The Spanish Journal of Psychology (2017), **20**, e14, 1–8.

doi:10.1017/sjp.2017.5

CAMBRIDGE UNIVERSITY PRESS

Test Anxiety and Academic Performance among Undergraduates: The Moderating Role of Achievement Motivation

Anthony Gbenro Balogun[1], Shyngle Kolawole Balogun[2] and Chidi Victor Onyencho[3]

[1] *Adekunle Ajasin University (Nigeria)*
[2] *University of Ibadan (Nigeria)*
[3] *Federal Neuropsychiatric Hospital (Nigeria)*

Abstract. This study investigated the moderating role of achievement motivation in the relationship between test anxiety and academic performance. Three hundred and ninety three participants (192 males and 201 females) selected from a public university in Ondo State, Nigeria using a purposive sampling technique, participated in the study. They responded to measures of test anxiety and achievement motivation. Three hypotheses were tested using moderated hierarchical multiple regression analysis. Results showed that test anxiety had a negative impact on academic performance (β = –.23; $p < .05$). Achievement motivation had a positive impact on academic performance (β = .38; $p < .05$). Also, achievement motivation significantly moderated the relationship between test anxiety and academic performance (β = .10; $p < .01$). These findings suggest that university management should design appropriate psycho-educational interventions that would enhance students' achievement motivation.

Received 29 April 2016; Revised 19 January 2017; Accepted 20 January 2017

Keywords: academic performance, achievement motivation, Nigeria, test anxiety, undergraduates.

It has been noted that between 25 to 40 percent of students experience test anxiety (Cassady, 2010). Students who experience high level of test anxiety are more likely to perform poorly academically (Jing, 2007; Mondal, Ghosh, & Das, 2013). For example, studies (e.g., Cassady & Johnson, 2002; Chapell et al., 2005; Khalaila, 2015) have shown that test anxiety is associated with low academic performance. However, little is known about the factors that can moderate the effect of test anxiety on academic performance (Barrows, Dunn, & Lloyd, 2013). Achievement motivation has been suggested as a potential variable that may buffer the effect of test anxiety on academic performance (Ergene, 2011). Nevertheless, literature review in this area showed that the moderating role of achievement motivation in the relationship between test anxiety and academic performance has not been given adequate empirical attention.

In response to call for more empirical studies, especially on the moderators between test anxiety and academic performance (Ergene, 2011), the primary aim of the present study was to examined the moderating role of achievement motivation in the relationship between test anxiety and academic performance. The secondary aim is to further the study on test anxiety and academic performance using sample of undergraduates drawn from a developing country such as Nigeria.

Conducting the study amongst undergraduates in Nigeria is warranted, because studies in Nigeria (e.g., Akpan & Umobong, 2013; Ogungbamila, 2011; Olanipekun, Garuba, Kio, & Ohiemi, 2014) have noted that there is high rate of poor academic performance of students in public schools. Parents, teachers, school administrators, and government are showing serious concern over students' poor academic performance (Akpan & Umobong, 2013; Ogungbamila, 2011). Their worries are becoming more intense as they realize that students' performance in school may connect with their performance in real life (i.e., outside school) (Ogungbamila, 2011). Previous studies in Nigeria have traced students' poor academic performance to teachers-specific factors, school-related problems (Adeyemi, 2005a; b) and home front (Akpan & Umobong, 2013). Yet, students' academic performance in Nigeria has not improved to expectations (Olanipekun et al., 2014), suggesting the need for further studies.

However, it is worthy of note that while there is ample studies on test anxiety-academic performance link in developed countries (e.g., America and Europe), few studies (Adewuyi, Taiwo, & Olley, 2012; Akanbi 2010; Akinsola & Nwajei, 2013; Olatoye, 2009; Onyeizugbo, 2010) have examined the role of test anxiety on academic performance in Nigeria. Besides, the

Correspondence concerning this article should be addressed to Anthony Gbenro Balogun. Department of Pure & Applied Psychology. Adekunle Ajasin University. P.M.B. 001. Akungba-Akoko Ondo State (Nigeria). Phone: +234–8032960406.

E-mail: tonybalogun17@yahoo.com

few available studies focused more on secondary school students. This sample may limit generalization of their results to students in the universities. In addition, none of these previous studies considered the role of achievement motivation in the relationship between test anxiety and academic performance.

Currently, enhancing students' academic performance is an explicit goal of Nigerian school reform. Therefore, in order to aid this reform, it would be crucial to understand psychological factors that influence students' academic performance. Hence, this study examined the moderating role of achievement motivation in the relationship between test anxiety and academic performance among undergraduates in Nigeria. Findings of the study might have implication for theoretical extension and suggest interventions strategies that would improve the academic performance of undergraduates.

Test anxiety and academic performance

Test anxiety is a psychological condition in which people experience extreme distress, discomfort, and anxiety in testing situations (Akinsola & Nwajei, 2013; Zeidner, 1998). It is a feeling of worry, apprehension, nervousness or uneasiness that occurs when a student encounters test or examination in any form and at any level (Onyeizugbo, 2010). Test anxiety involves four main components; cognitive, emotionality, behavioral, and physical components (Zeidner, 1998). The cognitive component is the mental activity that revolves around the testing situation. It constitutes elements such as thinking about consequences of failure, racing thoughts, negative and worrisome thoughts, problem in recalling facts, difficulty in reading and understanding questions etc. The emotionality component is characterized by tension, fear, apprehension, and nervousness towards test or examinations, which is usually associated with somatic symptoms such as palpitation, nausea, perspiration, headaches, stomach aches, nausea, diarrhea, excessive sweating, rapid heartbeat, dry mouth, and shortness of breath (Jing, 2007; Oludipe 2009; Sujit & Kavita, 2006). The behavioral component involves fidgeting, feeling of restlessness etc., while the physical component is characterized by poor study skills, avoidance and procrastination of work and physical discomfort (Onyeizugbo, 2010).

Many factors contribute to the development of test anxiety, some of which are fear of failing, consistently thinking about consequences of failure, procrastination, poor study habit, inadequate of knowledge of course materials, consistent poor performance, past experiences and beliefs, and lack of confidence in one's ability (McDonald, 2001; Sujit & Kavita, 2006). Characteristics of the test environment such as the nature of the test, time constraints, examiner characteristics, mode of test administration and physical setting may also create test anxiety for students (Putwain, Woods, & Symes, 2010). Apart from that, research has shown that students' personality dispositions may contribute to their development of test anxiety. For example, Hoferichter, Raufelder, and Eid (2014) found that adolescents who are neurotics tend to experience high levels of test anxiety. This may be because neurotic individuals tend to perceived testing situation as more stressful than non-neurotic individuals.

Some degree of test anxiety is needed by students to succeed in academic endeavor. This is because minimal or moderate amount of anxiety helps the body to respond rapidly and efficiently (DePhil, Brilot, & Nettle, 2011; Simpson, Parker, & Harrison, 1995). For example, Cassady and Johnson (2002) found that moderate cognitive test anxiety positively correlated with examination performance. It could therefore be said that unless a student demonstrate some degree of anxiety he/she may not prepare well for a test and perform adequately. Test anxiety, however, has debilitating effect, when it increases beyond optimal level (Onyeizugbo, 2010). This can weakens students' preparation for test, making it difficult for them to comprehend relatively simple instructions, organize or recall relevant information, concentrate, and perform adequately (Cassady, 2010; Rana & Mahmood, 2010), and thus inhibit their academic performance.

Hebb's (1972) theory of arousal and Sarason's (1988) cognitive interference model provide insight on how test anxiety affects academic performance. Hebb's (1972) theory of arousal was an adaptation of Yerkes and Dodson law (1908). This theory predicts a U-shaped function between arousal (anxiety) and performance, suggesting that performance increases with physiological or mental arousal, but only up to a certain point. Too much arousal (anxiety) hampers performance. Therefore, students whose arousal (anxiety) is above the optimal level will perform poorly academically. For instance, an optimal level of test anxiety can help a student focus on the test and remember the information that he/she studied, however, too much test anxiety can impair his/her ability to concentrate and remember the correct answers.

Cognitive interference model posit that anxiety present in testing situations may affect test performance. Ordinarily, testing situations are not stressful situations. Test anxiety only emerges as a result of an individual's subjective evaluation of the test situation as stressful (Hoferichter, 2016; Richter, 2009). Individuals who cognitively evaluate testing situation as very stressful may become highly anxious during tests and typically perform more poorly on tests than low test-anxious persons due to forgetfulness. Feelings of forgetfulness are developed because test anxiety produces

https://doi.org/10.1017/sjp.2017.5 Published online by Cambridge University Press

interference between relevant responses and irrelevant responses generated from the person's anxious state. The difference in performance of a high test-anxious student and a low test-anxious student is largely due to the difference in their ability to focus and pay attention on the test (Ossai, 2011). While a low test-anxious student is able to focus and pay greater attention on test, a high test-anxious student focused on internal self and the anxiety they are feeling. Therefore, high test-anxious students would perform poorly academically on a test because their attention is usually divided between themselves and the test.

There is broad agreement in the literature that test anxiety is associated with lower academic performance. For example, Chapell et al. (2005) found an inverse relationship between test anxiety and academic performance. Syokwaa, Aloka, and Ndunge (2014) reported that high test anxiety decreases students' academic achievement in Kenya. Barrows et al. (2013) reported a negative relationship between test anxiety and academic achievement. It was found that a significant negative relationship exists between test anxiety and students' achievement scores in Pakistan (Rana & Mahmood, 2010). In Nigeria, Adewuyi et al. (2012) found that secondary students with high anxiety performed poorly academically than those with low anxiety. Similarly, Akanbi (2010) reported that high test anxiety reduced secondary school students' academic performance in science. Despite the contributions of these previous studies, they paid less attention to the moderating role of achievement motivation in the relationship of test anxiety and academic performance. The direct and moderating role of achievement motivation in the relationship of test anxiety and performance is being reviewed in the following section.

Achievement motivation: Direct and moderating roles

The need and desire of individuals both have a strong impact on the direction of his behavior. Motivation is based on one's achievement-related goals (Elliot & McGregor, 2001). There are different forms of motivation including extrinsic, intrinsic, physiological, and achievement motivation (Mondal, Ghosh, & Das, 2013). Achievement motivation can be defined as the need for success or the attainment of excellence (Mondal et al., 2013). It is an individual desire for significant accomplishment, mastering of skills, control, or high standards. Achievement motivation is a desire to complete a task according to perfection criteria (Erdoğan, Kesici, & Sahin, 2011). For instance, outperforming other rivals, reaching or obtaining a difficult goal, solving a complex problem and improving skills, show the need for achievement. Individuals with high achievement motivation take reasonable risks, prefer tasks that are challenging, reach inner satisfaction stemming from their successes, and do not tend to care for anything except their tasks (Erdoğan et al., 2011).

High achievement motivation has been associated with strong drive to work with diligence and vitality, to constantly steer toward targets, to obtain dominance in challenging and difficult tasks, and create a sense of achievement as a result (Awan, Noureen, & Naz, 2011). In contrast, low achievement motivation is thought to be associated with a sense of low competence, low expectations, and orientation toward failure (Elliot & McGregor, 2001; Erdoğan et al., 2011).

Muola (2010) observes that achievement motivation is one of the factors that contribute to academic success. This may be because achievement motivation is an effective arousal state which directs the human behavior for successful participation in competition (Mondal et al., 2013). Most researches on achievement motivation have supported that students with a higher need to achieve perform significantly better than those with a lower need to achieve (Verkuyten, Thijs, & Canatan, 2001). For example, Awan et al. (2011) found that achievement motivation increases secondary school students' achievement in English and Mathematics. Steinmayr and Spinath (2009) also found that achievement motivation explained unique variance in general school performance amongst a sample of 342 German students. However, Affum-osei, Eric, Barnie, and Forkuoh (2014) and Ergene (2011) found no significant relationship between achievement motivation and academic achievement.

Also, there is a close relationship between achievement motivation and anxiety. In a study, Khan, Haider, Ahmed, and Khan (2011) reported a negative relationship between achievement motivation and anxiety. Kesici and Erdoğan (2010) found that achievement motivation reduces students' mathematics anxiety level in Turkey. Similarly, Erdoğan et al. (2011) reported that achievement motivation had a negative impact on math anxiety. Khalaila (2015) found that nursing students with high intrinsic motivation experienced low level of test anxiety. Individuals with high achievement motivation may experience low level of anxiety because they have high self-confidence, are highly focused, calm, bold, and have high determination to surpass high standards of excellence in competitive task (Mondal et al., 2013). However, achievement motivation may also increase students' level of test anxiety. For example, high achievement expectations may lead to high performance standards which may consequently culminate in high levels of anxiety in face of evaluation. Achievement motivation may produce emotional conflict between striving for success and avoiding failure (Covington, 2004), and thus give rise to experiences of high level of anxiety during test.

Whereas, it has been suggested that achievement motivation is capable of moderating the effect of test

https://doi.org/10.1017/sjp.2017.5 Published online by Cambridge University Press

anxiety on academic performance (Ergene, 2011), this has received little or no empirical attention on the pattern of the relationship. Based on the pattern of relationship between anxiety, achievement motivation, and performance in literature (Khalaila, 2015), we expect that achievement motivation will moderate the impact of test anxiety on academic performance by draining negative feelings and emotions of test anxiety away instead of allowing them to have overbearing control on the students' academic performance. For instance, a student who experiences high test anxiety is likely to have a low/poor academic performance (Erdoğan et al., 2011). However, the effect of test anxiety on academic performance may reduce or become insignificant, if the students have high achievement motivation. Against this background, the following hypotheses were tested.

Hypothesis 1: Test anxiety will have a negative impact on academic performance.
Hypothesis 2: Achievement motivation will have a positive impact on academic performance.
Hypothesis 3: Achievement motivation will significantly moderate the relationship between test anxiety and academic performance.

Method

Research design

This was an ex-post facto research. Test anxiety is the independent variable, academic performance is the dependent variable and achievement motivation is the moderating variable.

Participants

The participants comprised 393 (192 males and 201 females) undergraduates. They were selected from Adekunle Ajasin University in Ondo State, Nigeria using a purposive sampling technique. The participants were selected from Faculty of Art, Faculty of Science and Faculty of Social and Management Sciences. These Faculties were randomly selected for this study using a simple (balloting) random sampling technique. The ages of the participants ranged between 17 and 31 years (M = 20.41, SD = 3.57). Regarding their academic level, 100 (25.4%) were in 100 Level, 98 (24.9%) were in 200 Level, 91 (23.1%) were in 300 Level while, 104 (26.4%) were in 400 Level.

Measures

Demographic characteristics

Relevant data were gathered through the use of a validated questionnaire with four sections. The first section of the questionnaire elicited participants' socio-demographic information such as age, gender, academic level, and faculty. In the second section, the participants' were asked to indicate their current Cumulative Grade Point Average (CGPA), which were further verified from their various departments. The third and forth sections contained measures of test anxiety and achievement motivation.

Test anxiety

This was measured using a 20-item Test Anxiety Behavior Scale (STABS) developed by Suinn (1969). The scale was rated on a Likert format scale with responses ranging from '*Not at all*' (1) to '*very much*' (5). Oladipo and Ogungbamila (2013) obtained a Cronbach's alpha of .86 among Nigerian sample. A Cronbach's alpha of .77 was obtained in the present study. High score implies high test anxiety while low score indicate low test anxiety.

Achievement motivation

This was measured using a 20-item achievement motivation scale developed by Ray (1981). The scale used single words rather than sentence items to measured achievement motivation. The response format of the scale ranged from 1 = *Yes;* 2 = ?; 3 = *No*. Ray (1981) reported a reliability coefficient of .87 and validity value of .41. A Cronbach's alpha of .69 was obtained in the presented study. High score indicates high achievement motivation while low score indicate low achievement motivation.

Procedure

The study took place at Adekunle Ajasin University in Ondo State, Nigeria. Proximity, convenience, and heterogeneity of students informed the choice of this setting. Questionnaires were administered to the students using purposive sampling technique after a good rapport and the purpose of the research had been explained to them by the researcher and his two research assistants. Respondents were informed that participation was voluntary and that the data obtained would be analyzed in a group format. Confidential treatment and anonymity of information were also assured. The participants were also told that there was no right or wrong answer and as such should be honest in their responses. Four hundred (400) questionnaires were administered to students that consented. Three hundred and ninety five (395) were retrieved but only 393 were duly completed and valid for the analysis, yielding a response rate of 98.7%.

Data analysis

The Pearson r correlation statistics was used to establish the relationships between the study variables.

https://doi.org/10.1017/sjp.2017.5 Published online by Cambridge University Press

The study hypotheses were tested using moderated hierarchical multiple regression analysis. All analysis was conducted using Statistical Package for the Social Sciences (SPSS) program version 17.

Results

The results of the correlational analyses of the variables are presented in Table 1.

As shown in Table 1, test anxiety had a significant negative relationship with academic performance ($r(391) = –.24$; $p < .05$). This implies that as undergraduates test anxiety level increases, their academic performance decreases. However, achievement motivation had a significant positive relationship with academic performance ($r(391) = .35$, $p < .01$), suggesting that undergraduates who have high achievement motivation are likely to have high academic performance.

The moderated hierarchical multiple regression procedure of Cohen and Cohen (1983) was used to test the moderating role of achievement of motivation in the relationship between test anxiety and academic performance. The regression analysis constituted two models. In model 1, the predictor (test anxiety) and moderating variable (achievement motivation) were entered simultaneously in order to determine their unique effect on academic performance. In model 2, the cross-product term of test anxiety and achievement motivation was entered in order to test the significance interaction term. The results are presented in Table 2.

As shown in model 1, regressing academic performance on test anxiety and achievement motivation yielded a significant joint prediction ($F = 20.96$, $p < .05$; $R^2 = .19$), indicating that the change in academic performance is explained by 19% resulting from changes in the variables. The results also reveal the unique contribution of each of variables on academic performance. Test anxiety significantly predicted academic performance ($\beta = –.23$; $t = –5.97$; $p < .05$). This suggests that undergraduates who experience higher level of test anxiety are likely to perform poorly academically. Achievement motivation also significantly predicted academic performance ($\beta = .38$; $t = 8.54$; $p < .05$), such that undergraduates who have high achievement motivation were more likely to perform better academically. With these results, hypotheses 1 and 2 were supported.

In model 2, the interaction term between test anxiety and achievement motivation on academic performance yielded a significant equation ($\beta = .10$; $p < .01$). That is, achievement motivation and test anxiety interacted to influence academic performance. Thus, it implies that achievement motivation significantly moderated the effect of test anxiety on academic performance. This suggests that high test-anxious undergraduates who have high achievement motivation are more likely to perform well academically. This results supported hypothesis 3.

Table 1. *Mean, Standard Deviation, Inter-variable Correlations*

Variables	*M*	*SD*	1	2	3	4
1. Age	23.01	4.11	1			
2. Test anxiety	23.01	14.03	.40*	1		
3. Achievement motivation	26.24	10.11	.21*	.11*	1	
4. Academic performance	2.94	1.66	.07	–.24*	.35**	1

*correlation is significant at 0.05 level (2-tailed).
**correlation is significant at 0.01 level (2-tailed).

Discussion

This study investigated the moderating role of achievement motivation in the relationship between test anxiety and academic performance among a sample of undergraduates in Nigeria. Findings of the study showed that undergraduates who experience high test anxiety were more likely to have low academic performance. This result is in concordance with findings by Akanbi (2010), Chapell et al. (2005), and Onyeizugbo (2010); they found that high levels of test anxiety is associated with lower academic performance. This finding lends support to Hebb's (1972) theory of arousal and cognitive interference model (Sarason, 1988). The theories assert that test taker whose test anxiety level is above the optimal level are likely to forget what they have read, which in turn decrease their performance. Forgetfulness is developed because test anxiety produces interference between relevant responses and irrelevant responses generated from the person's anxious state (Sarason, 1988).

One possible explanation for this finding is that undergraduates who experience high levels of test

Table 2. *Moderated Hierarchical Regression Analysis Showing the Moderating Role of Achievement Motivation in the Relationship between Test Anxiety and Academic Performance*

Variables	R^2	ΔR^2	*F*	*df*	β	*t*
Model 1	.19	.19	20.96	2,391		
Test anxiety					–.23	–5.97*
Achievement motivation					.38	8.54*
Model 2 (Interaction Term)	.30	.14	22.73	1,392		
Test anxiety x Achievement motivation					.10	3.56**

*correlation is significant at 0.05 level (2-tailed).
**correlation is significant at 0.01 level (2-tailed).

https://doi.org/10.1017/sjp.2017.5 Published online by Cambridge University Press

anxiety tend to experience negative physiological reactions such as increase heartbeat, excessive sweating, dizziness, headaches, high blood pressure, and nausea (Zeidner, 1998). Fidgeting, fear, tension, excessive worry, feeling of wanting to cry, hopelessness, and restlessness are also likely to be present (Oladipo & Ogungbamila, 2013; Zeidner, 1998). All these might weaken students body system (Simpson et al., 1995) and make it difficult for them to prepare well, comprehend relatively simple instructions, organize or recall relevant information, concentrate, and perform adequately during tests (Onyeizugbo, 2010; Rana & Mahmood, 2010),

The results of the study also indicated that achievement motivation has a positive impact on academic performance. This implies that undergraduates with high achievement motivation are more likely to have better academic performance. This result agrees with the findings of Verkuyten et al. (2001). Their findings revealed that adolescents' with higher achievement motivation had higher academic performance than their counterparts with low achievement motivation. The result also support the findings by Awan et al. (2011), Kesici and Erdoğan (2010), and Khan et al. (2011) and Steinmayr and Spinath (2009) who reported a positive relationship between achievement motivation and academic performance.

Students who have high achievement motivation have strong drive to work with diligence and vitality, to constantly steer toward targets, to outperform other students, and to surpass high standards of excellence (Awan et al., 2011). They also have strong desires to excel in what they do, reach or obtain a difficult goal, solve complex tasks, improve and master skills, and create a sense of achievement (Erdoğan et al., 2011). These features may motivate them to perform adequately or significantly better academically than their counterparts who lack achievement motivation.

Lastly, results of the present study show that achievement motivation significantly moderates the negative relationship between test anxiety and academic performance. This implies that high test-anxious undergraduates who have high achievement motivation are more likely to perform significantly better academically. This is not surprising giving the fact that achievement motivated students seem to be highly confident, consistent, and focus especially in the presence of challenging and stressful task (Mondal et al., 2013). Their (i.e., achievement motivated students) aim is to master skills in performing a task, excel at all cost, outperform other rivals, and surpass standards of excellence (Erdoğan et al., 2011). All of these may reduce the effect of test anxiety on their performance in school.

Based on the findings of the present study, it was concluded that undergraduates who experience high levels of test anxiety are more likely to perform poorly academically. However, undergraduates with high test anxiety who have high achievement motivation are more likely to perform adequately. This implies that achievement motivation is an important factor that moderates the effects of test anxiety on academic performance amongst undergraduates.

These findings have practical and theoretical implications. Practically, the findings suggest that university management should design appropriate psychoeducational interventions that would reduce test anxiety and enhance achievement motivation. Parents can also play vital roles in enhancing their children achievement motivation from the home front especially during adolescence. During the period of adolescence, students' learning and performance motivation should be encouraged by parents. This is because, it is during this time that important career chances are being built and students are being confronted with pubertal changes related to a shift of interests and values that could lead to a decrease in achievement motivation.

Theoretically, the findings of the study lend support to Hebb's theory of arousal and cognitive interference model (Sarason, 1988). The finding further validates the models by showing that undergraduates (in a developing country such as Nigeria) who experience *higher* levels of test anxiety are more likely to perform poorly academically due to the *interference* of worrisome thoughts and emotions. However, that achievement motivation significantly moderates the relationship between test anxiety and academic performance among undergraduates calls for theoretical extension.

Nevertheless, the findings of the current study should be generalized with caution because the sample size and spread did not adequately represent universities in Nigeria. Moreover, undergraduates in private university were not captured in this study. The cross-sectional nature of the data also calls into question any inferences that could be made from findings of this study. It is important to also note that this study only analyzed manifest and not latent variables. Though the alpha of the instruments was satisfactory, further research on test anxiety should use a scale that includes the four–factor dimensions e.g., worry, emotionality, interference, and lack of confidence (Hoferichter, Raufelder, Ringeisen, Rohrmann, & Bukowski, 2015). Another limitation of this study is that the scales used are from past decades. Future research should use more recent scales or develop new ones that would suit their present environment. Using a larger sample, future studies should also examine more moderating variables (e.g., emotional intelligence, self-efficacy, affectivity). This should be tested using a longitudinal design.

https://doi.org/10.1017/sjp.2017.5 Published online by Cambridge University Press

References

Adeyemi T. O. (2005a). Teachers teaching experience and students learning outcomes in secondary schools in Ondo State, Nigeria. *African Journal of Educational Studies in Mathematics and Sciences*, *3*, 89–99. https://doi.org/10.4314/ajesms.v3i1.38607

Adeyemi T. O. (2005b). The influence of class-size on the quality of output in secondary schools in Ekiti, Nigeria. *International Journal of Emotional Psychology and Sport Ethics*, *7*, 1–13. https://doi.org/10.4314/ijepse.v7i1.38206

Adewuyi T. O., Taiwo O. K., & Olley B. O. (2012). Influence of examination anxiety and self-efficacy on academic performance among secondary school students. *Ife Psychologia*, *20*, 60–68.

Affum-osei E., Eric A. A., Barnie J., & Forkuoh K. S. (2014). Achievement motivation, academic self-concept and academic achievement among high school students. *European Journal of Research and Reflection in Educational Science*, *2*, 24–37.

Akanbi S. T. (2010). Test anxiety as a correlate of academic achievement among senior secondary school in Ogbomoso area of Oyo State. *African Journal of Educational Research*, *14*, 89–97.

Akinsola E. F., & Nwajei A. D. (2013). Test anxiety, depression and academic performance assessment and management using relaxation and cognitive restructuring technique. *Psychology*, *4*, 18–24. https://doi.org/10.4236/psych.2013.46A1003

Akpan I. D., & Umobong M. E. (2013). Analysis of achievement motivation and academic engagement of students in the Nigerian classroom. *Academic Journal of Interdisciplinary Studies*, *2*, 385–390. https://doi.org/10.5901/ajis.2013.v2n3p385

Awan R., Noureen G., & Naz A. (2011). A study of relationship between achievement motivation, self-concept, and achievement in English and Mathematics at secondary level". *International Education Studies*, *4*, 72–79.

Barrows J., Dunn S., & Lloyd C. A. (2013). Anxiety, self-efficacy, and college exam grade. *Universal Journal of Education Research*, *1*, 204–208.

Cassady J. C. (2010). Test anxiety: Contemporary theories and implications for learning. In J. C. Cassady (Ed.), *Anxiety in school: The causes, consequences, and solutions for academic anxieties* (pp. 7–26). New York, NY: Peter Lang.

Cassady J. C., & Johnson R. E. (2002). Cognitive test anxiety and academic performance. *Contemporary Educational Psychology*, *27*, 270–295. https://doi.org/10.1006/ceps.2001.1094

Chapell M. S., Blanding Z. B., Silverstein M. E., Takahashi M., Newman B., Gubi A., & McCann N. (2005). Test anxiety and academic performance in undergraduate and graduate students. *Journal of Educational Psychology*, *97*, 268–274. https://doi.org/10.1037/0022-0663.97.2.268

Cohen J., & Cohen P. (1983). *Applied multiple regressional correlation analysis for behavioural sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Covington M. (2004). Self worth goes to college: Or do our motivation theories motivate. In D. M. McInerney & S. van Etten (Eds.), *Research on socio-cultural influences on motivation and learning big theories revisited* (pp. 91–114). Greenwich, CT: Information Age Press.

DePhil M. B., Brilot B., & Nettle D. (2011). Anxiety: An evolutionary approach. *Canadian Journal of Psychiatry*, *56*, 707–715.

Elliot A. J., & McGregor H. A. (2001). A 2 x 2 achievement goal framework. *Journal of Personality and Social Psychology*, *80*, 501–519. https://doi.org/10.1037/0022-3514.80.3.501

Erdoğan A., Kesici S., & Sahin I. (2011). Prediction of high school students' mathematics anxiety by their achievement motivation and social comparison. *Elementary Education Online*, *10*, 646–652.

Ergene T. (2011). The relationship among test anxiety, study habit, achievement motivation, and academic performance among Turkey high school students. *Education and Science*, *36*, 320–330.

Hebb D. O. (1972). *A textbook of psychology* (3rd Ed.). Philadelphia, PA: W. B. Saunders.

Hoferichter F. (2016). *Exploring the landscape of socio-motivational relationships and achievement emotions in secondary school students*. (Published doctoral dissertation). Free University of Berlin, Berlin, Germany. Retrieved from http://www.diss.fu-berlin.de/diss/servlets/MCRFileNodeServlet/FUDISS_derivate_000000018821/Diss_Frances_pdf_bibo.pdf

Hoferichter F., Raufelder D., & Eid M. (2014). The mediating role of socio-motivational relationships in the interplay of perceived stress, neuroticism, and test anxiety among adolescent students. *Psychology in the Schools*, *51*, 736–752. https://doi.org/10.1002/pits.21778

Hoferichter F., Raufelder D., Ringeisen T., Rohrmann S., & Bukowski W. M. (2015). Assessing the multi-faceted nature of test anxiety among secondary students: An English version of the German Test Anxiety Questionnaire: PAF-E. *The Journal of Psychology*, *150*, 450–468. https://doi.org/10.1080/00223980.2015.1087374

Jing H. (2007). Analysis on the relationship among test anxiety, self-concept and academic competency. *US-China Foreign Language*, *5*(1), 48–51.

Kesici S., & Erdoğan A. (2010). Mathematics anxiety according to middle school students achievement motivation and social comparison. *Education*, *131*(1), 54–63.

Khalaila R. (2015). The relationship between academic self-concept, intrinsic motivation, test anxiety, and academic achievement among nursing students: Mediating and mediating effects. *Nurse Education Today*, *35*, 432–438. https://doi.org/10.1016/j.nedt.2014.11.001

Khan Z., Haider Z., Ahmed N., & Khan S. (2011). Sports achievement motivation and sports competition anxiety: A relationship study. *Journal of Education and Practice*, *2*, 1–5.

McDonald A. S. (2001). The prevalence and effects of test anxiety in school children. *Educational Psychology*, *21*, 89–101. https://doi.org/10.1080/01443410020019867

Mondal P., Ghosh A., & Das S. S. (2013). Relationship between anxiety and achievement motivation of chess players. *Physical Education*, *3*, 443–444.

Muola J. M. (2010). A study of the relationship between academic achievement motivation and home environment among standard eight pupils. *Educational Research and Reviews*, *5*, 213–217.

Ogungbamila B. (2011). Some psychological dynamics of learner-centered learning: Implications for school administration in Nigeria. *AAU: African Studies Review*, *10*, 279–289.

Oladipo S. E., & Ogungbamila A. B. (2013). Academic level students' faculty as factors of test anxiety among undergraduate students in Nigeria. *International Journal of Development and Sustainability*, *2*, 704–710.

Olanipekun S. S., Garuba I. A., Kio Y. M., & Ohiemi A. E. (2014). Students' English language proficiency and academic performance in vocational education College of Education Technology, Lafiagi, Nigeria. *Journal of Research and Method in Education*, *4*, 63–66.

Olatoye R. A. (2009). Students' test anxiety, motivation for examinations and science achievement in junior secondary schools in Ogun State, Nigeria. *International Journal of Psychology and Counseling*, *1*, 194–198.

Oludipe B. (2009). Influence of test anxiety on performance levels on numerical tasks of secondary school physics students. *Academic Leadership: Online Journal*, *7*, 1–10.

Onyeizugbo E. U. (2010). Self-efficacy and test anxiety as correlates of academic performance. *Educational Research*, *1*, 477–480.

Ossai M. C. (2011). Guidance and counseling implications of examination anxiety as a predictor of students' attitude towards examination malpractices. *Mediterranean Journal of Social Sciences*, *2*, 85–90.

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. https://doi.org/10.1348/000709909X466082

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

Ray J. J. (1981). Measuring achivement motivation by imediate emotional reactions. *The Journal of Social Psychology*, *113*, 85–93.

Richter V. (2009). *Beobachtet und bewertet werden. Leistungsangst aus evolutionärer Perspektive* [Being monitored and evaluated. Performance anxiety from an evolutionary perspective]. (Vol. *3*). Berlin, Germany: LIT Verlag.

Sarason I. G. (1988). Anxiety, self-preoccupation and attention. *Anxiety Research*, *1*, 3–7. https://doi.org/10.1080/10615808808248215

Simpson M. L. Parker P. W., & Harrison A. W. (1995). Differential performance on Talyor's manifest anxiety scale in black private college freshmen, a partial report. *Perceptual and Motor Skills*, *80*, 699–702.

Steinmayr R., & Spinath B. (2009). The importance of motivation as a predictor of school achievement. *Learning and Individual Differences*, *19*(1), 80–90. https://doi.org/10.1016/j.lindif.2008.05.004

Sujit S. S., & Kavita S. (2006). Effect of students' perceptions of course loads on test anxiety. *American Journal of Pharmacology Education*, *70*, 26–34.

Suinn R. M. (1969). The STABS, a measure of test anxiety for behaviour therapy: Normative data. *Behaviour Research and Therapy*, *7*, 335–339.

Syokwaa K. A., Aloka P. J. O., & Ndunge N. F. (2014). The relationship between anxiety levels and academic achievement among students in selected secondary schools in Lang'ata district, Kenya. *Journal of Education and Social Research*, *4*, 403–413.

Verkuyten M., Thijs R., & Canatan K. (2001). Achievement motivation and academic performance among Turkish early and young adolescent in the Netherlands. *Genetic, Social, and General Psychology Monographs*, *127*, 378–408.

Yerkes R. M., & Dodson J. D. (1908). The relation of strength of stimulus to rapidity of habit-formation. *The Journal of Comparative Neurology and Psychology*, *18*, 459–482. https://doi.org/10.1002/cne.920180503

Zeidner M. (1998). *Test anxiety: The state of the Art*. New York, NY: Ple-num.