

Intelligence, Family Pathology, and School Environment in Relation to Academic Achievement

Pradeep Shyam Ranjan*

**Pahalvan Gurudeen Mahila Mahavidyalay Panari, Lalitpur, Uttar Pradesh, India*

Received November 10, 2020; Revised December 27, 2020; Accepted December 29, 2020

ABSTRACT

Present study is intended to find out the relationship between predictor variables Intelligence, family pathology, school environment and criterion variable academic achievement. Sample consists of 200 high school (class 10th) students from Lalitpur (U.P.) city. A set of tools containing Test of General Mental Ability, Family Pathology Scale (FPS), and School Environment Inventory (HEI) were administered to gather information. Results revealed that intelligence is strongly associated with academic achievement. Multiple regression analysis has revealed an interesting pattern of relationship between predictors and academic achievement.

Keywords: Intelligence, Family pathology, School environment, Academic achievement

INTRODUCTION

Academic achievement has become a key factor for future growth in 21st century. Academic Achievement is the extent to which a student achieves his/her academic goals. It refers to what the students have learned or what skills the students have learned and is usually measured through the assessments like - standardized tests, performance assessments and portfolio, assessments.

The cognitive base of academic achievement is intelligence. It allows us to profit from educational experiences, to think/understand complex ideas, reason, and solve problems, to learn from experiences, and adapt effectively to the environment. According to Hunt [1], "intelligence" is solely a shorthand term for the variation in competence on cognitive tasks that is statistically associated with personal variables. Intelligence is used as a collective term for 'demonstrated individual difference in mental competence'. In case of school children, intelligence is the ability to learn and succeed in academic tasks. In the classroom, some children learn quickly, others do not. While high intelligence is no guarantee of the "good life," low intelligence creates extremely difficult obstacles to full participation in society and the attainment of a high standard of living [2]. Intelligence includes all the abilities that a student requires to learn something new, to adjust in their environment and to solve a problem. So, it was believed that more intelligent students should be good learner, should have good memory, good performer in academic activities and therefore should obtain high position in the classes, in terms of grades,

compared to their less intelligent friends. However, IQ tests rarely account for more than 50% of the variance in academic performance, suggesting that factors other than ability contribute to individual differences in academic performance [3]. Learning and performance both are determined by the environment in which they take place. Family is the most important among environmental variables that affect academic achievement. Family functioning refers to how well family members communicate with each other, work together, treat each other and function as a unit. "The emotional tone, which governs the relationship between any two persons, is continuously influenced in its course by emotional relationships of all others in the family. Family pathology refers to maladaptive behavior amongst the family members in their interaction with each other i.e., between spouses and between parents and children [4]. Dysfunctional families are perhaps less able to provide adolescents with family cohesiveness, stability and emotional support, which may result in school failure [5]. A survey of literature

Corresponding author: Pradeep Shyam Ranjan, Assistant Professor, Pahalvan Gurudeen Mahila Mahavidyalay Panari, 580, Azadpura, Lalitpur, Uttar Pradesh, India, Tel: +91 9889832036; E-mail: pshyam200@gmail.com

Citation: Ranjan PS. (2023) Intelligence, Family Pathology, and School Environment in Relation to Academic Achievement. J Psychiatry Psychol Res, 6(3): 497-502.

Copyright: ©2023 Ranjan PS. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

reveals very little work done on the subject of family pathology and achievement as such. Available research reveals the importance of family support and nurturance for individual academic achievement [6, 7]. Investigators have indicated that experiences within the family impact children's educational outcomes [6, 8]. Among rural African American youth, family cohesion was found to indirectly influence academic achievement through self-regulation [9].

After home, it is the school where a student spends his maximum time. School environment is a powerful force that plays a pivotal role in the all-round development of the student. School environment refers to psycho-social climate of school. In this climate, a number of teachers having different personality traits, values and dispositions have to work together for the harmonious development of the children's abilities, attitudes, and the personality as a whole. Interaction goes on among the teachers and between the principal and the teachers, weaves an intricate and delicate web of the school climate. School environment includes all the conditions, resources and their integrated and interrelated activities which directly or indirectly affect functioning of the school. Rich school atmosphere serves as a stimulating force for the learner. Bloom [10] regarded the environment as providing a network of forces and factors which surround, engulf, and play on the individual. He explains the environment as a shaping and reinforcing force which acts on the individual. Differences in achievements as well as pupil behavior can be explained by school factors such as quality of school life, values held at school, management style of teachers and responsibilities given to children.

Positive relationship with teachers motivates students to learn, participate more in class, or engage in other behavior related to academic achievement. Teacher's support helps students psychologically. Students who feel that they have supportive, caring teachers are more strongly motivated to engage in academic work than students with unsupportive, uncaring teachers [11].

SIGNIFICANCE OF THE STUDY

Achieving higher grades or percentages of marks in class has become the major goal of a student, his/her parents as well as teachers and school authorities. Success in school plays an important role in determining students' future opportunities, and in making some choices more likely and eliminating others. The stress on the phenomenon has overly increased now-a-days. This is assuming special and greater significance as the society is advancing industrially and technically and the structure of education is growing more and more complex.

Since the cognitive factors like intelligence and environmental variables like family pathology and school environment are the major factors influence the academic

achievements the investigator tries to find out the relationship of intelligence, family pathology and school environment with academic achievement. Hence the investigator selected the topic.

OBJECTIVES OF THE STUDY

1. First objective of the study is to find the association of academic achievement with intelligence, family pathology, and school environment.
2. Second objective of the study is to find the relationship between set of predictors and academic achievement.

HYPOTHESIS

On the basis of objectives and review of literature two hypothesis were formed:

1. Intelligence, family pathology and school environment will correlate significantly with academic achievement.
2. Set of predictors (Intelligence, family pathology and school environment) will correlate significantly with academic achievement.

METHOD

Sample

This study was conducted on a sample of 200 high school (10th class) students. The sample was taken from various high schools of Lalitpur (U.P.) city using stratified random sampling method. The age range of students was 14-16 years.

Measuring Tools

Following tools were used for measurement of intelligence, emotional intelligence and general well-being of students:

Test of General Mental Ability (Intelligence): This test is constructed by Joshi [12]. Test contains 100 questions in the test which made with seven types of questions namely synonyms, antonyms, number series, classification, best answer, reasoning, and analogies.

Family Pathology Scale (FPS): Family Pathology Scale (FPS) was used for the measurement of family pathology perceived by parents. FPS is constructed by Veeraraghavan and Dogra [4]. It measures the degree of maladaptive behavior present in the interaction of family members. Test contains 42 items. The split-half reliability using Spearman Brown formula for doubling the test length was found to be $\alpha = 0.57$ within index of reliability of this test is $\alpha = 0.70$. The test-retest reliability of this test is $\alpha = 0.79$. The face validity of the questionnaire is high. The content validity was assured by using only those items for which there was complete agreement among experts.

School Environment Inventory (SEI): School Environment Inventory constructed by Misra [13] is used for measurement of school environment. SEI measures the

psycho- social climate of schools as perceived by the pupils. SEI contains 70 items related to the six dimensions of school environment namely creative stimulus (CRS), cognitive encouragement (COE), acceptance (ACC), permissiveness (PER), rejection (REJ), and control (CON). Twenty items belong to the creative stimulation (CRS) while each of the remaining five dimensions has ten items belonging to it. The split-half reliabilities (corrected for length) for various dimensions of the school environment are 0.919 for creative stimulation, 0.797 for cognitive encouragement, 0.823 for acceptance, 0.673 for permissiveness, 0.781 for rejection and 0.762 for control.

Academic Achievement: Measurement of student's academic achievement includes their marks in IX class.

RESEARCH DESIGN AND PROCEDURE

Considering the ex-post-facto and multivariate nature of academic achievement a multivariate ex-post-facto research design was considered most suitable for the purpose of this research. All the respondents were given questionnaire. The researcher personally visited the respondent and sought their cooperation in filling the tests. Respondent were given sufficient time to respond to all the tests. Before accepting the tests back, the investigator checked the tests and the responses to it to ensure complete response. Every respondent was thanked for their considered cooperation. The test responses were scored according to the prescription of the test manual. The statistical analyses of obtained scores have been done using SPSS 17. Beyond descriptive statistics and statistics required for conditioning of matrices, stepwise multiple regression was used to examine the relationship between set of predictor variables and a single criterion variable.

RESULTS AND DISCUSSION

Carl Pearson product moment correlation was performed to find out the nature and extend of relationship of academic achievement with the intelligence, family pathology, and different aspect of school environment. The resulted obtained in the analyses are presented in the table given in (Table 1).

The results shown in Table 1 indicate that intelligence is positively and significantly correlated with academic achievement. This association is very strong also. Many studies have found the similar results [14, 15]. Some early studies also show positive relationship between abilities and achievement [16-21]. Family pathology is negatively and significantly related with academic achievement. Three variables of school environment, creative stimulation, cognitive encouragement and, permissiveness is positively correlated with academic achievement but correlation with permissiveness is not significant. Three variables of school environment, acceptance, rejection and control are negatively correlated with academic achievement but correlation with control is not significant. Creative

stimulation refers to teacher's activities to provide conditions and opportunities to stimulate creative thinking [13]. A positive relationship between the classroom climate and school achievement, has been found in a considerable number of studies [22-25]. Chaturvedi [26] has found a positive effect of creative stimulation on academic achievement, although it was not statistically significant. Availability of adequate materials, new techniques of teaching and especially trained teachers can always help in enhancement of motivational level in an adolescent. Lack of stimulus and opportunity for learning can result in the failure of young minds to develop. In the study cognitive encouragement is positively correlated with academic achievement. "Cognitive encouragement implies teacher's behavior to stimulate cognitive development of student by encouraging his actions or behaviors" [13]. Findings of the study indicate that by providing better cognitive encouragement school environment can enhances academic achievement. Rejection is negatively correlated with academic achievement. "Rejection refers to a school climate in which teachers do not accord to student's right to deviate, act freely and be autonomous persons" [13].

Model summary revealed a multiple R of 0.837. This value shows the degree of relationship between academic achievement and set of predictor variables is meaningful. This relationship is statistically significant ($F(3,196) = 152.884, p < 0.000$) (Table 2). The coefficient of multiple determination (R^2) was found to be 0.701 suggests that 70.1 percent variance in academic achievement has been predicted by the set of predictor variables. Thus, the unpredicted variance ($K^2 = 1 - R^2$) equals to 29.9%. The Adjusted R^2 , the estimated population value of R^2 , is equals to 0.696. The adjusted R^2 gives us some idea how well our model generalizes and ideally, we would like its value to be the same or very close to the value of R^2 [27]. For this model value of Adjusted R^2 (0.696) is very similar to the observed value of R^2 (0.701) indicating that the cross validity of this model is very good. Summary of ANOVA for the relationship between predictor variables and academic achievement is given in (Table 3). Standardized regression coefficients show the size of the effect for each predictor variable in predicting academic achievement. By the analysis, it is clear that out of eight variables there are only three variables that significantly predict academic achievement (Table 4). While intelligence and creative stimulation of school positively affects academic achievement, family pathology or maladaptive behavior pattern among family members negatively affect the academic achievement of 10th class students. The significance of B was analyzed using Fisher's t-test. The table reveals that the partial regression coefficients or weights were significant for intelligence ($t = 17.151, p < .000$), family pathology ($t = 4.339, p < 0.002$), creative stimulation ($t = 3.326, p < 0.001$) [28, 29]

Table 1. Pearson's correlations between predictor variables and academic achievement.

S No	Predictor Variables	Correlation
1	Intelligence	0.808**
2	Family pathology	-0.373**
3	creative stimulation	0.374**
4	cognitive encouragement	0.217**
5	Acceptance	-0.204**
6	Permissiveness	0.024
7	Rejection	-0.173*
8	Control	-0.124

** significant at 0.01 level

* significant at 0.05 level

Table 2. Shows Model Summary of Stepwise Multiple Regression between predictor variables and academic Achievement.

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.837	0.701	0.696	4.58496

Table 3. Shows ANOVA for the relationship between predictor variables and academic achievement.

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	9641.717	3	3213.906	152.884	0.000
Residual	4120.283	196	21.022		
Total	13762.000	199			

Table 4. Shows B, SE B, Beta, and t-test for the relationship between predictor variables and academic achievement.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	29.839	6.817		4.377	0.000
Intelligence	0.415	0.024	0.723	17.151	0.000
Family Pathology	-13.094	3.017	-0.175	4.339	0.000
Creative Stimulation	0.116	0.035	0.136	3.326	0.001

RECOMMENDATIONS

The investigator has studied the relationship of Intelligence, family pathology and school environment with academic achievement. From the findings, to improve the academic achievement of students, the following suggestions are recommended:

1. Parents should create an atmosphere at home in which children are allowed to express their feeling and thought freely. Children's rights as an individual should not be deprived.
2. School authority should create an environment that focus on cognitive stimulation, creative stimulation and cognitive encouragement of students.

3. Teacher should create lesson plan and activity plan in such a way that stimulates students creatively.
4. Teachers should avoid any kind of discrimination and rejection of students.

SUGGESTIONS FOR FURTHER RESEARCH

1. School environment is a broad concept. Other factors of school environment like school climate, features of school, style of administration etc. should be included in the study.
2. Present study was conducted on secondary school students. A study should be done on higher secondary students also.
3. In the present study, only student's perceived school environment was assessed. To understand a comprehensive view of school environment parents and teacher's observation should also be assessed.
4. In the present study, quantitative data was used. For better understanding of family pathology and school environment qualitative study is also required.

CONCLUSION

In present study intelligence is strongly associated with academic achievement. Family pathology is negatively and significantly related with academic achievement. Two variables of school environment namely creative stimulation and cognitive encouragement is significantly and positively associated with academic achievement. Two other variables of school environment- acceptance and rejection are negatively correlated with academic achievement. Intelligence, family pathology and creative stimulation are the best predictors among all the predictor variables. 70.1% variance in academic achievement is caused by these variables.

REFERENCES

1. Hunt E (1986) The heffalump of intelligence. In R J Sternberg and D K Detterman ed. What is intelligence? Contemporary viewpoints on its nature and definition. Norwood, NJ: Ablex. pp: 101-107.
2. Morgan CT, King RA, Weisz JR, Schopler J (1993) Introduction to psychology. 7th ed. Tata McGraw-Hill, 7 West Patel Nagar, New Delhi, India.
3. Chamorro-Premuzic T, Furnham A (2004) A possible model for understanding the personality-intelligence interface. *Br J Psychol* 95: 249-264.
4. Veeraraghavan V, Dogra A (2000) Family Pathology Scale. Psycho-Educational Testing Centre, Janakpuri, New Delhi, India.
5. Masselam VS, Marcous RF, Stunkard CL (1990) Parent adolescent communication, family functioning, and school performance. *Adolescence* 25(99): 725-737.
6. Floyd C (1997) Achieving despite the odds: A study of resilience among a group of African American high school seniors. *J Negro Educ* 65(2): 181-189.
7. Martini M (1995) Features of home environment associated with children's school success. *Early Child Dev Care* 111: 49-68.
8. Lam SF (1997) How the family influences children's academic achievement. New York: Garland Publishing, Inc.
9. Brody, GH, Stoneman Z, Flor D (1995) Linking family process and academic competence among rural African American Youth. *J Marriage Fam* 57: 567-579.
10. Bloom M (1968) Stability and change in human characteristics. New York: John Wiley and Sons.
11. Ryan RM, Deci EL (2000) Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemp Educ Psychol* 25: 54-67.
12. Joshi MC (1969) Test of general mental ability. Rupa Psychological Centre, Varanasi, India.
13. Misra KS (2002) School Environment Inventory. Ankur Psychological Agency, Lucknow, India.
14. Laidra K, Pullmann H, Allik J (2007) Personality and intelligence as predictors of academic achievement: A cross-sectional study from elementary to secondary school. *Pers Indiv Differ* 42(3): 441-451.
15. Deary IJ, Strand S, Smith P, Fernandes C (2007) Intelligence and educational achievement. *Intelligence* 35(1): 13-21.
16. Agrawal S (1973) A Study of Medical Aptitude and Other Psychological Variables Associated with Proficiency in Medical Examinations of U.P. (Unpublished Ph.D. thesis in Psychology), Agra University, Agra, India.
17. Das NC (1975) A Psychometric Study' of Low Achievement of School Final Candidates in General Science. D.Sc. Psychology. Calcutta University, Kolkata, India.
18. Girija PR (1980) A Study of Intellectual and Non-intellectual Factors in Academic Achievement of Advantaged and Disadvantaged Students from Professional Colleges. Ph.D. Psychology, Karnataka University, Karnataka.
19. Deshpande AS (1984) A Study of Determinants of Achievement of Students at the SSC Examination in the Pune Division of Maharashtra State, Ph.D. Education. Poona University, Mumbai.
20. Singh H (1984) A Survey of the Study Habits of High, Middle and Low Achiever Adolescents in Relation to Their Sex, Intelligence and Socio-economic status.

- Ph.D. Education. Himachal Pradesh University, Himachal Pradesh, India.
21. Mitra R (1985) Some Determinants of Academic Performance in Preadolescent Children. Ph.D. Education, Calcutta University, Kolkata, India.
22. Galluzzi EG, Kirby EA, Zucker KB (1980) Students' and teachers' perceptions of classroom environment and self- and others-concepts. *Psychol Rep* 46: 747-753.
23. Fraser BJ, Fisher DL (1982) Predicting students' outcomes from their perceptions of classroom psychosocial environment. *Am Educ Res J* 19: 498-518.
24. Nelson G (1984) The relationship between dimensions of classroom and family environments and the self-concept, satisfaction, and achievement of grade 7 and 8 students. *J Community Psychol* 12: 276-287.
25. Ryan RM, Grolnick W (1986) Origins and pawns in the classroom: Self-report and projective assessments of individual differences in children's perceptions. *J Pers Soc Psychol* 50: 550 -558.
26. Chaturvedi M (2009) School environment, achievement motivation and academic achievement. *Indian J Soc Sci Res* 6(2): 29-37.
27. Field A (2005) *Discovering statistics using SPSS*. SAGE Publications India Pvt Ltd, New Delhi, India.
28. Kerlinger FN, Pedhazur EJ (1973) *Multiple regression in behavioral research*. New York: Holt, Rinehart and Winston, Inc.
29. Steinberger ED (1993) *Improving student achievement*. Virginia: American Association of School Administrators.