RELATIONSHIP BETWEEN BACKGROUND VARIABLES AND STUDENT READING ACHIEVEMENTS AT STANDARD 6 IN BOTSWANA

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Abstract

Using the 2011 Progress in International Reading Literacy Study (PIRLS) data, the study examined the association between salient background variables across private and public schools and student reading achievement at Standard 6. The study uses descriptive statistics such as means and standard deviation to distinguish the students' performance in private and public schools. Further analysis is performed using the regression model of background variables on students' reading achievements. Results show that private schools attain higher mean score compared to public schools. Students who are bullied more frequently at school by their peers perform below their peers who had never been bullied. Parental guidance plays an important role in students' academic life. Class overcrowding, lack of safety at school, lack of usage of computer during instruction, state of school building were found to be statistically insignificant in students reading performances. Frequency of bullying, inadequacy of home amenities, and lack of parental support affect public school students more than their private school counterparts.

1.0 Introduction

In order to explain differences in educational attainment, a number of factors associated with the home and school must be considered. Resources relevant to education within the family and the assistance that family members are able to provide students with respect to their learning are among the background variables influencing educational attainment. School-related factors include leadership and resources. The quality of institutions and the commitment of teachers towards making the most valuable resources are very critical. Examinations results are influenced by the learning environment at schools. It has been revealed that the location of the school (rural or urban), the type of school (private or government), availability of learning equipment (computers, books, etc.) and so on are some of the learning conditions which influence the performance of students. According to Mullis et al (2012) the most successful schools tend to have students that are relatively economically affluent, speak the language of instruction, and begin school with early literacy skills. Successful schools also are likely to have better working conditions and facilities as

well as more instructional materials, such as books, computers, technological support, and supplies. In Botswana context, these conditions and resources are prevalent in Private English Medium Schools and scarce in government schools. To interrogate the issues regarding school factors further, the 2011 PIRLS data was analyzed further to compare student reading achievement in public and private schools in Botswana.

2.0 Background on PIRLS

PIRLS is an international assessment that measures trends in reading achievement of Grade 4 students, as well as policies and practices related to literacy. The study is administered every five years and

is carried out by the International Association for the Evaluation of Educational Achievement (IEA), an independent cooperative of research institutions and governmental agencies. IEA was founded in 1959, with a Secretariat in Amsterdam (the Netherlands), to conduct large-scale comparative studies on the effects of educational policies and practices around the world (Labrecque 2012). IEA's membership has now grown to over 60 countries. PIRLS is one of the regular research studies of cross-national achievement conducted by IEA, and it relies on collaboration among the research centres responsible for data collection in each country. It is overseen by IEA's TIMSS & PIRLS International Study Center, located at Boston College. PIRLS provides participating countries with unique information on how well their students can read after four years of elementary school and places this information in an internationally comparative context (Labrecque 2012).

PIRLS studies the reading achievement and reading behaviours and attitudes of fourth-grade students worldwide. Botswana participated in PIRLS for the first time in the 2011 cycle. In addition to PIRLS, pre-PIRLS was developed as a less difficult version of PIRLS to provide more assessment options for developing countries where students may not be prepared for the demands of PIRLS. The pre-PIRLS is based on the same view of reading comprehension as PIRLS but is designed to assess basic reading skills that are a prerequisite for success on PIRLS. Botswana administered prePIRLS to the fourth grade students and PIRLS to the sixth grades. The following constitute the major objectives of the PIRLS programme:
- assessing the level of reading in English at standard six
- identification of factors that impact on teaching and learning of English
- detection of trends in learning achievement of English if Botswana continues to participate in the coming cycles
- comparison of participating countries internationally
- providing a rich source of information to policy makers and other stakeholders

A supportive home environment and an early start are crucial in shaping children's reading literacy. In PIRLS 2011, at the fourth grade, sixth grade, and for the benchmarking participants and prePIRLS, students had higher reading achievement if their parents reported that they themselves liked reading, often engaged in early literacy activities with their children, had more home resources for learning, and that their children had attended pre-primary education. Children also had higher achievement if their parents reported that their children started school able to do early literacy tasks like to read sentences and write some words (Mullis et al 2012). Generally, private schools tend to have school background variables that are conducive to learning, although, Lubienski & Lubienski (2006) found that the public schools outscored the private after taking into account the socio-economic status. The reason raised was that private schools have advantages of selecting knowledgeable students and hence students going to private schools are a selected class of gifted students but when taking into account those differences students' performance is comparable between public and private schools. Furthermore, Mullis et al (2012) reported that students from disadvantaged backgrounds typically have higher achievement if they attend schools where the majority of students are from advantaged backgrounds.

The countries that assessed PIRLS 2011 at the sixth grade or participated in prePIRLS had relatively large percentages of students (43–82%) attending schools in small towns and rural areas, and these students had lower average reading achievement than students attending schools in cities larger than 100,000 people (Mullis et al 2012). Urban children have a greater exposure to better learning and teaching

facilities. These definitely facilitate and enhance better understanding of complex concepts in the given subjects. Among the many teaching and learning aids are the likes of computers, overhead projectors, TV, etc. Research is made easy by the availability of well stocked urban libraries that are strategically located. Furthermore, most people in urban areas now understand the value of education. Some parents go to the extent of hiring tutors to help their children at home. Transport availability also enhances concentration in the classroom since the urban students do not get worked out by getting to school. Although the home can be a rich environment for a student`s learning ability, for most children school remains the main location for formal education and educational activities.

The learning environment of the school can be a positive influence, encouraging a positive attitude toward academic excellence and facilitating classroom instruction. Considerable research has shown that higher levels of school resources are associated with higher achievement. However, the relationship between resources and achievement is complicated. First, a school can have a more socioeconomically advantaged student population, for example, because of its location or because it competes for students. Second, the school system can invest more money into schools for such things as facilities, teachers' salaries, equipment, and materials. It follows that the most successful schools are likely to have more socioeconomically advantaged students and better resources (Mullis et al 2012).

Family income has been shown to have a powerful influence on students' achievement in reading and mathematics (Dahl & Lochner, 2005). It seems to be obvious that stronger economic backgrounds tend to have students who achieve higher in education than their counterparts because they are well resourced with all the material that may enhance good learning. Availability of reading material in the home likewise is strongly related to achievement in mathematics and science as well as in reading. IEA's TIMSS studies have consistently shown that students with a large number of books in the home have higher achievement in mathematics and science (Mullis et al 2012).

Entwisile and Alexander (1995) supports this by suggesting that because students from wealthier countries and families tend to have more learning materials than their less well-resourced peers, they attain higher levels of educational achievements. Baker, et al(2002), also substantiate that students with more resources regardless of whether these are books, family income or teacher attention have more opportunity to learn and to translate their knowledge in to higher scores on tests and exams. In Botswana's case, the resources as described by Baker et al are mostly applicable to private schools.

Another factor that has been shown to influence academic achievements is the status of the school buildings and the general school environment. Schools with better facilities and safer/secure environment tend to do well in achievement while schools with high incidence rate and inadequate facilities deteriorate in achievement. In the early years, studies were designed on a planned variation model, where schools operating from different distances towards education were compared with one another e.g. Twenty years ago the Coleman et al. study (1966) ushered in an era of investigation that continues with the focus on naturalistic studies in which schools with usually high achievements are compared with others and the study was widely interpreted as indicating that variation between schools had little effect on student`s success because the ability and socio-economic background of the student themselves were such powerful factors.

3.0 Performance of Public and Schools in Primary School Leaving Examination (PSLE)

A desk review conducted in Botswana Examinations Council (BEC) indicates that despite the presumably varying school factors at private and government schools, private schools outperform their counterparts at a constant 98%. A trend analysis on A-C percentage pass at was done for both government and private schools over a period of five years (2007 -2011). Many private candidates sit for PSLE which is normally taken at grade 7, at grade 6, therefore the study assumed similar characteristics between PSLE candidates and grade 6 students that were used for PIRLS. Figure 1 depicts the trend analysis of A-C% pass of private schools versus government schools at PSLE. Results reflect a decline in the A-C performance for government primary schools, from 82% in 2007 to 62.8 % in 2011, while private schools were seen to be somewhat constant, ranging from 98% to 99% and differing by 0.5% at the most. Data consistently show a strong positive relationship between achievement and socioeconomic status (SES), or indicators of socioeconomic status such as parents' or caregivers' level of education or occupation, which explains the pattern of A-C Pass rate between Private and Government schools in Figure 1. Both PIRLS and Programme for International Student Assessment (PISA) have found strong positive relationships between level of parents' education and occupation and their children's educational attainment (Mullis et al 2012).
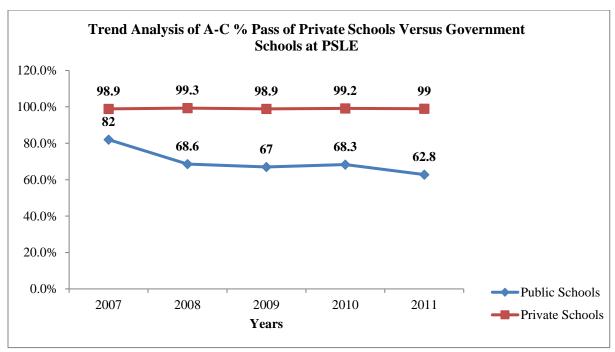

Figure 1: A-C Percentage Pass for Private and Government Schools at PSLE

4.0 Problem Statement

Despite the background given, it is not clear which factors shape Reading achievement and how they operate in Botswana since it seems difficult to reach the international low benchmark by PIRLS standards. School background factors considered for the 2011 (PIRLS) analysis used in this report include bullying, safety/security at the school, overcrowding and the state of the school buildings, and were hypothesized to be negatively affecting student achievement.

5.0 Significance of the Study

Although the study used PIRLS standard 6 data, it should enable the Botswana Examinations Council (BEC) to relate students` achievement to their school background factors and be in a position to differentiate the effect of teaching and that of assessment in the results from Primary School Leaving Examinations (PSLE).

6.0 Objectives

1. To explore the associations between students' reading achievement and selected school background variables.
2. To determine relationship between bullying and student reading achievement at standard 6 after controlling for school specific factors?

7.0 Method

7.1 Sampling Methodology of PIRLS

The PIRLS pride itself with a robust and comprehensive sampling technique which aims to obtain efficient, consistent and precise estimates. The sampling design for PIRLS was developed by Statistics Canada based on multi-stage sampling framework. The schools in the participating countries were divided into strata based on the region, school type, level of urbanization and schools 'level of performance. The participating countries collate information on these variables for all the schools in the country and send it to Statistics Canada for selecting the sample. In case of Botswana, 149 schools were sampled including the private and public schools. There were in all 4197 students in the sample. The schools were stratified by regions, level of urbanization (Urban, Semi-Urban and Remote Rural) and level of performance (High, Medium and Low). Botswana schools were stratified into 6 regions; North West, North East, Kweneng, Southern, South East and Central. This means some known districts in Botswana like Kgatleng, Ghanzi, Kgalagadi and Chobe were collapsed in some of the regions mentioned above. At the 1st stage of sampling the schools were selected according to probability proportional to size scheme, the 2nd stage involved sampling the classes within schools. At most two classes were selected in each school. About 0.3% of students were excluded from the sampling frame based on a predetermined exclusion criterion. The average participating rate for students within school was 99% during the survey.

8.0 Data Description

The study used the information obtained from students and teachers questionnaires used to gather information for the PIRLS 2011. The student's questionnaire entails the information about students' plausible scores for reading. Since an incomplete randomized design was used to allocate the students different reading booklets, plausible values were generated from students' score distribution to take care of missing information. The students' data also included information on students' background and their attitudes towards reading. Teacher questionnaire included information about school, pedagogical issues, resources for reading, homework for students, etc. All these tools were designed by IEA at the International Study Center and adapted by BEC to suit Botswana. The data sets for these instruments were merged using IDB Analyser. The following variables were used in the study:

Students Gender: Gender is categorical variable with dichotomous outcomes. In this regression analysis female is used as a reference in a dummy variable representing gender.

Students Age: Age is continuous and has been centred to the mean age of the group (12) for easier interpretation of the results.

Frequency of Bullying at School: This is a construct representing the following items asked to students*; I was made fun of or called names at school, I was left out of games or activities by other students at school, someone spread lies about me at school, something was stolen from me at school, I was hit or hurt by others students at school and I was made to do things I didn't want to do by other students at school*. The students were supposed to indicate how often these things happen to them at school.

Frequency of Parental Support: The variable frequency of parents support is a construct representing the following questions asked to students; *My parents ask me what I am learning in school, I talk about my schoolwork with my parents, my parents make sure that I set aside time for my homework and my parents check if I do my homework.* The students had to give frequency at which these things happen.

Amount of Home Possession: The variable amount of home possessions is a construct representing the following items the students have or do not have at home; Computer, Study desk/table, Books of their own, Own room, Internet connection, Calculator, Dictionary, Running tap water, Electricity, Television and Radio.

School-Based Variables: The factors relating to schools are the school resources such as availability of computers for instruction, overcrowding in class, safety at school and school infrastructure.

School Type: This is a dummy variable representing Private and Government schools. The private school is used as a reference point to compare against government school.

Class Overcrowding: Teachers were asked to indicate the extent to which overcrowding is a problem at school. The variable has 4 levels: not a problem, minor problem, moderate problem and serious problem. In regression analysis, the variable is dichotomous in to overcrowding is a problem or not a problem. The level used as a reference is overcrowding not a problem.

School located in a Safe Neighbourhood
Teachers were asked to indicate in four likert scale response whether they are agree or not with the statement that says the school is located in a safe neighbourhood. However, in regression the variable was dichotomised into agree and disagree. The level used as a reference for the dummy representing this variable is agreed.

I feel safe at School: Teachers were asked to indicate in four Likert-scale responses whether they agree or not with the statement that says the school is located in a safe neighbourhood. However, in regression the variables were dichotomised into agree and disagree

The School building needs Significant Repair: Teachers were asked to indicate whether school building require significant repair. The variable has 4 levels: not a problem, minor problem, moderate problem and

serious problem. In regression analysis the variable is dichotomous in to is a problem or not a problem. The level used as a reference is overcrowding not a problem.

Computer Usage at School: Teachers were asked whether they use a computer in classroom instruction or not.

9.0 Data Analysis Techniques

To achieve the stated objectives, the study used the reading achievements scores and the students and school background variables in the Grade 6 PIRLS data collected in 2011. Each student has 5 plausible values generated during data imputation. The data was analysed using IEA international Database (IDB) Analyser version 3.0 developed by DPC to help analysis of large scale assessment such as TIMSS and PIRLS. The application works with SPSS by creating code that are used in SPSS to conduct statistical analyses. IDB analyser has advantages of producing weighted statistical results. The means, percentages, correlation and regression coefficients are computed making use of appropriate sampling weights. All five plausible values generated are analysed and the output was combined using suitable statistical methods to take into account imputation error. The association between students' achievements scores and students and school background variables was determined by correlating the students' performance mean with the mentioned factors. Further analysis using regression analysis was performed to measure the direction and strength of association between students' achievements and school/students factors.

10.0   Results

The first part of the results reflects descriptive analysis on the relationship between student achievement and school/student background variables for private schools and public schools were separated, followed by a correlation of student achievement by private and government schools. Further analysis (private and government schools separated) was done with regression to measure the strength of association between students' scores and students' background variables controlling for other factors and separating the two school cadres.

11.0   Safety in the School

Standard 6 teachers were also asked to think about their current school and indicate the extent to which they agreed or disagreed with the following statements; this school is located in a safe neighborhood, I feel safe at this school. Table 1 displays the results for associating students' mean performance with the status of teacher's safety at school.

Table 1: *Teachers' Views on School Safety and Students Performance*

		n	%	Mean(SE)	SD	Diff
The school is located in a safe neighborhood	Agree A Lot	1 608	41.31	444.09(8.16)	95.70	1,2:40.32*
	Agree A Little	1 434	36.55	403.77(6.18)	84.12	1,3:27.85
						1,4: 54.85*
	Disagree A Little	440	11.25	416.24(13.33)	91.15	2,3: -12.47
	Disagree A Lot	415	10.89	389.24(9.88)	78.71	2,4: 14.53
						3,4: 27.00

I feel safe at this school	Agree A Lot	1 826	47.02	439.64(7.16)	93.77	1,2: 32.17*
	Agree A Little	1 402	35.27	407.47(7.29)	88.48	1,3: 34.06*
						1,4: 63.77*
	Disagree A Little	433	10.52	405.58(8.53)	80.95	2,3: 1.89
	Disagree A Lot	264	7.19	375.87(9.26)	76.28	2,4: 31.60*
						3,4: 29.71*

* Statistically significant at 5% level

For teachers who were of the view that their schools were located in a safe neighbourhood, the mean performance of the pupils was high at 444.09. For the teachers who felt there were somewhat in a safe neighbourhood the mean performance of the pupils was lower than those who thought they were in a safe place at 403.77 and 416.24 respectively. The pupils whose teachers disagreed a lot that their schools were in a safe place had the least means of 389.24. There was a significant difference between means of those agreeing a lot and those agreeing a little, as well as between those agreeing a lot and those disagreeing a lot. For teachers who agreed a lot to feeling safe at their schools, the mean performance of the pupils was high at 439.64. Overall, there was a significant difference in performance means between students who were taught by teachers who felt their schools were safe and those who felt their schools were not safe.

12.0   Overcrowding and Status of School Buildings

In the quest to establish the severity of problems that schools may be faced with, teachers were asked to indicate whether the following were not a problem, a minor problem, moderate problem or a serious problem; the school building needs significant repair, classrooms are overcrowded. Table 2 displays the results for associating students' mean performance with overcrowding and the status of school buildings.

Table 2: *Overcrowding, Status of School Buildings and its Association with Performance*

		n	%	Mean(SE)	SD	Diff
School building needing significant repair	Not a problem	413	11.95	467.63(20.86)	102.21	1,2:47.21*
	Minor problem	1 289	34.98	420.42(7.64)	90.43	1,3: 3.18*
						1,4: 4.49*
	Moderate problem	1 299	31.16	414.45(6.67)	87.82	2,3: 5.97
						2,4: 17.28
	Serious problem	890	21.91	403.14(6.94)	84.77	3,4: 11.31
Classrooms are overcrowded	Not a problem	1 387	38.14	420.97(7.97)	97.56	1,2: -6.67
	Minor problem	852	21.89	427.64(11.59)	95.67	1,3: 10.61
						1,4: 1.83
	Moderate problem	777	18.29	410.36(7.91)	82.76	2,3: 17.28
						2,4: 8.50
	Serious problem	880	21.68	419.14(7.24)	83.55	3,4: -8.78

*Statistically significant at 5% level

Regarding the issue of school building needing significant repair, only 11.95% believed that there was no significant problem whilst 34.98% and 31.16% indicated there was either a minor problem (34.98%) or a moderate problem respectively. A majority of 38.1% of teachers indicated that overcrowding of classrooms was a problem, while the remaining percentage was almost evenly split among those who

thought otherwise regarding overcrowding. It is clear that, students taught by teachers who perceived little or no over-crowding or rundown school buildings performed much better than their counterparts taught by teachers who considered them a problem.

13.0   Use of Computers for Classroom Instruction

Generally in Botswana the use computer for classroom instruction is minimal, especially in public schools. It may be found in private schools but even then, it often happens during computer lessons. The findings that can ascertain the aforementioned statements are in figure 2.

Table 3: *Use of Computers for Classroom Instruction and Students' Achievement*

	n	%	Mean(SE)	SD	Diff
Yes	430	10.74	449.77(16.97)	95.69	1,2: 33.52
No	3 537	89.26	416.25(4.71)	90.08	

Statistically significant at 5% level

A substantial proportion of students (89.26%) were taught by teachers who did not use computers for classroom instruction while only 10.74% were taught by teachers who used computers. The mean performance of learners who were taught by teachers who reported use computers was higher (449.77) than the mean of learners who their teachers reported to not use computers for classroom instruction (416.25). There was no significant difference between means of students who were taught by teachers who used computers in their teaching and those who did not use them.

14.0   Impact of Bullying on Reading Achievement

Bullying in this case refers to practices such as making fun or calling other students names by their peers, being left out of games, being hit or hurt by other students etc. Table 4 displays the results for associating students' mean performance with the frequency of bullying at school.

Table 4: *Reading Achievements by Frequency of Bullying at School*

	n	%	Mean(SE)	SD	Diff
At least Once a Month	1042	29.35	409.74(4.76)	91.66	1,2: -10.06
A Few Times a Year	1962	56.53	419.80(4.62)	90.35	1,3 -36.35*
Never	497	14.12	446.09(8.25)	91.71	2,3:-26.29*

**Statistically significant at 5% level*

Students who reported to be bullied at school at least once a month (29.35%) performed lower than those who were bullied a few times a year (56.53%) and never (14.12%) bullied. Statistical significant difference in performance was observed between students who were bullied at least once a month and those who were never bullied; and those who are never bullied and those who are bullied a few times a year. There were insignificant differences between those who are bullied a few times a year and those who are bullied at least once a month.

15.0   Overall Reading Achievement for Private Schools and Government Schools

As depicted in Table 5, private school pupils had a performance mean of 552.71, reaching and exceeding the international benchmark of 500 while their equals from government schools had a mean performance of 407.86 which is way below the international benchmark.

Table 5: *Reading Achievement for Private Schools by Government Schools*

	n	%	Mean(SE)	Diff
Private	210	8.74	552.71(11.88)	1,2: 144.85*
Government	3 200	91.26	407.86(3.82)	

*Statistically significant at 5% level

This therefore means that Private school pupils fare much better internationally in terms of Reading than their counterparts. This fact is supported by the statistical significance shown in the mean differences.

16.0   Do school and students variables affect Private and Public schools differently?

The study shows that the factors affecting students' performance are more severe in public school than in private schools. The factor termed amount of home possession is not significantly different within private school but significantly different among public schools. This is to say for private school, a student who comes from household with home possession regarded as high perform relatively the same as a student who come from household with home possession regarded as medium or low. In public schools the significant difference between levels of the home possession is observed implying that public school students are diverse with their home possessions. It also suggests the selection approach the private schools are using. Most students who attend private schools come from families which are wealthier and hence the effect of home possession does not show up compared to students who attend public schools.

The frequency of bullying at pubic (57.19%) and private (58.14%) schools is done mostly few times a year. The proportions of students who are never bullied are high for private compared to public schools. The effects of bullying on performance in private schools is relatively the same between students who are never been bullied compared to students who are bullied every day, some few time a month and some few time a year. In public schools there exist significant differences in performance between students who are bullied few times a year, every day and few times a month against students who were never been bullied. The differential effects of this factor on performance between private and public schools is indication that private schools are able to manage the effects of bullying very well. The school factors such as safe neighbourhood and safety in school affect both private school and public school equally. A private school in an unsafe neighbourhood will badly compared to schools in a safe neighbourhood. However, overcrowding and status of the building seem not to be a problem in both private and public schools (see the Appendix).

17.0   Regression Analysis of Reading Achievements on Students' Background Variables

A regression analysis is a way of getting the composite effect of background variables on performance when studying them together. The regression analysis was done to establish the relationship between students' performance and student/school factors controlling for others factors on both private and public schools. Results are shown in Table 6. The results of regression analysis suggest that a female student

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who was never being bullied at school, whose parents supported her more frequently on school work, who came from household with home possession regarded as high, attending a private school, who attended a safe school in safe neighborhood and attended in schools where overcrowding is not a problem will have a mean score of 590.53 (constant term in the model) compared to other students who did not possess the same characteristics mentioned above. It must be noted that all factors in the model with negative coefficient implied that any student with such characteristics would score less than 590.53. It is important to have a score above 500 because it is a benchmarking score recommended by the international community for the PIRLS.

A score below 400 is said to be unacceptable in these studies. Some Botswana students scored lower than this mark. However it is pleasing to notice that after taking into account students factors and schools factors the student mean score can be above 500. Factors such as amount of home possessions, frequency of parental guidance, frequency of bullying, overcrowding, safe school neighborhoods, safe schools and type of school are paramount if the students have to perform to higher level. However, a student from public school with similar characteristics mentioned above will score on average a 110.18 points lower than a student at a private school. Cognizance must be made to the fact that 8.74% of the students interviewed belonged to the private schools while 91.26% belonged to government schools.

The analysis further shows that student' factors such as age and gender are important attributes in students' achievement function. Students' age is negatively related to performance. A student who is 1 year older than the mean age of the students interviewed would score 22.53 points lower than a students at the mean age. And a student at 1 age lower would score 22.53 points higher than the mean age. There are conflicting results on the relationship between age and students' academic performance in literature. Crosser (1991), Kinnard & Reinherz (1986), Laparo & Pianta (2000) found that older students fare better academically than younger students. In contrast DeMeis and Stearns (1992); and Dietz & Wilson (1985) found no significant differences between age groups and achievements. The current results are supported by Coleman et al. (1966), White (1982) and Jabor M.K. et al. (2011) who found that when students get older the correlation between age and achievements diminishes. Empirical evidence shows that when students get older their academic performance goes down and older students are more likely to drop out from school. In terms of gender, female students outscored male students in reading scores.

Table 6: Results of Regression Analysis of Reading Achievements on Student's Background Variables

	Coefficients	STD Error	t-value
Constant	590.53	17.86	33.07*
Age	-22.55	2.08	-10.85*
Gender			
Male	-16.84	3.71	-4.53*
School Type			

Government	-110.18	13.68	-8.05*
Frequency of Bullying at School			
Monthly	-20.65	5.84	-3.54*
Yearly	-15.76	4.56	-3.46*
Home Possessions			
Medium	-27.23	9.04	-3.01*
Low	-10.72	6.71	-1.60
Parental Support			
Weekly	-13.77	4.19	-3.29*
Monthly	-26.63	5.74	-4.64*
Never	1.76	16.34	0.11
Number of Books at Home			
0--10 Books	-12.25	9.08	-1.35
11--25 Books	-1.15	8.78	-0.13
26-100 Books	4.01	8.25	0.49
School Factors			
Computer Usage	5.30	13.15	0.40
Safe Neighbourhood	-9.58	10.15	-0.94
I feel Safe at School	-7.14	9.76	-0.73
Building Needs Repair	2.92	6.76	0.43
Overcrowding	-10.72	6.71	-1.60

*Statistically significant at 5% level

It is evident from the analysis that students' background life experiences also have significant impact on students' performance. Life experience such as frequency at bullying at school, frequency of home support, amount of books at home and the level of possessions at home have a positive contribution to students performance if they are favourable to the students conditions. Frequency of bullying affects public school students' performance compared to private school. That means a student's who is bullied at public school will perform badly compared to her/ his counterpart at private school. The same applies to home possessions; a student who comes from household with high home possession and goes to private

school will score much higher than students in public school with the same conditions. It is however important to note that school factors controlled in the model have little effect on student reading achievements after taking into account students background variables such as bullying at school, parental support, etc. All school factors are statistically insignificant in the model.

18.0   Discussions

There is a negative linear relationship between bullying and student achievement in reading as substantiated by the linear differences in means for males who were bullied at least once a month and a few times a year on Table 6. The study proposes that the higher the frequency of bullying the less the achievement in reading. As prior research suggests that student victimization has a significant impact on school attendance (Banks, 1997; Fried, 1996; Hoover & Oliver, 1996), it is safe to conclude that bullying may cause the victim to be less engaged in school, and cease attending which inevitably results in low achievement. If the victim becomes engaged in school, his or her attendance of the school will be less affected and therefore his /her achievement will also be less affected. According to Wolpert 2010, the link between bullying and achievement can work both ways, for instance, the students who are doing poorly are at higher risk for getting bullied, and any student who gets bullied may become a low achiever. Irrespective of the time and place where bullying occurs, it can paralyze students from concentrating on academics.

As seen in the results, the safer the location of the school the better the performance of the learners is a conclusion that can be drawn from the correlation tables. Generally, pupils whose teachers felt safe in their schools performed better than those whose teachers felt unsafe, Arum (2003) substantiates this by saying that feelings of safety are positively related to both behavioural and academic outcomes. He finds variation in the relationship between safety and academic outcomes by gender, with feelings of safety having larger positive association with test scores for females than males. Other scholars found that exposure to neighborhood violence affects students' academic performance and that of their peers (Aizer 2008; Carrell and Hoekstra 2010; Delaney-Black et al. 2002; Gibson, Morris, and Beaver 2009; Ripski and Gregory 2009; Sharkey 2010). On contrary, the regression analysis of this paper could not support the aforementioned since all the variables pertaining to safety tested insignificant. It implies that there might be a correlation between safety at school and some of the variables being controlled for in the regression such as bullying.

Inference can be made that the use of computers in teaching in general, be it preparation, administration or classroom instruction enhances performance among learners as it can seen from the results that the means of students taught by teachers who used computers were higher than for those whose teachers did not use computers. The study also shows that school buildings are generally in a good state. However, there is a significant difference in the mean performances, between the pupils whose teachers did not see it as a problem and those who thought it was minor, those who thought it was not a problem and those who thought it was a moderate problem and lastly, between those who thought it was not a problem and those who thought it was a serious problem. This proves to be a subjective matter depending on different views the teachers may have. However, the regression analysis disqualifies the statements as it shows statistical insignificance. As for overcrowding, students taught by teachers who did not perceive the issue of overcrowding perform better than learners who were taught by teachers who viewed overcrowding as not a problem on table 2. Regression analysis affirmed this statement by showing no statistical significance

between overcrowding and performance. On the other hand, available research shows that overcrowding causes a variety of problems and the findings indicate that students in overcrowded schools and classrooms do not score as high on achievement tests as students in non-overcrowded schools and classrooms (Earthman, 2002). There is generally a dearth of research on this subject and it makes it difficult to be conclusive on the matter. Further regression analysis on this issue may be carried out when more variables are controlled for, such as segregating by urban and rural environments, teacher effects, pre-school etc.

19.0   Conclusion

The results show that the students Reading achievement is affected by frequency of bullying at school, type of school, gender, home possessions, and age. However there are differences between private and government schools in performance, with private school being in the lead. Frequency of bullying and parental guidance are prevalent in both school types; however, private schools may have better ways of addressing it as the results show a high mean performance nonetheless. The desk review results showed that in the five year period (Figure 1), private schools constantly performed significantly better than the government schools in Botswana. Contemporary literature links availability of both home and school resources to enhanced academic achievement.

References

Aizer, A. (2008) Neighborhood violence and urban youth. Cambridge, Mass: National Bureau of Economic Research.

Alexander, K. L., Entwisle, D. R., & Dauber, S. L. (1995) On The Success of Failure: A   Reassessment of the Effects of Retention in the Primary Grades. New York: Cambridge University Press.

Arum, R. (2003) Judging school discipline: The crisis of moral authority. Cambridge, MA: Harvard University Press.

Arum, R., & Velez, M. (2010) Improving learning environments in schools: Lessons from abroad. Unpublished manuscript.

Baker, D.J., Blumberg, R., & Freeman, R. (2002) Considerations for Functional Assessment   of Problem Behaviour Among Persons With Developmental Disabilities And Mental Illness. Programs and Services for People with Dual Developmental and Psychiatric Disabilities. New York: NADD.

Banks, R. (1997) Bullying in Schools. Champaign, IL: ERIC Clearinghouse on Elementary and Early Child-hood Education, ED407154.

Carrell, S. E., & Hoekstra, M. L. (2010) Externalities in the classroom: How children exposed to domestic violence affect everyone's kids. American Economic Journal: Applied Economics, 2(1), 211-228.

Chen, G. (2007) School disorder and student achievement. Journal of School Violence, 6(1), 27-43.

Coleman, J., Campbell, E., Hobson, C., McParland, J., Mood, A., Weinfield, F., & York, R. (1966) Equality of educational opportunity. Washington, D.C.: U.S. Government Printing Office.

Crosser, S.L. (1991) Summer birth date children: Kindergarten entrance age and academic achievement. Journal of Educational Research, 84 (3), 140-146.

DeMeis, J.L. & Stearns, E.S. (1992) Relationship of school entrance age to academic achievement. Journal of Educational Research, 86 (1), 20-27.

Dietz, C. & Wilson, B.J. (1985) Beginning school age and academic achievement. Psychology in the Schools, 22 (1), 93-94.

Fried, S., and Fried, P. (1996) Bullies and Victims: Helping Your Child Survive the Schoolyard Battlefield. New York, NY: Evans.

Foy, P., Arora, A., and Stanco G.M (2013).Supplement 1 International Version of the TIMSS & PIRLS 2011 Background and Curriculum Questionnaires. TIMSS & PIRLS International Study Center. IEA Boston College.

Hong, J. S., & Eamon, M. K. (2011) Students' perceptions of unsafe schools: An ecological systems analysis. Journal of Child and Family Studies, 1-11.

Hoover, J., and Oliver, R. (1996) The Bullying Prevention Handbook: A Guide for Principals, Teachers, and Counsellors. Bloomington, IN: National Educational Service.

Jabor, K. M., Machtmes, K. , Kungu, K., Buntat, Y., Nordin, S. M., (2011) The influence of Age and Gender on the Students' Achievements in Mathematics,IPEDR (5),304-308, IACSIT Press Singapore

Kinard, E.M. & Reinherz, H. (1986) Birth date effects on school performance and adjustment: A longitudinal study. Journal of Educational Research, 79 (6), 366-372.

Labrecque M, Chuy M, Brochu P, and Houme K (2012) Canadian Results from the Progress in International Reading Literacy Study. Council of Ministers of Education, Canada.

La Paro, K.M. & Pianta R.C. (2000) Predicting children's competence in the early school years: A meta-analytic review. Review of Educational Research, 70 (4), 443-484.

Lubienski, S, and Lubienski, T, (2006). Appalachian Collaborative Centre for Learning, Assessment, and Instruction in Mathematics (ACCLAIM).

Lundberg,I.& Linnakyla, P. (1993). Teaching Reading around the World, The Hague: IEA.

Mayer, M. J. (2010) Why do school order and safety matter? Educational Researcher, 39(1), 7-15.

Mullis, I. V.S et al, (2012). PIRLS 2011 International Results in Reading,TIMSS & PIRLS International Study Center, Boston College USA, IEA Netherlands.

Schwartz, D., Gorman, A. H., Nakamoto, J., & Toblin, R. L. (2005) Victimization in the peer group and children's academic functioning. Journal of Educational Psychology, 97(3), 425-435.

Sharkey, P. (2010) The acute effect of local homicides on children's cognitive performance.
Proceedings of the National Academy of Sciences, 107, 11733-11738.

Schreck, C. J., and Miller, J. M. (2003) Sources of fear of crime at school: What is the relative contribution of disorder, individual characteristics, and school security? Journal of School Violence, 2(4), 57-59.

Skiba, R., Michael, R., Nardo, A., & Peterson, R. (2002) The color of discipline: Sources of racial and gender disproportionality in school punishment. The Urban Review, 34(4), 317-342.

APPENDIX

	Home Possession	n	%	Mean(SE)	SD	Within Diff	Between Diff
Private	High	48.00	22.12	567.35(9.90)	53.85	1,2:18.75	1,1: 103.14**
	Medium	161.00	77.35	548.60(13.92)	65.56	1,3: 25.77	2,2: 134.75**
	Low	1.00	0.52	541.57(25.94)	0.00	2,3: 7.03	3,3: 162.55**
Public	High	69.00	2.09	464.20(10.33)	75.55	1,2: 10.33**	
	Medium	2,544.00	78.79	413.85(4.10)	84.69	1,3: 4.10**	
	Low	567.00	19.11	379.01(4.24)	71.80	2,3: 4.10**	

	Parent Support	n	%	Mean(SE)	SD	Within Diff	Between Diff
Private	Every Day	144.00	69.85	547.86(13.76)	64.32	1,2: -10.22	1,1: 123.80**
	Once or Twice a Week	53.00	23.84	558.08(10.26)	62.18	1,3: -34.47	2,2: 165.70**
	Once or Twice a Month	11.00	5.52	582.33(10.77)	44.54	1,4:-64.61	3,3: 207.69**
	Never	2.00	0.78	612.48(27.83)	12.80	2,3: -24.25	4,4: 215.32**
Public	Every Day	1,808.00	56.35	424.06(3.55)	78.94	1,2; 31.68**	
	Once or Twice a Week	983.00	31.48	392.38(4.92)	84.62	1,3: 49.42**	
	Once or Twice a Month	320.00	10.24	374.64(6.64)	84.20	1,4: 26.9	
	Never	60.00	1.92	397.16(17.13)	94.33	2,3: 17.74**	

	Bullying at School	n	%	Mean(SE)	SD	Within Diff	Between Diff
Private	Every Day	3.00	1.74	532.05(43.19)	42.77	1,2:-14.86	1,1: 133.04**
	Once a Month	38.00	17.73	546.91(17.04)	75.25	1,3: -21.75	2,2: 145.68**
	Few times a year	120.00	58.14	553.80(9.55)	59.14	1,4: -24.04	3,3: 148.86**
	Never	49.00	22.40	556.08(25.78)	64.45	2,3:-6.88	4,4: 124.28**
Public	Every Day	49.00	1.51	399.01(15.34)	95.58	1,2:-2.22	
	Once a Month	779.00	24.44	401.23(5.10)	86.71	1,3: -5.92	
	Few times a year	1,800.00	57.19	404.93(3.86)	82.22	1,4: -32.79**	
	Never	536.00	16.86	431.80(5.68)	79.53	2,3: -3.70	

	Number of Books at Home	n	%	Mean(SE)	SD	Within Diff	Between Diff
Private	0--10 books	30.00	13.67	535.90(15.06)	69.19	1,2: -10.82	1,1: 139.23**
	11--25 books	64.00	31.49	546.72(14.67)	63.62	1,3:-16.17	2,2: 124.98**
	26--100 books	78.00	36.86	552.07(12.29)	61.56	1,4; -45.29**	3,3: 121.48**
	101--200 books	23.00	11.09	581.19(16.37)	54.13	1,5: -35.16	4,4: 170.17**
	200+ books	15.00	6.89	571.06(18.32)	53.75	2,3: -5.35	5,5: 187.29**
Public	0--10 books	1,307.00	43.32	396.67(3.55)	77.42	1,2: -25.07**	
	11--25 books	1,051.00	33.88	421.74(4.20)	81.28	1,3: -33.92**	
	26--100 books	468.00	14.82	430.59(5.85)	90.13	1,4: -14.35	
	101--200 books	147.00	4.57	411.02(13.26)	98.56	1,5: 12.9	
	200+ books	111.00	3.41	383.77(11.71)	85.38	2,3: -8.85	

	Safe Neighborhood	n	%	Mean(SE)	SD	Within Diff	Between Diff
Private	Agree a Lot	162.00	79.31	546.60(14.43)	63.44	1,2: -42.07**	1,1: 122.68**
	Agree a Little	21.00	10.35	588.67(7.23)	52.58	1,3: -16.95	2,2: 187.86**
	Disagree a Little	27.00	10.35	563.57(6.72)	59.80	2,3: 25.12**	3,3: 162.99**
Public	Agree a Lot	1,172.00	37.18	423.93(7.49)	87.84	1,2: 23.12**	
	Agree a Little	1,305.00	41.85	400.81(5.16)	80.58	1,3: 23.39**	
	Disagree a Little	299.00	9.83	400.57(8.56)	82.45	1,4: 39.11**	
	Disagree a lot	324.00	11.14	384.81(10.91)	75.40	2,3: 0.24	

	School Building	n	%	Mean(SE)	SD	Within Diff	Between Diff
Private	Not a problem	120.00	60.66	548.09(17.37)	62.17	1,2-10.42	1,1: 146.29**
	Minor Problem	63.00	29.00	558.51(24.48)	66.21	1,3: -15.47	2,2: 147.16**
	Moderate problem	27.00	10.35	563.56(6.72)	59.80	2,3: -5.05	3,3: 150.95**
Public	Not a problem	237.00	8.29	401.79(10.78)	80.82	1,2: -9.56	
	Minor Problem	1,034.00	34.83	411.35(7.91)	84.11	1,3: -10.83	
	Moderate problem	1,028.00	31.77	412.61(7.40)	84.89	2,3: 2.95	
	Serious Problem	795.00	25.12	398.84(6.96)	83.69	2,4: -1.26	

	Classrooms Overcrowding	n	%	Mean(SE)	SD	Within Diff	Between Diff
Private	Not a problem	129.00	60.50	554.45(11.14)	63.21	1,2: -4.41	1,1: 152.52**
	Minor Problem	81.00	39.50	550.04(31.30)	63.61		2,2: 152.32**
Public	Not a problem	1,056.00	36.98	401.93(7.06)	86.00	1,2: 4.2	
	Minor Problem	568.00	17.46	397.73(7.96)	79.63	1,3: -11.67	
	Moderate problem	651.00	20.00	413.60(8.93)	82.89	1,4:-15.24	
	Seriious Problem	824.00	25.56	417.17(7.54)	84.05	2,3: -15.87	

	Computer Usage	n	%	Mean(SE)	SD	Within Diff	Between Diff
Private	YES	77.00	32.22	529.18(26.04)	62.17	1,2: 34.71	1,1: 106.78**
	NO	133.00	67.78	563.90(10.55)	60.97		2.2: 157.38**
Public	YES	299.00	8.47	422.41(15.78)	90.06	1,2: 15.89	
	NO	2,901.00	91.53	406.51(3.95)	83.07		

Within Diff represents the mean difference in performance between levels of the variable being studied within the school type.
Between Diff represents the mean difference in performance between similar levels across school type
**** denotes statistically significant difference**