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PARENTAL ATTITUDES TOWARDS MATHEMATICS AND ITS INFLUENCE ON PUPIL'S ACADEMIC PERFORMANCE IN THE SUBJECT.

A Thesis Defended on the 14th September 2022 to obtain a Masters in Sciences of Education

Option: ***Psychology of Education***

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SUMMARY

To my parents

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A special thanks goes to my supervisor Professor MBEDE Raymond. His commitment and dedication to the task of supervision was tremendously helpful.

I want to thank all my class mates for the marvelous collaboration we had during the school years we were together.

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I deeply wish to appreciate and express my overwhelming gratitude to all those who contributed in one way or the other to the materialisation of this research.

ABSTRACT

This research work is titled: “Parental attitude towards Mathematics and its influence on pupils’ academic performances in the subject. It is a quantitative research. The sample population was, thus, Class 6 pupils from GBPS Biyem-Assi, in the Yaounde 6 Sub-division. The population size was a heterogenous population of 109 respondents. The main instrument for data collection was the questionnaire, which was administered to these pupils. The research protocol warrants the emission of hypotheses, and the therefore, our General Hypothesis is the following: “parental attitude towards Mathematics influences the performance of child in the subject.” From it ensues two research hypotheses which are the following: RH1 (parental interest in the activities of the child influences their performance in the subject); RH2 (the socio-professional occupation of the parent influences the performance of the pupil in Mathematics). Both hypotheses were rejected after the collection, analyses and of data, they had a significant value of $p = 0.456$ and $p = 0.064$ respectively, both significant values exceeding $p = 0.05$ in the ANOVA SPSS data analyzing method. Interpretations to this research were made so as to better enlighten the reader on why the outcome proved so, as well as explore the possible reasons related to the occurrence of the dependent variable. Furthermore, the research rested on two psychological theories which are: The Social Learning Theory of Albert Bandura (1977) and the Social Impact Theory of Bibb Latane (1981). These theories were deeply analyzed and the bearings to the entire research were brought out, as well as other sub-theories built in in order to further buttress the research credibility. The difficulties encountered by the research, as well as suggestions and recommendations were brought out which brought this tough but interesting exercise to an end. The domain of research is very vast and limitless and this topic is therefore open for further research to be carried out so that the more enlightenment can be brought and new avenues explored, so that science can go further ahead.

RESUME

Le sujet de recherche entitulé «l'influence de l'attitude des parents envers les Mathématiques et leurs impactes sur les performances scolaire des élèves dans la matière. » est une recherche qui vise a vérifier l'incidence que la variable indépendente (les attitudes parentals envers les Mathématique) sur la variable dépendente (les performances scolaire de l'enfant en Mathématique). L'échantillon était les élèves de la classe de Class 6 de l'école GBPS Biyem-Assi, dans l'Arrondissement de Yaoundé 6. La population hétérogene d'étude était fait de 109 élèves. L'instrument de collecte des données était le questionnaire, qui a été repondu par cette population. La recherche voudrai que l'on ressorte des hypothèses de recherche, alors, notre hypothèse génerale était la suivante: «l'attitude des parents envers les Mathématique influence les performances scolaire des enfants dans la matière. » De cette hypothèse a découle des hypothèses spécifiques. HR1 (l'interêt que porte les parent au comfort de l'enfant en Mathématique influence les performances de ce dernier en Mathématique); HR2 (l'occupation socio-professionnel des parents influencent les performances des élèves en Mathématique). Les deux hypothèses ont été rejectées après la collecte, l'analyse, et l'inteprétation des données. Ils avaient des degrés de significations p = 0.456 et p = 0.064 respectivemment, d'ou les deux valeur superieurs à p = 0.05 dans la méthode d'analyse des données ANOVA SPSS. L'interprétations de ces données ont été faite pour d'avantage éclairer le lecteur sur pourquoi ces résultats, et de voir des raisons susceptibles d'expliquer la variable dépendente. De plus, la recherhe était fondé sur deux théories psychologiques : le Social Learning Theory (Théorie de l'Apprentissage Sociale) de Albert Bandura (1977) et le Social Impact Theory (Théorie de l'Impacte Sociale) de Bibb Latane (1981). Il y a eu d'autres sous-théories qui venaient appuyer ces théories de fond pour plus de pertinence. Les difficultés rencontrer pandent la recherche ainsi que les suggestions et recommendations ont été apporté et cela à marquer la fin de cette exercise dur mais interessant. Le domaine de la recherche est très vaste et sans limite, et ce sujet est très ouvert pour plus de recherche, pour plus d'èclaircissement, et pour de nouvel avenues à etre exploiter, pour l'avancement de la science.

LIST OF ABBREVIATIONS

FSLC	:	First School Leaving Certificate
GBPS	:	Government Bilingual Primary School
GH	:	General Hypothesis
ICT	:	Information and Communication Technology
PV	:	Process Verbal
RH	:	Research Hypothesis
SLT	:	Social Learning Theory
SIT	:	Social Impact Theory

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GENERAL INTRODUCTION

Since the beginning of time, education has been the tool that drives every society and has been the means to preserve the cultural heritage. Our modern society has embraced a form of education termed formal, where learners go to a well-structured and asserted place to acquire this knowledge. It entails a whole lot to manage: from facilities/installations to equipment and the teacher factor which is, if not, the most valued of them all. The young minds that go to these schools to acquire knowledge get in contact with a variety of courses or subjects that vary from languages to civics and historical courses, physical exercise subjects, and so on. Among all this plethora of subjects is Mathematics. Mathematics is a vital subject in their scholarisation process, as it enables them cope better with the challenges their society presents: from simple purchases of basic commodities to complex inventories at financial institutions. Generally, Mathematics catches the attention of learners and their parents, either constitute a problem, or are a gateway to easily acquire insight and prowess to resolve problems in dealing with figures. The first scenario paints the gloomy picture depicting Mathematics as an obstacle to the furthering of studies, as it brings about discouragement in the process of climbing the academic ladder. In Cameroon, the problem is posed at the same level. There is a considerable problem perceived in this delicate, yet interesting course called Mathematics. A large number of Cameroonian learners seem to face difficulties with this subject, and this is evidenced by the results they display at various evaluations they encounter. This problem can be explained by many factors that are endogenous or exogenous to the pupils. To this effect, Youssef Mourad (1995:3) sustains that:

‘‘the analysis of te behaviour of a living organism, from the most primitive to the most complex, presents numerous difficulties and poses alot of problems. The nature and behaviours of such organisms are the expresions of two factors: the organism itself on one hand, and the external environment on the other hand. Each of these two factors have their specific features and each have multiple and constant relationships. From the interaction of these two factors ensue external manifestations which constitute the observable beghaviour.’’

The author is saying that in an individual, there are internal and external forces that stir him into a given pattern of behaviour. Many of these neophytes are faced with the problem of lack of intrinsic motivation as just seeing figures get them confused, others may be faced with environmental impediments. Mourad further sustains that current classifications of various behavioural patterns bring about distinctions between the innate and the acquired. This classification resting on a clear distinction of two factors: those of hereditary and the

environment. As such, behaviours belonging to the former will include ‘tropism’, ‘reflexes’ and ‘instincts’ and pertaining to the latter are ‘habits’, which are definitely acquired via environmental influences and experiences. This simply means that our primary pupils are already endowed with a whole set of traits and behavioural patterns that enable them to display a certain degree of prowess and learning abilities that enable them adapt to the challenges presented to them by the environment they permanently interact with. However, habits are formed from the interaction they get with this environment and with repeated exposure to a given behavioural pattern they observe and are likely to appreciate, they tend to imitate or emulate. This therefore pushes the research to focus on the role parents have to play in the development of such behaviours that make the child either productive or unproductive as regards the subject Mathematics.

This further buttresses the fact that the parents are definitely at the centre of the behaviours they acquire as youngsters and the latter have the full right to suppress any behaviours that are undesirable or harmful not only for their academic pursuits, but for their entire lives. The author further points out that: «the role of each of the two factors has been diversely appreciated. The prevailing tendencies warranted minimising genetic factors and rather highlight the role of experience and exercise. It is certain that the structural and functional characteristics of an individual organism are due to the ‘hereditqry-environment’ dynamivcs. » Mourad (1955:64). In effect, the entire existence of an individual is built up on the interaction of the two elements that make up a living being, (that is, the innate and the hereditary).

They are a being with innate properties, like, reflexes, instincts, and so forth and they acquire habits through the environment they live in. This helps bring a balance in their lives, some sort of equilibrium and permits them adapt efficiently. Worthy of note is the fact that scholarly knowledge is usually acquired in formal settings. Large numbers of children from various backgrounds converge to get this precious treasure of education. These heterogeneous backgrounds cultivate the learners in different ways, bringing various disparities at the levels of the cognitive, affective and psychomotor domains, therefore making it quite complex and tedious to carry out a homogenous kind of education for them. However, some authors think at the base, there is a degree of homogeneity when the young pupils come to school to appropriate some knowledge. There is one of them who particularly propound an interesting thesis as regards this fact. In his narration on the development patterns in people, which he sub-titled “Common Trends in Development and Learning”, the famous Psychologist Hendrickz (1986:39) sustains that:

"…fortunately for teachers and those who have to deal with large numbers of people, human development generally follow an almost universal pattern, in that, the order in which progress is made is much the same for everyone. It seems that those inherited 'instructions' included in the genes which are responsible for the gradual unfolding of capacities are the same for all normal human beings, in a pattern or order which crosses ethnic and cultural barriers. For example, any normal child, anywhere in the world, whose central nervous system has matured enough in response to inherited instructions to enable him to identify and reproduce sounds which he hears, will begin to learn and speak intelligibly."

This school of thought clearly holds that being a normal human who has developed without any impediment from a given pathology will definitely have the ability to respond adequately to the lessons disseminated to them. This will, of course, apply to the cognitive domain most especially because this is where the learning and other intellectual activities actually take place. Reasoning, thought, intelligence, memory, and other intellectual activities resort from the cognitive domain of the individual. Therefore, the efficient learning of Mathematics is something available to all children who come to school. And if at all there are discrepancies as regards the levels of comprehension, the factors causing that would be those other than brain pathologies. Furthermore, he added that: "similarly, in the development of physical capacities there is an almost universal pattern in growth spurts followed by periods of slower consolidation until adulthood, sexual maturity being completed within the second ten years of life." (idem). Again, Hendrikz (1986:41) underscores that: "the criteria used for selecting or grouping learners are usually chosen because they fit in with what those who are responsible believe to be factors which reduce individual differences. One of the most obvious is chronological age, teachers assuming that children who are near each other in age will be sufficiently similar in developmental levels and needs for them to be manageable in a group…" If pupils are set together in a classroom, it is definitely because they are fulfilling the criteria set by the school authorities to be there. The State of Cameroon has put up some laws governing the intake of children into schools varying from age criteria to health criteria, rendering the platform leveled for all to acquire same and descent education. Haven said this, it must be underscored that this thesis has as task to research on one of these exogenous factors which are the parent. Parents are the principal influence in the education of their children as everything begins with them. Mourad underscores the fact that children like animals at the beginning all possess primitive reflex reactions as behaviours. But as they grow, their reasonable and reaction would come from external stimuli. He expresses this idea in these words: « the ulterior development will consist only of combinesions; associations;

and variations of their specific primary reactions. The organism will just reat to its environment and its response will always be determined by the exterior physical stimulus. » Mourad (1955:88). In addition, Reusser (2000: 17-18) adds that: «Mathematical learning difficulties, even if proven to have a genetic or hereditary component, do not appear "out of the blue" but manifest itself, as combinations of environmental and neurodevelopmental problems, in instructional and socio- cultural contexts. » As a result of this, and all the above that precede, focus will be paid on the attitudes the parents display towards Mathematics and how these play on the performances of their young ones in the subject. To carry out a good analysis of the above research, the work will be sectioned in four chapters: Chapter 1: Problematic of the research; Chapter 2: Theoretical framework; Chapter 3: Empirical framework; Chapter 4: Data analysis and interpretation. These presentations and analyses will be carried out in the paragraphes below:

CHAPTER 1: THE PROBLEMATIC

1.1. Context and justification

The research is working on this topic because the researcher has noticed that many pupils do not do very well in school and most of the time, people attribute this to a host of reasons failures to poor parental care, the inadequate and poor teaching, irresponsible teachers, peer pressure or upon the child himself.

Khokhar (2018) cites the World Development Report of 2018, which states that it's not just the quantity of education that matters, it's the quality. It's hard to measure learning in a way that's comparable across countries, but the report draws on new studies which attempt to do just that. The recently updated "Global Data Set on Education Quality" suggests that more than 60 percent of primary school children in low- and middle- income countries fail to achieve a minimum proficiency in mathematics and reading. By comparison, in high-income countries nearly all children reach this level in primary school. Athematics is anissue in Developing Nations, and Cameroon is definitely within the study of the above report.

At the primary school, we notice that the end of year examination is quite good in terms of the overall performance, however, there is a major problem with the subject of Mathematics. For the Common Entrance Examination of the 2019/2020 school year, the 'PV' from the Regional Delegation of the Centre Region had the following Statistics: the results in Mathematics were 47%, coming last as compared to English Language (80%); General Paper (78%); ICT (63%); and French (74%). The rate of failure in primary Mathematics is on an increase in spite of the recent developments in the pedagogic fields, government reforms, the introduction of ICTs, and so on. Helen Merril (2021: 46) draws attention to the fact that « mathematics is a difficult subject no one can deny. It demands, among other things, accuracy of thought and statement, definite mental concepts, connected thinking, a fair memory, quickness to recognize relations between forms and numbers, power of generalization, a willingness to work hard. The abstractness of much of the work renders it difficult to most minds, and obnoxious to some. » There is a new language to be learned, new symbols to be manipulated, new elements to be dealt with, in some cases a queer upsetting and rearranging of one's mental processes. The ability to reason about certain subjects seems, oddly enough, not always to ensure that ability in mathematics, the thought processes are different, highly specialized, and subject to rigid rules, the topics of thought seem remote from everyday thinking and experience, impersonal and detached, and at certain ages students demand intense human interests, the object of the work as a whole is not readily seen.

I must underscore the fact that I am not the first to have worked on the topic of academic performances. Many people have worked on the topic, especially on the relationship between

parents, pupils and their academic output. Authors like Robert Strom (1969) have published extensively on the matter and come with the conclusions that differences in IQ, even in monozygotic twins will be dependent on the factor of "rearing", that is, upbringing. Nevertheless, this research is more inclined towards an aspect of parenting, particularly narrowing down on the element of their perception and attitude towards Mathematics and how this influences the performances of their children in this subject. The Cameroonian context is the setting where the research is conducted. Most of the researches on the influence parents have on their children's academic performances are mostly conducted out of Cameroon and even out of Africa. This research is giving a zoom on the Cameroonian realities, as it differs from other countries in its political, economic, socio-cultural physiognomy.

In another development, the genetic epistemology theory of the Famous Child Psychologist Jean Piaget holds that in the cognitive development of an individual, he goes through four main stages: the sensory motor stage; the preoperational stage; the concrete operational stage and the formal operational stage. He says there are great acquisitions the children make as they grow in age and experience in their environments. They acquire the notions of classification, relations and conservation. All these notions clearly depict Mathematical concepts. This implies that the children are fit for any lesson in Mathematics at the primary. He further adds that intelligence is all about adaptation. He beautifully expresses this in these words: Jean Piaget (1968:10, 25) ''intelligence is adaptation. In order to grasp its relationship with life in general, precisions should be made on the relationship swhich exist between the environment and its environment.

In effect, life is a continuous creation of increasingly complex forms and a progressive equilikbrium between these forms and the environment. Saying that intelligence is a particular case of a biological adaptation is claiming that it is essentially an organisation and that its function is to structure the universe like the organism structures its immediate surrounding… intelligence has never appeared, at a given moment of mental development, to be a well structured mechanism, and radically distinct from those that preceded it. Conversely, it presents a remarkaable continuity with acquired or innate proceses and bringing out habitual associations and processeson which they rest on while being in use.''

Piaget is simply telling us that intelligence is not something acquired with time, but it is definitely innate and increases with the stimulations of the environment. So, the primary pupil is imbued with the capacity to solve Mathematical problems with the intelligence he has,

thereby, adapting to his environment in that domain. In addition, McV. Hunt (1961) thinks in the same vein with Piaget and recalls that hitherto, intelligence was considered as a capacity fixed once and for all by genetic inheritance and this was the wide currency. A vast majority of textbooks written before WW2 tended to present the view that the IQ is essentially constant because intelligence is fixed. Most treaties on intelligence appeared to have sustained and attested to this view.

Citing Byron, who defines intelligence as "an inherited capacity of the individual which is manifested through his ability to adapt and to reconstruct the factors of his environment in accordance with his group," McV. Hunt (1961:28) makes us clearly see that all the children who are qualified as normal definitely have this ability to adapt to new environmental stimuli that come their way. Mathematics will definitely be one of such stimuli as others and therefore be surmountable for all the pupils. He further quotes Burt who propounds the view that: "by intelligence, the psychologist understands inborn, all-round ability. It is inherited, or at least innate, not due to teaching or training; it is intellectual, not emotional, not moral, and remains uninfluenced by industry or zeal; it is general, not specific, that is, it is not limited to any particular kind of work, but enters into all we do or say or think. Of all our mental qualities, it is the most far-reaching; fortunately, it can be measured with accuracy and ease." McV. Hunt (1961:10). This thereby implies that no individual or child is confined to a particular intelligence pattern. Knowledge in mathematics is not exclusive to a particular set of pupils, but the ability to solve Mathematical problems is available to all learners in the school. What can therefore be the explanation of this paradox?

1.2. Statement of Problem

According to Grawitz (1986), a problem is a set of reflections on difficulties that surround a field.

The International Commission on Mathematical Instruction (ICMI) (1979:7) in a bid to find solutions to the present problem of failure in maths at various levels came up with solutions to palliate the problem. Their procedure points out that current development is motivated by two

desires which are complementary but different in character: "(1) to enhance the content o.f education by promoting the standardizing and simplifying power of mathematical thought, with the object of improving each individual's level of understanding and grasp of an environment full of mathematical situations; (2) to improve the learning process of every child and to introduce the study of mathematical ideas at the must appropriate moment. During the sixties, it was essentially the first idea which motivated the will for reform at all levels of education. It was a question of bridging the gap between mathematics taught in school and mathematics as developed by mathematicians. An attempt was therefore made to pass on the general unifying ideas at more and more elementary levels of teaching." The measures for the most aprt revolved around 6 axels, which include: the goal, the content, the teaching method and material, the teacher factor, the sociological component, research and problems.

More so, Amy Harris (2016) pointsout that several factors could lead to failures in maths and proposes some remedies to palliate or utterly solve the problem of failures in the subject. She mentions; the need for the individual to seek assistance, increase practice opportunities, work on prior knowledge, increasing one's attention levels, and so forth. These solutions mostly revolve around the learning himself. Also, Levy (2018) in the same vein proposes solutions to improve performances in maths. She prones things like: confidence building, increasing curiosity, proning understanding over proceure, and so on, to boost the learner's positive outcomes in the subject.

Furthermore, Erhan Bingolbali (2011:19) put foward a thesis that requires teaching to encourage the ''multi-solution''appraoch from students in order to foster the solutions and techniques the learners use to approach a mathematical problem. Hethe author underscores that: ''…enabling students to solve problems and questions in different ways has important implications for students' mathematical learning.'' He further quotes (Krutetskii, 1976; Schoenfeld, 1983, 1988; NCTM, 2000) who state that: ''essentially, solving mathematical problems and questions in different ways are considered to not only help students construct mathematical connections but also show their mathematical thinking styles.''

All these variables are certainly very pertinent factors; however, this research wants to give a look at the parent factor. Precisely, focus is paid to how the attitudes of parents towards Mathematics play in the performances of the pupils in the subject. Is it enough for the teachers to disseminate lessons, attend staff meetings, attend seminars get their salaries at the

end of the month? Or for parents to pay the pupils' fees, purchase their school requirements; get them snacks for lunch, and so forth?

According to Adewumi Moradeke Grace, Olojo oludare Jethro, Falemu Funke Aina (2012), the influence of parents on children school achievement is well documented in numerous studies. Gadden (2003) says greater parental involvement at early stage in children's learning, positively affects the child's school performance including higher academic achievement. Harderves (1998) review that families whose children are doing well in school exhibit the following characters: Establish a daily family routine by providing time and a quite place to study with the children and assigning responsibility for house hold chores ; monitor out-of-school activities, for example setting limits on television watching, reduce time of playing, monitor the groups of friends the pupils walk with ; encourage children's development and progress in school; that is maintaining a worm and supportive home, showing interest in children's progress at school, helping him or her with home work, discussing the value of a good education and future career with children.

1.3. Research question

1.3.1. The principal research question

The principal question we shall pose here is: "does parent's attitude towards Mathematics influence on pupils' academic performances in Mathematics"?

1.3.2. Specific research questions

RQ 1: does the degree of concern parents show towards Mathematics influence the pupil's performances in the subject?

RQ 2: does the parent's academic and social-professional background influence the pupils' performances in Mathematics?

1.4. Hypotheses

A hypothesis is a tentative answer that awaits confirmation. For this research project, our hypotheses are as follows:

1.4.1. General Hypothesis

The General Hypothesis here is the following: "parent's attitude towards Mathematics influence on pupils' academic performances"

1.4.2. Specific Hypotheses.

Our specific hypotheses are as follows:

RH 1: the degree of interest parents show towards Mathematics influence the pupil's performances in the subject.

RH 2: the parent's social-professional background influences the pupils' performances in Mathematics.

1.5. Objective

An objective is a thing aimed at or sought. For this research project, our objectives are as follows:

1.5.1. General Objective

The General Objective here is the following: to show that "parent's attitude towards Mathematics influence on pupils' academic performances"

1.5.2. Specific Objectives.

Our specific Objectives are as follows:

RH 1: to show that the degree of concern parents show towards Mathematics influence the pupil's performances in the subject.

RH 2: to show that the parent's academic and social-professional background influence the pupils' performances in Mathematics.

1.6. Interest of study

1.6.1. Research interests

The interest is generally what the researcher benefits from exploring this work. The goal of this research is to bring more to the scientific community, to find proposals or solutions to the problems faced by pupils in Mathematics. Thus, the research we are conducting allows us to identify types of interests that relate to our research subject, namely: scientific, managerial, political, personal.

1.6.2. Scientific interest

This study shows an interest and a permanent scientific concern on our part on the issue the influence parental attitudes towards Mathematics on pupils' performance in the Subject. This study brings us to see the magnitude this particular variable contributes to the issue of failures in Mathematics by pupils. This study will permit the scientific community to have a clear idea on the role of parents have in failures of pupils in Maths, be it implicitly or explicitly, and will permit to young researchers to be inspired to carry out further studies.

1.6.3. Managerial interest

The interest here will allow the parents better handle the learning needs of their children in Mathematics. The research serves as an eye opener to the parents on their role they must play for better performances of their children in school work in general, and Mathematics in particular. The research will also enable the school authorities, and the entire educational body to have statistics of the parental role in the success of the pupils and hold seminars to educate the parents on how to handle the education and instruction of the pupils at home.

1.6.4. Individual interest

The researcher derived pleasure and satisfaction carrying out this study. As a citizen of the great nation of Cameroon, and Africa, my contribution to the advancement of the literacy of the Cameroonian child in particular, and Africa in general, produces tremendous satisfaction. Enabling and empowering the parents to better handle the instruction of their kids, especially in Mathematics give the researcher the unique opportunity to impact the lives of leaders of tomorrow, and build a better nation and continent.

1.7. The delimitation of the study

Delimiting a study means setting the limits within a specific framework for this study. In this research framework, we delineate our study on a triple plan:

1.7.1. Thematic delimitation

The domain of the Sciences of Education is a vast field. We do not claim to analyze all social problems and phenomena in this research. The research is going to work on "the influence of parental attitudes towards Mathematics on pupil's performances in the subject." Certain is the fact that pupils' performances can be influenced by a myriad of factors, which, of course, would be pertinent and plausible. Nevertheless, our research would zero down on the parental factor, while controlling the other variables which would enable the research have relevance.

1.7.2. Spatial delimitation

Our choice is justified by the importance we place on Mathematics as a subject and its importance in the daily lives of Cameroonians. So our field of study is located in the district of Yaounde 6, of the Mfoundi Division, in the Centre Region of Cameroon. Our population sample would definitely fall within this area. The pupils would come from neighbourhoods from the Yaounde 6 Sub-Division. It must, however, it should be underscored that the neighborhoods have been categories into three groups, based on the criterion of the classy nature of the residential areas. These sub groups include: classy neighborhoods, average neighborhoods, and shanty neighbourhoods.

1.7.3. Time delimitation

This study on the influence of parental attitudes towards Mathematics on the performances on pupils in the subject is being carried out during the 2020/2021 school year. The research would be conducted during the period of classes, so as to have our research population with ease. The second term, that is, the month of January, is ideal for the acquisition of the marks of the pupils so as to get their performances in mathematics during the first term evaluation. These results enable the researcher to have the performances of the pupils in Mathematics, so as not to rely solely on the National Statistics for the nation which are performances by other pupils. The administering of our questionnaire was done in the third term (that is, the month of May) so as to have the data when the academic year has almost run out. This period allows for all home interactions with their parents to run full course, so that the research obtains reliable information from the pupils.

1.7.4. Theoretical delimitation

The research would have willfully touched as many theories as possible, for there are a host of theories that would suitably back up our research on the influence of parental attitudes towards Mathematics on the pupils' performances in the subject. However, the researcher narrowed down to the two most pertinent theories, that best suited the topic. The Social Leaning theory of Albert Bandura and the Social Impact theory of Bibb Latane were the ones that best suited the research. These theories go a long way to bring out the aspects of learning by observation and passively, as well as the element of social influence that compels an individual to adopt a behavioral change as a result of the imagined or effective presence of another. Both themes being fundamental to the parent/pupil dynamics and the result that manifests in the academic performances of the latter.

CHAPTER 2: THEORETICAL FRAMEWORK

2.1. Definition of concepts

1.2.1 Attitude

According to Henri Piéron (1951:39), it is some form of acquired emotional reaction one puts forth when faced with a stimulus. He expresses it in these words: « an acquired reaction which is more or less emotional towards any given stimulus. »

Furthermore, Mvessomba (2012:86) defines it as « un état d'esprit a l'égard d'une valeur, une disposition envers un objet social. » It therefore is not observable and thereby can only be inferred from a list of opinions, behaviours and mindsets. Attitudes are therefore, as expressed by the author: « founded on a set of information about the object. » (idem)

1.2.2 Performance

Still for the author quotes above, a performance is a test to evaluate mental functions which more or less excludes language. He states it in these words: « test to appreciate mental abilities which excludes the use of language. »

1.2.3 Social influence

Mvessomba (2012) defines social influence as a form of social interaction within which an individual or a group of individuals exert pressure over another individual or group of individuals in order that the latter get to modify their behaviour, opinions or attitudes. He further explain that its aim is usually to avoid conflict via the harmonisation of behaviours through conformity and submission. It is an adaptative conduct by which an individual shows their approval in relation to given norms, beliefs, values prescribed by the group he belongs to.

2.2. Theories:

A theory, as expressed by Fischer, cited by Mvessomba (2012:25) enables the description of a domain and gives general explanations to phenomena. He expresses this view in these words: "…enabling not only the definition of a domain but also provide to the topic a general explanation system: identify specific laws which facilitate the understanding of similar phenomena.

2.2.1. The Social Learning Theory

Razieh Tadayon Nabavi (2012) pointed out that the social learning theory was increasingly cited as an essential component of sustainable natural resource management and the promotion of desirable behavioural change. It was developed in the year 1977 by the Canadian American Psychologist Albert bandura. He published a psychological work titled « The Social Learning Theory », and this theory is based on the idea that we learn from our interactions with others in a social context. Separately, by observing the behaviors of others, people develop similar behaviors. After observing the behavior of others, people assimilate and imitate that behavior, especially if their observational experiences are positive ones or include rewards related to the observed behavior. According to Bandura, imitation involves the actual reproduction of observed motor activities. (Bandura 1977). He, however, changed the name of his theory in 1986. The new label was the 'Social Cognitive Theory.' It came as a result of an evolution in thought and research, as he percieved that children's thinking and learning was far more complex.

Bandura saw social factors as being key to our understanding of how children learn. He believed children's learning did not necessarily involve a change in their bahaviour. He believed children's motivation was a huge factor to how they learn. He theorised that the motivation level of the child influenced the way he observed another and how he learnt.

Going in direct contrast to the 'Behaviourist' theory prevailing in his day, he prooved learning is not necessarily a factor of conditionning as the theory held as principal tenet. His famous 'Bobo Doll' experiment goes a long way to butress this fact.

Indeed, Bandura is often associated with the 'Bobo Doll' experiment, which was carried out in 1960. He filmed a womwn aggressively hitting a large toy doll. He made a group of children watch the scene and later asked them to play in a separate room with a similar doll. These kids began hitting the doll just as they observed the woman doing. The experimenter undercored itw as significantly stricking that the children reproduced the observed behaviour though they were not reinforced or rewarded in any way. So, all this led him to introduce the concepts of 'imitation 'and 'identification.' Bandura (1977: 63) concluded that « children imitate the actions of those around them, and through identification with others, assimilate new learning into already existing concepts. Through this preocess fresh patterns of behaviour become internalised with children's cognitive structure, with the result that they then act in a manner they believe adults will act. » The Social Learning Theory is relevant to the study this research is working on the pupils in the home setting definitely have their parents as their principal models. They are extremely suceptible to model the parents. They would readily emulate their parents in almost everything, including their attitudes towards Mathematics, be they explicit or implicit.

The SLT has become perhaps the most influential theory of learning and development. It is rooted in many of the basic concepts of traditional learning theory. This theory has often been called a bridge between behaviorist learning theories and cognitive learning theories because it encompasses attention, memory, and motivation (McLeod, 2016), which will be analysed in the paragraphs below. However, on this regards, Bandura believes that direct reinforcement could not account for all types of learning. For that reason, in his theory he added a social element, arguing that people can learn new information and behaviors by watching other people. It is a fact individual diffences would greatly come into play to rationalise the application of the theory to the research. For some reason, some children would rapidly inteprete and copy the behaviours communicated by their parents, and others would, do so over time. Some would need some form of reinforcements and some not. Be that as it may, they all go a long way to influence the children's academic performances in the subject Mathematics.

Simply put, social learning theory is the idea that children learn from observing others. Stephen S. Leff cited by McLeod (2016) highlights that social learning theories emphasize the importance of the social context and posit that individuals can learn by observing others' actions and whether these individuals are positively or negatively reinforced when exhibiting aggressive behaviors. Research by Bandura has also suggested that young children imitate adults' aggressive actions that they witness in contrived social settings. Thus, aggressive behavior is thought to occur because it has been either modeled or reinforced over time. Based on previous studies, learning is defined as a persisting change in human performance or performance potential as a result of the learner's interaction with the environment.

According to Saul McLeod (2016) The Social Learning Theory agrees with the behaviorist learning theories of classical conditioning and operant conditioning. However, Albert Bandura adds two important ideas: Mediating processes occur between stimuli and responses; and, behaviour is learned from the environment through the process of observational learning. Individuals that are observed are called models. In society, children are surrounded by many influential models, such as parents within the family, characters on children's TV, friends within their peer group and teachers at school. These models provide examples of behavior to observe and imitate, for instance, masculine and feminine, pro and anti-social, and so forth. Children pay attention to some of these people (models) and encode their behaviour. At a later time they may imitate the behavior they have observed. They may do this regardless of whether the behavior is 'gender appropriate' or not, but there are a

number of processes that make it more likely that a child will reproduce the behavior that its society deems appropriate for its gender. Bandura (1977) believes that humans are active information processors and think about the relationship between their behavior and its consequences. Observational learning could not occur unless cognitive processes were at work. These mental factors mediate in the learning process to determine whether a new response is acquired. According to the elements of this theory there are three general principles for learning from each other.

First, the child is more likely to attend to and imitate those people it perceives as similar to itself. Consequently, it is more likely to imitate behavior modeled by people of the same gender, the author further highlights.

Second, the people around the child will respond to the behaviour it imitates with either reinforcement or punishment. If a child imitates a model's behavior and the consequences are rewarding, the child is likely to continue performing the behavior. If a parent sees a little girl consoling her teddy bear and says "what a kind girl you are," this is rewarding for the child and makes it more likely that she will repeat the behavior. Her behavior has been reinforced.

Third, the child will also take into account what happens to other people when deciding whether or not to copy someone's actions. A person learns by observing the of another person's behavior, for example, a younger sister observing an older sister being rewarded for a particular behavior is more likely to repeat that behavior herself. This is known as vicarious reinforcement.

According to Papadopoulos, (nd), Learning is not a process of having something done to you, it is a process of you doing something to yourself. There are sevral definitions different authors have come up with, nevertheless, Papadopoulos's definition ressonates well with bandura's theory. There are four mediational processes proposed by Bandura in the area of learning:

1. Attention: The extent to which we are exposed/notice the behavior. For a behavior to be imitated, it has to grab our attention. We observe many behaviors on a daily basis, and many of these are not noteworthy. Attention is therefore extremely important in whether a behavior influences others imitating it.

2. Retention: How well the behavior is remembered. The behavior may be noticed but is it not always remembered which obviously prevents imitation. It is important therefore that a

memory of the behavior is formed to be performed later by the observer. Much of social learning is not immediate, so this process is especially vital in those cases. Even if the behavior is reproduced shortly after seeing it, there needs to be a memory to refer to.

3. Reproduction: This is the ability to perform the behavior that the model has just demonstrated. We see much behavior on a daily basis that we would like to be able to imitate but that this not always possible. We are limited by our physical ability and for that reason, even if we wish to reproduce the behavior, we cannot. This influence our decisions whether to try and imitate it or not. Imagine the scenario of a 90-year-old-lady who struggles to walk watching Dancing on Ice. She may appreciate that the skill is a desirable one, but she will not attempt to imitate it because she physically cannot do it.

4. Motivation: The will to perform the behavior. The rewards and punishment that 3/5 follow a behavior will be considered by the observer. If the perceived rewards outweigh the perceived costs (if there are any), then the behavior will be more likely to be imitated by the observer. If the vicarious reinforcement is not seen to be important enough to the observer, then they will not imitate the behavior.

Bandura (1971: 1) « it is evident from informal observation that human behaviour is transmitted whether deliberately or inadvertantly, largely through exposure to social models. » This goes a long way to butress the fact that it would be extremely rare to find a parent outrightly wish failures for their children. If the kids are influenced to having a lakadeisical attitude towards mathematics by their parent, it certainly was inadvertantly done. An influence to failure is quite probably due to some things unintentionally said, and unintentionally done. At their young ages, they are extremely suceptible to influence, so they would quikly imitate the behaviours displayed by their parents who are for the most part at close proximity to them. Attitudes the parents display are extremely crucial to the development of love or hate for Mathematics. It is therefore necessary to delve a little from the concept of attitudes to better grasp the contours of the power of attitudes towards something and how via the Social Learning Theory, pupils mimic behaviours that would in turn influence their performances at school, especially in Mathematics.

Harris Chaiklin (2011:33) points that LaPiere "took the position that behavior is a direct attitude manifestation." Thus, one can only know a person's true attitude by the action he or she takes. It cannot be emphasized enough that the attitude theory is one of the pillar theories in social psychology. Its declinations are wide and its definitions are varied, though

they converge to something pretty much similar. For psychologist Anselm Strauss (2010:329), attitudes are: “motor sets of an organism towards some specific stimulus. They rest upon stimulus-response patterns as these have become modified, elaborated, and integrated through learning in the social world.” This definition brings out a behaviourist angle to the attitude theory. This is beautifully depicted by author Harris Chaiklin (2011:32) quoting (Dollard, 1949; Krech & Crutchfield, 1948; Kutner, Wilkins, & Yarrow, 1970; Lewin, 1999) who say: “if behaviour is to change attitudes change must come first.” This expresses the stimulus-response paradigm in a clear way, and of course, these attitudes would change in relation to the change in the stimulus. If the attitudinal object changes, the reaction to it would have a tendency of changing alongside it. Harris Chaiklin (2011:33) further explains this fact by stating that: “Psychologically oriented social psychologists hold on to their belief that changing attitudes are a precursor to changing behavior even when there are counter indications.”

Furthermore, Strauss (2010:33) quoting Thurstone (1970) underscores the fact that "attitudes can be measured." He defined an opinion as the expression of attitude and stated that the aim is not to predict behavior but to show that it is possible to measure attitudes. Verbal behavior is taken as an indicator of an underlying attitude. In addition, Strauss (idem) quotes, Campbell who wrote in 1988 and put it this way when he said attitudes are: "residues of experience or acquired behavioral dispositions." This goes a long way to say that attitudes are formed by a series of experiences acquired by contact with stimuli. This implies that if the stimuli for a series of appearances proof to be aversive, then the attitudinal response would be that of disdain and if these same attitudinal objects proof to be successively pleasant, the attitude towards them would be positive.

More so, Strass (2010:33) quotes Dockery & Bedeian who define a social attitude as: "a behavior pattern, anticipatory set or tendency, predisposition to specific adjustment or more simply, a conditioned response to social stimuli." A conditioned response to social stimuli! This mean that there is a norm at the base and the attitudes of an individual is basically determined by those rules and regulations, value systems that have been established by the society.

There are two main views on the definition of attitudes, which are the Traditional view, and the Behavioural-Analytic view.

Warren Street (1994:145) points out that a lot of mainstream write-ups (that is, the traditional view) in social psychology define attitudes as: “relatively enduring evaluations and

beliefs about objects that direct behavior toward those objects. Attitudes themselves are not behaviors. Attitudes are mental processes that relate the individual to objects." Warren Street (1994:146) citing Daryl Bem further defined an attitude as "an individual's self-description of his affinities for and aversions to some identifiable aspect of his environment." Bem pointed out that this is not the traditional definition of attitudes, but if one observes the events that are called attitudes, this definition is accurate. It is important to note that, in Bem's view, the self-description is not a measurement of the attitude: It is the attitude itself. This in fact is the behaviour analytic view. In a nutshell, for the traditional view, attitudes are not only self-reports but they also reflect internal dispositions, mental processes, that are relatively independent of settings, they arise from and direct other behavior, and they indicate enduring emotional responses to objects and factual assertions about the objects. In the behavior-analytic view, attitude measurement presents a stimulus to a person, and the response is determined by the person's history in the social context of the measurement setting. The act of making a self-report is not different from other behaviors.

Haven defined this theory of Attitude via several authors in the field, a closer look shall be given to the structure of Attitudes. In his article titled Attitude and Behaviour, Saul McLeod (2018) states that attitude structure can be described in terms of three components which are the Behavioural Component; the Affective component; and the Cognitive Component.

- The Affective component: this refers to a person's feelings, or emotions about the attitude object. For instance: "I love education in Cameroon".
- The Behavioral (or conative) component: it refers to the way the attitude we have influences how we act or behave. For example: "I love education in Cameroon, so I have enrolled in the University of Yaounde I".
- The Cognitive component: this refers to a person's belief / knowledge about an attitude object. For example: "I believe and know that education in Cameroon is good".

This model is known as the ABC model of attitudes. The author further asserts that an underlying assumption about the link between attitudes and behavior is that of consistency. This means that we often or usually expect the behavior of a person to be consistent with the attitudes that they hold. This is called the principle of consistency. This principle of consistency reflects the idea that people are rational and attempt to behave rationally at all times and that a person's behavior should be consistent with their attitude, or attitudes. Nevertheless, though this principle may be a sound one, it is clear that people do not always

follow it, sometimes behaving in seemingly quite illogical ways; for example, smoking cigarettes and knowing that smoking causes lung cancer and heart disease. Citing a study by psychologist Lapiere, he asserts that there is proper evidence that the cognitive and affective components of behavior do not always match with behavior.

The bearing that this study has with this research in one whereby, the attitudes the parents have towards the subject Mathematics could influence their children to have the same attitudes towards the subject and therefore influence the way they perform in it. The theory for the most part illustrates how attitudes are formed, the process of the formation, the components of the attitude formation and we would see to what extend they influence the performance of the pupils at school.

As seen above, attitudes can be formed from social norms that have been set by society and these norms, at a subjective level, prescribe in a default way, the way the individual responds. this is, however, not the always the case, since the individual may go against set rules and norms based on stimuli that may be stronger than the ones the societal norms set. So, this is parallelly very applicable to the home setting, whereby, at a subjective or passive level, the attitudes a parent had, or both parents had towards the attitudinal object Mathematics would cause them to behave in certain ways, either verbally, or action wise, and that in turn might influence the young learners to subjectively internalize these parental behaviours and reproduce them in turn. It is often said the parents have a strong influence on their children; and following the theory of Classical Conditioning, the children may be brought to reproduce the same reactions the observe in their parents which would influence their academic performances consequently.

2.2.2. The Social Impact Theory

Citing Herbert A. Simon, Edward Fink (1996:4) makes the following assertion: ‘’A man, viewed as a behaving system, is quite simple. The apparent complexity of his behavior over time is largely a reflection of the complexity of the environment in which he finds himself.’’ This assertion is largely plausible as several studies have proven its veracity time and time again. The Dynamic Social Impact theory ‘’discusses the creation, maintenance, structuring, and alteration of attitudes, beliefs, and belief systems; the dynamics of social influence; and the role of human ecology in the formation of beliefs and belief systems.’’ (idem). This goes without saying that human interaction is the key focus of the formationof ideologies, beliefs are every fndamental tennet we hold dear as the foundation stone of our very existance.

The Social Impact Theory was developed by Bibb Latané in 1981. The theory brings to light the effect of other persons on an individual. This theory asserts that there are three factors which increase a person's likelihood to respond to social influence. The author, Bibb Latane (1981), points out that when other people are the source of impact and the individual is the target, impact should be a multiplicative function of the strength, immediacy, and number of other people:

- ***Strength***: The importance of the influencing group to the individual
- ***Immediacy***: Physical (and temporal) proximity of the influencing group to the individual at the time of the influence attempt
- ***Number***: The number of people in the group

The Social Impact Theory "relates cognitive, cultural, and social processes'' as Herbert A. Simon, Edward Fink (1996:5) point out, and these components are the dynamics that forge any social interactions in any setting. The scope of the theory is seen in the fact that it encompasses change at four levels: the individual attitude, the individual person, the culture, and the society. This is very evident in the context of the reserach in the sense that the psychological dynamics at the family level produces a change in attitude in the child, a change in their person and leading to a cultural change (their learning or study culture), and a societal change (one in whch mathematics is regarded as a 'dreaded beast').

Furthermore, citing Moscovici & Faucheux, Latane & Wolf (1981:439) write that '' the greater an individual's dependence upon another individual or group, the more he will conform to that individual's position or to the group's norm.'' The authors further explains that there are two types of dependences: informational dependence (which referes to a situation whereby an individual relies on others for information about the environment); and Effect dependence (refering to a case where an individual relies on upon others for direct satisfaction of needs). In the context of the research, it goes without saying that the household scenario depicts one of a mjority and a minority; a provider of information and needs fufillment. The pupils are dependent on the parents both for information and the provision of their needs. This dynamic makes the childrens extremely susceptible for influence by their parents. Apart from youthfulness, the aspect of dependence plays a major role in making the kids actively or passively influenced by their parents. The influence on their academics is an outlet of this dynamics, and therefore, an influence on their mathematics performance by ricochet.

Furthermore, Helen Merril (2021: 51) insinuates that parents are generally reluctant to assist their children with their school assignments. She expressed this point in these words: « How much have one's family or friends or the outside non mathematical public to do with this matter? It is often a wonder that the modern boy and girl find time to do any studying. Many parents resent any attempt to have work brought home.» The releuctance in helping the kids with assignments from school already translates, even as subtle as it can be, an attitude of reluctance in the fulfilling of that assignment. The children inherently are predisposed to play rather than studies. The parents not showing concern are setting a tone for a care-free attitude for their studies., and hence, a failure in their school performances.

In addition, tossing careless labels on the subject worsens matters for the young learners who already find the subject not easy. In her own words, one reads: « once label a subject Very hard, and let that label be flaunted before the young pupils' sight, and they are handicapped from the start. They magnify every difficulty, are. discouraged too easily, accept failures as all but inevitable. » Helen Merril (2021: 51-52). This can be very dangerous coming from peers, but when that comes from the parents, the danger is exponential and the outcome far more devastating for the children's performances.

French psychologists Askevis-Leherpeux, Baruch, &, Cartron (2006:80) say social influence can manifest itself by a simple public effect or reveal a bigger transformation. It can therefore consist in abiding by a majority or, adopting the view point of a minority. They further say that: « on parle d'influence sociale quand un individu, confronté aux opinions, attitudes, jugements ou comportements d'autres personnes, est amené à modifier ses propres opinions, attitudes, jugements ou comportements. » this is clearly the psychological process that is carried out with our young pupils who are faced with parental role models who either bring them towards or push them away from Mathematics. Faced with a favourable, or disfavourable attitude, or behaviours towards the subject, they are brought to either love or disregard the value of success in Mathematics. Askevis-Leherpeux, & al. (2006) go on to write that: there can be conformism even when all the members of the majority are unanimously and totally in error. This is beautifully depicted by the experiment of **Solomon Asch**. This means in our case of the primary pupils, the parents who constitute the psychological majority over the child, or children, could actually be leading them to error, though not deliberately.

Social influence occurs when a person's emotions, opinions, or behaviors are affected by others. Social influence takes many forms and can be seen in the areas of: conformity, socialization, peer pressure, obedience, leadership, persuasion, sales, and marketing. In 1958,

Harvard psychologist Herbert Kelman identified three broad varieties of social influence. To him there are three processes of attitude change. The purpose of defining these processes was to help determine the effects of social influence: for example, to separate public compliance (that is, behaviour) from private acceptance (that is, personal belief). Amongs all the sub-concepts of social influence, that of Herbert Kelman seemed to be the most suited for the research. These varieties are as follows:

1) Compliance

Compliance, which is equally referred to as acquiescence is the act of responding favorably to an explicit or implicit request offered by others. Technically, compliance is a change in behaviour but not necessarily in attitude; one can comply due to mere obedience or by otherwise opting to withhold private thoughts due to social pressures. According to Kelman, the satisfaction derived from compliance is due to the social effect of the accepting influence (that is, people comply for an expected reward or punishment-aversion). Compliance demonstrates a public conformity to a group majority or norm, while the individual continues to privately disagree or dissent, holding on to their original beliefs or to an alternative set of beliefs differing from the majority. Compliance appears as conformity, but there is a division between the public and the private self. What appears to be conformity may in fact be congruence. Congruence occurs when an individual's behaviour, belief, or thinking is already aligned with that of the others, and no change occurs.

2) Internalization

Internalization is the process of acceptance of a set of norms established by people or groups that are influential to the individual. The individual accepts the influence because the content of the influence accepted is intrinsically rewarding. It is congruent with the individual's value system, and according to Kelman the "reward" of internalization is "the content of the new behaviour.”

3) Identification

Identification is the changing of attitudes or behaviours due to the influence of someone who is admired. Advertisements that rely upon celebrity endorsements to market their products are taking advantage of this phenomenon. According to Kelman, the desired relationship that the identifier relates to the behavior or attitude change.

Worthy of note is the fact that not all of these varieties of social influence by Kelman squarely fit the context of failure, or success, as they will suit the specific contexts of success or

failures by the pupils. The primary pupils who choose to copy the parents' negative attitude towards Mathematics are not necessarily influenced by compliance, for they are not encouraged in the decision, but just emulate role models they pretty much hold in high esteem. On the other hand certainly some of the pupils who perform well in Mathematics do so as a result of compliance, for their parents who have a pretty much positive attitude towards Mathematics influence them, even directly and with coercion, do take concrete actions to accomplish success. Some other successful pupils will have the good Mathematics outputs, simply because they identify with their parents who display positive attitudes towards the subject. Robert Strom (1969:19) beautifully depicts this idea of conditioning as he says: "Behaviourists accepted the idea human activity is almost entirely a matter of conditioning and that any child can be caused to develop in whatever direction those who train him so desire."

Morton Deutsch and Harold Gerard described two psychological needs that lead humans to conform to the expectations of others. These include our need to be right (informational social influence) and our need to be liked (normative social influence). Informational influence (or *social proof*) is an influence to accept information from another as evidence about reality. Informational influence comes into play when people are uncertain, either because stimuli are intrinsically ambiguous or because there is social disagreement. Normative influence is an influence to conform to the positive expectations of others. In terms of Kelman's typology, normative influence leads to public compliance, whereas informational influence leads to private acceptance. Social Influence is a broad term that relates to many different phenomena. Listed below are some major types of social influence that are being researched in the field of social psychology.

4) Conformity

Conformity is a type of social influence involving a change in behavior, belief, or thinking to align with those of others or to align with normative standards. It is the most common and pervasive form of social influence. Social psychology research in conformity tends to distinguish between two varieties: informational conformity (also called *social proof,* or "internalization" in Kelman's terms) and normative conformity ("compliance" in Kelman's terms). In the case of peer pressure, a person is convinced to do something that they might not want to do (such as taking illegal drugs) but which they perceive as "necessary" to keep a positive relationship with other people (such as their friends). Conformity from peer pressure generally results from identification with the group members or from compliance of some

members to appease others. Conformity can be in appearance, or it may be a complete conformity that affects an individual both publicly and privately.

It is, however, not enough to notice a change in behaviour, but by the type of change in behaviour, that is, is the change lasting to influence attitudes and beliefs, which then manifests itself in a variety of situations? As Herbert Kelman depicts it: "only if we know something about the nature and depth of changes can we make meaningful predictions about the way in which attitude changes will be reflected in subsequent actions and reactions to events" (IDEM).

Still for the author, the influence process has 3 variants: Compliance, Internalization, and Identification. Compliance being said to take place when an individual accepts influence because he hopes to achieve a favourable reaction from another person or group. He accepts the induced behaviour not because he believes in its content but because he expects to gain specific rewards or approval and avoid specific punishments or disapproval by conforming. Thus, the satisfaction derived from compliance is due to the social effect of accepting influence.

Identification can be said to occur when an individual accepts influence because he wants to establish or maintain a satisfying self-defining relationship to another person or group. This relationship may take the form of a reciprocal role relationship. The individual actually believes in the responses which he adopts through identification, but their specific content is more or less irrelevant. He adopts the induced behaviour because it is associated with the desired relationship. Thus, the satisfaction from identification is due to the act of conforming as such.

Internalization, on the third view point of the author is said to occur when an individual accepts influence because the content of the induced behaviour, that is, the ideas and the actions of which it is composed is intrinsically rewarding. He adopts the induced behaviour because it is congruent with his value system. He considers it useful for the solution of a problem or find it congenial to his needs. Behaviour adopted in this fashion tends to be integrated with the individual's existing values. Thus, the satisfaction derived from internalization is due to the content of the new behaviour.

The author underscores that three processes of behaviour influence represent here equalitatively different ways of accepting influence. A systematic treatment of the processes might, therefore, begin with an analysis of the determinants of influence in general. These

detarminants can be summerised by the following propositio: the probability of accepting influence is combined function of:

The relative importance of the anticipated effect

The relative power of the influencing agent; and the prepotency of the induced response.

The determinants of the three processes can therefore be distinguished from one another in terms of the nature of the anticipated effect, the source of the influencing agent's power, and the manner in which the induced response has become prepotent.

Power is a central theme in the process of influence in Kelman's influence process. It is the extent to which the influencing agent is perceived as instrumental to the achievement of the subject's goals. The source of the agent's power may vary. This brings out the following hypotheses as regards the variation in the source of power.

The extent to which the power of the influencing agent is based on mean-control, conformity will tend to take the form of compliance. And it is necessary to highlight the fact that when an individual adopts an induced response through compliance, he tends to perform it only under conditions of surveillance by the influencing agent.

The extent to which the power of the influencing agent is based on attractiveness, conformity will tend to take the form of compliance. Worthy of note is the fact that when an individual adopts an induced response through identification, he tends to perform it only under conditions of salience of his relationship to the agent.

The extent to which the power of the influencing agent is based on credibility, conformity will tend to take the form of compliance. Consequently, the individual adopts an induced behaviour via internalization, he tends to perform it under conditions of relevance of the issue, regardless of the surveillance or salience.

Conversion includes the private acceptance that is absent in compliance. The individual's original behaviour, beliefs, or thinking changes to align with that of the influencers, both publicly and privately. The individual has accepted the behavior, belief, or thinking, and has internalized it, making it his own. Conversion may also refer to individual members of a group changing from their initial (and varied) opinions to adopt the opinions of others, which may differ from their original opinions. The resulting group position may be a hybrid of various aspects of individual initial opinions, or it may be an alternative independent of the initial positions reached through consensus.

In situations where conformity (including compliance, conversion, and congruence) is absent, there are non-conformity processes such as **independence** and **anti-conformity**. Independence, also referred to as dissent, involves an individual (either through their actions or lack of action, or through the public expression of their beliefs or thinking) being aligned with their personal standards but inconsistent with those of other members of the group (either all of the group or a majority). Anti-conformity, also referred to as counter-conformity, may appear as independence, but it lacks alignment with personal standards and is for the purpose of challenging the group. Actions as well as stated opinions and beliefs are often diametrically opposed to that of the group norm or majority. The underlying reasons for this type of behavior may be rebelliousness or obstinacy, or it may be to ensure that all alternatives and viewpoints are given due consideration.

These concepts may not have a direct bearing with the context of the research, however, they enable better comprehend the theory of social influence so as to use the concepts appropriately and suitably. Worthy of note is the fact that for social influence to be effective, there some factors that come into play that make the process effective and successful. To this effect, many factors can affect the strength of social influence. Attention will be paid to the social impact theory of Bibb Latané and Robert Cialdini's weapons of influence.

Cialdini's "Weapons of Influence"

Robert Cialdini defines six "Weapons of Influence" that can contribute to an individual's propensity to be influenced by a persuader:

- Reciprocity: People tend to return a favor.
- Commitment and consistency: People do not like to be self-contradictory. Once they commit to an idea or behavior, they are averse to changing their minds without good reason.
- Social proof: People will be more open to things that they see others doing. For example, seeing others compost their organic waste after finishing a meal may influence the subject to do so as well.
- Authority: People will tend to obey authority figures.
- Liking: People are more easily swayed by people they like.
- Scarcity: A perceived limitation of resources will generate demand.

From the above concepts we notice that social influence is a very vast domain having several concepts that make it "conspicuous". However, the social impact theory of Bibb

Latané and the weapons of influence elaborated by Robert Cialdidni fit squarely with the research we are carried out. As regards the Social Impact Theory, the parents fit the criteria elaborated by Latané for influence to be effective: the strength of influence has it that the parents are very important figures to the children. Being their parents, the children perceive them as their all in all, thus, looking up to them for feeding, shelter, clothing, and so on. Whenever the parents put up an attitude, and particularly in Mathematics, there is a very high propensity for them to copy or emulate such behaviours though quite inappropriate. Also, immediacy has to do with the proximity between the stimulus and the reaction to be gotten. The parents live with the children and spend a considerable amount of time with them; at least the entire evening is spent with the children for most households. This makes the attitudes and behaviours very clear to the children. Finally, the number refers to the quantity. Though just two at home, the parents consider a psychological majority in front of their children. However, the Class 6 pupils or the formal operation child will most likely be alone at home as he faces the parents who will influence him into either developing love for Mathematics or disgust for the subject.

As regards Cialdini and his weapons of influence, there are two that are various obvious as regards the research: authority and liking. Anybody is susceptible to influence when they are subordinate to an authority. In the research context, the children are under their parents who are in authority over them. They give them instructions, permit them do certain and forbid them from doing other things, and so forth. So, being under such conditions, it is clear the child would be very tempted to emulate whatever behaviours and attitudes the later put up, and acquire the same social representations they have. More to that, being people that the children like, the parents would serve as immediate models for their children. These children see them as charismatic, loving, affectionate beings for the most, and so are very susceptible to get influenced by them, be it positively or negatively.

2.3. Literature Review.

Amy Harris (2016*)* brought out a couple of reasons to why students in general balls up in Mathematics. Some include the non-seeking of help; lack of practice; insufficient prior knowledge; not asking questions; difficulty paying attention. These reasons are very pertinent, for they contribute to a high per cent of the failure. They may be the most important factors for failures in Math. However, the list is not exhaustive, as we can bring out the teacher factor, learning conditions and environment. This research is most definitely studying the parent factor and how their attitude towards Mathematics has a bearing on their children's performance in it.

Robert Strom (1969:26) sustains that "a favoured procedure for assessing the impact of environment on intelligence has been to use subjects whose heredity is the same or similar but whose places of rearing have differed." This is very revealing and plausible because with monozygotic twins the results are unequivocal. Monozygotic twins are alike genetically, "they are from the standpoint of heredity the same individuals in duplicate" (idem). In the study of Newman et al., quoted by Robert Strom (1969:28), also mentioned above, an investigation was conducted on identical twins. 50 pairs were reared together and 19 reared apart. They ranged from 2 weeks to 6 years at the point separation. When studied as a group, they ranged from 12 to 60 years. The analysis concluded that the span of differences in IQ between these twins ran from 1 to 24 points with an average of 8.21. This was statistically significant when compared with the average IQ difference of 5.35 between identical twins reared together. Newman's findings seemed to indicate that when heredity is constant, as in identical twins, diverse environs produce differences in intelligence.

Most of the research in learning situations has dealt with the extent to which certain rewards and punishments, extrinsic to the individual, affect his achievement. A myriad of incentives were introduced such as prizes, honour rolls, gold stars for good work, rewards for completing assignments on time – all to reinforce the motivation towards accomplishment. Negative techniques were included as well to punish certain of the undesirable behaviours. "Schoolmen today should accept the broad definition of motivation, understand that it involves all of those variables that arouse, sustain and give direction to behaviour. As these variables differ between individuals, it is obvious by their very nature are impersonal and under the present circumstances reserved for only a small element who can attain them" (idem). "There is a great need in our time to find ways by which we can stimulate in all children the desire to learn. In short, this implies the need to find ways to make motivation intrinsic rather than extrinsic, making school pleasant and making children to become absorbed in their studies," says Robert Strom (1969:24).

Furthermore, according to the authors H.A. Witkin; Dyk; Faterson; Goodenough and Karp (1962:2) people, both adults and children, with heterogeneous ways of perceiving things, based on characteristic ways of functioning based on structural arrangement in personality, are often categorized into two groups,: the field-dependent and the field-independent people. These two groups of individuals are opposites and get to perceive information differently. The authors claim that: "*Field-dependent people take a rather long time to locate a familiar figure hidden in a complex design. Because they are less likely to*

attempt to structure ambiguous stimuli, as Rorschach inkblots, they usually experience such stimuli as vague and indefinite. They often find difficulty with the block-design, picture-completion, and object-assembly parts of standard intelligence tests. Yet, they are no different from field-independent people on the other portion of the intelligence tests which require concentrated attention; and they may even do better on portions concerned with vocabulary, information, and comprehension. They are also not different from field-independent people in the ability to learn new material. In Dunker's well-known insight problems they may not readily see alternative uses for items serving a familiar function."

This simply means that some of the children are kind of called to perceive in a particular way. This is to say their natural dispositions, or, their cognitive development coupled with their personality predisposes them to have a limited reasoning proficiency when faced with complex and ambiguous tasks. Consequently, faced with a Mathematics complex task, they are already 'beaten' and qualify the challenge as "vague and indefinite" as expressed by the authors above. Nevertheless, in the ability to learn new material, they are no different from their field-independent counterparts, as expressed by the authors. They have the same learning profiles as the others and are equally imbued with dispositions to follow and acquire knowledge to the best of their abilities.

There, however, is a fundamental difference that comes to play and which sets a wide margin in the kind of perception these two groups of individuals would have. The author expresses that they are not reputed to be firm in their perceptual analysis as they are susceptible to 'flip-flops' whenever a third party sets in with a contrary opinion. This assertion is best depicted by the authors as they sustain that: "these people (field-dependent) are likely to change their stated views on a particular social issue in the direction of the attitudes of an authority. They are also particularly attentive to the faces around them, and as a result, tend to be better than relatively field-independent persons at recognizing people they have seen only briefly before", (1962:3). With regards to the question of Mathematics, they definitely emulate or even imitate their parents who will have either a positive or negative attitude towards the subject and put up performances, either good or bad, based on the perceptions of these "people in authority" who definitely are the parents. Consequently, if the parents' attitudes towards the subject are those of admiration, then there is a high propensity for the field-dependent children to be influenced to put in their best for outcomes of success, and, on the other hand, if the parents' attitude towards the subject is negative and

lackadaisical, then there is also a high propensity that their field-dependent kids would put up the same attitude in relation to the subject, and evidently, produce extremely poor results.

Again, Witkin, et al. add that "young people tend to perceive in a relatively field-dependent fashion, and, as they grow older, their perception assumes a generally more field-independent form. This finding is consistent with the results of a number of other investigations which have shown that for younger children the over-all structure of a given configuration strongly dominates the manner in which constituent parts are perceived." (1962:7-8). This assertion only goes a long way to prove that at the base all children would showcase some degree of field-dependence, though at varying degrees. As children, there is always the tendency of looking up to somebody to build up one's self. This is a very natural phenomenon in children, and thus, parents have a tremendous role to play in the formation of their perception and attitudes towards studies in general, and in Mathematics in particular. More to that, the authors further sustain their view by stating that: "the fact that field-dependent perception is associated with earlier stages of development implied that it may be more rudimentary. Conversely, field-independent perception appeared to represent a developmentally more advanced level of functioning." (idem). So, the younger they are, the more children are field-dependent, and so, at that malleable stage of their cognitive growth, they must be channeled via positive examples from their environments, and thus, their parents.

Coming down to the elementariness of things, for the child to be field-independent, for proper assimilation and comprehension of one's environment, the subject needs to mature greatly. To this effect, Boyd McCandless (1961:118) propounds the idea that by maturation, we mean "the development of the organism as a function of time, or age; maturation refers to neuro-physiological-biochemical changes from conception to death." These are indispensible conditions for learning to take place; void of which will bring only frustration, discouragement and in the long term, it may lead to a totally negative perception of the item to be learnt as meant for others. The author further substantiates by saying that for the physical and anatomical development does not in any way make one acquire certain complex distinctive skills and that is where the process of learning becomes very necessary. He expresses this idea in these terms: "increased height, weight, and strength, then, are in part the result of maturation (time and nutrition), but organizing these maturational phenomena so that performances previously impossible for the child can be accomplished involves learning." (idem). McCandless provides us a suitable definition of learning and puts it in these terms:

"learning involves the acquisition of new skills, such as sitting up, talking and dropping one of two toys in order to pick up a third that is more interesting. It also includes acquiring new meaning…" Boyd McCandless (1961:119)**.** He cites Mcgeoch & Irion who define learning in these terms: "learning is a change in performance as a function of practice." (idem). Seeing that maturation involves not only the physiological, or the biological, but equally the cognitive and psychological, the parents of these young minds would have to be very careful as regards the kinds of behaviours, or attitudes they put up for the children are very observing and keen beings, especially when it comes to what adults do. As regards the subject Mathematics, therefore, a positive attitude displayed by the parents will make the child pre disposed to love, learn, and devout himself to it, and on the flip side, a negative attitude displayed by the parents towards the subject will only predispose the pupils to back off and finally internalize in himself that the subject Mathematics is not meant for him and, thus, failures will be the order of the day.

In addition, there is a lot written about motivation and extensive studies have been carried out on the topic, which touches the concept in diverse ramifications. Nevertheless, this research will pay attention to motivation as a trigger that galvanizes an individual and pushes them to take certain decision, such influences which could be direct or implied. According to Drew Weston (1996:437): *"The word motivation comes from the Latin word to move (movere) and refers to the moving force that energizes behaviour. Motives cannot be directly observed but are inferred from behaviour. Motivation has two components: what people want to do and how strongly they want to do it. The first component refers to the direction in which activity is motivated, namely which goals the person is pursuing or avoiding. The range of goals humans can be motivated to pursue is truly extraordinary, from going to the library, to parachuting out of a plane, to murdering a lover in a fit of rage. Motives also vary in their strength. People may have dozens of motives available for them at any point, but they only act on those that currently 'move' them."*

From what the author mentions above, there is always something that pushes a subject to pursue a course of action. This set of actions eventually produces consequences. The parents of these children serve as motivation to their children, be it in a positive or negative way. In developing strong proactive moves towards their studies and particularly in Mathematics, the parents definitely have a role they play in that decision. Similarly, the display of a cavalier or lackadaisical attitude towards the subject is also in part motivated by the attitude of the parents towards studies in general and Mathematics in particular.

Again, for Drew Weston (1996:437), "motivation refers to the moving force that energizes behaviour. Two components of a motive are its direction (aim/goal) and its strength. Motives can be divided into biological needs and psychological needs (such as needs for dominance, power, achievement, and relatedness to others), although nature and nurture contribute to both." Obviously, the direction of the attitude will be towards the children and the strength is automatically the parents who constitute a very strong psychological majority in comparison to the child. The attitudes the parents put up towards Mathematics may not be deliberately showcased to discourage or encourage the child, however, they do influence the child as the latter is a young mind that observes, emulates, and imitates without necessarily sieving the ramification of the behaviours they are copying. This research will analyze two perspectives of this theory of motivation in order to better grasp the contours of the theory so as to better appraise the level of motivation that is supplied by the parents to the children that pushes them to particular behavioural patterns towards their studies. These perspectives are the Behaviourist perspective, and the Cognitive perspective of motivation.

Behaviourist Perspective of Motivation

Fischer, quoted by Mvessonba (2012) explains social behavior from interactions between stimulus exerted on an individual and the change that is provoked in the individual. For this, the individual is a "being in situation", who when placed in a given situational context must react in a given manner to the stimulus in order to adapt. Drew Weston (1996:445) "although behaviourists usually prefer to avoid terms such as motivation that suggest a causal role for internal states, the theory of operant conditioning offers, if only implicitly, one of the clearest and most empirical supported views of motivation: Humans, like other animals, are motivated to produce behaviours rewarded by environment and to avoid behaviours that are punished. Learning theories recognized many years ago, however, that the internal state of the organism influences reinforcement; a pallet of food will reinforce a hungry rat but not a sated one." This research is hypothesizing that the successful learners in Mathematics are getting strong reinforcements from the parents who, obviously, will be putting up some really positive attitudes towards the subject; and obviously, the less successful children will be getting little or no reinforcement from their own parents and will, coupled to that, receive negative attitudes towards Mathematics that will instead reinforce luke warmness towards the subject.

Behaviourists like Clark Hull dealt with this issue through the concept of drive. Drew Weston cites Hull who sustains that all biological organisms have needs, such as those for

food, drink, and, sex. Unfulfilled needs lead to drives, defined by some theorists as states of arousal that motivate behaviour. Drive-reduction theories, which were popular in the 1940's and 1950's, propose that motivation stems from a combination of drive and reinforcement. Deprivation of basic needs creates an unpleasant state of tension; as a result, the animal begins emitting behaviours. If the animal in this state happens to perform an action that reduces the tension, it will associate this behaviour with drive reduction. Hence, the behaviour will be reinforced. This is very evident in children who are already very success conscious. Their need for high grades pushes them to exercise hard in order to achieve what they desire. Other children are, unfortunately, not as geared as the former children, and so, will be satisfied and contented with any average or mediocre result they get. The drive level in this case will be low and therefore leave them in a state of "inactivity" for the achievement of good grades. Parents' attitudes just come in as a reinforcement tool to buttress what already exists in the children. Drew Weston (1996:446) further adds that the conditioning process occurs with innate drives, like hunger, thirst, sex which are referred to as primary drives. Most human behaviours, however are not directed towards fulfilling primary drives, especially in wealthier societies, people spend much of their time in activities such as playing, studying, or earning a living. "The motives for these behaviours are secondary, or acquired drives. Secondary drives are learnt through classical conditioning and other mechanisms such as modeling. An originally neutral stimulus comes to be associated with drive reduction and thus itself becomes a motivator. In many cultures, the desire for money is a secondary, or acquired, drive, which ultimately permits the satisfaction of many other primary and secondary drives." The conditioning process is clearly perceived in our primary children who are "victims" of the actions their parent, their immediate environments, put up. They model them, emulate them, and copy them in almost all aspects of life. This is glaringly seen in their types of games, types of their conversations, and so on. For a course like Mathematics which in itself will push many to be discouraged, attitudes of hate, and lack of concern towards it will push the child to easily abandon interest as well and make them put in very little effort for successful outcomes.

From another angle, Drew Weston (1996:446) explains that although drive-reduction theories explain a wide range of behaviours, they leave others unexplained. Why, for example, do people sometimes stay up until 3:00 a.m. to finish a riveting novel, even though they are exhausted? And why are some people unable to refuse dessert, even after a filling meal? "Such behaviours seem motivated more by the presence of an external stimulus or reward – called an incentive – than by an internal state. Incentives control much behaviour, as

when a person previously hungry is enticed by the smells of a bakery or an individual not previously sexually aroused becomes excited by an attractive, scantily clad body on a beach. In these cases, stimuli activated drive states rather than eliminate them. Drive reduction theories also have difficulty explaining the motivation to create stimulation, encounter novelty, or avoid boredom, which is present, which is present to varying degrees in different individuals, and even in other animal species." The motivation could be an examination, the reception of the promise of a bicycle upon achieving certain grade, and so forth. Such external motivation most often than not set people in activity as they constitute goals to be imperatively attained. This will be very glaring with parents who display positive attitudes towards Mathematics and an intransigent attitude towards success in the subject. The children, either by constrain or by enticement, will be forced to meet up with either of the conditions that bind him.

The author further expatiates by underscoring that a powerful theory of motivation implicit in the theory of operant conditioning is that humans and other animals are motivated to repeat behaviours that lead to reinforcement and avoid behaviours associated to punishment. In the case of our primary school pupils, they will definitely choose to adopt behaviours depending the attitudes and behaviours their parents show forth and kinds of reinforcements or punishments they will set to enhance success in Mathematics. Some behavioural theorists have proposed drive-reduction theories, which assert that deprivation of basic needs create an unpleasant state of tension, the behaviour is reinforced. Some drives called primary drives, are innate, whereas others, called secondary drives, are learnt, through their association with primary drives.

Cognitive Perspective of Motivation.

Cantor, cited by D. Weston (1996), stresses that the cognitive perspective begins with nurture. This perspective focuses on goals – desired outcomes established through social learning – such as finding a friend or getting good grades. Theories often use the homeostat or thermostat analogies to describe the manner in which people set goals, monitor their progress, and respond to feedback by performance adjustment. This means there is a deliberate and conscious effort towards achieving a given outcome, with a benchmark performance which cannot accept anything beneath. Weston (1996:446) goes further to point out the fact that:

"A cognitive theory of motivation used widely by organizational psychologists interested in worker motivation is goal-setting theory (Locke, 1996; Lathan, 1990). The core proposition of the goal-setting theory is that conscious goals regulate much of human behaviours, especially

performance on work tasks (Locke, 1991). People establish goals, which specify desired outcomes that differ in some way from their current situation. A sales person may set a goal of selling 10 computers next month, which is 10 more than she has currently sold. Goals activate old solutions that have worked before and encourage efforts to create new solutions if the old ones fail."

According to this theory, maximum job performance occurs only under certain conditions:

The first condition is a discrepancy between what the person has and wants. If the sales person's income is tied to the number of computers she sells, she will be motivated to boost her sales figures if she is dissatisfied with her income.

Secondly, the person must receive continuing feedback about her progress towards achieving the goal. Without feedback, goals have minimal motivational value because people do not know whether they are succeeding or failing; consequently, they do not know when they need to work harder.

Thirdly, the individual must believe she has the ability to attain the goal.

Fourthly, the person must set a high enough goal. A computer sales person is not likely to perform optimally if she sets a goal of 10 computers per month when she could reasonably expect to sell 20; when people set their goals too low, they tend to lose their motivation once they have attained the goal.

Finally, the person must have a high degree of commitment to the goal. In a work setting, commitment tends to stem from the perception that a legitimate authority values the goal, from peer influence, from the goal being public, and from rewards or punishments contingent upon its attainment or non-attainment (idem).

Many other cognitive theorists use expectancy value theories to account for motivation. These theories like theories of decision making view motivation as "a jointly function of the value people place on an outcome and the extent to which they believe they can attain it." Drew Weston (1996:447). Several factors influence the value of an outcome or a goal to a person. One, of course, is the extent to which the individual needs the goal or object for a specific purpose; a student who is not taking organic chemistry is unlikely to buy and organic chemistry textbook. Success in Mathematics may not be very valued by the parent, as probably they ended up getting jobs that never required skills in Mathematics. Their

progenitors also coming after them just emulate these tendencies as they observe the cold attitudes they display as regards Mathematics.

Another is the amount of effort required to attain the goal. "Goals that are impossibly different or too easy to attain tend to be less attractive than moderately challenging goals." (idem). The average or weak pupil will tend to see the attaining of an excellent grade as a utopia, and so, give up in his heart, thereby, setting the threshold for his success at just average. This often time lead even to failures at the end of evaluation. To wrap this up, we could summarize this idea by stating that Cognitive theorists often account for motivation in terms of goals, which are valued outcomes and which are established through social learning. According to goal-setting theory, conscious goals regulate much of human action. According the expectancy-value theories, people are motivated to perform behaviour to the extent that they value the potential outcome and believe they can attain it.

In another development, a group of brilliant psychologists display some studies they carried out to see the relationship between the parenting styles in different cultures affect the children's performances in Mathematics. To this effect, they carried out a longitudinal study and a cross-cultural study.

LONGTITUDINAL STUDY

R. Vasta, S.A. Miller, S. Elis (2004), point out that several kinds of research give evidence about the contribution of family experience to children's intelligence… longitudinal studies have shown that the IQ is not perfectly stable as children develop and that a particular child's IQ may go up or down by 30 or 40 points. A lot of childhood researches have sought to discover whether these changes in IQ can be linked to characteristics of children's environments. The authors bring out the amazing study carried out by Semeroff and associates, who, for example followed a sample of children and their parents from the time the children were 4 until they reached 14. Included at both time periods was an assessment of the extent to which the child's family life was characterized by each of the 10 risk factors listed in Table 1 below. "At both age periods the children's IQs were negatively related to the number of risk factors; that is, the more the risk factors present, the lower, on average, the IQs. No single category of the accumulation of different forms of risk. Furthermore, risk at age 4 proved predictive of IQ at age 13. Children continued problems in intellectual adaptation. The negative impact of early risk is not limited to IQ scores but extends as well to measures of language development and performance in school." Vasta, & al., (2004:360).

Table 1: Risk factors in the Sameroff et al. study of Family Environment and IQ.

Risk Actor	Description
Minority status	Family is African American or Pueto Rican
Occupation	Head of household is unemployed or holds low-skilled occupation.
Mother's education	Mother did not complete high school
Family size	Family has four or more children
Father absence	Father is not present at home
Stressful life event	Family experienced at least 20 stressful events during the child's first four years
Parenting perspective	Parents hold relatively rigid and absolutist conception of children and child rearing
Maternal anxiety	Mother is usually high in anxiety
Maternal mental health	Mother has relatively poor mental health
Mother-child interaction	Mother shows little positive affect towards child

Table 1 above enables us perceive that the environment of the child influences even his IQ level. Intelligence is equally influenced by the environment. Parents with a particular profile will basically influence the children to produce results that will reflect that profile. It is true the context is American; nevertheless, the fact remains same that any home that does not show considerable level of concern in education will have a very high probability to have children with little or no love for education related activities. Having the profile of a person who bumped along in spite of Mathematics, and at the end getting a sort of blue-collar job,

will very probably produce a cavalier attitude towards Mathematics and their children will have the tendency to follow suit.

More so, in 1973, McCall as cited by Vasta, & al., and colleagues focused more directly on parents' contribution to stability or change in IQ. They analyzed patterns of IQ change for 80 children participating in a long-term longitudinal study. They found that two aspects of parental behaviour showed the strongest relation in IQ change. Children who declined in IQ tended to have parents who made relatively little effort to stimulate them or to accelerate their development and who also fell at the extremes in their use of punishment (either very high or very low). In contrast, children who increased in IQ tended to have parents who emphasized intellectual acceleration and who were intermediate in the severity of their discipline. Hence, Vasta, & al., (2004:361) emphasize that "the most adaptive parental pattern appeared to be one that stressed stimulation and intellectual encouragement within a general context of structure and control. Similar conclusions have emerged from other studies of the child-rearing antecedent of intellectual conference."

CROSS-CULTURAL STUDY

The comparing of different cultures permits us to explore variations in experience and development that might not be seen within a particular cultural group. Some of the most interesting result from such comparisons concern performance on the kinds of academic measures that are often linked to IQ. Differences in Mathematical achievement between Western and non-Western samples are particularly striking. American children, on the average, perform quite poorly in Mathematics. This conclusion ensues from several surveys of cross-national differences in Mathematics ability in recent years. Vasta, & al., (2004:363) reveal this interesting revelation as regards this reality: "why do American children do so poorly in Mathematics? It is tempting to indict the school system, and schools… some differences between Asians and Americans, however, are evident by age 5, before most children have even started school. Furthermore, Asian American students in the Unites States often outperform Caucasian students, even though both groups are moving through the same school systems. These findings suggest that schools are not the sole explanation; the family environment also contributes." The most ambiguous attempt to identify family basis for academic achievement is the programme of research by Stevenson & associates. The child participants for the beginning phase of the research were first and fifth graders from three countries, which are the United States, China, and Japan. The children took a variety of achievement tests, and the results fit those of previous research, that is, poorer performances

in Mathematics by American children than by Chinese and Japanese children. Many of the 1st-graders were retested in 5th and 11th grade, and the original results were confirmed; with the performance gap further widened.

The mothers of these children also took part in the study, and it was their beliefs and practices that constituted the main focus of the research. The maternal interviews included a variety of questions designed to reveal differences among families and among cultures that might lead to differences in academic performances. Mothers were asked, for example, to judge how well their children were doing in school and to indicate how satisfied they were with this progress. They were asked to give their beliefs about the bases of school success in particular, to judge the relative contributions of ability and effort to doing well in school success, such as no parental help with homework or the provision for a quite place to study.

The Stevenson group's assessment made clear that mothers in all 3 cultures are interested in and supportive of their children's academic development. At the same time, the maternal interviews brought to light a cross-cultural difference in beliefs and practices that might well contribute to the superior performance of Asian children. The Asian mothers, for example, were more likely than American mothers to regard effort as more important than ability for success in school. The emphasis on effort, in the beliefs about the malleability of human nature, and the possibility of improving oneself through hard work was paramount to them. In line with these beliefs, Asian mothers were most likely than American mothers to provide help for their children's academic endeavours. Vasta, & al., (2004) further reveals interesting statistical figures that in China, for example, 96% of children received assistance with homework, while the figure in the United States was 67%. And fully 95% of Chinese 5th graders and 98% of Japanese 5the-graders had their own study-desk at home at which to work. The figure for the American children was just 63%. Similarly results emerged from a measure of time spent on academically related activities like, reading, completing workbooks outside school; Asian children spent much more time in such activities than did American children.

Curiously, given the relatively poor performance of their children, American mothers might have been expected to be least satisfied with their children's academic achievement. In fact, just the reverse was true. American mothers were more satisfied with both their children's performance and their children's schools than were Chinese or Japanese mothers. American mothers also gave higher evaluations of their children's cognitive and academic abilities than did mothers in the other two cultures. The pattern suggests a basis for failure of

many American mothers to nurture optimal academic performance in their children. These mothers may believe that their children are doing better than they are doing and thus may be satisfied with levels of performance that are not that high. Furthermore, these mothers may believe that academic success is primarily a function of immutable ability rather than challengeable effort and thus may see little point in encouraging children to try harder.

This study runs parallel to the research on the primary pupils in the Cameroonian context. Parents of the pupils certainly by their attitudes towards Mathematics as a subject equally influences the way their children will perceive the subject and therefore influence their behaviours towards the subject and by ricochet, influence their performance in it. The nuance between Steven's study and this research is that Steven and his crew were focused on the difference in cultures in terms of race, and parental practices by just the mothers. This research is not only exploring the attitudes both parents give towards the subject Mathematics, but it explores other aspects like the areas the people live in, in terms of the urban or rural setting. Also the influence the parents have on the pupils may be quite passive but very effective, for the parents will not necessarily tell the pupils to neglect the subject, but the things they do, they will subtly, but efficiently communicate passivity as well in the young minds.

Day; Berlyne; Hunt (1971:3) underscore that "according to the drive theory, organisms become active only when they are driven by the strong stimuli originating from pain, from the homeostatic needs of hunger, thirst, etc and from sex, or from innocuous stimuli which had previously been associated with such strong drive stimuli. Behaviour starts with the onset of these strong stimuli or with the onset of innocuous stimuli which have previously been associated with them. It stops with the cessation of such stimuli." For a subject to have drive, they must be faced with strong stimulus that will push them to take action to alleviate or resolve the situation. Day, et al, is saying that the innocuous stimuli absolutely have to be associated with the strong stimulus for the organism to be set to action, therefore minimizing the power of innocuous stimuli. In our case of the parents, their children and Mathematics, the stimulus is quite innocuous, in the sense that there is no direct physical pain felt by the pupils who are permanently faced with the stimulus of negative attitudes showcased by their parents towards Mathematics. The research acknowledges the fact that stimuli absolutely pushed an organism to action, but claims the innocuous stimuls can be suggestible in nature, but very powerful, though leaving the object of influence without any harm or pain.

Furthermore, the works of Lashley, as quoted by Norbet Syllamy (1996: 169), state that behaviour depends on internal modifications and external stimuli that act on the brain. Motivation is therefore the "first chronological element of conduct". Motivation could be understood as a "psychological factor (conscious or unconscious) that predisposes an individual, an animal or human, to accomplish certain actions or to move towards certain goals." Henri Piéron (1990: 286). This theory is mobilized because it explains the motivational role the pupils' environment is to their success. Robert D. Strom (1969:16) says discrepancies in accomplishments among students occur because the facility of learning involves more than just mental ability; "it incorporates a number of non-intellectual factors as well. Among the non-intellectual elements which appear to influence success in school are motivation, aspiration, self-concept, and social adjustment." Consequently, if the child is surrounded by factors that stimulate him positively, that is, a high probability he will be successful in his academic pursuits, equally in Mathematics, and conversely, if the child is surrounded by factors that stimulate him adversely, there is equally a high probability they will produce poor academic outputs. In their study on identical twins in 1937, Newman, Freeman & Holzinger, cited by Strom (1969:28) came up with the conclusion that "when heredity is constant, as in identical twins, diverse environs produce differences in intelligence." Similarly, bringing out the studies carries out by Burt & Howard, Shields on monozygotic twins, they reveal that "…at least some variability can be attributed to environmental setting" (Idem).

Many students lack interest and proficiency in mathematics (Rice, Barth, Guadagno, Smith, & McCallum, 2012). In fact, 64% of eighth graders scored below proficient on the 2013 National Assessment of Educational Progress [NAEP] (NAEP, 2013; President's Council of Advisors on Science and Technology [PCAST], 2010). Research suggests a student's home environment may influence their attitude toward mathematics (Sheldon & Epstein, 2005), and parental involvement can increase student achievement (Areepattamannil et al., 2015; Jacobbe, Ross, & Hensberry, 2012). As a result, it is imperative that teachers involve parents in their child's mathematical learning. Although some parents do not have the mathematical content knowledge or pedagogical knowledge for teaching, parents feel more competent in their mathematical ability and interact more with their child when teachers reach out to them (Drummond & Stipek, 2004; Jacobbe, et al., 2012). Parental engagement and support is crucial when students are deciding whether or not to pursue science, technology, engineering, and mathematics (STEM) courses (Rice et al., 2012). Fan & Chen (2001) argue parental aspiration and expectation of their child's achievement has a strong relationship with

academic success, which in turn is related to their child's attitude toward the subject. For example, children who have high mathematics achievement generally have parents who support their mathematical ability and success. Parents generally get involved with their child in mathematics when they have high selfefficacy toward mathematics themselves and when they feel the school supports their involvement. Consequently, it is important for teachers to provide opportunities for parents to get involved and provide necessary tools for parents to help teach their child(ren) (Drummond & Stipek, 2004; Jacobbe et al. 2012; Sheldon & Epstein, 2005). However, some teachers and schools usually are not aware of ways to involve parents in such learning experiences, especially when some parents may have negative attitudes toward mathematics. As one approach, researchers suggest family math nights where parents, teachers, and students participate in fun, engaging mathematical activities together that not only provide education stimulus for students, but also prepare parents to help their children with the material (Grant & Ray, 2015). The purpose of this quantitative study is twofold.

First, we examined parents' and students' attitudes toward mathematics, and then we investigated how parents' attitudes influenced their child(ren)'s attitudes toward mathematics. Attitudes Toward Mathematics Attitudes, emotions, and beliefs make up the affective domain in mathematics education Attitudes involve "positive or negative feelings" toward an object, place, or thing. Specifically, attitudes refer to "affective responses that involve positive or negative feelings of moderate intensity" (McLeod, 1992:581). In other words, it is an individual's like or dislike toward mathematics. We know attitudes about mathematics develop over time and teachers, peers, and parents, as well as the environment can influence a student's attitude. Students' attitudes may also be established from their self-perceived abilities, selfefficacy, or social support from teachers and parents. Wilkins and Ma (2003) claim teachers', peers', and parents' positive support help students develop positive attitudes about the social importance of mathematics. Hon and Yeung (2005) suggest when students are surrounded by positive influences, they will be affected in a positive way. Environmental factors including students' home life and access to instructional materials as well as entertainment measures can all have an effect on attitude and achievement. Parents' Attitudes Toward Mathematics Most parents recognize the importance of being involved in their children's education, and they value their learning (Drummond & Stipek, 2004).

But, it is common that parents struggle helping their children learn and understand mathematics. Many parents feel inadequate helping their child(ren) with mathematics because they are not confident in their own mathematical ability, are unaware of the content, or do not

have the teaching skills needed to help their child (Drummond & Stipek, 2004). Drummond and Stipek (2004) argue parents who have lowincome status are likely to help their child more with reading than with mathematics because they claim mathematics is not as important to everyday life, and they are not confident in their own mathematical ability. The changes in the way mathematics is taught may also contribute to this feeling of incompetency. It has been found; however, when parents are taught how to work with their children, especially on mathematical concepts, they develop a better attitude toward school and the subject matter, which could influence students' attitudes toward mathematics. In fact, several qualitative research studies revealed a strong link between parents' and students' attitudes toward mathematics.

Parents who have negative feelings toward mathematics, or who have openly acknowledged their own mathematics deficiencies tend to have children with similar attitudes (Usher, 2009). On the other hand, parents who encourage mathematics and mathematical thinking and have positive feelings toward the subject tend to have children who also enjoy it, making them more likely to succeed as well as pursue STEM-related careers in the future. Involving parents in their child's mathematics education may prevent the decline in students' attitudes toward mathematics (Sheldon & Epstein, 2005). Wilkins and Ma (2003) suggest involving parents and students in family math nights increases positive mathematics interactions between parents and their child(ren), and family math nights improves parents' attitudes and feeling of competence toward mathematics. Bringing together school and family communities into one may be beneficial to students' achievement and students' attitudes toward mathematics. Students' Attitudes Toward Mathematics. Students are more likely to develop an interest in a subject if they feel competent or have high self-efficacy in that area, while they are likely to create an aversion to subject matter when they feel as if they will fail. Stodolsky, Salk, and Glaessner's (1991) conducted a study with 60 fifth-grade students and found that mathematics was considered one of the hardest subjects. Contrary to other subjects, students' attitudes toward mathematics were based off their achievement rather than their interest.

Similar to Usher's (2009) findings, students' negative attitudes were attributed to failure, feelings of difficulty, and frustration with the subject matter. Most students in Stodolsky et al. (1991) study reported they did not believe they could learn mathematics on their own, but needed guidance from a teacher or parent, unlike social studies in which most students reported they could teach themselves. Researchers report students' attitude toward mathematics is a good indicator of their success in the subject, with positive attitudes leading

toward higher achievement. Students' attitudes toward mathematics generally decline when students enter middle school, but remain steady during their high school years. Although students' attitudes may decrease over time, Ma and Xu (2004) reported an increase in mean achievement across time. The researchers analyzed the Longitudinal Study for American Youth (LSAY) data for students in grades 7–12 and found that even though students' attitudes decreased, they still performed well. Therefore, it is possible that attitude does not affect achievement, or attitude and achievement may be inversely related. Students who value and enjoy mathematics generally have a higher level of achievement (Gottfried, 1985).

However, poor mathematics achievement has been linked to a decline in students' attitude toward mathematics (Ma & Xu, 2004). During elementary school, students are introduced to concepts slowly and repetitively, resulting in positive attitudes and achievement for most students. As the material gets more diverse and abstract, students' attitudes and achievement levels begin to decline (Hiebert et al., 2003). Students' prior attitude has an effect on later attitude, and students' prior achievement has an effect on later achievement, with the effect of prior achievement being stronger (Ma & Xu, 2004). Students' prior achievement predicted later attitude for grades 7–12. However, prior attitude did not predict later achievement (Ma & Xu, 2004).

Therefore, achievement leads to a positive attitude, but a positive attitude does not necessarily lead to achievement. While this study argues a one-sided effect, several researchers conclude attitude and achievement influence one another in a cyclical fashion. For example, Maple and Stage (1991) argue students' attitude toward mathematics, not achievement in mathematics, was a statistically significant predictor of selecting a mathematics major. On the other hand, achievement at the middle school level determines the curricular choices of students in higher-level mathematics. It is not only personal achievement that affects a student's mathematics attitude, but social support also has a great impact. Middle school students are put into more ability grouped classes and have less support from their teachers who tend to think students cannot succeed, especially in lower-performing classes. This could account for part of the decline of students' selfefficacy, and in turn, their attitudes toward mathematics. Students receiving more positive support from teachers and parents tend to have more positive attitudes in mathematics. The decline in the middle school years could be due to students' negative perception of the social importance of mathematics as they are less likely to see a connection between what they are learning in mathematics and their everyday life. However, it has been noted that middle school students' attitudes toward mathematics is highly related to their mathematics achievement, and that attitudes toward the

subject influences the number of mathematics courses they will take in high school and college (Gilroy, 2002). If students' attitudes toward mathematics can improve, it would in turn influence their achievement and interest in pursuing a STEM-related field. While there have been several studies that regarded parents' attitudes toward mathematics as important and even some suggesting it has an effect on students' attitudes toward mathematics, little has been done quantitatively where parents participate directly. Student attitude scales have been developed and validated to measure student perceptions of parent attitudes, among other factors of student attitudes.

Previous studies have largely used qualitative data collection and analysis to make a connection between parents' and students' attitudes toward mathematics or used quantitative data reported by their child(ren) to quantify their parents' attitude. These studies rely largely on students' perception of parental support, expectation or attitudes toward mathematics. Maloney, Ramirez, Gunderson, Levine, and Beilock (2015) quantitatively studied the relationship between a parent's mathematics anxiety and what effect it had on their elementary (grades 1 and 2) student's achievement. This is the only known quantitative study that directly surveyed parent's mathematics anxiety or attitudes. In order to continue to investigate parents' attitudes toward mathematics and make stronger linkages regarding parents' influence on students' attitudes toward mathematics, there is a need for quantitative connections as well. Methods

This project utilized a quantitative survey design in order to answer the following research questions: What are parents' and students' attitudes toward mathematics? How do parents' attitudes influence their child(ren)'s attitudes toward mathematics? Parents' Attitudes Toward Mathematics 216 Volume 117 (5) We were interested in gaining a better indication of parents' attitudes toward mathematics and what kind of influence, if any, their attitudes had on their child(ren)'s attitudes. Participants and Context Convenience sampling was utilized to collect data from 468 adults and 770 students for seven years (2008–2015) at Family Math Night (FMN) events at multiple area elementary (grades K–5) and middle (grades 6–8) schools in a large urban school district in the upper south central region of the United States. A Family Math Night (FMN) is an event where students, their families, and the community come together for a night to have fun exploring content, activities, and games that support mathematical learning. FMNs are open to all families of students at the school site as well as the surrounding community. The school takes exhaustive recruitment measures to boost participation of families, including informational flyers and phone calls prior to the event, and transportation for families in need the evening of the event. Parents are asked to RSVP in

order for the school to estimate the amount of food needed for the event. The phone calls are made to families who do not turn in RSVPs and reminder phone calls are made to families of underrepresented populations, particularly students of color, low socioeconomic status, and low-achieving students. While the schools encourage all families to attend, it is acknowledged families who do choose to attend may have a positive bias toward mathematics. Data/Instrumentation The surveys used for the current study were adapted from the Attitudes Toward Mathematics Inventory (ATMI; Tapia, 1996). ATMI was first administered to students at a private high school, and four-factors (self-confidence, value, enjoyment, motivation) were identified using exploratory factor analysis (EFA) techniques. Confirmatory factor analyses (CFA) have been performed in subsequent studies, with results supporting instrument validation in different settings, including the setting of interest in the current study—middle grade students.

Tapia and Marsh (2002) found the same four-factor model from the original validation (Tapia, 1996) held for the college students enrolled in mathematics courses. ATMI has also been applied to the middle school grades (Ke, 2008; Tapia & Marsh, 2000). Other efforts to develop shorter surveys using ATMI have also been done (Lim & Chapman, 2013). The items adapted for the Parent Attitudes Toward Mathematics (PATM) and Brief Student Attitudes Toward Mathematics (BSATM) from ATMI were considered as a global measure for attitudes toward mathematics for this study, represented by a composite score used throughout the analysis. The additional factors were intentionally not considered because a single variable was determined to be reasonable as an overall measure of attitude. Parent survey. The Parent Attitudes Toward Mathematics (PATM) survey is a 24-item, 5-point Likert scale survey (strongly disagree! strongly agree; neutral category) intended to measure a single construct of mathematics attitude. Example statements from the survey include: • I do not like people to think I am smart in math. • During math class, I was interested. • I use math in some way every day. • I feel confident when I help my child with math. • It is okay if my child gets below a C in math. The survey took parents approximately 5–8 minutes to complete.

The Flesch Reading Ease was 96.3 and the Flesch-Kincaid Grade Level was 1.6 indicating all Englishspeaking adults should be able to understand the statements in the survey. Due to the nature of the events and to the limited amount of time available for participants to answer the survey, demographic information was not collected. The PATM was first assessed for reliability using Cronbach's alpha for the instrument overall, a 5 .963, indicating a very high reliability. Principal components analysis (PCA) was conducted on the PATM survey to assess for dimensionality and data reduction, thus supporting construct validity of the

instrument. The first component explained 55.621% of the total variance. While three factors were extracted, PCA results suggested a single factor is reasonable. The eigenvalues corresponding to each of the three factors extracted were 13.349, 2.326, and 1.095, respectively. As the ratio of the first eigenvalue to the second eigenvalue is larger than three (Embretson & Reise, 2000) and, by more restrictive, earlier recommendations exceeds four (Lord, 1980), the use of a single factor is supported. The loadings garnered further support for a single measure of parents' attitude being represented by the instrument. The loadings for all of the items on the first component were salient (>0.3; Klein, 1994/2000).

Where items loaded saliently on a second factor, the loading was stronger on the first component. Student survey. While there are several attitudes toward mathematics surveys available (Chamberlin, 2010), the researchers needed an instrument that could be taken by elementary and middle school students in 3–5 minutes. Therefore, the research team administered the Brief Student Attitudes Toward Mathematics (BSATM) survey. The BSATM is a 6-item, 4 point Likert scale survey (strongly disagree ! strongly agree; no neutral category) that Parents' Attitudes Toward Mathematics School Science and Mathematics 217 measures students' attitude toward mathematics. Statements from the survey included: • I like math. • Math is boring. • I do not like people to think I am smart in math. The Flesch Reading Ease of the BSATM was 100 and the Flesch-Kincaid Grade Level was 0.5 indicating all English-speaking school children should be able to understand the statements in the survey. Due to the nature of the Family Math Night and to the limited amount of time available for participants to answer the survey, demographic information was not collected.

The BSATM survey was first assessed for reliability using Cronbach's alpha, a 5 .86, indicating a high reliability (Nunnally, 1978). The BSATM was then assessed for dimensionality and data reduction to ensure the validity of the instrument. A principal components analysis of residual explained 60.475% of the total variance in the measure, which fit the expected results. Data collection. Both surveys were administered during FMNs (described above) at a booth for the students and a booth for the parents. The survey was administered on paper the first two years. Thereafter, the survey was given online using first a secure Moodle platform, and then migrating to Google Forms. Paper copies continued to be used at schools where internet access was unavailable. The survey administration was closely monitored for each event to minimize any outside people accessing the survey. There was only one instance of a nonfamily math night participant taking the survey and it was removed. Efforts were made to get parents to participate. For example, incentives were provided for both the parents and the students to take the survey. The parents were entered into a drawing

for prizes geared toward parents including, coffee mugs, gift cards to restaurants, massages, and so forth. The students received a stamp on their booth sheet (they had opportunities to collect stamps from all the booths at the event) and they turned in their stamped booth sheet at the end of the event to be entered into a drawing for educational door prizes. Food and water was provided for parents and students at the events.

Data Analysis The project utilized a quantitative survey design to answer the following research questions: What are parents' and students' attitudes toward mathematics? How do parents' attitudes influence their child(ren)'s attitudes toward mathematics? Survey data analyses were carried out with SPSS 21.0, a software package used for organizing data, conducting statistical analyses, and generating tables and graphs that summarize data. All cases were originally included in the data set. No cases were removed. Missing scores of the cases were imputed (mode for a given item) in line with Hox's (2010) discussion and the assumption that parents and students who took each survey were representative of the population of interest, respectively. The data analyses involved several steps. First, descriptive statistics were applied to analyze overall item response percentages and note any possible trends in responses. Next, we used one-tailed Pearson correlations to examine the relationships between students' attitudes toward mathematics and parents' attitudes toward mathematics. Lastly, a single predictor regression model was created to examine the extent to which the parents' attitude toward mathematics predicted their child(ren)'s attitudes toward mathematics.

Results to examine the influence of parents' attitude toward mathematics on students' attitudes toward mathematics, cases were matched by names given on the survey—parents provided the student(s)' name(s), and students provided their parents' names. It was optional to provide names on each of the surveys. There were eight cases in which two parents from the same family responded to the survey and had only one student's response. The students' responses for the eight cases were replicated and matched with the other parent's responses, creating 146 matched cases. Parents' Attitudes Toward Mathematics Survey Overall, parents displayed favorable attitudes toward mathematics. All except one item yielded an average of at least three on a five-point scale. In the context of the scale responses, this means parents either did not know, agreed, or strongly agreed. For 5 of the 24 items, the average was at least four, indicating an average response of agree. The mean and standard deviation for all parents' attitudes are presented in Table 1. The skewness (–.667) and kurtosis (.061) were within the normal distribution range of 21.0 to 1.0 (Huck, 2012) for the distribution of mean parents' attitude score for parents who we matched data with their child(ren) (Figure 1)

Children's attitudes towards mathematics and parental involvement in mathematics are both important in their contribution to children's learning outcomes in mathematics, such as achievement, motivation, performance, and participation. Previous research has alluded to the connection, mentioning that parental involvement may be important to consider in research about children's attitudes towards mathematics, but it is not a common focus of research (e.g., Adelson, & McCoach, 2011). It is important to consider the role of parents in children's attitudes towards mathematics in gaining insight into the possibility of parental involvement as providing a way to potentially improve children's attitudes towards mathematics and learning outcomes in mathematics.

Children's attitudes towards mathematics can be considered from several different aspects such as self-efficacy, self-concept, enjoyment, and anxiety, all of which have been found to have different implications for children's learning outcomes in mathematics. For example, children's perception of their ability, their self-efficacy and self-concept, can affect achievement and performance, therefore affecting their motivation in subsequent tasks (Adelson & McCoach, 2011). Moreover, children's feelings, their enjoyment or anxiety, towards mathematics can affect attention and engagement in mathematics (Martino & Zan, 2011). While positive attitudes towards mathematics can result in positive learning outcomes in mathematics, and negative attitudes can result in negative learning outcomes in mathematics, the type of learning outcome that occurs depends on which aspect of a child's attitude has been affected: Selfefficacy, self-concept, enjoyment, or anxiety. This depends on several external factors within a child's environment including the types of support that children Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 8 receive.

Parents are one type of support that can be seen to contribute to children's attitudes towards mathematics. Parental involvement, like children's attitudes, is important because of its complex association to children's learning outcomes in mathematics. Many types of parental involvement have been found to affect children's learning outcomes in different ways; some types of involvement have been found to improve children's learning outcomes, while some have been found to hinder it (e.g., Cao, Bishop, & Forgasz, 2006). For example, if parents communicate with their child about mathematics in a positive manner, such as playing mathematics-related activities or displaying support and encouragement, then this has been found to improve children's learning outcomes in mathematics such as achievement and participation, as well as enjoyment in mathematics (Cao et al., 2006). However, if parents display negative attitudes towards mathematics, have low expectations of their child, and help

their child in ways that undermine their child's ability, such as the roles that parents take on in helping in homework, then this is suggested to result in lower performance, participation, and achievement in mathematics (Cao et al., 2006).

External and internal factors exist that affect children's attitudes towards mathematics. Namely, this includes how a person thinks about mathematics, their predispositions as a person in society, and how the people around them think about mathematics (Adelson & McCoach, 2011). The literature suggests factors such as children's perceptions, achievement, gender, and support have received the most attention and have been found to influence children's attitudes towards mathematics in different ways (e.g., Adelson & McCoach, 2011). The ways in which these factors influence children's attitudes will be discussed in the following section. Internal Internal factors refer to individual aspects that can affect how a person feels and thinks about mathematics (Martino & Zan, 2011). This is the beliefs aspect of a person's attitude towards mathematics. Internal factors therefore refer to a person's perceptions about mathematics: how they think and feel about the subject (Adelson & McCoach, 2011). People's beliefs about mathematics are important because it affects how they react to mathematics, reinforcing their existing thoughts and attitudes towards mathematics (Martino & Zan, 2011).

The perceptions children hold about mathematics can influence their achievement and learning (Adelson & McCoach, 2011). Common perceptions in mathematics include enjoyment, ability, and usefulness. Enjoyment of mathematics has been found to be associated with mathematics ability, whereas enjoyment and perceived usefulness are seen to be related to mathematical persistence and enrolment in future courses in mathematics (Adelson & McCoach, 2011). This indicates that these factors are interrelated and have a combined influence on children's learning outcomes in mathematics such as ability, persistence, participation, and achievement (Adelson & McCoach, 2011). Perceived usefulness is a term used to define children's beliefs about the usefulness of mathematics presently and in the future (Adelson & McCoach, Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 16 2011; Bisans & Gierl, 1995; Murimo, 2013). This includes a person's thoughts about its worth, applicability, and practical use (Adelson & McCoach, 2011; Yim & Chapman, 2013). The concept is considered as a part of the affective domain and an important component in attitudes towards mathematics. It is important for children to perceive mathematics as useful because of its implications in children's learning outcomes (Adelson & McCoach, 2011). Children's perception of the usefulness of mathematics, both immediately and in their future, is a variable shown to be associated with

mathematics participation, persistence, motivation, and achievement (Adelson & McCoach, 2011; Murimo, 2013).

How children perceive mathematics is also linked to how they will use mathematics (Young-Loveridge, Taylor, Sharma, & Hawera, 2006). Adults are suggested to influence children's perceived usefulness of mathematics (Adelson & McCoach, 2011; Bisans & Gierl., 1995). This can be through societal beliefs and family situations. Children whose parents have higher levels of education and more possessions are more likely to perceive mathematics as useful (Murimo, 2013). Furthermore, families with higher levels of socio-economic status are likely to perceive mathematics as important for their children and their children's learning outcomes. This helps to explain why family situations influence children's perception of the usefulness of mathematics (Adelson & McCoach., 2011; Murimo, 2013).

The enjoyment of mathematics is seen as the extent to which children enjoy mathematics' classes and the subject matter. It is considered to be a part of the affective dimension of the attitudes domain. Enjoyment in mathematics is an important aspect to understand as this has several implications for children's learning outcomes in mathematics, such as increased problem-solving, motivation, performance, participation, attention, and engagement, as well as their self-concept in mathematics (Adelson & McCoach, 2011). A person's enjoyment in mathematics has been found to be improved by their Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 17 participation in mathematics-related games, positive learning environments, and achievement. The relationship between enjoyment and learning environment has been found to be reciprocal, where enjoyment determines the nature of the learning environment and the learning environment determines enjoyment. This could be related to the classroom and teaching styles.

Teacher enjoyment has been found to influence children's enjoyment in mathematics. When teachers display enthusiasm in mathematics, it is suggested that children are more likely to enjoy themselves. This can also be influenced by different teaching styles, affecting the teaching environment. For example, teachers that are motivating and supportive can contribute to children's enjoyment in mathematics. Games are suggested to increase interest in mathematics because children enjoy activities that are considered as fun (Bragg, 2007). Game-playing has been found to have a positive effect on children's attitudes towards mathematics (Bragg, 2007). Children have reported that they enjoy games that provide a positive experience (Bragg, 2007). However, it may be difficult to measure children's

enjoyment of games in relation to their learning due to the ambiguity that surrounds the definition of attitude (Bragg, 2007).

Regardless, games have been found to fire children's interest and motivation because children enjoy competition, challenge, and fun (Bragg, 2007). The relationship between enjoyment and achievement has been found to be reciprocal. That is, if children enjoy mathematics, they are more likely to have high levels of achievement, and if children have high achievement in mathematics, they are more likely to enjoy mathematics. This is important in considering the implications that achievement has for children's enjoyment of mathematics, and therefore, their attitudes towards mathematics. Perceived ability is the term used for a person's belief in their capability of completing tasks. This is an umbrella term that has been used for self-concept and Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 18 self-efficacy (Adelson & McCoach, 2011). Children's perceived ability is important because it has been found to be related to performance, motivation, engagement, ability, participation, and overall attitudes towards mathematics. When children have doubts in their ability, the aforementioned factors, such as performance, motivation, and participation, may be hindered.

Children are more likely to report low levels of confidence than children who perceive their mathematics at a high level (Young-Loveridge, 1992). It must be noted that actual ability does not reflect a person's perceived ability; actual ability and perceived ability can be different (Miserandino, 1996). However, perceived ability is important as it influences many learning outcomes in children's mathematics. Factors that can influence children's perceived ability in mathematics include previous experiences in mathematics, and the status and beliefs of the people around them (Miserandino, 1996). Previous performance has been found to help to form a child's perception of ability. This deems their learning experiences important. Furthermore, people in children's lives can influence their perception of ability (Miserandino, 1996). Learning environments, teaching styles, parents' beliefs, and parents' background have all been found to affect certain aspects of children's attitudes. Parents' beliefs, such as their perception of their child's competence can affect children's beliefs about themselves (Miserandino, 1996). If parents believe that their children are capable of completing a task, their child is more likely to perceive themselves as capable, therefore affecting their behaviour. Also, families with a high socio-economic status have been found to be associated with better perceptions in ability than those with a low socio-economic status. Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 19 External External factors are aspects of a person's mathematics experienced outside of themselves that affect

how they feel and think about mathematics through experience; factors include perceptions about gender, support from teachers, peers, and parents, and achievement in mathematics (Adelson & McCoach, 2011).

How these factors influence people's attitudes towards mathematics depends on the perceptions that exist about gender and mathematics, the level of support that they receive from their teacher, peers, and/or parents, and their level of achievement in mathematics. These factors can affect children's different perceptions about mathematics in different ways, therefore influencing their attitudes (Adelson & McCoach, 2011). These factors are important in understanding how a child's immediate surroundings can influence their attitudes, thus indicating the importance of children's environments. Children's attitudes towards mathematics can be influenced according to gender because of the societal beliefs that exist about gender and ability in mathematics.

The main belief is that boys are better at mathematics than girls. This belief can be passed on through teachers, parents, and peers, and ultimately affects children's perceptions of ability in mathematics. The marked difference in boys' and girls' perceptions of their mathematics ability is said to have decreased in recent years, but there is still a notable difference. Girls have been found to demonstrate lower self-efficacy, self-concept, and self-confidence in their mathematics ability than boys. These attitudes are said to be more notable later in schooling, rather than at the primary school age. This is found to be related to adolescents' susceptibility to social beliefs and change in gender identity around this age.

However, some research reports gender differences at younger ages, where boys are more likely than girls to indicate positive attitudes towards mathematics. This is an important issue to note because lower perceptions in ability could affect children's performance in mathematics (Muzzatti & Angoli). Changes in children's attitudes are more often related to social context than experience. Social contexts include school and home environments where different types of support in mathematics can affect children's attitudes towards mathematics. High levels of support from home and school have been found to influence children's self-concept, self-esteem, participation, and motivation in mathematics. However, it is important to note that perceived support determines learning outcomes in mathematics more than actual support. Support from more than one source is said to increase the facilitation of positive attitudes towards mathematics, especially when support is received from parents in conjunction with teachers.

Peers are another source of support, one which can readily hinder or foster positive attitudes, depending on the overall peer group's perception of mathematics. Social support is considered as any type of support with children's education that comes from teachers, peers, or parents. For teachers, this namely refers to their work inside the classroom: their teaching style, classroom environment, and overall attitude towards mathematics that they portray. Peer support mainly encompasses the school environment in which a child is learning with their peers. The nature of the environment, whether or not it supports children's mathematics learning, depends on the attitudes and behaviours of the peer group. Parents' support is any support that the parent provides that is related to mathematics; this ranges from help with schoolwork at home to communication with the school.

Despite the differences in support from teachers, peers, and parents, all have been found to influence children's learning outcomes in mathematics and their attitudes towards mathematics to some extent. Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 21 Teachers are seen to influence children's attitudes towards mathematics through their teaching techniques, classroom environment, and their actions and behaviour towards mathematics. This is because they largely determine the classroom environment. For example, 'fun' lessons, where the teacher displays enthusiasm and mediates activities that children consider as fun, have been found to increase positive attitudes towards mathematics. This is because teacher support can affect children's perceptions about mathematics.

A teacher's influence on perceptions has been found to occur indirectly, through the teacher's actions and behaviours. For example, if the teacher shows enjoyment in what they are teaching, this affects their teaching style and the environment which results in a more enjoyable lesson for children. Peers influence children's mathematics achievement and attitudes through a child's desire for acceptance; this includes one's need for approval, identification with friends, the need to be correct, and the need for selfenhancement. Peers within the school environment provide an academic comparison group for this to happen. It has been found that positive support from peers can result in positive attitudes, whereas negative support can lead to negative attitudes, anxiety, and avoidance in learning.

Peer support is therefore associated with enjoyment, anxiety, self-concept, and interest in mathematics. Parental support is complex in nature as it encompasses several roles that parents can take on in order to help their children in mathematics. Different roles can have different effects on children's attitudes towards mathematics. These roles can include helping

with homework, everyday conversations about mathematics, and communication with the teacher. Overall, parental involvement has been found to increase positive attitudes towards mathematics, affecting self-concept, selfefficacy, and affect. Moreover, parents can influence children's attitudes towards mathematics through Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 22 their own attitudes, actions, and behaviours; this is similar to the effect of teachers.

Teacher, peer, and parental support is important because of the multitude of ways that they can influence children's attitudes towards mathematics. This is seen in the environment that they create through their own attitudes, behaviours, and actions related to mathematics. Teacher, peer, and parental contribution has been found to affect a large range of perceptions and outcomes associated with children's attitudes towards mathematics, therefore due consideration about children's attitudes should be given with such support in mind. Factors Influenced by Attitudes It has been found that several factors can be influenced by children's attitudes towards mathematics (Adelson & McCoach). Achievement is a commonly discussed factor related to attitudes towards mathematics as both influenced by attitudes and influencing attitudes. Other factors include (but are not limited to) children's motivation, performance, and participation in mathematics (Adelson & McCoach, 2011).

It is important to understand how attitudes influence, and are influenced by mathematics learning because of the implications attitudes have for children's learning outcomes in mathematics (Ocak, & Yamac, 2013). Children's perceptions about mathematics and their overall attitudes towards mathematics have been found to be related to different learning outcomes in mathematics such as motivation, participation, performance, and overall marks in mathematics). For example, higher levels of self-concept have been found to increase motivation, whereas high levels of self-efficacy have been found to increase performance and participation in mathematics. However, both are seen to boost mathematics achievement (Ocak, & Yamac, 2013). It is helpful to include different aspects of attitudes, like self-concept and self-efficacy, in order to understand learning outcomes in mathematics both individually and in general. This is to better understand the complexity of the nature of attitudes and the factors that it influences and are influenced by. Much focus has been placed in the literature upon the relationship between children's attitudes towards mathematics and mathematics achievement.

However, the direction of the influence between the two remains unclear. Several studies within the literature have attempted to investigate which factor causes the other, but results

between studies still appear to be inconsistent. However, understanding this relationship between attitudes and achievement is important in improving the teaching and learning of mathematics. Several studies argue that children's attitudes towards mathematics influences their achievement in mathematics. Generally speaking, research reporting how attitudes influence achievement have found that children with positive attitudes towards mathematics are more likely to score higher in mathematics than those who have negative attitudes. Furthermore, positive attitudes are believed to encourage participation, performance, and motivation, whereas negative attitudes are found to result in avoidance, mathematics anxiety, low performance, and low achievement (Gunderson, Ramirez, Levine, & Beilock, 2012).

In contrast to this belief, other studies in the literature have argued that it is achievement that influences children's attitudes towards mathematics. Of those who have found that achievement influences attitudes, they maintain the notion that if children achieve well, they will have positive attitudes towards mathematics. These studies provide a controversial view of the relationship between attitudes and Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 24 achievement, arguing that the relationship between the two factors is not clear. This is reinforced by the findings that children who experience high levels of achievement have been found to hold positive attitudes towards mathematics, and children who do not achieve as highly are found to hold negative attitudes towards mathematics.

Furthermore, they argue that even if children have negative attitudes, they may still achieve well because achievement is not affected by children's attitudes towards mathematics. This would seem to essentially negate the importance of attitudes in children's learning of mathematics. It appears, given the inconsistency of the literature, that the relationship between children's attitudes towards mathematics and their achievement in mathematics is reciprocal in nature. This has been suggested by several researchers who have investigated the causal relationship between the two. In these studies, researchers have found that achievement has affected children's attitudes, and in turn attitudes have affected their achievement. For example, motivation has been found to affect children's attitudes towards mathematics, such that if a child can see the positive learning outcomes and success they will have in mathematics, it will justify their positive attitude towards mathematics, therefore increasing participation. In addition, children's attitudes have been found to be related to their level of performance, which in turn affects their attitude towards mathematics.

This means that if a child has negative attitudes towards mathematics, they are more likely to perform poorly, which in turn reinforces their existing negative attitude. These examples

illustrate the mutual relationship that can exist between attitudes and achievement in mathematics. This is important to consider as it could affect the impact that achievement and attitudes have on the teaching and learning of mathematics. Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 25 2.1.4 Summary The three factors of achievement, perceptions, and support are a focus in this literature review because of the complexity of their roles in, and the implications that they have for children's attitudes towards mathematics. Each factor, while contributing to overall attitudes, contributes to different facets of children's attitudes (e.g., self-concept & self-efficacy) towards mathematics in different ways (e.g., performance, achievement, & motivation). This is important to understand in order to facilitate future learning of mathematics. The relationship between attitudes and achievement is complex. The findings of the direction of the influence between the two remain inconsistent.

Some researchers have argued that attitudes influence achievement, some argue that it is achievement that influences attitudes, and some researchers have suggested that the relationship may be reciprocal. Regardless, it is evident that there is a positive relationship between children's attitudes towards mathematics and their achievement; this has been found to be dependent namely on children's perception of their ability and the type of achievement in question. Perceptions are a factor in children's attitudes towards mathematics that has received attention because of its many different facets and the various implications that can exist for children's achievement and learning in mathematics). For example, self-efficacy has been found to affect a person's performance, and self-concept can affect not only performance, but also a person's achievement and participation (Adelson & McCoach, 2011). Researchers have found that different aspects of children's attitudes towards mathematics can affect participation, motivation, performance, future subject choice, and overall achievement in mathematics Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 26 (Adelson & McCoach, 2011). It is important to understand each facet in order to examine how together they affect overall attitudes towards mathematics, children's learning, and their achievement in mathematics. The social support from others that children receive is also important because children's perceptions have been found to be influenced by their support systems.

The support of teachers, peers, and parents can affect children's attitudes towards mathematics: their self-concept, self-efficacy, affect, and perceived usefulness of mathematics. This then affects their motivation and achievement in mathematics. This support affects children's attitudes towards mathematics namely through the feelings and actions of

teachers, peers, and parents. Support is an important factor because it can influence how children think and feel about mathematics, which affects their attitudes towards mathematics, and therefore impacts on their learning outcomes in mathematics. It is important to understand the many facets of children's attitudes towards mathematics and the factors that influence, and are influenced by attitudes, in understanding how children's attitudes influence their mathematics learning.

While it is evident that children's attitudes affect children's learning, this statement does not provide insight into how these attitudes are important in children's learning. Several factors aforementioned such as children's perceptions and social support have different effects on children's achievement in different ways, and so describing and explaining those different effects is crucial in fully appreciating the importance of children's attitudes towards mathematics (Adelson & McCoach, 2011).

The following section explores parental involvement in children's mathematics learning. It first describes the different types of involvement that parents can engage in, in order to understand the complexity of involvement and its influences and learning outcomes in mathematics. This section will then explain the factors Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 27 that can affect parents' level of involvement, the outcomes of parental involvement, and finally the importance of involvement in the home; its implications, and outcomes will be emphasised.

Definitions Parental involvement is multi-faceted and encompasses a wide variety of parental behavioural patterns and parental practices (Fan & Chen, 2001). Researchers have previously examined parental involvement according to categories such as: providing support, motivation, monitoring, advice, communication, providing resources to learn, and teaching roles like helping with homework. More simply, parental involvement can be split into involvement at home and at school. Home involvement is defined as assisting one's own child at home with informal and/or school directed learning in mathematics. This can be divided further into reviewing work, monitoring progress, helping with homework, and discussing school events or course issues (Green, Walker, Hover-Dempsey, & Sandler, 2007).

School involvement includes any communication or participation that the parent has at school. This can be further divided into communication with the teacher, participation in school activities, requesting for extra help, and attending workshops to further assist their children (Cai, 2003). The vast number of categories alone indicates the complex nature of parental involvement. However, exploring several types of parental involvement is necessary

as it has been found that different types of involvement can have different implications for children's mathematics achievement and other learning outcomes in mathematics. Parental Involvement at Home The most influential contexts in which children's learning and development occurs are at home and at school. Therefore, it is surprising that the literature pertaining to parental involvement at home involving children at the primary school age is scarce. Involvement at home is important because the extent to Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 28 which parents are involved at home in mathematics activities has been found to enhance children's general attitudes towards mathematics, cognitive development, mathematics skill, mathematics performance, and numeracy knowledge.

Furthermore, parental involvement at home has been found to be associated with higher learning outcomes in mathematics for children who have previously shown low mathematics skill. However, this depends on the type of involvement that occurs. Home has been considered as the basis for supporting learning at school, meaning that early learning at home provides the foundation for learning at school (Hawighorst, 2005). This is partly because of the aforementioned implications it has for children's learning outcomes in mathematics; learning in the home can be seen to further enhance children's learning outcomes in comparison to only learning at school. When children learn in the home, they integrate the education they receive at home with school education, which improves their learning outcomes (Hawighorst, 2005). Home learning has been suggested to be important because it deals with different kinds of mathematics that is suggested to foster children's interest and participation in mathematics (Hawighorst, 2005). School mathematics are said to contain artificial problems, problems that do not necessarily have real life application for the present situation, where children look for abstractions and generalisations (Hawighorst, 2005). With school mathematics, children are said to be motivated by external factors such as classroom environment. At home, children are looking at practical problems and are suggested to be more motivated by internal factors, such as interest (Hawighorst, 2005).

This is important because home can foster children's attitudes towards mathematics in general, thus improving their learning outcomes in mathematics, reiterating the importance of learning at home as a basis for learning at school. Involvement in mathematics at home is considered as parents assisting their child at home in informal and in school-directed mathematics-related activities (Cai, 2003). These roles can include parents as motivators, monitors, Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 29 resource providers, mathematics content advisers, homework helpers, and mathematics

learning counsellors. Mathematics content adviser, homework helper, and mathematics learning counsellor are roles that parents play in directly assisting children's learning of mathematics at home.

Parents as motivator, monitor, and resource provider are roles that parents play in providing emotional and resource support in children's learning and are considered as indirect types of assistance (Cai, 2003). It is more effective for parents to serve the indirect roles of motivators and monitors than to be content advisors in children's mathematics learning at home (Cai, 2003). Direct involvement roles such as content advisors and learning counsellors have been found to be less important predictors of achievement and can be associated with negative learning outcomes in mathematics for children. It is important to consider both indirect and direct involvement in understanding the type of learning outcomes that direct and indirect involvement can facilitate, such as improved numeracy skill, achievement, performance, and participation.

Direct involvement at home generally pertains to parents' involvement in tasks purposefully designed to develop and improve children's mathematics skills. This includes parents in roles such as mathematics content adviser, homework helper, and mathematics learning counsellor (Cai, 2003). These roles usually encompass parents' involvement in mathematics-related homework and games. These roles have been found to be less important for children's achievement than other roles that parents can take on such as motivator, monitor, and resource provider (Cai, 2003). This is because direct involvement has been found to be associated with negative learning outcomes in mathematics for children. However, this mostly refers to involvement with homework; some positive learning outcomes have been found for families who engage in other mathematics-related activities, such as games. This is especially applicable for younger children. Positive learning outcomes in mathematics for involvement in games Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 30 include increased performance and numeracy skills.

This shows that although direct involvement can be associated with negative outcomes, this is not always the case. It has been found that parents often report their involvement in homework but it has also been found that involvement in homework can have a negative impact on children's learning performance and self-concept. This is believed to be because parents are more likely to become engaged in their children's homework tasks by monitoring and supervising their child, often focussing on 'drill and practice' exercises. Regardless of the

negative impact that has been found to be associated with helping with homework, it is suggested that many parents are limited to this kind of involvement.

This may be due to their ability and knowledge in mathematics (Clinton & Hattie, 2013). It may be possible that some types of direct involvement, such as engagement in mathematics-related games and activities could be associated with positive outcomes. Activities at home that support mathematics learning have been reported to include tasks such as cooking, board games, computer games, and shopping. Tasks like these have been found to promote positive experiences in mathematics and improve children's learning outcomes in mathematics such as performance and numeracy skills, as well as their self-concept. Indirect involvement at home pertains to support that does not directly relate to helping children with mathematics. This includes encouragement, parents' expectations of their child to achieve in mathematics, communication about mathematics, and parents' attitudes towards mathematics.

Indirect involvement differs from direct involvement such that types of indirect involvement are seen to facilitate children's mathematics learning in roundabout ways that are not necessarily obvious. These roles are important because they have been found to be associated with increased mathematics achievement, participation in mathematics, mathematics self- Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 31 efficacy, and mathematics enjoyment. The role of support from parents is considered to include parents' display of encouragement and interest in children's mathematics learning (Rice et al., 2013). Thus support includes parents' expectations for their child's achievement and family conversations about mathematics. This type of involvement is important because supportive parent-child relationships and interactions can have a positive influence on children's social, emotional, and educational development and can affect children's self-concept and overall attitudes towards mathematics. It is important to note that although parents' support can be effective, this depends on children's perception of their parents' support. If a child does not perceive their parents to be supportive, regardless of parents' actual level of involvement, then this can still result in negative outcomes for children.

However, it is important to look at the role of support in understanding ways that parents try to get involved in their child's learning. Parents' expectation for their child's success is influenced by their perception of their child's ability and perceived difficulty of the task, as well as their own attitude towards mathematics. If parents do not believe that their child is very able in mathematics, this could result in lower expectations for their child, which can

then influence the child's expectations of themselves. Also, if parents have a negative attitude towards mathematics, then this can be projected towards their child through their expectations, shown through parents' reinforcement of desired behaviours that are similar to their own.

Parents' expectation of their child's achievement is important because it has been found to be associated with children's achievement in mathematics (Fan & Chen, 2001). Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 32 Communication about mathematics can provide a way in which parents' expectations are transmitted to children. Depending on parents' own feelings about mathematics, the ideas that parents portray to their child in conversing about mathematics can affect children positively or negatively. If parents make comments about their contentedness with low achievement in mathematics, this can portray the idea that it is not necessarily important to achieve well in mathematics; this can influence children's expectations of themselves in mathematics.

However, if parents portray their expectancy that their child should achieve well in mathematics, this can help to improve children's performance, achievement, self-efficacy, and enjoyment of mathematics (Clinton & Hattie, 2013). Positive communication about mathematics is therefore important in improving children's learning outcomes in mathematics. Positive parent-child communication relating to mathematics can be seen to include talking about children's school mathematics and incorporating mathematics into everyday conversations. Talking about mathematics in school has been found to be positively associated with children's enjoyment. Incorporating mathematics into everyday conversations has been found to improve numeracy skills and overall attitudes towards mathematics. This is important in providing ways that parents can be involved positively at home, as not all parents can be involved in their child's school life.

Parental Involvement at School Involvement at school pertains to parents' communication with the teacher, participation in school activities, and providing extra help for their child, such as requesting for extra help and attending workshops to further help their child (Cai, 2003). Parents' involvement at school is important because it has been found to lead to higher performance for children (Strayhorn, 2010). However, this can sometimes be difficult because of parents' demanding workloads, daily stress, and knowledge and ability to help with mathematics. Regardless, it is important to build bridges between educators and parents in order to provide a solid education for children and improve children's learning.

Communication between the school and parents has been found to improve children's achievement; it can provide parents with a better understanding of the difficulties that their children are experiencing in mathematics, more understanding of the mathematics curriculum, and can inform them of ways that they can help their children (Galindo & Sheldon, 2010). Conversely, parents who are willing to participate in their child's mathematics learning in a positive way can help teachers by providing additional insight into their child's development that could aid the teacher in providing quality mathematics learning. Thus it is important for parents to communicate with teachers to help their children both at school and at home. Communication between the school may also provide the right information in being able to improve the level of parental involvement at home (Zhao & Akiba, 2009). Parents' involvement in school activities include parents helping in the classroom, attending school events, attending parent-teacher conferences, and participating in mathematics workshops.

Parental involvement in activities like these is suggested to increase when schools are supportive and enthusiastic about parental involvement. School's support of parental involvement at school can be displayed through the implementation of such activities and practices that encourage these interactions. Parental involvement at school is important because it has been found to reduce children's behaviour problems and increase attendance, grades, and overall achievement. However, due to parents' busy lives, involvement can often be limited to when children are struggling or having problems in mathematics. When involvement is limited in this way, parental involvement at school can have a negative impact for children as they may associate their parents' involvement with their inability in mathematics, which can then affect children's Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 34 mathematics self-concept (Tan & Goldberg, 2009).

Thus it is important that parental involvement is not only in response to negative mathematics experiences and/or learning outcomes. Workshops designed to support parents in their knowledge and understanding about how mathematics is being taught at school is important as it can increase parental involvement. Furthermore, it may help to increase parents' teaching confidence, conversations about mathematics at home, and minimise parent deficiencies in mathematics involvement. The effects for children whose parents participate in mathematics workshops have been found to be an increase in performance, achievement, and overall positive attitudes towards mathematics.

Furthermore, participation in mathematics workshops could help to strengthen the school-home partnership, which can help to maximise children's mathematics learning. A common issue with parental involvement is that parents are unsure of how best to help their children with mathematics and/or do not have the knowledge and understanding to be effectively involved. This can compound as children move through the grades, and so involvement becomes more difficult (Sheldon & Epstein, 2005). Mathematics workshops are one way to combat parents' confusion about how best to help, but this type of involvement can be difficult to maintain because of parents' busy schedules. Other means of building parents' knowledge is by strengthening home-school partnerships, parent-teacher rapport, having teachers that are enthusiastic about these programmes, and providing simple after-school options and take home exercises that are easy to use and understand.

This provides parents with several ways to expand their mathematics knowledge, enabling them to better help their child's learning in mathematics. Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 35 2.2.2 Factors that Influence Parental Involvement The type and level of parental involvement has been found to be influenced by several factors such as parents' background, the level of mathematics for parent and child, and the child's age. This is because these factors contribute to parents' perception of involvement, which determines the ways in which they get involved. For example, parents with a low level of education may not have the necessary knowledge to teach their child mathematics and instead get involved by monitoring their child's homework (Clinton & Hattie, 2013). This section discusses these aspects, focussing on types of parental involvement, their impacts, and barriers to involvement. Family background is an important determinant of success at school. However, the effectiveness of parental involvement can depend on the type of involvement, which can be influenced by parents' ethnicity, level of education, socio-economic status, and past experiences in mathematics.

This is because these factors affect parents' perceptions about involvement in their child's mathematics learning, therefore affecting how they become involved. It has been found that parents with a high socio-economic status are more involved than parents with a low socio-economic status. Conversely families from low socio-economic backgrounds are often keen to get involved in their children's learning and may have high expectations of their child, but do not necessarily know how to best help their child (Clinton & Hattie, 2013). This has been attributed to their level of education, attitude, and/or experience in mathematics. It has been suggested that lower socio-economic families struggle being involved because of their previously negative experiences in mathematics (Clinton & Hattie, 2013).

Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 36 Ethnicity is suggested to have an impact on parents' level of involvement because different cultures may have different ideas about learning and parental involvement in mathematics. This in turn, can affect how different ethnic families become involved. In New Zealand, it has been found that Pacific and Asian families have the highest expectations of their children in mathematics achievement, in comparison to Māori families who have been found to have lower expectations of their children in their mathematics achievement (Clinton & Hattie, 2013). Regardless of ethnicity, most parents are keen to be involved in their child's mathematics learning but can be unsure of how to best help due to lack of knowledge or past experience in the education system (Clinton & Hattie, 2013).

Thus it appears that level of education or experience could be more important in influencing involvement, rather than cultural differences. A lack of mathematics content knowledge can limit the ways in which parents are involved in their child's mathematics learning. This may be attributed to their level of education in mathematics. Furthermore, the difference between how children are presently taught mathematics in comparison to how parents were taught mathematics can be seen to disadvantage parents in being able to be involved (Marshalll & Swan, 2010). This causes concern for parents as their eagerness to help can be barred by their ability to help. However, a lack of mathematics knowledge helps to explain why it is common for parents to indicate 'monitor of homework' as their role in their involvement with their child's mathematics learning (Clinton & Hattie, 2013). It could be that their lack of mathematics knowledge limits their involvement to monitoring their children's learning rather than teaching or getting engaged in the mathematics that their child is learning. Parents' level of education is important because those that have higher levels of education have been found to communicate ideas better and have higher expectations of their child in terms of their mathematics achievement.

This is in contrast with parents who have lower levels of education who have reported concerns about homework set, topics learnt at school, and their inability to help. This can create tension and result in negative experiences for Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 37 both parents and children. It is important that parents are knowledgeable in how best to help their child in improving children's learning outcomes in mathematics. Parents with lower levels of education are unsure or unable to help more than parents with higher levels of education, and so it is important to consider this factor and its' impact on parents' level of involvement.

Parents' past experience in mathematics at school has been found to affect their level of involvement in mathematics (Clinton & Hattie, 2013). Parents who had positive past experiences in mathematics at school have been suggested to be more willing to be involved in children's mathematics learning, whereas parents with negative mathematics experiences are suggested to be uneasy about engaging in mathematics-related activities with their child (Marshall & Swan, 2010). Past experiences can contribute to a person's perceptions about, and attitudes towards mathematics; thus affecting how they engage in mathematics. Parents with negative mathematics experiences may not have knowledge necessary to help their child due to a lower level of engagement in their previous mathematics learning, which explains their uneasiness to help.

Thus how a parent has experienced mathematics in the past can affect how they will get engaged in mathematics with their child in the present and future. This is important because it can then affect children's learning outcomes in mathematics. Parental involvement can also be affected by children's age and level of mathematics (Clinton & Hattie, 2013). As children grow older and they become more independent, parents' involvement changes. This may be because of a child's age, but can also be due to the child's level of mathematics (HooverDempsey & Sandler, 2007). At younger ages, pre-school, it has been found that parental involvement in mathematics is consistent. But as children get older, and mathematics becomes more complex, it is common for the Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 38 level of parental involvement to decrease. This is found to be attributed to parents' level of understanding and knowledge in mathematics as children progress through school.

It is suggested that parents may lack the teaching skills needed to help children with more complex mathematics topics, such as fractions or algebra. It is important that children perceive their parents as involved in their mathematics learning in order to improve learning outcomes (Clinton & Hattie, 2013). 2.2.3 Summary Parental involvement is a complex topic regarding the implications that it can have for children's learning outcomes in mathematics; this is dependent on the type of involvement. Of specific interest are the roles that parents can take on at home to help children with their mathematics. This is because many types of mathematics-related activities at home are associated with positive learning outcomes for children and the home provides a space in which can be used to promote positive attitudes towards mathematics (Galindo & Sheldon, 2010).

The involvement factors of limited knowledge in mathematics, involvement in homework, and home involvement types associated with positive outcomes (e.g., support, encouragement, attitudes towards mathematics, and participation in mathematics-related conversations and games) are important in understanding how the level and type of involvement is vital in promoting positive learning outcomes for children. Parents' limited knowledge of mathematics has been found to be a large barrier to parents' ability to be positively involved in children's mathematics learning. Lack of knowledge has been found to be attributed to factors such as level of education and past experience (Marshalll & Swan, 2010). Level of education has been found to hinder parents' ability to help as they may not have the mathematics knowledge or teaching skills to help their child.

Therefore parents can become limited to only monitoring children's homework, a role associated with negative learning outcomes in mathematics for children. Past experience also limits parents' Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 39 knowledge of mathematics if parents have had negative experiences in mathematics which resulted in a negative attitude towards mathematics and disengagement from mathematics. This would limit their knowledge in mathematics, thus making them uneasy in their ability to help their child with mathematics. Homework has received much attention in the literature and is an important aspect of parental involvement to consider due to the amount of parents that report their involvement in homework and because it has been found to be associated with negative learning outcomes and negative attitudes towards mathematics for children. Homework involvement often translates to parents' help in mathematics by monitoring work; this can often result in lower self-concept and achievement in children's mathematics.

Given the relationship that involvement in homework has with negative learning outcomes and attitudes for children, it should be surprising that many parents continue to report their involvement in monitoring homework (Clinton & Hattie, 2013). However, due to many parents' lack of knowledge, teaching skills, and understanding in mathematics, this trend has continued. This is of large importance as it illustrates parents' willingness to be involved, but inability to be involved in ways that may be more advantageous to children's learning outcomes in mathematics. An important consideration from this literature review is parental involvement at home with other activities that have been found to be associated with positive outcomes.

These roles include support, encouragement, attitudes towards mathematics, and participation in mathematics-related conversations and games. These types of involvement have been associated with positive learning outcomes for children such as achievement, increase in numeracy skills, and improvement in participation in mathematics, as well as positive self-efficacy, self-concept and enjoyment in mathematics. Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 40 Encouragement, support, and parents' attitude towards mathematics are important as they have been found to influence children's perceptions about themselves and mathematics, which then influences learning outcomes in mathematics.

It has been found that if a parent expresses their interest in their child's mathematics learning and engages with their child in a positive manner, then this can result in children's positive perceptions towards mathematics (Clinton & Hattie, 2013). Mathematics-related games and activities are a way in which parents can be positively engaged in and foster children's positive perceptions towards mathematics, thus improving their learning outcomes in mathematics (Kilman, 2006). This review provides insight into the importance of exploring types of involvement that can promote positive learning outcomes for children and possible reasons as to parents' choices in their level and type of involvement. Given the potential that the home can have in facilitating positive learning outcomes for children, it is surprising that it has received less attention in the literature than involvement in schools (Jackson & Remillard, 2005). Furthermore, of the literature examined about parental involvement at home, much of the research has focused on involvement in homework, which is commonly associated with negative learning outcomes for children and negative attitudes towards mathematics.

Parental involvement in homework is commonly attributed to parents' limitations in their abilities to be involved due to their lack of knowledge and teaching skills in mathematics (Clinton & Hattie, 2013). Considering other types of parental involvement can enable insight into potential ways that parental involvement can facilitate children's positive attitudes towards mathematics and better learning outcomes in mathematics 2.3 Justification of the Study Research about children's attitudes towards mathematics and research about parental involvement in mathematics provide a breadth of knowledge and it is evident that children's attitudes and parental involvement are important in their contributions to children's learning outcomes, such as achievement, motivation, Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 41 performance, and participation.

However, there is little research that focuses on the connection between children's attitudes and parental involvement, specifically parental involvement at home and with children at the primary school age (Adelson, & McCoach, 2011). This is an important area to research because parental involvement could provide a way to facilitate children's positive attitudes towards mathematics therefore enhancing children's learning outcomes in mathematics. The role of parents in children's attitudes towards mathematics is important because of the types of parents' indirect involvement, specifically at home, that are associated to children's positive attitudes towards mathematics (Galindo & Sheldon, 2010; Kilman, 2006; Muir, 2011).

It has been found that parents' involvement can influence children's perceptions and confidence in mathematics, (self-concept and self-efficacy) and their feelings towards mathematics (anxiety and enjoyment) through different types of involvement, namely parents' perceptions, expectations, support, and attitudes towards mathematics (Fan & Chen, 2001). Other types of involvement at home, such as conversations about mathematics and games in mathematics, can provide ways in which these types of involvement can foster children's positive attitudes towards mathematics (Clinton & Hattie, 2013; Kilman, 2006). Although research has alluded to the connection between children's positive attitudes towards mathematics and parental involvement in mathematics, research that focuses on the connection between children's attitudes and parental involvement is not as common as a focus on teachers or peers. Furthermore, parental involvement at home has received less attention than parental involvement at school.

Home involvement should be considered as important because children's indirect experience with number, especially in motivating contexts like games, have been found to enhance children's numeracy knowledge, Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 42 mathematics skill, and overall achievement (Kilman, 2006). Parents' engagement with these activities can influence children's perceptions about mathematics through parents' expressions of interest, mathematics expectations, and attitudes towards mathematics (Galindo & Sheldon, 2010; Kilman, 2006). Therefore parents' roles at home are important for their implications in children's overall learning outcomes in mathematics.

Among the studies examining parental involvement in mathematics at home, only a few of them have been conducted with early childhood and primary school children. Furthermore, these studies were conducted in other countries such as America, England, and Australia. At

the primary school age, parental involvement has been found to have a bigger impact on children's learning than variation in school quality in countries such as America and England (Desforges & Abouchaar, 2003). Given this, it may be surprising that very few studies from the year 2000 onwards have focused on parent's roles in mathematics at home at the primary school age and in New Zealand. Furthermore, the effects of parents' expectations on children's attitudes towards mathematics is less studied in the primary school stage; a stage that is suggested to have a positive influence on children's later learning outcomes. Thus it is important to explore parent's roles in children's mathematics education in primary school to provide more information about parent's potentially critical role at this stage of children's education.

Both parental involvement and children's attitudes towards mathematics are important because of the implications that they can have for children's learning outcomes in mathematics. A gap in the literature is evident in the investigation of parental involvement at home at the primary school age (Cai, 2003). Few studies have focused on this but not with a focus on children's attitudes towards mathematics, this is uncommon (Adelson, & McCoach, 2011; Galindo & Sheldon, 2010. This thesis explored this connection to provide further research pertaining to the role of parents in Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 43 children's attitudes towards mathematics and the implications this can have for children's learning outcomes in mathematics.

This Study This research explores the connection between parents' perceptions and involvement in mathematics and their children's attitudes towards mathematics. The question it investigated is: What is the connection between parents' involvement in their child's mathematics learning and the child's attitudes towards mathematics? Shaunnie Farr – The Role of Parents in Children's Attitudes towards Mathematics 44 Chapter Three: Methods 3.1 Method in Theory This chapter begins with an examination of the use of the mixed-method design as an appropriate methodology for this study to answer the question: What is the connection between parents' involvement in their child's mathematics learning and the child's attitudes towards mathematics? Qualities of the questionnaires and interviews in relation to collecting data about attitudes towards mathematics and parental involvement in mathematics are presented.

This is followed by an explanation of the types of methods used including closed and open-ended questions in a questionnaire and the use of Likert scales, the advantages and disadvantages of Likert scales in terms of cost in time and analysis. From here, the advantages

and disadvantages of semistructured interviews are considered, and the reliability and validity of questionnaires and interviews is also explored. Finally, making ethical considerations and data analysis processes are reported.

2.4. Definition of Variables:

A variable, according to Martin E. Amin (2000:26), is simply "a quantity that can take different values." Some examples can include sex; social status; political affiliation; intelligence; and so forth. There are two types of variables in research terminology: the independent and the dependent variables.

2.4.1. Independent Variable

This is the variable the researcher manipulates in a bid to analyze the effects of the studied phenomenon. In the context of this research, the independent variable is as follows: the attitudes of parents towards Mathematics. Those of the hypotheses are:

- The degree of concern shown by parents towards Mathematics;
- The parent's socio-professional background.

2.4.2. Dependent Variable

The dependent variable is the main variable of interest in a research situation. This variable is behaviour which the researcher intends to measure and study. It is the variable which bears the effect of the independent variable. The dependent variable in this research is: the pupils' performance in Mathematics.

2.4.3. Modalities

A modality is a character which a variable can take. Our indicators are the following: yes, no, positive, negative, dissatisfaction, encouragement, indifference...

2.4.4. Indicators

An indicator is an element which can enable the researcher manipulate the independent variables objectively. Our indicators are as follows: gifts, the frequency of note book checks, the purchase of Mathematics text books and other related items in relation to the subject, assistance in Mathematics assignment, parents' highest Certificate, and so on.

Table 2: Synoptic Table of hypotheses, variables, indicators, & modalities.

Topic	General Hypothesis	Variable	Indicator	Modality	Research Hypotheses
The influence of Parental attitudes towards mathematics on pupil's academic performance in the subject.	Parent's attitude towards Mathematics influence on pupils' academic performances	**Independent Variable:** parental attitude towards Mathematics	Kind of random slangs parents throw in relation to Mathematics	Positive Negative	**RH 1:** The degree of concern showed by parents towards Mathematics influences pupils' performances in the subject.
			Scolding for poor Maths performances	Yes No	
			Parental assistance in Maths related assignments	Yes No	
			Parents' highest certificate	FSLC O/L A/L Bachelor's Masters PhD	**RH 2:** The parent's socio-professional occupation influences the pupils' performances in Mathematics.
			Parents' occupation		
			Parents' provision for tutors in Mathematics for children	Yes no	
		Dependent Variable: pupils' performance	Class marks	Good poor	

CHAPTER 3: METHODOLOGY

The methodology part of this research is an opportunity to present the procedure data is collected, treated and the results interpreted, in order for the realities on the field to be known and for the authorities to take appropriate decisions. It can be reiterated that the research studies the influence of parental attitudes towards Mathematics on pupils' performances. The research is quantitative and will be done in a quantitative approach. This section will focus on population of the study; the sample, the sampling technique; the instrument of data collection; and so on.

3.1. Population

According to Martin E. Amin (2000:13), a population is "the complete collection (or universe) of all the elements (units) we are interested in a particular investigation." He further underscores that it does not necessarily have to imply demography, that is, consisting of people. It may be a set of objects, or humans, for instance, students, cars, plants, companies, and so on. There are three types of populations: the target population, the accessible population, and the sampled.

3.1.1. Target population

This constitutes the grand aggregate from which the sample is collected from. Our target population size is the population of Class 6 pupils in Mfoundi Division.

3.1.2. Accessible Population

A sampled or accessible population is the population from which the sample will actually be drawn. A target population is the population to which the researcher ultimately wants to generalize his results. In the case of this research, the researcher targetted the town of Yaounde due to the fct that they reside in Yaounde and this would be easy for the researcher to smoothlyrun the study. Furthermore, a random sampling was done to choose the Sub-Division. Ballots were made and a kid was asked to pick one paper from the ballot of 8 pieces of well wrapped papers bearing the name of a Sub-Divisions each, Yaounde 6 was chosen. More so, to choose the school for research, all the government primary schools were written on pices of papers and a kid was asked to pick from the ballot and Government Bilingual

Primary School Biyem-Assi was picked. The school is made up of Group A, B, C, D. this means they are four schools in one site.

The researcher proceeded to carry out a cluster sampling to work with two out of the four groups. Cluster sampling is a sampling plan used when mutually homogenous yet internally heterogenous groupings are evident in a statistical population. GBPS Biyem-Assi has 4 groups and are slightly different in population size. The 4 goups constituted clusters and a kid was asked to pick 2 out of the 4 and Groups A and B were chosen. This led to the population size of 109.

Table 3: the distributionof pupils in the target population.

Class	Girls	Boys	Total
Group A	28	30	58
Group B	25	26	51
Group C	24	29	53
Group D	28	27	55

Table 3.1 above indicates that the population size is 217. This constitutes the total population size of Class 6 in the entire school. There are a total of 105 girls and 112 boys.

3.2. Sample

A sample is "a representative collection of some (a subset) element of a population." (idem). Its aim is being able to generalize the results of the data from the sample to the entire population from which the sample was drawn. For this extrapolation to be valid, the features of the population must be found in the sample. The sample collected for this research was primary school pupils in the town of Biyem-Assi. They were precisely children who fall within the age range of Piaget's concrete operational stage, that is, pupils ranging from 7 to 11 years. Class 6 pupils were the group we were studying, because, certainly, a great percent of them would be of the upper age limit of Piaget's grouping, that is, 10, 11, and above.

3.3. Sampling Technique

Martin E. Amin (2000:15) defines sampling as "the process of selecting elements from the population in such a way that the sample elements selected represent the population." A sampling technique is the procedure that enables reduce the size of a population, and also enables an easy investigation to be carried out. It is a procedure that facilitates an extraction from the accessible population the individuals that would facilitate the study. There are two sampling techniques that exist; *The Probabilistic sampling technique*, and the *The non-probabilistic sampling technique*.

The probabilistic sampling technique provides the basis for statistical inference, whereas, the non-probabilistic sampling technique, on the flip side, is a sampling methodology based on the subjective judgment of the researcher. Here the researcher decided on the element of the population to be included in the sample. The listing of the elements of the sample is called the sampling frame. Sampling is very important in a research because it reduces the cost and time to complete an investigation. Also, it is cheaper to obtain data from a sample than from an entire population.

Since our mother population was made of four schools, implying four Class 6 set of pupils, the researcher decided to work with two groups and therefore, wrote the schools on 4 pieces of papers. Then he proceeded to pick two out of the four to ensure an equal chance for the schools to be chosen. The picking fell on Group A and Group B and enabled the researcher to go to the field to collect data.

Among the probabilistic sampling technique, we have the following types: simple random sampling; stratified sampling; clustered sampling; systematic sampling and the matrix sampling.

This research is more of a quantitative research, so, to get our sample indicated above; we shall administer a questionnaire to collect our data. This will enable the research get a considerable size of data to ensure representativeness of the prevailing situation not only in the locality, but the country as a whole.

Table 4: the distribution of the accessible population.

Class	Girls	Boys	Total

Group A	28	30	58
Group B	25	26	51

Table 3.2 above indicates the accessible population that the researcher worked with. The two groups constituted the sample size. 58 in group A and 51 in group B. these making a sum total of 109 pupils that were to be investigated. The number of girls were 53 and the boys were 56.

3.4. Description of data collection instrument

The choice of the instrument of data collection is not done in a haphazard manner. It is done in function of the kind of research. It basically comes down to describing the instruments we used to collect our data. Describing the instrument of data collection is simply explaining how we verified our hypotheses, the fiability of the data and the type of verification instrument chosen to analyse them.

This research is an qauntitative one, so the tool for data collection is a questionnaire. A questionnaire was administered to class 6 pupils of GBPS Biyem-Assi. 40 pupils were interrogated and they responded effectively to the questions.

The questionnaire for this research was divided into three parts. Firstly, we have the preamble; followed by the questions for Research Hypothesis 1; and lastly, we have the questions for Research Hypothesis.

The preamble has for close questions. The RH 1 segment had 7 closed end questions, and 1 open end question. Lastly, the RH segment has 2 open end and 2 closed end questions.

3.4.1. Procedure of data collection:

The researcher scheduled the collection of data for the month of November, 2021, so prior to that a pre-investigation was done a month before. The researcher got in touch with the school authorities of GBPS Biyem-Assi Groups A and B. I explained to them the intention of carrying out research being a Masters student of the University of Yaounde I. a week before actually collected the data, the researcher got to the school to actually schedule the day for the data collection.

On the d-day, the researcher got to school and met the head-teacher of Group A and she asked for him to wait for nine o'clock. At the said time, I got in touch with the head-taehcer of Group B scheduled the research for the end of the day. At 9 o'clock, the teacher of Class 6 A escorted me to administer my questionnaire to the pupils. He assisted me in the process. The researcher explained the instructions to the pupils and shared the questionnaires to them. The researcher read each question out aloud and gave them some seconds to fill in the answers. At the end of the process, he collected the questionnaires and reapeated the processall over again in Class 6 B from 11 o'clock to midday.

3.4.2. Type of research

The study carried out is part of a quantitative research, using the quantitative method. The quantitative method determines the general relationship between one thing, the independent variable, to another, independent variable, in a population. Quantitative research is a way for researchers to generalize data observed on a sample. It is therefore from this perspective that this method allows us to understand the reasons or causes that push the employees of a giving structure not to get involved at work. It therefore makes it possible to propose possible solutions for the resolution of said problem.

The population is defined as the set of people concerned by an investigation, that is to say the collection of all the cases which meet a set determined by specific characteristics. Along the same lines, Mucchielli (2009: 16) thinks that the study population or survey universe is "the entire human group concerned by the objectives of the survey". The study population is therefore the entire human group concerned by the research objectives. In this study, this human group is made up of pupils of the Yaounde 6 Sub-division.

3.4.3. Method of data analyses.

The method of data analysis highly depends on the type of research being carried out. Since this research is quantitative the method of analysis consisted in verifying the degree to which the attitudes of parents towards Mathematics influences their children' performances in the subject. The description of statistical index will therefore be presented below: the research will have a descriptive presentation and analysis, and then an inferential presentation and analysis.

On one hand, a presentation of the various distributions will be done in tabular form. Then a descriptive statistical analysis will be carried out which will lead to an inferential analysis of the work. For the inferential analysis of the work, the research will use the 1-way ANOVA SPSS analysis method. This data analysis method would be used for it best suits the type of research. The research works on one variable which delineates into several modalities reason why the 1-way ANOVA data analysis method is best suited for the research.

CHAPTER 4. PRESENTATION AND ANALYSES AND INTERPRETATION OF RESULTS

This chapter constitutes the presentation of results, analyses, verification of hypotheses and the interpretation of research hypotheses. The chapter is divided into two parts; in the first part will be presenting the frequency tables and percentages of the used indicators while the second part is reserved for the verification and interpretation of the research hypotheses. To verify the hypotheses in this research work, the researcher chose the simple linear regression. This permits the establishment of a relationship and level of significance that exist between the independent variable and dependent variable.

Before we effectively begin, it could be mentioned that the pupils were very positive s regards the responses to the questions on the questionnaire. We could comfortably say apart from very minor areas of incomprehension which were promptly rectified, the data collection process was a tremendous success. The 109 pupils gave a 99.99% response satistisfaction.

4.1. Presentation and analysis of results

4.1.1 Descriptives Statistiques

Table 5: distribution of respondents according to their neighborhoods

	enrolment	percentage
Good	15	13.8
Average	74	67.9
Below Average	20	18.3
Total	109	100

Table n° 5 above shows that 15 pupils live in rich residential area, indicating that 15% of the pupils come from rich families. 74 pupils live in avearge neighbourhoods, showing that 67.9% of them come from average income earning families (middle class). And 20 pupils out of 109 live in poor neighbourhoods, indicating that 18.3% of the pupils come from low income earning families. This is simply reflective of the class structures of society.

Table 6: Distribution of respondents according to the child's attitude towards Mathematics

	enrolment	percentage
Positive	78	71.6
Negative	31	28.4
Total	109	100

Table n°6 above makes us observe that 78 pupils out of 109 are favourable disposed towards Mathematics, making it 71.6% of the pupils. And 31 of them are categorically unfavourably disposed to Mathematics, constituting 28% of the total population. This 31% can be explained by the fact that Mathematics is considered difficult as expressed by Helen Merril (2021).

Table 7: Distribution of pupils according to the appreciations of performance pupils' performanves in Mathematics

	enrolment	percentage
Good	45	41,3
Average	38	34.9
Below Average	26	23.9
Total	109	100

Table n° 7 above indicates that 45 out of 109 pupils scored a good pefrformance. In the context of this research, the minimum mark for this category was 12/20. This means that 41.3% of the pupils scored good. 38 of the pupils scored an average mark, and for the research, the score minimum was 10/20 for this category. This represents 34%. And finally, 26 out of the pupils scored below average. This constituted an average of 23.9% of the class. This means that in this particular sample group, a good number of pupils scored well in Mathematics, and close to 60% are either average or below avearge pupils in mathematics.

Table 8: Distribution of respondents according to parent's remarks towards Mathematics.

	enrolment	percentage
Positive	92	84.4
Negative	17	15.6
Total	109	100

Table n° 8 show that 92 respondents actually admit their parents say positive things in the light of Mathematics, making it 84.4% of them, while 17% of the pupils actually acdmit their parents say aegative things on Mathematics, hence, 15.6%. The reason for the negative remarks might not be that they intentionally want their kids to percieve it as difficult, but the poorly expressed good intention of the parents make the pupils to give a negative feedback towards the subject, which in turn affects their performances.

Table 9: Distribution of the respondents according to the kind of remarks towards Mathematics.

	enrolment	percentage
Easy	92	84.4
Difficult	17	15.6
Total	109	100

Table n° 9 is closely linked to the preceding table 7 above. The positive remarks made by parents indicate that they have responses like: Maths is easy, enjoyable, necessary for life, and so on. Pupils who indicated their parents said some negtive things about Math said they heard things like: maths is difficult, very hard, tough, and on, even though they generally were advised to take their studies seriously (all subjects and not Mathematics in particular).

Table 10: Distribution of respondents according to if the parents Scold children for a failure in Mathematics.

	enrolment	percentage
Yes	107	98.2
No	02	1.8
Total	109	100

Table n° 10 above indicates that 107 pupils actually mentioned that their parents scolded them for failure in Mathematics, making it a 98.2% rate. Only 2 respondents mentioned that their parents never really scolded them for a failure in Math, thus, 1.8%. It is very indicative that the parents actually want to see their pupils succeed in Mathematics.

Table 11: distribution of respondents according to their parents' intensity of scolding

	enrolment	percentage
00	02	1.8
Yes	14	12.8
No	93	85.3
Total	109	100

Table n° 11 above is closely linked to Table 9 which precedes it. Out of the 107 parents who scold their children for failures in Maths. So, out of the 107 pupils who responded positively to the fact that they got scoldeed for a mediocre performance in Mathematics, 14 of them admitted that both their parents had the same intensity as regards the scolding, making it a 12.8%. 93 of the respondents said both parents never shoed the same intensity of dissatisfaction as regards their poor performance in Math, hence, 85.3%. This means that for the latter category, the parents have different degrees of attitudes of dissatisfaction as regards their poor performance of their kids.

Table 12: Distribution of respondents according to which parent scolds more

	enrolment	percentage
Father	41	44.08
Mother	52	55.92
Total	93	100

Table n° 12 above shows that out of the 93 respondents who indicated both their parents do not show the same intensity in scolding them for failures in Maths, 41 of them indicated that their fathers were severer on them than their mothers. This shows a 44.08% of respondents. On the flip side, 52 resppondents indicated that their mothers were severer, indicating 55.92%. This simply means that the mothers give more attention to the outcomes of their children's performances in Mathematics compared to the fathers.

Table 13: Distribution of respondents according to parental assistance with assignments

	enrolment	percentage
Yes	80	73.4
No	29	26.6
Total	109	100

Table n° 13 above reveals that 80 respondents out of 109 responded positive to whether their parents helped them with their Mathematics assignment, thus, 73.4% of them ; while 29 of them responded negative to that fact, constituting 26.6%. This simplymeans that more parents do assist their pupils in school related task, and mathematics in particular.

Table 14: Distribution of respondents according to who owns a maths textbook

	enrolment	percentage
Yes	15	13.76
No	94	86.24
Total	109	100

Table n° 14 above indicates that 15 of the respondents indicated that they had Mathematics textbooks/workbooks for practice, making it 13.76% of them ; while 94 of the

pupils indicated they had no textbooks, hence, 86.24 of them. A discrepancy in performance in Mathematics would definitely be as a result of such a modality.

Table 15: Distribution of respondents according to the reaction of parents in case of a failure in Maths inspite of a success in other subjects.

	enrolment	percentage
Dissatisfaction	36	33
Encouragement	73	67
Total	109	100

Table n° 15 above shows that 36 respondents indicated their parents showed dissatisfaction withe their overall result when they performed poorly in Mathematics, thus 33% of them; while 73 of them indicated that their parents actually showed encouragement, constituting 67% of them. This mean that there are parents who are bent on seeing that their children gain value in mathematics compared to other subjects, while other parents would wish an all round good performance.

Table 16: Distribution of respondents according to their father's occupation

	enrolment	percentage
White collar	41	37.6
Blue collar	68	62.4
Total	109	100

Table n° 16 above reveals that 41 pupils indicated that their father had a white collar job, that is, 36.6% of the father ; while 68 of them indicated their father had a blue-collar job, thus, 62.4% of them. This means that the parents of 41 of the respondents carry out tasks that are reading and writing related, which the children would necessarily obeserve and be somewhat conditined to emulate.

Table 17: Distribution of respondenst according to their mother's occupation

	enrolment	percentage

White collar	71	65.1
Blue collar	38	34.9
Total	109	100

Table n° 17 above highlights that 71 respondents mentioned that their mother had a white collar job, that is, a 65.1% of them ; while 38% of the respondents indicated their mothers carried out a blue-collar job, making them 34.9%. This means that the parents of 71 of the respondents carry out tasks that are reading and writing related, which the children would necessarily obeserve and be somewhat conditined to emulate as with the case of the fathers.

Table 18: distribution of respondesnts according to their reception of prices or promises of gifts from their parents incase of a success in mathematics.

	enrolment	percentage
Yes	11	10.1
No	98	89.9
Total	109	100

Table n° 18 above highlights that 11 pupils mentioned that their parents actually gave or promised them prices, that is, 10.1 of them ; while, 98 respondents indicated that their parents never did, thus, 89.9% of them. This means that fewer parents actually deliberately motivated their kids to success in mathematics, compared to an overwhelming 89.9% who did not.

Table 19: Distribution of respondents according to whether their have a tutor for extra classes

	enrolment	percentage
Yes	11	10.09
No	98	89.91
Total	109	100

Table n° 19 above indicates that 11 respondents indicated they had tutors for extra classes, constituting 10.09% of them ; while 98 respondent responded negative asto whether they had a tutor for extra classes. They made up 89.91%. This implies that only 11 pupils had

the possibility of having a systematic follow up for additional work in Mathematics and possibly other subjects.

4.2. Inferential Statistics

4.2.1. Verification of Research Hypotheses

4.2.1.1. Verification of research hypotheses RH1

According to the significant test of F of Fisher, the statistic hypotheses are formulated in the following manner:

RH1: parent's interest towards their children's welfare mathematics influence on pupils' academic performances

Ha: there exists a significant linear relation between parent's interest towards their children's welfare mathematics influence on pupils' academic performances.

Ho: there exists no significant linear relation between parent's interest towards their children's welfare mathematics influence on pupils' academic performances.

For these hypotheses it is convenient to recall that:

- It was tested with $\alpha = 0.05$ (degree of significance)
- And that the rules of decision making was:
- if Sig < 0.05 then Ho is rejected and Ha is accepted;
- if Sig > 0,05 then Ho is accepted and Ha rejected;
- if F read is superior to F Calculated, Ho is accepted therefore Ha is rejected.
- if F read is inferior to F calculated, Ho is rejected therefore Ha is accepted.

Table 20 : distribution of performances in relation to the mean

	Enrolment	Mean	Standard deviation	Standard error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
LOW	54	10,59	2,891	,393	9,80	11,38
average	46	10,22	3,319	,489	9,23	11,20
high	9	9,22	3,346	1,115	6,65	11,79
Total	109	10,32	3,109	,298	9,73	10,91

Table 21: Multiples Comparisons

(I) parent's attitude	(J) parent's attitude	Mean Difference (I-J)	Standard Error	Significance	95% confidence Interval of Mean	
					Lower Bound	Upper Bound
LOW	average	,375	,625	1,000	-1,15	1,90
	high	1,370	1,121	,673	-1,36	4,10
average	LOW	-,375	,625	1,000	-1,90	1,15
	high	,995	1,135	1,000	-1,77	3,76
high	LOW	-1,370	1,121	,673	-4,10	1,36
	average	-,995	1,135	1,000	-3,76	1,77

Table n° 21, which is that of ANOVA, shows the F of Fisher-snedecor. In this table we observe F (1.90) = ,791 with the significance P = 0.456. The rules of ANOVA warrant that:

- if F read is superior to F Calculated, Ho is accepted meanwhile Ha is rejected.
- if F read is inferior to F calculated, Ho is rejected meanwhile Ha is accepted.

Hence, since F read is (1.90) superior to F calculated (,791), therefore (1.90 >,791) and with p= 0.456. Ho is confirmed and Ha is rejected. The research has failed to reject the null hypothesis. Therefore, there exist no significant linear relation between parent's interest towards their children's welfare mathematics influence on pupils' academic performances

In conclusion, with the line of margin of error of 5%, RH1 is not confirmed. As a consequence, the interest parents show towards the welfare of their children in mathematics does not significantly influence their performance in the subject.

4.2.1.2. Verification of research hypotheses RH2

According to the significant test of F of Fisher, the statistic hypotheses are formulated in the following manner:

RH2: the parent's social-professional background influences the pupils' performances in Mathematics.

Ha: there exist a significant linear relation between the parent's social-professional background influences the pupils' performances in Mathematics.

Ho: there exist no significant linear relation between the parent's social-professional background influences the pupils' performances in Mathematics.

For these hypotheses it is convenient to recall that:

- It was tested with $\alpha = 0.05$ (degree of significance)
- And that the rules of decision making was:
- if Sig < 0.05 then Ho is rejected and Ha is accepted;
- if Sig > 0,05 then Ho is accepted and Ha rejected;
- if F read is superior to F Calculated, Ho is accepted therefore Ha is rejected.
- if F read is inferior to F calculated, Ho is rejected therefore Ha is accepted.

Table 22: Distribution of the Prents' socio-professional occupation in relation to the mean

	Enrolment	Mean	Standard devition	Standard error	95% Confidence Interval for Mean

					Lower Bound
white	30	11,13	3,224	,589	9,93
blue	27	9,00	2,675	,515	7,94
father white and mother blue	41	10,56	2,793	,436	9,68
father blue and mother fwhite	11	10,45	4,180	1,260	7,65
Total	109	10,32	3,109	,298	9,73

Tables n° 22, which is that of ANOVA, show the F of Fisher-snedecor. It can be observed F (1.90) = 2,496 with the significance P = 0.064. The rules of ANOVA warrant that:

- if F read is superior to F Calculated, Ho is accepted meanwhile Ha is rejected.
- if F read is inferior to F calculated, Ho is rejected meanwhile Ha is accepted.

Hence, since F read is (1.90) superior to F calculated (2,496), therefore (1.90 >2,496) and with p= 0.064. Ho is confirmed then Ha is rejected. The research failed to reject the null. Therefore, there exist no significant linear relation between parent's socio-professional occupation and pupils' academic performances in Mathematics.

In conclusion, with the line of margin of error of 5%, RH2 is not confirmed. As a consequence, the parent's socio-professional occupation does not influence the performance of the pupils in Mathematics.

Table 23: Summary of results of simple linear regression test.

Research hypotheses	Decision	General hypothesis	Decision
RH1: the degree of interest parents show towards Mathematics influence the pupil's performances in the subject.	rejected	GH: parent's attitude towards Mathematics influence on pupils' academic performances	rejected
RH2: the parent's social-professional background influences the pupils' performances in Mathematics.	rejected		

4.2. Interpretation of Results

After the collecting of information from the field, they first are treated, and then analysed. From the analysis, interpretation of results, discussion of these results can take place base on the findings from the field. The interpretation and the discussion of results will be done hypothesis by hypothesis and based on the works of other authors and various theories that explains the phenomenon that was studied. This sectionis very necessary for us to understand the results and why we obtained such results. The first hypothesis to be analyse is RH 1:

4.2.1. Interpretation of Research Hypothesis 1 (RH1)

The research hypothesis number one is termed "the degree of interest parents show towards Mathematics influence the pupil's performances in the subject." This hypothesis was rejected as indicated in the ANOVA statistics above. Citing Bronfenbrenner, Laura Lara & Mahia Saracostti (2019), in an article with Frontiers in Psychology, affirms that reciprocal positive interactions between parents and school contributes positively to a child's socio-emotional and cognitive development.

Furthermore, Gina Madrigal Sapungan, Ronel Mondragon Sapungan (2014:43) sustain the fact that: « parental involvement in their children's learning not only improves a child's morale, attitude, and academic achievement across all subject areas, but it also promotes better behavior and social adjustment. » these assertions actually do buttress the fact that parental involvement in a child's studies goes a long way to boast not only the academic, but socio-emotional aspects of the child's life. The results of the research indicates that the lack of parental involvement in a child's study does not necessarily cause them to have failures at school in general and Mathematics in particular. This could be explained by the fact that in ours sample population, the pupils already demonstrated a favourable disposition towards Mathematics (which was the research's case study).

Out of the parents, 92 had a positive language and attitude towards maths, while 17 of the parents claim maths is difficult. This implies the majority of the pupils are conditionned to have a positive attitude towards the subject. More to that, 80 respondants said their parents helped them with their assignment, while parents assist 29 respondants said their parents don't assist them with their math assignment. This shows some importance the parentshave towards the subject.

Furthermore, 14 of the respondents affirmed both parents scold them equally when ever there was a failure in Math, irrespective of a suces in other subject. This tells us that they had high expectations from the pupilin the subject. 93 of the remaining respondents said just a single parent particularly showed dissatisfaction incase of a failure in Mathematics. The parents would scold at different intensity. As a matter of fact, 41 respondents said their fathers were more displeased with their failures compared to their mothers, while on the other hand, 52 respondents said their mother were more dissatified with their failure in maths compared to their fathers.

Actually, 6 respondents admitted to not loving Mathematics, but managed to have a pass grade. 3 of the 6 do not have textbooks, nor any private tutors in Mathematics. Certainly,

other factor would explain the reality in the classroom and failures in the FSLC examination. If it is not a matter of coincidence that success in school was recorded at that particular school, or that particular school year, then, most explanatory factors would revolve around the examination context in which the pupils find themselves. Other factors too would contribute to possible cases of failure.

4.2.2. Interpretation of Research Hypothesis 2 (RH2)

Research hypothesis 2 reads thus: the socio-professional occupation of the parents influences the pupil's performances in Mathematics. Once again, this hypothesis was rejected meaning that the occupation of the parent does not necessarily have an incidence on the performance of a child in Mathematics. It might have an influence, but in this research, it was not the case. This might be explained due to the fact that irrespective of the work type, the parents, or either of them, showed a minimal amount of concern as regards the performance of their kid in mathematics. Some with blue collar jobs actually assisted their kid in their Maths assignment, some took the pain to offer gifts to their children in the case of a success in Mathematics, and others got them textbooks and tutors. Certainly, others factors, both endogenous and exogenous could explain a possible success in Maths in the classroom and failure in the examination hall.

41 respondants indicated that their father worked white collar jobs and 68 repondants indicated that their father carried out blue collar occupations. As regards their mothers, 71 pupils responded that their mothers worked white collar jobs, while 38 of them indicated their mothers worked blue collar jobs. This implies fro the job categorisations, the fathers who worked white collar jobs were more concered with the performance in Maths as compared to their parents who were blue collar jobs. They were more consciencious, looked for tutors, and were personally implicated in bringing about the successful outcome in the subject as compared to parents in the blue collar sector.

Furthermore, 11 respondants do receive gifts from theirparents when they succeed in Maths and 98 repondants indicated they never did though they were successful in Maths. This implies the pupils performed relatively well inspite of the fact the had no special incentive from their parents. Their intrinsic motivationisstrong enough to make them succeed, and certainly, other factors are involved in the success rate.

11 respondants indicated their parents provided a tutor for extra classes while 98 repondants actually indicate their parents did not pay a tutor for extra classes in Maths for

their kids. Inspite of the low number of parents who provided their kids tutors for extra classes, the overall performance of the class in Math was positive, meaning irrespective of the lack of tutors for the pupils, other factors were sufficient to harness a pass grade in the subject.

4.3. Theoretical and Practical Implications

4.3.1. Theoretical Implications

This reseach which is about the parental attitude towards Mathematics and its influence on pupil's performance in the subject has great benefits in the scientific world. This research most definitely adds to the scientific literature on primary education in Cameroon and Basic education at large. It mobilises theories to explain the dynamics between the parents, the pupils and the subject in question making room for great understanding of the dynamics between the parents, the pupils and the content of study.

4.3.2. Practical implications

As regards the practical implications, the research enables the authorities and the educational community at large to take cognisance of the data at hand as regards the role of parents in the success of the parents in general, and Mathematics in particular. Also, the authorities could organize seminars for parents to further enlighten them on the role they could possibly play in the improvement of their children's academic performances as a whole, and Mathematics in particular.

More to that, the research enables the sensitization of parents and the community as a whole on the role they have to play in the success of their children at school. It draws the attention of the parents to the fact that they not only have to mobilise financial resources to send their kids to school, but to put in time to personally follow up the pupils att home to ensure they are actually taking their lessons seriously.

4.4. Suggestions and Recommendations

The goal of a research is either to better understand a phenomenon, or to provide a solution to a given problem. There is nevertheless the presence of the fact that the attitude of parents towards Mathematics influences the performance of pupils in the subject. Taking into account the write ups about the difficult, or tough nature of Mathematics, no stone can be left untuned. Though both hypotheses of this research were rejected, it is important to note that the attitude of parents in relation to Mathematics is vital for the pupils' success to an extent. Therefore, parents need sensitization to this effect. The purchase of textbooks and workbooks are a priority for the children.

Furthermore, diagnostic tests need to be conducted in order to detect pupils who are not very motivated with Mathematics in order to bring them from the state of passiveness to the level of them being active lovers of Mathematics, so that they can further bring their grades up.

In addition, parents should be encouraged to hire tutors for their children. Those extra classes go a long way in boosting the cognitive abilities of the child.

4.5. Difficulties Encountered

The difficulties encountered revolved around the collection to the population of collection of data from the population. To make that happen, the researcher often had to interupt thebreak time of the pupils for the administration of the questionnaire. This did not always do well with the learners who lacked focus due to their mates from other classes who were outside.

Also, clearance for the access of documents from State facilities was not always the easiest. Though the University of yaounde I issued the researcher a research clearance, or autorisation, the personnel at the MINEDUB as well as the Regional Delegation of Basic Education never really eased the job for the researcher. Most often, autorisation had to come from the Minister himself for the researcher to be given access to documents vital for the research.

More so, the research calendar always had to suit the schedule of the population sample. The research had to take place when no evaluations, seminars, extra curricular activities, and so forth, were taking place. The research schedule for some data had to wait for the end of the year to collect certain data, which caused waste oftime, and resources.

GENERAL CONCLUSION

All in all, the behaviour of an organism is usually motivated by two force which are either intrinsic or extrinsic to it. Youssef Mourad (1995:3) backs this claim by sustaining that: ‘‘the analysis of the behaviour of a living organism, from the most primitive to the most complex, presents numerous difficulties and poses alot of problems. The nature and behaviours of such organisms are the expresions of two factors : the organism itself on one hand, and the external environment on the other hand. Each of these two factors have their specific features and each have multiple and constant relationships. From the interaction of these two factors ensue external manifestations which constitute the observable behaviour.’’

The author is actually saying that in an individual, there are internal and external forces that stir him into a given pattern of behaviour. Many of these neophytes are faced with the problem of lack of intrinsic motivation as just seeing figures get them confused, others may be faced with environmental impediments. Mourad further sustains that current classifications of various behavioural patterns bring about distinctions between the innate and the acquired. This classification resting on a clear distinction of two factors: those of hereditary and the environment.

In a nutshell, it can be reiterated that this research is titled “Parental attitude towards Mathematics and its influence children in the subject. The research is a quantitative research which warranted a particular research course. GBPS Biyem-Assi was the sample population. The population size was a heterogenous population of 109 respondents. The main instrument for data collection was the questionnaire, which was administered to these pupils. The same label constituted the basis for the general hypothesiswas the following: “parental attitude towards mathematics influences pupil’s performances in the subject”. From it ensued two research hypotheses which are: RH 1: and RH 2: Both hypotheses were rejected after the collection, analyses and interpretation of data, with both significant values exceeding 0.05 in the ANOVA SPSS data analyzing tool. Both hypotheses were rejected after the collection, analyses and interpretation of data, they had a significant value of $p = 0.456$ and $p = 0.064$ respectively, both significant values exceeding $p = 0.05$. The research rested on two psychological theories which are: The Social Learning Theory by Albert Bandura (1977) and the Social Impact theory by Bibb Latane (1981). These theories were deeply analyzed and the bearings to the entire research was brought out. The difficulties encountered by the research, as well as suggestions and recommendations were made which brought this tough but interesting exercise to an end. The domain of research is very vast and limitless and this topic is therefore open for further research to be carried out so that the more enlightenment can be brought and new avenues explore so that science can go further ahead.

In addition, Bandura (1971: 1) porports that « it is evident from informal observation that human behaviour is transmitted whether deliberately or inadvertantly, largely through exposure to social models. » This goes a long way to butress the fact that it would be extremely rare to find a parent outrightly wish failures for their children. If the kids are influenced to having a lakadeisical attitude towards mathematics by their parent, it certainly was inadvertantly done. An influence to failure is quite probably due to some things unintentionally said, and unintentionally done. At their young ages, children are extremely suceptible to influence, so they would quikly imitate the behaviours displayed by their parents who are for the most part at close proximity to them. Attitudes the parents display are extremely crucial to the development of love or hate for Mathematics. It is therefore necessary to delve a little from the concept of attitudes to better grasp the contours of the power of attitudes towards something and how via the Social Learning Theory, pupils mimic behaviours that would in turn influence their performances at school, especially in Mathematics. This is one of the motivations for the study. However, the data analysed above proved though it is true, it is of no significant influence.

Furthermore, Robert D. Strom (1969:16) says discrepancies in accomplishments among students occur because the facility of learning involves more than just mental ability; "it incorporates a number of non-intellectual factors as well. Among the non-intellectual elements which appear to influence success in school are motivation, aspiration, self-concept, and social adjustment." Consequently, if the child is surrounded by factors that stimulate him positively, that is, a high probability he will be successful in his academic pursuits, equally in Mathematics, and conversely, if the child is surrounded by factors that stimulate him adversely, there is equally a high probability they will produce poor academic outputs. Many factor have to motivate the child for success, including the parental factor. Parents can come in at many levels: in the angles of financial assistance, provision of school requirements, provision of tutors for extra classes, motivation of the child, and so on. In this particular study, nevertheless, the parental attitude of the parents towards the subject of mathematics has no incidence on the pupils' performances in the subject as has been demonstrated in the chapters above.

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APPENDIX

QUESTIONNAIRE TO PUPILS

I- PERSONAL INFORMATION

1. What is your sex? ……..……
2. Where do you live? ……
3. How old are you?……
4. Do you love Mathematics? Yes…… No……
5. How is your general performance in Maths? Good…. Average …..Below average..….

II- QUESTIONS FOR RH 1

6. Do your parents make any particular remarks about Mathematics?
   Positive…… Negative ……..
7. What kind of remarks for instance?
   …….
8. Do your parents scold you for any poor performances in Maths?
   Yes…….. No ……..
9. Do both parents of yours show the same intensity of scolding as regards your poor or average?
   Yes…… No……
10. If no, who is more severe?
    My Father……. My Mother…….
11. Do your parents assist you in your Mathematics assignments?
    Yes…… No …….
12. Do you have a Mathematics workbook with which to exercise yourself at home?
    Yes……. No……..
13. When you perform quite well in other subjects and fail in Mathematics, what is the reaction of your parents about the failure in Mathematics?
    Dissatisfaction……. Encouragement…… Indifference……

III- QUESTIONS FOR RH 2

14. What is your father's occupation?
    ….
15. What is your mother's occupation?
    …….
16. Do your parents give you prices or make promises of gifts in case of a pass, or a good performance in Mathematics?
    Yes……. No……
17. Do you have a tutor for extra classes in Mathematics?
    Yes……... No …….

DESCRIPTIVES VARIABLES=AGE PERFF

/STATISTICS=MEAN STDDEV MIN MAX.

Descriptives

Remarks

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Descriptive Statistics

	N	Minimum	Maximum	Mean	Saandard deviation
AGE	109	9	15	11,87	1,582
performance	109	3	16	10,32	3,109
N valid (listwise)	109				

ACTIVATED DATASET

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Enrolment

Remarks

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	Observations taken into account	The statistics are based on all observations having valid data

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Statistiques

		SEX	Neighborhood	child attitude	performance en maths	parent's remark
N	Valide	109	109	109	109	109
	Manquante	0	0	0	0	0

Statistiques

		kind of remark	scolded by parents	intensity of scolding	more severe	assistance
N	Valide	109	109	109	109	109
	Manquante	0	0	0	0	0

Statistiques

		maths textbook	reaction of parents	father occupation	mother occupation
N	Valide	109	109	109	109
	Manquante	0	0	0	0

Statistiques

		price or promises of gifts	tutor for extra classes	parent's attitude	parent's attitude
N	Valide	109	109	109	109
	Manquante	0	0	0	0

Statistiques

		parents' occuation
N	Valide	109
	Manquante	0

Frequency tables

Sex

		enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	male	51	46,8	46,8	46,8
	female	58	53,2	53,2	100,0
	Total	109	100,0	100,0	

Neighborhood

		Enrolment	Percentage	Valid Percentage	Cumulative Percentage
Valide	rich	15	13,8	13,8	13,8
	average	74	67,9	67,9	81,7
	poor	20	18,3	18,3	100,0
	Total	109	100,0	100,0	

Child attitude

		Enrolment	Percentage	Valid Percentage	Cumulative Percentage
Valide	positive	78	71,6	71,6	71,6
	negative	31	28,4	28,4	100,0
	Total	109	100,0	100,0	

		Enrolment	Percentage	Valid Pourcentage	Cumulative Percentage
Valide	good	45	41,3	41,3	41,3
	average	38	34,9	34,9	76,1

	below average	26	23,9	23,9	100,0
	Total	109	100,0	100,0	

Parent's remark

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	positive	92	84,4	84,4	84,4
	negative	17	15,6	15,6	100,0
	Total	109	100,0	100,0	

Kind of remark

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	easy	92	84,4	84,4	84,4
	difficult	17	15,6	15,6	100,0
	Total	109	100,0	100,0	

Scolded by parents

		Enrolment	Percentage	Valid Pourcentage	Cumulative Percentages
Valide	yes	107	98,2	98,2	98,2
	no	2	1,8	1,8	100,0
	Total	109	100,0	100,0	

Intensity of scolding

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	0	2	1,8	1,8	1,8
	yes	14	12,8	12,8	14,7
	no	93	85,3	85,3	100,0
	Total	109	100,0	100,0	

More severe

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	father	60	55,0	55,0	55,0
	mother	49	45,0	45,0	100,0
	Total	109	100,0	100,0	

Assistance

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	yes	80	73,4	73,4	73,4
	no	29	26,6	26,6	100,0
	Total	109	100,0	100,0	

Maths textbook

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	yes	14	12,8	12,8	12,8

	no	94	86,2	86,2	99,1
	3	1	,9	,9	100,0
	Total	109	100,0	100,0	

Reaction of parents

		Enrolment	Percentage	Valid Percentage	Cuulative Percentages
Valide	dissatisfaction	36	33,0	33,0	33,0
	encouragement	73	67,0	67,0	100,0
	Total	109	100,0	100,0	

Father occupation

		Enrolment	Percentage	Valid Percentages	Cumulative Percentages
Valide	white collar	41	37,6	37,6	37,6
	blue collar	68	62,4	62,4	100,0
	Total	109	100,0	100,0	

Mother occupation

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	white collar	71	65,1	65,1	65,1
	blue collar	38	34,9	34,9	100,0
	Total	109	100,0	100,0	

price or promises of gifts

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	yes	11	10,1	10,1	10,1
	no	98	89,9	89,9	100,0
	Total	109	100,0	100,0	

tutor for extra classes

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	yes	59	54,1	54,1	54,1
	no	25	22,9	22,9	77,1
	3	17	15,6	15,6	92,7
	4	8	7,3	7,3	100,0
	Total	109	100,0	100,0	

parent's attitude

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	LOW	54	49,5	49,5	49,5
	average	46	42,2	42,2	91,7
	high	9	8,3	8,3	100,0
	Total	109	100,0	100,0	

parents' occuation

		Enrolment	Percentage	Valid Percentage	Cumulative Percentages
Valide	white	30	27,5	27,5	27,5
	blue	27	24,8	24,8	52,3
	father white and mother blue	41	37,6	37,6	89,9
	father blue and mother fwhite	11	10,1	10,1	100,0
	Total	109	100,0	100,0	

```
ONEWAY PERFF BY PATTITUD
  /STATISTICS DESCRIPTIVES HOMOGENEITY
  /MISSING LISTWISE
  /POSTHOC=BONFERRONI ALPHA(0.05).
```

Inferential Analyses

1.Parental attitude on pupils' academic performances

The one factor ANOVA test indicates that this influence is not significant (F(109)= 0.79, p= 0.45). After all, the post hoc tests confirm it.

A 1 factor

Remarques

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	Observations taken into account	The statistics of all the analyses are based on observations without lacking data for the variables used.

Syntax		ONEWAY PERFF BY PATTITUD /STATISTICS DESCRIPTIVES HOMOGENEITY /MISSING LISTWISE /POSTHOC=BONFERRONI ALPHA(0.05).
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Descriptives

performance

	N	Mean	Standard deviation	Standard error	Confidence interval at 95% for the mean	
					Lower bound	Upper bound
LOW	54	10,59	2,891	,393	9,80	11,38
average	46	10,22	3,319	,489	9,23	11,20
High	9	9,22	3,346	1,115	6,65	11,79
Total	109	10,32	3,109	,298	9,73	10,91

Descriptives

performance

	Minimum	Maximum

LOW	3	16
average	3	15
…….high	5	15
Total	3	16

Test of variance homogeneity

performance

Levene Statistices	ddl1	ddl2	Significance
1,554	2	106	,216

1 factor ANOVA

performance

	Sum of squares	ddl	Mean of squares	F	Significance
Inter-groupes	15,343	2	7,671	,791	,456
Intra-groupes	1028,419	106	9,702		
Total	1043,761	108			

Tests post hoc

Multiple coparisons

Dependent variable: performance

Bonferroni

(I) parent's attitude	(J) parent's attitude	Difference of means (I-J)	Standard error	Significance
LOW	average	,375	,625	1,000
	high	1,370	1,121	,673
average	LOW	-,375	,625	1,000
	high	,995	1,135	1,000
High	LOW	-1,370	1,121	,673
	average	-,995	1,135	1,000

Multiple comparisons

Depndent variable: performance

Bonferroni

(I) parent's attitude	(J) parent's attitude	Confidence interval at 95%	
		Lower Bound	Upper Bound
LOW	average	-1,15	1,90
	high	-1,36	4,10
average	LOW	-1,90	1,15
	high	-1,77	3,76
High	LOW	-4,10	1,36
	average	-3,76	1,77

```
ONEWAY PERFF BY OCCC
  /STATISTICS DESCRIPTIVES HOMOGENEITY
  /MISSING LISTWISE
  /POSTHOC=BONFERRONI ALPHA(0.05).
```

2. the influence of parents' occupation on pupils' performances

The one factor ANOVA test indicates that this influenceis not significant (F(109)= 2.49, p= 0.06). after all, the post hoc tests confirm it.

A 1 facteur

Remarks

Results obtained	20-JUL-2021 12:31:27
Commentries	

Entries	Data	D:\ANALYSES\TAS\TAS.sav
	Active data	The data
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	Weights	<none>
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Management of lacking values	Definition of lacking values	Lacking values defined by the user are treated as lacking.
	Observations taken into account	The statistics of all the analyses are based on the observation without the lacking data for none of the variables used.
Syntax		ONEWAY PERFF BY OCCC /STATISTICS DESCRIPTIVES HOMOGENEITY /MISSING LISTWISE /POSTHOC=BONFERRONI ALPHA(0.05).
Resources	Processor time	00:00:00,02
	Time elapsed	00:00:00,06

[Ensemble_de_données1] D:\ANALYSES\TAS\TAS.sav

Descriptives

performance

	N	Mean	Standard deviation	Standard error	Confidence interval at 95% for the mean
					Lower bound
White	30	11,13	3,224	,589	9,93
Blue	27	9,00	2,675	,515	7,94
father white and mother blue	41	10,56	2,793	,436	9,68
father blue and mother fwhite	11	10,45	4,180	1,260	7,65
Total	109	10,32	3,109	,298	9,73

Descriptives

performance

	Confidence interval at 95% for the mean	Minimum	Maximum
	Upper bound		
White	12,34	3	16
Blue	10,06	4	13
father white and mother blue	11,44	4	14
father blue and mother fwhite	13,26	3	16
Total	10,91	3	16

Variance test of homogeneity

performance

Levene statistics	ddl1	ddl2	Significance
1,681	3	105	,176

1 factor ANOVA

performance

	Sum of squares	ddl	Mean of squares	F	Significance
Inter-groupes	69,470	3	23,157	2,496	,064
Intra-groupes	974,292	105	9,279		
Total	1043,761	108			

Tests post hoc

Multiples comparisons

Dependent variable: performance

Bonferroni

(I) parents' occuation	(J) parents' occuation	Difference of means (I-J)	Standard error
White	blue	2,133	,808

	father white and mother blue	,572	,732
	father blue and mother fwhite	,679	1,074
	white	-2,133	,808
Blue	father white and mother blue	-1,561	,755
	father blue and mother fwhite	-1,455	1,090
	white	-,572	,732
father white and mother blue	blue	1,561	,755
	father blue and mother fwhite	,106	1,034
	white	-,679	1,074
father blue and mother fwhite	blue	1,455	1,090
	father white and mother blue	-,106	1,034

Multiple Comparaisons

Dependent Variable: performance

Bonferroni

(I) parents' occuation	(J) parents' occuation	Significance	Confidence interval at 95%
			Lower bound
	blue	,057	-,04
White	father white and mother blue	1,000	-1,40
	father blue and mother fwhite	1,000	-2,21
Blue	white	,057	-4,31

	father white and mother blue	,247	-3,59
	father blue and mother fwhite	1,000	-4,38
	white	1,000	-2,54
father white and mother blue	blue	,247	-,47
	father blue and mother fwhite	1,000	-2,68
	white	1,000	-3,57
father blue and mother fwhite	blue	1,000	-1,48
	father white and mother blue	1,000	-2,89

Multiple Comparaisons

Dependent Variable: performance

Bonferroni

(I) parents' occuation	(J) parents' occuation	Confidence interval at 95%
		Upper bound
	blue	4,31
White	father white and mother blue	2,54
	father blue and mother fwhite	3,57
	white	,04
Blue	father white and mother blue	,47
	father blue and mother fwhite	1,48
	white	1,40
father white and mother blue	blue	3,59
	father blue and mother fwhite	2,89

	white	2,21
father blue and mother fwhite	blue	4,38
	father white and mother blue	2,68

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