

DEMOGRAPHIC CHARACTERISTICS AND RESPONSE EFFECT OF STATISTICAL ANXIETY AMONG UNIVERSITY STUDENTS IN CROSS RIVER STATE, NIGERIA

BY

¹Dr. IDIKA, Delight O. ²Dr. OJONG, Blessing Mpantor³ UDEMBA Esther Chinenye

¹Department of Educational Foundations, Faculty of Education University of Calabar.^{2&3}Department of Educational Foundations and Childhood Education, Faculty of Education, Cross River University of Technology, Calabar.^{1,2&3}Cross River State, Nigeria

ABSTRACT

This study examined demographic characteristics and response effect of statistical anxiety among University students in Cross River State, Nigeria. To guide the study, two research questions and one hypothesis were formulated and the study adopted the ex-post facto research design. The population of the study comprised 9,221 year 3 students of the Universities situated in Cross River State, Nigeria. Stratified and purposive sampling techniques adopted for the study yielded a sample of 1221 year 3 students of 2015/2016 academic session drawn from two faculties of Cross River State University of Technology and four faculties of University of Calabar. All in Cross River State, Nigeria. The study utilised a researchers' developed questionnaire on statistical anxiety (SAQ), which was on a 4-point Likert-type scale with a response pattern of : Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1. The SAQ instrument was validated by experts in Educational Psychology, Measurement and Evaluation. The reliability of SAQ, measuring its internal consistency, was established through Cronbach alpha reliability method with estimates that ranged between 0.78 and 0.83. The null hypothesis was tested at 0.05 level of significance with the application of a three-way analysis of variance (ANOVA) and the findings revealed that; age and discipline remained significant across the subscales and overall scale. It was recommended, among others, that the curriculum planners should introduce statistics early enough and also make it a compulsory course to all categories of students to avert the anxiety encountered later in their course of study. Suggestions for further research considered the use of post-graduate students cutting across all the Universities in Cross River State, Nigeria.

Keywords: Demographic characteristics, Response effect, statistical anxiety, undergraduate students, Cross River State, Nigeria.

INTRODUCTION

Anxiety is a feeling that is characterized by an unpleasant state of inner turmoil, often accompanied by nervous behaviours such as pacing back and forth, somatic complaints and rumination. It is the

subjective unpleasant feelings of dread over anticipated events such as the feelings of eminent death (Davidson, 2008). Anxiety is not the same as fear which is a response to a real or perceived immediate threat. Whereas fear involves the expectation of future threat, anxiety is the feeling of uneasiness and worry, usually generalized and unfocused as a result of a reaction to a situation that is only subjectively seen as menacing. It is often accompanied by muscular tension, restlessness, fatigue and problems in concentration. Anxiety can be appropriate, but when experienced regularly, the individual may suffer from an anxiety disorder (Ohman, 2000).

Anxiety can also be seen as an emotion, characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure. People with anxiety disorders usually have recurring intrusive thoughts or concerns. They may avoid certain situations or worry; they may also have physical symptoms such as sweating, trembling, dizziness or a rapid heartbeat, (Adopted from the encyclopaedia of psychology). Smoller and Jordan (2009) opined that people facing anxiety may withdraw from situations which have provoked anxiety in the past. There are various types of anxiety. Existential anxiety can occur when a person faces “angst”, an existential crisis or nihilistic feelings. People can also face mathematical anxiety, somatic anxiety, stage fright or test anxiety. Social and stranger anxieties are caused when people are apprehensive about strangers or other people in general. Stress hormones released in an anxious state have an impact on bowel function and can manifest physical symptoms that may contribute to or exacerbate irritable bowel syndrome (IBS). IBS is a group of symptoms including abdominal pains and changes in the pattern of bowel movements without any evidence of underlying damage. Anxiety is often experienced by those who have an obsessive compulsive disorder (OCD). OCD is a mental disorder in which a person feels the need to perform certain routines repeatedly “compulsion” or has certain thoughts repeatedly called “obsessions”. The person is unable to control either the thoughts or the activities for more than a short period of time. This is an acute presence of panic disorder (Barker 2003).

Anxiety can be either a short-term “state” or long-term “trait”. Whereas trait anxiety represents worrying about future events, anxiety disorders are a group of mental disorders characterized by feeling of anxiety and fear. Anxiety disorders are partly genetic, with twin studies suggesting 30-40% genetic influence on individual differences in anxiety. Environmental influences (environment that affects twins in the same way) (Smoller, 2009). Specific measured ‘environments’ that have been associated with anxiety include child abuse, family history of mental health disorder and poverty.

Statistical anxiety is a feeling of anxiety when taking a statistics course or doing statistical analysis, that is, gathering, processing and interpreting data. Statistics anxiety is an anxiety which occurs when a student encounters statistics in any form and at any level. (Onwuegbuzie, DaRos and Ryan, 1997; Onwuegbuzie, 2004). Zeidner (1991) adds to this definition by stating that this anxiety is accompanied by worry, tension and psychological symptoms of stress when students are faced with taking a statistics course. Eysenck (1992) also opined that anxiety can be conceptualized as a

state in which an individual is unable to instigate a clear pattern of behaviour to remove or alter the event/object/interpretation that is threatening an existing goal.

In a study on anxiety and problem solving, Sarason(1960) found that an individual who scored high on the anxiety scale manifested greater interference in problem solving than a peer who scored low, despite the fact that both scored the same on an intelligence test. Since the statistics are used extensively in a problem solving environment, this finding illustrates the probable need for identification of strongly statistics anxious individuals. The use of the statistics as a problem-solving tool by strongly anxious persons could be very significantly hindered.

Three other studies, one by Malmo and Amsel (1948), another by Welch and Diethelm (1950), and relatively more recent one by Idika and Joshua (2005) and Paechter, Macher, Martskvishvili, Wimmer and Papousek (2017), all illustrated the negative effects, one way or the other of high anxiety in learning situations. According to Idika and Joshua, heightened anxiety via increased tension and worry impacts on examination and lead to tendency to cheat examinations. In same vein, Malmo and Arosel earlier found greater "forgetfulness" in highly anxious subjects, and in like manner, Welch and Diethelm found higher levels of failure in higher anxiety groups in the learning environment. However, Montague (1953), found that highly anxious subjects performed better on simple learning tasks than did less anxious subjects. But when faced with more difficult tasks, the situation was reversed. On the difficult tasks, the lower anxiety group showed better performance than the high anxiety group.

In a very bizarre study on problem solving, Patrick (1934) found some very clear evidence of the effects of anxiety on human problem solving. Patrick's problem was for an individual to attempt to get out of a room by determining the pattern of locked doors. To raise the anxiety level, subjects were subjected to three different anxiety causing situations. One group of subjects was given continual electric shock, a second group was continuously sprayed with a high pressure water hose, and a third group was blasted with a loud horn until they got out of the room. From this study, Patrick found that human problem solving degenerates to an animal level when anxiety is markedly increased. Without anxiety causing stimuli, humans were quite proficient in solving the problem, but when exposed to very extreme anxiety causing stimuli, the human subjects became very poor at solving the problem. Their behaviour greatly resembled the behaviour of laboratory rats that were given the identical problem solving environment but were not exposed to the anxiety causing stimuli.

Rodarte-Luna and Sherry (2008), explored the gender difference in the relationship between statistics anxiety and learning strategies. Surveyed participants included 323 students of South Western University US, enrolled in a statistics course. Discriminant analysis and canonical correlation were applied, which revealed the difference in gender as statistically significant. It was found that men have shown a significant positive relationship between fear of asking for help, interpretation and test and class anxiety and procrastination whereas females were found to have

negative relationship between the aforementioned variables. Although this study used 323 students as sample, the present study would be making use of 950 students (undergraduates) as sample for the study. The study looked at gender difference in relation to statistical anxiety which the present study will also be focusing on.

Mji (2009), examined whether the students' characteristics of gender and college major were related to statistics anxiety. Using the statistical anxiety rating scale (STARS) (Cruise & Wilkins, 1980), Mji found that statistics anxiety was high among all 226 South African technical college students used as sample. However, Mji found no gender or college major differences. A limitation of Mji's study was that it did not include a diverse ethnic sample nor was information collected on past mathematical experience or time between taking their last math course and their current statistics course.

Jan, Auwar and Warraich (2016) studied library anxiety, library use, and academic performance of (grade point average), gender and academic discipline among undergraduate students in Pakistan. Data were collected using a questionnaire from a sample of 725 fourth year undergraduate students of three different discipline from three Universities. The participation was voluntary. The collected data were processed using SPSS version 20. The findings of the study revealed that majority of the respondents (72.1%) experienced a mild library anxiety. The factors: user education and user knowledge were the greatest source of library anxiety. The findings also revealed differences in library anxiety on the basis of gender and academic discipline. Library anxiety and academic performance had a significant negative relationship with each other.

Statement of the problem

Statistics anxiety is regarded as the fear encountered when taking a statistics course or doing statistical analyses such as gathering, processing, and interpreting data for decision making. It is that apprehensive feeling that students experience when receiving instructions or being evaluated in statistics or when handling tasks involving statistics. These feelings come from a glaring fact that most students react easily to any situation in which they are confronted with figures. Personal interaction with most students revealed that majority of students experience high levels of statistics anxiety. Zeidner (1991) found that over 70% of the students have natural phobia for statistical courses in school. Statistics anxiety is conceivably becoming a critical issue bothering Administrators, educators, parents and students alike. It is equally observed that most undergraduate students of universities in Cross River State, Nigeria, are not left out on this matter as they find difficulties in graphing and interpreting statistical data, evidenced in the increasing complaints of research project supervisors during departmental and faculty researches involving particularly statistical data analysis at seminars periods.

For majority of these students, this negative feeling towards figures and statistics in particular is observably becoming enduring and habitual, such that students persistently report more than enough problems over the course of their statistics education. Such negative reports on poor statistics task handling by students could pose a strong signal to the enduring poor performances of students in statistics and other related courses yet to be envisaged. An understanding therefore, of the real context of statistics tasks plays an important role in the students' performance. Much needs to be done to be able to dismantle huge fallacies about statistics posing today as a challenge; this problem now manifests in the way students respond towards statistics and their consequent poor performance, all of which result from statistical anxiety. The problem is apparently assuming an alarming proportion as most students notably shy away from taking courses related to statistics in schools. Many are observably responding very poorly to the demands of their research project tasks of effectively carrying out statistical analysis and interpretation of results. Consequently, decisions and policies based on such statistics cannot be said to be reliable, neither can it be matched with any meaningful progress or development. This, of course negates the national plan for development via education or research in any national economy, such as ours. Statistical anxiety and its associated problems have also metamorphosed to the level that some of the students irrespective of gender, age or department where they belong, are variously observed to consult syndicates to assist them in their research project writing most especially in the analytical aspect, and hence, become duty bound to accept any output as authentic. Obviously, to a well-equipped statistician, the course is very simple if no room is given to anxiety. Under a heightened or intense statistical anxiety, it may be difficult or almost impossible to have the best performance or output which any student may ordinarily record where there is no challenge of statistical anxiety. Therefore, the problem of this study is: to what extent do demographic characteristics influence undergraduate students' response effect of statistical anxiety in Universities in Cross River State, Nigeria.

Research questions

The following questions were raised to guide the study:

1. What are the demographic differences in age, sex and discipline of the respondents in the study area?
2. What are the mean ratings of respondents based on sex, age and discipline?

Statement of hypotheses

The following hypothesis was formulated to guide the study:

1. Age, sex and academic discipline of undergraduate students have no significant interactive response effect on statistical anxiety scale.

2. METHODOLOGY

The study adopted more than one research design. The first was instrumentation research design which is aimed at developing and standardizing an instrument. Abonyi (2003) pointed that a study which is purely geared towards the development of an instrument in education is an instrumentation study. This is aimed at developing and certifying the efficacy of an instrument for measurement of a given behaviour or construct. Secondly, the study also adopted the ex-post facto research design which basically studies phenomena after they have occurred. Kerlinger (1986), as cited by Isangedighi, Joshua, Asim and Ekuri (2004), defines it as a systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulable. Hence, the effects of sex, age and discipline on the scale cannot be directly manipulated in the study, because these variables had already been in existence.

The population of the study comprised 9,221 year three students of the Universities situated in Cross River State, who were admitted into 2015/2016 academic session. The sampling technique that was adopted for the study is the stratified sampling technique which is appropriate when the nature or characteristics of the population consist of a number of distinct sub-groups that need to be represented in the sample. The reason for the stratification is to ensure that a more representative sample is drawn for the study, reflecting attributes such as sex, age and academic discipline. The area was stratified based on faculties, sex of students and academic discipline. The University of Calabar is made up of 14 faculties, while the Cross River University of Technology was further divided into 8 faculties, bringing it to a total of 22 faculties. Secondly, simple proportion of 30% was applied to determine the number of faculties that was used for the study. Purposive sampling technique was applied to select the faculties. In each of the faculties selected, simple proportion was again applied to determine the 50% of departments selected. 50% was further applied to select a total of 20 departments that was used for the study by the application of simple random sampling technique. The total sample of the study consisted of 1221 year three (3) students of 2015/2016 academic session drawn from the two (2) faculties of the

Cross River State University of Technology and four (4) faculties of University of Calabar. Out of this number, 557 were males and, 664 were females. Their age ranged from 20 to 29 years and their mean age is assumed to be 24.5 years.

TABLE 1: Sample distribution of the study

Schools	Faculties	Departments	Male	Female	No of yr 3 Students
University of Calabar	Education	5	113	188	301
	Management Sciences	2	52	62	114
	Agriculture	4	95	86	181
	Social Sciences	4	63	85	148
Cross River University of Technology	Education	2	130	72	202
University of Technology	Management Sciences	1	60	92	152
	Agriculture	2	50	73	123
Total		20	563	658	1221

The instrument was constructed by the researcher titled Statistics Anxiety Questionnaire (SAQ), was divided into two parts. Part 1 was designed to provide the bio-data of the respondents, such as age, sex and academic discipline, name of school and year/level. Part 2 was designed to measure the construct under study. This part was further divided into 6 sub-components whereas the major component was statistics anxiety. The sub-components are: perceived worth of statistics, fear of asking for help, interpretation anxiety, fear of statistics lecturers, computational self-concept, test and class anxiety. The items were generated based on the six adopted clusters of SAQ; consequently the items that were drafted brought the number to a total of 109 initial items and are shown in appendix II. The 109 items built up the form 2 SAQ. A 4-point Likert scale was used in response pattern of Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1. The reliability coefficient of ‘statistics anxiety scale’ with the initial 95 items was established by Cronbach alpha reliability method. The result produced a Cronbach alpha coefficient of .61 after trial testing. The index of the reliability obtained showed that the scale was reliable. The second stage of establishing reliability was done by administering the 35 items on the

actual sample used for the study which was 1221 year three undergraduate students. It produced a Cronbach alpha and split half reliability estimate of 0.78 and 0.83 respectively...

PRESENTATION OF RESULTS

Research question 1: What are the demographic distributions of respondents in the study area

Table 2: Demographic distribution of respondents

Demographic variable	Category	N	%
Sex	Male	470	49.8
	Female	473	50.2
	Total	943	100
Age	17-19yrs	139	14.7
	20-22yrs	300	31.8
	23yrs & above	504	53.4
	Total	943	100
Discipline	Education	384	40.7
	Social science	446	47.3
	Science	113	12
	Total	943	100

Table 2 shows the demographic characteristics of the respondents in the study area, male are 470 with a percentage of (49%); female are 473 with a percentage of (50.2%). Thus, female dominated the study, with demographic description based on age. Those who fall in the categories of 17-19yrs are 139 with a percentage of (14.7%); 20-22yrs are 30 (31.8) while 23yrs and above are 504 (53.4%). So the 23 yrs and above group dominated the study. With discipline, those of education are 384 (40.7%) social sciences are 446 (47.3%) while sciences are 113 (12%). This implies that social sciences dominated the study.

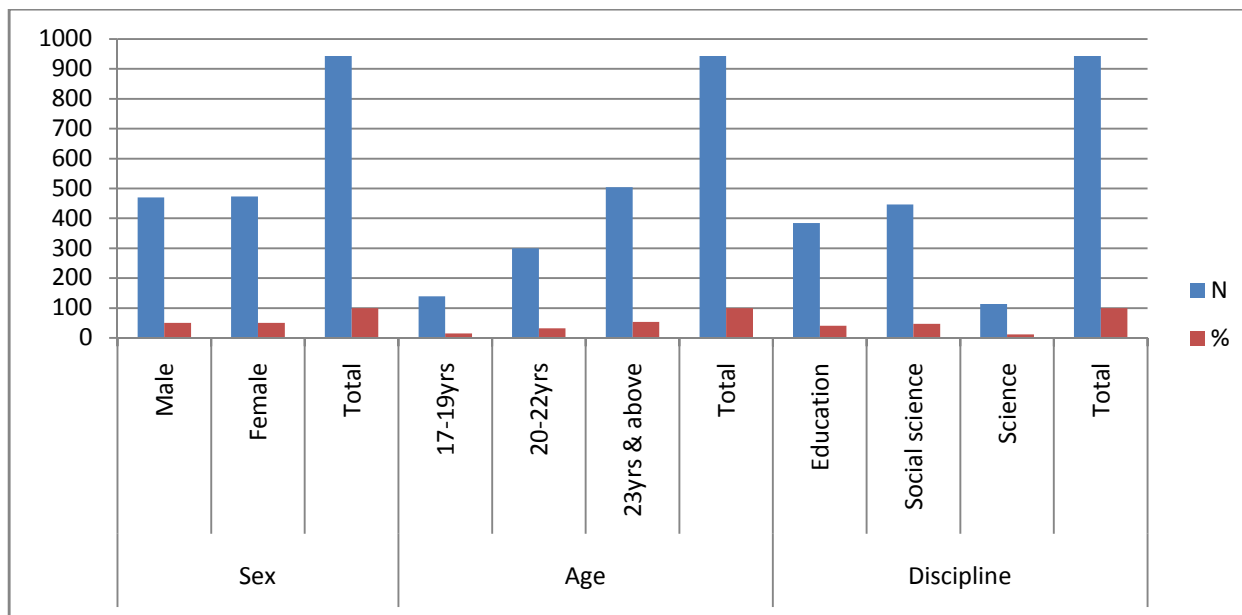


Figure 1: Bar chart showing demographic distribution of respondents

Research question 3: What are the means rating of respondents based on sex, age and discipline?

Variable		N(SAS)	\bar{x}	SD
Gender	Male	470	96.18	15.75
	Female	473	97.77	14.10
	Total	943	193.95	29.87
Age	17-19yrs	139	94.28	13.78
	20-22yrs	300	98.47	14.43
	23yrs and above	504	99.65	13.39
	Total	943	292.41	41.6
Discipline	Education	384	100.37	14.64
	Social Science	446	92.48	12.56
	Sciences	113	101.56	11.76
	Total	943	294.41	38.96

Table 3 shows the means and standard deviation in respect to gender: males are 470 with mean and standard deviation of 96.18 and 15.75 while females are 473 with mean of 97.77 and standard

deviation of 14.10. For age it was revealed that between 17-19yrs, 139 respondents were sampled with mean and standard deviation of 98.47 and 13.78; between 20-22yrs, 300 were sampled with a mean of 98.47 and stand deviation of 14.43 while for 23yrs and above, 504 were sampled with mean and standard deviation of 99.65 and 13.39 respectively. For students’ discipline, Education is 384 with mean of 100.37and standard deviation of 14.64; Social Science is446 with mean and standard deviation of 92.48 and 12.56 while sciences is 113 with a mean of 101.56 and a corresponding standard deviation of 11.76.

Table 4: Descriptive statistics of SIA: Age by sex by discipline.

AGE	SEX	DISCIPLINE	N	Mean	Std. Deviation	std error	
17-19 YEARS	MALE	EDUCATION	18	44.72	7.902	1.863	
		SOCIAL SCIENCE	44	41.61	7.462	1.994	
		SCIENCES	8	45.5	9.621	3.402	
	FEMALE	Total	70	42.86	7.886	0.943	
		EDUCATION	27	41.85	6.632	1.276	
		SOCIAL SCIENCE	33	42.33	7.708	1.342	
		SCIENCES	9	51	6.5	2.167	
		Total	69	43.28	7.673	0.924	
		Total	139	43.06	7.756	0.658	
	20-22 YEARS	MALE	EDUCATION	45	43	7.221	1.076
			SOCIAL SCIENCE	77	41.92	7.527	0.858
			SCIENCES	17	48.41	8.345	2.024
FEMALE		Total	139	43.06	7.756	0.658	
		EDUCATION	53	47.02	9.661	1.327	
		SOCIAL SCIENCE	50	42.56	8.704	1.231	
		SCIENCES	12	48.92	8.361	2.414	
		Total	115	45.28	9.377	0.874	
		Total	300	45.43	9.057	0.523	
23 AND ABOVE YEARS		MALE	EDUCATION	70	46.44	10.063	1.203
			SOCIAL SCIENCE	85	44.09	8.159	0.885
			SCIENCES	30	47.4	7.384	1.348
	FEMALE	Total	185	45.52	8.877	0.653	
		EDUCATION	123	46.69	9.856	0.889	
		SOCIAL SCIENCE	135	43.53	8.366	0.72	
		SCIENCES	42	47.83	7.603	1.173	
		Total	300	45.43	9.057	0.523	
		Total	504	46.65	8.291	0.369	
	Total	MALE	EDUCATION	108	47.31	9.512	0.915
			SOCIAL SCIENCE	157	44.91	7.323	0.584
			SCIENCES	20	49.95	5.53	1.237
FEMALE		Total	285	46.17	8.244	0.488	
		EDUCATION	108	48.87	8.512	0.819	
		SOCIAL SCIENCE	77	44.83	7.668	0.874	
		SCIENCES	34	47.79	8.082	1.386	
		Total	219	47.28	8.328	0.563	
		Total	504	46.65	8.291	0.369	
Total		MALE	EDUCATION	216	48.09	9.039	0.615
			SOCIAL SCIENCE	234	44.88	7.422	0.485
			SCIENCES	54	48.59	7.262	0.988
	FEMALE	Total	504	46.65	8.291	0.369	
		EDUCATION	179	46.96	9.391	0.702	
		SOCIAL SCIENCE	251	43.86	7.734	0.488	
		SCIENCES	40	48.75	7.358	1.163	
		Total	470	45.46	8.544	0.394	
		Total	943	45.73	8.549	0.278	

Hypotheses testing

Hypothesis 1: Age, sex and academic discipline of undergraduate students have no significant interactive response effect on statistical anxiety scale.

Table 5: Three-factor ANOVA of Statistical interpretation anxiety (SIA): Age by sex by discipline

Source of variation	Sum of Squares	df	Mean Square	F-value	P-value
Corrected Model	4861.835 ^a	17	285.99	4.134*	0.000
Intercept	1005164	1	1005164	14530.96*	0.000
Age	595.519	2	297.759	4.305*	0.014
Sex	6.604	1	6.604	0.095	0.757
Discipline	2140.77	2	1070.385	15.474*	0.000
Age by sex	34.941	2	17.47	0.253	0.777
Age by discipline	193.324	4	48.331	0.699	0.593
Sex by discipline	69.935	2	34.967	0.505	0.603
Age by sex by discipline	461.382	4	115.346	1.667	0.155
Error	63985.89	925	69.174		
Total	2041302	943			
Corrected Total	68847.72	942			

*Significant at .05 level. $p < .05$.

TABLE 6: Scheffe’s post hoc test for age and discipline

Age	17-19yrs	20-22yrs	23yrs and above
17-19yrs	43.06	2.36*	3.59*
20-22yrs	0.022	45.43	1.23
23yrs and above	0.000	0.129	46.65
Discipline	Education	Social Sciences	Sciences
Education	43.96	3.08*	1.24
Social sciences	0.000	47.04	4.32*
Sciences	0.380	0.000	48.28

*Significant at .05 level. $p < .05$

Values along main diagonal are group means, above it are mean differences (MD) and below it are corresponding P-values.

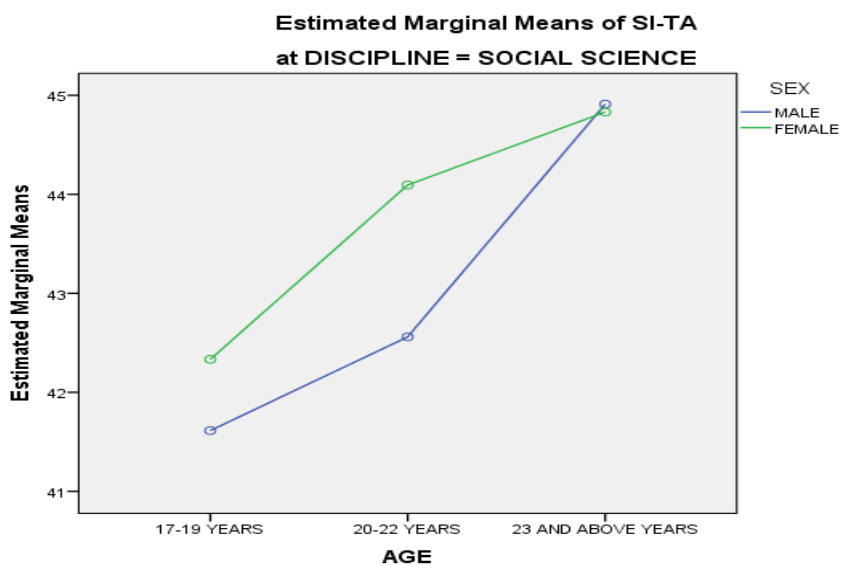


FIG 2: Estimated Marginal Means of SAS at Discipline = EDUCATION

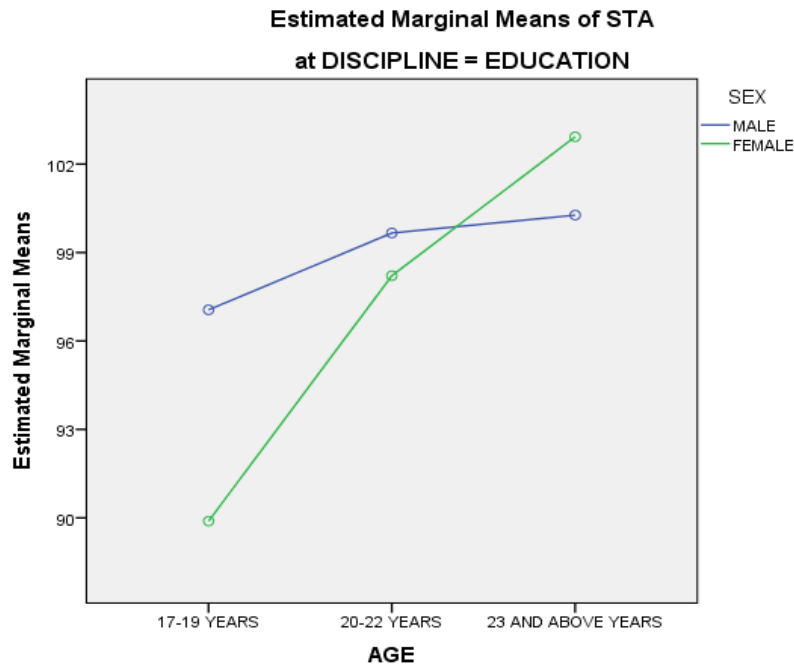


FIG 3 Estimated Marginal Means of SIA at Discipline = SOCIAL SCIENCE

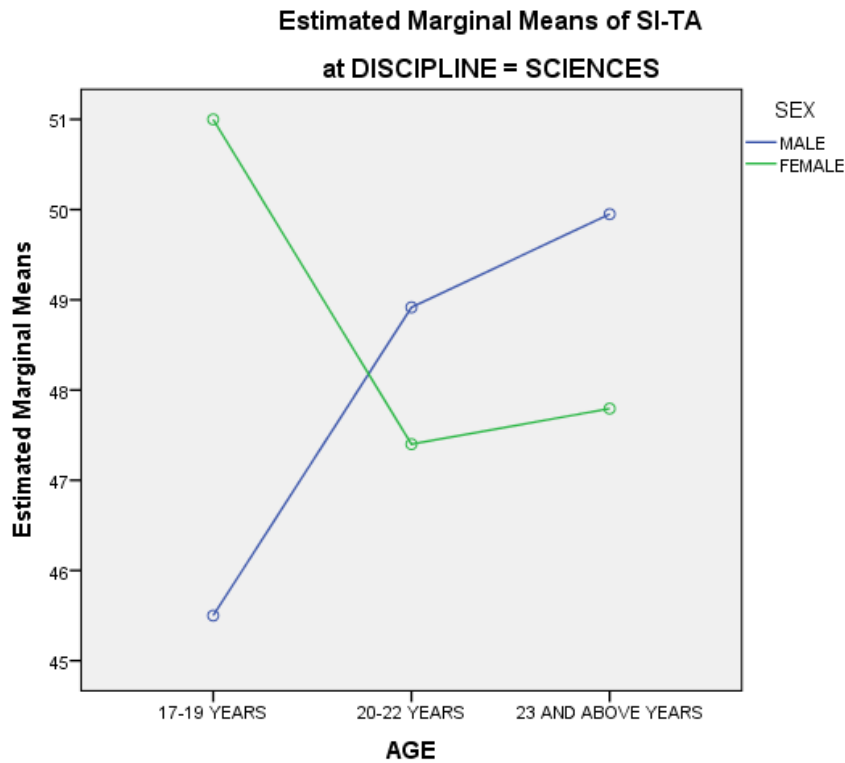


FIG 4 Estimated Marginal Means of SIA at Discipline = SCIENCES

This study formulated one hypothesis to testing three independent variables (age, gender and discipline). The focus was to establish age-based, sex-based and discipline-based on statistical anxiety. This hypothesis stated that students' age, sex and discipline have no significant main interaction effect on their statistics anxiety. To test this hypothesis, three-factor (3-way) ANOVA was carried out with the students' age, sex and discipline as factors and each of the three dimensions of statistics anxiety and the general statistics anxiety scale as dependent variables. The F-ratio and Scheffe's multiple comparison tests were used to test for significance. The descriptive statistics of SIA: age by sex by discipline, are shown in Table 4. From table 4, for age group 17-19 yrs and among males students, those in the sciences discipline were highest of the SIA scale ($X = 45.50$), followed by education ($X = 44.72$) and the least were those in the social sciences ($X = 41.61$). This pattern was maintained among all the students in this age group. The same pattern was observed for all categories in age group 20-22 yrs males, 23 yrs – above and all in this age group, total males, females and all of them pooled. On the whole, and in all categories of age and sex, the science students were highest in SIA.

The three-factor ANOVA of SIA results are presented in Table 5. From Table 18, the p-values (.000 & .014) associated with the computed F-values (4.134, 14530.961, 15.474 & 4.305) for the corrected model, intercept, discipline and age respectively, are less than .05. The other remaining P-values are higher than .05. Thus, the null hypothesis was rejected for corrected model, intercept, age and discipline but retained for sex and all the interaction effects. This means that the corrected model exhibits a significant model-fit, just as the intercept, age and discipline are important components of the SIA effect model.

DISCUSSIONS

The results of the present study showed that PME had a significant multivariate covariate effect on the combined dependent variables. Thus, the null hypothesis was rejected for corrected model, intercept, age and discipline but retained for sex and all the interaction effects. This means that the corrected model exhibits a significant model-fit, just as the intercept, age and discipline are important components of the SIA effect model. Results of the present study are in support of the previous studies by Rodarte-Luna and Sherry (2008) who found that men have shown a significant positive relationship

between fear of asking for help, interpretation and test and class anxiety and procrastination whereas females were found to have negative relationship between the aforementioned variables. Although this study used 323 students as sample, the present study made use of 950 students (undergraduate) as sample for the study. The study looked at gender difference in relation to statistical anxiety which the present study will also focused on.. Jan, Auwar and Warraich (2016) findings also revealed differences in library anxiety on the basis of gender and academic discipline. Library anxiety and academic performance had a significant negative relationship with each other.

However, the present study disagrees with that by Mji (2009) who found no gender or college major differences. A limitation of Mji's study was that it did not include a diverse ethnic sample nor was information collected on past mathematical experience or time between taking their last mathematics course and their current statistics course.

CONCLUSION

The present study revealed that problems associated with students' anxiety towards statistics have increased in recent years. Anxiety has been found to be one of the most prevalent attitudinal problems associated with statistics courses. To this end, researchers have clustered variables that affect statistics anxiety around three main factors: personality-related, course-related, and person-related (environmental). In general, the study concludes that demographic characteristics such as gender, age of the learner and area of discipline are salient factors that can influence students' anxiety in statistics. The research study also indicates that age of the students is an important variable in statistics anxiety however, regarding specific gender effects, the results are conflicting.

RECOMMENDATIONS

1. Based on the findings that age and discipline had a significant main effect on statistics anxiety scale, it is recommended that since anxiety increases with age, statistics as a course needs to be introduced to students at their younger age because any attempt to get same knowledge in an older age will definitely generate high anxiety.
2. It is also recommended that more credit load be added to statistics as a course to increase the value attached to statistics since statistics is applied in our every day to day activity irrespective of the discipline. The relevance of the course should be stepped up.

JUSTIFICATION OF THE FINDING TO STAKE HOLDERS IN THE EDUCATIONAL SECTOR

Statistics lecturers are expected to use Statistics Anxiety Scale SAS as a comprehensive tool in carrying out effective diagnostic assessment of students; by identifying individuals suffering from statistics anxiety and also gaining a better understanding of the factors or dimensions that contribute to such anxiety. By so doing, remedial mechanism to ameliorate the problem of anxiety over statistics among undergraduate students would have been provided.

The study is hoped to serve as a pointer to curriculum developers of the role statistics plays not just in academics but also in the professional and private lives of every individual in every sphere of life. This will also give a better understanding of the various functions of the world in a meaningful way, since statistical knowledge prevents the public from questioning theory thus, theory not well understood could be interpreted as facts.

The study is expected to be of immense benefit to students by helping them develop a strong positive self-concept towards interpretation of data when it comes to statistics and also rejecting information that provokes anxiety by identifying the different dimensions of anxiety which pose a problem to them and also mapping out strategies to overcoming such a problem as a way forward. Critical and sound thinking rather than fear could be promoted as part of the benefit of this study to statisticians.

REFERENCES

- Abonyi, O. S. (2003). Fundamental flaws in experimental research. *Journal of Science Teachers Association of Nigeria*, 38, 107 – 111.
- Barker, P. (2003). *Psychiatric and mental health nursing: The craft of caring*. London: Edward Arnold. ISBN9780-340-81026-2.
- DaRos, E. & Ryan, M.F. (1997). Assessing students' conceptual understanding after a first course in statistics. *Statistics Educational Research Journal*, 6(2), 28-58.
- Davidson, G. C. (2008). *Abnormal psychology*. Toronto: Veronical Visentin, 154, ISBN9780-470-84072-6.
- Eysenck (1992). *Anxiety: The cognitive perspective*. Hove, UK: Erlbaum.

Idika, D.O & Joshua, M. T. (2005). Psycho - social variables as predictors of cheating tendency among students in Calabar Education zone.

Global Journal of Educational Research 4 (1), 33-55

Isangedighi, A. J., Joshua, M. T., Asim, A. E & Ekuri, E. E. (2004). *Fundamentals of research and statistics in education and social sciences*. Calabar University of Calabar Press.

Jordan, J. & Haines, B. (2003). Fostering Quantitative Literacy. *Peer Review*, 5(4), 16-19.

Malmo, D. & Amsel, G.Y. (1948). Statistics and anxiety and performance: blessing in disguise. *Front. Psychology*, 6, 116 – 118.

Mji, U. (2009). A framework for thinking about statistical inference. *Statistical Educational Research Journal*, 8(1), 82-105.

Paechter, M, Macher, D., Martskvishvili, K., Papousek, I. & Wimmer, S.A (2017). Mathematics anxiety and statistics anxiety shared but also unshared, components and antagonistic contributions to performance in statistics. *Front Psychol*
[http:// doi.org/10.3389/fpsyg.2017.01196](http://doi.org/10.3389/fpsyg.2017.01196)

Sarason, I. G. (1980). *Test Anxiety: Theory, Research and Applications*. Hillsdale, N. J.: Erlbaum.

Smoller, J. & Jordan, R. (2009). “Genetics of anxiety disorders: The complex road from DSM to DNA” *Depression Anxiety*, 26(11), 955 - 975.

Smoller, T. (2009). Too afraid to learn, attitudes towards statistics as a barrier to learning statistics and to acquiring quantitative skills. *Politics*, 34(2), 191-200.

Walsh, J. J. & Ugumba-Agwunobi, (2002). Individual differences in statistics anxiety: The roles of perfectionism, procrastination and trait anxiety. *Personal and Individual Differences*, 33, 239–251.

Zeidner, M. (1991). Statistics and mathematics anxiety in social students: Some interesting parallels. *British Journal of Educational Psychology*, 61, 319–328.