DOI: https://dx.doi.org/10.4314/gjedr.v22i1.4

GLOBAL JOURNAL OF EDUCATIONAL RESEARCH VOL 22, 2023: 37-47
 ISSN 1596-6224
www.globaljournalseries.com.ng; globaljournalseries@gmail.com

DOES BIRTH ORDER OR GENDER INFLUENCE STUDENTS' ATTITUDE TOWARD MATHEMATICS IN JUNIOR SECONDARY SCHOOLS IN EKET AKWA IBOM STATE, NIGERIA?

IBOK, EKPENYONG EFFIONG, MEREMIKWU, ANNE NDIDI, ORIM, RICHARD EKONSI, ANDITUNG, PETER AGBUDU AND INAH LOVINA IDOKO.

(Received 23, November 2021; Revision Accepted 4, February 2022)

ABSTRACT

This study examined influence of birth order and gender on junior secondary school students' attitude toward Mathematics in Eket southern Nigeria. Ex-post facto research design was used. A sample of 1000 students was selected by stratified, random sampling procedures. Data was collected with a structured Questionnaire; with a Cronbach Alpha reliability estimate of .77. One-way Analysis of Variance (ANOVA) and Independent t- test were used for statistical test of the hypotheses at .05 level of significance. The result showed that first-borns had more positive attitude toward Mathematics than their other siblings (ANOVA: F= 16.096; p=0.000). Male students showed more positive attitude to Mathematics than their female counterpart (t=6.110; p=0.001). Study concluded that birth order and gender influenced students' attitude to mathematics Eket Nigeria. It was recommended that Mathematics teaching and evaluation strategies should be gender-sensitive so as to minimize gender-related bias and inequity.

KEYWORDS: Birth order, Gender, Student's Attitude. Mathematics

INTRODUCTION

Mathematics is one of the core and compulsory subjects in the Junior and Senior Secondary School Curriculum which reflects the recognition of the vital role it plays in contemporary society. The broad goals of secondary education as captured in the National Policy on Education is the preparation for higher education, and specifically; to equip the learner to live effectively in the modern age of science and technology. It is clear that the knowledge of Mathematics is

Ibok, Ekpenyong Effiong, Department of Science Education, Faculty of Vocational and science Education, University of Calabar, Calabar
Meremikwu, Anne Ndidi, Department of Science Education, Faculty of Vocational and science Education, University of Calabar, Calabar
Orim, Richard Ekonsi, Department of Science Education, Faculty of Vocational and science Education, University of Calabar, Calabar
Anditung, Peter Agbudu, Department of Science Education, Faculty of Vocational and science Education, University of Calabar, Calabar
Inah Lovina Idoko, Department of Science Education, Faculty of Vocational and science Education, University of Calabar, Calabar

very necessary for the attainment of these goals (Federal Republic of Nigeria, 2014). In spite of the importance attached to Mathematics, students' academic achievement in secondary schools over the years has been reported low especially in external examinations such as West African Secondary School Certificate Examination (WASSCE) and National Examination Council (NECO). This has been attributed partly to the declining standard of education in Nigeria (Ana & Adina, 2012).

There is generally low interest in the study of mathematics and mathematics related-disciplines among students at all levels of education in Nigeria (Mohamed & Waheed, 2011). Interest is believed to have a very strong influence on the teaching and learning of mathematics. The degree and direction of attitude towards mathematics are largely determined by the kind of interest developed by students for it. Generally, attitudes are fundamental to the dynamics of behaviour change. Thus, a student with positive attitude towards mathematics is devoted to the study of mathematics because he likes it. Although mathematics is compulsory for all secondary school students, it is common knowledge that the majority of students show little interest in mathematics or simply hate the subject. Some of these students often boycott mathematics lessons and those who attend mathematics classes pay little or no attention in class. It is far less likely for such students to practice how to solve mathematics problems on their own. A student that takes interest in mathematics will get satisfaction from acquiring mathematics ideas. Students are likely to work more diligently and effectively at performing tasks in which they have interest. This therefore implies that a major challenge in mathematics education is the task of building positive attitude in learners (Sanchez, & Zimmerman, 2004)

Attitude towards learning is a function of dynamic change in behaviour, as learning will not take place except there is that change in behavior through experience and continuous practice. Thus, a student who possesses a positive attitude towards his/her studies in Mathematics spends more time studying and makes a positive achievement. Such students understand better and make achievements to expected standard because they have positive attitude towards this particular subject (Toil, Mauindi, & Kithinji, 2007). Positive attitude towards mathematics reflects a positive emotional disposition in relation to the subject and, in a similar way, a negative attitude towards mathematics relates to a negative emotional disposition. These emotional dispositions have an impact on an individual's behavior, as one is likely to achieve better in a subject that one enjoys, has confidence in or finds useful. For this reason, positive attitude towards mathematics is desirable since it may influence one's willingness to learn and also the benefits one can derive from mathematics instruction. Nicolaidou and Philippou (2003) stated that negative attitudes may be the result of frequent and repeated failures or problems encountered when dealing with mathematical tasks and these negative attitudes may become relatively permanent. Udo, (2019) observed that students tend to lose interest in a subject when they repeatedly experience difficulties. These difficulties may come as a result of the language used in teaching, the complexity of mathematical calculations involved, difficulty with understanding the symbols associated with it, fear and poor attitude of the teacher. A common pattern of behaviour among student's that dislike mathematics is the tendency to give up too soon. Once they try solving a particular concept but could not understand or get it correct, they close their books for days (Aderanti, 2010). If the current trend of lack of interest in mathematics is not checked, it could lead to a dearth of Mathematician and Mathematics educators in the nation in future.

The construct of attitude is shaped within the context of social psychology as orientation to behave in a certain way, hence with an explicit attention to its relationship with behavior, and particularly to predicting behavior. During the first phase of research on attitude – as it happened for beliefs – theoretical aspects stay in the background, whereas the construction of observation instruments comes to the forefront. The first studies on attitude in mathematics education show this approach, as well as the belief that 'something called "attitude" plays a crucial role in learning mathematics' (Neale, 1969, p. 631). In actual fact, these studies, more than searching for a relationship between attitude and mathematics learning, mainly try to identify a cause/effect relationship between positive attitude and achievement in mathematics. This of course poses the problem of characterizing positive attitude. This problem is tackled without theoretical subtleties, and most of all,

without a specific definition of attitude to draw on. According to many researchers (Kulm, 1980; Leder, 1985; Mc Leod, 1992; Ruffell et al., 1998), one of the reasons that have hindered the development of an adequate theory is exactly the fact that most studies have concentrated on the creation of measurement instruments, rather than on the development of a theoretical base. Di Martino and Zan (2011) in their study on Attitude towards mathematics: A bridge between beliefs and emotions proposed a characterization of attitude towards mathematics grounded in students' experiences, which includes students' emotional disposition, their vision of mathematics, and their perceived competence

The most recent theories make reference to a tripartite model, according to which attitude has a cognitive, an affective, and a behavioral component (Triandis, 1971; Eagly & Chaiken, 1998). Within the field of mathematics education, many explicit definitions of attitude towards mathematics refer to this tripartite model (Leder, 1992; Ruffell et al., 1998; Grigutsch & Törner, 1998), even if it is possible to find some explicit definitions according to which attitude is simply a general emotional disposition (Haladyna et al., 1983). Daskalogianni and Simpson (2000) proposed a bi-dimensional definition, in which behavior does not appear as an explicit component: attitude is seen as the pattern of beliefs and emotions regarding a certain subject tackled without theoretical subtleties, and most of all, without a specific definition of attitude to draw on. Students' perceived competence in mathematics is related to their idea of success in mathematics, so the link between negative emotional disposition and low perceived competence may be diversified depending on the different ideas of success that emerge (Di Martino & Zan, 2010).

In Nigeria, several efforts have been made to motivate children to take more interest in the subject of mathematics but these have obviously not been very successful hence the persistence of poor students interest and high failure rates in the subject. Government has provided motivational incentives such as scholarships for the best students in Mathematics, laboratory, library, and established model schools with qualified educators. Non-governmental organizations also organize Mathematics and Science competitions for students and present awards to students with the best performance every year. All these are to enable students gain interest and develop positive attitudes to Mathematics but it is sad to know that despite all these measures, a high proportion of students in secondary schools still have poor attitude to mathematics and perform poorly in Mathematics examinations like the West African Senior Secondary Certificate Examination (Ana & Adina, 2012). The need to identify and address factors that may be contributing to this lack of interest has been the subject of several research, and remains a research priority. In a bid to explore factors that may influence the attitude of students towards mathematics, the study of birth order and gender became necessary because both factors had been implicated in research to have some association with behavioural patterns.

The birth order is a child's position in the sequence of birth among children (sibling) born to the same parents. Birth order is often believed to have a profound and lasting effect on psychological development and learning. The first child is normally the oldest child that is born into a family. The middle child can be the second or third child all the way to the last born or the baby of the family. The birth order can change if there is a large difference in ages from one child to the next. The birth order of a child who is the second born can change if the child has an older sibling that he/she was not raised with. The birth order then changes for the child to be a second first born child of the parent (Fergusson, Horwood & Boden,2006).

Research has shown that the climate in which a child spends his or her childhood has a deep and lasting impact on his or her cognitive, emotional, and social development (Holmgren, Molander, & Nilsson, 2006; Leman, 2009). Most scientists and researchers acknowledge that a child's overall development is shaped and formulated by variables within the home environment, such as quality of parenting, and the resources which are readily made available to the family (Downey, 2001). Downey (2001) further stated that it may seem surprising to some researchers and laypeople to learn that "one of the most consistent predictors of educational outcomes is the number of siblings, or sibship size" (p. 497). As such, the importance of sibling relationships and impact of birth order cannot be overstated. Since the works of Adler (1927, 1946; Ansbacher & Ansbacher, 1956) were published in the early 20th century, researchers have been working to find links between the family of origin and variables such as academic achievement, personality development and socioeconomic

status (Fergusson, Horwood, & Boden, 2006). Adler (1927, 1946; Ansbacher & Ansbacher, 1956) believed that children's characters are primarily shaped by familial environment (Campbell, White, & Stewart, 1991). Children must work to create an individual and important role, or niche, which thus spurs and supports development (Sulloway, 1997). In working to create a role unique from those of their siblings, children are naturally assisted by their birth orders (Sulloway, 1997). According to Adler (1927, 1946), there are two types of birth order: biological and psychological. Biological birth order is defined as the placement into which one is born – first born, middle child, last born, or only child (Leman, 2009). Psychological birth order, which is the focus of this study, is defined as the birth order role with which one most closely identifies, regardless of one's biological position (Campbell, White, & Stewart, 1991). It is quite possible for one's biological birth order to differ from one's psychological birth order due to a variety of variables such as divorce or sibling handicap (Leman, 2009).

Some families have several babies in one family that is not directly related to the order of the birth. If children are raised alone then the child could be considered either a first born or the baby. Alfred Adler is recognized as the first to identify birth order as a significant factor in personality development. He described the characteristics that the various birth orders seem to share, and showed that in addition to difference in behavior, siblings do differ in terms of personality characteristics and intelligence among other attributes (Tobias 2003). Adler and many subsequent authors in this subject area were known propagate the believe that firstborns, by virtue of their position in the birth order, become endowed with such superlative attributes as being very responsible, conscientious, well organized, serious, self-reliant, goal-oriented and high achievers. (Fergusson, Horwood & Boden,2006). These researchers suggest these positive characteristics motivate the first born or oldest child to succeed academically and professionally ahead of his/her siblings.

Tshuiand Tam (2018) investigated birth order effect on personality and academic performance amongst 120 Malaysians. Results indicated that participants of different birth positions did not differ significantly in terms of personality and academic performance. Also Kogce., Yıldız, Aydın, and Altındağ, (2009) in their studies on birth order and student's attitude toward Mathematics found significant differences between younger and older students' attitudes towards mathematics with 8th graders having lower attitudes than 6th graders. Ekpo (2006) examined the influence of family socio – economic status and birth order on attitude toward learning among 600 senior secondary school students in Calabar Metropolis, Cross River state. The results obtained revealed that birth order significantly influenced students' attitude toward learning, with the first-borns performing better as high achievers.

The findings of several studies on the relationship of birth order with intelligence have shown that the oldest child in the families studied was more likely to have the highest IQ score, and the scores declined with each successive younger sibling (Saraglou & Fiasse, 2003; Healy & Ellis, 2007; Conley, Pfeiffer & Velez, 2007). Also Asikhia (2010) reported that on average, firstborn children were more likely to have higher educational aspirations than others, achieve higher education and spend more years in school. There were however, similar studies with results that did not support the findings that firstborns were more likely have higher IQ scores or perform better academically than their siblings (Guo & VanWey, 1999; Retherford & Sewell, 1991).

Weng (2009) conducted a study to determine if motivation style was the underlying construct that bridges the influence of birth order with intelligence, school performance and personality. That study assessed participant's motivation style as a measure of the tendency to activate or inhibit behavior based on learned rewarding or punishing environmental cues. The result showed that family size and academic achievement were positively correlated, and that the only and oldest child had higher academic achievement scores than children of other birth orders.

Gender differences in secondary mathematics is a prominent issue that has been the focus of many studies, but reported differences in mathematics achievement between boys and girls remains a contentious issue. The literature has not come to a clear consensus; some studies have shown girls outperforming boys (e.g., Stevens, Wang, Olivarez, & Hamman, 2007), while others found boys outperforming girls (e.g., Preckel, Goetz, Pekrun, & Kleine, 2012). Recent research from large-scale studies such as the Trends in International Mathematics and Science Study (TIMSS) has found that "there were no gender differences in 22 of the 42 countries that

were tested at Year 8, including Australia, where no gender differences were found within any single state or territory (Thomson, Hillman, & Wernert, 2012, p. 20). There also studies that undoubtedly do find differences between boys' and girls' achievement in mathematics. However, while studies focusing on gender differences in achievement are inconclusive, there is clearer evidence that positive attitudes, behaviour and participation rates in mathematics generally favour boys.

There are also noticeable differences in the beliefs held by boys and girls. Girls tend to show negative attitude and have lower mathematics self-concept than boys. Asante (2012) observed that, when compared with boys, "girls lacked confidence, had debilitating causal attribution patterns, perceived mathematics as a male domain, and were anxious about mathematics" The research carried out by Asante (2012) in Ghana, showed that boys had more positive attitudes towards mathematics than girls. Similarly, Sanchez, Zimmerman, and Ye (2004) in their study of North American students found significant gender differences in eighth grade students' attitudes towards mathematics. American boys showed more interest in mathematics than girls, but girls perceived mathematics as more important than boys. Girls also presented higher scores on items with regard to difficulties with mathematics. Asante (2012) identified factors that may contribute to the differences between attitude of boys and girls towards mathematics to include school environment, developmental changes in gender identity, teacher and parent attitudes and student beliefs towards mathematics.

Georgiou, Stavrinides and Kalavana, (2007) in their studies on gender inequality in Mathematics found no difference either in mathematics achievement or in mathematics attitudes between boys and girls. However, high achieving boys and girls, considered mathematics as an attractive subject but differed in the explanations they gave for their performance. Since the ability attributions of boys were higher, they believed that their grades were due to their intelligence more consistently than girls did. Sanchal (2017) study investigated the impact on Year 10 students' attitudes towards mathematics when learning mathematics in a sporting context in Kuiti High School New Zealand Sashi Sharma. A closed ended, self-reported questionnaire with 4-point Likert type statements was used to collect data. Individual statements were analysed by comparing the percentage of students agreeing or disagreeing pre-teaching and post-teaching. In this study, students' attitude comprised of their confidence, awareness of mathematics and engagement. This study concluded that when students learn in a sporting context, their confidence, perception about the importance of mathematics and engagement increase for both male and female students but male students developed more positive attitude toward studying Mathematics than their female counterpart.

Gender differences are a recurrent theme throughout the literature in academic studies in general and in mathematics studies in particular. Mathematics is often considered to be a domain in which boys are higher achievers, both in terms of attitudes and self-concept. Contrary to this, a meta-analysis conducted by Lindberg, Hyde, Petersen, and Linn, (2010) with data from 242 studies representing 1.286.350 people, found no significant gender differences and nearly equal male and female variances. According to Asikhia (2010) among the variables that influence senior secondary school students' attitude toward science, gender has generally been shown to have a consistent influence. Male students were more likely to have positive attitude toward science than their female counterpart. In the Mathematics classes, most girls saw themselves as inferior to the boys and were not sufficiently motivated for the learning process. The feeling of being inferior and lack of motivation made the girls to withdraw from the learning task. They tended to lose interest, effort and concentration from studying physics and mathematics, which may consequently hinder their achievement in these subjects.

The foregoing discourse on the potential influence of birth order and gender on attitude and learning justify this study which sought to explore how these factors could be contributory to the prevailing low level of students' interest in mathematics in Nigeria.

Theoretical framework

The theoretical basis for this paper derive from postulates drawn from Alder's theory and Bandura's social cognitive theory.

Adler's theory: The earliest theoretical constructs on birth order were credited Alfred Adler. Adler theory proposed that the order of birth is a major social influence in childhood, one from which we create our style of life. He theorized that though siblings have the same parents and live in the same house, they do not have identical social environments. Adler's

postulate holds that firstborn children are concerned with power and authority (Adler 1963; Adler 1970 as cited by Tobias 2003) This theory suggests that being older or younger than one's siblings and being exposed to differing parental attitudes create different childhood conditions that help determine personality. It explained that being older or younger than one's siblings and being exposed to differing parental attitudes create different childhood conditions that help determine personality. His predictions focus on the effects of both parent-child and sibling interactions and emphasized the importance of power relationships in the family.

Bandura's theory: The second theoretical basis for this study is drawn from the Social cognitive theory (SCT) of Bandura which has been widely implemented in the domains education, communication and psychology. This theory proposes that acquisition of knowledge occurs through inter-related processes of direct observation, interaction, experiences and outside media influence (Bandura 2002). SCT seeks to explain the interrelationship between behaviour, environment factor and personal factor in the process of learning. Environment factor includes both social and physical environment. While social environment typically refers to family and friends, physical environment refers to physical characteristics that determine the presence of comfort or its absence (Gopalan 2017). The two hypothesis proposed in this study seek to explore how birth order and gender may influence the students' attitude to mathematics. The social interactions implied in the construct of the SCT could relate to the influence that the child's birth order in the family or gender identity in society could have on his or her attitude to mathematics. In fact, formulation of the Social Cognitive Theory drew from Bandura's experiment to prove that social influences affect people including children (Bandura 1989). This postulate on influence of social context could be applied to explanation of the influence of the child's social context regarding his/her birth order or gender may have on the child's attitude to mathematics as hypothesized in our study.

Statement of hypotheses

The following null hypotheses were formulated to guide the study.

1. There is no significant influence of birth order on students' attitude to Mathematics.
2. Gender does not significantly influence students' attitude to Mathematics.

METHODOLOGY

The study area was Eket Education Zone of Akwa Ibom State in southern Nigeria. The research design adopted was Ex-post facto design. Ex-post facto research is a method of testing possible antecedents of events that have happened and cannot, therefore, be manipulated. The information collected from the sample through the questionnaire was quantified, analysed and interpreted using appropriate statistical techniques, which allowed for valid generalizations.

The population for the study consisted of all the Junior Secondary School (JSS) III Students in Uyo Education Zone of Akwa Ibom State. There are 10,888 JSS III male and female students in the educational zone. A multi-stage sampling technique involving stratified, proportionate and simple random technique was adopted in selecting 1000 students for the study.

The instrument used was a structured four-point Likert Scale questionnaires designed to elicit determinants of students' attitude toward Mathematics The questionnaire consisted of two sections (A&B). Section A described the bio data of the respondents such as birth order, gender, class while section B dwelt on the main variables which is attitude toward Mathematics. The questionnaire was based on four point Likert scale used in measuring respondent's opinion level of agreement or disagreement, namely; Strongly agreed, Agreed, Disagreed and Strongly disagreed. The instrument was face validated by two experts in measurement and evaluation from the University of Calabar. Areas that needed corrections were pointed out by the expert and adjusted by the researchers to enhance the validity of the instrument. The reliability estimate of the questionnaire was established through Cronbach Alpha reliability which gave an estimate of .77

Statistical analysis: The Statistics Package for Social Sciences (SPSS) computer programme was used to analyze the data collected. Inferential statistical methods used for testing the hypotheses were One Way Analysis of Variance (ANOVA) for hypothesis one and independent t-test for hypothesis two. The result of the analysis is presented in the tables 1, 2&3. The hypotheses were tested at .05 significance level.

RESULTS

Hypothesis one

There is no significant influence of birth order on students' attitude toward Mathematics.

The independent variable in this hypothesis is birth order while the dependent variable is students' attitude toward Mathematics. To test this hypothesis, birth order was categorized into three sub-groups (First, Middle and last). Based on this categorization, one-way analysis of variance (ANOVA) test statistic was employed in testing the hypothesis based on their attitude toward Mathematics. The result of the analysis is presented in Table 1.

TABLE 1: One-way analysis of variance (ANOVA) of influence of birth order on students' attitude to Mathematics

Birth order	N	X	SD		
First	491	16.99	5.40		
Middle	221	15.73	5.02		
Last	288	15.38	5.56		
Total	1000	16.25	5.93		
Source of variation	SS	df	MS	F-ratio	p-level
Between Group	1,026.212	2	1026.212	16.096	.000
Within Group	63,564.010	997	63.755		
Total	64,590.222799				

* Significant at 0.05 level (Critical $F_{2,\ 997} = 3.00$)

The result of the analysis (F= 16.096; p=0.000) as presented in Table 1 indicates that there is a significant influence of birth order on students' attitude toward Mathematics. With this result, the null hypothesis was rejected at 0.05 level of significance and alternative hypothesis was accepted**.** The result also shows that first born were more likely to shows positive attitude toward Mathematics than the others, with Mean score of 16.99, followed by middle born with mean score of (15.73) and then by last born with mean score of (15.38). Based on the above result, a post hoc test-multiple comparison was performed and the result is presented in Table 2.

TABLE 2: LSD post hoc test analysis of the influence of students' perception of teachers' classroom management on their academic achievement in Algebraic processes

Birth Order	First (n=491)	Middle (n=221)	Last (n=288)
First	16.99[a]	-1.26[b]	-1.61
Middle	-1.95*[c]	15.73	-0.35
Last	-2.72	-0.49	15.38
Ms within 63.755			

P<.05

a= Group mean along the principal diagonal

b= Mean differences above the principal diagonal

c= t-values below the principal diagonal.

The Post hoc test-multiple comparisons result also indicates that the Fisher's significant t-value of -2.72 and a non-significant t-value of -1.95 and -0.49. This imply that, for students' of the first born order and last born order, birth order had a significant influence on attitude toward Mathematics (t=-2.72;p=0.000)

Hypothesis two

Gender does not significantly influence students' attitude to Mathematics.

The independent variable in this hypothesis is gender while the dependent variable is students' attitude toward Mathematics. To test this hypothesis, birth order was categorized into two sub-groups (Male and Female). The mean scores derived from their responses on attitude toward Mathematics were compared using the independent t-test analysis. The result is presented in Table 3.

TABLE 3:

Independent t-test analysis of influence of influence of gender on students' attitude to Mathematics

Variable	N	X	SD	t	p-level
Male	559	18.34	6.32		
				6.110	.001
Female	441	16.11	5.22		
Total	1000	17.36	6.79		

*Significant at 0.05 level of significance

The result of the analysis (t=6.110; p=0.001) as presented in Table 3 indicated that there is a significant influence of gender on attitude toward Mathematics. With this result, the null hypothesis was rejected at 0.05 level of significance and alternative hypothesis was accepted**.** The result also shows that male students with mean score of 18.34 showed more positive attitude to Mathematics than their female counterpart with mean score 16.11.

DISCUSSION

The result of the first hypothesis revealed that birth order has a significant influence on student's attitude toward Mathematics. This finding agrees with those of many researchers who have reported studies that tended to support Adler's prediction on the dominance of the firstborn in diverse sphere of life. Ekpo (2006) examined the influence of family socio –economic status, birth order on attitude toward learning among senior secondary school students in Calabar Metropolis, Cross River state Nigeria and found that birth order significantly influence students' attitude toward learning with first-borns as the top achievers. Many other Studies have shown that firstborns scored higher than later-born siblings in different academic achievement tests which include such subjects as English, mathematics, verbal skills, and verbal reasoning (Eysenk & Cookson, 1969; Kellaghan & McNamara, 1972; Paulhus & Shaffer, 1981). The studies by Saraglou and Fiasse, (2003); Healy and Ellis, (2007); Conley, Pfeiffer, and Velez (2007) showed that the oldest child in a family had the highest IQ score, and the scores declined with each successive younger sibling. According to Asikhia, (2010) on average, firstborn children achieve higher education more frequently and spend more years in schools.

There have been similar studies that did not support the findings discussed above (Guo & VanWey, 1999; Retherford & Sewell, 1991). There have also been many studies that did not confirm Alder's predictions about the influence of birth order on academic performance or perception of academic effectiveness. Tobias, (2003) in a study of the Influence of Birth Order and Other Variables on Student Perceptions of School Effectiveness showed no significant difference in student perceptions on any of the seven dimensions of school effectiveness studies based on birth order, the only exception being firstborn African American females who had significantly higher mean scores than their lastborn counterparts. Also, the results of a study of 120 firstborns, middle children, last borns and only children in Malaysia with a mean age of 20.0 years indicated that participants of different birth positions did not differ significantly in terms of personality and academic performance (Ha & Tam, 2011).

The result of the second hypothesis revealed that gender has significant influence on students' attitude toward Mathematics. Gender differences in studying Mathematics continue to be a focus of interest and the majority of the studies leaning towards the communal belief that males are better in Mathematics. According to Asikhia, (2010) among the variables that influence senior

secondary school students' attitude toward science, gender has generally been shown to have a consistent influence. Male students consistently had positive attitude toward science than their female counterpart. Girls who saw themselves as less capable than the boys in mathematics and science may not be motivated sufficiently for the learning process. They tend to withdraw their interest, effort and concentration from studying Mathematics which may hinder their achievement in studying Mathematics.

Gender differences in secondary mathematics remains an unresolved research question as with differences in conclusions of several studies that examined the role of gender in mathematics achievement. The literature has not come to a clear consensus; some studies have shown girls outperforming boys (e.g., Stevens, Wang, Olivarez, & Hamman, 2007), while others find boys outperforming girls (e.g., Preckel, Goetz, Pekrun, & Kleine, 2012). That our study found boys to show more positive attitude to mathematics than girls may be seen in a global sense to have contributed to this controversy. However, in our national context where several indices of access to education and social welfare suggest that female children are disadvantaged, our results raise pertinent question on gender equity in education. For instance, the net attendance ratio for secondary school among children age 13-18 year in Nigeria was 11% and 17% respectively in girls and boys from the lowest wealth quintile (i.e. poorest households) in Nigeria but the attendance ratio for children from the 4^{th} wealth quintile (fairly wealthy households) was 68% and 73% for girls and boys respectively (NPC Nigeria & ICF. 2019, p. 19). This is one of several examples where gender inequity is worsened by poor socioeconomic status. Our finding that female students had poorer attitude towards mathematics should be the subject of more research to elicit the root causes with a view to apply suitably tailored solutions.

CONCLUSION

A positive attitude towards mathematics reflects a positive emotional disposition in relation to the subject and, in a similar way, a negative attitude towards mathematics relates to a negative emotional disposition. These emotional dispositions have an impact on an individual's behavior, as one is likely to achieve better in a subject that one enjoys, has confidence in or finds useful. Therefore, birth order and gender are very important factors and should be considered when trying to promote positive attitude toward Mathematics among the students. On the basis of findings of the study the following recommendations were made: (a) Since birth order differences exist in students' attitude toward Mathematics, parents and teachers should be giving equal care and attention to children irrespective of their birth order and by so doing motivate and encourage them to develop positive attitude towards Mathematics. (b) Since gender differences exist in student's attitude toward Mathematics, Mathematics teaching and evaluation strategies should be free of gender bias. This will make males and females to see themselves as equal, capable of competing and collaborating in school activities.

REFERENCE

Aderanti, S., 2010. Towards improving educational standards. Journal of Educational Management, 1(2), 26-28.

Adler, A., 1963. The practice and theory of individual psychology (P. Radin, Trans.). Paterson, NJ: Littlefield, Adams. (Original work published 1924)

Adler, A., 1970. The education of children. Chicago: Henry Regency. Ana, I. and Adina, C., 2012. Correlations of selected affecting behaviours with students' academic performance. International sources of Africa and African American studies 9(8), 14-44.

Asante, K., 2012. "Secondary students' attitudes towards mathematics, IFEPsychology, 20, (1), 121–133.

Asikhia O. A., 2010. Students and Teachers' Perception of the Causes of Poor Academic Performance in Ogun State Secondary Schools, Nigeria: Implications for Counselling for National Development. European Journal of Social Sciences, 13 (2): 229 – 249.

Bandura A, Human agency in social cognitive theory. American psychologist,44, 9, 1175, 1989.

Bandura A, Social cognitive theory of mass communication. In J. Bryant and M. B. Oliver (Eds.), Media Effects: Advances in Theory and Research, New York, NY: Routledge, 94-124 2002.

Conley, D., Pfeiffer, K. M. and Velez, M., 2007. Explaining Sibling Differences in Achievement and Behavioral Outcomes: The Importance of Within- and Between-Family Factors. Social Science Research, 36, 1087-1104.

Ekpo, T. E., 2006. socio –economic status, birth order on attitude toward learning among senior secondary school students in Calabar Metropolis, Cross River State. Unpublished Med thesis, University of Calabar.

Eysenk, H. J., and Cookson, D., 1969. Personality in primary school children: Family background. British Journal of Educational Psychology, 40, 117-131.

Federal Republic of Nigeria, 2013. National Policy on Education (revised Edition) Lagos: NERDC Press.

Fergusson, D. M, Horwood, U. and Boden, J. M., 2006. Birth order and educational achievement in adolescence and young adulthood. Auglalian Journal of Education, 50(2), 122-139.

Georgiou, S., Stavrinides, P. and Kalavana, T., 2007. "Is Victor better than Victoria at Mathematics?" Educational Psychology in Practice, 23, (4), 329–342.

Gopalan V, Abu Bakar J. A., Zulkifli A. N., Alwi A, and Ruzinoor Che Mat R., 2017. A review of the motivation theories in learning. AIP Conference Proceedings 1891, 020043 (2017); doi: 10.1063/1.5005376 View online: http://dx.doi.org/10.1063/1.5005376 [Accessed 03/5/2020)

Guo, G. and VanWey, L. K., 1999. Sibship Size and Intellectual Development: Is the Relationship Causal? American Sociological Review, 64, 169-187.

Ha TS, Tam C. L., 2011. Study of Birth Order, Academic Performance, and Personality. 2011 International Conference on Social Science and Humanity IPEDR vol.5, 2011. IACSIT Press, Singapore.

Healey, M. D. and Ellis, B. J., 2007. Birth Order, Conscientiousness, and Openness to Experience Tests of the Family-Niche Model of Personality using a Within-Family Methodology. Evolution and Human Behavior, 28, 55-59.

Kellaghan, T., and McNamara, J., 1972. Family correlates of verbal reasoning ability. Developmental Psychology, 7, 49-53.

Kogce, D. C., Yıldız, M. Aydın, A. Altındağ, R., 2009. "Examining elementary school students' attitudes towards mathematics in terms of some variables," Procedia, 1, (1),291–295.

Lindberg, S. M, Hyde, J. S., Petersen, J. L and M. C. Linn, M. C., 2010. New trends in gender and mathematics performance: a meta-analysis. Psychological Bulletin, 136 (6), 1123–1135

Mohamed, L and H. Waheed, H., 2011. Secondary students' attitude towards mathematics in a selected school of Maldives," International Journal of Humanities and Social Science, 1,

National Population Commission (NPC) [Nigeria] and ICF. 2019. Nigeria Demographic and Health Survey 2018. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF. (15)277–281.

Nicolaidou, N. and Philippou, G., 2003. Attitudes towards mathematics, self-efficacy and achievement in problem solving, in European Research in Mathematics Education III, M. A. Mariotti, Ed., pp. 1–11, University of Pisa, Pisa, Italy.

Paulhus, D., and Shaffer, D. R., 1981. Sex differences in the impact of number of younger and number of older siblings on scholastic aptitude. Social Psychology Quarterly, 44, 363-368.

Preckel, F., Goetz, T., Pekrun, R., and Kleine, M., 2012. Gender differences in gifted and average-ability students: Comparing girls' and boys' achievement, self-concept, interest, and motivation in mathematics. Gifted Child Quarterly, 52(2), 146-159.

Retherford, R. D. and Sewell, W. H., 1991. Birth Order and Intelligence: Further Tests of the Confluence Model. American Sociological Review, 56, 141-158.

Sanchal, A., 2017. Students' attitudes towards learning Mathematics: impact of teaching in a sporting context. Unpublished Master theses, University of Waikato New Zealand.

Sanchez, K, Zimmerman, L. and Ye, R., 2004. "Secondary students' attitudes toward mathematics," Academic Exchange Quarterly, 8(2), pp. 56–60.

Saraglou, V. and Fiasse, L., 2003. Birth Order, Personality, and Religion: A Study among Young Adults from a Three-Sibling Family. Personality and Individual Differences, 35, 19-29.

Stevens, T., Wang, K. Olivarez Jr., A., and Hamman, D., 2007. Use of self-perspectives and their sources to predict the mathematics enrollment intentions of girls and boys. Sex Roles, 56, 351-363.

Thomson, S., Hillman, K., and Wernert, N., 2012. Monitoring Australian Year 8 student achievement internationally: TIMSS 2011. Camberwell, Victoria: Australian Council for Educational Research

Tobias, H., 2003. A Study of the Influence of Birth Order and Other Variables on Student Perceptions of School Effectiveness in a Southwestern Michigan County. Dissertations. 733. https://digitalcommons.andrews.edu/dissertations/733

Tshui, A. and Tam, R., 2018. Birth order effect on personality and academic performance in Malaysians. Unpublished master degree, University of Malaysia

Udo, F. S., 2019. The relationship between teachers instructional behaviour and students' academic achievement. International Journal of Academic Research, 3 (8), 129-139.

Weng, T. C., 2009. Birth order and motivation. Unpublished master degree Western Reserve University.