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Analyzing Interactions among Academic Stress, Academic Self-Concept & Academic Grades

Janet Fernandez
St. Xavier's College, Goa

The present study attempts to assess and analyze interactions as well as observe gender differences among three psychological variables, namely; academic stress, academic self concept and academic grades. The participants consist of 135 Std. IX students, 72 boys and 63 girls, age range of 14 – 16 years, selected by simple random sampling, from four co-ed schools in Goa. Educational stress scale, Academic self-concept questionnaire and records of school grades were used as appropriate tools for data collection. The study involves the survey method and factor analysis design, wherein the research tools were administered to participants in the classroom after seeking necessary permissions. The results revealed a significant moderate negative correlation (Pearson's $r = -0.45$, $p < 0.01$) between academic stress and academic self concept. One- way- ANOVA indicated a significant difference on academic stress [$F(4,130) = 7.466$, $p < 0.001$] as a function of academic grades and significant difference on academic self concept [$F(4,130) = 10.064$, $p < 0.001$] with respect to academic grades. Logistic Ordinal Regression model revealed that academic stress and academic self concept significantly predict variance on academic grades. Significant Gender differences were found on academic stress ($t = 2.012$, $p< 0.05$) with girls experiencing higher level of academic stress as compared to boys, and on academic self concept ($t= 2.37$.$p< 0.01$) wherein girls showed higher scores on academic self concept as compared to boys. No significant gender differences were found on academic grades. The study results reviews the significant interconnections among the variables selected in the study and stresses on the importance of interventions to reduce academic stress, implement exercises and workshops to nourish academic self-concept and provide opportunities for earning higher academic grades.

Keywords: Academic stress, Academic self concept, Academic grades, Gender differences.

A big share of child and adolescence life involves acquiring knowledge in a formal educational process. The Ecological Systems Theory by Bronfenbrenner (1979) identifies school as a significant system that has a direct influence on students. Academic learning is among the most important source of stress among young students worldwide and appears to be quite severe in Asian countries (Brown, Teufel, Birch, &Kancherla, 2006. Asian students usually have higher academic burden (Lee & Larson, 2000), and may suffer more academic stress (Ang& Huan, 2006; Ang, Huan, &Braman, 2007) than their counterparts in English speaking countries. National survey conducted in China (Youth Social Service Center, 2008) found that most children and adolescents (66.7%) considered academic pressure as the biggest stress in their lives.

Academic stress is a significant contributor to a variety of mental and behavioral disorders, such as depression, anxiety and suicidal behavior (Ang, Huan, 2006; Bjorkman,2007). Study done by Liu and Tein (2005) states that academic stress can be one of the correlates of adolescent Suicidality. A study done in Kerala-India (Dinesh & Syamakumari, 2010) revealed that more than 90% of school children of the state are facing above normal levels of stress and tension, with severe stress seen in both genders between the ages of 12 – 16 years. Rebellow & Asir (2015) conducted a study on

school going adolescents in the Tiruchirappalli district of Tamil-Nadu, India, and found that 80% of the students experienced stress due to examinations and failure in examinations. Watode, Kishore, Kholi (2015) revealed that school related work- studies and exams were major stressors in school going adolescents in the capital city of Delhi –India, with girls found to have more stress as compared to boys.

Self-concept is a multidimensional construct (Marsh, 1993) having several specific facets, one of which is academic self-concept. The term 'academic self-concept' can be characterized by two elements: descriptive (e.g., I like math) as well as evaluative (e.g. I am good at math) aspects of self-perception focused on scholastic competence, rather than attitudes. Academic self-concept is the perception and evaluation that a student has or does about his/ her academic abilities (Bong & Skaalvik 2003). Research has supported reciprocal relationship between academic self concept and academic achievement(Marsh, Trautwein, Ludtke, Koller & Baumert, 2005) and meta-analysis of relevant research led to a conclusion that academic self-concept had a significant effect on academic achievement and vice versa(Valentine, Dubois, & Cooper, 2004). Moreover, these results generalized over age, gender, ethnicity and countries. Academic self-concept is significant in the academic domain, due to its significant influence on appropriate cognitive functioning (Santana, Feliciano, & Jimenez, 2009); creation of various cognitive and self regulative strategies (Zimmerman, 2000), refracting on academic performance (Schunk, Printrich, &Meece, 2008). Empirical studies have observed that students with high academic self-concept value their own abilities, accept challenges, take risks, try new things (Bong &Skaalvik, 2003) and possess a higher motivation to complete difficult academic tasks and set higher goals (Pintrich, Roeser, & De Groot, 1994). Hence, most students with higher academic performance show high academic self-concept (Schunk, Printrich, &Meece, 2008). Whereas, Students showing low academic self-concept undervalue their talents, avoid situations that cause anxiety (Ommundsen, Haugen, & Lund, 2005), have less cognitive and motivational resources which are reflected in low academic performance (Moller &Pohlman, 2010).

Review of research indicates a gap of focusing on interconnections among academic stress, academic self concept and academic grades. The present study is unique because it seeks to identify relationships among academic stress, academic self concept and academic achievement with standard IX students as participants in the present study. The IX standard is a crucial year of school life. According to the National Education Policy, school based institutions follow the 'No Fail Policy' till std. VIII. Hence, a student promoted to standard IX often experiences 'do or die' situation. There is no doubt that a student faces a tough challenge both in effort and confidence for promotion to Std X. The present study will focus on analyzing interactions and gender differences among the three variables of the study in an effort to highlight the importance of revisiting the National Educational policy and suggesting ways to deal with the educational challenge.

Aim:

To assess gender differences and analyze interactions among academic stress, academic self-concept and academic grades.

METHOD

Design:

The survey method was used to collect data. The ESSA and ASCQ tools were administered to the participants in the classroom during school hours. A brief introduction about the study was given and any clarifications/ doubts were cleared. Necessary permission was sought from school authorities. Participation was voluntary. The data obtained was treated with factorial analysis to obtain results.

Participants:

135 school students presently studying in Std. IX, age range 14 – 16 years, 72 boys and 63 girls, selected using simple random sampling technique, from 4 schools in Goa. Participation was voluntary and anonymous.

Tools:

Educational Stress Scale for Adolescents (ESSA) developed by Sunn et al.(2011) consists of 16 items. The scale demonstrates adequate

internal consistency (Cronbach's Alpha 0.70), Test- retest reliability (0.44 – 0.67 with an interval of two weeks, and satisfactory concurrent and predictive validity.

Academic Self-concept Questionnaire (ASCQ) developed by Liu & Wang (2005) consists of 20 items. The questionnaire is found to have adequate test-retest reliability (0.70) and construct validity (0.80).

Academic grades : Mid-Semester academic grades- A,B,C,D,E are used as ordinal categories with A indicating superior performance and E indicating least performance.

Results:

The results observed in the study are stated as under:

Levels of academic stress (high, moderate & low).

It was observed that 47 percent (n= 63) of the participants reported moderate levels of academic stress and 53 percent (n =72) reported high levels of stress. It is interesting to note that there was no case observation on low academic stress. A large number of participants experienced high levels of stress.

Levels (high & low) of academic self concept (ASC)

It was observed that 74 percent (n= 100) of the participants reported lower ASC and 26 percent (n =35) reported higher ASC. A large percentage of participants recorded lower scores on ASC.

Gender differences on academic stress, ASC & Academic grades.

On the variable of Academic Stress, there is a significant difference on academic stress reported by male and female students (t value = 2.012, df 133, $p < 0.05$) with female participants reporting experience of more academic stress as compared to males.(Refer to table 1 below).

On the variable of ASC, male and female students differ significantly (t value= 2.372, df 133, $p< 0.01$), with females scoring higher as compared to male students (Refer to table 1 below).

On Academic Grades, a Chi-Square analysis did not show significant differences on gender.

Table1: indicates t statistics with respect to gender on academic stress & ASC

Variables	Gender	N	Mean	SD	Statistical Inference (2 tailed)
Academic stress	Male Female	72 63	31.88 33.86	5.554 5.886	t = 2.012, (df: 133) P< 0.05 significant
Academic Self Concept	Male Female	72 63	31.88 33.86	5.554 5.886	t = 2.372, (df: 133) P< 0.05 significant

Relationship between Academic Stress and ASC

The Pearson's correlation coefficient computed between academic stress and academic self concept ($r = – 0.45$, N = 135, $P< 0.01$) indicates a significant moderate negative correlation between academic stress and academic self concept. Hence, the relationship is inverse and significant.

VARIABLES: Academic stress & ASC	
Pearson Correlation	-.45**
Sig. (2-tailed)	.000
N	135
	Significant at 0.01 level (2 tailed)

Academic stress (DV) and ASC (DV) as a function of Academic Grades (IV)

Significant difference is observed on academic stress as a function of academic grades [$F (4,130) = 7.466$, $p < 0.001$] (Refer table 3)

Similarly, significant difference on academic self concept is observed as a function of academic grades [$F (4,130) = 10.064$, $p < 0.001$]. (Refer table 3)

One way ANOVA results indicate that academic grades have a significant impact on academic stress and academic self concept. Higher the academic grades lower the academic stress and higher the academic self concept.

Table 3: indicates the summary results of one way ANOVA statistics.

Variables: DV	Variance	Sum of squares	df	Mean square	F	Sig.
Academic stress (AS)	Between Groups	834.965	4	208.741	7.466	.000**
	Within Groups	3634.635	130	27.959		
	Total	4469.600	134			
Academic self concept (ASC)	Between Groups	1942.641	4	485.660	10.064	.000**
	Within Groups	6273.240	130	48.256		
	Total	8215.881	134			

**Significant at 0.01level (2 tailed).

Regression Analysis: Academic grades as the outcome variable and Academic Stress (AS) & ASC as predictor variables.

An Ordinal Logistic Regression analysis was performed with academic grades as the ordinal dependent variable and academic stress & academic self concept as independent variables. Table 4 below presents the case summary.

Table 4: Case Processing Summary

variables		N	Percentage
academic. grades	A	25	18.5%
	B	46	34.1%
	C	42	31.1%
	D	11	8.1%
	E	11	8.1%
Academic stress	low - 1	64	47.4%
	high - 2	71	52.6%
ASC	Low- 1	57	42.2%
	High -2	78	57.8%
Valid		135	100.0%
Missing		0	
Total		135	

The model fit -2 log likelihood ratio Chi-Square test [$\chi 2$ (df 2) = 40.87, $p < 0.001$] is significant. The Goodness of Fit test of Chi-Square Pearson and Deviance is not significant. The Nagelkerke Pseudo R-Square is 0.267 which suggest that predictor variables may cause 26.7% of the variance on academic grades. However, this has to be interpreted with caution. The Parameter Estimates Table 5 indicates the coefficients, their standard errors, the Wald test and associated p-values (sig.), and the 95% confidence interval of the coefficients. Academic stress and Academic self concept are statistically significant predictors at 0.05 level of significance. Academic stress is a negative significant predictor and academic self concept is a significant positive predictor. Hence, for Academic stress, every one unit increase in academic stress, we expect a - 0.69 decrease in the ordered log odds of being in a higher academic grade, when controlling for academic self concept in the model. Alternatively, with every one unit increase in academic self concept, we expect a 1.58 increase in the ordered log odds of being in a higher academic grade, given that academic stress variable in the model is held constant. The proportional odds assumption was tested with Test of Parallel Lines and obtained a non-significant result. The results clearly indicate the significant influence of predictor variables on the outcome variables, with academic self concept showing a greater influence on academic grades as compared to academic stress.

Discussion

School is considered as a second home and school life is considered as a significant environment in a student's life. The National Education Policy favors a no-detention policy up to standard VIII. A student promoted to class IX, suddenly is exposed to a tough challenge of academic work, more hours of serious study, and often has to expend more efforts, time and energy to avoid failure and excel at academic grades. The present study explores this challenging situation for the IX Std students and seeks to assess and analyse the interactive importance of three variables, namely; academic stress, academic self-concept and academic grades.

Table: 5: Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound	
Threshold	[acad.grad = 1]	-1.361	.333	16.693	1	.000	-2.015	-.708
	[acad.grad = 2]	.640	.316	4.108	1	.043	.021	1.258
	[acad.grad = 3]	2.540	.390	42.467	1	.000	1.776	3.304
	[acad.grad = 4]	3.374	.449	56.410	1	.000	2.493	4.254
Location	A. Stress low =1.00	-.686	.342	4.029	1	.045	-1.356	-.016
	A. stress high =2.00	0[a]	.	.	0	.	.	.
	ASC LOW =1.00	1.852	.374	24.479	1	.000	1.119	2.586
	ASC HIGH =2.00	0[a]	.	.	0	.	.	.
Link function: Logit.								
a. This parameter is set to zero because it is redundant.								

Previous research done in Asian schools and even some parts of India highlight the fact that academic stress prevails among students in schools with significant reports of harmful effects on

physical, psychological and mental health. Higher Academic grades occupy special importance and failure in school is considered a shame in Indian society. More closely related is academic self concept that comes with maturity and a realization of what one is capable of doing in the academic arena and which contributes to the overall self concept.

It is noteworthy to state that in the present study, out of the sample of 135 participants, 47% reported moderate levels of stress and the remaining 53% reported high levels of stress. Observations on lower level of stress were nil. This high level of stress may be attributed to increased pressure to achieve from significant others or self, or a need to invest more time and efforts to handle academic curriculum challenges at the cost of personal choices and activities.

It was also interesting to note that a large 74% of the participants indicated lower scores on ASC. The participants of the study are in the early adolescent stage. Novel adjustments to pubertal changes in their bodies coupled with increased demands of academic work, parental pressures towards responsibility and maturity and the increased ability to know oneself and comprehend the feedback of others may cause an increased tendency to form a lowered overall self concept which may have spillover effects on academic self-concept.

Gender based comparisons on academic stress and academic self concept reveals that male and female students significantly differ, with female students showing a higher level of academic stress and also higher levels of academic self-concept. The difference on academic stress may be due to females emphasizing increased levels of importance to academic performance as compared to male students. Comparatively, girls are better at reading skills, social skills, communications skills and presentation skills which may all contribute to a higher self concept in the academic domain as compared to male students. It is an overall trend in Goa to say that girls often outperform boys on academic grades in schools but the present study did not find significant differences on academic grades as a function of gender.

A negative significant correlation between academic stress and academic self concept shows that the relationship is inverse and moderate; stating that with a rise in academic stress there is a decrease in academic self concept and vice-versa. Hence, efforts to reduce academic stress or increase academic self concept seems to be a viable solution.

Furthermore, Analysis of variance indicated statistically significant impact of academic

grades on academic stress as well as ASC. Higher academic grades contributed to lower scores on academic stress and higher scores on ASC. Thus, efforts to achieve higher academic grades could significantly contribute to development of a positive ASC and lesser academic stress.

To understand relationships among the study variables further, an ordinal logistic regression indicated that academic stress and ASC were significant predictors accounting for variance in academic grades. Lesser the academic stress more the odds of achieving a higher grade and conversely higher the ASC more the odds of achieving a higher academic grade.

Hence the statistical results of the present study indicate the fact that academic stress, ASC and academic grades are interconnected and each one influences the other significantly. This helps to highlight the fact that all three selected variables in the study are significant factors in school learning and they need to be considered during policy frameworks and decisions regarding educational programs and achievements. In the school settings and curriculum development, opportunities need to be provided to reduce academic stress, raise ASC and achieve academic excellence.

The present study suggests the following ways to achieve positive results:

- Teacher-student relationship synergy could be used to achieve positive results. The teacher could use strategies such as providing constructive feedback to students, assist students in formulating success and failure attributions and reinforce students for engaging in positive self- talk.
- The ability of academic stress and academic self concept to predict academic grades significantly is an eye-opener to the neglect shown by schools to implement workshops and programs that will help students reduce stress and improve self concept. The schools often concentrate on completion of the syllabus rather than offer opportunities for holistic personality development and growth to students. The educational system is often criticized to be traditional with heavy emphasis on theoretical knowledge rather than practical applications. Most of the time expectations and pressures surrounding exams and importance given to marks push the students to be a winning horse and decide the future. Today, school learning and teaching calls for a change in pedagogical methods and assessment schedules. Learning directed towards only gaining knowledge is insufficient. Basic personal skills, social skills, self – sufficiency, and personality development programs should be embedded in the school curriculum for a better understanding of life and living by policy makers/educationists.
- Special sessions on time management and stress management are mandatory.
- Yoga and meditation classes should be made mandatory as a part of physical education to promote concentration and relaxation.
- Need based programs for parents also could serve as an added advantage for focused on building family relationships and reducing academic pressures and unrealistic expectations.
- Formation of peer support often called as buddy support teams could help weaker students to move towards higher levels of achievement.
- The school counselor/s could take up the task of identifying the multidimensional nature of academic stress and ASC and introduce workshops and provide personal counseling to reduce academic stress and develop a positive academic self concept.
- The Educational Policy needs to be reworked, revised and revisited in the interest of a smooth journey for students and a larger interest in the good of the community.

Limitations of the study:

A larger sample size would help to make wider generalizations and understand in depth

the variables of the study. The results of the present study can be used to draw conclusion only for standard IX school students.

Suggestions for further research:

A cross- standard study of a similar kind could be undertaken to reveal differences on the three variables used in the present study. Mental health issues linked to school life could be another area of study.

Implications:

This study serves to be an eye-opener to policy makers, educationists, teachers, parents and students. The result of the study impels the importance of interventions to reduce academic stress, implement exercises and workshops to nourish academic self-concept and work towards designing a school curriculum based on choice and innovation that has the potential to excite creativity and hidden potentials towards holistic development of school students. This academic challenge is the need of the hour for policy makers, teachers and school counselors.

Conclusion

Within the limitations, the following conclusions may be made:

- Participants experience moderate to high levels of academic stress.
- Lower ASC is observed among a large percentage of participants.
- Significant gender differences exist on academic stress and academic self concept with female students scoring high on both academic stress and academic self concept.
- No significant differences on academic grades with respect to gender.
- Significant negative correlation exists between academic stress and academic self-concept.
- Academic grades significantly impact academic stress and academic self concept
- Academic stress and Academic Self concept are significant predictors of the variance on academic grades.
- Interactional analysis reveals that academic stress, ASC and academic grades are significantly interconnected and are important considerations for academic excellence.

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Janet Fernandez, Ph.D., Professor & Head, Department of Psychology, St. Xavier's College, Goa, Pin code: 403507, drjanet2307@gmail.com.