GENDER STEREOTYPE THREAT AND MATHEMATICS ACHIEVEMENT AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT

The study examined the relationship between gender stereotype threat and mathematics achievement among secondary school students. The research design of the study was correlational. Four hundred and two senior secondary two (SSII) students (male, n=199 & female, n=203) using multistage sampling from ten government owned schools were utilized in the study. Gender Stereotype Threat Scale (GSTS) and Mathematics Achievement Test (MAT) designed by the researchers were used as instruments for data collection. Results indicated that there was significant negative relationship between gender stereotype threat and mathematics achievement of students. In addition, the study revealed a statistical significant difference in gender stereotype threat between male and female students with male students having higher gender stereotype threat than female students. The study also revealed that gender factor was statistically significant with female students reporting higher mathematics achievement mean scores. The study recommended that the rights, responsibilities and opportunities of students should not depend on gender.

1. INTRODUCTION

Gender preconception in mathematics achievement has been a lingering problem especially in Nigeria. Mathematics is the abstract study of topics encompassing quantity, structure, space, change and other properties (Army and Denis, 2006). Mathematics achievement refers to the outcome of teaching and learning in mathematics attained by students. It is generally measured by examination, test or assessment. Stakeholders in education have continually expressed concern over the mathematics achievement of secondary school students in Nigeria. Though conscious efforts have been expended to tackle issues bordering gender stereotypes in the classrooms, it is still an extant problem.

Gender difference in mathematics achievement as a subject matter has been extensively examined but there seem to be controversies as to which gender performs superior to the other.

According to Kauchak and Eggen (2011), the brains of male and female children are wired differently for learning. Their findings showed that the components of the brain that focus on words and motor skills develop a year ahead for girls than for boys, thus giving the female child

opportunities and advantages in reading and performing small motor tasks. Although Samuelsson and Samuelsson (2016) found that boys perceive mathematics to be more important than girls do, Ajai and Imoko (2015) maintain that performance is a function of orientation not gender, thus male and female students are capable of competing and collaborating in mathematics. Nejad and Khani (2014) opine that girls right from primary to secondary school underestimate their abilities in mathematics even though their performances remain the same as that of boys. This underestimation could be as a result of gender stereotypical environment in which children are groomed. Also, the degree of intellectual simulation in mathematics that students receive from learning situations rooted in gender stereotypes may be responsible for observable gender differences in mathematics.

A stereotype, according to Steele and Aronson (2005) is a popular belief, though unfounded, about specific social groups or types of individuals. Gender stereotype threat occurs when a negative stereotype about one's gender becomes self-relevant, typically as an interpretation for something one is does, an experience one is has, or for the situation one is in, which has relevance to one's self definition (Steele, 1997). It involves judging one of the sexes to be less intelligent or academically inferior to the other sex. It also entails highlighting the weaknesses and strengths of either of the sexes. Stereotype threat surfaces when individuals from a group are placed in a situation where they are likely to confirm or be judged according to negative stereotypes. Ellemers (2018) affirms that stereotypical expectations not only reflect existing differences, but also impact the way males and females define themselves and are treated by others. Specifically, stereotype threat theory suggests that the perceived risk of confirming a negative stereotype about an individual's identity group acts as a psychological burden that negatively impacts performance (Taasoobshirazi, Puckett & Marchand, 2019). Also, stereotype threat results to negative responses which can be seen in the stereotyped individual's reactions, performance on a task, motivation and self-esteem (Ugwuanyi & Nwagbo, 2013).

The impact of stereotype threat also tends to change the individual's perception of reality over a period of time (Igbo, Onu & Obiyo, 2015). Steele and Aronson (1995) suggest that stereotype threat may also affect vulnerable individuals' identities. Hence, people may distance themselves from the threatened identity. No wonder the issue of transgender seems to have received an alarming global acceptance among youths. Spencer, Logel and Davies (2016) claim that research on stereotype threat has provided insights into the potential mechanisms behind how gender stereotypes might affect girls and boys, indicating that girls can show lower mathematics performance if they are reminded of the stereotype that females perform worse than males in mathematics, whereas boys' performance can benefit from such stereotypes. In addition, Pronin, Steel and Ross (2004) posit that female students who focus on mathematics may marginalize their feminine identity as long as it fits the stereotype concerning women's mathematical abilities. Hence, gender stereotype threat may promote disengagement from threatening domains among stereotyped individuals (Steele, James & Barnett, 2002). To evade some of the insidious effects of gender stereotype threat, nonchalance about academics becomes inevitable since performance under such circumstances is likely to be depressing.

Gender primarily describes how the society gives certain roles to boys and girls (Igbo et al., 2015). Acccording to Ellemers (2018), gender differences develop over the life span due to the way boys and girls are raised and educated. Hence, the different societal roles and power positions of men as economic providers and women as homemakers, rather than biological distinctions between them, emphasize differences. Individuals of the same sex identify

themselves with certain traits which tend to affect children as they develop. For instance, the environment a child lives has a lot of impact on the child. An environment saturated with stereotypical views about gender might negatively shape the child to begin to conform to such notions. In Nigeria, preference is given to the male child, hence males and females are treated differently at birth. Parents are hard on boys and rigidly instruct them in preparation for manhood. Girls on the other hand, are nurtured in placidness and groomed at an early age to be good wives in the future. In support, Kauchak and Eggen (2011) stated that male children are regarded as handsome and seen as tougher and harder, and parents are rougher with their sons and involve them in more physical stimulation than their female children. Children's comprehension of the meaning of categories, traits and changes in role-taking abilities stems from imbibed cognitive developmental changes occasioned by apparent gender disparity in treatments. This may not be unrelated to the gender differences that occur between male and female mathematics achievement.

The study by Flore, Mulder and Wicherts (2018) in the Netherland found a gender gap on the on mathematics test, with boys outperforming girls. Similarly, study from Nigeria conducted by Igbo et al. (2015) among 342 senior secondary school students in Eastern Nigeria showed that male students performed better than female students. Again in Eastern Nigeria, Ugwuanyi and Nwagbo (2013) found that when gender stereotype was present, the males performed better than the females. On the other hand, Webb-Williams (2014) in a study conducted in the East of England with 52 students revealed gender differences with boys scoring significantly lower than the girls on the attainment measure. However, Nejad and Khani (2014) in their study using 200 secondary school students in Iran found no significant interaction in the development of mathematics between boys and girls. Frenzel, Pekrun and Goetz (2007) also indicated that though there was no significant difference in the mathematics achievement of both girls and boys, girls reported significantly less enjoyment and pride than boys. Ajai and Imoko (2015) in their study conducted in Benue state revealed that male and female students taught algebra using Problem Based Learning did not significantly differ in achievement scores.

Gender stereotype threat is one factor that seems to be entrenched in the school setting. Igbo et al. (2015) allege that gender stereotype becomes a problem when forces in schools and the society limit the academic potential of either male or female students. Parents and teachers who instruct via the lenses of gender stereotype tend to hide behind the clause "protecting the female gender". Rydell, Rydell and Boucher (2010) posit that females, mostly in the male-dominated fields of mathematics are regularly subjected to the negative stereotype that they are bad in math, a stereotype anonymously formed and seated in the subconscious of many female learners and even professionals. Also, Francis and Skelton (2005) maintain that male students tend to receive more encouragement in sciences while females are nurtured more in arts.

The notions that mathematics is hard and belongs to the males create gender stereotype threat that can undermine achievement in the subjects. In a classroom environment where a teacher uses these notions against the female students during mathematics class, gender stereotype threat will definitely be induced in the female students (Ugwuanyi & Nwagbo, 2013). Ugwuanyi and Nwagbo (2013) further opine that given the widely held belief regarding women's underperformance compared to that of men in mathematics, simply mentioning that the task involves gender differences and that it involves these particular domains is enough to activate gender stereotypes and therefore induce stereotype threat. Hence, emphasis on one's gender should be checked in the mathematics classroom as Brewer (2016) purports that promoted

awareness of one's threatened social identity results to decrement in expected performance. Stereotypes about gender as postulated by Nejad and Khani (2014) triggers loss of self-confidence rather than lack of abilities in academic achievement. Ryan and Adams (1999) believe that higher levels of students' stereotyping lead directly to more positive or negative attitudes toward school in children with positive attitudes leading to higher academic achievement, while negative attitudes lead to lower academic achievement.

The female gender appears to be the victim in issues of gender stereotype threat. Girls are saddled with responsibility of catering for the family's domestic chores. There are instances where the girl child, due to poverty, is withdrawn from school to cater for the fees of the male child. Mangal (2010) has it that girls are left to perform mostly as domestic workers. In the process of helping out with many household chores or to complement the family income, female children dedicate less time to their studies, creating opportunities for poor academic achievement. If parents, teachers and caregivers who are saddled with the responsibilities of the upbringing of children continue to be stereotypical about gender, it would encumber the attainment of the millennium development goal (MDG) which emphasizes promoting gender equity and equality. The diverse aspirations and needs of students ought to be considered, valued and favoured equally and in fairness.

The influence of gender stereotype threat is vicious as Gupta and Bhawe (2007) claim that stereotype threats not only create performance decrements but ultimately may also impact major life decisions (such as choice of profession/career) and prevent individuals from reaching their full potential within a threatened domain. In a study involving 320 participants in Anambra State, Eastern Nigerian, Nwasor (2014) reported that non-gender stereotyped Senior Secondary class two (SS2) students had a higher mean score in mathematics than their gender stereotyped counterparts in the same class. In Udi, Enugu State of Nigeria, Igbo et al. (2015) also found that gender stereotype had significant influence on academic achievement of secondary school students in mathematics in favour of males.

In addition, Ugwuanyi and Nwagbo (2013) in Enugu State, Nigeria used quasi experimental design on a sample of 40 students and found a significant difference in the mean achievement scores of students exposed to gender stereotype threat and those not exposed to this threat in favour of the latter. They also found significant difference in the mean achievement scores between male and female students exposed to gender stereotype threats in favour of the male students, but no significant difference in the mean achievement scores of male and female students who were not exposed to gender stereotype threats. In other words, when gender stereotype threat was removed during curriculum delivery, both the male and female students performed equally well in mathematics but when it was included, the males performed better than the females.

In a study of Ugandan females in coeducational and single sex schools, Picho and Stephens (2012) observed that stereotype threat impacted more negatively on students in coeducational schools than it did on those in single sex schools where there seemed to be higher levels of identification with mathematics as a subject as well as self-efficacy. According to Picho and Stephens (2012), stereotype threat becomes more effective on the affected based on context as a moderator of the effects of stereotype threat, that is, females in single-sex schools were observed to possess a higher level of identification with mathematics as well as in their self-efficacy than did female students in coeducational schools.

Shih, Pittinsky and Ambady (1999) in their study, Stereotype susceptibility: Identity salience and shifts in quantitative performance, administered a questionnaire on Asian-American undergraduate women, followed by a mathematics examination. The questionnaire provided three conditions: female-identity salient, Asian-identity salient, and control condition. When gender identity was made salient, performance dwindled compared to the control group. Also, the study by Inzlicht and Ben-Zeev (2000) had women in Rhode Island, North America complete mathematics tests in classrooms that contained (along with numerous men) either zero, one or two other female test-takers. They found that women performed worst when there were no other women present in the testing setting, whereas they performed best when two other women were present (Inzlicht & Ben-Zeev, 2000).

Recent studies have reported contrary as Wille, Gaspard, Trautwein, Oschatz, Scheiter and Nagengast (2018) in their study on 335 German fifth-grade students examined how stereotypes entrenched in a television program about mathematics influenced girls' and boys' stereotype endorsement and mathematics performance. Results from this study failed to show that children's performance were strongly affected by the stereotypes presented in the television program however, girls and boys in the experimental condition reported a higher endorsement of stereotypes compared with the respective control condition. In the Netherland, Flore, Mulder and Wicherts (2018) investigated whether stereotype threat manipulation influenced the mathematical test performance of girls and boys in Dutch high schools. Results showed no evidence of performance decrements due to the stereotype threat manipulation though there was a gender gap on the on mathematics test, with boys outperforming girls. The study by Taasoobshirazi, Puckett and Marchand (2019) indicated that there were no gender differences by stereotype threat condition.

Many studies have been conducted on gender stereotype threat and academic achievement but adequate research has not yet established a firm connection between gender stereotype threat and mathematics achievement. Based on literature search, there seem to be no study on relationship between gender stereotype threat and mathematic achievement. Also, only few studies have examined gender stereotype threat in Nigeria. Therefore, this study is aimed at determining the relationship between students' gender stereotype threat and mathematics achievement in senior secondary schools in Imo State. Specifically, the study sort to find out the following:

1. The relationship between gender stereotype threat and mathematics achievement among students.
2. The difference in gender stereotype threat between male and female students.
3. The difference in academic achievement between male and female students.

1.1 Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

Ho₁ There is no significant relationship between gender stereotype threat and mathematics achievement among students.
Ho₂ There is no significant difference in gender stereotype threat between male and female students.

Ho₃ There is no significant difference in academic achievement between male and female students.

2. MATERIALS AND METHODS

The design for the study is correlational. Multistage sampling technique was employed to obtain the sample for the study which comprised 402 senior secondary school two (SSII) students who were randomly selected from 10 public secondary schools across Imo State of Nigeria. Participants consisted of 199 male and 203 female senior secondary school students.

2.1 Instrumentation

Gender Stereotype Threat Scale (GSTS) and Mathematic Achievement Test (MAT) designed by the researchers were used as instruments for data collection. The GSTS was employed to measure students' gender stereotype threat. It presented respondents with statements about the self showing how vulnerable they were to stereotype threat. The 10-item scale encompassed positive statements such as "girls can always perform as good as boys in school" and negative statements such as "most of the time, I can't do my schoolwork because I am a girl/boy". Participants indicated their agreement with each statement on the rating scales on a 4-point Likert scale from 1 (Very Low Extent) to 4 (Very High Extent). These four options formed the scoring pattern of the instruments with 40 as the maximum score and 10 the minimum score. Also, scores were computed as the mean of the items on each scale and negative items were reverse-scored. For descriptive purposes only, the researchers ranked scores as follows; 10 to 20 indicated low stereotype threat, 21 to 30 implied moderate stereotype threat and 31 to 40 connoted high stereotype threat.

MAT, with 50 multiple choices items (each with four options), was used to obtain students' mathematics achievement scores. With 2 marks for each item, it had a total score of 100%. The maximum score was 100 and minimum 0. With 50 as average score, scores within 0 to 49 indicated below average while scores within 51 to 100 signified above average. The instruments were validated by experts in the fields of Educational Psychology, Measurement and Evaluation and Mathematics. Using Cronbach Alpha on GSTS and Kuder-Richardson on MAT to test for internal consistency, the instruments had reliability coefficients of 0.83 and 0.80 respectively.

2.2 Procedure For Data Collection

The instruments were administered on the participants using face to face method, with the support of two well-informed and trained research assistants to ensure high percent return of the completed scale. The consent of each participant was sought via a cover letter. The participants were also assured confidentiality of all information provided. In order not to induce gender stereotype threat in the participants, they were instructed to solve the Mathematics Achievement Test before completing their bio-data and then the stereotype threat scales. The instruments were collected at the end of the administration.

2.3 Method Of Data Analysis

For data analysis, descriptive statistics was employed to summarize the means and standard deviation of students' gender stereotype threat and their mathematics achievement scores.

Hypothesis one was tested using Pearson Product Moment Correlation while hypotheses two and three were tested with Independent Students t-test at 0.05 level of significance.

3. RESULTS

Ho$_1$ There is no significant relationship between gender stereotype threat and mathematics achievement among students.

Table 1: Relationship between Students' Gender Stereotype Threat and Mathematics Achievement

Variables	N	$\overline{X}$	SD	r	p	Remark
				-0.284	0.000	
						Significant
Gender stereotype threat	402	19.8	5.5			
Mathematics achievement	402	42.9	19.6			

N= number of subjects; $\overline{X}$= mean; SD = standard deviation; r = reliability coefficient, P < 0.05

The results from Table 1 reveals that there is significant negative relationship between gender stereotype threat and mathematics achievement of secondary school students (r = -0.284, P < 0.001). Result also shows that participants had low gender stereotype threat ($\overline{X}$=19.8) and performed below average in the mathematics achievement test ($\overline{X}$= 42.9).

Ho$_2$ There is no significant difference in gender stereotype threat between male and female students.

Table 2: Independent t-test Analysis of Gender Stereotype Threat between Male and Female Students

Variables Decision	N	$\overline{X}$	SD	df	t	p
Male	199	22.2	5.2			
				400	9.383 0.000	Significant
Female	203	17.5	4.8			
Mean difference	4.7					
d	0.97					

N= number of subjects; $\overline{X}$= mean; SD = standard deviation df = degree of freedom d = effect size
Result from Table 2 depicts that t-test was statistically significant with male students ($\overline{X}$ = 22.2, SD = 5.2) having gender stereotype threat some 4.7 higher than female students ($\overline{X}$ = 17.5, SD = 4.8), t(400) = 9.383, p < 0.001, d = 0.97. Hence, the null hypothesis which stated that there is no significant difference in gender stereotype threat between male and female students is not accepted.

Ho$_3$ There is no significant difference in academic achievement between male and female students.

Table 3: Independent t-test Analysis of Mathematics Achievement between Male and Female Students

Variables	N	$\overline{X}$	SD	df	t	p	Decision
Male	199	39.5	17.9				

				400	-3.418	0.001	Significant
Female	203	46.1	20.6				
Mean Difference	6.6						
d	0.34						

N= number of subjects; $\overline{X}$*= mean; **SD** = standard deviation df = degree of freedom **d** = effect size*

Result from table 3 portrays that gender factor was statistically significant with male students ($\overline{X}$ = 39.5, SD = 17.9) reporting mathematics achievement mean scores some 6.6 lower than female students ($\overline{X}$ = 46.1, SD = 20.6), t(400) = -3.418, p = 0.001, d = 0.34. Therefore, the null hypothesis which stated that there is no significant difference in academic achievement between male and female students is not accepted.

4. DISCUSSION

The objective of the study aimed at examining the relationship between gender stereotype threat and mathematics achievement of secondary school students. Findings from the study revealed that there was significant negative relationship between gender stereotype threat and mathematics achievement of students. That is, the higher the students' gender stereotype threat, the poorer their mathematics achievement and the lower the students' gender stereotype threat, the better their mathematics achievement. The findings are in line with that of Nwasor (2014) who reported that non-gender stereotyped SS2 students had a mean score higher than that of gender stereotyped SS2 students in mathematics. In consonance, Ugwuanyi and Nwogbo (2013) in their study, concluded that introduction of stereotype threat in the teaching process produced a decremented performance in females. The study by Picho and Stephens (2012) also found that students in coeducational schools had their mathematics achievement affected due to the impact of gender stereotype threat. In addition, Shih, Pittinsky, and Ambady (1999) in their study established that when gender identity was made salient, performance dwindled compared to the control group. However, the studies by Wille et al. (2018) and Flore et al. (2018) reported that gender stereotype threat had no influence on students' mathematics achievement.

The findings from this present study illustrate promising confirmation that a decline in stereotype threat improves mathematics achievement. It is important to note that the researchers, in the course of this study, were cautious not to induce gender stereotype threat in the participants as Ugwuanyi and Nwagbo (2013) in consonance with Brewer (2016) maintained that simply mentioning that the task involves gender differences is sufficient to trigger gender stereotypes. Hence, during the data collection, students were instructed to solve the Mathematics Achievement Test first before completing their bio-data and then the stereotype threat scales.

Results from the current study also demonstrated that students generally had low gender stereotype threat. However, there was statistical significant difference in gender stereotype threat between male and female students with male students having higher gender stereotype threat than female students. This implies that though generally the students are not affected by gender stereotype threat, male students are more likely to be influenced. By Cohen's (1988) conventions, the effect size of the difference reported by this study is considered large. The findings reporting low gender stereotype threat among students could be attributed to the fact that the Eastern Nigeria especially Imo State has been at the forefront of gender equity and equality particularly in education. Though the Nigerian environment inadvertently is saturated with gender stereotype in favour of male, there has been massive promotion of education for both girls and boys by the government of Imo State through its free education programme. Societal expectations on the male

child could be responsible for the male students having higher gender stereotype threat than female students.

The study also revealed that gender factor was statistically significant with male students reporting mathematics achievement mean scores lower than female students. This finding is in consonance with that of Webb-Williams (2014) who revealed gender differences with boys scoring significantly lower than the girls on the attainment measure. This is however at variance with Flore et al. (2018) and Igbo et al. (2015) whose findings revealed that male students performed better than female students. Also in disagreement with the findings of this study, part of the findings of Ugwuanyi and Nwagbo (2013) established that males performed better than the females when gender stereotype was present. Furthermore, the findings by Ajai and Imoko (2015) in tandem with Nejad and Khani (2014) are inconsistent with that of this study since they found no significant difference in the mathematics achievement between girls and boys. Frenzel and Pekrun (2007) also had similar findings indicating that male and female students did not significantly vary in achievement scores.

This finding is principally significant because of extant concerns over females' declining achievement in mathematics. The reason for this difference in mathematics achievement in favour of female students may not be unconnected with the fact that female students in Imo state, Nigeria, just as their male counterparts are encouraged to compete in mathematics. This is evident in the current study as female students reported low gender stereotype threat. This affirms that performance is not a function of gender but orientation.

5. CONCLUSIONS

Preliminary findings indicate that classroom and curriculum free of gender stereotype have strong potential to impact students' outcomes in mathematics. The current study established significant negative relationship between gender stereotype threat and mathematics achievement of students. This implies that the higher the students' gender stereotype threat, the poorer their mathematics achievement and the lower the students' gender stereotype threat, the better their mathematics achievement. It is hoped that this study will stimulate more scholars to research into gender stereotype threat in order to draw the attention of Nigerian stakeholders in education so as to make frantic efforts to curb stereotypes in schools, home and society at large.

6. RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proffered:

1. Educational authorities in schools should organize sensitization programmes for both teachers and students on gender stereotype threats through seminars and workshops by certified educational psychologists.
2. Teachers should confront stereotypical notions that may arise in the classroom to ensure that the learning environment is devoid of gender stereotypes. Also, educational discussion about gender differences should be replaced with references to individual students' abilities, efforts and needs.
3. Teachers and stakeholders in education should give every student equal opportunity to thrive academically. They should avoid mentally sorting students into more or less

capable categories based on gender as it unconsciously influences the teaching-learning process.

4. The rights, responsibilities and opportunities of students should not depend on gender. Hence, teachers, parents and stakeholders in education should encourage students to develop their personal abilities and make choices without limitations set by stereotypes, rigid gender roles and prejudices.

REFERENCES

[1]   Ajai, J. T. & Imoko, I. I. (2015). Gender differences in mathematics achievement and retention scores: A case of problem-based learning method. *International Journal of Research in Education and Science,* 1(1), 45-50.

[2]   Amy K. K. & Denise, S. (2006). Implicit stereotypes and women's math performance: How implicit gendermath stereotypes influence women's susceptibility to stereotype threat. *Journal of Experimental Social Psychology*, 8, 1-3.

[3]   Aronson, J. & Steele, C. M. (2005). Stereotypes and the fragility of human competence, motivation, and self-concept. In C. Dweck, & E. Elliot (Eds.), *Handbook of competence & motivation.* New York: Guilford Press.

[4]   Brewer, W. F. (2016). *Schema theory.* Encyclopedia of Education. Retrieved April, 2017 from http://www.encyclopedia.com

[5]   Cohen, J (1988). *Statistical power analysis for the behavioural sciences* (2nd ed.). Hillsdale, NJ : Erlbaum.

[6]   Ellemers N. (2018). Gender stereotypes. *Annual Review of Psychology,* 69:275-298.

[7]   Flore, P.C., Mulder, J & Wicherts, J.M. (2018). The influence of gender stereotype threat on mathematics test scores of Dutch high school students: A registered report. Comprehensive Results in Social Psychology 3(2).

[8]   Francis, B., & Skelton, C. (2005). *Reassessing gender and achievement.* New York, NY: RoutledgeFalmer.

[9]   Frenzel, A. C., Pekrun, R. & Goetz, T. (2007). Girls and mathematics - A "hopeless" issue? Acontrol-value approach to gender differences in emotions towards mathematics. *European Journal of Psychology of Education, 22*(4), 497-514.

[10]   Gupta, V. K. & Bhawe, N. M. (2007). The influence of proactive personality and stereotype threat on women's entrepreneurial intentions. *Journal of Leadership and Organizational Studies,* 13, 73–85.

[11]   Igbo, J. N., Onu, V. C. & Obiyo, N. O. (2015). Impact of gender stereotype on secondary school students' self-concept and academic achievement. *SAGE Open, 1*–10. Retrieved from http://www.uk.sagepub.com/openaccess.htm

[12]   Nwasor, V. C. (2014). *Secondary school students' mathematics achievement based on stereotype threats in Anambra State.* (Master's Thesis). Nnamdi Azikiwe University, Awka, Nigeria.

[13]   Inzlicht, M. & Ben-Zeev, T. (2000). A threatening intellectual environment: Why females are susceptible to experiencing problem-solving deficits in the presence of males. *Psychological Science, 11,* 365-371.

[14]   Kauchak, D. & Eggen, P. (2011). *Introduction to teaching: Becoming a professional* (4th ed.). Boston, MA: Allyn & Bacon.

[15]   Mangal, S. K. (2010). *Advanced education psychology* (2nd ed.). New Delhi, India: PHI Learning Private Limited.

[16]   Nejad, E. H. & Khani,S. S. (2014). Studying the interaction of gender and self-efficacy [high and low]on the academic achievement of students in third grade. Bulletin of *Environment, Pharmacology* and *Life Sciences*, 3 (2): 67-72.

[17]   Picho, K. & Steven, J.M. (2012).Culture, Context and Stereotype Threat: A Comparative Analysis of Young Ugandan Women in Coed and Single-Sex Schools. *Journal of Educational Research,* 105 (1).

[18]   Pronin, E., Steele, C. M. & Ross, L. (2004). Identity bifurcation in response to stereotype threat: Women and mathematics. *Journal of Experimental Social Psychology, 40*(2), 152-168.

[19]   Ryan, D. & Adams, K. (1999). Economic pressures in African American families: A replication and extension of the family stress model. *Developmental Psychology*, *38*, 179-193.

[20]   Rydell R. J., Rydell M. T. & Boucher K. L. (2010). The effect of negative performance stereotypes on learning. *Journal of Personality and Social Psychology*, 99(6):883-96.

[21]   Samuelsson, M. & Samuelsson, J. (2016). Gender differences in boys' and girls' perception of teaching and learning mathematics. *Open Review of Educational Research*, 3(1) 18-34.

[22]   Shih, M., Pittinsky, T. L. & Ambady, N. (1999). Stereotype Susceptibility: Identity Salience and Shifts in Quantitative Performance. *Psychological Science*, 10(1), 80-83.

[23]   Spencer, S. J., Logel, C., and Davies, P. G. (2016). Stereotype threat. *Annual Review of Psychology,* 67, 415–437. doi: 10.1146/annurev-psych-073115-103235

[24]   Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual ability and performance. *American Psychologist*, 52, 613-629.

[25]   Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69, 797−811.

[26]   Steele, J., James, J.B. & Barnett, R. C. (2002). Learning in a Man's World: Examining the Perceptions of Undergraduate Women in Male-Dominated Academic Areas. *Psychology of Women Quarterly,* 26 (1), 46–50.

[27]   Taasoobshirazi, G., Puckett, C. & Marchand, G. (2019). Stereotype Threat and Gender Differences in Biology. *International Journal of Science and Mathematics Education*, 17 (7), 1267–1282.

[28]   Ugwuanyi, C. S. & Nwagbo, C. R. (2013). Influence of gender stereotype threats on undergraduate students' achievement in mathematics and science. *Journal of Education and Practice,* 4 (28). Retrieved from www.iiste.org

[29]   Webb-Williams, J. (2014). Gender differences in school children's self-efficacy beliefs: Students' and teachers' perspectives. *Educational Research and Reviews*, 9(3), 75-82.

[30]   Wille, E., Gaspard, H., Trautwein, U., Oschatz, K., Scheiter, K. & Nagengast, B. (2018). Gender stereotypes in a children's television program: Effects on girls' and boys' stereotype endorsement, math performance, motivational dispositions, and attitudes. *Frontier in Psychology,* 9, 2435