

Full Length Research Paper

Parent's socio economic background, mathematics anxiety and academic achievement

Mahigir F.¹, Venkatesh Kumar G.² and Ayat Karimi^{3*}

¹Department of psychology, Behbahan Branch, Islamic Azad University, Behbahan, Iran.

²Department of Psychology, University of Mysore, India.

Accepted 9 March, 2012

The objective of the study is to determine the effect of parent's socio economic background on Mathematics anxiety and academic achievement in high school students. The sample comprised 540 (268 boys and 272 girls) 8th, 9th and 10th grade high school students from Karnataka, Kerala and Tamil Nadu states. The answers of students were evaluated using a Mathematics anxiety scale (MAS) and parent's socio economic background estimated by a socio economic background questionnaire. The results have revealed that among the parent's socio economic background variables, only parent's education has a negative correlation with Mathematics anxiety and multivariate regression for this model revealed that combination of age, income and education can be a good predictor for Mathematics anxiety. The second part of results also exposed that parent's income and parent's education has a significant positive correlation with mathematics anxiety and multivariate regression for this model also revealed that combination of parent's socio economic background can be a good predictor for Mathematics anxiety. On the basis of these findings, it was recommended that special classes should be provided for training of parents and they should be prepared in counseling and pedagogical classes.

Key words: Academic achievement, parent's socio economic background, mathematics anxiety.

INTRODUCTION

The investigations of the factors that influence academic performance of students have attracted the interest and concern of researchers and school administrators. Achievement is a cumulative function of current and prior family, community, and school incomes (Steven et al., 2005) and a study of the entire process would require complete family, community, and school histories. House and family structure socio economic background are essential aspects in development of student's personality and academic function. These variables play a basic role in student academic achievement and their mathematics performance (Farland, 2001; Higbee and Thomas, 1999).

The psychological factors and their effects on academic situations are the growing concerns of the educational

researchers and practitioners. Many learners experience Mathematics anxiety in our schools today. Reported consequences of being anxious toward mathematics include the avoidance of mathematics and the decline in Mathematics achievement and conceptual processes. This kind of 'anxiety' was first detected in the late 1950s. Dreger and Aiken (1957) noticed undergraduate college students reacting emotionally to arithmetic and Mathematics. Although this reaction appeared to be similar to test anxiety in general; they found that Mathematics anxiety has an existence of its own. They labeled it 'number anxiety'. It is often assumed that high level of anxiety impairs performance. A moderate amount of anxiety may actually facilitate performance. Beyond a certain degree, however, anxiety hinders performance particularly in the case of higher mental activities and conceptual process (Shemp, 1986).

Psychological literature provides a number of

*Corresponding author. E-mail: ayat191@gmail.com.

conceptualizations of Mathematics anxiety (Rabalise, 1988). Richardson and Suinn (1972) defined Mathematics anxiety in terms of its (debilitating) effect on mathematical performance. They observed that the feeling of tension and anxiety interfere with manipulation and solving of mathematical problems in a wide variety of ordinary life and academic situations. It has been also defined as involving feelings of tension and anxiety that interfere with the manipulating of numbers and the solving of mathematical problems in a wide variety of ordinary life and academic situations (Suinn, 1988). Many students who suffer from Mathematics anxiety have little confidence in their ability to do mathematics and tend to take the minimum numbers of required mathematics courses, greatly limiting their career choice options (Garry, 2005).

While researchers tend to agree that household quality is an important determining factor in influencing student outcomes, there is little consensus about the relationship between specific parents socio economic background (for example, age, income and education) (Green, 1990; Ingersoll, 2001). Secondly, there is need for studies which will address variables in the levels of academic performance, or other psychological issues. The objectives of the present study therefore focus on the relationship between parents socio economic background (age, income and education), Mathematics anxiety and academic achievement, it is assumed that combination of parents socio economic background can be a good predictor for Mathematics anxiety and academic achievement.

HYPOTHESIS

There is no significant relationship between parent's socio-economic background and student's Mathematics anxiety.

There is no significant relationship between parent's socio-economic background and student's academic achievement.

MATERIALS AND METHODS

Sample

The participants of this study comprised of 540 students of 8, 9 and 10 grade including 268 boys and 272 girls, selected randomly from 16 high schools in south of India (Karnataka, Kerala and Tamil Nadu states).

Tools

Mathematics anxiety rating scale-India (MARS-I).

This questionnaire was developed by Karimi (2008); and included 31 questions describing the Mathematics anxiety in high school students. It has two subscales – Math test Anxiety with 15 items and Numerical tasks with 16 items. Each item of this scale was

rated on a five – point scale rating, from very much anxious - 5 to not anxious at all - 1. Psychometric properties of this scale are computed by the researchers. The correlation between scores on MARS-I and MARS (Richardson and Suinn, 1972) was 0.87. Two weeks test-retest reliability of the scale was 0.85 and internal consistency alpha coefficient was computed 0.88.

Academic achievement

Average marks obtained from the students of the last class examination in their academic subjects.

Procedure

All the participants of the study were administered Mathematics anxiety scale and they were also required to complete a biographical questionnaire, which had several questions about their father's age, education and socioeconomic status. After the collection of data, they scored individually for each subject and in order to prove the formulated hypothesis, the scores obtained were analyzed using spss software.

RESULTS

Coefficients of correlations between parent's socio economic background, Mathematics anxiety and academic achievement are presented in the correlation matrix Table 1.

The coefficients of correlations given in Table 1 showed inverse relationship between parent's education and Mathematics anxiety ($r=-0.09$, $P<0.01$), but the relationships between parent's age and income with Mathematics anxiety was not significant [$r=-0.003$, $P>0.05$ for income and Mathematics anxiety and $r=-0.007$ $P>0.05$ for age and Mathematics anxiety].

Concurrently, significant positive relationships between two subvariables of parent's socio economic background and academic achievement are identified. Coefficients of correlation between parent's income and academic achievement was positively significant ($r = 0.33$, $P<0.01$). It was also significant positive relationships between parent's education and academic achievement ($r=0.21$, $P<0.01$) but the correlation between parent's age and academic achievement was not significant ($r=0.23$, $P>0.05$).

To test the prediction of Mathematics anxiety and academic achievement by parent's variables, data were analyzed using multiple regressions. The results of regression analysis for each of two the dependent variables are shown in Table 2.

Table 2 shows results of multiple regression analysis using parent's socio economic background as predictor of Mathematics anxiety. The results indicated that combination of the independent variables included in the models, had a statistically significant negative prediction for Mathematics anxiety [$F(3, 536)=4.19$, $P<0.001$ and Adjusted R Square = 0.017] and it can operate as a good calculation for Mathematics anxiety. With regard to independent variables separately, parent's education was

Table 1. Coefficients of correlation between of parent's socio economic background , Mathematics anxiety and academic performance.

Parent's socio economic background	Mean	S.D	Mathematics anxiety Mean = 65.12, S.D = 9.48	Academic performance Mean = 68.14, S.D = 6.40
Parent's income	1.8852	0.90441	-0.003	0.227 (*)
Parent's education	1.7093	1.46027	-0.151(*)	0.105 (*)
Parent's age	1.7037	0.72919	0.007	-0.009

*Correlation is significant at the 0.01 level (1-tailed). N = 540.

Table 2. Coefficients of multiple regression analysis for two models.

DV _a	IV _b	B	Beta	t	Adjusted R square	F
Mathematics anxiety	parent's income	-0.024	-0.002	-0.053	0.017	4.19**
	parent's education	-0.982	-0.151	-3.541**		
	parent's age	0.159	0.012	0.283		
Academic performance	parent's income	1.656	0.234	5.523**	0.059	12.28***
	parent's education	0.450	0.103	2.453*		
	parent's age	-0.438	-0.050	-1.177		

DV_a: Dependent variable, IV_b: Independent variable, * p <.05. ** p < 0.01.

found to be significant predictor for Mathematics anxiety (B=-0.982, Beta=-0.151, t=-3.541, P<0.0001) but parent's income and parent's age was not significant predictor for Mathematics anxiety.

The results of multiple regression for second model with Enter method, also revealed that combination of parent's income, education and age can operate as a good predictor for academic achievement [F(3, 596) =12.28, P<0.001, and Adjusted R Square = 0.059] in students. In this model also, with regards to the effect of independent variables separately, parent's income was found as a significant predictor of academic achievement (B = 1.656, Beta=0.234, t=5.523, P<0.0001) and parent's

education (B=0.450, Beta=0.103, t=2.453, P<0.0001) but parent's age was not a significant predictor for academic achievement.

DISCUSSION

The results demonstrated quite clearly that there are significant correlations between some parts of parent's socio economic background with Mathematics anxiety and academic achievement. The consequences of multiple regressions for two models revealed that, combination of the parent's age, income and education can operates as a good estimate for Mathematics anxiety and academic achievement.

The results have revealed that, the Mathematics anxiety of students can be influenced by age, income and education of parent's. It is also reported by the other researchers that getting higher of these kinds of socio economic background lead to decreasing in Mathematics anxiety (Higbee, 1999). Mathematics anxiety as a special kind of state anxiety occurs in the academic situations and can be reduced by using of more educated parent's. The second part of these studies also demonstrated that there is significant relationship between socio economic background and academic achievement. Previous researches by (Murnane, 1975; Robertson and Symons, 2003; Robertson and Symons, 2003) also supporting this results.

Conclusion

This paper has used a sample of the students in three states in south of India to investigate the relationship between three sub variables of parent's socio economic background with Mathematics anxiety and academic achievement. According to the previous mentioned results: a) a significant negative correlation was found between one sub variables of parent's socio economic background and mathematics anxiety, and b) a significant positive correlation was detected between two parts of parent's socio economic background and academic achievement. It is also found that Mathematics anxiety and academic achievement in students can be predicted by set of parent's age, income and education. Similar study of Green (1990) also indicated that there is significant correlation between parent's socio economic background and Mathematics anxiety. Moreover, Garry (2005) founds this conclusion with a group of high school students.

With regard to mentioned results and importance of parent's educational level in Mathematics anxiety and academic achievement, it is recommended that parents should be prepared in counseling and pedagogical classes, and developing special classes can increase their communicational and educational skills.

REFERENCES

- Dreger RM , Aiken LR (1957). The identification of number anxiety in a college population. *Educ. Psych.* 47:344-351.
- Garry VS (2005). The effect of Mathematics anxiety on the course and career choice of high school students. *Vocational- technical education students.* 12(3):11-19.
- Green LT (1990). Test anxiety, mathematics anxiety, and parent's comments: Relationships to achievement in remedial mathematics classes. *Negro Education.* 59(3):320-335.
- Higbee J L ,Thomas P V (1999). Affective and cognitive factors related to mathematics achievement. *Dev. Educ.* 23:8-24.
- Ingersoll RM (2001). Parent's Turnover and parent's Shortages: An Organizational Analysis. *Am. Educ. Res. J.* 38:499-534.
- Rabalise A (1988). Identification of math anxiety subtypes. Thesis submitted for degree master of clinical psychology in West Virginia University.
- Richardson FC, Suinn RM (1972). The Mathematics Anxiety Rating Scale: Psychometric Data. *J. Counsel. Psychol.* 19(6):551-554.
- Shemp RR (1986). *The psychology of learning" mathematics.* Penguin: Harmondsworth. 95-112.
- Suinn T, Edwards B (1988). The measurement of Mathematics anxiety: The mathematics anxiety rating scale for adolescents - MARS-A. *Clin. Psychol.* 38(3):576-580.
- Karimi BA (2008). Development of mathematics anxiety scales in high school students of India and Iran. Thesis submitted for degree PhD of clinical psychology in Mysore University.
- Farland DA (2001). Student resistance: How the formal and informal organization of classrooms facilitate everyday forms of student defiance. *A. J. S.* 107:612-678.
- Steven G, Rivkin E, anushek A and John F (2005). Parents, schools, and academic achievement. *Econ. J.* 73:417-458.