

Bullying and Christian Schools

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based on the

Bullying Survey for Christian Schools (2016)

Analysis of Data (2022) by Precision Consulting

Research Hypotheses

The following null and alternative hypotheses were addressed in this study:

H₀1: There is no statistically significant relationship between gender and the type of bullying reported.

H_a1: There is a statistically significant relationship between gender and the type of bullying reported.

H₀2: There is no statistically significant relationship between gender and the location of bullying.

H_a2: There is a statistically significant relationship between gender and the location of bullying.

H₀3: There is no statistically significant relationship between gender and whether bullying was reported.

H_a3: There is a statistically significant relationship between gender and whether bullying was reported.

H₀4: There is no statistically significant relationship between grade and the type of bullying reported.

H_a4: There is a statistically significant relationship between grade and the type of bullying reported.

H₀5: There is no statistically significant relationship between grade and the location of bullying.

H_a5: There is a statistically significant relationship between grade and the location of bullying.

H₀6: There is no statistically significant relationship between grade and whether bullying was reported.

H_a6: There is a statistically significant relationship between grade and whether bullying was reported.

H₀7: There is no statistically significant relationship between years attending a Christian school and the type of bullying reported.

H_a7: There is a statistically significant relationship between years attending a Christian school and the type of bullying reported.

H₀8: There is no statistically significant relationship between years attending a Christian school and the location of bullying.

H_a8: There is a statistically significant relationship between years attending a Christian school and the location of bullying.

H₀9: There is no statistically significant relationship between years attending a Christian school and whether bullying was reported.

H_a9: There is a statistically significant relationship between years attending a Christian school and whether bullying was reported.

H₀10: There is no statistically significant relationship between school size and the type of bullying reported.

H_a10: There is a statistically significant relationship between school size and the type of bullying reported.

H₀11: There is no statistically significant relationship between school size and the location of bullying.

H_a11: There is a statistically significant relationship between school size and the location of bullying.

H₀12: There is no statistically significant relationship between school size and whether bullying was reported.

H_a12: There is a statistically significant relationship between school size and whether bullying was reported.

Descriptive Statistics

Table 1 reports the results of the frequency analyses for gender, grade, division, and race. Of the 2016 students included in the sample, 48.8% were male and 51.2% were female. Regarding Race, nearly eight in ten (77.3%) were White, 11.8% were Black, 4.2% were Asian, 3.8% were from multiple races, 1.3% were Hispanic, 1.0% were Amber Indian, 0.6% were Native Hawaiian, and 0.1% reported either Hispanic or Latin American. In addition, 32.7% were in grades 3 through 5, 35.9% were in grades 6 through 8, and 31.3% were in grades 9 through 12. Moreover, 33.3% reported their grade division as elementary school, 35.8% indicated middle or junior high school, and 31.0% stated high school.

Table 1

Results of the Frequency Analyses for Demographic Characteristics of the Sample

Demographic Characteristics		Frequency	Percent
Gender	Male	984	48.8
	Female	1032	51.2
Grade	3	205	10.2
	4	225	11.2
	5	228	11.3
	6	198	9.8
	7	240	11.9
	8	287	14.2
	9	167	8.3
	10	154	7.6

	11	150	7.4
	12	162	8.0
Race	White	1558	77.3
	Asian	84	4.2
	Black	237	11.8
	Multiple	76	3.8
	Amer Indian	20	1.0
	Native Hawaiian	12	0.6
	Hispanic	27	1.3
	Hispanic or Latin American	2	0.1
Grade Division	Elementary School	671	33.3
	Middle or Junior High School	721	35.8
	High School	624	31.0

Evaluating Research Hypotheses

Twelve research hypotheses were addressed in this study. Pearson Chi-square test was utilized to evaluate Hypotheses 1-3 and 10-12, independent samples *t*-test was employed to evaluate Hypotheses 4 -6, and ANCOVA was utilized to examine Hypotheses 7-9. Due to the multiple tests being conducted to address most of these hypotheses, there was the risk of increasing Type I error probability when interpreting the results of the statistical tests. The Bonferroni correction method was utilized to avoid this issue. Following this approach, the significance level for each hypothesis is determined by dividing the number of tests being conducted by the original significance level of .05 (Sedgwick, 2012). Furthermore, for each Chi-square test, Cramer's *V* value was reported to assess the magnitude of the association between the categorical variables under study when a significant association is identified. Values less than .20 were considered indicative of weak associations, .20-.40 as moderate, .40-.60 as relatively strong, and above .60 as strong associations. In addition, Cohen's *d* values were calculated for each of the independent samples *t*-tests as a measure of the magnitude of the mean differences between the two groups under comparison. This measure was calculated by dividing

the mean of the differences by the pool standard deviation of the differences between the two groups. Values around .20 were regarded as indicative of small effects, around .50 as moderate effects, and around .80 as large effects (Cohen, 2013).

Hypothesis 1

Null Hypothesis 1 is that there is no statistically significant relationship between gender and the type of bullying reported. To address this hypothesis, three Pearson Chi-squared tests were conducted to determine whether there were significant associations between gender and each of the dummy variables representing seeing bullying, perpetrator of bullying, and victim of bullying. By applying a Bonferroni correction, the significance level for these tests was determined at $\alpha = .017$. The results of these analyses are summarized in Table 2.

It was found that only the dummy variable representing seeing bullying was significantly associated with gender ($p < .017$). These results suggested that females were more likely to state that they had witnessed an act of bullying than males. The Cramer's V value indicated that the magnitude of this association was weak. On the other hand, there were no significant associations between gender and other types of bullying ($p > .017$). Overall, these results provided support to reject Null Hypothesis 1 that there is no statistically significant relationship between gender and the type of bullying reported.

Table 2

Results of Examining the Associations Between Gender and Different Types of Bullying

Bullying Type	χ^2	<i>df</i>	<i>p</i> -value	Cramer's <i>V</i>
Seeing Bullying	14.154	1	<.001	.084
Perpetrator	0.451	1	.462	.016
Victim	3.266	1	.071	.040

In addition to the Chi-squared tests, a series of independent samples *t*-tests were performed to examine whether there were significant differences in physical, verbal, and social

bullying by gender. These analyses were conducted based on the number of times students had seen, been victimized by, and been perpetrators of physical, verbal, and social bullying. Hence, a total of nine tests were needed to be conducted. Using a Bonferroni correction method, the significance level for these tests was set at $\alpha = .050/9 = .006$.

The results of the independent samples *t*-tests are summarized in Table 3. From these results, it can be seen that there were statistically significant differences in the number of times students had seen verbal and social bullying, and the number of times students had been victimized by social bullying between male and female students. The effect size values for these variables indicated that the magnitudes of all these mean differences were very large. It can be concluded from these results that, on average, female students witnessed significantly more instances of both verbal and social bullying. In addition, the average number of times being socially bullied by other students was significantly higher for females than males. In terms of these three types of bullying, no further significant differences were identified by gender.

Table 3

Comparing Physical, Verbal, and Social Bullying by Gender

Variable	Equal Variances	<i>T</i>	<i>df</i>	<i>p</i> -value	Mean Difference	Std Error Difference	Effect Size
Seeing Physical	Assumed	-1.338	2014	.181	-0.090	0.067	-1.343
Seeing Verbal	Not Assumed	-3.821	2013.849	<.001	-0.304	0.080	-3.800
Seeing Social	Not Assumed	-4.428	2011.26	<.001	-0.360	0.081	-4.444
Victim of Physical	Assumed	-0.111	2014	.912	-0.007	0.059	-0.119
Victim of Verbal	Assumed	-1.094	2014	.274	-0.068	0.062	-1.097
Victim of Social	Not Assumed	-3.321	1995.405	.001	-0.219	0.066	-3.318
Perpetrator of Physical	Not Assumed	1.148	1960.054	.251	0.039	0.034	1.147
Perpetrator of Verbal	Not Assumed	1.595	1904.629	.111	0.057	0.036	1.583
Perpetrator of Social	Assumed	0.125	2014	.900	0.004	0.036	0.111

Hypothesis 2

Null Hypothesis 2 is that there is no statistically significant relationship between gender and the location of bullying. To address this hypothesis, a series of Pearson Chi-squared tests were conducted to determine whether there were significant associations between gender and each of the 15 dummy variables representing location of bullying for those who had witnessed bullying, perpetrators of bullying, and victims of bullying. This means that a total of 45 Chi-squared tests were needed to be conducted. By applying a Bonferroni correction, the significance level for these tests was determined at $\alpha = .050/45 = .001$.

The first series of Chi-square tests were performed to examine the associations between gender and the dummy variables representing location of bullying for seeing bullying. These analyses were performed based on the data collected from the students who reported seeing bullying. As displayed in Table 4, it was found that there was a significant association between the dummy variable representing hallways and gender ($p < .001$). The Cramer's V value suggested that the magnitude of this association was weak. These results indicated that females were more likely than males to see an act of bullying in the hallways than males. No further significant associations were identified between gender and the dummy variable for bullying location ($p > .001$).

Table 4

Results of Examining the Associations Between Gender and Different Bullying Locations for Those Who Had Witnessed an Act of Bullying

Bullying Location	χ^2	<i>df</i>	<i>p</i> -value	Cramer's <i>V</i>
Class-Teacher Present	4.352	1	.037	.068
Class- Teacher not Present	1.244	1	.265	.036
Playground	7.784	1	.005	.090
Gym	.037	1	.847	.006

Hallways	18.568	1	<.001	.140
Restroom	2.001	1	.157	.046
Cafeteria	5.102	1	.024	.073
Walk To or From School	1.640	1	.200	.041
Bus	.156	1	.693	.013
Online	1.563	1	.211	.040
Phone	8.185	1	.004	.093
After School Events	2.042	1	.153	.046
Home	2.051	1	.152	.046
Church	4.124	1	.042	.066
Other Places	0.000	1	.994	.000

The second series of Chi-square tests were performed to examine the associations between gender and the dummy variables representing location of bullying for perpetrators. These analyses were conducted based on the data collected from those who reported being perpetrators. As reported in Table 5, there were no significant associations observed between gender and any of the dummy variables representing bullying location ($p > .001$).

Table 5

Results of Examining the Associations Between Gender and Different Bullying Locations for Perpetrators of Bullying

Bullying Location	χ^2	Df	p-value	Cramer's V
Class-Teacher Present	0.319	1	.572	.037
Class- Teacher not Present	3.948	1	.047	.130
Playground	0.035	1	.852	.012
Gym	0.092	1	.762	.020
Hallways	1.126	1	.289	.069
Restroom	0.063	1	.802	.016
Cafeteria	0.856	1	.355	.060
Walk To or From School	0.043	1	.836	.013
Bus	1.561	1	.212	.082
Online	0.056	1	.813	.015
Phone	0.016	1	.899	.008
After School Events	0.204	1	.652	.029
Home	0.104	1	.747	.021

Church	0.296	1	.586	.035
Other Places	0.004	1	.951	.004

The third series of Chi-square tests were performed to examine the associations between gender and the dummy variables representing location of bullying for victims of bullying. These analyses were conducted based on the data obtained from those who reported being victimized by bullies. Table 6 shows that there were no significant associations between gender and any of the dummy variables representing bullying location ($p > .001$).

Table 6

Results of Examining the Associations Between Gender and Different Bullying Locations for Victims of Bullying

Bullying Location	χ^2	Df	p-value	Cramer's V
Class-Teacher Present	3.434	1	.064	.076
Class- Teacher not Present	0.532	1	.466	.030
Playground	0.630	1	.427	.033
Gym	0.024	1	.876	.006
Hallways	1.397	1	.237	.049
Restroom	0.100	1	.752	.013
Cafeteria	0.031	1	.859	.007
Walk To or From School	1.178	1	.278	.045
Bus	1.416	1	.234	.049
Online	0.133	1	.715	.015
Phone	5.069	1	.024	.093
After School Events	0.355	1	.551	.024
Home	3.568	1	.059	.078
Church	0.210	1	.647	.019
Other Places	0.070	1	.791	.011

In summary, the results of the Pearson Chi-squared tests determined that some indicators of bullying location were significantly associated with gender. Hence, these results provided support to reject Null Hypothesis 2 that there is no statistically significant relationship between gender and the location of bullying.

Hypothesis 3

Null Hypothesis 3 is that there is no statistically significant relationship between gender and whether bullying was reported. To address this hypothesis, a Pearson Chi-squared test was conducted to examine the association between gender and whether bullying was reported. Only the data for those who reported being victims of bullying were included in this analysis. The results of this analysis are reported in Table 7. It was found that a significant association existed between gender and whether bullying was reported ($p < .05$). The Cramer's V value indicated that the strength of this association was weak. These results suggested that females were significantly more likely to report being victimized by bullies than males. Therefore, these results provided support to reject Null Hypothesis 3.

Table 7

Results of Examining the Associations Between Gender and Whether Bullying Was Reported for Victims of Bullying

	χ^2	<i>Df</i>	<i>p</i> -value	Cramer's <i>V</i>
Bullying Being Reported	6.121	1	.013	.103

Hypothesis 4

Null Hypothesis 4 is that there is no statistically significant relationship between grade and the type of bullying reported. To address this hypothesis, three independent samples t -tests were conducted to examine whether there were significant differences in the mean of grade by the dummy variables representing seeing bullying, being a perpetrator of bullying, and being a victim of bullying. By applying a Bonferroni correction, the significance level for these tests was determined at $\alpha = .050/3 = .017$.

As displayed in Table 8, the results of the independent samples *t*-tests revealed that the mean of grade level significantly varied by all three different types of bullying ($p < .017$). The effect size values for these grouping variables suggested that the magnitudes of all these differences were very large. These results indicated that the mean of grade was significantly lower for those who had seen bullying, perpetrators of bullying, and victims of bullying compared to the other groups. It can be concluded from these findings that students in lower grades were significantly more likely to have witnessed bullying, be perpetrators of bullying, and be victims of bullying compared to students in higher grades. Overall, these results provided support to reject Null Hypothesis 4 that there is no statistically significant relationship between grade and the type of bullying reported.

Table 8

Results of Comparing Grade Level by Different Types of Bullying

Grouping Variable	Equal Variances	<i>t</i>	<i>Df</i>	<i>p</i> -value	Mean Difference	Std Error Difference	Effect Size
Seeing Bullying	Not assumed	-3.238	2012.910	.001	-0.393	0.121	-3.248
Perpetrator	Not assumed	-2.546	314.350	.011	-0.448	0.176	-2.545
Victim	Assumed	-9.327	2014	< .001	-1.225	0.131	-9.351

In addition to the independent samples *t*-tests, a series of Pearson correlation analyses were conducted to examine whether there were significant associations between physical, verbal, and social bullying and grade. A total of nine tests were needed to be conducted. Hence, using a Bonferroni correction method, the significance level for these tests was set at $\alpha = .050/9 = .006$.

As reported in Table 9, the results of the Pearson correlation analyses indicated that significant negative associations existed between grade and the variables of the number of times students had seen physical bullying, had been physically, verbally, and socially bullied by other students, and had physically bullied other students. On the other hand, grade was significantly

positively correlated with the number of times students had witnessed verbal bullying. No further significant associations were identified.

Table 9

Examining the Correlations Between Grade and Physical, Verbal, and Social Bullying

Variable	<i>Df</i>	Pearson Correlation	<i>p</i> -value	Strength of the Association
Seeing Physical	2014	-.117	< .001	Small
Seeing Verbal	2014	.069	.002	Very Small
Seeing Social	2014	-.002	.935	Very Small
Victim of Physical	2014	-.200	< .001	Medium
Victim of Verbal	2014	-.072	.001	Very Small
Victim of Social	2014	-.124	< .001	Small
Perpetrator of Physical	2014	-.066	.003	Very Small
Perpetrator of Verbal	2014	.015	.506	Very Small
Perpetrator of Social	2014	-.034	.129	Very Small

Hypothesis 5

Null Hypothesis 5 is that there is no statistically significant relationship between grade and the location of bullying. To address this hypothesis, a series of independent samples *t*-tests were conducted to determine whether there were significant differences in the mean of grade by each of the 15 dummy variables representing location of bullying for those who had witnessed bullying, perpetrators of bullying, and victims of bullying. Thus, a total of 45 *t*-tests tests were needed to be conducted. By applying a Bonferroni correction, the significance level for these tests was determined at $\alpha = .050/45 = .001$.

The first series of *t*-tests were performed to examine whether there were significant differences in the mean of grade by each of the dummy variables representing location of bullying for seeing bullying. These analyses were performed based on the data collected from the students who reported seeing bullying. The results of these *t*-tests indicated that there were

statistically significant differences in the mean of grade level by the dummy variables representing classroom with the teacher present, playground, gym, hallways, online, phone, and after school even. The effect size values for these grouping variables indicated that the magnitudes of all these associations were very large. Furthermore, these results suggested that students in higher grades were significantly more likely to see bullying in the classroom with the teacher present, in the hallways, online, by phone, and after school events compared to students in lower grades. On the other hand, students in lower grades were significantly more likely to witness bullying on the playground and in the gym. No other significant differences were observed.

Table 10

Results of Comparing Grade Level by Different Locations of Bullying for Those Who Had

Witnessed an Act of Bullying

Grouping Variable	Equal Variances	<i>T</i>	<i>Df</i>	<i>p</i> -value	Mean Difference	Std Error Difference	Effect Size
Class-Teacher Present	Assumed	-6.068	951	<.001	-1.028	0.169	-6.083
Class- Teacher not Present	Not assumed	-3.024	943.727	.003	-0.507	0.168	-3.018
Playground	Not assumed	15.561	751.458	<.001	2.383	0.153	15.575
Gym	Not assumed	3.580	825.886	<.001	0.596	0.166	3.590
Hallways	Assumed	-9.976	951	<.001	-1.611	0.162	-9.944
Restroom	Assumed	2.610	951	.009	0.565	0.217	2.604
Cafeteria	Not assumed	-2.317	950.351	.021	-0.390	0.168	-2.321
Walk To or From School	Assumed	0.150	951	.881	0.047	0.314	0.150
Bus	Assumed	1.870	951	.062	0.554	0.296	1.872
Online	Not assumed	-5.607	231.765	<.001	-1.212	0.216	-5.611
Phone	Not assumed	-5.836	228.521	<.001	-1.224	0.210	-5.829
After School Events	Assumed	-3.503	951	<.001	-0.685	0.196	-3.495
Home	Not assumed	1.173	110.765	.243	0.376	0.321	1.171
Church	Not assumed	-0.025	41.471	.980	-0.012	0.493	-0.024
Other Places	Not assumed	-0.189	39.600	.851	-0.067	0.355	-0.189

The second series of *t*-tests were performed to examine whether there were significant differences in the mean of grade by each of the dummy variables representing location of bullying for perpetrators. These analyses were conducted based on the data collected from those who reported being perpetrators. As displayed in Table 11, it was found that there was a significant difference in the mean of grade level by the dummy variable representing playground ($p < .001$). The value of the effect size suggested that the magnitude of this difference was very large. These results indicated that students in lower grades were significantly more likely to be perpetrators of bullying on the playground than students in higher grades. No further significant differences were observed ($p > .001$).

Table 11

Results of Comparing Grade Level by Different Locations of Bullying for Perpetrators of Bullying

Grouping Variable	Equal Variances	<i>t</i>	<i>df</i>	<i>p</i> -value	Mean Difference	Std Error Difference	Effect Size
Class-Teacher Present	Assumed	-1.321	233	.188	-0.447	0.339	-1.319
Class- Teacher not Present	Assumed	-1.084	233	.280	-0.376	0.347	-1.084
Playground	Assumed	5.075	233	<.001	1.829	0.361	5.066
Gym	Assumed	-0.663	233	.508	-0.263	0.397	-0.662
Hallways	Not assumed	-2.98	175.079	.003	-0.971	0.326	-2.979
Restroom	Not assumed	-0.383	48.757	.703	-0.153	0.398	-0.384
Cafeteria	Not assumed	-1.595	145.326	.113	-0.545	0.342	-1.594
Walk To or From School	Assumed	-0.22	233	.826	-0.157	0.716	-0.219
Bus	Assumed	1.239	233	.217	0.827	0.668	1.238
Online	Assumed	-1.543	233	.124	-1.19	0.772	-1.541
Phone	Assumed	-1.624	233	.106	-0.927	0.571	-1.623
After School Events	Not assumed	-1.468	46.117	.149	-0.594	0.405	-1.467
Home	Assumed	1.797	233	.074	0.917	0.51	1.798
Church	Assumed	0.77	233	.442	1.122	1.457	0.770
Other Places	Assumed	0.315	233	.753	0.284	0.903	0.315

The third series of *t*-tests were conducted to examine whether there were significant differences in the mean of grade by each of the dummy variables representing location of bullying for victims of bullying. These analyses were conducted based on the data obtained from those who reported being victimized by bullies. The results of the mean comparisons using the *t*-tests indicated that there were significant differences in the mean of grade level by the dummy variables for classroom with the teacher present, playground, hallways, cafeteria, online, and phone. The effect size values indicated that the magnitudes of all these mean differences were very large. These results suggested that students in higher grades were significantly more likely to be bullied in the classroom with the teacher present, in the hallways, in the cafeteria, online, and by phone. On the contrary, students in lower grades were significantly more likely to be bullied on the playground. No further significant differences were observed.

Table 12

Results of Comparing Grade Level by Different Locations of Bullying for Victims of Bullying

Grouping Variable	Equal Variances	<i>t</i>	<i>df</i>	<i>p</i> -value	Mean Difference	Std Error Difference	Effect Size
Class-Teacher Present	Assumed	-5.613	589	<.001	-1.203	0.214	-5.621
Class- Teacher not Present	Assumed	-2.19	589	.029	-0.478	0.218	-2.193
Playground	Not assumed	13.364	537.325	<.001	2.449	0.183	13.383
Gym	Not assumed	0.549	383.65	.584	0.120	0.219	0.548
Hallways	Assumed	-6.359	589	<.001	-1.344	0.211	-6.370
Restroom	Assumed	0.956	589	.340	0.304	0.318	0.956
Cafeteria	Assumed	-3.547	589	<.001	-0.784	0.221	-3.548
Walk To or From School	Assumed	-1.082	589	.280	-0.543	0.502	-1.082
Bus	Assumed	0.595	589	.552	0.265	0.446	0.594
Online	Assumed	-3.924	589	<.001	-1.271	0.324	-3.923
Phone	Assumed	-5.284	589	<.001	-1.636	0.31	-5.277
After School Events	Assumed	-2.376	589	.018	-0.650	0.274	-2.372
Home	Not assumed	-0.105	85.501	.916	-0.038	0.361	-0.105
Church	Assumed	-0.696	589	.487	-0.392	0.563	-0.696
Other Places	Assumed	-0.786	589	.432	-0.381	0.486	-0.784

To sum it up, the results of the independent samples *t*-tests determined there were statistically significant differences in the mean of grade by several indicators of bullying location. Hence, these results provided support to reject Null Hypothesis 5 that there is no statistically significant relationship between grade and the location of bullying.

Hypothesis 6

Null Hypothesis 6 is that there is no statistically significant relationship between grade and whether bullying was reported. To address this hypothesis, an independent samples *t*-test was performed to test whether there was a significant difference in the mean of grade by whether bullying was reported. Only the data for those who reported being victims of bullying were included in this analysis.

The results showed that there was a statistically significant difference in the mean of grade level by whether bullying was reported. The effect size value determined that the magnitude of this difference was very large. These results indicated that students in lower grades were significantly more likely to report that they were bullied than students in higher grades. Thus, these results provided evidence to reject Null Hypothesis 6 that there is no statistically significant relationship between grade and whether bullying was reported.

Table 13

Results of Comparing Grade Level by Whether Bullying Was Reported for Victims of Bullying

Grouping Variable	Equal Variances	<i>T</i>	<i>Df</i>	<i>p</i> -value	Mean Difference	Std Error Difference	Effect Size
Bullying Being Reported	Not assumed	-3.717	523.946	<.001	-0.792	0.213	-3.718

Hypothesis 7

Null Hypothesis 7 is that there is no statistically significant relationship between years attending a Christian school and the type of bullying reported. To evaluate this hypothesis, three

ANCOVAs were performed to determine whether there were significant differences in the mean of number of years attending a Christian school by the dummy variables representing seeing bullying, being a perpetrator of bullying, and being a victim of bullying after controlling for grade. By applying a Bonferroni correction, the significance level for these tests was determined at $\alpha = .050/3 = .017$.

As shown in Table 14, the results of these analyses indicated that there was a statistically significant difference in the mean of number of years attending a Christian school by being a perpetrator of bullying ($p < .017$). The effect size for this grouping variable indicated that the magnitude of this difference was small. It can be concluded from these results that after accounting for grade, students attending a Christian school for more years were significantly more likely than those attending for fewer years to be perpetrators of bullying. No further significant differences were observed ($p > .017$). Overall, these results provided support to reject Null Hypothesis 7 that there is no statistically significant relationship between years attending a Christian school and the type of bullying reported.

Table 14

Results of Comparing Years at a Christian School by Different Types of Bullying After Controlling for Grade

Grouping Variable	<i>df1</i>	<i>df2</i>	<i>F</i>	<i>p</i> -value	Effect Size
Seeing Bullying	1	2013	0.026	.871	<.001
Perpetrator	1	2013	9.986	.002	.005
Victim	1	2013	2.080	.149	.001

Hypothesis 8

Null Hypothesis 8 is that there is no statistically significant relationship between years attending a Christian school and the location of bullying. To evaluate this hypothesis, a series of ANCOVAs were conducted to determine whether, after controlling for grade, there were

significant differences in the mean of number of years attending a Christian school by each of the 15 dummy variables representing location of bullying for those who had witnessed bullying, perpetrators of bullying, and victims of bullying. Hence, a total of 45 ANCOVAs tests were needed to be conducted. Using the Bonferroni correction approach, the significance level for these tests was determined at $\alpha = .050/45 = .001$.

The first series of the ANCOVAs were performed to examine whether there were significant differences in the mean of number of years attending a Christian school by each of the dummy variables representing location of bullying for seeing bullying. These analyses were performed based on the data collected from the students who reported seeing bullying. As displayed in Table 15, after controlling for grade, no significant differences were identified in the mean of number of years attending a Christian school by any of the dummy variables representing location of bullying for seeing bullying ($p > .001$).

Table 15

Results of Comparing Years at a Christian School by Different Locations of Bullying for Those Who Had Witnessed an Act of Bullying After Controlling for Grade

Grouping Variable	<i>df1</i>	<i>df2</i>	<i>F</i>	<i>p</i> -value	Effect Size
Class-Teacher Present	1	950	1.241	.265	.001
Class- Teacher not Present	1	950	4.360	.037	.005
Playground	1	950	0.056	.813	.000
Gym	1	950	0.004	.950	.000
Hallways	1	950	1.364	.243	.001
Restroom	1	950	2.859	.091	.003
Cafeteria	1	950	0.261	.609	.000
Walk To or From School	1	950	0.803	.371	.001
Bus	1	950	4.162	.042	.004
Online	1	950	0.391	.532	.000
Phone	1	950	3.754	.053	.004
After School Events	1	950	0.545	.460	.001
Home	1	950	0.243	.622	.000
Church	1	950	1.798	.180	.002

Other Places	1	950	0.630	.427	.001
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The second series of ANCOVAs were conducted to determine whether there were significant differences in the mean of number of years attending a Christian school by each of the dummy variables representing location of bullying for perpetrators. These analyses were conducted based on the data collected from those who reported being perpetrators. As reported in Table 16, after controlling for grade, no statistically significant differences were observed in the mean of number of years attending a Christian school by any of the dummy variables representing the location of bullying for perpetrators ($p > .001$).

Table 16

Results of Comparing Years at a Christian School by Different Locations of Bullying for Perpetrators of Bullying After Controlling for Grade

Grouping Variable	<i>df1</i>	<i>df2</i>	<i>F</i>	<i>p-value</i>	Effect Size
Class-Teacher Present	1	232	0.198	.657	.001
Class- Teacher not Present	1	232	0.209	.648	.001
Playground	1	232	0.098	.754	.000
Gym	1	232	0.010	.921	.000
Hallways	1	232	0.821	.366	.004
Restroom	1	232	0.212	.646	.001
Cafeteria	1	232	2.160	.143	.009
Walk To or From School	1	232	0.117	.733	.001
Bus	1	232	0.000	.999	.000
Online	1	232	0.399	.528	.002
Phone	1	232	1.540	.216	.007
After School Events	1	232	0.367	.545	.002
Home	1	232	1.906	.169	.008
Church	1	232	6.118	.014	.026
Other Places	1	232	4.515	.035	.019

The third series of the ANOVAs were conducted to examine whether there were significant differences in the mean number of years attending a Christian school by each of the dummy variables representing location of bullying for victims of bullying. These analyses were

conducted based on the data obtained from those who reported being victimized by bullies. As reported in Table 17, it was found that after controlling for grade, no statistically significant differences were observed in the mean of number of years attending a Christian school by any of the dummy variables representing the location of bullying for victims of bullying ($p > .001$).

Table 17

Results of Comparing Years at a Christian School by Different Locations of Bullying for Victims of Bullying After Controlling for Grade

Grouping Variable	<i>df1</i>	<i>df2</i>	<i>F</i>	<i>p-value</i>	Effect Size
Class-Teacher Present	1	588	0.069	.794	.000
Class- Teacher not Present	1	588	3.822	.051	.006
Playground	1	588	0.421	.517	.001
Gym	1	588	0.282	.595	.000
Hallways	1	588	0.429	.513	.001
Restroom	1	588	0.662	.416	.001
Cafeteria	1	588	2.471	.117	.004
Walk To or From School	1	588	0.632	.427	.001
Bus	1	588	1.345	.247	.002
Online	1	588	3.575	.059	.006
Phone	1	588	4.495	.034	.008
After School Events	1	588	1.021	.313	.002
Home	1	588	0.316	.574	.001
Church	1	588	0.003	.954	.000
Other Places	1	588	0.097	.756	.000

In summary, the results of the ANCOVAs failed to provide support to reject Null Hypothesis 8 that there is no statistically significant relationship between years attending a Christian school and the location of bullying.

Hypothesis 9

Null Hypothesis 9 is that there is no statistically significant relationship between years attending a Christian school and whether bullying was reported. To evaluate this hypothesis, an

ANCOVA was performed to determine whether there was a significant difference in the mean of number of years attending a Christian school by whether bullying was reported after controlling for grade. Only the data for those who reported being victims of bullying were included in this analysis. As reported in Table 18, it was observed that after controlling for grade, there was no significant difference in the mean of number of years attending a Christian school by whether bullying was reported, $F(1,577) = 0.635, p = .426$. Hence, these results failed to provide evidence to reject Null Hypothesis 9 that there is no statistically significant relationship between years attending a Christian school and whether bullying was reported.

Table 18

Results of Comparing Years at a Christian School by Whether Bullying Was Reported for Victims of Bullying After Controlling for Grade

Grouping Variable	<i>df1</i>	<i>df2</i>	<i>F</i>	<i>p-value</i>	Effect Size
Bullying Being Reported	1	577	0.635	.426	.001

Hypothesis 10

Null Hypothesis 10 is that there is no statistically significant relationship between school size and the type of bullying reported. To address this hypothesis, three Pearson Chi-squared tests were conducted to test whether there were significant associations between school size and each of the dummy variables representing seeing bullying, perpetrator of bullying, and victim of bullying. Three chi-square tests were conducted to evaluate this hypothesis.

By performing a Bonferroni correction, the significance level for these tests was determined at $\alpha = .017$.

As can be seen from Table 19, the results of the Chi-squared tests revealed that there were significant associations between school size and all dummy variables representing different types of bullying ($p < .017$). The Cramer's V values indicated that the magnitudes of these

associations were weak. These results indicated that the students in the schools that fell into the category of medium were more likely to see bullying, commit bullying, and be bullied than students in small and large schools. In addition, students in small schools were more likely to witness bullying, commit bullying, and be bullied than students in large schools. Hence, these results provided evidence to reject Null Hypothesis 10 that there is no statistically significant relationship between school size and the type of bullying reported.

Table 19

Results of Examining the Associations Between School Size and Different Types of Bullying

Bullying Type	χ^2	Df	p-value	Cramer's V
Seeing Bullying	50.908	2	<.001	.159
Perpetrator	19.754	2	<.001	.099
Victim	27.548	2	<.001	.117

In addition to the Chi-squared tests, a series of one-way ANOVAs were performed to examine whether there were significant differences in physical, verbal, and social bullying by school size. These analyses were conducted based on the number of times students had seen, been victimized by, and been perpetrators of physical, verbal, and social bullying. Hence, a total of nine tests were needed to be conducted. Using a Bonferroni correction method, the significance level for these tests was set at $\alpha = .050/9 = .006$.

The results of the one-way ANOVAs comparing physical, verbal, and social bullying by school size are reported in Table 20. There were statistically significant differences in the number of times students had seen physical, verbal, and physical bullying, the number of times students had been physically and socially bullied, and the number of times they had physically, verbally, and socially bullied other students by school size. The magnitudes of these differences can be seen in Table 20. Tukey's procedure was utilized for post hoc analysis in order to

determine where these differences had occurred. The results of the post hoc analysis showed that the average number of times students had seen physical bullying was significantly higher ($p < .001$) in medium schools ($M = 1.44, SD = 1.73$) than in large schools ($M = 0.83, SD = 1.32$). The average number of times students had witnessed verbal bullying was significantly higher ($p = .003$) in small schools ($M = 1.55, SD = 1.99$) than in large schools ($M = 1.16, SD = 1.75$). The average number of times students had seen social bullying was significantly higher ($p < .001$) in medium schools ($M = 1.69, SD = 1.91$) than in large schools ($M = 1.19, SD = 1.75$). Moreover, the average number of times students had been physically bullied was significantly higher ($p < .001$) in medium schools ($M = 0.91, SD = 1.56$) than in large schools ($M = 0.51, SD = 1.14$). The average number of times students had been socially bullied was significantly higher ($p < .001$) in medium schools ($M = 0.94, SD = 1.60$) than in large schools ($M = 0.66, SD = 1.38$). Furthermore, the average number of times students had physically bullied other students was significantly higher ($p < .001$) in medium schools ($M = 0.34, SD = 0.96$) than in large schools ($M = 0.14, SD = 0.52$). The average number of times students had socially bullied other students was significantly higher ($p = .001$) in medium schools ($M = 0.33, SD = 0.93$) than in large schools ($M = 0.18, SD = 0.68$). No further significant differences were identified.

Table 20

Comparing Physical, Verbal, and Social Bullying by School Size

Variable	<i>df1</i>	<i>df2</i>	<i>F</i>	<i>p</i> -value	Effect Size	Magnitude of the Difference
Seeing Physical	2	2013	33.937	< .001	.033	Medium
Seeing Verbal	2	2013	7.939	< .001	.008	Small
Seeing Social	2	2013	15.898	< .001	.016	Medium
Victim of Physical	2	2013	19.260	< .001	.019	Medium
Victim of Verbal	2	2013	3.331	.036	.003	Small
Victim of Social	2	2013	7.733	< .001	.008	Small

Perpetrator of Physical	2	2013	16.094	< .001	.016	Medium
Perpetrator of Verbal	2	2013	5.242	.005	.005	Small
Perpetrator of Social	2	2013	7.074	.001	.007	Small

Hypothesis 11

Null Hypothesis 11 is that there is no statistically significant relationship between school size and the location of bullying. To evaluate this hypothesis, a series of Pearson Chi-squared tests were conducted to determine whether there were significant associations between school size and each of the 15 dummy variables representing location of bullying for those who had witnessed bullying, perpetrators of bullying, and victims of bullying. Thus, a total of 45 Chi-squared tests were needed to be conducted. Using the Bonferroni correction method, the significance level for these tests was set at $\alpha = .050/45 = .001$.

The first series of Chi-square tests were performed to examine the associations between school size and the dummy variables representing location of bullying for seeing bullying. These analyses were conducted based on the data obtained from the students who reported seeing bullying. As reported in Table 21, the results of these tests showed that there were significant associations between school size and the dummy variables representing classroom without the teacher present, playground, bus, and phone ($p < .001$). The Cramer's V value indicated school size was weakly associated with classroom without the teacher present and moderately associated with playground. These results showed that regarding school size, students in small schools were most likely to see bullying in the classroom without the teacher present, while students in large schools were least likely. In addition, students in medium schools were most likely to see bullying on the playground while students in large schools were least likely. Moreover, students in small schools were most likely to witness bullying on the bus whereas

students in large schools were least likely. Lastly, students in large schools were most likely to witness bullying by phone whereas students in small schools were least likely. No other significant associations were found.

Table 21

Results of Examining the Associations Between School Size and Different Bullying Locations for Those Who Had Witnessed Bullying

Bullying Location	χ^2	<i>df</i>	<i>p</i> -value	Cramer's <i>V</i>
Class-Teacher Present	1.074	2	.584	.034
Class- Teacher not Present	26.170	2	<.001	.166
Playground	53.596	2	<.001	.237
Gym	1.689	2	.430	.042
Hallways	8.246	2	.016	.093
Restroom	6.926	2	.031	.085
Cafeteria	6.071	2	.084	.080
Walk To or From School	8.689	2	.013	.095
Bus	27.876	2	<.001	.171
Online	8.119	2	.017	.092
Phone	16.635	2	<.001	.132
After School Events	3.374	2	.185	.060
Home	6.999	2	.030	.086
Church	4.257	2	.119	.067
Other Places	0.818	2	.664	.029

The second series of Chi-square tests were performed to evaluate the relationships between school size and the dummy variables representing location of bullying for perpetrators of bullying. These tests were conducted based on the data collected from those who reported being perpetrators. As shown in Table 22, these results revealed that there were significant associations between school size and the dummy variables representing classroom without the teacher present, and playground ($p < .001$). The Cramer's *V* value indicated that the magnitude of both these associations was weak.

These results revealed students in small schools were most likely to be perpetrators of bullying in the classroom without the teacher present, while students in large schools were least likely. Furthermore, students in medium schools were most likely to be perpetrators of bullying on the playground while students in large schools were least likely. No further significant relationships were observed ($p > .001$).

Table 22

Results of Examining the Associations Between School Size and Different Bullying Locations for Perpetrators of Bullying

Bullying Location	χ^2	<i>df</i>	<i>p</i> -value	Cramer's <i>V</i>
Class-Teacher Present	6.647	2	.036	.168
Class- Teacher not Present	18.628	2	<.001	.282
Playground	18.957	2	<.001	.284
Gym	2.160	2	.340	.096
Hallways	.064	2	.968	.017
Restroom	6.322	2	.042	.164
Cafeteria	4.665	2	.097	.141
Walk To or From School	9.601	2	.008	.202
Bus	1.348	2	.510	.076
Online	0.885	2	.642	.061
Phone	0.134	2	.935	.024
After School Events	0.436	2	.804	.043
Home	2.824	2	.244	.110
Church	2.247	2	.325	.098
Other Places	1.150	2	.470	.080

The third series of Chi-square tests were performed to examine the associations between school size and the dummy variables representing location of bullying for victims of bullying. These tests were performed based on the data obtained from those who reported being victimized by bullies. The results of these tests are provided in Table 23. It was found that there were statistically significant associations between school size and the dummy variables indicating playground, and walk to or from school ($p < .001$). The Cramer's *V* values indicated that school

size was moderately associated with playground and weakly associated with walk to or from school. These results indicated that students in medium schools were most likely to be victimized by bullies on the playground whereas students in large schools were least likely. Furthermore, students in medium schools were most likely to be bullied when walking to or from school while students in small schools were least likely. No other significant associations were identified ($p > .001$).

Table 23

Results of Examining the Associations Between School Size and Different Bullying Locations for Victims of Bullying

Bullying Location	χ^2	<i>Df</i>	<i>p</i> -value	Cramer's <i>V</i>
Class-Teacher Present	1.209	2	.546	.045
Class- Teacher not Present	9.265	2	.010	.125
Playground	24.978	2	<.001	.206
Gym	1.313	2	.519	.047
Hallways	12.334	2	.002	.144
Restroom	1.584	2	.453	.052
Cafeteria	2.755	2	.252	.068
Walk To or From School	15.615	2	<.001	.163
Bus	10.004	2	.007	.130
Online	2.045	2	.360	.059
Phone	3.864	2	.145	.081
After School Events	7.225	2	.027	.111
Home	13.233	2	.001	.150
Church	2.272	2	.321	.062
Other Places	3.541	2	.170	.077

To sum it up, the results of the Pearson Chi-squared tests determined that some indicators of bullying location were significantly associated with school size. Therefore, these results provided support to reject Null Hypothesis 11 that there is no statistically significant relationship between school size and the location of bullying.

Hypothesis 12

Null Hypothesis 12 is that there is no statistically significant relationship between school size and whether bullying was reported. To evaluate this hypothesis, a Pearson Chi-squared test was conducted to examine the association between school size and whether bullying was reported. Only the data for those who reported being victims of bullying were included in this analysis. As shown in Table 24, the results of this test indicated that there was no significant association between bullying being reported and school size ($p > .05$). Thus, Null Hypothesis 12 was not rejected.

Table 24

Results of Examining the Associations Between School Size and Whether Bullying Was Reported for Victims of Bullying

	χ^2	<i>Df</i>	<i>p</i> -value	Cramer's <i>V</i>
Bullying Being Reported	4.321	2	.115	.086

References

- Sedgwick, P. (2012). Multiple significance tests: the Bonferroni correction. *Bmj*, 344.
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Routledge.