British Journal of Multidisciplinary and Advanced Studies:
Education, Learning, Training & Development, 5(3),25-35, 2024
Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

Effects of Test Anxiety On Students' Performance in Mathematics in Senior Secondary Schools in Ekiti State

Thomas Olabode Abe, (Ph.D)
Counseling Psychology Department, College of Education,
Bamidele Olumilua University of Education Science and Technology Ikere

Sunday Oluwaseun Gbenro
Department of Mathematical Science,
Bamidele Olumilua University of Education Science and Technology Ikere

doi: https://doi.org/10.37745/bjmas.2022.0486 Published May 15, 2024

Citation Abe T.O., and Gbenro S.O. (2024) Effects of Test Anxiety On Students' Performance in Mathematics in Senior Secondary Schools in Ekiti State, *British Journal of Multidisciplinary and Advanced Studies*: Education, Learning, Training & Development, 5(3),25-35

ABSTRACT: *The study examines the effect of test anxiety on students' performance in Mathematics. Four Hundred (400) students' were randomly selected and Forty (40) students' were purposively selected from Ten (10) schools which comprised of five (5) schools each from private and public school. Three (3) general questions were formulated and answered descriptively while three hypotheses in the study were t-test statistics. The result showed there was no significant difference in the mean of observable test and anxiety behavior between JSS II and SS II students. Also, students' gender and class did not have any significant influence on their test anxiety level while school type significant influenced anxiety level and thus academic performance in Mathematics among the sampled secondary schools in Ikere Local Government Area in Ekiti State. The study recommended that students' perception of Mathematics should be enhanced through teachers genuine interest in developing their students' Mathematical competencies. Mathematics teachers should alleviate the fear of their students by emphasizing that mathematics is not a difficult subject. Also, teachers and students' perception of mathematics should be changed through the creation of an enabling environment in term of infrastructural and other materials that can enhance the teaching and learning of Mathematics.*

KEYWORDS: Test Anxiety, Performance, Students, Mathematics

INTRODUCTION

Test anxiety is a physiological condition in which people experience extreme stress, anxiety, and discomfort during and/or before taking a test/examination. These responses can drastically hinder

an individual's ability to perform well and negatively affect their social, emotional and behavioral development and feeling about themselves and school (Salend, 2012). Rana and Mahmood (2010), and Putwain et al (2010) argued that characteristics of the test environment such as nature of the task difficulty atmosphere, time constraint, examiner's characteristics, mode of administration and physical setting can affect the level and anxiousness felt by the student. A low anxious test taker is able to focus greater attention on the tasks required of them while taking the test while a high anxious test taker is focused on their internal self and anxiety they are feeling. Anxious test takers do not perform adequately on a test as their attention is divided between themselves and the test. In view of this, students with high test anxiety and unable to focus their full attention on the test. Anxiousness is evoked when a student believes that the evaluative situation such as an assessment exceeds his or her intellectual, motivational and social capabilities. Zeidner (1998) argued that test anxiety is a combination of physiological over-arousal, tension and somatic symptom along with worry, dread, fear or failure and catastrophe that occur before or after test situation. Andrew and Wilding (2004) defined test anxiety as a physiological condition in which people experience extreme stress anxiety and discomfort during and/or before a test. This anxiety creates significant barriers to learning and performance. Research suggests that high level of emotional distress have a direct relationship to reduces academic performance and overall student drop-out rate (Pritchard & Wilson, 2013; Andrew & Wilding, 2004; Vaez & Lailamme, 2008).

Test anxiety negatively affects students' performance as shown by recent studies, for instance, Barrows, et al (2013). Their study revealed a strong and positive relationship between test anxiety and examination grades, and self- efficacy and examination grades. The multiple linear regression analyzes exhibited showed that test anxiety predicted examination grades and self- efficacy level. Yildrim (2012) found that high mathematics self-efficacy is positively related to mathematics achievement, and high test anxiety is negatively related to Mathematics achievement. Rena and Mahmood (2010) found that a significant negative relationship existed between test anxiety scores and students' achievement scores. Result showed that a cognitive factor (worry) contributes more in test anxiety than affective factor (emotion). Therefore, it was concluded that test anxiety is one of the factors responsible for students under achievement and low performance. However, test anxiety can be managed by appropriately training of students in dealing with factors causing test anxiety.

The findings of Hassanzadeh, et al (2012) showed that test anxiety inhabit students' ability to focus on their academic achievements thus negatively influencing grades. This was corroborated by the findings of Abdi, et al (2012) which found negative relationship between test anxiety and overall grade point average of students, Kesici and Ahmet (2009) found that test anxiety was a significant predictor of Mathematics anxiety with about 18 percent of the variance in Mathematics anxiety explained by test anxiety. Tsui and Mazzo (2007) found that mathematics performance of students does not correlate during timed and untimed testing conditions. When students were not timed in taking the sample test, they took twice long to complete it as opposed to when they were timed.

By looking at these results, test anxiety may be provoked by having to finish a set of mathematics problems in an allotted amount of time. If one is affected by Mathematics anxiety as well as test anxiety, both anxieties may combine causing a students' performance to drop significantly.

There are generally poor performances by students in mathematics at all levels of educational strata in Nigerian schools. This has been a thing of great concern to mathematics educators, parents, and government. This is in line with the observation of Mathematics Association of Nigeria (MAN, 2013). The problem of this study is anchored on the effects of test anxiety on academic performance in mathematics at secondary schools in Ikere local government area of Ekiti state, Nigeria. Therefore, the study seeks to answer the following general questions as generated by the researchers:

1. What are the effects of test anxiety on students' academic performance in Mathematics among the secondary schools in Ikere local government area?
2. What are the effects of test anxiety on male students' academic performance in mathematics among the secondary schools in Ikere local government area?
3. What are the effects of test anxiety on female students' academic performance in mathematics among the secondary schools in Ikere local government area?

Research Hypothesis

Ho1: There is no significant difference in the mean rating of observable test anxiety behavior between Junior Secondary School II (JSS II) and Senior Secondary School II (SSS II) students

METHODOLOGY

The study is a descriptive research of survey type which involved strictly the comparative analysis of effect of test anxiety on student performance in mathematics. The target population for the study consisted of all private and public secondary schools in Ikere local government area of Ekiti state. The number of schools was sixteen all together which involved six private and ten public secondary schools. A sample of four hundred (400) students was randomly selected from ten secondary schools. Tens schools were randomly selected from the sixteen secondary schools with forty (40) students selected from each of the schools. The instrument for the study was a Four Likert scale questionnaire designed by the researchers based on some test anxiety variables as it affects the learning of mathematics in secondary schools. The face and content validity were ascertained by two lecturers from the department of educational foundation in which one specialized in test, measurement and evaluation and the other one from psychology. The construct validity and reliability was determined by the researchers using Cronbachs Alpha. The result of the estimate was 0.73 and this index is considered high and significant enough for this kind of study.

British Journal of Multidisciplinary and Advanced Studies:
Education, Learning, Training & Development, 5(3),25-35, 2024
Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

With the assistance of various mathematics teachers whose class were used for the study, mostly from the ten sample schools, the completed questionnaires were collected from the respondents, coded and analyzed. There was no instrument mortality thus 100% return rate was achieved. The data collected were analyzed descriptively to answer the three general questions while t-test statistic was used to test the three hypotheses formulated at 0.05 level of significance using SPSS version 23.

RESULTS

Table 1: Effect of test anxiety on students' academic performance in mathematics

S/N	Items	SA	A	D	SD	RMK
1	I feel confident and relaxed while taking tests	286 (71.5)	64 (16.0)	42 (10.5)	8 (2.0)	SA
2	While taking examination I have an uneasy upset feeling	58 (14.5)	78 (19.5)	74 (18.5)	190 (47.5)	SD
3	Thinking about my grade in a subject interferes with my work on tests	92 (23.0)	86 (21.5)	32 (8.0)	190 (47.5)	SD
4	During examination I find myself thinking about whether I will ever get through school	60 (15.0)	90 (22.5)	58 (14.5)	192 (48.0)	SD
5	I freeze up on important examination	104 (26.0)	72 (18.0)	66 (16.5)	158 (39.5)	SD
6	The harder I work at taking a test the more I get	152 (38.0)	96 (24.0)	94 (23.5)	58 (14.5)	SA
7	Thoughts of doing poorly interfere with my concentration on tests	64 (16.0)	78 (19.5)	70 (17.5)	188 (47.0)	SD
8	I feel very jittery when taking important tests	62 (15.5)	110 (27.5)	136 (34.0)	92 (23.0)	D
9	Even when I am well prepared for a test I feel very nervous about it	98 (24.5)	130 (32.5)	70 (17.5)	102 (25.5)	A
10	I start feeling uneasy just before getting a test paper back	52 (13.0)	116 (29.0)	124 (31.0)	108 (27.0)	D
11	During test I feel very tensed	56 (14.0)	176 (44.0)	92 (23.0)	76 (19.0)	A
12	I wish examination did not bother me so much	72 (18.0)	154 (38.5)	86 (21.5)	88 (22.0)	A
13	During important tests, I am so tensed that my stomach gets upset	38 (9.5)	74 (18.5)	84 (21.0)	204 (51.0)	SD
14	I seem to defeat myself while working on important test	94 (23.5)	78 (19.5)	100 (25.0)	128 (32.0)	SD
15	I feel very panicking when I take important test	50 (12.5)	118 (29.5)	92 (23.0)	140 (35.0)	SD
16	I worry a great deal before taking an important examination	86 (21.5)	134 (33.5)	94 (23.5)	86 (21.5)	A
17	During tests I find myself thinking about the consequence of failing	66 (16.5)	124 (31.0)	44 (11.0)	166 (41.5)	SD

18	I feel my heart beating very fast during important test	60 (15.0)	188 (47.0)	106 (26.5)	46 (11.5)	A
19	After an examination is over I try to stop worrying about it but I can't	76 (19.0)	80 (20.0)	160 (40.0)	84 (21.0)	D
20	During examinations I get so nervous that I forget fact I really know	70 (17.5)	82 (20.5)	90 (22.5)	158 (39.5)	SD

SA=strongly Agree, A = Agree, D= Disagree, SD= Strongly disagree, RMK= Remark (The numbers in parenthesis indicate percentage)

Table 1 above shows the result of analysis of the relationship between student's text anxiety level and their academic performance in mathematics. The table revealed that most of the respondents indicated "Strongly Agree" in items 1 and 6, "Agree" in items 9, 11, 12,16, and 18, "Disagree" in items 8, 10, and 19, while they "Strongly Disagree" in items 2, 3, 4, 5, 7, 13, 14, 15, 17, and 20.

Table 2: Effect of test anxiety on male students' academic performance in mathematics

S/N	Items	SA	A	D	SD	RMK
1	I feel confident and relaxed while taking tests	134 (69.1)	38 (19.6)	20 (10.3)	2 (1.0)	SA
2	While taking examination I have an uneasy upset feeling	30 (15.5)	40 (20.6)	34 (17.5)	90 (46.4)	SD
3	Thinking about my grade in a subject interferes with my work on tests	46 (23.7)	46 (23.7)	12 (6.2)	90 (46.4)	SD
4	During examination I find myself thinking about whether I will ever get through school	36 (18.6)	40 (20.6)	30 (15.5)	88 (45.4)	SD
5	I freeze up on important examination	56 (28.9)	32 (16.5)	26 (13.4)	80 (41.2)	SD
6	The harder I work at taking a test the more I get	80 (41.2)	52 (26.8)	36 (18.6)	26 (13.4)	SA
7	Thoughts of doing poorly interfere with my concentration on tests	42 (21.6)	34 (17.5)	30 (15.5)	88 (45.4)	SD
8	I feel very jittery when taking important tests	20 (10.3)	66 (34.0)	68 (34.0)	40 (20.6)	D
9	Even when I am well prepared for a test I feel very nervous about it	58 (29.9)	56 (28.9)	34 (17.5)	46 (23.7)	SA
10	I start feeling uneasy just before getting a test paper back	30 (15.5)	66 (34.0)	50 (25.8)	48 (24.7)	A
11	During test I feel very tensed	22 (11.3)	102 (52.6)	44 (22.7)	26 (13.4)	A
12	I wish examination did not bother me so much	44 (22.7)	68 (35.1)	32 (16.5)	50 (25.8)	A
13	During important tests, I am so tensed that my stomach gets upset	18 (9.3)	34 (17.5)	44 (22.7)	98 (50.5)	SD
14	I seem to defeat myself while working on important test	52 (26.8)	32 (16.5)	46 (23.7)	64 (33.0)	SD
15	I feel very panicking when I take important test	24 (12.4)	68 (35.1)	42 (21.6)	60 (30.9)	A

16	I worry a great deal before taking an important examination	46 (23.7)	64 (33.0)	42 (21.6)	42 (21.6)	A
17	During tests I find myself thinking about the consequence of failing	36 (18.6)	58 (29.9)	22 (11.3)	78 (40.2)	SD
18	I feel my heart beating very fast during important test	32 (16.5)	96 (49.5)	46 (23.7)	20 (10.3)	A
19	After an examination is over I try to stop worrying about it but I can't	40 (20.6)	34 (17.5)	86 (44.3)	34 (17.5)	D
20	During examinations I get so nervous that I forget fact I really know	42 (21.6)	34 (17.5)	34 (17.5)	84 (43.3)	SD

SA=strongly Agree, A = Agree, D= Disagree, SD= Strongly disagree, RMK= Remark (The numbers in parenthesis indicate percentage)

Table 2 above shows the result of analysis of the relationship between male students' text anxiety level and their academic performance in mathematics. The table revealed that mosts of the respondents indicated "Strongly Agree" in items 1 and 6, and 9, "Agree" in items 10, 11, 12, 15, 16, and 18, "Disagree" in items 8, 10, and 19, while they "Strongly Disagree" in items 8, and 19, while they "Strongly Disagree" in items 2, 3, 4, 5, 7, 13, 14, 17, and 20.

Table 3: Effect of test anxiety on female students' academic performance in mathematics

S/N	Items	SA	A	D	SD	RMK
1	I feel confident and relaxed while taking tests	152 (73.8)	26 (12.6)	22 (10.7)	6 (2.9)	SA
2	While taking examination I have an uneasy upset feeling	28 (13.6)	38 (18.4)	40 (19.4)	100 (48.5)	SD
3	Thinking about my grade in a subject interferes with my work on tests	46 (22.3)	40 (19.4)	20 (9.4)	100 (48.5)	SD
4	During examination I find myself thinking about whether I will ever get through school	24 (11.7)	50 (24.3)	28 (13.6)	104 (50.5)	SD
5	I freeze up on important examination	48 (23.3)	40 (19.4)	40 (19.4)	78 (37.9)	SD
6	The harder I work at taking a test the more I get	72 (35.0)	44 (21.4)	58 (28.2)	32 (15.5)	SA
7	Thoughts of doing poorly interfere with my concentration on tests	22 (10.7)	44 (21.4)	40 (19.4)	100 (48.5)	SD
8	I feel very jittery when taking important tests	42 (20.4)	44 (21.4)	68 (33.0)	52 (25.2)	D
9	Even when I am well prepared for a test I feel very nervous about it	40 (19.4)	74 (35.9)	36 (17.5)	56 (27.2)	SA
10	I start feeling uneasy just before getting a test paper back	22 (10.7)	50 (24.3)	74 (35.9)	60 (29.1)	A
11	During test I feel very tensed	34 (16.5)	74 (35.9)	48 (23.3)	50 (24.3)	A
12	I wish examination did not bother me so much	28 (13.6)	86 (41.7)	54 (26.2)	38 (18.4)	A

British Journal of Multidisciplinary and Advanced Studies:
Education, Learning, Training & Development, 5(3),25-35, 2024
Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

13	During important tests, I am so tensed that my stomach gets upset	20 (9.4)	40 (19.4)	40 (19.4)	106 (51.5)	SD
14	I seem to defeat myself while working on important test	42 (20.4)	46 (22.3)	54 (26.2)	64 (31.1)	SD
15	I feel very panicking when I take important test	26 (12.6)	50 (24.3)	50 (24.3)	80 (38.8)	A
16	I worry a great deal before taking an important examination	20 (19.4)	70 (34.0)	52 (25.0)	44 (21.4)	A
17	During tests I find myself thinking about the consequence of failing	30 (14.6)	66 (32.0)	22 (10.7)	88 (42.7)	SD
18	I feel my heart beating very fast during important test	28 (13.6)	92 (44.7)	60 (29.1)	26 (12.6)	A
19	After an examination is over I try to stop worrying about it but I can't	36 (17.5)	80 (20.0)	46 (22.3)	50 (24.3)	D
20	During examinations I get so nervous that I forget fact I really know	28 (13.6)	48 (23.3)	56 (27.2)	74 (35.9)	SD

SA=strongly Agree, A = Agree, D= Disagree, SD= Strongly disagree, RMK= Remark (The numbers in parenthesis indicate percentage)

Table 3 above shows the result of analysis of the relationship between students' text anxiety level and their academic performance in mathematics. The table revealed that most of the respondents indicated "Strongly Agree" in terms 1 and 6, "Agree" in items 9, 11, 12, 16, and 18. "Disagree" in items 8, 10, and 19, while they "Strongly Disagree" items 2, 3, 4, 5, 7, 13, 14, 15, 17, and 20.

Hypothesis Testing

Hypothesis One: There is no significant difference in the mean rating of observable test anxiety behavior between JSS II and SSS II students.

Table 4: t-test analysis of students' response

Class	N	Mean	SD	df	t_{cal}	t_{tab}	Decision
JSS II	200	2.66	0.96	398	1.54	1.96	Not Significant
SSS II	200	2.43	0.94				

The result in Table 4 shows the difference in mean rating of observable test anxiety behavior between male and female students. The mean rating of male students in (2.59) was greater than the mean rating of female students (2.51) with mean difference of (0.08). The t-test analysis showed that t_{cal} (0.49) was less than t_{tab} (1.96) at $p < 0.05$ level of significant. This implies that there is no significant difference in the mean rating of observable test anxiety behavior between male and female students. Hence, the null hypothesis was upheld.

DISCUSSION OF FINDINGS

Most of the respondents opined that they feel confident and relaxed while taking tests, the harder they work at taking tests, the harder they work at taking a test the more confused they get, even

when they are well prepared for a test they feel very nervous about it, during test they feel very tense, they wish examination did not bother them so much, and they worry a great deal before taking an important examination. More so, thinking about their grades in a subject does not interfere with their work on tests, the thoughts of doing poorly does not interfere with their concentration on tests, they do not have uneasy feeling just before getting a test paper back. Finally, during tests they find themselves thinking about the consequence of failing, and after the examination is over they try to stop worrying about it but cannot.

The result showed that there is no significant difference in the mean rating of observable test anxiety behavior between JSSSII and SSSII students in mathematics. This means that students' class does not have any significant influence on their anxiety level in mathematics. This result is in line with that obtained by Andrew and Wilding (2004).

CONCLUSION

The study has been able to establish the nature of the relationship between students' test anxiety level and their academic performance in mathematics. The students variables take into consideration in analyzing the connecting between test anxiety and academic performance were gender, class, and school type.

Firstly, it was found that a higher proportion students experience some level of anxiety prior, during or after a mathematics test examination. These anxiety manifest different forms ranging from internal expressions such as nervousness, loss of concentration, uneasy feeling, worry or fear and failure to physical expressions such as panicking, increased heartbeat and stomach upset. However, few of the students are able to exercise control over their feelings towards mathematics and express great confident while taking mathematics test examinations. In addition, the test of hypotheses reveals that there was no significant difference in the mean rating of observable test anxiety behavior between JSSII and SSSII students in mathematics.

Based on the findings of the study, curriculum planners should make adequate provision for instructional materials and teaching aid to enhance students' understanding of mathematical concepts thereby developing their confidence in mathematics. The relevant instructional materials should be made readily available to both teachers and students in order to enable them effectively utilize students' potentials in mathematics related subjects and help them overcome the anxiety usually experienced in mathematics tests and examinations.

The importance of mathematics as a tool in science and technology as well as nation building cannot be overemphasized hence students' perception of mathematics should be enhanced through teachers' genuine interest in developing their students mathematical competences. Teachers should employ teaching progressive methods that position the student at the center of the teaching-

learning process. Mathematics teachers should alleviate the fears of their students by emphasizing that mathematics is not a difficult subject and it could be fun learning mathematics.

Both state and federal ministries of education and the National Education Research and Development Council (NERDC) should establish regular training and retraining of mathematics teachers as a way of equipping and updating them on new teaching strategies that can yield the required result of improved students' performances in mathematics examinations. Seminars should be organized for mathematics teachers especially before the introduction of new topic(s) in the mathematics curriculum to prepare them for the new tasks.

Environment has a great influence on the teaching-learning process hence government should provide Conducive environment where teaching-learning can be effectively utilized. Teachers and students' perception of mathematics can be changed through the creation of an enabling environment in terms of infrastructures and other materials than can enhance the teaching and learning of mathematics. Enhanced salary and other emoluments alongside with Conducive environments should be made available for teachers and students in both private and public secondary schools in the state and by federal ministry of education. This will motivate them to give their best to the teaching and learning of mathematics.

REFERENCES

Abe, T.O. (2014). The effects of teachers' qualification on students' performance in mathematics. *Sky Journal of Educational Research*, 2(1), 10-14.

Abdi, H.M., Bageri, S., Shogi, S., Goodazish & Hassinzadeh, A. (2012). The role of meta- and self-efficacy beliefs in students test anxiety and academic achievement. *Australian Journal of Basic and Applied Sciences*, 6(12), 418-422.

Adeyemi, T.O. (2007). *Research Methods and Thesis Writing in Educational Studies*. Lagos: New Heaven Publisher.

Alonge, M.F. (1998). *Measurement and Evaluation in Education and Psychology* (1st ed.). Ado-Ekiti: Adedayo Publishing Company.

Alonge, M.F. (2004). *Measurement and Evaluation in Education and Psychology* (2nd ed.). Ado-Ekiti: Adedayo Publishing Company.

Alonge, M.F. (2016). *Essential of Research Methods and Designs for Educators*. Ado-Ekiti: Green Line Publishers.

Andrew, B.S., & Wilding, T.M. (2004). The relation of depression and anxiety to life stress and achievement in students. *British Journal of Psychology*, 95, 509-521.

Barrows, J., Dunn, S., & Lloyd (2013). Anxiety self-efficacy and college exam grades. *Universal Journal of Educational Research*, (3), 204-208.

Champion, D. J. (1970). *Basic Statistics for social research*. Tennessee, USA: Chandler Publishing Company.

Gray, L. R. (1996). *Educational Research for Analysis and Application* (5th ed.). Upper Saddle, River, New Jersey: Hall Inc, & Simon Schuster Company.

Hassenzadeh, R., Ebrahim, S., & Mehdinyard, G. (2012). Studying test anxiety and its relationship with self-efficacy, ,meta-cognitive beliefs and some affective predictable variables. *European Journal of Social Services*, 30(4), 511-522.

Kesici, S., & Ahmet, E. (2009). Predicting college students' mathematics anxiety by motivational belief and self-regulated learning strategies. *College Students Journal*. (2), 631-842.

Macintosh, H. P. (1974). *Techniques and Problems of Assessment*: A Pratical Handbook for Teachers. London: Edward Arnold Limited.

Nworgu. B. G. (1991). *Educational Research, Basic Issues and Methodology* (1st ed.). Ibadan: Wisdom Publisher Limited.

Nworgu. B. G. (2006). *Educational Research Basic Issues and Mthodology* (2nd ed.). Nsukka. I. nugu: University Trust Publisher.

Putwain. D. W., Woods, k. A., & Symes, W. (2010). Personal and situational predictors of test anxiety of students in post compulsory education. *British Journal of Educational Psychology*, 80, 137-160.

Pritchard, M. E., & Wilson, G. S. (2003). Using emotional and social factors to predict students' success. *Journal of College Students' Development,* 44, 18-28.

Rana, R. A., & Mahmood. N. (2010). The relationship between test anxiety and academic achievement. *Bulletin of Educational and Research*, 32(2), 63-74.

Salend, S.J. (2012). *Teaching Students Not to Sweat the Test.* Phi. Delta Kappan, 93(6), 20-25.

Tsni. J. M., & Mazzocco. M. M. (2007). Effects of maths anxiety and perfectionism on timed versus untimed maths testing in mathematically gifted sixth graders. *Roeper Review*. 29(2), 132-139.

Yildirium, S. (2012). Teacher support, motivation, learning strategy use, and achievement: A multilateral mediation model. *The journal of Experimental Education*, 80(2), 150-172.

Vaez, M., & Lailamme, L. (2008). Experienced stress, psychological symptoms, self rated health and academic achievement. University students' social behavior and personality.

Zeinder, M. (1998). Does test anxiety bias scholastic aptitude test performance by gender and socio-cultural group? *Journal of Personality Assessment. 55, 145-160*