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Test anxiety: contributions of gender, age, parent's occupation and self-esteem among secondary school students in Nigeria

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Most of the previous studies on test anxiety have focused on students in higher institutions with little research on test anxiety in secondary school students. The present study examined the contributions of gender, age, parent's occupation and self-esteem on test anxiety among secondary school students. Participants were 281 students (males = 156, females = 125; mean age = 17.05, SD = 1.87) who were candidates for centralised, high-stakes examinations in two randomly selected secondary schools in Onitsha, Anambra state, Nigeria. Data were collected using questionnaires comprising the State Self-esteem Scale, the Test Anxiety Inventory and spaces for the provision of relevant socio-demographic information. Results of a hierarchical multiple regression analysis indicated that age and gender did not significantly contribute to test anxiety. Parent's occupation explained 2% of the variance in test anxiety and self-esteem contributed 10% in explaining test anxiety. Based on the findings, personal predispositions explain test anxiety among school students more than do their demographics.

Keywords: age, gender, parent's occupation, self-esteem, test anxiety

The present generation of young people are growing in a society that has become increasingly competitive and emphasises academic achievement in school (Conley, 2008; Boyle & Burns, 2012). The increased need for knowledge and professionalism have also necessitated assessments and examinations aimed to measure and classify secondary school students in order to enter a university or other higher institutions and even to qualify for employment in certain jobs. This classification could potentially lead to the experience of test anxiety (Sarason, 1984; Bhoola-Patel & Laher, 2011). A small amount of anxiety acts as a performance motivator by encouraging students to try harder. Conversely, too much anxiety has the opposite effect and it can disrupt mental processes that are needed for students to perform well (Wachelka & Katz, 1999; Lufi, Okasha, & Cohen, 2004)). Test anxiety is defined by a combination of perceived physiological over-arousal, feelings of worry and dread, self-depreciating thoughts, tension, and somatic symptoms that occur in relation to test situations (Zeidner, 1998). It can hamper organised thinking by disrupting the ability to remember material at the time of the test. Test anxiety can also lead to difficulty in reading and understanding the test material (Cizek & Burg, 2006; Cassady, 2010). However, personal predispositions such as self-concept and career advancement orientation can mediate the relationship between test anxiety and performance. Individuals that become highly anxious during tests typically perform poorer on tests than low-test anxious persons, especially when tests are given under stressful evaluative conditions such as external examinations.

There are numerous publications on test anxiety among college students and undergraduates (Stöber & Pekrun, 2004) but test anxiety among lower and intermediate students has been less extensively studied. The extent and influence in younger children may be less clear compared to elderly individuals, but it is neither uncommon nor necessarily harmless (Nyroos, Korhonen, Linnanmäki, & Svens-Liavåg, 2012). A study of test anxiety at the secondary level of education is vital because test anxiety can be progressive in nature (Zaheri, Shahoei, & Zaheri, 2012). There may be an early onset at the lower educational level and it just gets more acute in college/university as the stakes to succeed increase.

High stakes testing settings

Students are, particularly, often well aware of the effects of national and international assessment (Reary & Wiliam, 1999) because of its high stakes. High-stakes tests are generally perceived as being stressful, resulting in anxiety (O'Neil & Abedi, 1992) and there are current concerns over the downward trend of performances of students in public examinations such as West African Senior School Certificate Examinations (WASSCE) and Senior School Certificate Examination (SSCE) - increasing the performance pressure on the students. The WASSCE is an international examination conducted by the West African Examinations Council (WAEC) for secondary school students in the English-speaking countries of West Africa. The SSCE is a national examination conducted by the National Examination Council (NECO) for secondary school students in Nigeria. The examinations are commonly called external exams in Nigerian schools.

In order to be admitted into any higher institution or be employed into mid-level job positions in Nigeria, an applicant must obtain at least five credits in not more than two sittings in either WASSCE or NECO's SSCE. Although there is substantial evidence concerning the association between test anxiety and academic performance (for reviews, see Chapell et al., 2005; Rana & Mahmood, 2010), this is primarily from developed country education settings. The present study examines the contributions of gender, age, parent's occupation and self-esteem to test anxiety in a sample of secondary school students in Nigeria - a developing country setting.

Influences of demographics

The research evidence on the influences of student

demographics on test anxiety is inconclusive. For instance, in some studies, females reported higher levels of test anxiety than males (Liebert & Morris, 1967; Zeidner & Safir, 1989; Zeidner, 1990; Mwamwenda, 1994; Chapell et al., 2005; Eum & Rice, 2010; Rana & Mahmood, 2010; Zaheri et al., 2012; Butt, Akram, Gulzar, & Yahya, 2013). However, other studies (e.g., Chandler, 2006; Hembree, 1988; Wigfield & Eccles, 1989; Nyroos et al., 2012) found that boys reported higher test anxiety than girls. Other studies (e.g., Onyeizugbo, 2010) reported that there was no significant gender differences in test anxiety. Research evidence also suggests significant differences in the experience of test anxiety by age (Fiore, 2003; Ross & Driscoll, 2006). Specifically, students who are older in age may have less test anxious from having acquired the necessary academic skills to cope with the challenges of examinations (e.g., through self-identification) than younger students. However, Eubank (1993) did not find a significant relationship between age and test anxiety in associate degree nursing students.

Socio-economic status explains a significant promotion of the variance in children's school achievement (Onocha, 1985; Putwain, 2008; Rajua & Asfawa, 2009). For instance, the occupation of a parent/guardian may influence educational aspiration and performance on achievement tests (Madaus & Clarke, 1998; Feliciano, 2006). Parents with higher educational levels are better able to provide the types of resources that would place their children at an advantage over children those whose parents have lower levels of education. These resources include providing more literacy opportunities, communicating with more sophisticated vocabularies, providing access to computers, actively cross-checking homework assignments, providing private lessons, and other academic supports (Suárez-Orozco & Suárez-Orozco, 1995; 2001). Huilin (2012) discovered that parent's occupation had a significant impact on test anxiety among Chinese high school students. There is a dearth of empirical literature on the role of parent's occupation on test anxiety.

Personal predispositions
Self-esteem is a personal predisposition rooted in an overall view of the self as worthy or unworthy (Baumeister, 1998). For instance, those who feel ostracised or rejected experience a variety of negative reactions, including physical illness, emotional problems, and negative affective states (Heatherton & Wyland, 2007). In some developed countries, self-esteem boosting programmes are routinely provided to students (See Heatherton & Wyland, 2007). These "social promotions" are based on the belief that positive self-esteem is of cardinal importance (Heatherton & Wyland, 2007, p. 219). Self-esteem can be viewed as a 'state' as well as a 'trait' (Heatherton & Polivy, 1991), and state self-esteem is likely to predict long-term personal outcomes (Heatherton & Wyland, 2007). The present researchers conceptualised self-esteem as a state dependent attribute because, in a similar view, test anxiety is more of a state anxiety (Spielberger & Sarason, 1989; Sady, 2010) than a trait anxiety.

Researchers (Wilson & Rotter, 1986; Putwain et al., 2010) reported that a low academic self-concept was associated with higher worry and tension among students about their abilities to do well on a test. Other studies found that those who have high anxiety levels tend to express themselves in negative statements (Wine, 1971; Meichenbaum, 1972; Sarason, 1984) as well as irrational thoughts (Ellis, 1973). Existing studies on the contribution of self-esteem in test anxiety are few. Naseri (1976) reported a negative relationship between self-esteem and test anxiety. Peleg (2009) compared adolescents who had a learning disability and those who were free from a learning disability on self-esteem and test anxiety but the association of self-esteem and test anxiety was not considered in the study.

Goals of the study
The current research seeks to examine the contributions gender, age, parent's occupation and self-esteem in test anxiety among secondary school students in Nigeria. The key research question is whether gender, age, parent's occupation and self-esteem would significantly contribute to the variance in test anxiety among secondary school students in Nigeria.

We hypothesised that:
- Age will not significantly contribute to the variance in test anxiety (H_2).
- Gender will not significantly contribute to the variance in test anxiety (H_1).
- Parent's occupation will not significantly contribute to the variance in test anxiety (H_3).
- Self-esteem will significantly contribute to the variance in test anxiety (H_4).

Method
Participants and setting
Two hundred and eighty-one secondary school students participated in this study (males = 156, females = 125). They were drawn from two randomly selected urban schools in the commercial city of Onitsha, Anambra state, Nigeria. The students were in their final year of secondary school and candidates for the West African Senior School Certificate Examination (WASSCE) and NECO's SSCE. Age range was from 16–19 years ($M = 17.05$; SD = 1.87). By parent's occupation they consisted of public servants ($n = 67$, 24%), business persons ($n = 208$, 74%), farmers ($n = 5$, 1.8%) and retiree ($n = 1$, 0.2%).

Instruments
The students completed the State Self-Esteem Scale (SSES: Heatherton & Polivy, 1991) and Test Anxiety Inventory (TAI: Spielberger, 1980b). Data for gender, age and parent's occupation were obtained from the information provided by the participants in the appropriate spaces in the questionnaire.

The SSES comprises 20 items to assess state-dependent self-esteem. Sample items from the SSES include: I feel that I am having trouble understanding things that I read, I feel as smart as others, I feel that others respect and admire me, I feel frustrated or rattled about my performance, etc. SSES is a commonly used measure with excellent stability including sensitivity to laboratory manipulations of self-esteem (Heatherton & Wyland, 2007). Scores from the SSES have high internal consistency (Cronbach's alpha = 0.92). An internal consistency reliability of 0.72 was observed in the current study.

The TAI consists of 20 items for assessing test anxiety among students. Test-retest reliability coefficients of 0.56–80 have been reported in previous studies (Spielberger, 1980a; Omoluabi, 1993).

Procedure

Permission to conduct of the study was granted by the by the Principal of Queen of the Rosary College and the Vice Principal (Academic) of Christ the King College, Onitsha. Participants assented to the study. The data were collected from the schools in January 2013 by the second listed author. Of 305 questionnaires that were completed and returned, 281 copies (92%) were properly completed and used for the study.

Data analysis

Hierarchical multiple regression was used predict test anxiety from age, gender, parent's occupation and self-esteem. This technique involves a series of steps comprising four models. After obtaining the Pearson correlations for all the variables in the study, the regression analysis was initiated using the step-wise method. Gender was entered in the first model. The second model included age. In the third model parent's occupation was added. In the fourth (final) model, self-esteem was entered. The criterion was test anxiety in all the four models.

Results

Table 1 presents the descriptive statistics for the study variables. As can be observed from table 1, parent occupation was positively associated with test anxiety ($r = 15$, $p < 0. 01$). State self-esteem was negatively associated with test anxiety ($r = -0.32$, $p < 0.001$). There was also a positive association between age and gender ($r = -0.37$, $p < 0.001$). The other variables were not significantly related to each other.

Influences of gender, age and parent's occupation

Result of the hierarchical multiple regression in Table 2 showed that gender did not significantly contribute to test anxiety ($\beta = 0.08$; $R^2\Delta = 0.01$), $F (1, 279) = 1.67$, $p = 0.20$. Age also did not explain a significant variance in the model ($\beta = -0.08$; $R^2\Delta = 0.01$), $F (2, 278) = 1.64$, $p = 0.20$. However, parent occupation significantly contributed to test anxiety ($\beta = 0.15$, $p < 0.05$; $R^2\Delta = 0.02$), $F (3, 277) = 3.28$, $p < 0.05$. The 95% CI for the population coefficient is between 0.65 and 4.98. Since the confidence interval for parent's occupation did not encompass any negative value, it can be concluded that the population regression coefficient for parent's occupation is positive ($t = 2.56$, $p < 0.05$). The regression coefficient (B) for parent's occupation was 2.81, indicating that for every one unit rise in parent's occupational status, test anxiety increases by 2.81 units. The multiple R and R^2 for the combined predictor effect of gender, age, and parent's occupation were 0.19 and 0.034 ($p < 0.01$) respectively. Together the 3 demographic variables accounted for 2% of the variance in test anxiety ($\Delta R^2 = 0.02$) which could be solely attributable to the role of parent's occupation in test anxiety ($R^2\Delta = 0.02$).

Influences of self-esteem

As expected, self-esteem significantly contributed to test anxiety ($\beta = -0.31$, $R^2\Delta = 0.10$), $F (4, 276) = 10.24$, $p < 0.001$. The regression coefficient (B) for self-esteem was -0.21, which showed that for every one unit rise in self-esteem, test anxiety decreases by 0.21. One can be 95% confident that the population B is between -0.29 and -0.14. The confidence intervals encompassed negative values indicating that the population B is negative ($t = -5.48$, $p < 0.001$). The β was -0.31 ($p < 0.001$) showing that self-esteem was the strongest predictor of test anxiety. The multiple R and R^2 of gender, age, parent's occupation and self-esteem combined together were 0.36 and 0.13

Table 1. Means (*M*), standard deviations (SD) and Pearson's correlations of gender, age, parent's occupation, self-esteem and test anxiety ($N = 281$)

	M	SD	1	2	3	4	5
1 Age	17.05	1.87	1				
2 Gender	-	-	−0.37**	7			
3 Parent occupation	-	-	0.07	0.07	1		
4 SSE	70.70	12.96	0.01	0.07	−0.07	1	
5 Test anxiety	44. 03	8.83	−0.10	0.08	0.15*	−0.32**	1

*$p < 0.01$; **$p < 0.001$; SSE = state self-esteem

Table 2. Hierarchical multiple regression model of contributions of gender, age, parent's occupation and self-esteem to test anxiety

Model	B	SE	95%CI Lower	95%CI Upper	Beta(β)	*t*	*R*	R^2	AR^2	$R^2\Delta$	*F*
1 Gender	1.37	1.06	−0.71	3.45	0.08	1.29	0.08	0.01	0.00	0.01	1.67
2 Gender	0.084	1.14	−1.40	3.08	0.05	0.74					
Age	−0.38	0.30	−0.98	0.21	−0.08	1.26	0.11	0.01	0.01	0.01	1.64
3 Gender	0.68	1.13	−1.54	2.90	0.04	0.60					
Age	−0.45	0.30	−1.04	14	−0.10	−1.49					
PO	2.81	1.10	0.65	4.98	0.15*	2.56*	0.19	0.034**	0.02	0.02	3.29*
4 Gender	1.21	1.08	1.91	3.30	0.07	1.12					
Age	−0.37	0.29	−0.95	0.20	−0.08	−2.19					
PO	2.39	1.05	0.33	4.46	0.13***	2.28**					
SSE	−0.21	0.04	−0.29	−0.14	−0.31	−5.48***	0.36	0.13***	0.12	0.10	10.24***

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; B = regression coefficient; *SE* = standard error of B; CI = confidence interval; β = standardized regression coefficient; *t* = t-value; R^2 = R squared; AR^2 = adjusted R^2; $R^2\Delta$ = change in R^2; PO = parent's occupation; SSE = state self-esteem

respectively ($p < 0.001$). All the predictors explained 12% of the variation in test anxiety ($AR^2 = 12$). The $R^2\Delta$ associated with the contribution of self-esteem to the model was 0.10 which indicates that 10% of the variation in test anxiety was explained by self-esteem.

Discussion

Parent's occupation was positively associated with test anxiety and it was found that parent's occupation significantly contributed to test anxiety among the students. This finding is consistent with a previous study (Huilin, 2012) which reported that parent's occupation significantly influenced test anxiety among high school students. Parent's occupation may influence academic outcomes through associations with growth pathways for supportive parenting and family disposition to school performance and expectations. Sarason (1984) emphasised that the appearance of anxiety depends on the importance that the student gives to the testing situation as informed by life experience and personality variables shaping his or her world view. The parental occupation may determine the disposition to and pressures towards the examination. However, the percentage of variance in test anxiety contributed by parent's occupation is low (2%); likely from the sample being relatively homogenous in being from SES. Gender did not predict test anxiety in the regression model. It was hypothesised that gender would not significantly contribute to the variance in test anxiety (H_1). This hypothesis was supported. The present finding is consistent with some other research findings (Rhone, 1986; Ndirangu et al., 2009) indicating no significant gender difference in test anxiety. There are several social transformations in the modern Nigerian society that appear to have made female students become as proactive as men. Current socialisation practices in Nigeria may make male and female students to view school work and scholastic performance as highly valued and valuable for upward social mobility in a rapidly changing world. Both boys and girls could regard a testing situation as a challenge and therefore have similarities in test anxiety. Educational achievement is no longer seen as a necessity for any particular gender because both males and females are now encouraged and given a relatively equal opportunity for educational aspirations compared to the situation in the past. Gender equality activists organise public enlightenment programmes in schools which are geared towards empowering the girl-child to be more resolute in embracing education to the highest level.

Age did not significantly contribute to the variance in test anxiety among the students in this study and a significant relationship between age and test anxiety was not found. The finding is inconsistent with a previous report of significant age differences in the experience of test anxiety (Ross & Driscoll, 2006). However, it is in agreement with Eubank (1993), who did not find a significant relationship between age and test anxiety. The hypothesis that age would not significantly contribute to test anxiety (H_2) was supported by the finding of the present study. This result may be explained on the basis that the students in this study were mostly in the same age group of late adolescence. Also majority (92.8%) were urban dwellers. Thus, there could be reasonable similarities in their socio-cultural experiences.

Strengths and limitations of the study

One major contribution of this research was that test anxiety was investigated in an understudied sample of Nigerian secondary school students. Previous studies on test anxiety focused on students in tertiary institutions. Most importantly, the state approach to self-esteem adopted in this study was very apt and aimed at more strongly predicting the state-based criterion of test anxiety. However, there are some weaknesses in the present research. The researchers selected only two secondary schools out of the schools in the commercial city. Increasing the number of schools and participants in subsequent studies is recommended. Specifically, a large student population-based comparative study of students in all the levels of education may be necessary in order to properly examine age differences in test anxiety among students in the Nigerian educational institutions. In conducting such studies, researchers may benefit from including other relevant psychological variables, while still adding the demographic variables as control variables or covariates.

Additionally, it is most likely that test anxiety will be sensitive to cultural, developmental and familial factors. It is also possible that students from schools with different testing procedures and regimes in their internal examinations would differ in experiences of test anxiety concerning centralised national examinations. Such issues should be given attention by researchers in future. The present study examined general test anxiety but investigations of anxiety in specific tests/subjects may further provide additional knowledge. It may also be necessary for subsequent studies to investigate the mediation and moderation pathways of relationship between self-esteem and test anxiety.

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