.993, Figure (1d) shows a correlation of +.993 and figure (1d) shows a correlation of +. 866. Comparing figures (1a), (1c), and (1d), you see figure (1a) is nearly a perfect uphill straight line, and figure (1c) shows a very strong uphill linear pattern. Figure (1b) and figure (1d) is going downhill but the points are somewhat scattered in a wider band, showing a linear relationship is present, but as strong as in figures (1a), (1c) and (1d).

Discussion

The study claimed that the socio-economic status was statistically related with memory, social skill, language acquisition, logical reasoning, and problem solving aspects of development of pre-school children of Assam. In addition to that, anthropometric status and home environmental status was positively related with the cognitive development of pre-school children. The family and the learning environment of the students of Assam were surprisingly better than other parts of India because parental economy was not the barrier in the cognitive development. It's true to say that SES of the parents is necessary for the development, rather early educational programs are essential for cognitive development of child. Parental awareness and direct involvement in the educational programs could enhance cognitive development of children. In India, SES affects overall human development, including our memory, social skill, language acquisition, logical reasoning, and problem solving and mental health. Naturally, parents having various levels of SES (low, average, and high) have certain relationship with achievement, poverty, mental development, and poor health, ultimately it affects our society. Society benefits from an increased foundation of socioeconomic growth. The study claimed memory, social skill, and language acquisition, logical reasoning, and problem solving aspects of pre-school children positively correlated with SES of the parent but necessary parental affection, nutrition, and early childhood care has significant role in the development of on memory. Social skill aspect of cognitive development of the preschool children has relationship

with socio-economic status. Socioeconomic status can represent the quality of life as well as the opportunities and privileges to the people within society. In addition to that, SES is a consistent and reliable predictor of including physical and psychological health like memory, social skill, language acquisition, logical reasoning, and problem solving and mental health. Anthropometric status assessed the preschoolers' weight, age, height, wrist and arm circumference, and head circumference and socioeconomic status assessed the parental income and education found direct relations with development. The study showed that weight, height and arm circumference and head circumference mediated the relation between socioeconomic status and developmental outcome memory, social skill, language acquisition, logical reasoning, and problem solving and mental health. Especially, home-environmental status was the sum of parental care, love, and affection to the child has significant relations with child's social skill, language acquisition factor of the development. Like anthropometric status and anthropometric status, home-environmental status is a predictor of logical reasoning and problem solving skills of preschool children.

Conclusion

Children's memory development needs parental economic status, but it's true that the social skill of cognitive development needs home- environmental status. In Assam, India, socio-economic status of the parents is average and below average but it has significant relations with the children's cognitive development. There is a universal relationship between socio-economic status and health, and it has a strongest association between memory, social skill, language acquisition, logical reasoning, and problem solving and mental health. Investigator wanted to examine the relationship between socio-economic position and memory, social skill, language acquisition, logical reasoning, and problem solving and mental health. Similarly, anthropometric status has the significant role in the cognitive development of pre-school children. Home environmental status was an important factor related with cognitive development of preschool children. Specifically, memory aspect of the cognitive development of pre-school children was related with anthropometry and home environment. Here, home environment is the predictors of children's social- skill aspect of cognitive development. That is why, parental necessary to the children for their development of social skill. Not only was that but also logical reasoning aspects of the cognitive development also related with anthropometry. Therefore, parents and teachers should take cares the pre-schoolchildren for their development of memory, social–skill, language- acquisition, logical reasoning, and problem solving skills. The parents should provide well nutrition in support to the cognitive development of pre- schoolers. The recent study recommended to the other researchers and the world of the educationalists, colleagues, researchers, policy makers, curriculum framers to undertake further research in this area. However, the researcher studied socio-economic status, anthropometry, and home environmental status to predict the cognitive developmental phenomena but other factors like ethnicity, co- operative learning, and group activities could influence the cognitive development of pre- schoolchildren needs further investigation.

Strengths and limitations

The novelty and the strength of the study was to find out the relationship between the socio-economic status, anthropometric status, and home environmental status with the memory, social skill and language acquisition, logical reasoning and problem solving aspects of cognitive development of Indian pre-school children. In Cachar area, socio- economic status has huge role in the developmental phenomena of the children. However, limitation of this study was that why didn't happen same in other parts of countries. In these countries, socio-economic status has a significant role with memory, social skill and language acquisition, logical reasoning and problem solving aspects of the cognitive development of pre-school children.

References

Adler, N.E., Ostrove, J.M. (1999).Socioeconomic status and health: What we know and what we don't. *Annals of the New York Academy of Sciences*, 896, 3–15.

Andrade, S.A., Santos, D.N., Bastos, A.C., Pedromônico, M.R., de Almeida-Filho, N., Barreto, M.L.(2005). Family environment and child's cognitive development: an epidemiological approach. *Rev Saude Publica*, 39, 606–611.

Biedinger, N.(2011). The Influence of Education and Home Environment on the Cognitive Outcomes of Preschool Children in Germany. *Child Development Research*, 2011, 10-20.

Blau, R., Klein, P.S. (2010). Elicited Emotions and Cognitive Functioning in Preschool Children. *Early Child Development and Care*, 180(8),1041-1052.

Bose, K., Bisai, S., Mukherjee, S.(2015). Anthropometric characteristics and nutritional status of rural schoolchildren. *The Internet Journal of Biological Anthropology*, 2(1), 1-6.

Bradley, R. H., Caldwell, B.M.(1976). The Relations of Infants' Home environments to Mental Test Performance at fifty-four Months: A follow-up Study. *Child Development*, 47(4), 1172-1174. DOI: 10.2307/1128457.

Bradley, R.H. & Cardwell, B.M.(1980). The Relation of Home Environment, Cognitive competence, and IQ among Males and Females. *Center for child Development and Education*, 51(4), 1140-1148. D.O.I.: 10.2307/1129555.

Bradley, R.H., Caldwell, B.M., Richard, E. (1979). Home Environment, and Cognitive development in the first 2 years: A Cross-lagged panel analysis. *Developmental Psychology*, 15(3), 246-250.

Bradley, R.H., Caldwell, B.M., Rock, S.L., Barnard, K.E., Gray, C., Hammond, M.A., Mitchell, S., Ontario, L.S., Ramey, C.T., Gottfried, A.W., Johnson, D.L.(1989). Home Environment and Cognitive Development in the First 3 Years of Life: A Collaborative Study Involving Six Sites and Three Ethnic Groups in North America. *Developmental Psychology*, 25(2), 217-235.

Cabrera, N.J., Fagan, J., Wight, V., Schadler, C. (2011). Influence of Mother, Father, and Child Risk on Parenting and Children's Cognitive and Social Behaviors. *Child Development,* 82(6),1985-2005.

Carr, M., Kurtz, B.E., Schneider, W., Turner, L. A., Borkowski, J.G.(1989). Strategy acquisition and transfer among American and German Children: Environmental influences on metacognitive development. *Developmental Psychology*, 25(5), 765-771. http// dx. doi. org/ 10.1037/0012-1649.25.5.765.

Eilertsen, T, Thorsen, A.L, Holm, S.E, Bøe, T., Sørensen, L., Lundervold, A.J. (2016). Parental socioeconomic status and child intellectual functioning in a Norwegian sample. *Scandinavian Journal of Psychology*, 57, 399–405.

Espy, K.A., Molfese, V.J., DiLalla, L.(2001). Effects of environmental measures on intelligence in young children: Growth curve modeling of longitudinal data.*Merrill-Palmer Quarterly*, 47, 42–73.

Evans, G.W., Ricciuti, H.N., Hope, S., Schoon, I., Bradley, R.T.H., Corwyn, R. F., Hazan, C.(2010). Crowding and Cognitive Development: The Mediating Role of Maternal Responsiveness among 36-Month-Old Children. *Environment and Behavior*, 42(1), 135-148.

Farah, M.J., Shera, D.M., Savage, J.H., Betancourt, L., Giannetta, J.M., Brodsky, N.L.(2006). Childhood poverty: specific associations with neurocognitive development. *Brain Research,* 1110, 166–174.

Fish, A.M., Li, X., McCarrick, K., Butler, S.T., Stanton, B., Brumitt, G.A., Partridge, T.Y.(2008). Early childhood computer experience and cognitive development among

Urban low-income preschoolers. *Journal of Educational Computing Research, 38*(1), 97-113. DOI: 10.2190/EC.38.1.e.

Gottfried, A.W., & Gottfried, A.E. (1984). Home environment and cognitive development in young children of middle-socioeconomic-status families. In A. W. Gottfried (Ed.), Home environment and early cognitive development. *Longitudinal research,* 57-115. New York: Academic Press.

Gunstad, J., Paul, R.H., Cohen, R.A.(2007). Elevated body mass index is associated with executive dysfunction in otherwise healthy adults. *Compr Psychiatry*, 48(1), 57–61.

Jena, A.K., Paul, B. (2014). Cognitive Developmental Scale. Assam University, Silchar.

Jena, A.K., Paul, B.(2014). Anthropometric Checklist Published Tool. Assam University, Silchar.

Jena, A.K., Paul, B.(2014). Home-Environment Schedule Published Tool. Assam University, Silchar.

Jena, A.K., Paul, B.(2014). Socio-Economic Status Scale Published Tool. Assam University, Silchar.

Karp, R., Martin, R., Sewell, T., Manni, J., Heller, A.(1992). Growth And Academic Achievement in Inner-city Kindergarden Children. *Asia Pacific Journal of Public Health*, 31(6),336-340.

Kuczaj, S.A., Lederberg, A.R.(1997). Height, Age and Function : Differing influences on Children's Comprehension of "Younger" and "Older". *Journal of Child language*, 4(3), 395-416.

Li, X., Atkins, M.S., Stanton, B.(2006). Effects of Home and School Computer Use on School Readiness and Cognitive Development among Head Start Children: A Randomized Controlled Pilot Trial. Merrill-Palmer Quarterly Journal of Developmental Psychology, 52(2), 239-263.

Malmberg, L., Mwaura, P., Sylva, K. (2011). Effects of a Preschool Intervention on Cognitive Development among East-African Preschool Children: A Flexibly Time-Coded Growth Model. *Early Childhood Research Quarterly*, 26(1): 124-133.

Manna, P.K., De, D., Bera, T.K., Chatterjee, K., and Ghosh, D.(2011). Anthropometric Assessment of Physical Growth and Nutritional Status among School Children of North Bengal. *Anthropologist,* 13(4), 299-305.

Mitchell, C.M., Croy, C., Spicer, P., Frankel, K., Emde, R.N.(2011). Trajectories of Cognitive Development among American Indian Young Children. *Developmental Psychology*, 47(4), 991-999.

Moussaoui, N., Braster, S.(2011). Perceptions and Practices of Stimulating Children's Cognitive Development among Moroccan Immigrant Mothers. *Journal of Child and Family Studies,* 20(3), 370-383.

Nasir, M.T.M., Norimah, A.K., Hazizi, A.S., Suraya, I.(2012). Child feeding practices, food habits, anthropometric indicators and cognitive performance among preschoolers in Peninsular Malaysia. *Appetite,* 58(2), 525-30.

Noble, K.G., Frank, N.M., Farah, M.J.(2005). Neurocognitive correlates of socioeconomic status in kindergarten children. *Developmental Science*, 8(1), 74–87.

Noble, K.G., Houston, S.M., Brito, N.H., Bartsch, H., Kan, E., Kuperman, J.M., Akshoomoff, N., Amaral, D.G., Bloss, C.S., Libiger, O., Schork, N.J., Murray, S.S., Casey, B.J., Chang, L., Ernst, T.M., Frazier, J.A., Gruen, J.R., Kennedy, D.N., Van, Z.P., Mostofsky, S., Kaufmann, W.E., Kenet, T., Dale, A.M., Jernigan, T.L., Sowell, E.R.(2015). Family income, parental education, and brain structure in children and adolescents. *Nat Neurosci*, 18(5), 773-778.

Pal, S., Bose, K.(2017). Anthropometric characteristics of rural primary school children of Hooghly District, West Bengal, India. *Human Biology Review*, 6(1), 30-46.

Richards, M., Hardy, R., Kuh, D., Wedsworth, M.E.J.(2000). Birth Weight and Cognitive function in the British 1946 birth Cohort, longitudinal population based study. *BMJ*, 322: doi-org/10.1136/bmj-322.7280.199.

Ronfani, L., Brumatti, L.V., Mariuz, M., Tognin, V., Bin, M., Ferluga, V., Knowles, A., Montico, M., and Fabio, B.(2015). The Complex Interaction between Home Environment, Socioeconomic Status, Maternal IQ and Early Child Neurocognitive Development: A Multivariate Analysis of Data Collected in a Newborn Cohort Study. *PLoS One*, 10(5), 12-22.

Rosenblum, G.D., Lewis, M.(2003). The Relations among body image, physical attractiveness, and Body Mass in Adolescence, 70(1), 50-64. D.O.I: 10.1111/1467-8624.00005.

Sandjaja, Poh, B.K., Rojroonwasinkul, N., Le, Nyugen, B.K., Budiman, B., Ng, L.O., Soonthorndhada, K., Xuyen, H.T., Deurenberg, P., Parikh, P., SEANUTS(2013). Study Group. Relationship between anthropometric indicators and cognitive performance in Southeast Asian school-aged children. *Br J Nutr*, 110(3), 57-64. doi: 10.1017/ S0007 11451 3002079.

Slaughter, D.T., Epps, E.G.(1987). The Home Environment and Academic Achievement of Black American Children and Youth: An Overview. The Journal of Negro Education, 56(1): 3-20.

Sturman, M.T., de Leon, C.F., Bienias, J.L., Morris, M.C., Wilson, R.S., Evans, D.A.(2008). Body mass index and cognitive decline in a biracial community population. *Neurology,* 70(5), 360-7.

Tucker-Drob, E.M., Harden, K.P.(2012). Early Childhood Cognitive Development and Parental Cognitive Stimulation: Evidence for Reciprocal Gene-Environment Transactions. *Developmental Science*, 15(2): 250-259.