Effects of Environmental Conditions on Development of Intelligence of College Students in The Districts of Kolkata and North & South 24 Parganas, West Bengal

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Abstract:

Various environmental factors like place of birth, family income, physical exercise, parent's occupation and education influence the intelligent quotient of student to a great extent. Genes play a pivotal role in determining intelligence. The genes contribute bout 20-40% of the variance in intelligence in childhood and about 80% in the adulthood. Gene and its interaction with environment have created the variation in intelligence in groups of young children. Environment and intelligence are correlated with each other and environment has great impact on different levels of intelligence. Here the researcher search that how environmental condition and intelligence are correlated with different age, sex, cast, locate. The investigator wants to know the effect of environmental conditions on the growth of intelligence of student. This paper deals with how environmental condition closely is related with intelligence.

Key words: Environment conditions, Intelligence, College students

Introduction: Development of intelligence is affected by various environmental influences like family, peer-group, training and intervention environmental environment. Intelligence cannot be changed with changed timeline. Love affection, concern, generosity bestowed on growing of student Childhood to adulthood. Poor environments related and retorted development of intelligence. A student's IQ is influenced by genetic and environmental factors. The major characteristics of intelligence are ability to learn, solved problem, think abstractly, comprehending complex ideas and learn.
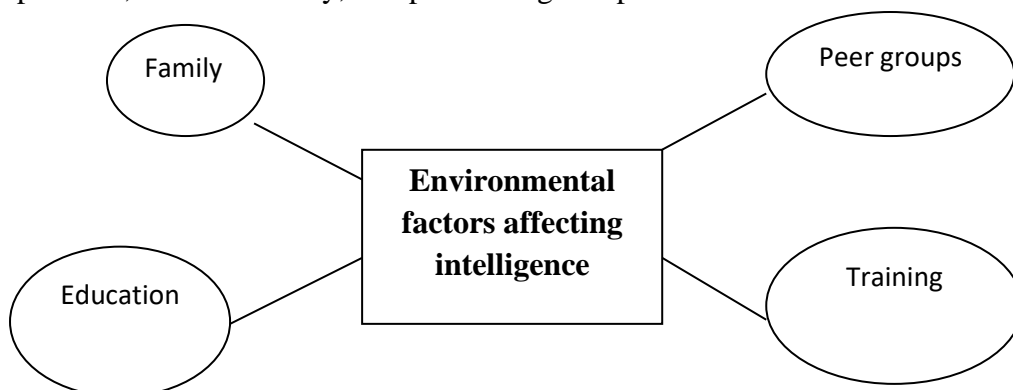
The environmental factors influence typically the intelligence of children which is termed s general intellectual climate of the home. According to psychologists parental encouragement and involvement for achievement, responsiveness of parent's to the child's overtures, stimulating lays and Books, intellectual activities of parents all are together called 'between family environmental factors'. Between family environmental factors are influential but the environmental conditions that contribute to the mental performance of the students (Freeberg & Pyne, 1967; McCall, 1979). Rows and Plomin (1981) have emphasized that the between family factors may be great influence on the development of intelligence. They suggest half the variance of general mental performance is an environmental and half of that environmental variation is within the family and not shared by sibling. Biometric students of adult twines used to estimates of genetic and environmental influence on intelligence and special mental abilities. Sir Francis Galton observed the relationship between biological families confounded genetic and environmental determinants of human traits. Galton introduces the use of both twins and adoptees for a method to detachment two sources of influence (Galton 1876, 1883). He also invented the method of correlation (Galton 1888; Stigler 1989), variants of which underlie most twin research (Neale and Cardon 1992) Galton is the pioneer and founder of quantitative behavioural genetics.

Review of Related Literature:

In Galton's period, both our understanding of the nature of human mental abilities and methods for detaching the various genetic and environmental sources of variance in these abilities (Bouchard Jr. J.T.; 1998) Genetic influences are the main drawing force behind continuity in general cognitive ability. Unique environmental influences contribute to the change of cognitive abilities solely (Bartels N.; Rietveld H.J.N., Ball V.N.C.G. et. al). Development of intelligence is affected by various environmental influences like family, peer group, education, training and intervention environmental enrichment and biological influences like nutrition, stress, mental age, perinatal factors, exposure to toxic chemicals and other substances also effects intelligence and development of genius (Nagpal J., Arora K.V. Nagpl B.; 2015). A longitudinal study that reveal that intra individual variation average in IQ accounts for as such or more variability that has been estimated to be the non-shared within environmental variation in IQ (McCall B.R.; 1983). Students should set detailed short term goals to easily achieve long term goals. Soft skill élans like self identification skills, goal setting skills, time management skills help to student's their own strengths and weakness and able to set suitable goals and achieve that goal effectively, those skills classes help students learn how to solve problem in life and learning (NGUYEN T.K., DOUNG M.T. et. l 2019). Individual differs in intelligence due to difference in their environment (Makharia A., Nogranjn A., Mishra A. Et. al., 2016).

Objectives of the Study:

1. To find out any difference between the distribution of intelligence between government and non government schools in the same environment.
2. To find out any difference between the distribution of intelligence boys and girls students in the same environment.
3. Two find out any difference between distribution of intelligence between urban and rural students in the same environment.
4. Two find out any difference between distribution of intelligence between general and schedule caste students in the same environment.

Hypothesis:

H_{01}: There is no effect of environmental conditions on the distribution of intelligence between government and non government college level.

H_{02}: There is no effect of environmental conditions on the distribution of intelligence between Boys and girls student college level.

H_{03}: There is no effect of environmental conditions on the distribution of intelligence between urban and rural students at college level.

H_{04}: There is no effect of environmental conditions on the distribution of intelligence between general and scheduled caste students at college level.

Methodology:

Present study conducted by primary and secondary data, place of residence, physical activity, family income, parental education, occupation of father. This study was quantitative in nature and descriptive survey approach was applied for conducting research.

Variables:

Intelligence question considered as a variable and environmental condition considered as an independent variable.

Sample:

The sample of 600 students in different colleges at Kolkata district and its fringe district North 24 Parganas and South 24 Parganas was conducted as a sample and simple random sampling was used to data collection.

Tools:

A questionnaire was developed on environmental factor influence intelligence with 60 items (30 positive and 30 negative). This test item was based on five point likert scales. This reliability of the tool was established using split-half method, content and construct validity has been established by the researcher. .Weschlet's IQ test for calculation of IQ has been used. Cross sectional observational study for 500 college student the age 19 – 23 from 10 government college, 15 private college, 5 villages, 5 cities statistical techniques, percentage, SD 't' test of the data was used to research purpose.

Delimitation of the Study:

The study was confine to college level student because their more sincere, young and sophisticated and attentive to their course and curriculum are than children. This study was confined to Kolkata District, North 24 Parganas, and South 24 Parganase because the admission procedures of college are arranged to their merit and they are attracted by good academic calendar of the college in mentioned district.

Data Analysis and interpretation:

(a) **Descriptive Statistics:**

Variable	IQ			TOTAL	P Value
	Dull Average	Average	Bright Average		
Urban	240 (65.21)	80 (21.7)	48(13.04)	368(61.33)	

Local (600)	Rural	153(22.8	69(29.7)	10(4.3)	232(38.7)	0.001
Gender (600)	Boys	151(43.0)	101(28.8)	99 (28.2)	351(58.5)	0.001
	Girls	115(46.1)	102(40.9)	32 (12.9)	249(41.5	
College 510	Govt.	217(53.9)	100(24.9)	85(21.1)	402(78.8	0.001
	Non-Govt	62(57.4)	40(37.0)	6 (5.6)	108(21.2)	
Caste 600	General	220(45.8)	200(41.7)	60(12.5)	480(80)	0.001
	Schedule	51(43.5)	52(43.3)	17 (14.2)	120(20)	
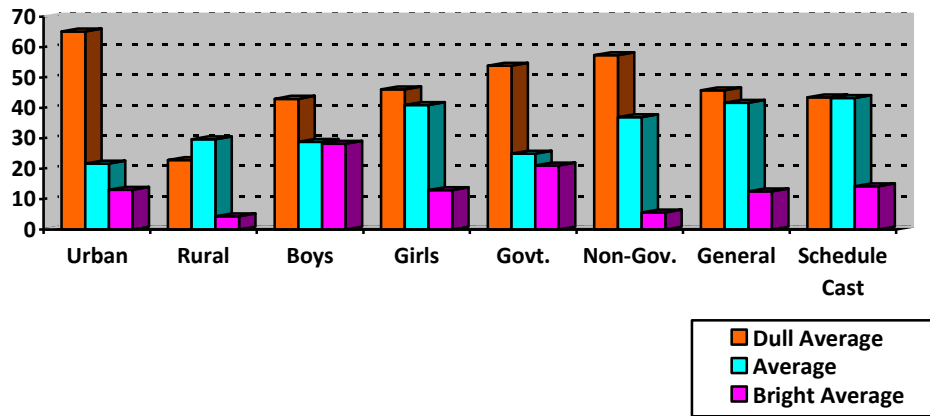
At first the college student were fill up the environment condition. Test book let, answer sheet, stop watch, pencil, and scoring key is used for scoring. The total number of correct responses gives the total score.

Age	19	20	21	22	23
Mean	42	48	43	53	56
SD	8.00	9.50	9.00	10.00	10.00
Scoring	50	62	60	65	68

IQ of age 19 = $50/42 \times 100$ = 149

IQ of age 20 = $\dfrac{62}{48} \times 100$ = 129.1

IQ of age 21 = $\dfrac{60}{43} \times 100$ = 139.5

IQ of age 22 = $\dfrac{55}{53} \times 100$ = 122.6

IQ of age 23 = $\dfrac{68 \times 100}{56}$ = 121.4

Interpretation = All student comes under average and bright average category.

(b) Inferential Statistics

(a) Comparison between Government and Non-government College.

Step – I: Setting up null hypothesis H_0

H_0 : There is no difference between the distributions of intelligence in both the groups, in other word; groups do not differ in terms of distribution of intelligence.

Step – II : Computation of rank order between government school and non government school.

Score	Rank	Score	Rank	
121	25	116	17.5	Step – III : Total of Rank
98	04	99	05	$R_1 + R_2$ = 235.5 + 115.5 = 351
109	12	112	15.5	$\dfrac{N(N+1)}{2}$
104	07	110	13.5	
116	17.5	97	03	Here N = $N_1 + N_2$ = 16 + 10 = 26
118	21.5	119	23	Therefore Total = $\dfrac{26 \times 27}{}$ = 351
120	24	94	02	Step IV :
117	19.5	118	21.5	U = $N_1N_2 + \dfrac{N_1(N_1+1)}{2}$ - R_1
106	09	94	02	U' = $N_1N_2 + \dfrac{N2(N_2+1)}{2}$ - R_2
125	26	90	01	
108	10.5	R_2 = 115.5		U = 16 ×10 + $\dfrac{16(16+1)}{2}$ - 235.5
105	08			= 160 + 136 – 235.5
108	10.5			= 160 + 136 – 235.5
112	15.5			= 296 + 235.5 – 60.5
				U + U' $N_1 \times N_2$ or U' = $N_1 \times N_2$ - U
				60.5 = 16 × 10 – U'
				U' = 160 – 60.5 = 99.5
				U = 160 X 10 + $\dfrac{10(10+1)}{}$ – 115.5
				= 160 + 55 + – 115.5
				= 215 – 115.5 = 99.5
114	6			

Step – V : In the table find N_1 (larger group) i.e. 16 and N_2 (smaller group = 10 at .... 0.05 level. The critical value of 'U' from the table is 48. (t the intersection of N_1 and N_2. The computed smaller value of

U is 60.5. It is larger than the critical value of U i.e. 48 from the table for this significance at 0.05 level. Hence H_0 is to be accepted. Thus the researcher conclude that the both the schools do not differ in terms of the distribution of intelligence on account of the environmental influence.

(b) Comparison between Urban and Rural Student:

Step 1 : Setting null hypothesis

H_0 : There is no difference between the distribution of intelligence in the both the urban and rural student, on these groups of student do not differ in terms of distribution of intelligence.

Level of significance = 0.05 level.

Step – II Comparison of rank order between urban and rural college student.

Rural		Urban		
Score	Rank	Score	Rank	
60	12.5	65	18	Step – III : Total of Rank
62	14.5	62	14.5	$R_1 + R_2 = 85 + 218 = 303$
47	2	59	11	$\dfrac{N(N+1)}{2}$
54	7.5	62	14.5	
60	12.5	67	20	Here $N = N_1 + N_2 = 10 + 15 = 25$
48	3	51	6	Therefore Total $= \dfrac{25 \times 26}{2}$
64	16.5	56	10	
50	5	68	21	Step IV : $= \dfrac{650}{2} = 325$
54	7.5	69	22	
49	4	45	1	$U = N_1N_2 + \dfrac{N_1(N_1+1)}{2} - R_1$
		66	19	
		64	16.5	$U' = N_1N_2 + \dfrac{N_2(N_2+1)}{2} - R_2$
		55	9	
		60	12.5	$U = 10 \times 15 + \dfrac{10(10+1)}{2} - 85$
$R_1 = 85$		70	23	$= 150 + \dfrac{10 \times 11}{2}$
		$R_2 = 218$		$= 150 + \dfrac{55}{2} - 85$
				$= 150 + 27.5 - 85$
				$= 177.5 - 85 = 92.5$

$U' = N_1N_2 + \dfrac{N_2(N_2+1)}{2} - R_2$

$= 10 \times 15 + \dfrac{15(15+1)}{2} - 218$

$= 150 + \dfrac{15 \times 16}{2} - 218$

$= 150 + \dfrac{240}{2} - 218$

$= 150 + 120 - 218$

$= 270 - 218$

$= 52$

Actually $U + U' = N_1 N_2$ or $U' = N_1 N_2 - U$

$52 = 10 \times 15 - U...$

or $U' = 150 - U$

$= 150 - 92.$

find $N_1 = 10$ (Smaller group) and N_2 (larger group) at the 0.05 level the critical value of U from table is 44. The computed value is 57.5. It is larger than critical value of U i.e. 44 read from the table for the significance level. Thus we may conclude that both the groups do not differ in terms of the distribution of intelligence on account of the environmental differences.

(c) Comparison between Boys and Girls student at college level :-

Step – I Setting up of null hypothesis H_0

H_0 : There is no difference between the distribution of intelligence in both boys and girls. In other hand the groups do not differ in terms of distribution of intelligence

Step – II Computation of Table of Rank R_1 and R_2

(d) Comparison of rank order Boys and Girls student.

Boys Student			Girls Student		
Score	Rank		Score	Rank	
57	115		68	25	$R_1 + R_2 = 250.5 + 170.5 = 421$
60	16.5		64	23.5	$\dfrac{N(N+1)}{2}$
62	19.5		65	25	
56	9.5		66	19.5	Here $N = N_1 + N_2 = 21 + 10 = 31$
58	13.5		62	16.5	Therefore Total $= \dfrac{31 \times 32}{2} = 496$
54	5.5		60	13.5	
56	9.5		58	21.5	Step IV : =
64	23.5		63	21.5	
52	2.5		63	43	$U = N_1 N_2 + \dfrac{N_1(N_1+1)}{2} - R_1$
54	6.5		53		

56	9.5		$R_2 = 170.5$	$U' = N_1N_2 + \dfrac{N_2(N_2+1)}{2} - R_2$
				$U = 21 \times 10 + \dfrac{21(21+1)}{2} - 250.5$
				$= 210 + \dfrac{21 \times 22}{2} - 250.5$
				$= 210 + \dfrac{462}{2} - 250.5 = 441 - 250.5 = 190.5$
57	14.5			
53	4.3			
55	8.0			
52	2.5			
51	1			
63	21.5			
64	23.5			
61	18			
60	16.5			
59	15			
$R_1 = 250.5$				

$$Z = \frac{U - \dfrac{N_1N_2}{2}}{\sqrt{\dfrac{N_1N_2(N_1 + N_2 + 1)}{12}}}$$

$$Z = \frac{190.5 - 21 \times 10}{\sqrt{\dfrac{21 \times 10(21 + 10 + 1)}{12}}}$$

$$Z = \frac{-19.5}{\sqrt{\dfrac{210 \times 32}{12}}}$$

$$Z = \frac{-19.5}{\sqrt{560}}$$

$$\dfrac{19.5}{23.66}$$

$$0.824$$

$$\frac{\dfrac{195.5 - 308}{2}}{\sqrt{\dfrac{308 \times 37}{12}}}$$

$$\frac{\dfrac{195.5 - 308}{2}}{\sqrt{\dfrac{11396}{12}}}$$

$$= \frac{56.25}{} \qquad = \frac{56.25}{} \qquad Z = 1.83$$

949.66   30.81

The computed value of Z => 1.96 is considered not significant at 0.05 level of significance for two tailed test.) and hence H_0 is accepted. For one tailed test – Z value ≥1.64 at 0.05 and reject the alternative hypothesis

It is significant at 0.05 level because computed value of Z > 1.96. So H_0 stand rejected so. There can be difference in intelligence between boys and girl. So, environmental condition effects the growth of intelligence.

(d) Comparison between general caste and scheduled cast students in college.

H_0 - There is no difference between the distribution of intelligence in both general and scheduled caste student, these group of student do not differ in terms of distribution of intelligence :

Level of significance at 0.05 level.

Scheduled Caste		General Cast		
Score	Rank	Score	Rank	
107	10	105	22.5	Computation of rank R_1 and R_2
110	14.5	120	17.5	$R_1 + R_2 = $ 365.5 + 212 = 577.5
115	22.5	110	25	Here N = N_1+N_2 = 22 + 14
110	14.5	108		= 36
14	16	116		Therefore total $\frac{36 \times 37}{2}$
108	11.5	100		
109	13.1	112		= 666
120	26.5	114		
114	20.5	115		
115	22.5	112		
120	26.5	118		
83	1	9.9		
85	2	94		
88	3	96		
99	6			
120	26.5			
125	19			
113	30			
126	22.5			
115	29			
125	28			
124				

$R_1 = 365.5$	$R_2 = 212$	

$$Z = \frac{`U - \dfrac{N_1 N_2}{2}}{\sqrt{\dfrac{N_1 N_2 (N_1 N_2 + 1)}{12}}}$$

$$Z = \frac{195.5 - 308}{\sqrt{\dfrac{22 \times 14 (22 + 14 + 1)}{12}}}$$

$$Z = \frac{195.5 - 308}{\sqrt{\dfrac{308 \times 37}{12}}}$$

$$Z = \frac{195.5 - 308}{\sqrt{949.66}}$$

$$Z = \frac{-112.5}{\sqrt{30.815}} \qquad Z = 3.65$$

The computed value Z $\geq$ is consider not significant at 0.05 level of significance for two tailed test and hence 80 stand accepted. For one tailed test the Z value $\geq$ 1.64 at 0.05 level reject the alternative hypothesis.

It is significant at 0.05 level because computed value of Z $\geq$ 1.96 so H_0 Stand rejected. Therefore there can be difference in intelligence between general caste and schedule caste students. Here, environmental conditions like caste effect the growth of intelligence.

Discussion:

From the above data, researcher concludes according to descriptive statistics 65.2% urban students belong in dull average and 225% in rural area. Average students are maximum the both urban and rural area like 22% to 30%. So, maximum students in college level belong average IQ. According to gender boys students are more dull average than girl's students in college level. Average IQ of girls (41%) is more than boys' students. At the college level. Dull average students belong in non government college than Government College. According caste average IQ students belong the both general and schedule caste students. But bright students are same level (10 – 20%) but more students belong in average IQ in both general and scheduled caste students.

Conclusion:

From the above discussion IQ is a significant factor which is influence of environmental condition like local, gender college status, caste etc. Another important environment factors related with IQ are family with income, peer group, education, training and intervention, environmental enrichment, security students, child safety thinking of living house, living security, missing college class, water, quality, softy food etc.

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