Youth Response to State Cyberbullying Laws

Kabir Dasgupta

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[This study is an updated version of a previous study on states' cyberbullying laws. The modified analysis incorporates additional empirical tests in an attempt to obtain specific evidence on youth's reporting behavior in relation with school violence and cyberbullying victimization.]

Abstract:
Cyberbullying is a large social concern among youth in the US. This is the first empirical study to examine how high-school teenagers respond to cyberbullying laws that require schools to enact effective guidelines to reduce cyberbullying. The analysis utilizes nationally representative samples of high-school students from Youth Risk Behavior Surveys and incorporates state and time variation in the implementation of cyberbullying laws to estimate the causal impacts of the law in a difference-in-differences framework. Key results indicate that adoption of cyberbullying law is related to statistically significant increases in the likelihood that students report experiences of being victimized by various forms of school violence. Further empirical tests reveal (to some degree) that the state laws are potentially more likely to promote victims' reporting of school violence/ cyberbullying victimization experiences. Finally, evaluation of important components of the state laws indicate that compared to other legislative provisions, criminal sanctions are more likely to increase victims' reporting of school violence victimization. The regression estimates are robust to the inclusion of multiple sensitivity checks.

JEL Classification: I28; I12; K32

Keywords: Cyberbullying Laws; Electronic Harassment; Youth; Youth Reporting; School Violence; Mental Health; Difference-in-differences.

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1. Introduction

The primary objective of this study is to examine the impact of state cyberbullying laws on young people's reporting behavior with respect to outcomes related to school violence and safety. Bullying in school is regarded as a large social issue in the United States. Bullying is commonly defined as a 'repeated pattern of aggressive behavior that involves an imbalance of power and that purposefully inflicts harm on the bullying victim' (US Department of Education 2011). Cyberbullying is a form of bullying that is defined as a 'willful and repeated harm inflicted through the use of computers, cell phones, and other electronic devices' (Hinduja & Patchin 2006; 2008).

Recent advances in modern electronic technology and growth in social networking sites have increased the risk of cyberbullying victimization among youth (Hinduja & Patchin 2006; U.S. Department of Education 2011). In general, annual estimates of proportion of American adolescents (aged under 18) reported to be cyberbullied varies between 9 percent and 35 percent across different youth surveys (Centers for Disease Control and Prevention 2009). Physical separation between offender and victim, means to maintain offender's anonymity, potential to reach a large audience, and lower levels of parental supervision of children's online activities are some of the important and specific aspects of cyberbullying that make it distinct from traditional form of school bullying (Hinduja & Patchin 2006; US Department of Education 2011; Sticca & Perren 2013). Due to the distinct features of cyberbullying, it is often regarded as a bigger threat to youth than traditional bullying (Dooley et al. 2009; Sticca & Perren 2013). Cyberbullying victimization is associated with serious physical and mental health disorders leading to several long-term emotional and

psychological consequences (Ybarra 2004; Hinduja & Patchin 2008; Wolak et al. 2008; Hinduja & Patchin 2014; stopbullying.gov[1] 2015).

In response to the above concerns, most states have implemented cyberbullying law as a part of their bullying prevention law in the period 2006 through 2015. In particular, these laws require schools to enact effective polices to reduce electronic form of harassment or bullying. South Carolina was the first state to extend its bullying law to account for bullying via electronic communication in 2006 (National Conference of State Legislatures 2015; Hinduja & Patchin 2016). Currently all states, except Alaska[2], have a cyberbullying law.

Hinduja & Patchin (2016) provide evidence on the important heterogeneities observed across state cyberbullying laws. These heterogeneities are with respect to inclusion of- school sanctions, criminal sanctions, and provisions to address students' off-campus behavior.

For my analysis, I use large-scale nationally representative samples of high-school students drawn from national and state Youth Risk Behavior Surveys (YRBS) (biennial surveys).

One of the primary objectives of the state laws is to increase victims' reporting of cyberbullying experiences in order to evaluate the nature and extent of cyberbullying among youth (Hinduja & Patchin 2014). To investigate the potential outcomes of the cyberbullying laws on youth's reporting behavior, my analysis estimates the impact of passage of cyberbullying legislation (over the time period 2001-2013) on youth's reporting of experiences of various forms of school violence victimization. For my analysis, I rely on data related to physical violence victimization at school, as there is no empirical sources of

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[1] Stopbullying.gov is a federal government website managed by the U.S. Department of Health & Human Services; Retrieved from https://www.stopbullying.gov/ on November 15, 2015.
[2] Alaska does not explicitly have a cyberbullying law. However, the state has introduced school sanctions and criminal sanctions for cyberbullying crime. Montana is the last state to implement a cyberbullying law (2015). (see Hinduja and Patchin 2016).

information on cyberbullying experience itself (for the period during which the majority of

these laws were enacted). Based on recent research (Schneider et al. 2012; Landstedt &

Persson 2014) there is an expectation that physical violence in school and cyberbullying are

highly positively related; as such YRBS data on physical violence at schools provides us with

the closest proxy for the main outcome of interest. Additionally, I test the robustness of my

main results for a small sample of states that enacted cyberbullying law during later dates

(2011-2012), such that for that timeframe there is YRBS evidence on cyberbullying

victimization. In particular, the additional empirical analysis compares nine states in the

YRBS sample that implemented cyberbullying law between 2011 and 2013 YRBS[3] with two

states that never had a law during the main study period 2001-2013 (Alaska and Montana).

The additional empirical test provides similar results to the main analysis, when the outcome

measure utilized is school-related physical violence.

The analysis indicates that adoption of cyberbullying law leads to- an 11 percent

increase in the probability that students report experiences of being threatened by harmful

weapons on school property, a 17 percent increase in the probability that students report

experiences of feeling unsafe going to school, and a 12 percent increase in the probability that

students report being bullied at school. However, given the available information, it may not

be clear from the above findings whether the law promotes reporting of personal experiences

of bullying (and cyberbullying) victimization among young victims. The rise in youth

reporting of school violence victimization experiences (as observed in my analysis) during

the post-implementation period can be potentially due to an actual increase in incidence of

school violence and cyberbullying. Therefore, I consider additional YRBS measures of

students' mental health and academic outcomes to collect more specific evidence on the

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[3] 2011 and 2013 YRBS are the only two years for which the survey incorporates students' report on 'electronic
bullying' victimization.

effectiveness of the law with respect to young victims' reporting behavior. I find that although cyberbullying law does not have any significant effect on students' probability of feeling of sadness or suicidal ideation, students report scoring better academic grades (A's and B's) during the post-implementation period.

Finally, I document heterogeneity in the effects of the cyberbullying laws' important components and also study the impact of cyberbullying laws on high-school girls and high-school boys, separately. The causal estimates obtained in my analyses are robust to the inclusion of multiple sensitivity checks (discussed later in the paper).

The paper is organized as follows: Section 2 discusses youth issues commonly associated with cyberbullying and provides a brief background on states' cyberbullying laws; Section 3 reviews related literature to explain the possible mechanisms by which cyberbullying laws can affect young people; Section 4 describes the data and the variables used in this study; Section 5 outlines the empirical approach employed in this study; Section 6 reports the key findings obtained from the analysis; and Section 7 presents concluding remarks.

2. Background

2.1 Cyberbullying and youth outcomes

Estimates of cyberbullying victimization rates among adolescents in the US vary across surveys. Recent data from School Crime Supplement of the National Crime Victimization Survey shows that the proportion of high-school students (ages 12 to 18 years) who were cyberbullied grew from 6 percent to 9 percent in the period 2009 through 2011 (National Center for Education Statistics 2011; 2013). Tokunaga (2010) reports that the proportion of youth reported to be cyberbullied varies from 20 percent to 40 percent on average annually. A 2007 study commissioned by the National Crime Prevention Council found that 43 percent

of young people ages 13 to 17 years were victimized by cyberbullying in the year prior to the survey (King, 2010). Based on nine recent studies conducted on random samples of middle and high-school students across the US, Hinduja and Patchin (2016[b]) estimated that on an average, around 26 percent of the students were cyberbullied in the period 2007 through 2015.[4]

Youth outcomes associated with cyberbullying and traditional bullying victimization are largely similar in nature (Hoff & Mitchell 2009; Tokunaga 2010; Li et al. 2011; Kowalski & Limber 2013). Moreover, a large fraction of young people victimized by traditional bullying are at an elevated risk of being cyberbullied (Li 2007; Slonje & Smith 2008; Smith et al. 2008; Erdur-Baker 2010; Schneider et al. 2012; Chang et al. 2013; Kowalski & Limber 2013). In particular, the common youth health-related problems associated with cyberbullying victimization include mental anxiety, anger, depression, low self-esteem, suicidal intention, delinquency, and substance misuse problems (Ybarra 2004; Hinduja & Patchin 2007; 2008; Juvonen & Gross 2008; Wolak et al. 2008; Hoff & Mitchell 2009; Hinduja & Patchin 2011; King 2010; Meredith 2010; Tokunaga 2010; Suzuki et al. 2012; Chang et al. 2013; Kowalski & Limber 2013; Elgar et al. 2014; Hinduja & Patchin 2014; Van Geel et al. 2014; stopbullying.gov 2015). Further, cyberbullying victims are more likely to skip schools and tend to have poor academic performance (Schneider et al. 2012; Hinduja & Patchin 2014; stopbullying.gov 2015).

Mental and emotional problems associated with cyberbullying experiences are not limited to victims only. It is found that cyberbullying offenders tend to suffer from mental depression and high incidence of suicidal ideation (Hinduja & Patchin 2011; Chang et al.

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[4] Details on estimates of cyberbullying victimization and offending are retrieved from http://cyberbullying.org/cyberbullying-research-2013-update/ on January 11, 2016.

2013; Kowalski & Limber 2013). Kowalski and Limber (2013) observe that youth who experience cyberbullying both as offender and victim are more likely to experience adverse health and psychological problems than others.

Studies in cyberbullying literature also discuss gender-specific differences with respect to cyberbullying experiences. While Slonje and Smith (2008) and Tokunaga (2010) do not find gender differences in connection with cyberbullying experiences, a few other studies conclude that girls are more likely to be victimized by cyberbullying (Smith et al. 2006; Hinduja & Patchin 2008; Wang et al. 2009; Mishna et al. 2012; National Center for Education Statistics 2014). Li (2006) and Wang et al. (2009) observe that boys are more likely to be cyberbullying offenders. However, Ybarra and Mitchell (2004) and Beckman (2013) observe that girls are equally likely to be cyberbullies as boys. Meredith (2010) argues that girls are more likely to be involved in cyberbullying both as victims and as offenders.

2.2 Cyberbullying law – A brief review

Starting from the year 2000, states have enacted bullying prevention laws to reduce bullying in schools. The Columbine High School shooting in 1999 was one of the first major incidents of school violence related to bullying that provided a strong premise for states to adopt legislative measures to respond to bullying on school premises (Greene & Ross 2005; US Department of Education 2011). In addition, increasing trends in incidence of suicides among school-age youth because of bullying victimization prompted state governments to implement school-level anti-bullying laws (US Department of Education 2011). As of 2016, all states have implemented bullying prevention laws (stopbullying.gov 2015; Sabia & Bass 2017).

A number of high-profile suicide incidents substantiated the need for legislative interventions to prohibit cyberbullying and online harassment (Meredith 2010; King 2010;

Hinduja & Patchin 2015).[5] Beginning in 2006, the states' anti-bullying laws were extended to include legal provisions to address electronic forms of harassment, more commonly called cyberbullying (Hinduja & Patchin 2015; National Conference of State Legislatures 2015; stopbullying.gov 2015). Currently, all states, but Alaska have enacted cyberbullying laws (Hinduja & Patchin 2015; stopbullying.gov 2015). State cyberbullying laws, like anti-bullying laws, require schools to design and implement effective policies and guideline to address bullying using electronic media.

Table 1 (see below) provides details on state cyberbullying laws. Cyberbullying laws vary widely across states (King 2010; Meredith 2010; Hinduja & Patchin 2015). Table 1 also provides information on three important components of state cyberbullying laws that explain some of the important state-specific heterogeneities in the laws. Currently, 45 states have school sanctions for bullying and cyberbullying, 18 states have criminal sanctions for cyberbullying, and 15 states account for students' off-campus behavior related to bullying and cyberbullying (Hinduja & Patchin 2016). State laws that incorporate criminal sanctions for cyberbullying usually treat cyberbullying as a misdemeanor criminal offense. Criminal sanctions may include financial penalties (ranging from 50 dollars to 2,500 dollars) or jail time (usually ranging from 3 to 12 months) (Hinduja & Patchin 2015; 2016). Strictness of criminal sanctions for cyberbullying crimes vary by age and graveness of offense. For example, adult offenders are likely to face stronger punishments than younger cyberbullies. School sanctions for cyberbullying involve disciplinary actions taken by the school against a student identified as a cyberbullying offender. In most cases, school sanctions are informal in nature. However, serious incidents may involve formal responses from schools. Informal

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[5] Examples of high-profile suicide incidents related to cyberbullying include cases of Ryan Halligan (2003), Megan Meier (2006), Jessica Logan (2008), Hope Witsell (2009), Tyler Clementi (2010), and Amanda Todd (2012). Retrieved from http://nobullying.com/six-unforgettable-cyber-bullying-cases/ on February 1, 2016.

school response includes counselling the victim and the offender, discussing the issue with the parents of the parties involved in cyberbullying, and condemning cyberbullying incidents. Examples of formal response include detention, suspension, and expulsion of the offender from the school (Chibbaro 2007; Hinduja & Patchin 2014).

3. Mechanisms: Evidence from related literature

State intervention in the form of cyberbullying legislation has been recognized as an important policy measure to reduce cyberbullying among youth (King 2010; Meredith 2010; US Department of Education 2011; Hinduja & Patchin 2015). However, a number of social influences and legal challenges associated with cyberbullying can potentially offset the intended deterrent impact of the laws.

First, it is more difficult to monitor cyberbullying compared to traditional form of bullying or physical bullying that occurs at school. Cyberbullying offenders can maintain physical distance from their victims and remain anonymous to their targets (Shariff & Hoff 2007; Shariff 2009; US Department of Education 2011; Sticca & Perren 2013; Hinduja & Patchin 2014). As a result, cyberbullying is a more frequent off-campus phenomenon than traditional bullying (Mishna et al. 2012; Diamanduros et al. 2008; Hinduja & Patchin 2014). In addition, a cyberbullying offense can reach to a larger audience through electronic media (Sticca & Perren 2013; Hinduja & Patchin 2014). Substantial growth in internet users and a rapid increase in public access to modern electronic technology and advanced communication devices have further increased youth's cyberbullying victimization risks. Since 2006, 95 percent of US teenagers (ages 12 to 17 years) have access to the internet and 74 percent stay connected to the internet via mobile electronic devices such as smart phones and tablets (Madden et al. 2013; Hinduja & Patchin 2014).

Second, adopting punitive measures for cyberbullying offense under state legislation has its own challenges. Criminalizing cyberbullying may often come in conflict with an individual's constitutional rights to freedom of speech and expression provided by the First Amendment to the United States Constitution (Servance 2003; King 2010; Hinduja & Patchin 2011). Difficulties in identifying cyberbullying offenders and discerning graveness of cyberbullying incidents further explain states' reluctance to criminalize cyberbullying behavior under their bullying prevention laws (Hinduja & Patchin 2015). Instead, most states require schools to take necessary disciplinary actions against cyberbullying offenders.

Third, as mentioned earlier, cyberbullying laws vary across states. States with stricter laws may also experience an increase in incidence of cyberbullying among youth. Iyengar (2009) finds that mandating arrests (under state legislation) for domestic violence crimes increases intimate partner homicide rates. This might be due to the possibility that strong punitive measures may result in reduction in reporting from domestic violence victims due to fear of future reprisal from their offenders. The same hypothesis may hold true in cyberbullying incidents. It has been found that cyberbullying victims are less likely to report an incident to an adult family member or school authorities (Li 2006; Agatston et al. 2007; Slonje & Smith 2008; Chang et al. 2013). In addition, victims may not report their experiences due to social stigma or fear of school sanctions and/or increased parental supervision. On the other hand, prohibiting acts of retaliation or reprisal for reporting of cyberbullying incidents by several states under their respective cyberbullying legislation indicate that reprisal is a common phenomenon in cyberbullying (Hayward 2011).[6] While laws that encourage reporting can help schools to reduce future occurrence of cyberbullying,

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[6] Some of the states that prohibit reprisal or retaliation for reporting cyberbullying incidents include Delaware, Florida, Georgia, Iowa, Maryland, Massachusetts, New Hampshire, New Jersey, Oregon, Rhode Island, South Carolina, Tennessee, and Wyoming (Hayward 2011; National Conference of State Legislatures 2015).

acts of reprisal as a reaction to victims' reporting can deter reporting of cyberbullying incidents.

Despite the above concerns, researchers have widely advocated for providing schools with legislative support to alleviate cyberbullying (Smith et al. 2008; King 2010; Meredith 2010; Hinduja & Patchin 2015). Existing literature has emphasized the importance of parental mediation and school intervention in addressing cyberbullying (Beale & Hall 2007; Smith et al. 2008; Hinduja & Patchin 2014). However, parental role in monitoring their children's online behavior is often limited by the lack of their knowledge of modern technology (Bauman 2007; Smith et al. 2008; Hinduja & Patchin 2014). In addition, schools are often constrained by their inability to intervene in off-campus behavior of students beyond school hours (Shariff & Hoff 2007; Ellison 2009; Hinduja & Patchin 2014). Effective state interventions in the form of cyberbullying laws can potentially mitigate these restrictions by- promoting public awareness regarding cyberbullying, encouraging cyberbullying victims to report cyberbullying incidents, and imposing costs on cyberbullying offense.

4. Data

4.1 Youth Risk Behavior Surveys

The data on youth outcomes related to measures of school violence and safety is drawn from YRBS for the period 2001 through 2013. The Centers for Disease Control and Prevention (CDC) performs the national YRBS biennially by collecting information on different types of health-related behaviors of young high-school students in the US. The individual-level data includes survey responses provided by a nationally representative sample of youth population, ages 12 to 18 years. The state YRBS are similar to the national YRBS. State YRBS are coordinated by the CDC and administered by participating states' education and

health agencies. To perform my main analysis, I combine the national and state YRBS,[7] following from the approach employed by some previous empirical research (Sabia & Anderson 2014; Sabia et al. 2014; Sabia & Bass 2017; Anderson et al. 2015).

It is important to note, the YRBS data is based on self-reported information. Further, given the nature of health-related information the surveys capture (such as behavioral information on substance use and sexual experiences), some youth outcomes are likely to be under-reported. Despite these potential empirical concerns, YRBS is the best available data source for the empirical analysis in this study.

Table 2 provides details on all the youth outcome variables considered in the main analysis. Based on my discussion in this paper, I use four youth indicators of school violence and safety measures. In particular, I consider survey responses containing information on-frequency of a person's involvement in physical fights in school in the year prior to the survey, number of times a person was threatened or injured with a weapon on school property in the year in prior to the survey, number of times a person skipped school because s/he felt unsafe going to school in the month prior to the survey, and whether a person was bullied on school property in the year prior to the survey. *Bullying information is available for the period 2009 through 2013 only*. To gain deeper understanding regarding the true impact of cyberbullying laws on youth's reporting behavior, I consider some additional youth variables from YRBS to estimate youth academic and mental health outcomes of cyberbullying laws. In particular, I look at students' information on academic scores, feeling of sadness or hopelessness, and suicidal ideation. For suicidal ideation, I create a dichotomous indicator by

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[7] To construct the main dataset, I combine national and state YRBS by the outcome variables, year, FIPS code, and individual demographic controls. I use the state-identifiers (FIPS code) provided by YRBS for the national surveys to obtain state-level information on the outcome variables.

combining three YRBS variables. The indicator equals 1 if a person 'considered' and/or 'planned' attempting suicide and/or 'attempted' suicide (at least once) prior to the survey.

All the youth outcomes of YRBS are converted to binary indicators. Based on the regression samples used in my analysis, Table 2 information suggests that bullying experiences are more common than other forms of school-related physical violence (which can be considered as more serious types of bullying). In particular, almost 19 percent of students reported being bullied at school. After stratifying the YRBS sample by sex, descriptive information in Table 2 reports that a higher proportion of boys reported being involved in fights and being threatened by weapons on their school property compared to girls. However, proportion of students who report being bullied is larger for girls. Further, while girls appear to perform better than boys academically, they are also more likely to suffer from feeling of insecurity (with respect to attending school), sadness and suicidal ideation problems.

I include information on students' sex, race, ethnicity, and age to control for their individual demographic characteristics in my regression analyses. Table 3 reports descriptive statistics on individual demographic characteristics. Proportion of male students in the YRBS sample is 49 percent. Whites account for 48 percent and people belonging to the Hispanic ethnicity account for 16 percent of the total sample. With respect to age, 13 percent of the sample are 14 years old or younger. High-school students aged 15 and 16 account for 26 percent of the total sample each. 23 percent of the sample are 17 years old and rest of the 12 percent are adults.

4.2 Construction of policy variable

A number of sources are used to collect information on state-specific statutes of cyberbullying laws (US Department of Education 2011; National Conference of State

Legislatures 2015; Hinduja & Patchin 2016). Hinduja and Patchin (2016) provide the most detailed information on state cyberbullying laws and their various components.

To construct the main policy variable (i.e. cyberbullying law), it is important to note that national and state YRBS are conducted biennially during the spring of odd-numbered years. The surveys include individuals' health-related information prior to the survey date. Hence, laws that are implemented during the odd-numbered years of the study period may not affect youth's reporting behavior recorded in the same years in YRBS. Further, using the state-specific statutes information provided by the above sources, I conduct a primary search using HeinOnline and Lexis Nexis databases to collect information on the specific months of implementation of cyberbullying laws. Most state cyberbullying laws appear to have been enacted in the months of April through December. Therefore, to precisely estimate the laws' impact, I construct a binary indicator 'Law$_{st}$' that equals 1 when a state has already enacted a cyberbullying law. Law$_{st}$ equals 0 for years prior to the implementation and for the year when the law was implemented. For example, if a state implemented cyberbullying law in year 1999, Law$_{st}$ would equal 1 from the year 2000 and forward. Equating Law$_{st}$ to 1 from the year 1999 would imply that the cyberbullying law can potentially affect youth outcomes recorded in the 1999 survey, which primarily consists of information relating to a period prior to the implementation of the law. For state laws that were enacted in even-numbered years, constructing Law$_{st}$ in this way would not affect the causal interpretation in my analysis.[8]

To study the effects of important components of cyberbullying law, I incorporate a similar approach (as above) to construct three binary indicators, each for inclusion of school sanctions, criminal sanctions, and provisions to address students' off-campus behavior.

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[8] As an additional robustness measure, I perform regressions with a policy variable that equals 1 from the year of implementation. Results are consistent with that of the primary analysis.

4.3 <u>State-specific controls</u>

Table 4 provides descriptive information of the state-specific variables controlled for in the main regression models. Implementation of cyberbullying laws may be correlated with state-specific characteristics (and public policies) that can potentially affect youth outcomes studied in my analysis. Therefore, exclusion of important state-level information can potentially bias the true estimates of the effects of cyberbullying laws. To ensure robustness of my regression estimates, I include relevant state-specific policy, economic, and school-quality indicators in my regression analyses to account for important state-specific heterogeneities.

In particular, state-level policy controls include school anti-bullying laws (source: US Department of Education, 2011), criminal sanctions of child witness to domestic violence (source: Child Welfare Information Gateway, 2015), and state regulations on substance use in the form of cigarette tax (source: Tax Burden on Tobacco) and beer tax (source: Beer Institute). In addition, I control for school quality indicators by including student-teacher ratios and annual per-pupil school expenditure in state public schools during the study period (National Center for Education Statistics, Common Core Data). Further, following from my earlier discussion in the paper, I control for annual state suicide rates (suicides per 100,000 individuals) of young people ages 10 to 19 years (Wide-ranging Online Data for Epidemiologic Research).[9]

Further, youth information in YRBS is based on samples of youth who are enrolled in high-school. It is likely that the regression analysis may suffer from sample selection bias since data on youth population who are out of school is unavailable. In this regard, I control

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[9] CDC's WONDER is an online public health information system that manages around 20 public-use data and provides public access to US-based information including natality, mortality, cancer incidence, HIV and AIDS, tuberculosis, vaccinations, census data.

for annual high-school dropout rates using the Current Population Survey (Annual Social and Ecnomic Supplement) data. To construct annual state-level high-school dropout rates I refer to National Center for Education Statistics' definition of status dropout rate (for people aged 16 to 24).

5. Empirical approach

The empirical analysis employs variation across states and timing in the implementation of cyberbullying laws in a differences-in-differences framework to identify the causal effect of cyberbullying laws on youth's reporting behavior. In particular, I estimate five regression models, ranging from a baseline model (model 1) to a more saturated model (model 5).

I begin with a baseline model (Model 1), in which I regress youth outcome on cyberbullying law by controlling for state and year fixed effects. The baseline model is:

$$Y_{ist} = \alpha_0 + \alpha_1 Law_{st} + \gamma_s + \lambda_t + \varepsilon_{ist}, \qquad (1)$$

where Y_{ist} is a dichotomous indicator of school violence and safety for individual i in state s and time t. The variable Law_{st} is a binary indicator for whether state s has a cyberbullying law at time t. γ_s captures time-invariant state fixed effects and λ_t represents year fixed effects that controls for factors affecting the nation as a whole.

In Model 2, I incorporate individual demographic characteristics (from YRBS) in the right hand side. In Model 3, I add in controls for state-specific economic and school-level indicators. In model 4, I control for state-specific policy variables and yearly estimates of states' youth suicide rate and high-school dropout rate in addition to Model 3 controls. Finally, in Model 5, I include state-specific linear time trends to control for variations in

unmeasured state-specific trends in youth outcomes evolving over time. The most saturated

model (Model 5) is:

$$Y_{ist} = \beta_0 + \beta_1 Law_{st} + \beta_4'X_{ist} + \beta_5'Z_{st} + \gamma_s + \lambda_t + \Omega_{st} + \nu_{ist}, \qquad (2)$$

where in addition to variables defined above, X_{ist} is the vector of individual demographic

controls and Z_{st} is the vector of state-level controls. Variable Ω_{st} represents the state-specific

linear time trends created by interacting state dummies with year. β_1 is the parameter of

interest that measures the effect of cyberbullying laws on youth reporting behavior with

respect to school violence and safety.

Further, trends in youth outcomes may prompt states to implement relevant youth

policies. Later in this paper, to further investigate the possibility of policy endogeneity, I test

for granger causality between the youth outcomes and cyberbullying laws by performing an

event study to estimate the anticipatory and post-treatment effects of cyberbullying laws

(Angrist & Pischke 2009).

To study the effects of the different components of cyberbullying laws across states, I

estimate separate regression models (to avoid collinearity issue) similar to equation (2). For

binary indicators of youth outcomes, I estimate linear probability regression models (LPM) to

obtain the causal impacts of cyberbullying laws and its components.[10] All the regressions are

weighted by state-year youth population estimates (population aged below 20; data source:

US Census Bureau) (Solon et al. 2015).

6. Results

6.1 Cyberbullying laws and youth reporting of school violence and safety

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[10] Estimation of probit regression models generate similar marginal effects as LPM.

In Table 5, I report the estimated regression coefficients obtained from LPM analyses with respect to youth measures of school violence. In column (1), estimated marginal effects across all regression model specifications suggest that implementation of cyberbullying laws does not have any effect on students' reporting behavior regarding their involvement in fights on school property. However, with respect to other measures of school violence ('Threat' and 'Bullied'), in the more saturated models (models 4 and 5), I find that adoption of cyberbullying law is positively related to the binary youth indicators. In particular, model 5 results (equation 2) suggest that cyberbullying law implementation leads to a 0.9-percentage point increase (11.4 percent relative to the sample mean) in the probability that students report being threatened by a weapon at school (column 2). Further, the law leads to a 2.3-percentage point increase (12.4 percent relative to the sample mean) in the probability that students report being bullied at school (column 4). In model 5, both the effects are statistically significant at the 1 percent level. For the variable 'Unsafe', the marginal effects are statistically insignificant in the less saturated models (column 3; models 1-4). However, controlling for state-specific linear time trends in model 5, the regression coefficient of the policy variable (Law_{st}) is statistically significant at the 5 percent level. More specifically, in model 5, adoption of cyberbullying law appears to result in a 16.7 percent increase in the probability that students report feeling unsafe going to school.

For variables in columns 1-4 in Table 5, estimation of models 1-5 indicates that regression coefficients are likely to be biased downward if relevant state-specific controls are excluded from regression models (see model 3-5). In this regard, inclusion of state-specific linear time trends potentially allow me to capture unobserved state-specific heterogeneities that vary with time (such as unmeasured trends in youth delinquency) that can affect causal interpretation of regression estimates.

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6.2 <u>Specific evidence on youth reporting behavior</u>

Reporting of school violence victimization may not accurately indicate students' reporting behavior with respect to cyberbullying victimization. Despite empirical concerns regarding availability of state-level cyberbullying victimization data, I attempt to obtain more direct evidence on the effects of cyberbullying laws on youth reporting of cyberbullying experiences. For my analysis, I use limited period data from 2011 and 2013 YRBS.

First, following from evidence on a close association between bullying and cyberbullying victimization (discussed earlier), I combine YRBS 2011 and 2013 data to compare trends in students' reporting of their bullying and electronic bullying experiences across all participating states (in YRBS). Figure 1 illustrates the youth trends in reporting experiences of being bullied and electronically bullied. Although overall prevalence of bullying and cyberbullying may vary across states, the graph indicates that youth's reporting behavior with respect to cyberbullying may have a close resemblance with that of bullying in most states.

Next, I use the 2011 and 2013 survey data to study the effect of cyberbullying law on youth's reporting of electronic bullying victimization using difference-in-differences models. Nine states (present in the YRBS sample of interest) that enacted a cyberbullying law in between 2011 and 2013 surveys belong to the treatment group (Colorado, Connecticut, District of Columbia, North Dakota, Ohio, Tennessee, Texas, Vermont and West Virginia; for respective years of passage, see Table 1). Although seven states enacted cyberbullying law in 2011, I consider them as treated states since 2011 YRBS were fielded before the timing of implementation of law in those states. The controls group includes Alaska and Montana (see Table 1). I report difference-in-differences estimates using models 1-5 specifications in column (5) in Table 5. Similar to my analysis based on other measures of

school violence, I find that cyberbullying laws are positively related to students' reporting of experiences of electronic bullying victimization. The regression coefficients are statistically different from zero at the 1 percent level across all models. Further, I find similar effects when I compare two states that enacted cyberbullying laws in 2012 (District of Columbia and Tennessee) with the control states. However, due to the limited data used in the analysis, *regression results reported in column (5) in Table 5 should be treated with some caution.*

6.3 <u>Cyberbullying laws and additional youth outcomes</u>

It may not be clear from the above findings whether adoption of cyberbullying laws across states encourages cyberbullying and school violence victims to report their victimization experiences. Reporting of victimization experiences may rise due to an actual increase in incidence of cyberbullying and/or school violence (Iyengar's (2009) reprisal hypothesis) during the post-implementation period. In addition, given youth's propensity to engage in risky behaviors, increasing costs of cyberbullying may induce young offenders to engage in other forms of school violence (see 'Conservation of Risk' by Gruber 2009).

Analyzing relationship between cyberbullying and youth's reporting behavior with respect to various forms school violence as well as electronic bullying victimization (as done in the previous sections) may partially address some of the above concerns. To further explore whether the observed effects in youth reporting of victimization experiences during the post-implementation period are driven by a rise in school violence (or in cyberbullying) or by the states' legislative intervention, I look at additional youth indicators of students' academic (academic grades) and mental health outcomes (feeling of sadness and indicator for suicidal ideation). Rise in incidence of school violence or cyberbullying during the post-implementation period is expected to induce increase in academic and mental health problems among youth.

I report LPM estimates using additional youth indicators as outcome variables in Table 6. Estimating equation (2) (or model 5), I find that implementation of cyberbullying law leads to a 2 percent (marginal effect relative to sample mean) increase in the probability that students report scoring better grades (A's and B's) in class (column 1). The estimated regression coefficients for students' academic performance are similar across all model specifications. However, cyberbullying laws appear to have no effect on the probability that students report feeling sad or having suicidal ideation in model 5.

6.4 Additional robustness checks - Event study

States can potentially implement cyberbullying laws as a response to varying trends in youth violence and health-related problems. This may further affect identification of true β_1 in equation (1). I test the robustness of my estimates by including policy leads and lags in a separate regression analysis (Autor, 2003; Angrist and Pischke, 2009). In order to perform an event study, I incorporate indicator variables for- one, two, and three years before the law was passed, the year the law was enacted, one and two years after passage of law, and for subsequent years from the third year onwards. Period prior to 3 years before the law was enacted is the excluded category. The coefficients of the variables will allow me to evaluate the significance of anticipatory and post-treatment effects of cyberbullying laws and test for statistical evidence of policy endogeneity.

I report my findings from the event study in Table 7. In the joint test for leads, the results provide little evidence of significant variations in the trends of the youth outcomes before the law was implemented. In addition, the results in the individual as well as joint test of significance of the lagged variables provide weak evidence of significant post-treatment effects of cyberbullying laws.

6.5 Effects of important components of cyberbullying law

Finally, my analysis looks at the effects of three important components of cyberbullying law. Table 8 documents the linear regression estimates of the impact of school sanctions, criminal sanctions, and states' legislative provision for students' off-campus behavior on the youth outcomes considered in my main analysis. Estimating equation (2), I find criminal sanctions are more likely to have a positive relationship with students' reporting of school violence victimization experiences (columns 1, 2, and 3). Further, school sanctions are positively related to the likelihood that students report being threatened by weapons on school property but negatively related to the probability that students report feeling unsafe going to school. Provisions for students' off-campus behavior do not appear to have significant effects on youth's reporting behavior.

Table 9 presents evidence on sex-specific impacts of cyberbullying laws. After stratifying the YRBS sample by sex, LPM estimates indicate that cyberbullying laws are more likely to affect young female victims' reporting behavior compared to male victims. While cyberbullying laws have significant and positive effects on reporting of school violence victimization experiences for both the sexes, the laws appear to have a favorable impact on girls' academic and mental health outcomes (columns 5-6).

7. Discussions

This study is characterized by some limitations. First, the data used in this study does not allow me to identify and differentiate between cyberbullying victims and offenders. Therefore, the analysis is not able to explore evidence on the deterrent impact of cyberbullying laws. Further, changes in victim's outcomes caused by state intervention in youth cyberbullying are likely to be different from changes in an offender's outcomes. Second, although, measures have been taken to ensure robustness of my estimates by including state-specific linear time trends and by performing a separate event study, the

saturated regression models are based on the assumption that the unobserved variables have a linear relationship with the youth outcomes.

Nonetheless, this study opens up a wide scope for future research on evaluating the effectiveness of state cyberbullying laws and how education policy interventions related to cyberbullying can affect human capital outcomes of children and youth. To summarize, the analysis in this paper finds that adopting cyberbullying law induces an increase in reporting of victimization experiences from young victims of school violence (and possibly of cyberbullying). However, given currently available information on cyberbullying, the study cannot explore whether the state laws deter incidence of cyberbullying. Promotion of reporting of cyberbullying incidents (especially by cyberbullying victims) is one of key objectives of the states' legislative measures. To some degree, the empirical analysis in this paper offers suggestive evidence that the state cyberbullying laws potentially promote an environment in which victims feel safe to report their victimization experiences even if the law may not have an immediate deterrent impact on cyberbullying itself.

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Table 1
State cyberbullying/ electronic harassment laws

State	Electronic Harassment Law	Year of Passage	Components of Law (Year of Passage)		
			School Sanction	Criminal Sanction	Addresses off-campus behavior
Alabama	The Alabama Student Harassment Prevention Act – House Bill 216, Ala. Code §16-28B-3	2009			
Alaska	No Act		2006	2006	
Arizona	Senate Bill 1266, Section 8-309	2010	2011		
Arkansas	Ark. Code Ann. §6-18-514	2007	2007	2011	2007
California	Assembly Bill 86, Cal. Educ. Code §32261	2008	2008		2013
Colorado	House Bill 11-1254, C.R.S. §22-93-101	2011	2011	2015*	
Connecticut	Raised Bill 1138, Conn. Gen. Stat. § 10-222d	2011	2008		2011
Delaware	House Bill 7, Del. Code Ann. Tit. 14, §4112D	2007	2007		
District of Columbia	D.C. Act 19-384—"Youth Bullying Prevention Act of 2012"	2012	2012		2012
Florida	House Bill 669, Fla. Stat. Ann. §1006.147	2008	2008		2013
Georgia	Senate Bill 250, Ga. Code Ann. §20-2-751.4	2010	2010		
Hawaii	Senate Bill 2094, Chapter 302A	2010	2010		
Idaho	House Bill 750, Idaho Code §18-917A	2006	2006	2006	
Illinois	Senate Bill 3266, 105 Ill. Comp. Stat. §27-23.7	2010	2012	2008	2014*
Indiana	House Bill 1276, IC 20-19-3-10	2010	2010		
Iowa	Senate File 61,Iowa Code §280.28	2007	2007	2007	
Kansas	House Bill 2758, Kan. Stat. Ann. §72-8256	2008	2008		
Kentucky	House Bill 91, Ky. Rev. Stat. Ann. §525.080	2008	2008	2008	
Louisiana	House Bill 1259, La. Rev. Stat. Ann. §17:416.13	2010	2010	2010	2011
Maine	SP035501, Sec. 1. 20-A MRSA §6553	2009	2009		
Maryland	House Bill 199, Md. Code Ann., Educ. §7-424	2008	2008	2013	
Massachusetts	Senate Bill 2404, Mass. Gen. Laws §71-37O	2010	2010		2010
Michigan	Executive Order 2007-46	2007			
Minnesota	Senate Bill 646, Minn. Stat. §121A.0695	2007	2007		2014*
Mississippi	Senate Bill 2015, Miss. Code Ann. §37-11-67	2010	2010	2011	
Missouri	House Bill 1543, Mo. Rev. Stat. §160.775	2010	2010	2008	

Table 1 (contd.)
State cyberbullying/ electronic harassment laws

State	Electronic Harassment Law	Year of Passage	Components of Law (Year of Passage)		
			School Sanction	Criminal Sanction	Addresses off-campus behavior
Montana	"Bully-Free Montana Act"	2015*		2015*	
Nebraska	Legislative Bill 205	2008	2011		
Nevada	Senate Bill 163, Nev. Rev. Stat. Ann. §388.124	2009		2009	
New Hampshire	House Bill 1543, N.H. Rev. Stat. Ann. §193-F:3	2010			2010
New Jersey	Senate Bill 993, N.J. Stat. Ann. §18A: 37-14	2007	2007	2014*	2010
New Mexico	N.M. Admin. Code §6.12.7.7	2006	2006		
New York	Senate Bill 7051	2008	2011		2013
North Carolina	House Bill 1261, N.C. Gen. Stat §14-458.1	2009	2009	2009	
North Dakota	House Bill 1465, N.D. Cent. Code 15.1-19 §1-2	2011	2011	2009	
Ohio	House Bill 116, Jessica Logan Act	2012	2012		
Oklahoma	Senate Bill 1941, Okla. Stat. Ann. §70-24-100.3	2008	2008		
Oregon	House Bill 2673, Or. Rev. Stat. §339.351	2007	2007		
Pennsylvania	House Bill 1067, Pa. Cons. Stat. §13-1303.1-A	2008	2008		
Rhode Island	Senate Bill 2012, R.I. Gen. Laws §16-21-26	2008	2008		
South Carolina	House Bill 3573, S.C. Code Ann. §59-63-120	2006	2006		
South Dakota	Senate Bill 130, S.D. §13-32-19	2012	2012		2012
Tennessee	Tenn. Code Ann. § 49-6-1014, Tenn. Code Ann. § 49-6-1015	2012	2012	2009	2014*
Texas	House Bill 1942, Texas HB No. 1942	2011	2011		
Utah	Senate Bill 91, Utah Code Ann. §53A-11a-102, Utah Code Ann. §76-9-201	2009	2009		
Vermont	16 V.S.A. § 11	2011	2011		2011
Virginia	House Bill 1624, § 22.1-279.6	2009	2009	2001	
Washington	Senate Bill 5288	2010	2007	2004	
West Virginia	W. Va. Code Ann. §18-2C-2/ W. Va. Code Ann. §18-2C-3	2011	2011		
Wisconsin	Senate Bill 154, Wis. Stats 947.0125	2010	2010	1996*	
Wyoming	House Bill 223, Wyo. Stat. Ann. §21-4-312	2009	2009		

*Denotes the year of implementation does not lie within the study period, 2001-2013.
Note: The information on dates and components of cyber-bullying laws are primarily obtained from National Conference of State Legislatures (2010) and Hinduja and Patchin (2016). Additional sources used for verification of the above information include U.S. Department of Education's study on state anti-bullying legislations (2011), National Association of State Boards of Education, LexisNexis, and HeinOnline databases.

Table 2
Indicators of youth outcomes from Youth Risk Behavior Surveys

Variable name	Survey questions used	Binary outcome	High-school students	High-school girls	High-school boys
			Mean (SD)	Mean (SD)	Mean (SD)
Fights in school	*'During the past 12 months, how many times were you in a physical fight on school property?'*	0- Never 1- At least once	0.117 (0.321)	0.080*** (0.272)	0.155 (0.362)
Threat	*'During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?'*	0 – Never 1- At least once	0.079 (0.269)	0.058*** (0.233)	0.101 (0.302)
Unsafe	*'During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?'*	0 – 0 days 1- At least once	0.072 (0.258)	0.074*** (0.262)	0.069 (0.254)
Bullied	*'During the past 12 months, have you ever been bullied on school property?'*	0 – No 1- Yes	0.185 (0.388)	0.201*** (0.401)	0.167 (0.373)
Academic score	*'During the past 12 months, how would you describe your grades in school?'*	0 – Mostly C's, D's, and F's 1 – Mostly A's and B's	0.706 (0.456)	0.765*** (0.424)	0.643 (0.479)
Sadness	*'During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?'*	0 – No 1- Yes	0.282 (0.450)	0.350*** (0.477)	0.209 (0.407)
Suicide index	Variable incorporates three YRBS measures that include information on whether an individual 'considered' or 'planned' attempting suicide and number of times an individual attempted suicide during the past 12 months.	0 – No/ Never 1 – Yes/ at least once	0.199 (0.399)	0.234*** (0.423)	0.162 (0.369)

*** - Difference in means of variable across girls and boys is significantly different from zero at the 1 percent level.
Note: Bullying information is available in the YRBS for the period 2009-2013 only. The means of the variables are based on the respective regression samples used in the analysis. The regression sample sizes for each variable are reported in Tables 5, 7, 8, and 9.

Table 3
Individual demographic controls, YRBS, (2001-2013)

Variables	% in sample [N]
Sex	
Male	48.78 [475612]
Female	51.22 [499399]
Race	
White	47.57 [455539]
Non-whites	52.43 [502024]
Ethnicity	
Hispanic	16.09 [154072]
Non-whites	83.91 [803491]
Age	
14 years or younger	13.68 [133664]
15 years	25.77 [251892]
16 years	26.35 [257,483]
17 years	22.68 [221617]
18 years or older	11.53 [112661]

Table 4
Explanatory variable and state-level controls, by data source (2001-2013)

State Variables	Mean (SD)	Source
-Cyber-bullying law	0.44 (0.50)	National Conference of State Legislatures (2010), U.S.
-Includes school sanction	0.32 (0.47)	Department of Education (2011), Hinduja and Patchin
-Includes criminal sanction	0.08 (0.26)	(2016), National Association of State Boards of
-Addresses off-campus behavior	0.05 (0.22)	Education (2016), HeinOnline, and Lexis Nexis
-Anti-bullying law	0.55 (0.50)	U.S. Department of Education (2011) and bullypolice.org
-Child witness to domestic violence law	0.32 (0.47)	Child welfare information gateway, Lexis Nexis, HeinOnline
-Youth suicide rate (per 100,000 cases)	4.410 (2.679)	CDC WONDER
-High-school dropout rate (per 100 people aged 16-24)	0.085 (0.032)	Current Population Survey
-Pupil-teacher ratio	15.31 (2.58)	National Center for Education Statistics
-Per pupil expenditure	9824.62 (3017.63)	National Center for Education Statistics
-Beer tax (in 2005$))	0.27 (0.24)	Beer Institute
-Cigarette tax (in 2005$)	1.02 (0.78)	Tax Burden on Tobacco
-Unemployment rates	6.10 (2.06)	Bureau of Labor Statistics
-Per-capita personal income (2005$)	37544.06 (7899.31)	Bureau of Economic Analysis

Note: The policy variables are binary indicators that take values 0 or 1 based on the periods when the laws became effective in states. Specific dates for school anti-bullying policies are retrieved from http://www.bullypolice.org/ on November, 26, 2015.

Table 5

Difference-in-differences estimates of relationship between cyberbullying laws and youth reporting on school violence and safety

	School violence and safety measures				Limited sample analysis (2011-2013 YRBS) ✓✓
	Fights in school	Threat	Unsafe	Bullied	e-Bullied (Sample mean=0.165)
	(1)	(2)	(3)	(4)	(5)
Model 1 – Baseline (with state and year fixed effects)					
Cyberbullying law	0.001	0.005**	0.005	0.003	0.024***
	(0.003)	(0.002)	(0.007)	(0.006)	(0.001)
Model 2 – Model 1 + demographic controls					
Cyberbullying law	-0.003	0.005*	0.003	0.005	0.018***
	(0.003)	(0.003)	(0.007)	(0.006)	(0.001)
Model 3 – Model 2 + state economic and school-level controls					
Cyberbullying law	-0.003	0.004	0.005	0.006	0.021***
	(0.003)	(0.003)	(0.007)	(0.007)	(0.004)
Model 4 – Model 3 + state-level- policy controls, youth suicide rate and dropout rate					
Cyberbullying law	-0.002	0.005*	0.006	0.010*	0.017***
	(0.004)	(0.003)	(0.006)	(0.006)	(0.002)
Model 5 – Model 4 + state-specific linear time trends					
Cyberbullying law	0.000	0.009***	0.012**	0.023***	0.018***
	(0.005)	(0.002)	(0.005)	(0.006)	(0.002)
N	852962	911398	938939	479194	49670

*, **, and *** denote significance at the 10%, 5% and 1% level.

Note: Weighted linear probability regression estimates are reported in the above table. Standard errors are corrected for clustering on the state and reported in parentheses. All regressions are weighted by states' annual youth population estimates (aged under 20). Demographic controls include sex, age, race, and ethnicity. State economic and school-level controls include seasonally adjusted unemployment rate, per-capita personal income, student-teacher ratio, and per-pupil expenditure in public high-schools. State-level- policy controls include school anti-bullying law, criminal sanctions for child witness of domestic violence, cigarette tax, and beer tax. Model 4 and 5 also control for youth suicide rate and high-school dropout rate (using National Center for Education Statistics' definition of status dropout rate for people aged 16-24).

✓✓The YRBS sample used for analysis in columns 5 and 6 is based on 2011 and 2013 surveys only. The regression analysis compares states that enacted cyberbullying laws between the two surveys (Colorado, Connecticut, District of Columbia, North Dakota, Ohio, Tennessee, Texas, Vermont and West Virginia) and states that never had cyberbullying laws in the study period (Alaska; no act, and Montana; enacted in 2015). South Dakota also implemented cyberbullying law in between 2011 and 2013 YRBS. However, YRBS does not have data from South Dakota for the relevant periods of interest (2011-2013).

Table 6

Difference-in-differences estimates of relationship between cyberbullying laws and youth reporting on academic and mental health outcomes

	Additional youth measures		
	Academic Score	Sadness	Suicide index
	(1)	(2)	(3)
Model 1 – Baseline (with state and year fixed effects)			
Cyberbullying law	0.017	-0.010***	-0.003
	(0.011)	(0.004)	(0.005)
Model 2 – Model 1 + demographic controls			
Cyberbullying law	0.022**	-0.012***	-0.004
	(0.008)	(0.003)	(0.005)
Model 3 – Model 2 + state economic and school-level controls			
Cyberbullying law	0.018***	-0.010***	-0.000
	(0.006)	(0.003)	(0.008)
Model 4 – Model 3 + state-level- policy controls, youth suicide rate and dropout rate			
Cyberbullying law	0.017***	-0.010***	-0.003
	(0.006)	(0.003)	(0.007)
Model 5 – Model 4 + state-specific linear time trends			
Cyberbullying law	0.014***	-0.004	-0.003
	(0.005)	(0.003)	(0.007)
N	386485	931295	877211

*, **, and *** denote significance at the 10%, 5% and 1% level.

Note: Weighted linear probability regression estimates are reported in the above table. Standard errors are corrected for clustering on the state and reported in parentheses. All regressions are weighted by states' annual youth population estimates (aged under 20). Demographic controls include sex, age, race, and ethnicity. State economic and school-level controls include seasonally adjusted unemployment rate, per-capita personal income, student-teacher ratio, and per-pupil expenditure in public high-schools. State-level- policy controls include school anti-bullying law, criminal sanctions for child witness of domestic violence, cigarette tax, and beer tax. Models 4 and 5 also control for youth suicide rate and high-school dropout rate (using National Center for Education Statistics' definition of status dropout rate for people aged 16-24).

Table 7
Table 7
Event analysis to estimate anticipatory and post-treatment effects of cyberbullying laws

	School violence and safety measures				Additional youth outcomes		
	Fights in school	Threat	Unsafe	Bullied	Academic score	Sadness	Suicide index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
3 years before	-0.004	0.001	-0.003	-0.008	0.011	-0.001	-0.007
	(0.005)	(0.002)	0.007	(0.017)	(0.006)	(0.007)	(0.008)
2 years before	-0.004	-0.005**	-0.016***	0.019	-0.002	0.003	-0.006
	(0.004)	(0.002)	(0.006)	(0.011)	(0.006)	(0.004)	(0.011)
1 year before	-0.005	-0.001	0.001	0.016	0.005	0.003	-0.002
	(0.005)	(0.003)	(0.006)	(0.013)	(0.010)	(0.003)	(0.006)
Effective year of law	0.002	-0.003	0.002	-0.006	-0.031***	0.010**	-0.002
	(0.005)	(0.002)	(0.005)	(0.006)	(0.009)	(0.004)	(0.006)
1 year after	-0.002	0.002	0.000	0.017**	0.001	-0.006	-0.003
	(0.002)	(0.004)	(0.005)	(0.008)	(0.008)	(0.004)	(0.006)
2 years after	-0.008	0.005	0.003	-0.000	-0.017*	0.005	-0.015
	(0.008)	(0.004)	(0.004)	(0.007)	(0.009)	(0.006)	(0.018)
3+ years after	-0.009	-0.005	-0.008	-0.000	-0.013	-0.005	-0.008
	(0.006)	(0.005)	(0.006)	(0.006)	(0.011)	(0.006)	(0.007)
F-value of $\beta_{lead1} + \beta_{lead2} + \beta_{lead3} = 0$	F=2.26 Pr=0.14	F=0.96 Pr=0.33	F=2.02 Pr=0.16	F=0.45 Pr=0.50	F=0.91 Pr=0.35	F=0.17 Pr=0.69	F=0.98 Pr=0.32
N	852962	911398	938939	479194	386485	931295	877211

*, **, and *** denote significance at the 10%, 5% and 1% level.
Note: Weighted linear probability regression estimates are reported in the above table. Standard errors are corrected for clustering on the state and reported in parentheses. All regressions are weighted by states' annual youth population estimates (aged under 20). The above regressions are estimated using Model 5 (see Table 5) specification. Each indicator variable for 1-3 years before law and 0-2 years after law equals 1 only in the relevant years and 0 otherwise. For the indicator for 3+ years after law, the variable equals 1 for each year starting from the third year after the law was enacted. Period prior to 3 years before the law was enacted is treated as the excluded category.

Table 8
Analysis of effects important components of cyberbullying laws

	School violence and safety measures				Additional youth outcomes		
	Fights in school	Threat	Unsafe	Bullied	Academic score	Sadness	Suicide index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Includes school sanctions	-0.006	0.006[*]	-0.012[**]	0.008	0.008	-0.005	-0.007
	(0.004)	(0.003)	(0.005)	(0.007)	(0.007)	(0.004)	(0.011)
Includes criminal sanctions	0.012[***]	0.012[**]	0.005	0.021[*]	0.004	0.004	-0.010
	(0.004)	(0.006)	(0.005)	(0.011)	(0.019)	(0.009)	(0.011)
Addresses off-campus behavior	0.009	0.004	0.013[*]	-0.002	-0.056[***]	-0.002	0.005
	(0.009)	(0.008)	(0.008)	(0.015)	(0.019)	(0.004)	(0.033)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific linear time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	852962	911398	938939	479194	386485	931295	877211

*, **, and *** denote significance at the 10%, 5% and 1% level.
Note: Weighted linear probability regression estimates are reported in the above table. Standard errors are corrected for clustering on the state and reported in parentheses. All regressions are weighted by states' annual youth population aged under 20. The above regressions are estimated using Model 5 (see Table 5) specification.

Table 9
Difference-in-differences analysis of sex-specific impacts of cyberbullying laws

	School violence and safety measures				Additional youth outcomes		
	Fights in school	Threat	Unsafe	Bullied	Academic score	Sadness	Suicide index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High-school girls							
Cyberbullying law	-0.003	0.009***	0.019***	0.021**	0.028***	-0.006*	-0.004
	(0.003)	(0.003)	(0.007)	(0.010)	(0.005)	(0.004)	(0.009)
N	439171	468788	482823	247255	198736	479440	452967
High-school boys							
Cyberbullying law	-0.000	0.009***	0.006*	0.027**	0.000	0.001	0.000
	(0.005)	(0.002)	(0.003)	(0.008)	(0.008)	(0.002)	(0.008)
N	413791	442610	456116	231939	187749	451855	424244
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific linear time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*, **, and *** denote significance at the 10%, 5% and 1% level.
Note: Weighted linear probability regression estimates are reported in the above table. Standard errors are corrected for clustering on the state and reported in parentheses. All regressions are weighted by states' annual youth population estimates (aged under 20). The above regressions are estimated using Model 5 (see Table 5) specification.

Figure 1
Trends in students' reporting of bullying and cyberbullying experiences across states
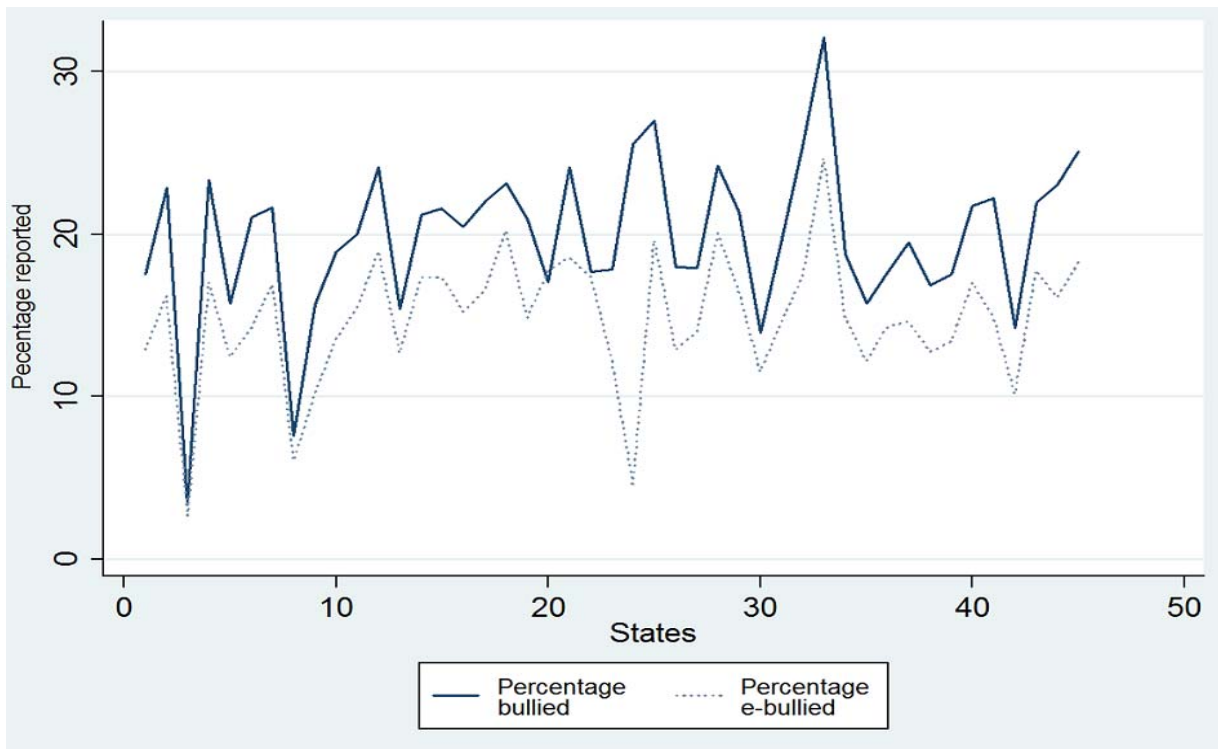
Note: The above figure is based on a sample of 44 states. State-specific percentage reported (Y-axis) has been estimated as proportions of total number of respondents (in combined 2011-2013 YRBS) who reported being bullied and electronically bullied.