

The Impact of Bullying Climate on Schoolwide Academic Performance

Anna Lacey and Dewey Cornell

Curry School of Education

University of Virginia

July 9, 2011

Do not cite without permission

Author Notes

Anna Lacey, M.Ed. is with the Programs in Clinical and School Psychology, Curry School of Education, University of Virginia. Dewey Cornell, Ph.D. is with the Curry School of Education, University of Virginia.

We thank Donna Bowman Michaelis of the Virginia Department of Criminal Justice Services and Arlene Cundiff of the Virginia Department of Education, and their colleagues, for their support of the Virginia High School Safety Study. We also thank our research assistants Sharmila Bandyopadhyay, Megan Eliot, Francis Huang, Tse-Hua Shih, Erica Shirley, Aisha Thompson, Jennifer Klein, Talisha Lee, and Farah Williams. Finally, we thank Peter Sheras for his contribution to the manuscript.

This project was supported in part by a grant from the Office of Juvenile Justice and Delinquency Prevention of the U.S. Department of Justice, but the views in this article do not necessarily reflect policies or recommendations of the funding agency.

Correspondence concerning this article should be addressed to Anna Lacey at apl4gu@virginia.edu, P.O. Box 400270, Charlottesville, VA 22904-4270.

Abstract

This study demonstrated that the extent of bullying (bullying climate) in a high school is predictive of schoolwide performance on state-mandated achievement testing used to meet No Child Left Behind requirements. Measures of bullying climate were obtained from a statewide survey of 7,304 ninth grade students and 2,918 teachers randomly selected from 284 Virginia high schools. Hierarchical regression analyses found that bullying climate was predictive of schoolwide passing rates on Virginia's Standards of Learning (SOL) tests for Algebra I, Earth Science, and World History. These findings could not be attributed to the proportion of minority students in the school, student poverty, or school size, which were statistically controlled. The statistical effect sizes for bullying climate were comparable in magnitude to those found for student demographics, which often receive much more attention in assessing a school's capacity to meet state and national standards. These results support the need for greater attention to the impact of bullying on high school student performance on high stakes testing.

The Impact of Bullying Climate on Schoolwide Academic Performance

Bullying is a pervasive problem in American schools (Nansel, Overpeck, Pilla, Ruan, Simons-Morton, & Scheidt, 2001). A national survey estimated that approximately 12% of adolescent students are victims of bullying (Spriggs, Iannotti, Nansel, and Haynie, 2007). Although previous research has documented the effects of bullying on individual students (e.g. Boulton, 2008; Nakamoto & Schwartz, 2010; Nansel et al., 2001), less attention has been given to the impact of bullying on schoolwide academic performance. A basic principle of bullying prevention is that bullying affects all students in the school, even those who are not directly involved as bullies or victims. Therefore, this study examined how a climate of bullying is predictive of schoolwide student performance on high stakes testing,

School Climate and Bullying

Cohen (2006) defined school climate as the subjective experience of the school environment from the perspective of the students, faculty, and staff including norms, values, and relationships (Cohen, McCabe, Michelli, & Pickeral, 2009). The prevalence of bullying is an important aspect of school climate. Bullying climate can be regarded as the extent to which students and teachers perceive bullying and teasing behavior to be pervasive in the school. A recent study found that bullying climate was associated with school safety conditions, the level of school suspensions, and student willingness to seek help from teachers (Bandyopadhyay, Cornell, & Konold, 2009). Another study found that bullying climate was associated with the level of student engagement in learning and involvement in school activities (Mehta, Cornell, Fan, & Gregory, under review).

The current study extends research on bullying climate to schoolwide academic achievement. Due to the implementation of the No Child Left Behind Act (NCLB) of 2001,

schools are under great pressure to assess and improve schoolwide performance on high-stakes examinations (No Child Left Behind Act, 2006). Virginia high school students take Standards of Learning (SOL) tests at the end of designated courses and schools must achieve 70% schoolwide passing rates to maintain accreditation.

Studies have shown that peer victimization is related to lower academic achievement (Nansel et al, 2001). Results from a meta-analysis of 33 studies revealed that victims of bullying, teasing, and peer exclusion have lower academic functioning (Nakamoto & Schwartz, 2010). Research on middle and high school students demonstrated that victims of bullying had lower grade point averages than nonvictims (Glew, Fan, Katon, and Rivara, 2008; Juvonen, Wang, and Espinoza, 2011). A longitudinal study demonstrated that victims of bullying had greater decreases in grade point average over time than nonvictims (Juvonen et al, 2011).

Although most studies have focused on individual student experiences and outcomes, studies of school climate have found schoolwide effects. One study demonstrated that schools in which teachers perceive a more negative school climate have lower mean student achievement (Johnson & Stevens, 2006). Ripski and Gregory (2009) reported that schools with a more hostile school climate had lower average student classroom engagement and poorer performance on 10th grade standardized reading tests. Another study demonstrated that schools in which 90% of the students passed standardized tests also possessed healthier climates than schools where less than 79% of students passed the same assessment (MacNeil, Prater, & Busch, 2009).

The Current Study

We hypothesized that bullying climate would be associated with schoolwide test performance. Measures of bullying climate were collected from ninth-grade students and teachers. Ninth grade was selected for study because it is the first year of high school (permitting

future longitudinal study as the cohort progressed through high school) and it is a pivotal year for student adjustment and achievement. Further, grade failure is high in ninth grade and poor ninth grade achievement predicts high school drop-out (Donegan, 2008; Nield, Stoner-Elby, & Frustenberg, 2008).

Bullying climate was assessed by asking students and teachers to report on the extent of bullying and teasing at school. In order to distinguish perceptions of bullying occurring at school from personal experiences of being bullied, students were also asked to report individual bullying victimization. Victimization was used as a control variable before considering the effects of bullying climate.

The student composition of a school has been found to be associated with both levels of bullying and academic performance (Gottfredson, Gottfredson, Payne, & Gottfredson, 2005). Therefore, school demographic variables of school size, percentage of minority students, and percentage of students eligible for free or reduced price meals were used as control variables.

Student passing rates on the Virginia Standards of Learning (SOL) exams served as a measure of schoolwide academic performance. The SOL exams are state-mandated standardized tests that are administered in grades 3, 5, and 8 and at the end of specific courses required for graduation from high school (VDOE, 2010). This program helps fulfill state and NCLB requirements, with 70% passing rates are required for state accreditation (VDOE, 2010; No Child Left Behind Act, 2006).

Methods

Sample and Procedure

The Virginia High School Safety Study (VHSS) was designed to collect school climate data from all public high schools in Virginia (Cornell & Gregory, 2008). Eligible schools

included 9th-12th grade classes, offered high school diplomas, and served primarily students under age 18.

The sample used in this study consisted of 284 public high schools with available data, representing 90% of the 314 eligible schools. This high participation rate was achieved through the cooperation and endorsement of the study from the Department of Education and the Virginia Department of Criminal Justice Services. The total school enrollment for grades 9-12 varied between 171 and 4,080 students ($M = 1,243$, $S.D. = 708$). The percent of students in each school who received free or reduced price meals (FRPM) ranged from 1.1 to 82.7 ($M = 30$, $S.D. = 15.8$). The percentage of racial minority students in each school ranged from 0 to 100 ($M = 34$, $S.D. = 25.7$).

Student and teacher surveys were completed online. On average, 25 ninth-grade students were chosen to complete the survey at each school by the school principal using a series of random numbers provided by the researchers. These random numbers were based on class size and alphabetically matched with ninth-grade rosters. Students were ineligible for participation if they could not read English or if they had cognitive or physical limitations that prevented the student from understanding the survey. Approximately 73% of contacted students agreed to participate and completed the survey, resulting in a sample of 7,304 9th grade students. Approximately 63% of the students self-identified as Caucasian, 22% as African American, 5% as Hispanic, 3% as Asian American, 5% as some other ethnicity, and less than 1% as American Indian. The students were 49% female and age ranged from 13 to 17 years ($M = 14.8$).

Approximately 10 ninth grade teachers from each school were invited to complete the survey using a similar random number method that was used to select student participants. Altogether, 2,918 teachers completed the survey (64% female). The majority (83%) of the

teachers were Caucasian, 12% were African American, 2% were Latino, 1% were Asian American, 2% were Other, and less than 1% were American Indian.

Measures

The study used measures of victimization and bullying climate taken from the School Climate Bullying Survey (Cornell, 2011). The survey used the following definition of bullying.

“Bullying is defined as the use of one’s strength or popularity to injure, threaten, or embarrass another person on purpose. Bullying can be physical, verbal, or social. It is not bullying when two students of about the same strength argue or fight.”

Victimization. Consistent with other measures of bullying victimization (Nansel et al, 2001; Olweus, 2007) the survey asked students to report whether they had been bullied at school. The question used the past month as a timeframe with response options of *never*, *once or twice*, *about once per week*, or *several times per week*. Following the recommendation of Solberg and Olweus (2003), students who reported being bullied once per week or more were categorized as victims. Validation studies have shown that this measure of bullying corresponds to peer and teacher nominations (Branson & Cornell, 2009; Cornell & Brockenbrough, 2004). Further, self reported bullying victimization is correlated with depression, negative school perception, and lower grade point average (Branson & Cornell, 2009)

Bullying climate. Bullying climate was measured with a four-item scale (referred to as the Prevalence of Teasing and Bullying Scale or PTBS in previous studies; Bandyopadhyay, Cornell, & Konold, 2009; Gregory et al, 2010). The bullying climate scale consisted of four items describing the extent of teasing and bullying that takes place at school as a whole rather than individual victimization, with response options of *strongly disagree*, *disagree*, *agree*, or *strongly agree*. The items were: (1) Bullying is a problem at this school, (2) Students here often

get teased about their clothing or physical appearance, (3) Students here often get put down because of their race or ethnicity, and (4) There is a lot of teasing about sexual topics at this school. Other measures of bullying (e.g., Juvonen, Nishina, & Graham, 2001; Olweus, 2007) include similar questions about peer harassment and teasing without necessarily using the term “bullying.” These items were chosen from a pool of items that were found to be common topics of concern in high school.

The four items were identified as forming a stable factor with full metric invariance across gender and race groups using a series of exploratory and multigroup confirmatory factor analyses (Bandyopadhyay et al, 2009). Further, it was shown that, at the school level, the scale was meaningfully related to four markers of school disorder: short term suspension rates, teacher reports of help seeking behavior, teacher reports of bullying and teasing, and teacher reports of gang violence (Bandyopadhyay et al, 2009). Bullying climate was analyzed at the school level using two scores: the average student score and the average teacher score aggregated for each school.

School data and academic achievement. School demographics and passing rates for SOL exams were obtained from records of the Virginia Department of Education. The SOL subject exams most commonly completed in the ninth grade were used as the measures of academic achievement: Algebra 1, Earth Science, and World History.

SOL exams can be completed at any grade; as a result, the passing rates were not grade specific. In order to recognize high levels of performance, the SOL exams have a basic or proficient passing level and a higher, advanced passing level. Consequently, both basic and advanced passing rates were examined in this study. Because students that pass at the advanced

level are also included in the reported passing rates, the two rates are highly correlated (see Table 2).

Results

Table 1 provides descriptive statistics and Table 2 provides intercorrelations for study variables. In summary, the control variables of the proportion of students receiving FRPM and proportion of minority students in the school correlated with passing rates for all three exams. School size correlated with Earth Science and World History passing rates. Student reports of victimization were not correlated with exam passing rates, but both student and teacher reports of bullying climate correlated with passing rates for all three exams. Student and teacher measures of bullying climate were modestly correlated ($r = .31, p < .01$).

Multiple Regression Analyses of Passing Rates

Regression was used in this study instead of Hierarchical Linear Modeling (HLM) because individual student SOL exam scores were not available. Separate regression analyses were conducted using school passing rates for Algebra 1 (Table 3), Earth Science (Table 4), and World History (Table 5). Each regression was performed in a three step sequence with student demographic variables entered at step 1, bullying victimization at step 2, and bullying climate at step 3.

Algebra 1 passing rate. At Step 1, enrollment size, percentage of minority students, and percentage of students receiving FRPM accounted for a statistically significant portion of variance in Algebra 1 passing rates, $R^2 = .048, F(3, 277) = 4.63, p = .004$. Notably, the percentage of minority students added predictive power to the model ($\beta = -.164, p < .05$). At Step 2, bullying victimization did not add significant predictive power to the model. At Step 3, bullying climate added significant predictive power of the model, $\Delta R^2 = .106, p < .001$. Both

student perceptions ($\beta = -.166, p < .01$) and teacher perceptions ($\beta = -.249, p < .01$) were statistically significant.

Algebra 1 advanced passing rate. At step 1, student demographics accounted for a significant portion of variance in Algebra 1 advanced passing rates, $R^2 = .076, F(3, 277) = 7.56, p < .001$. The percentage of minority students ($\beta = -.321, p < .01$) and school enrollment ($\beta = .250, p < .01$) were significant predictors. At Step 2, bullying victimization was not significant. At step 3, bullying climate significantly improved the predictive power of the model $\Delta R^2 = .106, p < .001$. Both student ($\beta = -.236, p < .01$) and teacher perceptions of the prevalence of bullying and teasing ($\beta = -.190, p < .01$) significantly contributed to the regression model.

Earth science passing rate. At step 1, school demographic variables explained a significant portion of variance in Earth Science passing rates, $R^2 = .277, F(3, 277) = 35.19, p < .001$ (See Table 4). The percentage of minority students ($\beta = -.434, p < .01$) and the percentage of students receiving FRPM ($\beta = -.203, p < .01$) were significant added to the model. At Step 2, bullying victimization was not significant. At step 3, bullying climate added to the model, $\Delta R^2 = .044, p < .001$. Both student ($\beta = -.165, p < .01$) and teacher perceptions of the prevalence of bullying and teasing ($\beta = -.111, p < .05$) were significant.

Earth science advanced passing rate. At step 1, the demographics accounted for a significant portion of variance in school Earth Science Advanced passing rates; $R^2 = .302, F(3, 277) = 39.71, p < .001$. The percentage of minority students ($\beta = -.317, p < .01$) and the percentage of students receiving FRPM ($\beta = -.347, p < .01$) were significant predictors. At Step 2, bullying victimization did not add to the model. At Step 3, bullying climate significantly improved the model, $\Delta R^2 = .035, p = .001$. Only student reports of bullying climate ($\beta = -.209, p < .01$) was statistically significant.

World History passing rate. At step 1, demographic variables accounted for a significant portion of variance in World History, $R^2 = .266$, $F(3, 277) = 26.48$, $p < .001$. Percentage of minority students ($\beta = -.288$, $p < .01$), percentage of students receiving FRPM ($\beta = -.291$, $p < .01$), and school enrollment ($\beta = .231$, $p < .01$) were significant. At Step 2, bullying victimization did not add to the model. At Step 3, bullying climate significantly improved the model, $\Delta R^2 = .061$, $p < .001$. Only student perceptions of the prevalence of bullying and teasing ($\beta = -.232$, $p < .01$) was statistically significant.

World History advanced passing rate. At step 1, the demographic variables accounted for a significant portion of variance in World History passing rates; $R^2 = .302$, $F(3, 277) = 31.57$, $p < .001$. All three demographic variables added predictive power to the model: percentage of minority students ($\beta = -.200$, $p < .01$), percentage of students receiving FRPM ($\beta = -.367$, $p < .01$), and school enrollment ($\beta = .238$, $p < .01$). At step 2, bullying victimization did not add significant predictive power to the model. At step 3, bullying climate significantly improved the model, $\Delta R^2 = .037$, $p = .002$. Only student perceptions of the prevalence of bullying and teasing ($\beta = -.172$, $p < .01$) was a significant predictor.

Passing rates for schools with high, medium, and low bullying climate. In order to translate the statistical findings into a format that would permit easier assessment of the real-world significance of the findings, schools were categorized into terciles that generated low, medium, and high groups based on bullying climate scores. Figure 1 shows the passing rates for schools low, medium, and high bullying climate schools using student reports of bullying. Figure 2 shows passing rates associated with teacher reports of bullying.

Discussion

Schoolwide performance on standardized tests has become of great interest in public schools due to the No Child Left Behind Act of 2001. School districts must meet annual progress goals of proficiency in math, reading, and science to avoid reductions in federal funding (No Child Left Behind Act, 2006). In order to meet annual progress goals, schools in Virginia must achieve specific passing rates on the SOL exams and show improvement from previous years.

This study demonstrates that bullying climate is consistently related to schoolwide passing rates on Algebra 1, Earth Science, and World History SOL exams. This relationship holds for both minimum and advanced achievement levels. Between 3.5% and 10.6% of the variance in schoolwide passing rates on SOL exams is attributable to bullying climate. These analyses control for school demographics as well as individual student victimization. These results are consistent with previous studies showing a relationship between school climate and schoolwide achievement (Ripski & Gregory, 2009; MacNeil, Prater, and Busch, 2009; Johnson & Stevens, 2006).

The three demographic variables accounted for approximately 17% of the variance in school achievement on average. Demographic variables explained more of the variance for science (21%) and history achievement (23%) than for mathematics achievement (5.5%).

There is important real-world significance to these findings. The statistical effects of bullying climate are comparable in magnitude to those for the student demographic variables, which are widely recognized as important factors in influencing school passing rates. Notably, for Algebra 1 passing rates, the beta coefficients for student and teacher reports of bullying climate were as large or larger than the corresponding coefficients for school size, student poverty, or the percentage of minority students in the school. Although school administrators are

frequently concerned with the impact of school demographics on their schoolwide test performance, these findings suggest that attention to bullying climate is also important to consider.

Figures 1 and 2 show that schools with a low level of bullying obtain passing rates that are 3 to 5.5% higher than schools with high levels of bullying. These differences are large enough to make a substantial difference in school passing rates and can make the difference between meeting or failing to meet state and national standards.

We found that self-reported bullying victimization produced different effects than bullying climate. Self-reported victimization did not predict passing rates on SOL exams. However, previous research has indicated that bullying victimization is related to academic achievement (Glew et al, 2005; Glew et al, 2008). We used the victimization measure primarily as a control variable to distinguish perceptions of the bullying climate from any individual bullying that the student participants might have experienced. It is possible that the broader context of bullying and teasing assessed in the bullying climate measure was a better indicator of school climate than asking students a single question about being bullied.

Although this is a correlational study and cannot demonstrate a causal relationship, it is consistent with the view that bullying has an effect on student performance on standardized exams. Many different mechanisms might explain the relationship. Students in schools with more pervasive bullying may have poorer engagement in learning due to concerns about bullying or a more general level of school disorder associated with bullying. Previous research has indicated that victims of bullying experience disrupted concentration and attention even when they are not directly involved as victims (Boulton, 2008). Also, it has been demonstrated that student engagement is directly related to student achievement (Ripski and Gregory, 2009).

Teachers may be less effective in schools in which there are high levels of bullying because they spend more time focused on discipline. Working with teachers to increase classroom management skills and implement bully prevention techniques may be helpful to increasing academic performance on standardized tests.

This study underscores the importance of treating bullying as a schoolwide problem rather than just an individual problem. Furthermore, this study supports the case for schoolwide bullying prevention programs as a step to improve school climate and facilitate academic achievement. By improving school safety and increasing student perception of safety at school, administrators may improve student performance on standardized exams.

Limitations

This was a correlational study and cannot establish a causal relationship or the direction of effects. It is possible that the relationship between bullying climate and academic achievement is bidirectional or the product of other variables.

Second, the survey was only conducted with ninth-grade students and teachers, which might not represent the school as a whole. Studies using different measures obtained from a more representative sample of the school might yield stronger results.

Third, the analyses were based on school level passing rates and individual student test scores were unavailable. A more comprehensive assessment would include the SOL test performance for individual students along with their perceptions of school climate, permitting analyses with hierarchical linear modeling techniques.

Conclusions

In the era of No Child Left Behind, American schools have come to devote considerable effort to finding ways to improve student performance on standardized tests. Much of this effort has focused understandably on academic instruction, tutoring, preparation in test-taking skills, etc. Our study suggests that bullying climate may play an important role in student test performance. In order to improve academic performance on standardized tests, schools should consider schoolwide efforts to reduce bullying and create a more positive school climate conducive to learning.

References

- Bandyopadhyay, S., Cornell, D., & Konold, T. (2009). Internal and external validity of three school climate scales from the School Climate Bullying Survey. *School Psychology Review, 38*, 338-355.
- Boulton, M. (2008). Pupils' perceptions of bullying and disruptions to concentration and attention to school work, *Pastoral Care in Education, 26* (2), 83-89.
doi:10.1080/02643940802062592
- Branson, C. E., & Cornell, D. G. (2009). A comparison of self and peer reports in the assessment of middle school bullying. *Journal of Applied School Psychology, 25*, 5-27.
doi:10.1080/15377900802484133
- Cohen, J. (2006). Social, emotional, ethical, and academic education: Creating a climate for learning, participation in democracy, and well being. *Harvard Educational Review, 76*(2), 201-237.
- Cohen, J., McCabe, E.M., Michelli, N.M. & Pickeral, T. (2009). School Climate: Research, policy, practice, and teacher education. *Teachers College Record, 111*(1), 180-213.
- Cornell, D. (2011). *The School Climate Bullying Survey: Description and research summary*. Charlottesville, Virginia: Curry School of Education, University of Virginia.
- Cornell, D. G., & Brockenbrough, K. (2004). Identification of bullies and victims: A comparison of methods. *Journal of School Violence, 3*, 63-87. doi:10.1300/J202v03n02_05
- Cornell, D. G., & Gregory, A. (2008). *Virginia high school safety study: Descriptive report of survey results from ninth grade students and teachers*. Charlottesville, Virginia: University of Virginia.
- Donegan, B. (2008). The linchpin year. *Educational Leadership, 65*, 55-57.
- Glew, G. M., Fan, M., Katon, W., Rivara, F. P., & Kernic, M. A. (2005). Bullying, psychosocial adjustment, and academic performance in elementary school. *Archives of Pediatric and Adolescent Medicine, 159*, 1026-1031
- Glew, G.M., Fan, M.Y., Katon, W., & Rivara, F.P. (2008). Bullying and school safety, *Journal of Pediatrics, 123*-128.
- Gottfredson, G. D., Gottfredson, D. C., Payne, A. A., & Gottfredson, N. C. (2005). School climate predictors of school disorder: Results from a national study of delinquency prevention in schools. *Journal of Research in Crime and Delinquency, 42*, 412-444.
- Gregory, A, Cornell, D., Fan, X., Sheras, P., Shih, R.H., & Huang, F. (2010). Authoritative school discipline: High school practices associated with lower bullying and

- victimization. *Journal of Educational Psychology*, 102(2), 483-496.
doi:10.1037/a0018562
- Johnson, B. & Stevens, J.J. (2006) Student achievement and elementary teachers' perceptions of school climate. *Learning environment Research*, 9, 111-122. doi:10.1007/s10984-006-9007-7.
- Juvonen, J., Nishina, A., & Graham, S. (2001). Self-views versus peer perceptions of victim status among early adolescents. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: A plight of the vulnerable and victimized* (pp. 105-124). New York: Guilford Press.
- Juvonen, J., Wang, Y., & Espinoza, G. (2011). Bullying Experiences and Compromised Academic Performance Across Middle School Grades, *Journal of early Adolescence*, 31(1), p 152-173.
- MacNeil, A.J., Prater, D.L., & Busch, S. (2009) The effects of school culture and climate on student achievement, *International Journal of Leadership in Education*, 12(1), 73-84. doi:10.1080/13603120701576241
- Mehta, S., Cornell, D., Fan, X., & Gregory, A. (under review). Bullying climate and school engagement in ninth grade students.
- Nakamoto, J. & Schwartz, D. (2010). Is peer victimization associated with academic achievement? A meta-analytic review, *Social Development*, 19(2), 2010. doi: 10.1111/j.1467-9507.2009.00539.x
- Nansel, T., Overpeck, M., Pilla, R., Ruan., W. Simons-Morton, B. & Scheidt, P. (2001). Bullying behaviors and US youth: Prevalence and association with psychosocial adjustment. *American Medical Association*, 2094-2100. doi:10.1001/jama.285.16.2094
- No Child Left Behind Act of 2001, 20 U.S.C.
- Olweus, D. (2007). *The Olweus Bullying Questionnaire*. Center City, MN: Hazelden.
- Ripski, M.B. & Gregory, A. (2009). Unfair, unsafe, and unwelcome: Do high school students' perceptions of unfairness, hostility, and victimization in school predict engagement and achievement. *Journal of School Violence*, 8, 355-375. doi:10.1080/15388220903132755
- Solberg, M. E., & Olweus, D. (2003). Prevalence estimation of school bullying with the Olweus Bully/Victim questionnaire. *Aggressive Behavior*, 29, 239-268. doi:10.1002/ab.10047
- Spriggs, A, L, Iannotti, R.J., Nansel, T.R., & Haynie, D.L. (2007). Adolescent bullying involvement and perceived family, peer, and school relations: Commonalities and differences across race/ethnicity. *Journal of Adolescent Health*, 41, 283-293.
- Virginia Department of Education (VDOE). *Testing and Standards of Learning* (2010).

Retrieved from <http://www.doe.virginia.gov/>

Table 1. *Descriptive Statistics for Study Variables*

Variable	Mean	SD	Min	Max
Algebra 1				
% Passing	89.9	6.7	57	100
% Advanced	11.9	9.1	0	52
Earth Science				
% Passing	85.4	7.6	51	100
% Advanced	17.9	8.9	0	47
World History				
% Passing	88.8	7.7	62	100
% Advanced	28.5	13.4	3	75
School Population				
School Enrollment	1242.7	707.7	171	4080
% Minority	34	25.7	0	100
% Free/Reduced Price Meal	30.4	15.8	1.1	82.7
Bully Victimization ^a	.40	.17	0	1.00
Bullying Climate				
Teacher Reports	10.25	.738	7.44	12.33
Student Reports	10.05	.988	7.29	14.67

Note. Prior to all analyses, the data were inspected for outliers, extreme values, and missing data through interpretation of descriptive data, MalANOVA analyses, and boxplots. These analyses showed that there were five detected outliers. However, upon investigation, it was confirmed that the extreme school sizes were correct and the indicated cases were included in the present analyses.

^a Self-report of personal bully victimization in the past month averaged across survey participants from each school.

Table 2. *Correlations among Study Variables*

	2	3	4	5	6	7	8	9	10	11	12
1. Algebra 1 % Passing	.57**	.43**	.31**	.43**	.35**	.07	-.15**	-.17**	-.04	-.31**	-.22**
2. Algebra 1 % Advanced	--	.32**	.34**	.40**	.45**	.09	-.19**	-.09	-.03	-.27**	-.23**
3. Earth Science % Passing		--	.68**	.61**	.46**	.027	-.45**	-.37**	-.03	-.23**	-.21**
4. Earth Science % Advanced			--	.51**	.48**	.12*	-.38**	-.48**	.01	-.10	-.20**
5. World History % Passing				--	.70**	.23**	-.28**	-.45**	.00	-.22**	-.26**
6. World History % Advanced					--	.30**	-.21**	-.50**	-.05	-.20**	-.21**
7. School Enrollment						--	.36**	-.42**	-.04	.09	.18**
8. Student: % Minority							--	.31**	-.14*	.15*	.05
9. % Free/Reduced Meal								--	-.07	.06	.02
10. Bully Victimization									--	.03	.32**
11. Bullying Climate (Teacher)										--	.31**
12. Bullying Climate (Student)											--

Note. *p < .05. **p < .01.

Table 3. *Multiple Regression Analyses Algebra 1 Passing Rates*

	% Passing			% Advanced Passing		
	β	R^2	ΔR^2	β	R^2	ΔR^2
<i>Step 1</i>		.048**	.048**		.076**	.076**
% Minority	-.164*			-.321**		
% Free/Reduced Meal	-.082			.106		
School Enrollment	.106			.250**		
<i>Step 2</i>		.052**	.004		.078**	.002
% Minority	-.171*			-.327**		
% Free/Reduced Meal	-.086			.103		
School Enrollment	.104			.249**		
Bully Victims	-.064			-.048		
<i>Step 3</i>		.158**	.106**		.184**	.106**
% Minority	-.156*			-.323**		
% Free/Reduced Meal	-.037			.162*		
School Enrollment	.175*			.337**		
Bully Victimization	.004			.041		
Student Report of Bullying Climate	-.166**			-.236**		
Teacher Report of Bullying Climate	-.249**			-.190**		

Note. N = 281. * $p < .05$. ** $p < .01$.

Approximately 99.7% of the schools in the sample had data for this exam.

Table 4. *Multiple Regression Analyses Earth Science Passing Rates*

	% Passing			% Advanced Passing		
	β	R^2	ΔR^2	β	R^2	ΔR^2
<i>Step 1</i>		.277**	.277**		.302**	.302**
% Minority	-.434**			-.317**		
% Free/Reduced Meal	-.203**			-.347**		
School Enrollment	.109			.099		
<i>Step 2</i>		.286**	.009		.304**	.002
% Minority	-.443**			-.321**		
% Free/Reduced Meal	-.208**			-.350**		
School Enrollment	.105			.097		
Bully Victims	-.096			-.048		
<i>Step 3</i>		.330**	.044**		.339**	.035**
% Minority	-.433**			-.333**		
% Free/Reduced Meal	-.174**			-.314**		
School Enrollment	.156*			.154*		
% Bully Victims	-.038			.020		
Student Report of Bullying Climate	-.165**			-.209**		
Teacher Report of Bullying Climate	-.111*			.024		

Note. N = 280. * $p < .05$ ** $p < .01$.

Approximately 99% of the schools in the sample had data for this exam.

Table 5. *Multiple Regression Analyses World History Passing Rates*

	% Passing			% Advanced Passing		
	β	R ²	ΔR^2	β	R ²	ΔR^2
<i>Step 1</i>		.266**	.266**		.302**	.302**
% Minority	-.288**			-.200**		
% Free/Reduced Meal	-.291**			-.367**		
School Enrollment	.231**			.238**		
<i>Step 2</i>		.269**	.002		.311**	.010
% Minority	-.293**			-.211**		
% Free/Reduced Meal	-.294**			-.372**		
School Enrollment	.230**			.236**		
Bully Victims	-.050			-.098		
<i>Step 3</i>		.329**	.061**		.349**	.037**
% Minority	-.267**			-.189**		
% Free/Reduced Meal	-.240**			-.330**		
School Enrollment	.287**			.280**		
% Bully Victims	.024			-.042		
Student Report of Bullying Climate	-.232**			-.171**		
Teacher Report of Bullying Climate	-.087			-.083		

Note. N = 223. *p < .05 **p < .01.

Approximately 79.4% of the schools in the sample had data for this exam. Data was not obtained for the other 20.6% because too few students completed the exam for data to be reported or data was unavailable for an unspecified reason.



