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The Impacts of State Anti-Bullying Laws on Bullying Perpetration Levels
Among School-Aged Children and Adolescents in the United States

by

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of the requirements for the degree of
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Abstract

Bullying is gaining worldwide public attention as more students are affected by the bullying phenomenon. It is a serious concern and threat to the safety and well-being of the nation's youth. In this paper, I study how state anti-bullying laws (ABLs) enacted across the United States reduce occurrences of bullying during childhood and adolescence by examining the changes in reported number of students involved in bullying perpetration. Using the National Survey of Children's Health conducted in 2007 and 2011, I use an ordered logistic model and apply a difference-in-differences method to conduct empirical analyses of the average treatment effect of anti-bullying laws among students (ages 6-17 years). I find that students in the states with the anti-bullying laws are less likely to have higher levels of bullying perpetration compared to students in the states with no legislation enacted. Moreover, the effects in reducing bullying perpetration levels are greater among male students and within small metropolitan statistical areas (MSAs) with total population of less than 500,000 persons in a given state.

Keywords: Bullying; Anti-Bullying Laws; Difference-in-Differences; Perpetration; Victimization; Children; Adolescence; Public Policy; School Law and Policy; Prevention; United States

Introduction

Bullying is a complex problem. It can appear in various forms, such as physical, verbal, social, or electronic bullying, and can happen to anyone at almost any time and anywhere. Bullying is commonly found among youths; national statistics report that more than a quarter of students have experienced being bullied in the United States (Robers, Zhang, & Truman, 2012), while approximately 30% of students have admitted that they have bullied others (Grunbaum, Kann, & Kinchen, 2014). Previous studies have shown that students' involvement in bullying as victims, perpetrators, or both affect a variety of youth outcomes, including but not limited to poor academic performance and physical and mental health-related issues in addition to their adulthood outcomes. Arising from growing concerns over the prevalence of bullying and awareness of its devastating consequences, many bullying prevention programs and interventions have been introduced, and ongoing research is continuously trying to identify the best solution to these bullying problems. For example, although there is no federal law that directly addresses bullying behaviors among students, all 50 states and the District of Columbia in the United States have passed anti-bullying laws (ABLs) as of 2015.

In this study, I hypothesize that students are more likely to never bully others and less likely to have students with higher levels of bullying perpetration in states with the ABLs compared to states without the anti-bullying legislation. This paper uses the National Survey of Children's Health (NSCH) data collected in 2007 and 2011. An econometric approach using a nonlinear difference-in-differences method is used to estimate the effectiveness of state ABLs in reducing students' bullying behaviors. Evaluating the correlation between this state-level policy intervention and the prevalence of bullying perpetration among students will aid policymakers and be useful as the research on this topic has been more widely expanding in recent decades.

As an overview, the paper is structured as follows: Section 2 provides more in-depth background information and findings from earlier studies on bullying and state anti-bullying laws. In Section 3, I describe data acquisition and explain key variables to be studied in this paper. Next, the designed study question and its methodology—nonlinear difference-in-differences (DD) model—are discussed in Section 4. Then, Section 5 shows the results from the ordered logistic regression and the marginal effects of anti-bullying laws on students’ likelihood of having bullying experiences. These effects are also analyzed by subsamples of the data. Later in Section 5, other explanatory variables that have statistically significant causal impacts on reduction in the prevalence of bullying perpetration are further reported. Lastly, the paper concludes with a summary of the results while acknowledging some existing limitations of the study.

Background

Peer victimization (Schwartz, Hopmeyer, Nakamoto, & Toblin, 2005), abuse of power (Smith, & Sharp, 1994), power imbalance (Olweus, 1999), repeated mistreatment (Motin, 2009), unprovoked attack (Ross, 2002) and aggressive behavior (Smith, Schneider, Smith, & Ananiadou, 2014) are some examples of words frequently found in literature to define or describe the act of bullying in social environments such as school settings or work places. According to a newly presented uniform definition of bullying among youths by the Centers for Disease Control and Prevention and the United States Department of Education, bullying is “any unwanted aggressive behavior(s) by another youth or group of youths who are not siblings or current dating partners that involves an observed or perceived power imbalance and is repeated multiple times or is highly likely to be repeated (Gladden et al., 2014).” There are three common types of traditional bullying behaviors:

physical (hitting, kicking, spitting, tripping, or breaking one's possessions), verbal (name-calling, sexually commenting, or threatening), and social (spreading rumors or excluding someone from activities on purpose) bullying. Males tend to engage in direct bullying that involves physical and verbal bullying; females tend to engage in indirect bullying that is often associated with social bullying behaviors (Card, Stucky, Sawalani, & Little, 2011). Although phrased and labeled differently depending on intentionality, intensity, frequency, and recurrence, bullying at any level has become a serious developmental concern internationally because of researches that now show solid results of its detrimental consequences.

Involvement with bullying in any role, as a victim or perpetrator, is predictive of negative results not only in physical and psychological health (Freeman et al., 2009) and academic achievements during school years (Schwartz, Hopmeyer, Nakamoto, & Toblin, 2005), but also in adulthood outcomes, especially when projecting to long-term wealth, health, and interpersonal relationship problems (Wolke, Copeland, Angold, A., & Costello, 2013). Victims of bullying are reported to be at higher risks for school failure and poor performance in work settings than those who have never experienced being bullied. Especially, bully-victims – those who bully as well as get victimized – in their childhood have the worst predicted health and wealth outcomes in adulthood and particularly at risk for anxiety and antisocial personality disorders (Sourander et al., 2007). From 2002 through 2004, a study on how bullying experience can become risk factors later on for depression and suicidality was conducted through self-completion screening questionnaires with follow-up assessment targeted to 2,342 participating high school students in New York State (Klomek et.al, 2013). Among 317 students who were identified to be at risk for suicide, 96 students reported to be frequently involved in bullying/victimization behaviors, of which 41 out of these 96 students identified themselves as bully perpetrators. The findings imply that high school students

who frequently bully others are at an increased risk for later depression and suicidality. Additionally, another study using the 2016 National Survey of Children's Health assesses a surprisingly strong association between bullying victimization and bullying perpetration, which brings up another important reason why bullying needs more worldwide attention and intensive efforts to prevent bullying involvement. Among children and adolescents in the United States, children (ages 6-11 years) with previous experience as bullying victims have a 567% increase in the prevalence of bullying others, while adolescents (ages 12-17 years) who were bullied by other at least once in their lives have a 706% increase in prevalence of bullying other, compared to those who have never experienced bullying before (Lebrun-Harris, L.A. et al., 2018). Thus, bullying is a behavior that is highly likely to be repeated, and once repeated, a prior bullying victim now has a higher chance to become a subsequent victimizer– or a bully-victim.

A concerning high number of bullying-related acts of violence in and out of the school settings has been reported continually over time and around the world. From 2001 to 2008, 736,014 Emergency Department Visits (EDVs) – that is over 92,000 incidents per year – resulted from *intentional* injuries sustained in schools (Amanullah, Heneghan, Steele, Mello, & Linakis, 2014). This comprises approximately 10% of the total EDVs originating in school settings during this time period throughout the United States. The recorded intentional injuries include the following intents: legal interventions (0.9%), self-inflicted accidents (3.3%), and deliberate actions done by another person or a group of multiple perpetrators (95.8%). The authors emphasize the need for designing preventive efforts because intentional injuries have immense effects on victims' mental health as previous studies also indicate that victims have high likelihood to be involved in future violence either as bullying victims or perpetrators. It is shown that both physical and mental health

crisis among students is directly associated with bullying experience, whether in the form of traditional bullying or electronic bullying.

Bullying has expanded in its scope of harmful or potentially traumatic results onto individuals. This newly formed bullying known as cyberbullying has become more prevalent due to the rapidly advanced technology and increased media consumption among adolescents in recent years. Hinduja and Patchin (2014) define cyberbullying as “willful and repeated harm inflicted through the use of computers, cell phones, and other electronic devices.” In the 2016 National Survey of Children’s Health, it is reported among children (ages 6-11 years) that the prevalence of bullying victimization is positively associated with technology usage. Compared to those with one hour or less technology usage, a 37% greater prevalence of being bullied by others is found among children with more than 3 hours of technology usage (Lebrun-Harris, L.A. et al., 2018).

In response to the negative outcomes of bullying—whether traditional or electronic bullying—extending over many aspects of youths, all 50 states and the District of Columbia in the United States have now enacted anti-bullying laws (ABLs) to prevent bullying. The state of Georgia first passed its law in 1999 after the Columbine High School shooting that killed 12 students and a teacher and injured more than 20 other people. Yet, there is no federal anti-bullying laws at present, and each state addresses or refers to bullying in its laws differently (Nikolaou, 2017).

Although implementation of state anti-bullying laws may vary across states, key components shared in the legislation are: purpose of statement, statement of scope, specification of prohibited conduct, enumeration of specific characteristics, and development of local educational agency (LEA) policies. Accordingly, state policy frameworks generally include, but are not limited to, providing relevant trainings on bullying to all teachers and other school staffs, referring students in need to appropriate counseling and health services and expanding school

surveillance authority. Some states require schools to implement additional school-based policies or programs for bullying prevention, while other states require no specific school-level policy implementation. In certain cases, school bullying behavior is an offence under criminal codes applying to juveniles and has disciplinary sanctions imposed to ensure the safety of students. The sanctions may refer to regulations on the crimes of bullying through penalties or any means of punishments. Depending on school districts, the measure of these sanctions ranges from school suspensions or expulsions to severe fines and imprisonment. Several states have already come up with criminal sanctions for bullying. For an instance, a new city-level anti-bullying law recently went into effect in North Tonawanda, New York, on October 1, 2017. This newly enacted law made parents responsible for their children's actions of repeatedly bullying others. They could face fines up to \$250 or be put into jail for 15 days if their children violated the city's law for two times within a 90-day period. Laws with additional policy interventions and more detailed and comprehensive specifications of prohibited conducts lead to more effective results. For example, according to Cyberbullying Research Center, most states explicitly address cyberbullying under their statutes, except for Alaska and Wisconsin as of 2017. According to Das Gupta (2016), based on data collected from the national Youth Risk Behavior Survey, high school students under states' cyberbullying laws more likely report the school violence and victimization experiences. Adopting the law has a 12% increase in the probability of victims' reporting of their bullying experiences among youth.

Focusing on the prevalence of bullying perpetration as the measuring outcome, this study is expected to build on existing research and literatures about the effectiveness of current state anti-bullying laws.

Data

The National Survey of Children's Health (NSCH) is a large nationwide survey that collected cross-sectional data from all 50 states and the District of Columbia four times between 2003 and 2016 and is conducted by the National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention. For this study, specifically, I choose to use the 2011 NSCH and 2007 NSCH. The 2011 NSCH was conducted from February 2011 through June 2012, and the 2007 NSCH was conducted from April 2007 through July 2008. There are a few factors that led me to choose these years over the others:

- 1) Several key changes were made since 2016 NSCH, including a vast change in its survey methodology from originally conducting telephone interviews to allowing participants to complete either a paper version or an electronic version of the survey.
- 2) Only 2007 and 2011 NSCH surveys share the exact same wordings for its bullying question and its corresponding response options, and
- 3) Most of the states enacted their ABLs before year 2012. Because all states enacted legislation by 2015, this may hinder an analysis on the post-treatment effects of ABLs using difference-in-differences method for that no control group can possibly be constructed.

The National Survey of Children's Health has collected the data with sample size ranging between approximately 91,000 and 102,000. The 2007 NSCH has a total of 91,642 responses nationally, while 95,677 responses are collected in the 2011 NSCH. On average, 1,797 and 1,876 surveys were completed per state. Households which are contacted at random voluntarily choose to complete the survey if they have one or more children under 18 years old. In each household, an adult (parent or guardian) who knows the child's health and health care the most is asked to

answer the interview questions. Multiple call backs are made to reach the person if he or she is not available. After the initial screening is completed, the person is then asked to randomly select one child if there are more than one children in the household.

The parent-reported bullying question is only asked if selected children are in the middle childhood and adolescence, and that includes children in the age range of 6 and 17 with an average number of 7,521 children for each year in age category. Bullying perpetration levels are assessed through the behavioral question which asks how often the selected child “bullies or is cruel or mean to others.” Five different response options are provided to choose the level of the child’s bullying perpetration in a natural order of increasing degree of how often a participant thinks, sees, and feels that the selected child bullies others: (1) Never (2) Rarely (3) Sometimes (4) Usually and (5) Always. However, in data analyses of this study, I acknowledge that the bullying measures are entirely parent- or guardian-reported, and that is based on the assumption that the caregivers are aware of their children’s behavior in or out of school. Thus, it is understandable that parents may be reluctant to answer that their children are “always” bullying or mean to others. This is reflected in the small percentage, 0.38%, with response category that answers as bullying “always.” Taking this into account, I created a new, separate variable for “Sometimes and more bullies” to combine responses from “Sometimes,” “Often,” to “Always.”

In this study, bullying perpetration levels, *bullies*, are examined as the main outcome variable that has categorical values as discussed earlier; whereas the state anti-bullying law is the treatment variable, *treat*, and is a dummy variable representing whether the state had enacted the anti-bullying law when the interview was conducted over two different time periods of 2007 and 2011. Table 1 shows the selected covariates to be studied in the paper that include: demographic characteristics (gender, ethnicity, and race of the selected child), family-related factors

(educational attainment level of child's mother and/or father), geographical characteristic (large vs. small metropolitan statistical areas status), and school types (public vs. private school). For the highest level of education completed by the respondent, the responses are collapsed into three naturally ordered categories of increasing degree: (1) less than high school, (2) high school graduate, and (3) more than high school. A large metropolitan statistical area (*urban* = 1) indicates whether the household resides in a Metropolitan Statistical Area (MSA) that also meets the 500,000 persons threshold; small metropolitan statistical areas (*urban* = 0) refer to all the other areas within and outside MSAs that have a total population of less than 500,000 persons in a given state. Overall, after adjusting for covariates and to account for missing observations due to nonresponses, the final merged dataset has a sample size consisting of 90,255 observations as shown in the following tables. Table 2 gives a statistics summary by treatment and control groups (means and standard deviation), while Table 3 gives a full set of descriptive statistics summary (means, standard deviation, minimum, and maximum range) for all primary explanatory variables studied in this analysis by bullying perpetration levels.

Table 4 summarizes years that each state enacted the ABLs. In this study, states that enacted ABLs during the year 2012 (Period 2) are considered 'not treated' because a bill's effective date is not always obvious since the process of effectively implementing the law can take time. For the same reason, states that enacted the law in the year of 2007 (Period 1) are considered as they had already enacted the law before the survey. Six states—Alaska, Arizona, Arkansas, Georgia, Iowa, and Maine—already enacted ABLs before the first survey conducted in 2007, and these states are also considered as a treatment group. Among untreated group before 2007, 38 states received the treatment (treatment group) between 2007 and 2011, leaving the remaining 7 states—Delaware,

Michigan, Minnesota, Montana, Ohio, South Dakota, and District of Columbia –to be untreated (control group).

Methods

The main goal of this study is to test the statistical significance of a null hypothesis that enacting anti-bullying laws has no effect on students' bullying perpetration rates, whereas the alternative hypothesis states that if a state enacted legislation against bullying, then the students would be less likely to bully, be mean or cruel to others. In this study, the structure of the dataset consists of the perpetration level responses that are naturally and sequentially ordered with more than two categories. Therefore, an ordered logit model, or ordinal logistic regression, is rather used instead of using a simple linear regression specification to empirically test the above hypothesized relationship between anti-bullying laws (treatment variable) and bullying perpetration levels (outcome variable) among children and adolescents in the United States.

The analysis employs a nonlinear Difference-in-Differences (DD) design model to estimate the causal effect of ABLs' enactment on the outcome variable of bullying perpetration, *bullies*. However, the sign and the magnitude of the treatment effect in nonlinear DD model cannot be identified in a straightforward way as it can be in linear DD model. According to Puhani (2012), the treatment effect is “a difference between cross differences,” in which I subtract the conditional expected value of the counterfactual (unobserved) outcome from the conditional expected value of the actual (observed) outcome. Here, the counterfactual outcome represents the potential outcome on the treated group in the time period after the enactment of the law but without an actual intervention. This difference in cross differences indicates the incremental (marginal) effect of the

interacted term's coefficient, which can then be interpreted as the treatment effect. For simplicity, I consider a potential outcome framework with a binary treatment indicator denoting as

$$\left\{ \begin{array}{l} G_s = 1 \text{ if state } s \text{ has the anti-bullying law} \\ G_s = 0 \text{ if state } s \text{ does not have anti-bullying law,} \end{array} \right\}$$

and a binary time indicator denoting as

$$\left\{ \begin{array}{l} T_t = 1 \text{ if the interview year is after anti-bullying law enactment year} \\ T_t = 0 \text{ if the interview year is before anti-bullying law enactment year.} \end{array} \right\}$$

Then, the DD model in the case of an ordered logit regression can be specified as:

$$E(Y_{ist}) = f(\beta_0 + \beta_1 G_s + \beta_2 T_t + \beta_3 GT_{st} + \mathbf{X}_{st} \theta)$$

Also, the treatment effect, τ , in a nonlinear DD model can be written as:

$$\tau = E[Y_{ist}, GT_{st} = 1 \mid G_s = 1, T_t = 1, \mathbf{X}_{st}] - E[Y_{ist}, GT_{st} = 0 \mid G_s = 1, T_t = 1, \mathbf{X}_{st}]$$

$$\tau = f(\beta_0 + \beta_1 + \beta_2 + \beta_3 + \mathbf{X}_{st} \theta) - f(\beta_0 + \beta_1 + \beta_2 + \mathbf{X}_{st} \theta)$$

Where Y_{ist} is a measure of outcome for an individual i in a certain state s at an interview year t , and \mathbf{X}_{st} is a set of covariates including a constant term for time- and state-fixed effects in a vector form that may be related to the dependent variable. By controlling for these covariates, I can eliminate their effects— omitted variable bias —from the equation and thus see the more accurate, adjusted estimate for the impact of a treatment variable on the dependent variable, or as in my case the effect of state's enacted legislation on reducing bullying perpetration. Also taken into account in my nonlinear DD model are that every state has different intervention periods to enact the

legislation and thus there are some states that already enacted the laws before the first survey was conducted.

In context of nonlinear DD model designs, the interpretation of treatment effect works slightly different from how it does in standard linear DD models. The nonlinear DD estimate on ABLs can be used to predict the treatment effect of policy intervention (ABLs) on bullying; in other word, the sign (direction) of treatment effect, τ , is the same as the sign of interaction term, β_3 , and this sign helps interpret whether a statistically significant treatment effect exists. Next, the incremental (marginal) effects of the interaction coefficients is computed to predict how likely the students in states with the anti-bullying laws are to have higher level of bullying perpetration, which then can be interpreted as the magnitude of τ . With specifying the interaction term in the regression, the estimates of DD treatment effect and its standard errors can be also calculated with the application of margins in Stata.

Implementing the difference-in-differences specification, it is expected that at some point a gap in outcome levels should exist between states that enacted the legislation to prevent bullying and states that did not. However, this gap between groups of states should not be a problem for identifying the causal impact of the anti-bullying laws due to no differential trend shown in the pre-period. In other words, the difference between two groups of states (having anti-bullying law or not) during pre-treatment period may be due to selection bias that is related to fixed characteristics of individual states and time trend. And since the magnitude of the selection bias term and time trend are not changing over time, this difference, if true, is known to be parallel, or common, causing no problem when I try to estimate the causal impact of the anti-bullying laws on students' bullying perpetration levels. Difference-in-differences estimates won't be valid when

treatment and comparison groups were not on the same trajectory when there is an absence of the program.

Result

All regressions in the study are clustered by states for the standard errors to be adjusted for 50 states and the District of Columbia. The treatment effects are estimated by examining the marginal effects of the anti-bullying laws on student's likelihood to experience bullying perpetration, in which the marginal effect is a measure to approximate how much the dependent variable is expected to increase or decrease for a unit change in an explanatory variable. First, Table 5 (column 1) reports a marginal effect of 0.012 at the significance level of 10% or below for students with no bullying perpetration experiences suggesting that enacting ABLs increases the probability of students never bullying others by 1.2 percentage points. It also decreases the probability by 0.7 percentage points and 0.5 percentage points for students who rarely bully and students who sometimes and more bully, respectively. In other words, the state anti-bullying law has a causal impact on total prevalence of bullying experiences as it decreases the likelihood of students' having higher levels of bullying perpetration with a statistical significance.

For the remaining columns in Table 5, the marginal effects are also analyzed at the level of subsamples, including individual demographic information (gender and ethnicity/race of the selected child), geographical information (state population), and school types. In the presence of ABLs, it is shown that the ethnicity/race (column 3 and 4) and school types (column 7 and 8) have no statistically significant causal effect in reducing the prevalence of bullying perpetration. The treatment effect of enacting the ABLs shows an increase in the likelihood of male students' having

no bullying perpetration experience by 1.9 percentage points at the p-value of less than 0.01, while it decreases the likelihood of having higher bullying perpetration levels by 1.1 percentage points for students who rarely bully and 0.8 percentage points for students who sometimes and more bully when the gender of a selected child is male. Additionally, when the selected child lives in a small metropolitan statistical area (Rural), its marginal effect of ABLs is 0.027 for no bullying perpetration, while the marginal effects are reported to be -0.016 and -.011, respectively, for students who rarely bully and students who sometimes and more bully with a significance level of 5%. As a result, the treatment effects are found to be the greatest among male students living in small metropolitan statistical areas, where the state ABLs increase the students' probability of having no bullying perpetration experiences by 3.9 percentage points given a set of predictors at the p-value of less than 0.01. It decreases the probability by 2.3 percentage points for students who rarely bully, while showing the marginal effect of -0.016 for students who sometimes and more bully.

According to Table 6 that presents the additional results from the marginal effects of covariates, additional findings suggest some other explanatory variables may also play a crucial role in the reduction of bullying perpetration levels. Explanatory variables that have statistically significant causal impacts on its dependent variable, the prevalence of bullying perpetration, include: the gender of selected child, the school type enrolled by the child, and the state population (shown in Table 6). With p-values of less than 0.01, it is shown that when the selected child is female, is enrolled in private school, or is from urban areas, the child is less likely to never bully and more likely to have higher levels of bullying perpetration (rarely bullies or sometimes and more bullies).

As shown in Appendix A, I report the estimated post-treatment coefficients from ordered logistic regression with respect to primary predictor variables. From examining the sign of treatment variable coefficient, one can assess what impact the statistically significant treatment effect has in reducing the bullying perpetration levels among students (ages 6 – 17 years). Additionally, it is also shown that more students were involved in bullying perpetration as interview years passed from 2007 to 2011. However, the negative directions also known as the sign of other coefficients are observed when the selected child is female, the child's age is between 8 and 17 years old, the mother and/or father of the child receives more education, and the type of school enrolled by the child is private with the p-value of less than 0.01; in other words, the findings suggest that the prevalence of bullying perpetration is less likely to be found in the above cases.

Discussion

From the findings of my study, the nonlinear DD estimates show that the students in state that enacted the anti-antibullying laws are less likely to be associated with higher levels of bullying perpetration at the p-value of 0.10, or 10% significance level or below. That is, its preliminary evidence shows that the presence of ABLs is effective in reducing the prevalence of bullying among school-aged children and adolescents.

For my analysis, I focus on evaluating whether the laws have a statistically significant effect on the parent- or guardian- reported rates of selected children's bullying perpetration. There are several limitations to consider in future research to bring out more quantifiable implications. Introducing anti-bullying laws decreases bullying-related behaviors in the findings above,

however a deterrence effect or reporting effect could possibly be partially responsible for the decrease. Every interview question in the National Survey of Children's Health is answered by parents or guardians to the best of their knowledge for their selected children. First, it can hardly be assumed that all parents are fully aware of their children's social activities and encounters on school campuses. And more importantly, as the laws get strict and the punishments become severe, parents may avoid answering or reporting their children as the offender of bullying acts in fear of the ABL's punitive measures for their youngsters. So, interpreting the effect of ABLs is somewhat limited due to a deterrence effect of ABLs or due to the parents' unwillingness to answer honestly and truthfully. In a similar way, less than 30% of students report that they notify adults about bullying situations (Ttofi and Farrington, 2011). A decrease in reported numbers of bullying perpetrators may possibly be the result not only from parents but also from the students themselves.

In addition, as many empirical findings of previous studies imply, students involved in bullying in any role are more likely to encounter adverse effects on both their academics and well-being. In this study, the frequency of the bullying perpetration levels was mainly measured. However, lower frequency of bullying among students combined with high level of intensity—measuring how harmful the occurrence of bullying is on an individual—might probably lead to different predicted outcomes from what has been found in the results of this paper. Thus, another possible limitation would be the complexity of bullying and the difficulties in correctly and precisely quantifying the intensities of bullying, such as the degree of its traumatic, psychological effects on students.

Despite acknowledging some of the limitations shown in the findings, this study potentially helps policymakers, advocates, and researchers with its evidence showing that bullying prevention policy and its intervention can lead to beneficial effects in reducing bullying. Students under states

with anti-bullying laws are less likely to become bullying perpetrators than students under states without enacted legislation do, and especially these effects are found to be greater among male students and within small metropolitan statistical areas. In addition to existing literatures that stress the correlation of students' exposure to bullying during school years and its damaging outcomes, it is now suggested that more attention and studies on the effectiveness of each state's anti-bullying laws are required in order to reduce the number of students involved in bullying at any roles, both in and out of school settings. First, it is crucial to understand what bullying is. Second, it is equally important and necessary to create environments for students to safely and easily speak up and express what they are going through. Considerable works and efforts are still required from everyone including students, educators, parents, and communities to identify the most effective, promising and sustainable way to reduce and eliminate bullying.

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Table 1: Individual and State Demographic Controls

Variables	% in Sample	N
<i>Sex</i>		
Male	52.05	46982
Female	47.95	43273
<i>Ethnicity</i>		
Hispanic	90.63	8458
Non-Hispanic	9.37	81797
<i>Race</i>		
Black	6.37	5752
Non-Black	93.63	84503
<i>Age</i>		
12 years or younger	45.82	41351
12 years and older	54.18	48904
<i>Education of Mother</i>		
Less than high school	5.74	5182
High school graduate	18.43	16634
More than high school	75.83	68439
<i>Education of Father</i>		
Less than high school	6.72	6067
High school graduate	22.64	20434
More than high school	70.64	63754
<i>State Population</i>		
Large metropolitan statistical areas	52.10	47020
Small metropolitan statistical areas	47.90	43,235
<i>School</i>		
Public School	86.43	78003
Private School	13.57	12252

Table 2: A Summary Statistics

Variables	Treated (N = 45,385)		Untreated (N = 44,870)	
	Mean	SD	Mean	SD
Sex	0.480	0.500	0.479	0.500
Ethnicity	0.116	0.321	0.071	0.257
Race	0.061	0.239	0.067	0.250
Age	11.734	3.491	11.936	3.510
Education of Mother	2.695	0.580	2.707	0.558
Education of Father	2.628	0.618	2.651	0.590
State Population	0.529	0.499	0.513	0.500
School	1.123	0.329	1.148	0.356

Table 3: Descriptive Summary Statistics – by Bullying Perpetration Levels

Bullying Perpetration Levels	Mean	SD	Min	Max
<i>Never bullies (N = 60,379)</i>				
Treatment (ABLs)	.497	.500	0	1
Interview year	2009.018	2.000	2007	2011
Gender of selected child	.489	.500	0	1
Ethnicity	.094	.291	0	1
Race	.065	.247	0	1
Education of child's mother	2.706	.562	1	3
Education of child's father	2.650	.594	1	3
State population	.525	.499	0	1
School type enrolled by the child	1.140	.347	1	2
<i>Rarely bullies (N = 21,189)</i>				
Treatment (ABLs)	.523	.499	0	1
Interview year	2009.216	2.000	2007	2011
Gender of selected child	.463	.499	0	1
Ethnicity	.082	.275	0	1
Race	.047	.211	0	1
Education of child's mother	2.750	.528	1	3
Education of child's father	2.676	.578	1	3
State population	.5135	.500	0	1
School type enrolled by the child	1.137	.344	1	2
<i>Sometimes & More bullies (N = 8,687)</i>				
Treatment (ABLs)	.493	.500	0	1
Interview year	2009.017	2.000	2007	2011
Gender of selected child	.451	.498	0	1
Ethnicity	.122	.328	0	1
Race	.095	.294	0	1
Education of child's mother	2.544	.684	1	3
Education of child's father	2.472	.704	1	3
State population	.511	.500	0	1
School type enrolled by the child	1.102	.303	1	2
<i>Total (N = 90,255)</i>				
Treatment (ABLs)	.503	.500	0	1
Interview year	2009.064	1.999	2007	2011
Gender of selected child	.479	.500	0	1
Ethnicity	.094	.291	0	1
Race	.064	.244	0	1
Education of child's mother	2.701	.570	1	3
Education of child's father	2.639	.604	1	3
State population	.521	.500	0	1
School type enrolled by the child	1.136	.343	1	2

Table 4: State Anti-Bullying Laws

State	ABL	Year	Period 1, Treated	Period 1, Not Treated	Period 2, Treated	Period 2, Not Treated
Alabama	AL	2009		x	x	
Alaska	AK	2006	x		x	
Arizona	AZ	2005	x		x	
Arkansas	AK	2005	x		x	
California	CA	2008		x	x	
Colorado	CO	2010		x	x	
Connecticut	CT	2008		x	x	
Delaware	DE	2012		x		x
Florida	FL	2008		x	x	
Georgia	GA	1999	x		x	
Hawaii	HI	2011		x	x	
Idaho	ID	2010		x	x	
Illinois	IL	2008		x	x	
Indiana	IN	2011		x	x	
Iowa	IA	2007	x		x	
Kansas	KS	2008		x	x	
Kentucky	KY	2008		x	x	
Louisiana	LA	2008		x	x	
Maine	ME	2005	x		x	
Maryland	MD	2008		x	x	
Massachusetts	MA	2010		x	x	
Michigan	MI	2012		x		x
Minnesota	MN	2012		x		x
Mississippi	MS	2010		x	x	
Missouri	MO	2008		x	x	
Montana	MT	2013		x		x
Nebraska	NE	2008		x	x	
Nevada	NV	2009		x	x	
New Hampshire	NH	2010		x	x	
New Jersey	NJ	2011		x	x	
New Mexico	NM	2011		x	x	
New York	NY	2010		x	x	
North Carolina	NC	2009		x	x	
North Dakota	ND	2011		x	x	
Ohio	OH	2012		x		x
Oklahoma	OK	2008		x	x	
Oregon	OR	2009		x	x	
Pennsylvania	PA	2008		x	x	
Rhode Island	RI	2008		x	x	

Table 4: State Anti-Bullying Laws (Continued)

State	ABL	Year	Period 1, Treated	Period 1, Not Treated	Period 2, Treated	Period 2, Not Treated
South Carolina	SC	2008		x	x	
South Dakota	SD	2012		x		x
Tennessee	TN	2009		x	x	
Texas	TX	2011		x	x	
Utah	UT	2008		x	x	
Vermont	VT	2008		x	x	
Virginia	VA	2009		x	x	
Washington	WA	2010		x	x	
Washington D.C.	DC	2012		x		x
West Virginia	WV	2008		x	x	
Wisconsin	WI	2009		x	x	
Wyoming	WY	2009		x	x	
<i>Total</i>		<i>51</i>	<i>6</i>	<i>45</i>	<i>44</i>	<i>7</i>

Source: StopBullying.gov. StopBullying.gov is a federal government website with management of U.S. Department of Health and Human Services that provides various information about bullying topics.

Table 5: Marginal Effects of State Anti-Bullying Laws on Bullying Perpetration Levels

	(1) Total Sample (<i>N</i> = 90,255)	(1) Female (<i>N</i> = 43,273)	(2) Male (<i>N</i> = 46,982)	(3) Hispanic & Black (<i>N</i> = 13,912)	(4) Non-Hispanic & Non-Black (<i>N</i> = 89,957)
Bullying Perpetration Levels:					
Never bullies	0.012* (0.0072)	0.004 (0.0098)	0.019* (0.0100)	-0.012 (0.017)	0.012 (0.0072)
Rarely bullies	-0.007* (0.0043)	-0.003 (0.0060)	-0.011* (0.0059)	0.006 (0.0082)	-0.007 (0.0043)
Sometimes and more bullies	-0.005* (0.0029)	-0.002 (0.0038)	-0.008* (0.0041)	0.006 (0.0090)	-0.005 (0.0029)

Note: Robust standard errors in parentheses, clustered by states

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Marginal Effects of State Anti-Bullying Laws on Bullying Perpetration Levels (Continued)

	(5) Urban (<i>N</i> = 47,020)	(6) Rural (<i>N</i> = 43,235)	(7) Public School (<i>N</i> = 78,003)	(8) Private School (<i>N</i> = 12,252)
Bullying Perpetration Levels:				
Never bullies	-0.005 (0.0067)	0.027** (0.0110)	0.011 (0.0077)	0.018 (0.0203)
Rarely bullies	0.003 (0.0040)	-0.016** (0.0065)	-0.006 (0.0046)	-0.012 (0.0138)
Sometimes and more bullies	0.002 (0.0026)	-0.011** (0.0045)	-0.004 (0.0032)	-0.006 (0.00647)

Note: Robust standard errors in parentheses, clustered by states
 * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Marginal Effects of State Anti-Bullying Laws on Bullying Perpetration Levels (Continued)

	(9) Male, Urban (<i>N</i> = 24,473)	(10) Male, Rural (<i>N</i> = 22,509)	(11) Female, Urban (<i>N</i> = 22,547)	(12) Female, Rural (<i>N</i> = 20,726)
Bullying Perpetration Levels:				
Never bullies	-0.002 (0.0084)	0.039*** (0.0147)	-0.008 (0.0121)	0.014 (0.0134)
Rarely bullies	0.001 (0.0050)	-0.023*** (0.0085)	0.005 (0.0075)	-0.008 (0.0082)
Sometimes and more bullies	0.001 (0.0034)	-0.016*** (0.0062)	0.003 (0.0047)	-0.005 (0.0052)

Note: Robust standard errors in parentheses, clustered by states
 * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Marginal Effects of Covariates on Bullying Perpetration Levels

	(1) Gender of Selected Child	(2) State Population	(3) School Types
Bullying Perpetration Levels:			
Never bullies	0.027*** (0.00308)	0.011*** (0.0031)	0.028*** (0.0044)
Rarely bullies	-0.016*** (0.00188)	-0.067*** (0.0019)	-0.017*** (0.0028)
Sometimes and more bullies	-0.012*** (0.0012)	-0.004*** (0.0012)	-0.019*** (0.0017)
N	22509	13912	89957

Note: Robust standard errors in parentheses, clustered by states

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix A: Ordered Logit Coefficients

	(1) Coefficients
<i>Treatment (ABLS)</i>	-0.054* (.0329)
<i>Sex</i>	
Female	-0.127*** (.01287)
<i>Ethnicity</i>	
Hispanic	-0.044 (.0312)
<i>Race</i>	
Black	0.056 (.0396)
<i>Education of Mother</i>	
High school graduate	-0.160*** (.0378)
More than high school	-0.162*** (.0368)
<i>Education of Father</i>	
High school graduate	-0.190*** (.0353)
More than high school	-0.284*** (.0413)
<i>State Population</i>	
Large metropolitan statistical areas	-0.040 (.0303)
<i>School</i>	
Private School	-0.088*** (.0208)

Appendix A: Ordered Logit Coefficients (Continued)

	(1) Coefficients
<i>Interview Year</i>	
2011	0.144*** (.0264)
<i>Age</i>	
7	-0.029 (.0386)
8	-0.099*** (.0367)
9	-0.107*** (.0400)
10	-0.189*** (.0371)
11	-0.219*** (.0391)
12	-0.216*** (.0341)
13	-0.213*** (.0386)
14	-0.289*** (.0343)
15	-0.364*** (.0325)
16	-0.464*** (.0338)
17	-0.592*** (.0337)
N	90255

Note: Robust standard errors in parentheses, clustered by states

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$