

EMILY OLSEN

# School Violence and Sexual Identity among United States Adolescents

*Results from the Youth Risk Behavior  
Surveillance System, 1995–2015*



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Sexual Identity among  
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ACADEMIC DISSERTATION

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# DEDICATION

Dedicated to Adelaide Fern, August Patrick, Nonna, Bops, Gigi, Grandpa, and my darling Marc. You put your lives on hold for me, and my life is so much better for it. Thank you for encouraging me to take the chance and for taking it with me. I love you all.



# ABSTRACT

The aim of this dissertation was to describe the prevalence of peer victimization and bullying by sexual identity, to assess secular trends in peer victimization by sexual identity, and to describe the frequency and prevalence of teen dating violence victimization by sexual identity among large, representative, school-based samples of adolescents in grade 9-12 in the United States. The data were collected from several components of the Youth Risk Behavior Surveillance System, a monitoring system of adolescent health-risk behaviors and outcomes conducted biennially since its inception in 1991.

The first aim was to describe the prevalence, stratified by sex, of school violence among heterosexual, gay or lesbian, bisexual, and not sure students residing in 10 states and in 10 large urban school districts during 2009 and/or 2011. School violence was measured using four peer victimization questions (physical fighting on school property, carrying a weapon on school property, missing school because of safety concerns, and being threatened or injured with a weapon on school property) and one measure assessing being bullied on school property. Generally, school violence was more prevalent among gay or lesbian and bisexual female and male students compared to their heterosexual counterparts, even after controlling for race/ethnicity and grade in school.

The second aim was to assess secular trends in peer victimization (during 1995 to 2015) and bullying victimization (during 2009 to 2015) among lesbian, gay, or bisexual (LGB) students compared to heterosexual students in the state of Massachusetts. The study showed linear decreases overall and among heterosexual students for two peer victimization measures (having missed school due to safety concerns and having been threatened or injured with a weapon on school property) and for being bullied on school property. Among LGB students, the two peer victimization measures declined linearly during 1995-2015, but no trend was detected for bullying victimization at school. Despite this progress, in 2015 LGB had higher prevalence of having missed school because of safety concerns and being bullied at school than their heterosexual peers.

The third aim was to describe the frequency of sexual teen dating violence victimization and physical teen dating violence victimization among LGB male and female students compared to their heterosexual peers. Additionally, another aim was to ascertain the prevalence of teen dating violence victimization using a combination of the physical and sexual teen dating violence measures. The study used nationally-representative data, which included sexual identity for the first time in 2015. The results of the study indicated that teen dating violence victimization is more prevalent among female heterosexual compared to male heterosexual students; however, this difference by sex was not detectable among LGB female compared to LGB male students.

Taken together, the results of the three studies show a consistent pattern of increased at-school victimization of LGB compared to sexual non-minority students. Both male and female LGB students experience disproportionate school violence relative to their heterosexual peers, although the disparity is not always equal for male and female sexual minority students. The results suggest that school-based violence prevention policies and programs are needed that are effective for students of all sexual orientations.

Further research is needed to examine the etiology of school-based LGB victimization and to identify additional factors associated with increased school violence. Moreover, surveillance provides information for action, yet globally still few nations assess adolescent sexual identity and therefore most miss the opportunity to implement programs and policies that would benefit these vulnerable LGB students.



# TIIVISTELMÄ

Tutkimuksen tavoitteena oli kuvata vertaisten toteuttaman kaltoinkohtelun ja kiusaamisen yleisyyttä ja ajallisia muutoksia sekä kuvata nuorten seurusteluun liittyvän kaltoinkohtelun yleisyyttä ja määrää eri seksuaalisen identiteetin omaavilla nuorilla laajoissa 9-12-luokkalaisia koskevissa kouluotoksissa Yhdysvalloissa. Aineisto kerättiin useissa osissa osana the Youth Risk Behavior Surveillance System –seurantajärjestelmää. Seurantajärjestelmän tiedot on kerätty joka toinen vuosi vuodesta 1991 lähtien.

Ensimmäisenä tavoitteena oli kuvata sukupuolittain kouluväkivallan yleisyys heteroseksuaalien, homojen, lesbojen ja biseksuaalien keskuudessa sekä niiden keskuudessa, jotka eivät olleet varmoja seksuaalisesta identiteetistään. Mukana oli 10 osavaltiota ja 10 suurta kaupunkialuetta vuosina 2009 ja/tai 2011. Kouluväkivalta mitattiin neljällä vertaisten toteuttamaa kaltoinkohtelua kartoittavalla kysymyksellä (tappelu koulualueella, aseiden kantaminen koulualueella, koulupoissaolo turvallisuushuolen takia, joutuminen aseella uhatuksi tai vahingoittuminen aseiden käytön seurauksena koulualueella) sekä yhdellä koulualueella kiusatuksi tulemista kartoittavalla kysymyksellä. Kouluväkivalta oli yleisempää homoilla, lesboilla ja biseksuaaleilla tytöillä ja pojilla kuin heteroseksuaaleilla senkin jälkeen, kun rotu/etninen tausta ja luokka-aste oli vakioitu.

Toisena tavoitteena oli arvioida vertaisten toteuttaman kaltoinkohtelun yleisyyden muutosta vuosina 1995-2015 ja kiusatuksi tulemisen yleisyyden muutosta vuosina 2009-2015. Lesboja, homoja ja biseksuaaleja (LGB) verrattiin heteronuoriin Massachusettsin osavaltiossa. Tutkimus osoitti, että kaksi vertaisten toteuttaman kaltoinkohtelun muotoa (poissaolo koulusta turvallisuushuolen takia ja joutuminen aseella uhatuksi tai vahingoittuminen aseiden käytön seurauksena koulualueella) ja koulualueella kiusatuksi tuleminen vähenivät lineaarisesti sekä kaikilla että heteroseksuaalisilla nuorilla. LGB-nuorten joukossa vertaisten toteuttama kaltoinkohtelu väheni lineaarisesti 1995-2015, mutta koulussa kiusatuksi tuleminen ei vähentynyt. Myönteisestä kehityksestä huolimatta koulusta poissaolo

turvallisuushuolen tai kiusatuksi tulemisen takia oli vuonna 2015 yleisempää LGB-nuorilla kuin heteroseksuaaleilla.

Kolmantena tavoitteena oli kuvata nuorten seurusteluun liittyvän seksuaalisen ja fyysisen kaltoinkohtelun määrää ja yleisyyttä LGB-poikien ja -tyttöjen joukossa verrattuna heteroseksuaaleihin. Tutkimuksessa käytettiin kansallisesti edustavaa aineistoa vuodelta 2015, jolloin kysymys nuoren seksuaalisesta identiteetistä sisällytettiin ensimmäisen kerran kyselyyn. Tulokset osoittivat, että seurusteluun liittyvä kaltoinkohtelu oli yleisempää heteroseksuaalisilla tytöillä kuin heteroseksuaalisilla pojilla, kun taas LGB-nuorten joukossa ei ollut sukupuolieroja.

Edellä kuvatut tulokset osoittavat yhdenmukaisesti, että LGB-nuoret ovat vertaisten toteuttaman koulussa tapahtuvan kaltoinkohtelun uhrina useammin kuin nuoret, jotka eivät kuulu seksuaalisiin vähemmistöihin. Sekä mies- että naispuoliset LGB-opiskelijat kokevat kouluväkivaltaa useammin kuin heteroseksuaaliset, joskin ero voi vaihdella sukupuolten välillä. Tulokset tukevat sellaisten kouluväkivallan ehkäisytoimien ja -ohjelmien kehittämistä, jotka ovat tehokkaita riippumatta nuorten seksuaalisesta suuntautumisesta.

Koulussa tapahtuvan LGB-nuoriin kohdistuvan kaltoinkohtelun syiden selvittämiseksi ja muiden kouluväkivaltaan liittyvien tekijöiden tunnistamiseksi tarvitaan uutta tutkimusta. Lisäksi yleisyyden seuranta tuottaa tietoa toimenpiteiden pohjaksi; kuitenkin kansainvälisesti katsottuna nuorten seksuaalinen identiteetti sisältyy tutkimuksiin vain harvoissa maissa. Tällä hetkellä mahdollisuus kehittää ohjelmia ja toimenpiteitä haavoittuvassa asemassa olevien LGB-nuorten tilanteen parantamiseksi jää laajalti käyttämättä.

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# ABBREVIATIONS

AHLS	Adolescent Health and Lifestyle Survey
APR	Adjusted prevalence ratio
CDC	United States Centers for Disease Control and Prevention
CI	Confidence interval
GSHS	Global School-based Student Health Survey (also known as G-YRBS)
G-YRBS	Global Youth Risk Behavior Survey (also known as GSHS)
HBSC	Health Behaviour in School-aged Children
LGB	Lesbian, gay, or bisexual
LGBT	Lesbian, gay, bisexual, or transgender
OBBP	Olweus Bully Prevention Program
TDV	Teen dating violence
TDVV	Teen dating violence victimization
U.S.	United States
YRBS	Youth Risk Behavior Survey
YRBSS	Youth Risk Behavior Surveillance System
WHO	World Health Organization

# LIST OF ORIGINAL PUBLICATIONS

- Publication I **Olsen EO**, Kann L, Vivolo-Kantor A, Kinchen S, McManus T. School violence and bullying among sexual minority high school students. *Journal of Adolescent Health* 2014;55(3):432-438.
- Publication II **Olsen EO**, Vivolo-Kantor A, Kann L, Milligan C. Trends in victimization of gay, lesbian, and bisexual youth – Massachusetts, 1995-2015. *American Journal of Public Health* 2017; 107(7):1116-1118.
- Publication III **Olsen EO**, Vivolo-Kantor A, Kann L. Physical and sexual teen dating violence by sexual identity among U.S. high school students, 2015. *Journal of Interpersonal Violence* 2017:1-20 (online).





# 1 INTRODUCTION

Adolescents in the United States (U.S.) spend an average of 7 hours per weekday doing education-related activities, including 6 hours attending classes (Office of Adolescent Health, 2016). For most adolescents, school is the hub of social activity and pervades almost every aspect of their social lives. School should be a place of learning and safe development but for many students it can be a place of suffering from harassment, bullying, and victimization from peers and romantic partners. The long-term effects of school violence, including peer victimization, bullying, and teen dating violence victimization are well established and can be severe. impacting mental and physical health, overall educational achievement, and lifetime economic outcomes.

School violence – explicitly peer victimization and bullying - are not unique to the U.S. and are not a new phenomenon. The scientific study of bullying began in Scandinavia and was first described as *mobbning* by Swedish physician Heinemann (Heinemann, 1972). A few years later, three suicides occurred in Norway as the result of severe bullying and the Norwegian Ministry of Education invested in the study of bullying and its prevention. Thirty years later the U.S. saw the occurrence of another rash of suicides from bullying – this time among lesbian, gay, or bisexual (LGB) youth - and received a maelstrom of media attention that prompted an outcry among parents, youth, teachers, advocates, and researchers. Despite the growing media attention and advocates' pleading for data, little data and scientific evidence of bullying among LGB students existed (Sell & Becker, 2001). The timing coincided with the call to action from the National Academy of Medicine (formerly the Institute of Medicine, or IOM) for collection of sexual orientation data on federal surveys (IOM, 2011) and with the release of the surveillance summary of adolescent sexual orientation data and health-risk behaviors by the U.S. Centers for Disease Control and Prevention (CDC) (Kann et al., 2011).

The thesis describes the work that began in 2011 to contribute to the literature high-quality evidence of LGB adolescent peer victimization and bullying. The work disseminates data from the Youth Risk Behavior Surveillance System, which monitors health risk behaviors among representative samples of youth in grades 9 to 12 throughout the United States. In 2016, CDC released U.S. national estimates of the number of LGB students in grades 9 through 12: 8.0% of all students, which extrapolates to approximately 1.3 million adolescents (Kann, Olsen et al., 2016). The 2015 addition of sexual orientation measures on the national Youth Risk Behavior Survey also enabled the study of teen dating violence victimization among LGB-identified students. Teen dating violence is considered to be pertinent to and in the purview of schools and can be classified as a form of school violence (Ely, 2004). Assessing peer victimization, bullying, and teen dating violence together paints one of the first pictures of the frequency of at-school victimizations for U.S. adolescents, particularly among LGB students.

## 2 BACKGROUND

### 2.1 School-based behavior surveillance

Surveillance is a crucial component of public health. Most simply, surveillance is information for action; the World Health Organization (WHO) defines public health surveillance as “the continuous, systematic collection, analysis, and interpretation of health-related data needed for the planning, implementation, and evaluation of public health practice”(World Health Assembly, 21, 1968; World Health Organization., 2003). Surveillance of behavioral risk factors is tailored to assessing health-behaviors that are associated with leading causes of morbidity and mortality.

School-based behavioral surveillance is an efficient mechanism to gather data on health behaviors among representative samples of adolescents. The health behaviors and habits made during adolescence can persist through adulthood and have lifelong impact on morbidity and mortality (for example: Epstein et al., 2015; Gordon-Larsen, Nelson, & Popkin, 2004; Harris, Gordon-Larsen, Chantala, & Udry, 2006) and it is important to monitor these. School-based behavior surveillance systems are implemented globally, although the specific sampling and design methods, generalizability, and question modules vary greatly across nations.

#### 2.1.1 International monitoring systems

There are two major international school-based health surveys; both are supported by WHO. The first is the Global School-based Student Health Survey (GSHS), also known as the Global Youth Risk Behavior Survey (G-YRBS), which is conducted in the following regions: Africa, Americas, Europe (only Kazakhstan, Tajikistan, and Macedonia), Eastern Mediterranean, Southeast Asia, and Western Pacific. This survey contains 10 core questionnaire modules capturing health-risk behaviors that are associated with the leading causes of morbidity and mortality and

aims to target adolescents aged 13-17 years. The general sampling methods for GSHS countries consist of a standardized scientific school sampling method, common school-based methodology, and self-administered questionnaires that combine core survey questions, core-expanded questions, and country-specific questions (Centers for Disease Control and Prevention, 2018).

The second major international school-based health survey is Health Behaviours in School-aged Children (HBSC), founded in 1982 and executed in collaboration with WHO. The HBSC “seeks to advance the scientific field of adolescent health internationally whilst acting as a monitoring tool” (Currie, Nic Gabhainn, & Godeau, 2009). The HBSC is conducted in 48 countries, mostly in Europe and North America, and uses an international standardized questionnaire so that results can be compared across countries. The HBSC samples children aged 11, 13, and 15 years who attend school. The surveys are self-administered and take place during a class period (C. Roberts et al., 2009).

## 2.1.2 Country-specific systems

In addition to the global systems described above, many countries conduct their own independent school-based behavior surveillance. Two countries, Finland and the United States, are described.

### 2.1.2.1 Finland

Finland has one of the oldest existing continuous youth behavioral surveillance systems in its Adolescent Health and Lifestyle Survey (AHLS), which was initiated in 1977 (Hakala, Rimpelä, Salminen, Virtanen, & Rimpelä, 2002), but it is not school-based. AHLS is a nationally-representative system to monitor health and lifestyle-related health among adolescents in Finland (Koivusilta & Rimpelä, 2005). The sampling frame of AHLS is the Population Register Centre; all Finns born on specific, adjacent dates are selected to yield representative samples of 12, 14, 16, and 18 year-old youth. The selected youth are mailed voluntary, self-administered questionnaires for completion (Hakala et al., 2002). The questionnaires

contain items on topics such as tobacco use and dependency, alcohol use, perceived health and stress symptoms, violence, and many other priority health risks.

Finland also has the school-based School Health Promotion (SHP) study, which aims to monitor the health and wellbeing of Finnish youth such that results can be used to inform school planning, policies, and reform (National Institute for Health and Welfare, (THL), 2017). The survey is anonymous and voluntary and is administered in classrooms every other year; the 2017 SHP study reached between 51% and 80% of children in the targeted grades (National Institute for Health and Welfare, (THL), 2017). The questionnaire includes questions about living conditions, health, health-related behaviors, school work, and school-based health services. The SHP study ascertains school bullying and, for the first time in 2017, sexual orientation.

### 2.1.2.2 United States

The United States has one major school-based behavior surveillance system, the Youth Risk Behavior Surveillance System (YRBSS). The YRBSS was built in 1990 with three primary purposes: first, to focus the nation on health behaviors of adolescents; second, to assess how risk behaviors change over time; and third, to provide comparable data across sex, race/ethnicity, and grade. The YRBSS monitors priority health-risk behaviors that contribute to morbidity and mortality in six priority areas, including: behaviors that contribute to unintentional injuries and violence, sexual behaviors associated with unintended pregnancy and sexually transmitted infections, alcohol and other drug use, tobacco use, unhealthy dietary behaviors, and inadequate physical activity. More recently, the YRBSS added two health outcomes (obesity and asthma) (Kann, McManus et al., 2016). The YRBSS also assesses the prevalence of other priority health risk behaviors as well as sexual identity and sex of sexual contacts.

The YRBSS is the source data for the current analyses and the methodology is described at length in section 5.1.

## 2.2 Concept definitions

### 2.2.1 Sexual orientation and sexual identity

#### *Sexual Orientation*

Sexual orientation as a construct is intangible and difficult to define (Ridolfo, Miller, & Maitland, 2012). The American Psychological Association defines sexual orientation as “an enduring pattern of emotional, romantic and/or sexual attractions to men, women or both sexes” (VandenBos, 2015); however, researchers more commonly agree that sexual orientation is defined by or composed of three primary and distinct phenomena (or dimensions) that are not limited to sexual attraction: sexual attraction, sexual behavior, and sexual identity (Berenbaum & Beltz, 2011; Fisher, Ristori, Morelli, & Maggi, 2017; R. C. Savin-Williams, 2008). Other literature posits a fourth dimension, including either physiologic sexual arousal (Bailey et al., 2016) or romantic partnership (Badgett, 2009). The four widely accepted sexual orientations are heterosexual (straight), gay or lesbian, bisexual, and asexual; however, a person’s sexual orientation may vary by sexual orientation dimension.

Although there is significant overlap of persons’ sexual orientation dimensions, prevalence of each sexual orientation (Bailey et al., 2016; Geary *et al.*, 2018; Priebe & Svedin, 2013) and associated health, behavioral, and psychologic outcomes vary widely depending on which dimension is measured (Bailey et al., 2016; Kann et al., 2016; Pathela, Blank, Sell, & Schillinger, 2006). For example, persons who have same-sex sexual contact may identify as heterosexual, and those who identify as lesbian or gay may have only had sexual contact with persons of the opposite sex. Thus, in the context of public health research, researchers must identify which sexual orientation dimension is measured; this will often vary depending on the specific research question. Additionally, current research suggests that sexual orientation may vary over time for an individual (Diamond, 1998; Katz-Wise et al., 2017; McManus, 2003). This phenomenon is often described as “fluidity” or sexual orientation fluidity.

The literature on sexual orientation development among adolescents initially focused on linear progression through developmental stages; that is, “most sexual-minority youths quietly struggle with same-sex attractions in childhood, shy away from heterosexual dating, and gradually realize that they are gay or lesbian in mid- to late-adolescence. Although many youths follow this linear trajectory” (Diamond, 2003b), it is not a universal experience and consensus in the modern literature is that there is no one way that sexual orientation develops (Diamond, 1998; Diamond & Savin-Williams, 2000; Diamond, 2003b; Rosario, Schrimshaw, & Hunter, 2008; R. Savin-Williams, 1998; R. Savin-Williams & Diamond, 2000).

While no single model for sexual orientation development exists, researchers believe that it most commonly occurs during adolescence. Assessing sexual orientation during this developmental time period is important but can be challenging for researchers interested in measuring components of sexual orientation. Adolescents tend to have greater sexual identity fluidity than adults, and adoption of a sexual identity occurs differently. Qualitative studies have explored adolescent sexual orientation self-identification and concluded, “three distinct groups were identified: those with affirmed sexuality, where homosexuality is clearly recognised and accepted; those with emergent sexuality, where homosexuality has not yet been acknowledged or affirmed; and those with open sexuality, where sexual orientation is unfixed” (Snape, Thompson, & Chetwynd, 1995). It should be noted that many sexual orientation development models were not based on diverse cohorts (excluding, for example, adolescents and/or participants of color) and some researchers doubt the “applicability of these models to ... [gay, lesbian, bisexual, and transgender] youth of color and women”(Holmes & Cahill, 2004).

### *Sexual Identity*

This research uses sexual identity as the primary dimension for measuring sexual orientation; as such, results and implications are explicitly described with the specific term. Bailey and colleagues (2016) defined sexual identity as “one’s self-conception (sometimes disclosed to others and sometimes not) as a homosexual, bisexual, or heterosexual person” (Bailey et al., 2016). Sexual identity is self-perceived and subjective. Sexual identity differs from sexual behavior and sexual arousal because identity is not something that one does, but rather something that one is, a

social group and community that one joins. Some literature suggests that sexual identity is a political statement (Ridolfo et al., 2012), whereas sexual behavior and sexual attraction are not.

As described previously, those who identify as gay/lesbian or heterosexual do not have homogenous sexual attraction, rather, their attraction is “distinct from their [sexual] identity” (Vrangalova & Savin-Williams, 2012). The same is true for behavior – it is possible for a person to have a strong sexual identity without ever having had sexual contact (and, conversely, it is possible for a person to have a multitude of sexual experiences and not have a strong affiliation to a sexual identity) (Haseldon & Joloza, 2009). This is particularly true for adolescents (Kann et al., 2016; Laumann, 1994; Pathela et al., 2006; Saewyc et al., 2004). Consistent with one’s sexual orientation, sexual identity is believed to have fluidity such that it may be altered throughout the life course (Rosario et al., 2008). The scientific field also agrees that sexual identity, like sexual orientation, is not discrete; i.e., sexual identity is a continuum such that people may identify as heterosexual on one end of the continuum or as gay or lesbian on the other end of the continuum, but many people will identify somewhere in between these two opposite ends (Kinsey, Martin, & Pomeroy, 1948).

### *Additional terminology*

Within the context of this study, the following terminology related to sexual identity is used:

Gay or lesbian: gay or lesbian refers to a student who endorsed “gay or lesbian” as their sexual identity. “Gay” is an adjective and “lesbian” can be used as a noun or as an adjective.

Heterosexual/Straight: “heterosexual” or “straight” are used to describe only a student who endorsed “heterosexual (straight)” as their sexual identity. Heterosexual and straight are adjectives.

Bisexual: “bisexual” refers to a student who endorsed “bisexual” as their sexual identity. Bisexual is an adjective.



Not Sure: “not sure” refers to a student who endorsed “Not Sure” regarding their sexual identity. This could indicate that the student is not sure of their sexual identity; that they did not feel comfortable endorsing heterosexual (straight), gay or lesbian, or bisexual; or that they did not understand the question. In the data, there is no way to identify why a student endorsed “not sure.”

Sexual minority: sexual minority refers to a someone whose sexual orientation is not in the majority; that is, someone who has sexual contact with sexual partners of the same sex or of both sexes, or who identifies as gay or lesbian, bisexual, queer, or questioning.

## 2.2.2 School violence

School violence is a broad terminology that includes many separate but highly-correlated individual measures. In his compendium *School Violence and Primary Prevention*, Thomas W. Miller (2008) defines the modern term “school violence” as referring to “such behaviors as child and teacher victimization, child and/or teacher perpetration, physical and psychological exploitation, cyber victimization, cyber threats and bullying, fights, bullying, classroom disorder, physical and psychological injury to teacher and student, cult-related behavior and activities, sexual and other boundary violations, and use of weapons in the school environment.” (Miller, 2008)page 15). Within this inclusive definition is “peer victimization.” Additionally, extant literature posits that teen dating violence is another form of school violence, because it often occurs on school property and it should be addressed by school personnel (Ely, 2004).

### 2.2.2.1 Peer victimization

Like school violence, peer victimization is a broad terminology. Simply, peer victimization refers to being the target of aggression by a peer, (Kasen S, Johnson JG, Chen H, et al., 2011) in which aggression refers to “acts that intend to hurt another person directly or indirectly” (Card, Isaacs, & Hodges, 2008). Thus, peer victimization can include social, academic, physical, and emotional victimization.

Within the context of this study, peer victimization refers to violence-related behaviors that take place on school property and are not specifically bullying or teen dating violence. This includes missing school at least one day during the last month because of safety concerns and being threatened or injured with a weapon on school property. Two additional measures are not clearly victimization or aggression, in that it is unclear whether the involved student was the perpetrator or the victim, however, the measures clearly relate to peer victimization and aggression: carrying a weapon on school property and physical fighting on school property. The measures are described at length in Section 5.3.

#### 2.2.2.2 Bullying

Bullying is one form of peer aggression, school violence, and peer victimization. Bullying is undoubtedly an ancient phenomenon; however, the study of bullying originated in the 1970's in Scandinavia. Peter-Paul Heinemann, a Swedish physician, first adopted the Swedish term "*mobbning*" ("mobbing", in English) to describe group aggression and social exclusion in schools (Cederborg, Sylwander, & Blom, 2016; Heinemann, 1972). His description places the group, rather than an individual, as the perpetrator of the bullying incident (Eriksson, Lindberg, Flygare, & Daneback, 2002; Lagerlöf, 2004). Daniel Olweus, a Norwegian psychologist, disagreed and coined the term "bullying" in his landmark book *Aggression in the Schools: Bullies and Whipping Boys* (Olweus, 1978). Olweus described bullying as something that occurs when there is repeated, intentional harm (either physical, emotional, or social), excluding situations when the bully and the victim have equal positions of power (real or perceived). As the research on bullying has evolved, many researchers have argued that bullying does not happen in isolation but is rather a phenomenon and issue of peer groups rather than individuals (Salmivalli, 2010; Swearer & Espelage, 2004). Swearer and Espelage (2004) apply the social-ecological framework to bullying among youth, such that the individual is at the center of his/her own social ecology, and their participation in bullying incidents will be highly influenced by the social ecology around them (Swearer & Espelage, 2004). A prominent Finnish researcher, Christina Salmivalli, suggests that there are up to eight roles played in school bullying, including of course the victim, the bully, but also the assistant, reinforcer, outsider, and defender (Salmivalli, 1999). This perspective of bullying elucidates the indirect effects of bullying; for example, that some youth will

distance themselves from bullied peers in order to avoid becoming a target themselves (Salmivalli, Lappalainen, & Lagerspetz, 1998).

This thesis is based on CDC's definition of bullying that is similar to Olweus's definition. CDC defines bullying as "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. Bullying may inflict harm or distress on the targeted youth including physical, psychological, social, or educational harm" (Gladden RM, Vivolo-Kantor AM, Hamburger ME, Lumpkin CD, 2013).

### 2.2.2.3 Teen dating violence

Teen dating violence is not equivalent to intimate partner violence, which occurs among adults. This is because adults and adolescents are different and their romantic relationships are also quite distinct (Clark, 2013). Adolescent romantic relationships often affect school social environments and performance, and dating violence within these relationships often occurs on school property. Teen dating violence is relevant to and in the purview of schools for prevention and intervention, and is often considered a form of school violence (Ely, 2004). Definitions of teen dating violence vary greatly across countries and cultures, and there is no universal definition (Ulloa, Kisse, Castaneda, & Hokoda, 2013). This makes it difficult to estimate and compare prevalence in different settings, although the literature indicates the importance of assessing relationship violence within cultural contexts. Like in the bullying concept, this thesis is based on CDC's definition of teen dating violence. Teen dating violence is a form of intimate partner violence that takes place among adolescents who are in a close relationship. Teen dating violence can be physical, sexual, or psychological/emotional in nature, and also includes stalking. Teen dating violence can take place at any time during or after the romantic relationship and can also take place in person or electronically (such as through the internet, text messages or emails, etc.)(CDC, 2016d). Teen dating violence is often assessed and addressed separately for perpetration and victimization. This study focuses solely on teen dating violence victimization and does not assess perpetration.

## 2.3 Previous studies

### 2.3.1 Sexual orientation and sexual identity

#### *Global Surveys Assessing Sexual Identity Among Adolescents*

As of 2018, few countries had ever assessed sexual identity or any sexual orientation measure on a school-based survey; even fewer assessed it on their school-based surveillance system. As of 2017, no GSHS participants ever ascertained sexual identity, although some sites assessed sex of sexual contacts (personal communication, Tim McManus). Within the HBSC system, eight countries have ascertained sexual orientation (specifically sexual attraction) since 2014 (personal communication, Alina Cosma), although as of 2018 only Iceland has published these data in English (Thorsteinsson, Loi, Sveinbjornsdottir, & Arnarsson, 2017) and no sites have ascertained sexual identity specifically (personal communication, Alina Cosma).

In the United States, sexual orientation has been included on representative, school-based surveys since the mid-1980's, when it was assessed on the Minnesota Adolescent Health Survey (Remafedi, Resnick, Blum, & Harris, 1992). The Minnesota Adolescent Health Survey is not part of the YRBSS. Sexual orientation was first assessed on a YRBS in 1995 by Boston, Massachusetts, and Seattle. There are also notable surveys that assess sexual orientation but do not serve the purpose of surveillance, for example, the Growing Up Today Study, a cohort study of children from the Nurses' Health Study II. An additional survey, the National Longitudinal Survey of Adolescent Health (AddHealth), was conducted in waves beginning in 1991; however, the validity of the Wave 1 sexual orientation data has been questioned in the literature and studies of sexual orientation and risk behaviors based on these data are potentially dubious (Li, Katz-Wise, & Calzo, 2014; R. Savin-Williams & Joyner, 2014).

A literature search was conducted to identify large-scale school-based surveys, preferably surveillance systems, that ascertained the identity or attraction components of sexual orientation and published the data in English (Table 1). In

addition to the YRBSSs and other aforementioned U.S.-based studies, survey data exist for Canada, Finland, Iceland, Mexico, the Netherlands, New Zealand, South Korea, Sweden, and Switzerland (Bos & Sandfort, 2015; Cénat, Blais, Hébert, Lavoie, & Guerrier, 2015; Knipe, 2017; Moral-de-la-Rubia, 2011; Priebe & Svedin, 2013; Rossen, Lucassen, Denny, & Robinson, 2009; Saewyc et al., 2004; Thorsteinsson et al., 2017); however, most of these surveys ascertained sexual attraction rather than sexual identity. Thus, the results are not directly comparable to those from the U.S. (and are rarely comparable to each other). Sex of sexual partners was not included in the literature search. Table 1 summarizes the introduction of sexual orientation on each survey; for example, the Massachusetts Youth Risk Behavior Survey assessed sexual identity on their YRBS for the first time in 1995 and included the survey question on every survey since then; however, in Table 1 it is listed for 1995 because that was when the question was introduced; further, the results shown are also from that particular year.

Table 1. Global monitoring systems and surveys assessing adolescent sexual identity or sexual attraction

Year	Country (region)	Target population	Survey name	Survey question wording	Prevalence of heterosexual (straight)	Prevalence of gay, lesbian, or bisexual	Reference
1986	Finland	[Not reported]	KISS	"Can you say what your sexual orientation is at the moment?" <sup>1</sup>	[Not reported]	7% of boys and 10% of girls	Kontula 1987
1986-1987	USA, Minnesota	Students in grades 7-12	Minnesota Adolescent Health Survey	Which of the following best describes your feelings? <sup>2</sup>	88.20%	0.4% mostly or totally homosexual, 0.7% bisexual	Remafedi <i>et al.</i> 1992
1992	Canada: British Columbia	British Columbia students in grades 7 through to grade 12	British Columbia Adolescent Survey	People have different feelings about themselves when it comes to questions of being attracted to other people. Which of the following best describes your feelings? <sup>2</sup>	92.5% heterosexual, 5.5% mostly heterosexual	0.3% gay/lesbian, 1.7% bisexual	Stawyc, Homma <i>et al.</i> 2009
1994-1995	USA	Nationally-representative sample of adolescents in grades 7-12 in the U.S. during the 1994-1995 school year	The National Longitudinal Study of Adolescent to Adult Health, wave 3	"Have you ever had a romantic attraction to a female?" and "Have you ever had a romantic attraction to a male?"		7.3% of boys and 5.0% of girls	Russell & Joyner, 2001
1995	USA, Massachusetts, Boston	Public school students in grades 9-12 in the jurisdiction	Youth Risk Behavior Survey	"Which of the following best describes you?" <sup>3</sup>		2.8%	Unpublished data from Study II
1995	USA, Seattle	Public school students in grades 9-12 in the jurisdiction	Seattle Teen Health Risk Survey	How would you describe your sexual orientation/ preference? <sup>4</sup>	95.05%	1.0% gay/lesbian, 3.4% bisexual	Stawyc, Skay <i>et al.</i> 2006
1995-1996	Switzerland	National school-based survey of students aged 16-20 years old	[Not reported]	Which of the following best describes your feelings? <sup>5</sup>	96.20%	0.5% homo-sexual, 1.1% bisexual	Narring <i>et al.</i> 2003
2001	USA	Children of Nurses Health Study II participants	Growing Up Today Study	Which one of the following best describes your feelings? <sup>6</sup>	93.5% heterosexual, 4.5% mostly heterosexual	0.3% mostly or completely homosexual, 1.9% bisexual	Berlan 2010
2001	USA: San Francisco, Baltimore	Public school students in grades 9-12 in the jurisdiction	Youth Risk Behavior Survey	"Which of the following best describes you?" <sup>3,7</sup>	Not publicly available		
2003	USA: Delaware, Chicago	Public school students in grades 9-12 in the jurisdiction	Youth Risk Behavior Survey	"Which of the following best describes you?" <sup>3</sup>	Not publicly available		
2004	The Netherlands, 4 cities	Adolescents aged 13-15 years in four high schools in different cities	[Not reported]	Do you feel sexually attracted to someone of your own sex? <sup>8</sup>	[not reported]	8.6% same-sex attraction (12.5% among female students and 3.0% among male students)	Bos <i>et al.</i> 2008
2005	USA: Vermont, New York City	Public school students in grades 9-12 in the jurisdiction	Youth Risk Behavior Survey	"Which of the following best describes you?" <sup>3</sup>	Not publicly available		
2005	Mexico	Prospective sample of 75,630 Mexican adolescents from 12-29 years	Survey and Survey on Youth Behaviors in School-aged Children	[in Spanish]	[not reported in English]	1.7% non-heterosexual identity	Mora De La Ruba 2011
2006	Ireland	Young people attending school aged 11, 13, and 15 years old	Health Behaviour in School-aged Children	"Have you ever had a crush on anyone?" and "Have you ever had sex?"	83.0%	3.1% lesbian, gay, or bisexual	Thorsen <i>et al.</i> 2017

<sup>1</sup> Response options: "I am attracted to:" "only boys," "mostly boys," "mostly girls," "only girls," "I cannot say."

<sup>2</sup> Response options: 100% heterosexual (attracted to persons of the opposite sex), Mostly heterosexual, Bisexual (equally attracted to men and women), Mostly homosexual (gay/lesbian), attracted to persons of the same sex), Not sure

<sup>3</sup> Response options: (Heterosexual or straight, Gay or Lesbian, Bisexual, Not Sure)

<sup>4</sup> Response options: Heterosexual—attracted to both sexes; Bisexual—attracted to both sexes; Homosexual (Gay or lesbian)—attracted to same sex; Not Sure

<sup>5</sup> Response options: Heterosexual (attracted to/dream about persons of the opposite sex), Predominantly heterosexual, Bisexual (equally attracted to men and women), Predominantly homosexual, Homosexual (gay/lesbian), attracted to/dream about persons of the same sex), Not sure

<sup>6</sup> Response options: Completely heterosexual (attracted to persons of the opposite sex), Mostly heterosexual, Bisexual (equally attracted to men and women), Mostly homosexual, Completely homosexual (gay/lesbian, attracted to persons of the same sex), Not sure

<sup>7</sup> Response options for Baltimore 2001: Heterosexual (like the opposite sex), Gay or lesbian (like the same sex), Bisexual (like both sexes), Not sure, None of the above

<sup>8</sup> Response options: very often, often, frequently, sometimes, never

<sup>9</sup> Response options: 100% heterosexual, mostly heterosexual, bisexual, mostly homosexual, 100% homosexual, not sure, not attracted to either sex

<sup>10</sup> Response options: 'the opposite sex', 'the same sex', 'both sexes', 'not sure' or 'neither'

Table 1 (continued). Global monitoring systems and surveys assessing sexual identity or sexual attraction

Year	Country (region)	Target population	Survey name	Survey question wording	Prevalence of heterosexual (straight)	Prevalence of gay, lesbian, or bisexual	Reference
2006-2007	United Kingdom	Cohort of parents and children from Avon, UK	Avon Longitudinal Study of Parents and Children	Description that best fits how you think about yourself <sup>9</sup>	88.3% heterosexual, 9.3% mostly heterosexual	0.3% homosexual, 0.6% mostly homosexual, 1.6% bisexual	Pebody, Shelton <i>et al</i> 2014
2007	USA: Maine, Rhode Island, District of Columbia	Public school students in grades 9-12 in the jurisdiction	Youth Risk Behavior Survey	"Which of the following best describes you?" <sup>3</sup>	Not publicly available		
2007	New Zealand	10,000 students in grades 9-14 (ages 13-17)	Youth 17	"Which are you sexually attracted to?" <sup>6</sup>	92.20%	0.9% gay or lesbian, 3.3% bisexual	Rosser 2009
2009	USA: Hawaii, Illinois, North Dakota, Houston, Los Angeles, Milwaukee, San Diego	Public school students in grades 9-12 in the jurisdiction	Youth Risk Behavior Survey	"Which of the following best describes you?" <sup>3</sup>	Not publicly available		
2009	Sweden	Representative sample of Swedish high school seniors	Youth, Sex, and the Internet project	"How do you consider yourself?" <sup>11</sup>	90.5% (87.7% among female students and 93.7% among male students)	0.5% homosexual, 3.4% bisexual	Pribe & Svedin 2013
2011	USA: Connecticut, Wisconsin, San Diego	Public school students in grades 9-12 in the jurisdiction	Youth Risk Behavior Survey	"Which of the following best describes you?" <sup>3</sup>	Not publicly available		
2013	USA: Arizona, Florida, Maryland, Michigan, New Hampshire, New Mexico, North Carolina, Baltimore, Charlotte-Mecklenberg, Detroit, Fort Lauderdale (FL), Memphis, Orange County (FL), Palm Beach County (FL)	Public school students in grades 9-12 in the jurisdiction	Youth Risk Behavior Survey	"Which of the following best describes you?" <sup>3</sup>	Not publicly available		
2015	USA: Arkansas, California, Indiana, Kentucky, Nevada, New Jersey, New York, Oklahoma, Pennsylvania, Wyoming, Cleveland (OH), DeKalb County (GA), Duval County (FL), Fort Worth (TX), Miami (FL), Oakland (CA), Philadelphia	Public school students in grades 9-12 in the jurisdiction	Youth Risk Behavior Survey	"Which of the following best describes you?" <sup>3</sup>	Median of 25 states: 87.4% Median of 19 districts: 86.0%	Median of 25 states: 2.7% gay or lesbian, 6.4% bisexual Median of 19 districts: 3.1% gay or lesbian, 6.5% bisexual	Kam <i>et al</i> 2016
2015	USA	Nationally representative sample of public and private school students in grades 9-12 in 4 <sup>th</sup> , 9 <sup>th</sup> grades	National Youth Risk Behavior Survey	"Which of the following best describes you?" <sup>3</sup>	88.80%	2.0% gay or lesbian 6.0% bisexual	Kam <i>et al</i> 2016
2017	Finland		School Health Promotion	"Which of the following best describes your sexual orientation at this moment?" <sup>12</sup>	Data not available as of May 2018		THL website accessed 2018

<sup>9</sup> Response options: "I am attracted to: "only boys," "mostly boys," "both boys and girls," "mostly girls," "only girls," "I cannot say"

<sup>10</sup> Response options: 100% heterosexual (attracted to persons of the opposite sex), Mostly heterosexual, Bisexual (equally attracted to men and women), Mostly homosexual (gay/lesbian", attracted to persons of the same sex), Not sure

<sup>11</sup> Response options: (Heterosexual or straight, Gay or Lesbian, Bisexual, Not Sure)

<sup>12</sup> Response options: Heterosexual—attracted to both sexes; Bisexual—attracted to both sexes; Homosexual (gay or lesbian)—attracted to same sex; Not Sure

<sup>6</sup> Response options: Heterosexual (attracted to/didn't care about persons of the opposite sex), Predominantly heterosexual, Bisexual (equally attracted to men and women), Predominantly homosexual, Homosexual (gay/lesbian", attracted to/didn't care about persons of the same sex), Not sure

<sup>7</sup> Response options: Completely heterosexual (attracted to persons of the opposite sex), Mostly heterosexual, Bisexual (equally attracted to men and women), Mostly homosexual, Completely homosexual (gay/lesbian, attracted to persons of the same sex), Not sure

<sup>8</sup> Response options for Baltimore 2007: Heterosexual (like the opposite sex), Gay or lesbian (like the same sex), Bisexual (like both sexes), Not sure, None of the above

<sup>9</sup> Response options: very often, often, frequently, sometimes, never

<sup>10</sup> Response options: 100% heterosexual, mostly heterosexual, bisexual, mostly homosexual, 100% homosexual, not sure, not attracted to either sex

<sup>11</sup> Response options: 'the opposite sex', 'the same sex', 'both sexes', 'not sure' or 'neither'

<sup>12</sup> Response options: Heterosexual, Homosexual (lesbian/gay), Bisexual, Unsure, None of these

<sup>13</sup> Response options: 'Straight', 'Bisexual', 'Gay', or 'None of the above'

### 2.3.2 School violence

Unlike sexual orientation, school violence is frequently measured in adolescent surveillance systems and is well-represented throughout the international literature.

#### *Peer victimization*

Although some researchers do not explicitly separate peer victimization and bullying, many monitoring systems include non-bullying measures for peer victimization at school. Importantly, students who are victimized at school but do not meet the criteria of being bullied are likely to have many of the same short- and long-term consequences as those who are bullied (Ybarra, Espelage, & Mitchell, 2014). WHO estimates that globally, 26% of countries that have conducted representative surveys also assessed youth violence (WHO 2014). A 2004 study used HBSC data to compare violence among U.S. adolescents to those in four other countries (Ireland, Israel, Portugal, and Sweden) and found that the prevalence of physical fighting (around 60%) was “remarkably similar across countries” (Smith-Khuri et al., 2004). Physical fighting was shown to have decreased among U.S. adolescents aged 12-19 years during 2002-2014 (Salas-Wright, Nelson, Vaughn, Reingle Gonzalez, & Córdova, 2017).

#### *Bullying*

A 2008 WHO report summarized global bullying estimates among 13-15 year old students in 66 countries, using data from HBSC and GSHS (Due, Holstein, & Soc, 2008). The estimates ranged from 7.1% (among both boys and girls in Tajikistan) to 67.1% among girls (in Zambia) and 70.2% among boys (in Zimbabwe), suggesting that the rate of bullying varies widely across countries but is nevertheless globally quite prevalent. This may be related to cultural differences in the definition and concept of bullying and because the term “bullying” does not always translate precisely into some other languages (Smorti, Menesini, & Smith, 2003).



### *Teen dating violence*

The international literature on teen dating violence is somewhat limited, however, Ulloa et al. describe the state of the research that has emerged from the International Dating Violence Study, “a consortium of researchers from 32 nations investigating perpetration and being a victim of dating violence among university students” (Straus, Hamby, Boney-McCoy, & Sugarman, 1996; Ulloa et al., 2013). These data are more than 20 years old, and the age group is older than that in the current study; with that in mind, the results indicate that the prevalence of teen dating violence victimization vary widely across countries (e.g., median prevalence of physical teen dating violence victimization: 26%, range: 14%-39%). Evidence is sparse for younger adolescents, but that which exists indicates that the prevalence similarly varies across country and type of teen dating violence victimization (Ulloa et al., 2013).

### *Demographic characteristics and school violence*

Although peer victimization, bullying, and teen dating violence are essentially universal and are prevalent across all countries and cultures, some demographic subgroups are at increased risk and/or experience these victimizations differently (Safran, 2008). For example, school violence experiences and roles may differ by sex. Male adolescents are more likely than their female peers to be involved in physical fighting and general antisocial behavior (Moffitt, Caspi, Rutter, & Silva, 2001; Wang, Iannotti, & Nansel, 2009), while female youth are more likely to perpetrate and experience social exclusion (Safran, 2008). However, some researchers have argued that the evidence is actually mixed (Espelage, Mebane, & Swearer, 2004). Moreover, there has been considerable debate about parity of teen dating violence victimization among male and female youth in the United States (Foshee, 1996; Hamby, 2014; Molidor & Tolman, 1998), although an analysis of the 2013 national YRBS indicated that female students have nearly double the risk of male students of teen dating violence victimization (Vagi, O'Malley Olsen, Basile, & Vivolo-Kantor, 2015). However, evidence also suggests that male and female adolescents perpetrate equally (Foshee, 1996; Ulloa et al., 2013).

The association between school violence and race/ethnicity is complex. A 2012 review article by Hong and Espelage suggests that demographic distribution and racial/ethnic dynamics within communities, schools, and classrooms is a better predictor of racial/ethnic peer victimization than race/ethnicity alone (Hong & Espelage, 2012). Bullying roles are weakly related to socioeconomic status, in that victims have higher odds of low SES and slightly lower odds of high SES compared to non-victims (Tippett & Wolke, 2014).

### 2.3.3 School violence among sexual minority adolescents

#### *Peer victimization and bullying*

Peer victimization and bullying in U.S. schools has been studied for decades, but the literature by sexual orientation is still emerging and only a limited amount of the research uses population-based data (Hatzenbuehler & Keyes, 2013; Kann et al., 2016). Previous studies had small sample sizes (Friedman, Koeske, Silvestre, Korr, & Sites, 2006; Williams, Connolly, Pepler, & Craig, 2005), were not inclusive of racial/ethnic minority students, or were conducted more than a decade ago (Berlan, Corliss, Field, Goodman, & Austin, 2010; Bontempo & D'Augelli, 2002). At the time Study I was prepared there were very few high-quality studies that assessed disparities in school violence and bullying by sexual identity. Kosciw's 2011 study of a large convenience sample of sexual minority students found that 82% were verbally harassed at school because of their sexual orientation, and more than 18% were physically assaulted (Kosciw, Greytak, Bartkiewicz, & Boesen, 2011). However, that study was not able to compare the sexual minority results to those of sexual non-minority students, and the data were not population-based or generalizable. In the few years since the publication of Study I, nationally-representative data on sexual orientation became available (Kann et al., 2016).

Despite the recent boom in peer victimization research among sexual minority youth, there have been almost no studies of trends. A recent report from the 2015 National School Climate Survey indicated that the physical harassment and the physical assault of LGBTQ students at school was at its lowest in 2015 since the

survey's inception in 1999 and were significantly lower than all prior years (Kosciw, Greytak, Giga, Villenas, & Danischewski, 2016).

### *Teen dating violence*

In 2015, 11.7% of female and 7.4% of male high school students experienced physical teen dating violence victimization and 15.6% of female and 5.4% of male high school students experienced sexual teen dating violence victimization (Kann et al., 2016). The literature on teen dating violence victimization among U.S. sexual minority youth is limited yet developing. Within the emerging literature, six studies have sought to understand the prevalence of teen dating violence victimization among sexual minority youth. However, these studies are limited by sample size, the generalizability of the sample, and/or the components of teen dating violence victimization measured. For example, three studies used data from convenience samples or small samples and did not compare heterosexual adolescents with sexual minority adolescents. Specifically, Freedner and colleagues analyzed data from a convenience sample of 521 youths aged 13 to 22 years attending a lesbian, gay, bisexual, and transgender rights rally during spring 2000 and concluded that sexual minority youth have rates of teen dating violence victimization similar to their heterosexual counterparts based on prevalence estimates from other studies (Freedner, Freed, Yang, & Austin, 2002). Halpern and colleagues used data from the 1996 Wave II of the National Longitudinal Study of Adolescent Health to assess the prevalence of partner violence among 117 adolescents aged 12 to 22 years who reported same-sex intimate relationships (Halpern, Young, Waller, Martin, & Kupper, 2004). This study indicated the prevalence of any partner violence victimization among sexual minority youth was 24% but did not compare it with the prevalence among heterosexual youth from the same sample. Hipwell and colleagues (2013) used data from a longitudinal sample of 1,647 urban females aged 17 years to compare sexual risk-taking and teen dating violence victimization by sexual minority status (Hipwell et al., 2013). Their findings demonstrated increased prevalence of teen dating violence victimization among sexual minority youth females compared with heterosexual females; however, the findings are limited in their generalizability.

Three more recent studies used large, school-based samples to examine teen dating violence victimization among sexual minority youth. Dank, Lachman, Zweig, and Yahner (2014) analyzed data from 5,647 seventh- to 12th-grade students in the Northeast and found that sexual minority youth had a higher prevalence of multiple forms of teen dating violence victimization compared with heterosexual students (Dank, Lachman, Zweig, & Yahner, 2014). Luo and colleagues analyzed Youth Risk Behavior Survey (YRBS) data from nine urban school districts that conducted surveys during 2001-2011 (Luo, Stone, & Tharp, 2014). This study assessed physical teen dating violence victimization and sexual minority status and concluded that sexual minority youth had higher rates of physical teen dating violence victimization than sexual non-minority youth. Martin-Storey (2015) used data pooled from Massachusetts YRBSs in 2003, 2005, 2007, and 2009, and had about 10,500 total respondents. The study assessed physical teen dating violence victimization and sexual minority status, stratified by sex, and, like the previous studies, found higher prevalence of teen dating violence victimization among sexual minority students compared with sexual non-minority students (Martin-Storey, 2015).

### 2.3.4 Global associations of school violence and sexual orientation

Studies of adolescent school violence and bullying by sexual orientation have been performed in many countries, including South Korea (D. Y. Lee, Kim, Woo, Yoon, & Choi, 2016), the Netherlands (Bos & Sandfort, 2015; Van Bergen, Bos, Van Lisdonk, Keuzenkamp, & Sandfort, 2013), New Zealand (Rossen et al., 2009) (Rossen et al. ) and Canada (Cénat et al., 2015), among others. Taken together these studies indicate that sexual minority youth face increased school violence globally when compared to their heterosexual counterparts. Using a sample of 518 students in grades 1, 2, and 3 in Amsterdam, Bos & Sandfort concluded that students with higher same-sex attraction experienced higher victimization and lower quality peer relationships (Bos & Sandfort, 2015). A report from the Youth '07 survey, which aimed to sample 10,000 adolescents in New Zealand, stated that same- and both-sex attracted students, when compared to opposite-sex attracted students, had higher prevalence of being afraid that someone would hurt them at school, missed school because of being afraid that someone would hurt them at school, having been bullied at school, and having been hit or physically harmed (Rossen et al., 2009). In Canada,

a school-based representative sample of 14-20 year-old high school students from Quebec showed that school bullying was significantly higher among gay or lesbian and bisexual students compared to heterosexual students (Cénat et al., 2015). The International Lesbian, Gay, Bisexual, Transgender, and Queer Youth and Student Organization (IGLYO) indicated that among 754 sexual and gender minority youth across 37 countries, 61.2% reported experiencing discrimination at school (Vella, Nowotnick, Selun, & van Roozendaal, 2009). This study was neither school-based nor representative; however, it points to the international work underway already in 2006. Lastly, Blais and colleagues reported high prevalence of teen dating violence among sexual minority youth in the Western world (Blais, Hébert, Gervais, & Bergeron, 2014).

## 2.4 Consequences of school violence

Among all adolescents, school victimization and bullying have been shown to have negative short- and long-term effects. Multiple studies have found that victims of peer victimization and bullying are more likely to feel unsafe at school (AERA, 2003), feel less connected to school (O'Brennan, Bradshaw, & Sawyer, 2009), perform poorly academically (Masten et al., 2005), and drop out of school (Sharp, 1995). At-school victimization has also been linked to school climate (Kasen S, Johnson JG, Chen H, et al., 2011), although the direction of the relationship is unknown, and it may be cyclical in nature where a pre-existing negative school climate leads to increases in victimization that reinforces the negative school climate. However, a positive school climate, defined as “individual perceptions that school was a good place to be, where students and teachers could be trusted, students were treated with respect, and rules were fair” (Guerra, Williams, & Sadek, 2011 [p. 307]), is negatively associated with bullying perpetration and victimization. Regardless, research suggests schools with shared beliefs and attitudes supporting bullying and aggression endorse a negative school climate in which these behaviors become the norm (Unnever & Cornell, 2003). Further, in schools where teachers endorse attitudes that are permissive or dismissive of bullying occurrence, victimization rates are high (Holt M, Keyes M, Koenig B., 2011), and a negative environment has been linked to increased risk for suicide attempts among sexual minority youth (Hatzenbuehler, 2011). The report from the 2015 National School Climate Survey

indicated that much of the school-based harassment of sexual and gender minority youth was coming from teachers rather than students (Kosciw et al., 2016).

In addition to educational disruptions, all youth may experience short- and long-term health problems because of peer victimization and bullying, including increased risk for suicide and other mental health problems (Friedman et al., 2006; Poteat, Mereish, Digiovanni, & Koenig, 2011; Russell, Ryan, Toomey, Diaz, & Sanchez, 2011), cigarette smoking, alcohol and other drug use, and unsafe sexual behaviors (Bontempo & D'Augelli, 2002; Cook, Williams, Guerra, Kim, & Sadek, 2010).

The correlates of teen dating violence victimization are consistent across international studies, although the prevalence estimates vary widely by country. Teen dating violence victimization is consistently associated with teen dating violence perpetration, with increased risks of sexual risk-taking behaviors, unplanned pregnancy, and mental health issues (Ulloa et al., 2013). Among North American adolescents, sexual minority youth have been found to be at increased risk for mental health issues (e.g., depression and suicide) (Marshall et al., 2011; Robinson & Espelage, 2011), alcohol abuse (Marshall, Burton, Chisolm, Sucato, & Friedman, 2013; Talley, Sher, & Littlefield, 2010), and illicit drug use (Corliss et al., 2010; Newcomb, Birkett, Corliss, & Mustanski, 2014), as well as sexual risk behaviors (Herrick, Marshall, Smith, Sucato, & Stall, 2011), which are all known risk factors for teen dating violence (Exner-Cortens, Eckenrode, & Rothman, 2013). Teens who experience teen dating violence victimization are also at risk for long-term negative health and behavioral outcomes, including suicide ideation and attempts, poor academic performance, and intimate partner violence (Foshee, Reyes, Gottfredson, Chang, & Ennett, 2013; T. A. Roberts, Klein, & Fisher, 2003).

The literature on sexual minority youth is emerging, and some studies suggest that the consequences of school violence may be more severe for non-heterosexual youth. At-school peer victimization may increase the risk for suicide and other mental health problems (Friedman et al., 2006; Russell et al., 2011) including depression and lowered self-esteem (Klomek et al., 2013; Kowalski & Limber, 2013), multiple other health-risk behaviors (Bogart et al., 2014; Cook et al., 2010), and poor academic performance (Kosciw, Palmer, Kull, & Greytak, 2013; Kowalski & Limber,

2013) among all adolescents, but particularly among sexual minority adolescents. These related risks are associated with long-term negative health and economic outcomes.

### 3 JUSTIFICATION OF RESEARCH

The effects of adolescent victimization on health, education, and long-term economic success of the victims are well-documented; bullying is widely accepted as a public health concern and many governments have taken action to surveil adolescents and schools and/or to implement prevention programs. Clark (2013) summarizes the mechanisms linking adolescent victimization to poor health and economic success as related to disrupted educational attainment in adolescence (Clark, 2013). Essentially, youth who are victimized at school then skip school or transfer, which impacts educational attainment. This projects forward into lower socioeconomic status in adulthood (Clark, 2013; Macmillan, 2001). Knowing that adolescents require a safe school environment to succeed, it is imperative to identify which students are at the greatest need for intervention and to quantify the extent of the problem. Few studies exist that examine school violence among sexual minority youth that are based on large, population-based, representative samples of adolescents.



## 4 AIMS OF THE PRESENT STUDY

The main purposes of this study were to determine the prevalence of school violence, including peer victimization, bullying, and teen dating violence victimization by sexual identity among U.S. students in grades 9-12, using population-based samples from the Youth Risk Behavior Surveillance System, and to assess associations of school violence and sexual identity among U.S. students in grades 9 through 12.

The specific research questions of the studies were as follows:

1. Is the prevalence of school-based peer victimization and bullying associated with sexual identity? (Study I)
2. What are the trends over time of school-based peer victimization and bullying by sexual identity, and are they the same for heterosexual compared to the LGB students? (Study II)
3. Are the prevalence and frequency of teen dating violence victimization (TDVV) associated with sexual identity? (Study III)

# 5 MATERIALS AND METHODS

## 5.1 The Youth Risk Behavior Surveillance System

The Youth Risk Behavior Surveillance System (YRBSS) currently comprises two components: the national Youth Risk Behavior Survey (YRBS) which is conducted by the United States Centers for Disease Control and Prevention (CDC); and state, large urban school district (i.e., “district”), tribal, and territorial YRBSSs that are conducted by the respective state, local, and territorial health and/or education agencies, or tribal governments. This study did not use territory or tribal YRBSSs. The detailed methodology of the YRBSS has been published in the report, Methodology of the Youth Risk Behavior Surveillance System – 2013 (Brener et al., 2013) and is described herein. The two components of the surveillance system are compared in Table 2, and the procedures are explained below.

**Table 2: Youth Risk Behavior Surveillance System Methodology by System Components**

Method	Youth Risk Behavior Surveillance System Component	
	National (Study III)	State or District (Studies I and II)
Conductor	CDC	State education or health agencies or large urban school districts
Sampling	Three-stage cluster sample <sup>1</sup>	Two-stage cluster sample <sup>2</sup>
Oversampling	Yes, for African-American/Black students	No
Questionnaire	National (standard <sup>3</sup> + 10 questions)	Standard <sup>3</sup> +/- additional questions <sup>4</sup>
Weighting	Adjusts for oversampling and non-response	Adjusts for non-response
Weighted N	Equal to the sample size of the survey	Equal to the jurisdiction size
Generalizability	Representative of students enrolled in public and private schools in grades 9 to 12 in all 50 states and the District of Columbia	Representative of students enrolled in public school in grades 9 to 12 in the jurisdiction
Data availability	Available from cdc.gov website	Depends on the site (see Table 3)

<sup>1</sup>National: Stage I consists of primary sampling units comprised of counties or groups of contiguous counties; Stage II consists of schools that are selected within PSUs; Stage III is entire classes within each school.

<sup>2</sup>State and large urban school districts: Stage I consists of schools, Stage II consists of entire classes within each school

<sup>3</sup>The standard questionnaire is developed by CDC each cycle that sites can use with or without modifications. It is 89 questions. The questions may change from one cycle to the next.

<sup>4</sup>Sites may remove and/or add additional questions to the standard questionnaire in order to meet their needs.

### 5.1.1 Sampling and weighting

The Youth Risk Behavior Surveillance System uses multistage sampling to obtain representative samples of students in grades 9-12 in each jurisdiction. The sampling and weighting design was published by Brener et al. (2013).

The national YRBS (Study III) employs a three-stage cluster sample design to obtain nationally-representative estimates of students in grades 9-12. The target population for the national YRBS is youth enrolled in public and private schools in all 50 states and the District of Columbia. All stages are sampled without replacement. The first stage sampling frame for each national YRBS includes primary sampling units (PSUs) that consist of large-sized counties or multiple smaller, contiguous counties that are grouped. The PSUs are then selected with probability proportional to size from 16 strata that are categorized by Metropolitan Statistical Area (MSA) status (i.e., geographical areas with population of 500,000 or greater) and the percentage of students who have black or Hispanic race/ethnicity. If the MSA is one of the 64 largest MSAs in the U.S. then the stratum is labelled urban, otherwise the stratum is labelled rural. The second stage consists of sampling schools from within each PSU. Before sampling, schools are categorized by enrollment size as either large or small and schools are selected from each of the categories with probability proportional to enrollment size. The third stage consists of one or two entire classes from each of grades 9-12 that are randomly selected within each school. For the 2015 national YRBS CDC used one strategy to ensure oversampling of black and Hispanic students, which was to select two classes per grade rather than one class per grade selected in schools with high proportion of non-white students. All students in the selected classes are eligible to complete the survey (Brener et al., 2013).

A sampling weight based on student sex, race/ethnicity, and school grade is applied to each record to account for non-response and the oversampling of black and Hispanic students. The final overall weights are scaled such that “the weight equals the total sample size and the weighted proportions of students in each grade match national population projections for each survey year” (Brener et al., 2013). This is a notable difference from the weights assigned to the state and district YRBSs.

State and district YRBSs (Studies I and II) employ a two-stage cluster sample design to obtain representative samples of public school students enrolled in grades 9-12 in its jurisdiction. The samples are selected using a proprietary software, PCSample. The first stage is schools sampled with probability proportional to size. The second stage consists of randomly sampled intact classes of a subject (e.g., English or homeroom) or a class period (e.g., fourth period). Oversampling is not implemented for state and district YRBSs. As with the national YRBS, all students in a sampled class are eligible to participate (Brener et al., 2013).

Those surveys that have sampled according to this protocol, include proper documentation, and have an overall participation rate greater than or equal to 60% are weighted. The weight is applied to each record to adjust for student nonresponse and the distribution of sex, race/ethnicity, and grade in each jurisdiction. Weighted estimates are therefore representative of all students in grades 9-12 in the jurisdiction and are scaled to the size of the target population in the jurisdiction (Brener et al., 2013). All surveys included in the thesis had weighted data.

### 5.1.2 Survey

There are two YRBS questionnaires: the standard YRBS and the national YRBS. The standard questionnaire is the starting point for local questionnaires. It typically contains 89 questions and is then modified by each site to meet their jurisdiction's needs. The survey can have up to 99 questions, and a list of optional questions is made available to sites. In 2015 only four sites used the standard questionnaire without modification. The ability of sites to add or remove questions allowed sexual orientation measures to appear on the Massachusetts, Boston, and Seattle questionnaires as early as 1995. The national questionnaire is the standard questionnaire plus ten additional questions, which may change from one cycle to the next. Sexual orientation measures first appeared on the standard and the national questionnaires in 2015.

### 5.1.3 Survey implementation

For all YRBSs, the survey is completed during a single class period using pencil and paper on a computer-scannable answer sheet or in a computer-scannable booklet. Participation in the surveys was anonymous and voluntary, and local parental consent procedures were followed. Data from all sites were edited, cleaned, and weighted using a standardized process; this included editing and cleaning for logical inconsistencies and out-of-range responses (Brener et al., 2013).

### 5.1.4 Parental consent

The parental permission procedures are described in the report, *Methodology of the Youth Risk Behavior Surveillance System – 2013* (Brener et al., 2013). Prior to administering any YRBS in any school, local procedures for obtaining parental permission are followed. Parental permission varies by jurisdiction; certain schools use active permission, meaning that parents must send back to the school a signed form indicating their approval before their child can participate. Conversely, some schools use passive permission, meaning that parents send back a signed form only if they do not want their child to participate in the survey. As of 2017, the majority of participating jurisdictions use passive procedures, but not all. For example, in the 2011 state and large urban school district surveys, four (9%) of 47 participating states (Alaska, Hawaii, New Jersey, and Utah) used statewide active permission procedures, and two (9%) of 22 large urban school districts (Dallas and San Bernardino) used district-wide active permission. Some schools within other sites also used active permission. The national YRBS must also follow whichever parental consent procedures are in place at each participating school. In the 2011 national YRBS, 10% of schools used active permission, and 90% used passive permission. Although local parental permission procedures are not consistent across school-based survey sites, CDC demonstrated in a 2004 study that the type of parental permission typically does not affect prevalence estimates as long as student response rates remain high (Eaton, Lowry, Brener, Grunbaum, & Kann, 2004).

### 5.1.5 Anonymity and confidentiality

Confidentiality and anonymity are imperative strengths of the YRBSS. The survey procedures employ the following tactics to ensure anonymity and confidentiality for all participants. First, as students complete their answer booklet/form, they are provided paper to cover the rest of the answer sheet. Second, the survey employs no skip patterns, thus allowing all students to complete the survey in about the same amount of time. Third, as much as possible, desks are arranged to maximize privacy for each student, for example, by moving desks away from each other and turning some at angles. Fourth, the questionnaire includes a statement ensuring that the surveys are anonymous. Fifth, for students taking the national survey, they place their answer sheet in an unmarked envelope and seal it before turning it in to the proctor or survey administrator. Finally, there is no student identifier of any type included on the surveys, answer sheets, or envelopes (Brener et al., 2013).

### 5.1.6 Human subjects review

The Institutional Review Board (IRB) at CDC reviewed and approved the national YRBS. State and district YRBS sites follow local IRB procedures. In many cases, behavioral surveillance is not considered research and may be registered with the IRB without receiving full human subjects review.

### 5.1.7 Data availability

The national YRBS data are made publicly available in the summer following the survey fielding year; for example, the 2015 national data was posted on the [www.cdc.gov/yrbs](http://www.cdc.gov/yrbs) website in June 2016. Local YRBS data are posted at the discretion of the jurisdiction. Many sites grant “blanket permission” to the CDC to post their data online; these data are standardized and aligned with the other sites. Some sites do not allow blanket permission and require researchers to follow specific processes to request the data. The processes vary across the sites. The blanket permission (and therefore, public access/data availability) of 2015 YRBS data for sites that included the standard sexual identity question is shown in Table 2.

## 5.2 Analytic data sets

Study I was based on two data sets: one created by combining YRBS data from 10 states (Connecticut, Delaware, Hawaii, Illinois, Maine, Massachusetts, North Dakota, Rhode Island, Vermont, and Wisconsin) and the other created by combining data from 10 districts (Boston, Chicago, District of Columbia, Houston, Los Angeles, Milwaukee, New York City, San Diego, San Francisco, and Seattle). Each of these states and districts included a question on sexual identity in their YRBS questionnaire and had weighted data in the 2009 and/or 2011 cycle. Note that some of the districts are within listed states; however, the districts and states have their own separate YRBS. The creation of these two data sets was done out of an abundance of caution to avoid potential overlap in populations (e.g., Chicago and Illinois). Additionally, the district samples include only urban students, while the state samples include both urban and rural students, so a single combined data set may yield biased results towards the urban students. All surveys were conducted during the spring of 2009 and/or 2011 except in Chicago (fall of 2010), the District of Columbia (fall of 2010), and Seattle (fall of 2008 and 2010).

The following sites had data from both years (i.e., 2009 and 2011) included in the combined state data set: Delaware, Illinois, Maine, Massachusetts, North Dakota, Rhode Island, and Vermont. The following district sites had data from both years: Boston, Chicago (2009 and 2010), Los Angeles, New York City, San Francisco, and Seattle (2008 and 2010). For these sites only, each student sampling weight was divided by two such that these cities contributed the average overall weight to the combined data sets. In this case, data from these listed sites represented the average population of students in the respective jurisdictions during 2009-2011 (or 2009-2010 for Chicago and 2008-2010 for Seattle). This procedure follows the official YRBS methods guidance (CDC, 2016b).

Study II analyzed data from 11 cycles of Massachusetts YRBSs, including: 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, and 2015. The data were combined into one large data set in order to carry out the trend analyses; however, because the data were analyzed by year, it was not necessary to adjust the student-level sampling weights (CDC, 2016b).

Study III used data from the 2015 national YRBS, which was the first national YRBS to include a survey question ascertaining sexual identity. Finally, the data comparability analysis analyzed data from 2015 national, state, and district YRBSs that assessed sexual identity and included at least one of the five school violence questions and/or both teen dating violence victimization questions. In 2015, YRBS's from 25 states and 19 districts included sexual identity, all of these sites asked at least one of the school violence questions. All sites were taken from the pooled YRBS data set available on the CDC's YRBS website and combined with the national data set. Afterwards, data from sites without blanket permission were also standardized and combined. A categorical variable was created to indicate blanket permission status in mutually-exclusive categories: national, state publicly available (referred to as "PA"), state request-only (referred to as "RO"), district publicly available, and district request only. It is important to note that sites without blanket permission usually grant public-access to their data upon request, however, the difficulty of the process and timeliness varies by site and impacts whether these data are included in research analyses. Of the 25 states, 20 granted blanket permission; however, among the 19 districts, only 6 granted blanket permission (CDC, 2016a) (Tables 3a and 3b). For this analysis, all sites are combined and analyzed by public-availability category, i.e., no state or district YRBS data are individually presented or summarized.



**Table 3a: Blanket permission and related violence measures from state 2015 Youth Risk Behavior Surveys with weighted data and sexual identity**

Site Name	Blanket permission?	Data availability category <sup>1</sup>	Physical fighting on school property	Being threatened or injured with a weapon on school property	Weapon carrying on school property	Not going to school because of safety concerns	Being bullied on school property	Physical teen dating violence victimization	Sexual teen dating violence victimization
Arizona	Yes	PA	x	x	x	x	NO	NO	NO
Arkansas	Yes	PA	x	x	x	X	x	x	x
California	Yes	PA	x	x	x	x	x	x	x
Connecticut	Yes	PA	NO	x	x	x	x	x	x
Delaware	Yes	PA	x	x	X	x	x	x	x
Florida	Yes	PA	x	x	NO	x	x	x	x
Hawaii	No	RO	NO	NO	NO	x	x	x	x
Illinois	Yes	PA	x	x	x	x	x	x	x
Indiana	No	RO	x	x	x	x	x	x	x
Kentucky	Yes	PA	x	x	x	x	x	x	x
Maine	Yes	PA	x	x	x	x	x	x	NO
Maryland	Yes	PA	x	x	x	x	x	x	x
Massachusetts	No	RO	x	x	x	x	x	x	x
Michigan	Yes	PA	x	x	x	x	x	x	x
Nevada	Yes	PA	x	x	x	x	x	x	x
New Mexico	No	RO	x	NO	x	x	x	x	x
New York	Yes	PA	NO	x	x	x	x	x	x
North Carolina	Yes	PA	x	x	x	x	x	x	x
North Dakota	Yes	PA	x	NO	x	NO	x	x	NO
Oklahoma	Yes	PA	x	x	x	x	x	x	x
Pennsylvania	Yes	PA	x	x	x	x	x	x	x
Rhode Island	Yes	PA	x	NO	x	x	x	x	x
Vermont	No	RO	x	x	x	x	NO	x	NO
West Virginia	Yes	PA	x	x	x	x	x	x	x
Wyoming	Yes	PA	x	x	x	x	x	x	x

<sup>1</sup> PA= Publicly available; RO= Request only

**Table 3b: Blanket permission and related violence measures from large urban school district 2015 Youth Risk Behavior Surveys with weighted data and sexual identity**

Site Name	Blanket permission?	Data availability category <sup>1</sup>	Physical fighting on school property	Being threatened or injured with a weapon on school property	Weapon carrying on school property	Not going to school because of safety concerns	Being bullied on school property	Physical teen dating violence victimization	Sexual teen dating violence victimization
Baltimore, MD	No	RO	x	x	x	x	x	x	x
Boston, MA	No	RO	x	x	x	x	x	x	x
Cleveland, OH	No	RO	NO	NO	NO	x	x	x	x
Dekalb County, GA	No	RO	NO	x	x	x	x	x	x
Detroit, MI	No	RO	x	x	x	x	x	x	x
District of Columbia	No	RO	x	x	NO	x	x	x	x
Duval County, FL	Yes	PA	x	x	x	x	x	x	x
Fort Worth, TX	No	RO	x	x	x	x	x	x	x
Broward County, FL	Yes	PA	x	x	x	x	x	x	x
Houston, TX	No	RO	x	x	x	x	x	x	x
Los Angeles, CA	No	RO	x	x	x	x	x	x	x
Miami-Dade County, FL	Yes	PA	x	x	x	x	x	x	x
New York City, NY	Yes	PA	NO	x	x	x	x	x	x
Oakland, CA	No	RO	x	x	x	x	x	x	x
Orange County, FL	Yes	PA	x	x	x	x	x	x	x
Palm Beach County, FL	No	RO	x	x	x	x	x	x	x
Philadelphia, PA	No	RO	x	x	x	x	x	x	x
San Diego, CA	Yes	PA	x	x	x	x	x	x	x
San Francisco, CA	No	RO	x	x	x	NO	x	x	x

<sup>1</sup> PA= Publicly available; RO= Request only

## 5.3 Measures

### 5.3.1 Sexual identity

The sexual identity survey question was similar for all studies, with a few minor variations. The most common question wording for assessing sexual identity was, “Which of the following best describes you?” with the response options “heterosexual (straight),” “gay or lesbian,” “bisexual,” and “not sure.” This is the exact wording and response option for the national YRBS used in Study III.

In Study I and Study II, almost every site used the aforementioned survey question, although some sites slightly varied the punctuation of the response options (e.g., “heterosexual, straight” instead of “heterosexual [straight]”). Washington, D.C., in 2009, assessed sexual identity using the same question, but with the response options “Heterosexual (straight),” “gay,” “lesbian,” “bisexual,” and “not sure.” In this case, “gay” and “lesbian” were combined for analysis to be consistent with the other sites.

Gay or lesbian and bisexual students are reported separately in Study I. However, in Studies II and III, to obtain a sufficient sample size for analysis by sexual identity, students who responded “gay or lesbian” or “bisexual” were combined into “lesbian, gay, or bisexual” and are referred to as LGB students.

### 5.3.2 Race/ethnicity

The standard YRBS questionnaire uses two questions to separately assess race and ethnicity (Kann et al., 2016). The first question is, “Are you Hispanic or Latino?” with response options “yes” and “no.” The second question is “What is your race?” with response options “American Indian or Alaska Native,” “Asian,” “black or African American,” “Native Hawaiian or other Pacific Islander,” and “white.” Students could select multiple response options for the second question. Students who selected “yes” to the first question were categorized as Hispanic or Latino regardless of their response to the second question. Race/ethnicity was considered missing for students who did not respond to the first question and for students who answered “no” to the first question and who did not respond to the second question. This analysis uses a three-level race/ethnicity classification: white, non-Hispanic (referred to as “white”); African American or black, non-Hispanic (referred to as “black”); Hispanic or Latino (referred to as “Hispanic”). The numbers of students from other racial/ethnic groups were too small for meaningful analysis; these students are included in the analyses, but their results are not shown separately.

### 5.3.3 School violence measures

Four items were used to measure peer victimization (i.e., physical fighting on school property, being threatened or injured with a weapon on school property, weapon carrying on school property, and not going to school because of safety concerns) and one item assessed bullying on school property (Table 4).

Physical fighting on school property and being threatened or injured with a weapon on school property were measured in number of “times” and the recall period was the 12 months before the survey. For this analysis, responses to each of these two questions were collapsed into dichotomous responses as “0 times” or “1 or more times.”

Carrying a weapon on school property and not going to school because of safety concerns were measured in number of days and the recall period was the 30 days before the survey. For this analysis, responses to each of these two questions were collapsed into dichotomous responses as “0 days” or “1 or more days.”

Immediately preceding the bullying survey question, a definition of bullying was supplied. It read, “*Bullying is when 1 or more students tease, threaten, spread rumors about, hit, shove, or hurt another student over and over again. It is not bullying when 2 students of about the same strength or power argue or fight or tease each other in a friendly way.*” Being bullied on school property had a dichotomous yes/no response and the recall period was the 12 months before the survey.

Of the five peer victimization and bullying items, only three clearly measure victimization: being threatened or injured with a weapon on school property, not going to school because of safety concerns, and being bullied on school property. The remaining two items are ambiguous with respect to victimization, perpetration, or both.

**Table 4. School violence measures in the current thesis**

Violence measure	Survey Item	Response options	Analysis Categories	Study			DCA <sup>1</sup>
				I	II	III	
Physical fighting on school property	During the past 12 months, how many times were you in a physical fight on school property?	"0 times," "1 time," "2 or 3 times," "4 or 5 times," "6 or 7 times," "8 or 9 times," "10 or 11 times," or "12 or more times."	dichotomous responses as "0 times" or "1 or more times."	x			x
Being threatened or injured with a weapon on school property	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 times," "1 time," "2 or 3 times," "4 or 5 times," "6 or 7 times," "8 or 9 times," "10 or 11 times," or "12 or more times."	dichotomous responses as "0 times" or "1 or more times."	x	x		x
Weapon carrying on school property	During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?	"0 days," "1 day," "2 or 3 days," "4 or 5 days," and "6 or more days."	"0 days" or "1 or more days."	x			x
Not going to school because of safety concerns	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 days," "1 day," "2 or 3 days," "4 or 5 days," and "6 or more days."	"0 days" or "1 or more days."	x	x		x
Being bullied on school property	During the past 12 months, have you ever been bullied on school property?	"yes" or "no."	"yes" or "no."	x	x		x
Physical teen dating violence victimization: frequency	During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon). <sup>a</sup>	"I did not date or go out with anyone during the past 12 months," "0 times," "1 time," "2 or 3 times," "4 or 5 times," and "6 or more times."	Continuous: 0, 1, 2, 5, 4, 5, or 6, 5.			x	x
Physical teen dating violence victimization: prevalence	During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon). <sup>a</sup>	"I did not date or go out with anyone during the past 12 months," "0 times," "1 time," "2 or 3 times," "4 or 5 times," and "6 or more times."	Dichotomous responses as "0 times" or "1 or more times."			x	x
Sexual teen dating violence victimization: frequency	During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon). <sup>a</sup>	"I did not date or go out with anyone during the past 12 months," "0 times," "1 time," "2 or 3 times," "4 or 5 times," and "6 or more times."	Continuous: 0, 1, 2, 5, 4, 5, or 6, 5.			x	x
Sexual teen dating violence victimization: prevalence	During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon). <sup>a</sup>	"I did not date or go out with anyone during the past 12 months," "0 times," "1 time," "2 or 3 times," "4 or 5 times," and "6 or more times."	Dichotomous responses as "0 times" or "1 or more times."			x	x
Teen dating violence victimization	Combined analysis variables of prevalence for physical and sexual teen dating violence victimization		Four-level categorical variable: "Physical TDVV only," "Sexual TDVV only," "Both physical and sexual TDVV," and "No TDVV"				x
Any teen dating violence victimization			Dichotomous responses as "No TDVV" or "Any TDVV"				x

<sup>1</sup> DCA: Data comparability analysis

Teen dating violence victimization (TDVV) was assessed using two questions, one to measure physical TDVV and one to measure sexual TDVV (Table 4). TDVV was measured in “times” and the recall period was 12 months. Examples of physical and sexual TDVV were included in the question wording, as was the parameter “someone you were dating or going out with”. The TDVV questions were treated as discrete frequency variables and also as dichotomous. The two questions were also combined to compute the individual and combined components of TDVV, that is, to create a four-category combined TDVV measure: “physical TDVV only,” “sexual TDVV only,” “both physical and sexual TDVV,” and “none.” As such, reporting  $\geq 1$  time for physical TDVV and 0 times for sexual TDVV was classified as “physical TDVV only,” reporting 0 times for physical TDVV and  $\geq 1$  time for sexual TDVV was classified as “sexual TDVV only,” reporting  $\geq 1$  time for physical TDVV and  $\geq 1$  time for sexual TDVV was classified as “both physical and sexual TDVV,” and reporting 0 times for physical TDVV and 0 times for sexual TDVV was classified as “none.” A dichotomous variable also was created to indicate any TDVV (i.e., reporting  $\geq 1$  time for either physical and/or sexual TDVV) and none (referred to as “any” TDV). Students who did not date during the past 12 months were excluded from the analyses.

## 5.4 Statistical analysis

Because of the multi-stage cluster sample designs, it was not appropriate to analyze the data with traditional methods that assume a simple random sample. Therefore, we conducted all analyses in SUDAAN version 11.0.1 (Research Triangle Institute, NC, USA) to account for the complex sample design and sampling weights. All variance estimations are calculated using Taylor Series Linearization Models (RTI International, 2012). All point estimates reported herein reflect weighted estimates, although unweighted Ns are reported rather than weighted Ns. The significance level for all analyses was 5% and was not adjusted for multiple comparisons.

### *Descriptive analyses*

All prevalence estimates herein reflect the sampling weights and are reported with 95% confidence intervals. We used the CROSSTAB procedure within SUDAAN to generate Rao-Scott confidence intervals, which are often asymmetrical. Bivariate associations were assessed for significance using overall chi-squared tests. Pairwise differences in prevalence were calculated using the pairwise option in SUDAAN's PROC DESCRIPT, which uses t-tests. T-tests and chi-squared tests give identical results for prevalence data including that in the current study.

In Study II, t-tests were used to compare prevalence of the peer victimization and bullying outcomes between heterosexual and LGB students at the starting point (1995 for peer victimization and 2009 for bullying) and again at the ending point (2015).

### *Multivariable analyses*

Studies I, II, and III used multiple logistic regression as the primary modeling method. Additional syntax within SUDAAN software were included in order to generate predicted marginals, which were then used to calculate adjusted prevalence ratios (APRs) and corresponding 95% confidence intervals (Bieler, Brown, Williams, & Brogan, 2010). Because of the cross-sectional study design and the underlying prevalence of the school violence measures, prevalence ratios are a more appropriate measure of relative effect than odds ratios. Heterosexual sexual identity was the reference group for all adjusted effect measures.

Study I stratified all analyses by sex because male and female adolescents may experience school violence and bullying differently (Gorman-Smith & Vivolo, 2012). Statistical interaction testing did not indicate a need to stratify by race/ethnicity. Multiple logistic regression was used to separately model each school violence and bullying outcome variable on categorical race/ethnicity, grade, and sexual identity variables. Results from the multivariable analyses are reported as APRs with 95% confidence intervals. The reference group for all APRs was heterosexual students. Finally, in order to test whether the type of data (i.e., state YRBS compared to district YRBS data) was associated with the peer victimization

and bullying outcomes, interactions between the two datasets and sexual identity were tested for each peer victimization and bullying variable.

In Study II trend analysis used logistic regression to separately model secular trends in each school violence measure. The models were not stratified by sex due to an anticipated lack of power based on the limited sample sizes. However, the models were stratified for sexual identity. All models were defined such that the school violence measure (dichotomous) was the outcome variable, the independent variables were sex and race/ethnicity, the exposure variable was time. Continuous linear and quadratic time variables were coded using orthogonal coefficients. A significant (i.e.,  $p < 0.05$ ) linear time component with its parameter estimate (i.e.,  $\beta$ ) less than 0 was considered a linear decrease; similarly, a significant linear time component with parameter estimate greater than 0 was considered a linear increase.

Significant quadratic time components indicate a non-linear trend in prevalence of the outcome. If a significant quadratic trend was detected, the predicted marginals and corresponding standard errors for each year were entered into Joinpoint software (Statistical Methodology and Applications Branch, Surveillance Research Program, National Cancer Institute, 2018) and evaluated for a joinpoint (also called a break-point). The additional parameters required that at least three time points were needed for each line, and there had to be at least six time points available to guarantee more than one option for the joinpoint. For example, a model with five time points (e.g., 2007, 2009, 2011, 2013, and 2015) allows for one line with three time points (2007, 2009, and 2011), a joinpoint at 2011, and a second line with three time points (2011, 2013, and 2015). In this scenario, 2011 is the only possible joinpoint. Therefore, at least six time points must be available in order to assess for a quadratic time component. Because the bullying measure was only assessed in four YRBS cycles, we did not test for quadratic time components in this model only.

After determining the joinpoint, linear trends were assessed for all time points up to and including the joinpoint, then separately for all time points including and following the joinpoint. These trend analysis methods are described at length on the YRBS website (CDC, 2016c). Finally, the slope (i.e.,  $\beta$ ) of the linear time components was assessed for interaction to determine whether the magnitude of the



trend in school violence varied statistically among LGB and heterosexual students. An interaction term significant at the alpha level indicated that the prevalence trend was unequal between the subgroups.

In Study III logistic regression models assessed the association between TDVV and sexual identity, controlling for sex, race/ethnicity, and grade. These associations are reported as adjusted prevalence ratios (APRs) with 95% confidence intervals (CI) (Bieler et al., 2010); the reference levels were varied to show adjusted pairwise comparisons across each type of sexual identity.

Finally, in the data comparability analysis, the number of analyses of YRBSS sexual orientation data in the literature increased substantially and rapidly in just five years; however, not all researchers obtain the same number or list of available data sets. The data comparability analysis was performed in order to test whether the association between sexual identity and peer victimization is the same by YRBS data type (national, state publicly available, state request only, district publicly available, district request only). For each of the school violence study variables listed in Table 4, prevalence among heterosexual students, prevalence among LGB students, and prevalence among not sure students were shown for each of the five data types. Additionally, within each data type, each of the seven violence measures (as described in Table 4) were modeled using logistic regression and the primary predictor variable as three-level sexual identity (i.e., heterosexual, LGB, and not sure students) controlled for race/ethnicity, sex, and grade. The adjusted prevalence ratios were calculated with heterosexual students as the referent category. Significance was assessed by whether the 95% confidence interval on the APR excluded 1.0. All calculations were performed in SUDAAN version 11 and were graphed using R version 3.4.3 (R Core Team, 2013) package ggplot2 (Wickham, 2009).

## 6 SUMMARY OF THE RESULTS

### 6.1 Peer victimization and bullying by sexual identity

The overall response rates for the surveys in the state data set ranged from 60% to 84% (median: 68%), and the overall response rates for the surveys in the district data set ranged from 67% to 88% (median: 78%). The state data set had a combined sample size of 74,581 students. Among these students, 71,950 (96.5%) responded to the sexual identity question. The district data set had a combined sample size of 47,724 students. Among these students, 44,199 (92.6%) responded to the sexual identity question.

The two data sets had very similar demographic distributions by sex but very different distributions by race/ethnicity (Table 5). In the state data set, 66.4% of the students were white compared with 12.5% of the students in the district data set. In the state data set, 94.0% of the male students were heterosexual, 1.8% were gay, 2.1% were bisexual, and 2.1% were unsure, and 89.4% of the female students were heterosexual, 1.3% were lesbian, 6.5% were bisexual, and 2.8% were unsure. Similarly, in the district data set, 91.7% of the male students were heterosexual, 2.7% were gay, 2.7% were bisexual, and 3.0% were unsure, and 84.6% of the female students were heterosexual, 2.0% were lesbian, 9.3% were bisexual, and 4.1% were unsure (Table 5).

Table 5. Sexual identity by demographic subgroup among high school students -- selected sites, Youth Risk Behavior Surveys, 2009-2011

Data Set	Subgroup	N	All Students			Heterosexual			Gay or Lesbian			Bisexual			Not Sure		
			%	CI <sup>1</sup>	%	CI	%	CI	%	CI	%	CI	%	CI			
States <sup>2</sup>	All	71950			91.6	91.1-92.1	1.6	1.4-1.8	4.3	4.0-4.7	2.5	2.2-2.7					
	Male	35187	50.6	49.2-52.0	94	93.4-94.6	1.8	1.6-2.1	2.1	1.8-2.4	2.1	1.8-2.5					
	Female	36057	49.4	48.0-50.8	89.4	88.5-90.2	1.3	1.1-1.6	6.5	5.9-7.2	2.8	2.4-3.2					
	White <sup>3</sup>	47105	66.4	63.6-69.0	92.9	92.3-93.5	1.3	1.1-1.6	3.6	3.2-4.0	2.2	1.8-2.5					
	Black <sup>3</sup>	5263	12.3	10.4-14.5	90.3	88.8-91.6	1.6	1.2-2.3	5.4	4.4-6.7	2.6	2.0-3.5					
	Hispanic	7920	13.2	11.6-15.0	88.5	87.2-89.7	2.5	2.0-3.1	6	5.2-6.9	3	2.4-3.7					
Districts <sup>4</sup>	All	44199			88	87.5-88.5	2.4	2.1-2.6	6.1	5.7-6.4	3.6	3.3-3.9					
	Male	20851	49.2	48.0-50.4	91.7	91.0-92.3	2.7	2.4-3.0	2.7	2.3-3.0	3	2.6-3.4					
	Female	23207	50.8	49.6-52.0	84.6	83.8-85.4	2	1.7-2.2	9.3	8.7-10.0	4.1	3.8-4.5					
	White <sup>3</sup>	5564	12.5	11.2-13.8	90.6	89.4-91.7	1.7	1.3-2.2	4.3	3.6-5.1	3.4	2.7-4.1					
	Black <sup>3</sup>	10746	29.5	27.2-31.8	87.8	86.7-88.7	2.8	2.4-3.3	6	5.3-6.8	3.4	3.0-4.0					
	Hispanic	17241	45	42.7-47.4	87.1	86.4-87.8	2.3	2.0-2.7	7.2	6.7-7.8	3.4	3.0-3.8					

<sup>1</sup> CI: 95% confidence interval.

<sup>2</sup> Combined data set includes data from the following Youth Risk Behavior Surveys: Connecticut 2011, Delaware 2009, Delaware 2011, Hawaii 2011, Illinois 2009, Illinois 2011, Maine 2009, Maine 2011, Massachusetts 2009, Massachusetts 2011, North Dakota 2009, North Dakota 2011, Rhode Island 2009, Rhode Island 2011, Vermont 2009, Vermont 2011, Wisconsin 2011.

<sup>3</sup> Non-Hispanic.

<sup>4</sup> Combined data set includes data from the following Youth Risk Behavior Surveys: Boston, MA 2009; Boston, MA 2011; Chicago, IL 2009, Chicago, IL 2010; Washington, DC 2010; Houston, TX 2011; Los Angeles, CA 2009; Los Angeles, CA 2011; Milwaukee, WI 2011; New York City, NY 2009; New York City, NY 2011; San Diego, CA 2011; San Francisco, CA 2009; San Francisco, CA 2011; Seattle, WA 2008; Seattle, WA 2010.

Sex-stratified prevalence estimates, 95% confidence intervals, and chi-squared  $p$ -values of peer victimization and bullying measures by sexual identity are presented in Table 6. All school violence measures were strongly associated with sexual identity for male and female students in both data sets; all Chi-squared tests of association yielded  $p$ -values less than 0.001. Among both data sets, generally male students across all sexual identities had at least equal, if not significantly higher, prevalence rates for all behaviors compared with female students. There was no consistent pattern to indicate that peer victimization or bullying were more prevalent in the state or district data sets. Being bullied on school property was the most prevalent school violence measure in the state data set (for both male and female students of all sexual identities). In the district data set, the prevalence of being bullied on school property was not greater than other peer victimization measures for male and female students across all sexual identities.

**Table 6: Prevalence of peer victimization and bullying by sexual identity among high school students and tests of bivariate association, by sex -- selected sites, Youth Risk Behavior Surveys, 2009-2011**

Data Set	Behavior	Sex	Sexual Identity						P <sup>2</sup>
			Heterosexual		Gay or Lesbian		Bisexual		
			%	CI <sup>1</sup>	%	CI	%	CI	
States <sup>3</sup>	In a physical fight on school property <sup>4</sup>	Male	11.3	10.5-12.1	12.7	9.0-17.8	26.1	20.4-32.8	*
		Female	5.2	4.7-5.9	16.9	11.7-23.9	13.2	9.9-17.4	**
	Threatened or injured with a weapon <sup>5</sup> on school property <sup>4</sup>	Male	7.8	7.2-8.5	24.8	17.9-33.3	23.1	17.6-29.6	**
		Female	4.0	3.5-4.6	16.2	10.6-23.9	10.7	8.0-14.0	**
	Carried a weapon <sup>5</sup> on school property <sup>6</sup>	Male	6.1	5.4-6.8	8.7	5.7-13.0	15.5	11.0-21.4	*
		Female	1.5	1.2-1.9	10.9	6.7-17.5	8.9	6.6-12.0	**
	Did not go to school because of safety concerns <sup>6</sup>	Male	4.2	3.7-4.8	13.0	8.6-19.1	13.6	9.7-18.6	**
		Female	4.5	3.9-5.1	16.2	10.7-23.7	9.2	6.6-12.6	**
	Bullied on school property <sup>7</sup>	Male	18.3	17.1-19.7	43.1	34.9-51.8	35.2	28.8-42.1	**
		Female	19.9	18.7-21.2	29.5	21.4-39.1	35.3	31.1-39.7	**
Districts <sup>8</sup>	In a physical fight on school property <sup>4</sup>	Male	16.3	15.3-17.3	24.7	18.4-32.2	33.6	26.4-41.7	**
		Female	8.9	8.2-9.8	16.4	12.0-22.1	17.5	14.6-21.0	**
	Threatened or injured with a weapon <sup>5</sup> on school property <sup>4</sup>	Male	9.0	8.3-9.8	25.0	20.2-30.6	25.8	20.3-32.1	**
		Female	4.5	4.0-5.0	15.0	11.2-19.8	11.1	9.3-13.2	**
	Carried a weapon <sup>5</sup> on school property <sup>6</sup>	Male	5.3	4.7-5.9	13.7	9.8-18.9	16.4	11.8-22.3	**
		Female	1.8	1.5-2.3	11.0	7.3-16.1	6.7	5.3-8.5	**
	Did not go to school because of safety concerns <sup>6</sup>	Male	7.4	6.7-8.2	21.5	16.3-27.9	21.1	16.7-26.4	**
		Female	8.1	7.4-8.9	17.8	13.7-22.8	13.6	11.8-15.6	**
	Bullied on school property <sup>7</sup>	Male	11.4	10.6-12.2	25.7	20.8-31.4	33.2	27.6-39.4	**
		Female	11.8	11.0-12.6	14.0	9.9-19.6	18.8	16.2-21.7	**

<sup>1</sup> 95% confidence interval.

<sup>2</sup> Based on Chi-square tests used to assess significant bivariate differences by sexual identity; \*p<0.001, \*\* p<0.0001<sup>3</sup> Combined data set includes data from the following Youth Risk Behavior Surveys: Connecticut 2011, Delaware 2009, Delaware 2011, Hawaii 2011, Illinois 2009, Illinois 2011, Maine 2009, Maine 2011, Massachusetts 2009, Massachusetts 2011, North Dakota 2009, North Dakota 2011, Rhode Island 2009, Rhode Island 2011, Vermont 2009, Vermont 2011, Wisconsin 2011.

<sup>3</sup> Based on Chi-square tests used to assess significant bivariate differences by sexual identity; \*p<0.001, \*\* p<0.0001

<sup>4</sup> One or more times during the 12 months before the survey.

<sup>5</sup> Such as a gun, knife, or club.

<sup>6</sup> On at least one day during the 30 days before the survey.

<sup>7</sup> During the 12 months before the survey.

<sup>8</sup> Combined data set includes data from the following Youth Risk Behavior Surveys: Boston, MA 2009; Boston, MA 2011; Chicago, IL 2009, Chicago, IL 2010; Washington, DC 2010; Houston, TX 2011; Los Angeles, CA 2009; Los Angeles, CA 2011; Milwaukee, WI 2011; New York City, NY 2009; New York City, NY 2011; San Diego, CA 2011; San Francisco, CA 2009; San Francisco, CA 2011; Seattle, WA 2008; Seattle, WA 2010.

\*p<0.001, \*\*p<0.0001

Results from the adjusted models were similar (Table 7) to the unadjusted results. The state and district data sets showed similar adjusted associations between peer victimization and bullying and sexual identity.

Among male students, it was seen in both data sets that gay students were more likely than heterosexual male students to have been threatened or injured with a weapon on school property, to have not gone to school because of safety concerns, and to have been bullied on school property. Likewise, it was consistent in both data sets that bisexual male students were more likely than heterosexual male students to have experienced all five school violence and bullying behaviors. However, in the district data set only, gay students also were more likely than heterosexual students to report physical fighting on school property and weapon carrying on school property, which were not statistically significant in the state data set.

Among female students, in both data sets, lesbian and bisexual female students were more likely than heterosexual female students to have experienced all five school violence behaviors, with one exception. Lesbian students in the district data set were not statistically more or less likely to have been bullied on school property than heterosexual students. In the state data set, the increased risks were generally not as high among bisexual female students as they were among lesbian students. Compared with heterosexual female students, lesbian students were about three times more likely to have been in a physical fight on school property and not gone to school because of safety concerns, about four times more likely to have been threatened or injured with a weapon on school property, and about six times more likely to have carried a weapon on school property.

The associations between all school violence measures and sexual identity were not statistically different between the two data sets for either sex, apart from bullying on school property among male students. Compared with heterosexual male students, bisexual male students in the state data set (APR: 2.0, 95% confidence interval: 1.6-2.5) were at a lower risk of being bullied on school property than bisexual male students in the district data set (APR: 3.0, 95% confidence interval: 2.4-3.6) ( $p=0.03$ , test results not shown).

Table 7: Adjusted associations<sup>1</sup> of school violence behaviors among gay, lesbian, and bisexual compared to heterosexual students, by sex -- selected sites, Youth Risk Behavior Surveys, 2009-2011

Data Set	Sex	Sexual identit <sup>2</sup>	In a physical fight on school property <sup>2</sup>		Threatened or injured with a weapon <sup>3</sup> on school property <sup>2</sup>		Carried a weapon <sup>3</sup> on school property <sup>4</sup>		Did not go to school because of safety concerns <sup>4</sup>		Bullied on school property <sup>5</sup>	
			6-Apr	CI <sup>7</sup>	APR	CI	APR	CI	APR	CI	APR	CI
States <sup>8</sup>	Male	Gay	1.2	0.8-1.7	3.1	2.2-4.3	1.3	0.8-2.0	2.9	1.9-4.4	2.5	2.1-3.1
		Bisexual	2.2	1.7-2.8	2.7	2.0-3.7	2.6	1.7-3.8	2.9	2.0-4.3	2.0	1.6-2.5
	Female	Lesbian	3.0	2.1-4.4	3.9	2.5-6.0	6.2	3.7-10.4	3.3	2.1-5.1	1.6	1.2-2.1
		Bisexual	2.4	1.8-3.1	2.4	1.8-3.2	5.0	3.4-7.3	1.9	1.3-2.7	1.8	1.6-2.0
Districts <sup>9</sup>	Male	Gay	1.6	1.2-2.1	2.6	2.1-3.3	2.5	1.7-3.6	2.9	2.1-3.9	2.3	1.8-2.8
		Bisexual	2.0	1.6-2.6	2.8	2.2-3.6	2.9	2.1-4.2	2.8	2.1-3.7	3.0	2.4-3.6
	Female	Lesbian	1.7	1.2-2.4	3.2	2.4-4.4	5.3	3.3-8.6	2.0	1.5-2.6	1.2	0.8-1.7
		Bisexual	1.9	1.6-2.4	2.4	1.9-2.9	3.3	2.4-4.4	1.6	1.3-1.8	1.6	1.4-1.8

<sup>1</sup> Adjusted for race/ethnicity and grade in school.

<sup>2</sup> One or more times during the 12 months before the survey.

<sup>3</sup> Such as a gun, knife, or club.

<sup>4</sup> On at least one day during the 30 days before the survey.

<sup>5</sup> During the 12 months before the survey.

<sup>6</sup> Adjusted prevalence ratio; heterosexual is the reference group for all presented APR estimates.

<sup>7</sup> 95% confidence interval.

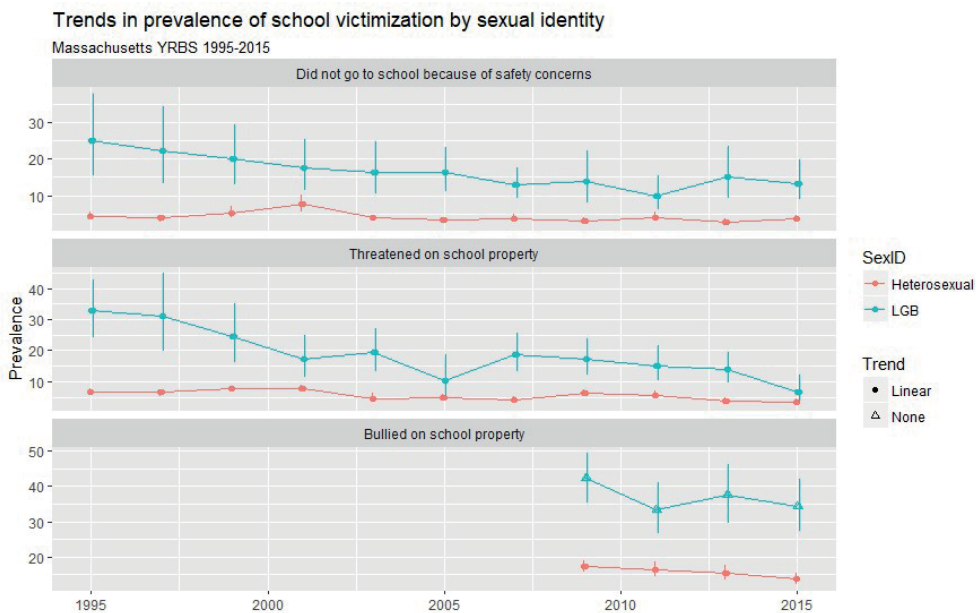
<sup>8</sup> Combined data set includes data from the following Youth Risk Behavior Surveys: Connecticut 2011, Delaware 2009, Delaware 2011, Hawaii 2011, Illinois 2009, Illinois 2011, Maine 2009, Maine 2011, Massachusetts 2009, Massachusetts 2011, North Dakota 2009, North Dakota 2011, Rhode Island 2009, Rhode Island 2011, Vermont 2009, Vermont 2011, Wisconsin 2011.

<sup>9</sup> Combined data set includes data from the following Youth Risk Behavior Surveys: Boston, MA 2009; Boston, MA 2011; Chicago, IL 2009, Chicago, IL 2010; Washington, DC 2010; Houston, TX 2011; Los Angeles, CA 2009; Los Angeles, CA 2011; Milwaukee, WI 2011; New York City, NY 2009; New York City, NY 2011; San Diego, CA 2011; San Francisco, CA 2009; San Francisco, CA 2011; Seattle, WA 2008; Seattle, WA 2010.

## 6.2 Secular trends in school victimization by sexual identity

During 1995 to 2015, the Massachusetts YRBS was conducted 11 times. The sample sizes ranged from 2,707 (in 2009) to 4,415 (in 1999) (median: 3,522), the school response rates ranged from 75% (in 2015) to 96% (in 1999 and 2011) (median: 87%), the student response rates ranged from 77% (in 1995) to 88% (in 2013) (median: 81%), and the overall response rates ranged from 61% (in 2015) to 77% (in 2001) (median: 70%). The trends are illustrated in Figure 1.

**Figure 1.**



LGB: Lesbian, gay, or bisexual

Note: Error bars depict 95% confidence intervals.

The prevalence of having not gone to school because of safety concerns was significantly higher among LGB than heterosexual students in both 1995 (25.0% vs. 4.3%, respectively) and 2015 (13.4% vs. 3.8%) (Figure 1). Similarly, the prevalence of having been bullied on school property was also higher among LGB than heterosexual students in 2009 (42.3% vs. 17.3%, respectively) and 2015 (34.4% vs. 13.8%). However, while the prevalence of having been threatened or injured with a



weapon on school property was higher among LGB than heterosexual students in 1995 (32.9% vs. 6.5%, respectively), in 2015 no differences were detected in the prevalence of this behavior by sexual identity (6.7% vs. 3.5%, respectively).

Assessing the secular trends, controlled for race/ethnicity and sex, the prevalence of having not gone to school because of safety concerns decreased linearly overall (from 5.6% to 4.8%), among heterosexual students (from 4.3% to 3.8%), and among LGB students (from 25.0% to 13.4%) during 1995 to 2015. During the same time period, the prevalence of having been threatened or injured with a weapon on school property also decreased linearly overall (from 7.8% to 4.1%), among heterosexual students (from 6.5% to 3.5%), and among LGB students (from 32.9% to 6.7%). During the shorter time period of 2009-2015 the prevalence of having been bullied on school property decreased linearly overall (from 19.4% to 15.6%) and among heterosexual students (from 17.3% to 13.8%), but no linear change was detected among LGB students. No quadratic trends were detected among the overall population, nor among heterosexual or LGB subgroups for any of the three school violence measures. Moreover, among the linear trends, no interactions were detected between the linear time component and sexual identity; although visual review of Figure 1 indicates the trend lines are clearly decreasing at different rates, it is thus not possible to conclude that the change in school victimization over time differed by sexual identity between heterosexual and LGB students in Massachusetts.

### **6.3 Teen dating violence victimization by sexual identity**

For the 2015 national YRBS, 15,713 questionnaires were completed in 125 public and private schools. The national data set was cleaned and edited for inconsistencies, and missing data were not statistically imputed. Among the 15,713 completed questionnaires, 89 failed quality control and were excluded from analysis, resulting in 15,624 usable questionnaires. The school response rate was 69%, the student response rate was 86%, and the overall response rate was 60%.

Among participating students, 14,703 (94% of full sample) responded to the sexual identity question and 14,160 (90% of full sample) responded to the sexual identity question and both teen dating violence victimization questions. Of those, 70% had dated or gone out with someone during the 12 months before the survey (i.e., had dated). The analytic N was 9,917 students, 63% of the full sample. The analytic sample was 55% White, 14% Black, and 22% Hispanic; 51% male; and 24% were in ninth grade, 25% were in 10th grade, 25% were in 11th grade, and 26% were in 12th grade. Table 8 summarizes the distribution of sexual identity by sex among the 70% of students who had dated or gone out with someone during the 12 months before the survey.

**Table 8. Demographic distributions among students who dated or went out with someone during the 12 months before the survey, by sex—United States, 2015.**

	<i>n</i>	All Students		Male		Female	
		Prevalence	CI <sup>1</sup>	Prevalence	CI	Prevalence	CI
<b>Sexual identity</b>							
Heterosexual	8769	89.3	87.7-90.7	94.5	92.7-95.8	84.1	81.8-86.3
LGB <sup>2</sup>	886	8.3	7.2-9.6	3.6	2.6-5.0	13.2	11.3-15.3
Not sure	262	2.3	2.0-2.8	1.9	1.3-2.6	2.7	2.2-3.3
<b>Race/ethnicity</b>							
White, non-Hispanic	4490	55.3	49.7-60.8	54.8	48.7-60.7	56.0	49.7-62.1
Black, non-Hispanic	1094	13.9	11.5-16.6	14.2	11.3-17.8	13.5	11.0-16.3
Hispanic	3218	22.2	17.9-27.1	22.0	17.6-27.1	22.4	17.8-27.9
<b>Teen dating violence victimization<sup>3</sup></b>							
Physical <sup>4</sup> only	544	5.0	4.4-5.6	4.3	3.6-5.0	5.7	4.6-7.0
Sexual <sup>5</sup> only	600	6.0	5.2-6.9	2.3	1.7-3.1	9.7	8.3-11.3
Both physical and sexual	448	4.6	4.0-5.2	2.9	2.3-3.8	6.0	5.1-7.1
None	8325	84.5	83.1-85.8	90.5	89.3-91.7	78.6	75.6-81.2

<sup>1</sup> 95% CI = 95% confidence interval.

<sup>2</sup> LGB = lesbian, gay, or bisexual.

<sup>3</sup> One or more times during the 12 months before the survey.

<sup>4</sup> Being physically hurt on purpose (counting being hit, slammed into something, or injured with an object or weapon) by someone they were dating or going out with.

<sup>5</sup> Being forced to do sexual things (counting kissing, touching, or being physically forced to have sexual intercourse) they did not want to do by someone they were dating or going out with.

Among these male students, 94.5% identified as heterosexual, 3.6% as gay or bisexual, and 1.9% as not sure. Among these female students, 84.1% identified as heterosexual; 13.2% as lesbian, gay, or bisexual; and 2.7% as not sure.

Stratified by sex and sexual identity (Table 9), heterosexual male students had a significantly lower prevalence and lower mean frequencies of sexual teen dating violence victimization (prevalence: 4.3%,  $M = 0.14$  times) and physical teen dating violence victimization (6.2%, 0.18 times) compared with LGB (sexual teen dating violence victimization: 20.9%, 0.46 times; physical teen dating violence victimization: 19.9%, 0.59 times) and not sure male students (sexual teen dating violence victimization: 21.7%, 1.07 times; physical teen dating violence victimization: 30.5%, 1.41 times) and compared with heterosexual female students (sexual teen dating violence victimization: 14.5%, 0.36 times; physical teen dating violence victimization: 10.7%, 0.27 times). Among male students, not sure students were more likely to have experienced sexual and physical teen dating violence victimization 6 or more times compared with heterosexual and LGB male students and physical teen dating violence victimization 6 or more times compared with not sure female students. Among female students, heterosexual students experienced a lower prevalence and frequency of sexual teen dating violence victimization and physical teen dating violence victimization than LGB students and a lower frequency of physical teen dating violence victimization than not sure students; we did not detect any significant differences in the mean frequency or prevalence between not sure and LGB female students.

Among those who experienced sexual teen dating violence victimization  $\geq 1$  time, heterosexual male students had higher mean frequencies of sexual teen dating violence victimization ( $M = 3.38$  times) compared with heterosexual female students ( $M = 2.51$  times;  $p < 0.0001$ ). Heterosexual male students had a lower prevalence of sexual teen dating violence victimization 1 time (34.3%) compared with heterosexual female students (45.9%;  $p = 0.04$ ) and a higher prevalence of teen dating violence victimization  $\geq 6$  times (27.5%) compared with heterosexual female students (12.0%;  $p = 0.001$ ). No differences between LGB male and LGB female students were detected for sexual teen dating violence victimization mean frequencies or prevalence. Not sure male students had a higher mean frequency ( $M = 4.92$  times) compared with not sure female students ( $M = 3.16$  times;  $p = 0.04$ ) and a higher

prevalence of sexual teen dating violence victimization  $\geq 6$  times (64.9%) compared with not sure female students (26.2%;  $p = 0.03$ ). Among male students, significant differences were detected between all sexual identity subgroups for mean frequencies and prevalence of sexual teen dating violence victimization  $\geq 6$  times; differences were also detected between LGB male students compared with heterosexual and not sure male students for experiencing sexual teen dating violence victimization 1 time. Conversely, among female students, no differences were detected in sexual teen dating violence victimization between heterosexual, LGB, or not sure students.

Among students who experienced physical teen dating violence victimization 1 or more times, no differences were detected in mean frequencies or prevalence between heterosexual male and heterosexual female students or between LGB male and LGB female students. Not sure male students experienced slightly higher mean frequencies ( $M = 4.62$ ) compared with not sure female students ( $M = 3.39$ ;  $p = 0.03$ ). Among male students, not sure students experienced the highest mean frequencies, and were the most likely to experience teen dating violence victimization 6 or more times. Among female students who experienced physical teen dating violence victimization 1 or more times, the only significant differences detected were between heterosexual and not sure students, in that heterosexual students were more likely to experience physical teen dating violence victimization 1 time (45.7%) when compared with not sure students (27.6%;  $p = 0.04$ ).

**Table 9. Prevalence (SE) and mean (SE) of frequencies of teen dating violence victimization<sup>1</sup>, by sex and sexual identity—United States, 2015.**

	Among All Students						Among Students Who Experienced TDVV <sup>2</sup> ≥1 Time					
	Male			Female			Male			Female		
	Heterosexual	LGB <sup>3</sup>	Not sure	Heterosexual	LGB	Not sure	Heterosexual	LGB	Not sure	Heterosexual	LGB	Not sure
<b>Sexual TDVV<sup>4</sup></b>												
0 times	95.7 (0.4) <sup>FGN</sup>	79.1 (4.9) <sup>H</sup>	78.3 (5.3) <sup>H</sup>	85.5 (1.0) <sup>MG</sup>	77.4 (2.5) <sup>H</sup>	78.8 (4.5)	—	—	—	—	—	—
1 time	1.5 (0.3) <sup>FG</sup>	13.2 (4.9) <sup>H</sup>	4.4 (2.4)	6.7 (0.5) <sup>MG</sup>	10.1 (1.3) <sup>H</sup>	7.8 (2.9)	34.3 (5.1) <sup>FG</sup>	63.2 (12.5) <sup>HN</sup>	20.3 (11.5) <sup>G</sup>	45.9 (2.7) <sup>M</sup>	44.7 (4.4)	36.8 (11.2)
2-5 times	1.6 (0.3)	5.1 (1.8)	3.2 (1.8)	6.1 (0.7)	8.4 (1.4)	7.8 (3.0)	38.2 (6.0)	24.4 (8.6)	14.9 (8.4)	42.1 (2.9)	37.2 (4.3)	36.9 (11.2)
6+ times	1.2 (0.2) <sup>N</sup>	2.6 (1.1) <sup>N</sup>	14.1 (5.3) <sup>HG</sup>	1.7 (0.3) <sup>G</sup>	4.1 (1.0) <sup>H</sup>	5.6 (2.5)	27.5 (3.7) <sup>FGN</sup>	12.4 (6.0) <sup>HN</sup>	64.9 (13.9) <sup>HG</sup>	12.0 (1.8) <sup>M</sup>	18.1 (3.9)	26.2 (10.7) <sup>M</sup>
Mean frequency	0.14 (0.02) <sup>FGN</sup>	0.46 (0.10) <sup>H</sup>	1.07 (0.34) <sup>H</sup>	0.36 (0.03) <sup>MG</sup>	0.62 (0.09) <sup>H</sup>	0.67 (0.18)	3.38 (0.18) <sup>FGN</sup>	2.21 (0.43) <sup>HN</sup>	4.92 (0.68) <sup>HG</sup>	2.51 (0.11) <sup>M</sup>	2.73 (0.21)	3.16 (0.53) <sup>M</sup>
<b>Physical TDVV<sup>5</sup></b>												
0 times	93.8 (0.5) <sup>FGN</sup>	80.1 (4.1) <sup>H</sup>	69.5 (7.7) <sup>H</sup>	89.3 (1.0) <sup>MG</sup>	83.1 (1.6) <sup>H</sup>	83.2 (3.5)	—	—	—	—	—	—
1 time	2.5 (0.4) <sup>F</sup>	7.8 (3.1)	4.3 (1.6)	4.9 (0.6) <sup>M</sup>	5.8 (1.1)	4.6 (1.9)	40.8 (4.5) <sup>N</sup>	38.9 (14.2)	14.0 (6.5) <sup>H</sup>	45.7 (3.5) <sup>N</sup>	34.1 (5.3)	27.6 (8.5) <sup>H</sup>
2-5 times	2.4 (0.2)	9.8 (4.3)	10.0 (4.0)	4.4 (0.5)	7.8 (1.2)	7.7 (2.0)	39.2 (3.0)	49.1 (15.9)	32.8 (9.1)	40.8 (3.5)	46.0 (6.1)	45.6 (9.2)
6+ times	1.2 (0.2) <sup>N</sup>	2.4 (1.0) <sup>N</sup>	16.2 (5.6) <sup>HG</sup>	1.4 (0.3)	3.3 (1.0)	4.5 (1.9) <sup>M</sup>	20.0 (3.8) <sup>N</sup>	12.0 (5.9) <sup>N</sup>	53.2 (9.3) <sup>HG</sup>	13.5 (2.5)	19.9 (5.6)	26.7 (9.3) <sup>M</sup>
Mean frequency	0.18 (0.02) <sup>FGN</sup>	0.59 (0.13) <sup>H</sup>	1.41 (0.41) <sup>H</sup>	0.27 (0.03) <sup>MG</sup>	0.51 (0.07) <sup>H</sup>	0.57 (0.14) <sup>H</sup>	2.88 (0.20) <sup>N</sup>	2.99 (0.39) <sup>N</sup>	4.62 (0.38) <sup>HG</sup>	2.55 (0.13)	3.00 (0.27)	3.39 (0.45) <sup>M</sup>

<sup>1</sup> Among students who dated or went out with someone during the 12 months before the survey.

<sup>2</sup> TDVV: teen dating violence victimization

<sup>3</sup> LGB: Lesbian, gay, or bisexual

<sup>4</sup> Being physically hurt on purpose (counting being hit, slammed into something, or injured with an object or weapon) by someone they were dating or going out with.

<sup>5</sup> Being forced to do sexual things (counting kissing, touching, or being physically forced to do have sexual intercourse) they did not want to do by someone they were dating or going out with.

<sup>H</sup>Significantly different from heterosexual students (*t* test, *p* < .05)

<sup>G</sup>Significantly different from LGB students (*t* test, *p* < .05)

<sup>N</sup>Significantly different from not sure students (*t* test, *p* < .05)

<sup>F</sup>Significantly different from female students with the same sexual identity (*t* test, *p* < .05)

<sup>M</sup>Significantly different from male students with the same sexual identity (*t* test, *p* < .05)

Descriptive statistics for the four-level combined teen dating violence victimization measure and the “any teen dating violence victimization” measure indicated that greater than a quarter of LGB male and nearly 30% of LGB female students experienced “any teen dating violence victimization,” compared with 8.3% of heterosexual male and 20.0% of heterosexual female students (Table 9). Among male LGB students, 15.4% experienced both physical and sexual teen dating violence victimization. Among female LGB students, 12.0% experienced sexual teen dating violence victimization only and 10.6% experienced both physical and sexual teen dating violence victimization. For three types of teen dating violence victimization—sexual teen dating violence victimization only, both physical and sexual teen dating violence victimization, and “any teen dating violence victimization”—heterosexual female students had a higher prevalence than heterosexual male students. However, sex differences were not detected among LGB students or students who were not sure of their sexual identity for physical teen dating violence victimization only, both physical and sexual teen dating violence victimization, or for “any teen dating violence victimization.” A difference was detected between female LGB students (12.0%) and male LGB students (5.6%;  $p = 0.048$ ) for sexual teen dating violence victimization only.

Among female students, the prevalence of physical teen dating violence victimization only and sexual teen dating violence victimization only did not differ significantly by sexual identity; however, the prevalence of both physical and sexual teen dating violence victimization was higher among LGB female (10.6%) compared with heterosexual female (5.2%) students ( $p = 0.03$ ) and the prevalence of “any teen dating violence victimization” was higher among LGB female (29.0%) than heterosexual female (20.0%) students ( $p = 0.02$ ).

Among male students, those who were not sure of their sexual identity had higher prevalence of physical teen dating violence victimization only (14.0%), both physical and sexual teen dating violence victimization (17.8%), and “any teen dating violence victimization” (35.7%) than heterosexual male students (4.0%, 2.2%, and 8.3%, respectively). LGB students also had a higher prevalence of both physical and sexual teen dating violence victimization (15.4%) and “any teen dating violence victimization” (25.8%) compared with heterosexual students (Table 10).

**Table 10. Prevalence of combined physical and sexual teen dating violence victimization among U.S. high school students<sup>1</sup>, by sex and sexual identity—United States, 2015.**

Sex	Sexual Identity	Physical TDVV <sup>2,3</sup>		Sexual TDVV <sup>4</sup>		Both Physical and Sexual		$p^6$	Any TDVV		$p^7$
		%	CI <sup>5</sup>	%	CI	%	CI		%	CI	
Male	Heterosexual	4.0 <sup>N</sup>	3.4-4.8	2.1 <sup>F</sup>	1.5-2.9	2.2 <sup>FGN</sup>	1.6-2.9	.002	8.3 <sup>FGN</sup>	7.3-9.5	.0001
	LGB <sup>8</sup>	4.8	2.5-9.2	5.6 <sup>F</sup>	1.6-17.3	15.4 <sup>H</sup>	8.4-26.4		25.8 <sup>H</sup>	17.3-36.6	
	Not sure	14.0 <sup>H</sup>	6.9-26.5	3.9	1.1-12.6	17.8 <sup>H</sup>	9.5-31.1		35.7 <sup>H</sup>	21.7-52.7	
Female	Heterosexual	5.5	4.3-7.0	9.3 <sup>M</sup>	7.8-11.0	5.2 <sup>MG</sup>	4.3-6.4	.03	20.0 <sup>MG</sup>	17.2-23.2	.02
	LGB	6.5	4.6-8.9	12.0 <sup>M</sup>	8.5-16.7	10.6 <sup>H</sup>	7.8-14.1		29.0 <sup>H</sup>	24.0-34.6	
	Not sure	8.2	4.5-14.5	12.4	6.2-23.1	8.9	4.6-16.4		29.4	20.3-40.6	

<sup>1</sup> Among students who dated or went out with someone during the 12 months before the survey.

<sup>2</sup> TDVV: teen dating violence victimization.

<sup>3</sup> Being physically hurt on purpose (counting being hit, slammed into something, or injured with an object or weapon) by someone they were dating or going out with.

<sup>4</sup> Being forced to do sexual things (counting kissing, touching, or being physically forced to do have sexual intercourse) they did not want to do by someone they were dating or going out with.

<sup>5</sup> CI: 95% confidence interval;

<sup>6</sup>  $P$  value from overall chi-square test of equal distribution of sexual identity by four-level TDVV (i.e., physical TDVV only, sexual TDVV only, both physical and sexual TDVV, and no TDVV).

<sup>7</sup>  $P$  value from overall chi-square test of equal distribution of sexual identity by "any TDVV."

<sup>8</sup> LGB: lesbian, gay, or bisexual.

<sup>H</sup> Significantly different from heterosexual students ( $t$  test,  $p < .05$ ).

<sup>G</sup> Significantly different from LGB students ( $t$  test,  $p < .05$ ).

<sup>N</sup> Significantly different from not sure students ( $t$  test,  $p < .05$ ).

<sup>M</sup> Significantly different from female students with the same sexual identity ( $t$  test,  $p < .05$ ).

<sup>F</sup> Significantly different from male students with the same sexual identity ( $t$  test,  $p < .05$ ).

Controlling for sex, race/ethnicity, and grade, the APRs (Table 11) indicate that both LGB and not sure students were more likely to experience both physical and sexual teen dating violence victimization and “any teen dating violence victimization” compared with heterosexual students (see Table 11). Not sure students were also more likely to experience physical teen dating violence victimization only compared with heterosexual students. No differences were detected between the sexual identity subgroups for sexual teen dating violence victimization only, and no differences were detected between not sure and LGB students for any of the combined teen dating violence victimization categories.

**Table 11. Adjusted<sup>1</sup> prevalence ratios<sup>2</sup> of combined teen dating violence victimization among U.S. high school students<sup>3</sup>, by sexual identity**

<b>TDVV type</b>	<b>Comparison of TDVV<sup>4,5</sup></b>		
	<b><u>LGB<sup>6</sup> vs Heterosexual</u></b>	<b><u>Not sure vs Heterosexual</u></b>	<b><u>Not sure vs LGB</u></b>
	<b>APR (CI)<sup>7</sup></b>	<b>APR (CI)</b>	<b>APR (CI)</b>
Physical TDVV <sup>8</sup> Only	1.33 (0.91-1.94)	<b>2.25</b> <b>(1.36-3.70)</b>	1.69 (0.91-3.16)
Sexual TDVV <sup>9</sup> Only	1.55 (0.99-2.42)	1.62 (0.93-2.82)	1.04 (0.61-1.78)
Both Physical and Sexual TDVV	<b>2.53</b> <b>(1.86-3.45)</b>	<b>3.35</b> <b>(1.96-5.72)</b>	1.33 (0.74-2.37)
Any TDVV	<b>1.63</b> <b>(1.28-2.08)</b>	<b>2.07</b> <b>(1.55-2.77)</b>	1.27 (0.90-1.81)

<sup>1</sup> Adjusted for sex, grade, and race/ethnicity.

<sup>2</sup> APRs that were significant at the 5% level are shown with **bold font**.

<sup>3</sup> Among students who dated or went out with someone during the 12 months before the survey.

<sup>4</sup> TDVV: teen dating violence victimization;

<sup>5</sup> Written in the format: exposure subgroup versus referent subgroup.

<sup>6</sup> LGB: Lesbian, gay, or bisexual.

<sup>7</sup> CI: 95% confidence interval.

<sup>8</sup> Being physically hurt on purpose (counting being hit, slammed into something, or injured with an object or weapon) by someone they were dating or going out with.

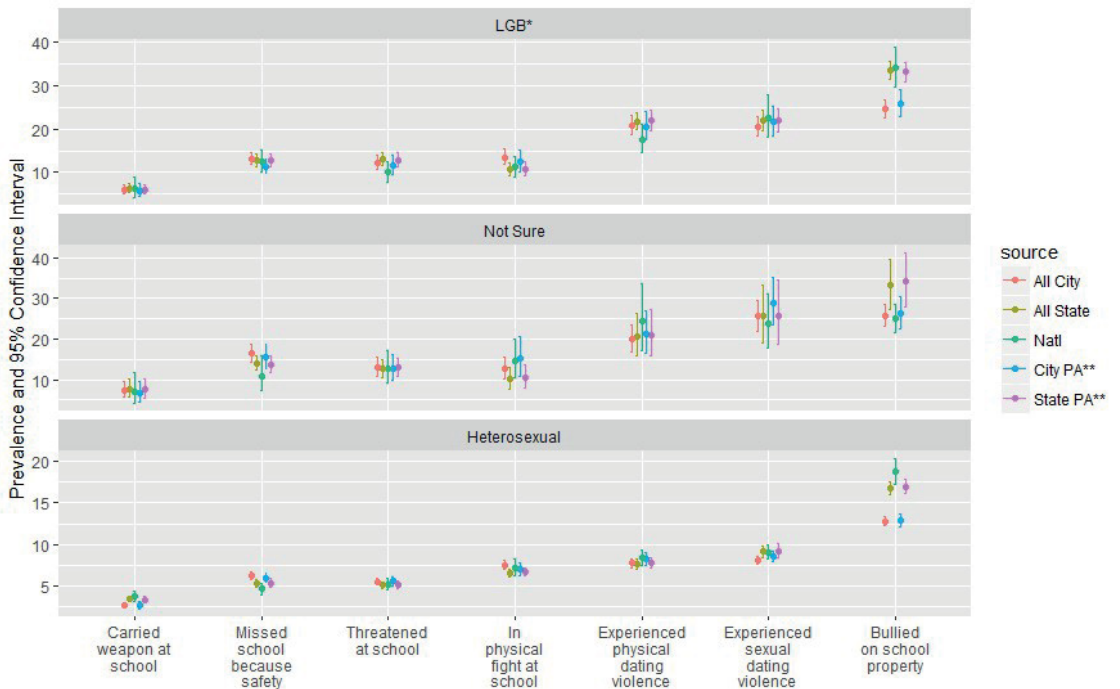
<sup>9</sup> Being forced to do sexual things (counting kissing, touching, or being physically forced to do have sexual intercourse) they did not want to do by someone they were dating or going out with.



## 6.4 Data comparability analysis

The prevalence and 95% confidence intervals of each violence behavior by sexual identity and data type is shown in Figure 2. Generally, the prevalence estimates varied slightly by data type but not drastically; as expected, the confidence interval widths also vary by data type. Also as expected, the confidence intervals are widest for the national data; the cluster design and relatively lower sample sizes (compared to the very large state and district data sets) are responsible for these widths. The greatest difference in prevalence by data type was seen for bullying on school property; this was seen for all three sexual identity categories.

**Figure 2: Prevalence of school violence variables by sexual identity among 2015 Youth Risk Behavior Surveys.**



\*LGB: Lesbian, gay, or bisexual

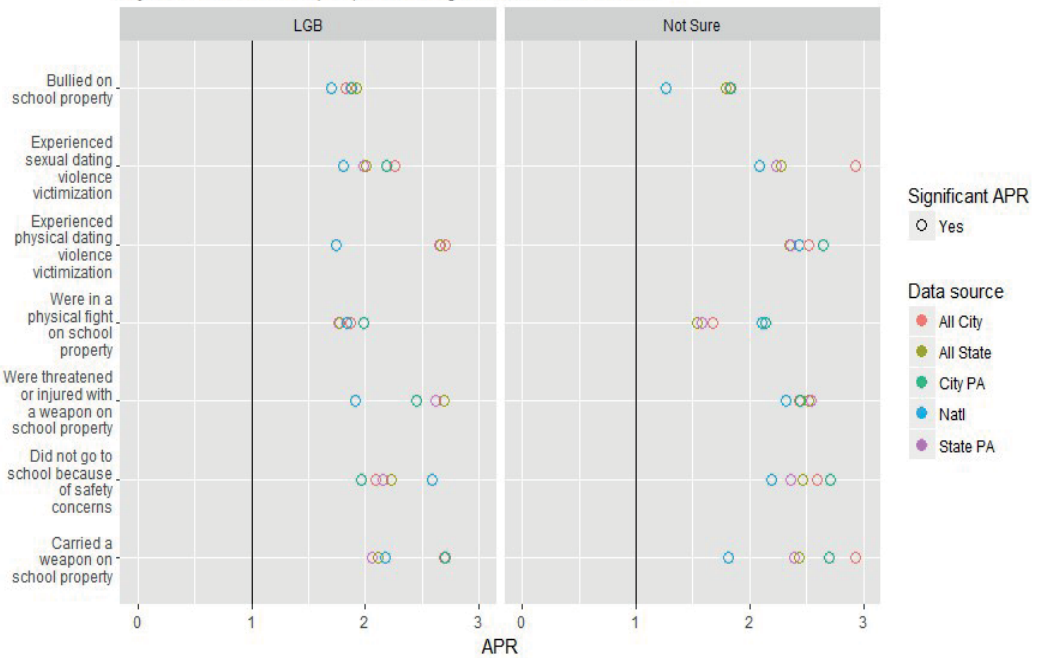
\*\* PA: Publicly available data only

Note: The scale of the y-axis varies.

The comparative analysis assessed adjusted prevalence ratios for LGB and not sure students compared to heterosexual students (Figure 3). All adjusted prevalence ratios for all school violence variables were significantly greater than 1.0, indicating that LGB and not sure students had significantly higher prevalence of all seven school violence measures compared to heterosexual students. The magnitude of the adjusted prevalence ratios ranged between 1.7 to 2.7 among LGB compared to heterosexual students and between 1.3 to 3.7 among not sure compared to heterosexual students.

**Figure 3. School violence and sexual identity**

Adjusted Prevalence Ratios (APR) referenced against Heterosexual students



LGB: Lesbian, gay, or bisexual; PA: Publicly available data only

## 7 DISCUSSION

### 7.1 School violence among LGB and heterosexual youth

The thesis findings generally confirm the hypotheses, which were that LGB students would have increased prevalence of seven school violence measures compared to heterosexual students.

#### 7.1.1 Higher prevalence of school violence among LGB compared to heterosexual students

Using data from ten states and ten large urban school districts, the results indicated that, among male and female students, peer victimization was usually higher among gay and lesbian than heterosexual students and was consistently higher among bisexual than heterosexual students. Being bullied at school was also higher among gay or lesbian and bisexual students compared to heterosexual students among male and female students.

These results corroborate the existing literature. At the time of its publication, the peer victimization and bullying study was one of the first to use a large population-based data set to assess school violence by sexual identity, and the results corroborated results of previous studies (Berlan et al., 2010; Bontempo & D'Augelli, 2002; Hatzenbuehler & Keyes, 2013; Kann et al., 2011). Since that time, CDC released a report of the 2015 national YRBS which summarized all YRBS health-risk behaviors by sexual identity and sex of sexual contacts (Kann et al., 2016). The CDC report indicated that all four peer victimization measures and having been bullied on school property were significantly higher overall among LGB compared to heterosexual students, as well as among LGB female compared to heterosexual female students (Kann et al., 2016, pages 10-15). The three measures that distinctly measured victimization (having been threatened or injured with a weapon on school

property, having missed school because of safety concerns, and having been bullied on school property) also had higher prevalence among gay and bisexual male compared to heterosexual male students; however, a similar association was not detectable among male students for the remaining two measures that did not clearly measure victimization or perpetration (carrying a weapon on school property and having been in a physical fight on school property).

Similar results were also described in the 2015 National School Climate Survey report, which assesses school climate using a large convenience sample of lesbian, gay, bisexual, transgender, and queer adolescents. The report indicated that 32% of these students missed an entire day of school in the past month because they felt unsafe or uncomfortable; 10% missed four or more days (Kosciw et al., 2016). Moreover, 13% of lesbian, gay, bisexual, transgender, and queer students were physically assaulted (e.g., punched, kicked, injured with a weapon) in the past year because of their sexual orientation (Kosciw et al., 2016).

Teen dating violence is another component of school violence. Results of the thesis suggest that LGB students experience physical teen dating violence victimization and sexual teen dating violence victimization at higher rates than their heterosexual counterparts, especially among male students. After controlling for sex, race/ethnicity, and grade, LGB students and not sure students are at highest risk of teen dating violence victimization compared with heterosexual students. The adjusted results also indicate that LGB and not sure students are more likely than heterosexual students to experience both physical and sexual teen dating violence victimization. This is concerning because a previous national study showed that youth who experienced both physical and sexual teen dating violence victimization were at an increased risk for many other risky behaviors, including suicide ideation and fighting, compared with youth who experienced only physical or only sexual teen dating violence victimization (Vagi et al., 2015). Lastly, students who endorsed “not sure” for their sexual identity have a unique teen dating violence victimization pattern and additional research could provide more information about why these students are particularly vulnerable.

The teen dating violence victimization findings align closely with previous studies of adolescents (Dank et al., 2014; Luo et al., 2014) and also follow patterns

of intimate partner violence by sexual orientation in adults (Walters, Chen, & Breiding, 2013). The prevalence of any teen dating violence victimization among sexual minority students was 25.8% among male LGB students and 29.0% among female LGB students. These estimates corroborate some previous estimates of violence among sexual minority youth within dating relationships. Halpern reported approximately 25% of sexual minority youth had experienced some victimization (Halpern et al., 2004), while Freedner estimated 43% to 45% of gay and lesbian adolescents had experienced victimization (Freedner et al., 2002). Four recent studies estimated rates of physical teen dating violence victimization among sexual minority youth to be between 19% and 30% in one study (Luo et al., 2014), 31% in another study (Hipwell et al., 2013), 43% in the third study (Dank et al., 2014), and between 19% and 44% in the fourth study (Martin-Storey, 2015). In a study of U.S. university students – an older age group than in the current thesis - Edwards et al. (2015) found higher rates of physical teen dating violence victimization among LGB compared to heterosexual students; however, the moderating role of sex contradicted the results of the current thesis (Edwards et al., 2015).

### **7.1.2 Gender differences in associations between sexual identity and school violence**

The results of the thesis can also be described by sex, as is appropriate for violence-related research. Gay and bisexual male students compared to heterosexual male students were 2-3 times more likely to report peer victimization and bullying (Study I). In the same study, female LGB compare to female heterosexual students had a great range of relative risk estimates: they were about 3-6 times more likely to carry a weapon to school and the remaining school violence measures ranged from 1.2 to nearly 4.0 times more likely. Male gay students were not significantly more likely than male heterosexual students to report the two (of five) measures that are not clearly victimization – physical fighting at school and carrying a weapon at school.

The results by sex from the teen dating violence study indicated lack of disparity in teen dating violence victimization prevalence among LGB male and female students, consistent with the extant literature (Luo et al., 2014). A national study among U.S. high school students indicated that teen dating violence victimization was twice as prevalent among female than male students, without considering sexual identity (Vagi et al., 2015). The current study suggests that this disparity exists among heterosexual students, consistent with the existing literature, but is not detected among subgroups of sexual minority students; in one case, male LGB students had higher prevalence of teen dating violence victimization than female LGB students. Our results also suggest that sexual minority female students are not immune to teen dating violence victimization and in fact are at greater risk for some of these victimizations than heterosexual female students.

### **7.1.3 Decreasing trends of peer victimization and bullying among heterosexual and LGB students**

Peer victimization declined among both heterosexual and LGB students during 1995-2015 in one state – Massachusetts - although current prevalence of some peer victimization is still higher among LGB than heterosexual students in 2015. As noted in section 6.2, the visual display of the trends suggests that the two peer victimization behaviors are declining with a steeper slope among LGB compared to heterosexual students. Nonetheless, the tests for differences in the slope of the time component were not significant, indicating that there was no detectable difference in the rate of decrease between heterosexual and LGB students. This is likely because the analysis was underpowered. Although being bullied on school property was not assessed on the Massachusetts YRBS until 2009, during the last four Massachusetts YRBS cycles being bullied on school property declined significantly among heterosexual but not among LGB students. Again, this may be due to the relatively low number of LGB students in each survey year in Massachusetts.

Although there is some evidence to suggest that societal acceptance of sexual minority individuals has increased during recent decades (Keleher & Smith, 2012), it is challenging to corroborate the trend results of this thesis. There is a paucity of literature on trends of adolescent or school-based peer victimization by sexual identity; this is likely because there are few data sets to support these kinds of analyses. However, a separate study published in December 2016 also assessed Massachusetts YRBS data on school violence, bullying, and sexual orientation during 1999-2013 and showed very similar results (Goodenow, Watson, Adjei, Homma, & Saewyc, 2016). The National School Climate Survey has been conducted regularly since 1999, and the most recent report indicated that the 2015 survey showed the lowest proportion of sexual and gender minority students victimized at school because of sexual orientation since the inception of the survey (Kosciw et al., 2016).

#### 7.1.4 Potential explanations for sexual identity disparities in school violence

Anecdotally and from smaller or less recent scientific studies, it has long been believed that LGB adolescents faced disproportionate school violence compared to their straight peers. The current data provide corroborating, population-based prevalence estimates but cannot give etiological insight; in fact, there is a paucity of quantitative and qualitative literature that examines *why* this disparity occurs among sexual minority youth. Patrick et al. (2013) estimated that the prevalence of being bullied “because someone thought you were gay, lesbian, or bisexual (whether you are or not)” was between 9% and 11% among male and between 6% and 10% among female high school students (Patrick, Bell, Huang, Lazarakis, & Edwards, 2013). One explanation might be that sexual minority youth are an attractive target for bullies, who generally prefer targets who are “insecure of themselves (Salmivalli & Isaacs, 2005) ... and in a low-power, rejected position in the group (Hodges & Perry, 1999)” (Salmivalli, 2010) p. 113), and “those who were not likely to be defended by significant others” (Veenstra, Lindenberg, Munniksma, & Dijkstra, 2010). Compared to their sexual non-minority counterparts, LGB youth have increased risk of low self-esteem or negative self-concept, stemming from many possible sources such as internalized homophobia (Herrick et al., 2013), parental rejection (Baiocco et al., 2016; R. C. Savin-Williams, 1989), and stigma (Hatzenbuehler, 2009). Additionally, there is some evidence that sexual minority

youth have increased rates of internalizing symptoms and deficits in emotional regulation (Hatzenbuehler, McLaughlin, & Nolen-Hoeksema, 2008), additional factors that have “consistently been found to be strongly associated with peer victimization” (Card et al., 2008) p. 127) and are associated longitudinally with increases in peer victimization over time (Card et al., 2008). Altogether, these characteristics may make them more visible and/or more vulnerable to aggressive peers and/or dating partners looking for a victim. Moreover, ecological factors can exacerbate existing or introduce additional risks for peer victimization of LGB (Hatzenbuehler, 2017) and it can be difficult for these students to find school staff willing or able to effectively intervene on their behalf (Grossman et al., 2009; Holmes & Cahill, 2004). The proposed theory holds well for peer victimization and bullying as well as for teen dating violence victimization.

The theory also could be extrapolated to explain the noted sex differences in the effect the association between sexual identity and school violence. Some research suggests that self-esteem and other social behaviors and personality characteristics may affect participant role behaviors (in bullying) to a greater extent among boys than girls (Salmivalli, 1998). There may be other possible explanations for the differences in school violence between male and female LGB students. One explanation is related to cultural gender norms. Dominant masculinity, in which sexual minority men are devalued, may pose additional stress for gay and bisexual male adolescents, who must “develop their own... sense of masculinity” (Wilson et al., 2010) in settings where adolescent boys monitor and “police” their peers’ masculinity (Reigeluth & Addis, 2016). A 2016 qualitative study by Reigeluth and Addis suggests that policing masculinity is a prevalent, pervasive aspect of male adolescents’ social development, and frequently includes homophobic slurs and insults (Reigeluth & Addis, 2016). Lastly, there remains an explanation that is quite simple: the findings are often greater among boys because, generally, the evidence indicates that boys are more often victimized by their peers than girls (Card et al., 2008). Additionally, girls tend to be more empathetic and supportive of bullying victims compared to boys, who may tend to believe that the victim is deserving of bullying (Rigby, 1997). Thus, perhaps boys are more likely to bully other boys and are less likely to defend victimized boys. On the other hand, positions in the recent literature now suggest that gender differences in perpetration and victimization are



mixed (Espelage et al., 2004). Along these lines, it may follow that the survey items measuring peer victimization are measuring physical aggression and victimization, which is more common among boys than girls (Wang et al., 2009). Other forms of peer victimization, such as ostracization and social exclusion, are more frequent among girls than boys (Wang et al., 2009) and are not assessed on the YRBS.

Violence and victimization are associated with a multitude of other behaviors that were measured on the 2015 Standard YRBS survey but were not included in these analyses, such as alcohol and other substance use and abuse, risky sexual behaviors, tobacco use, and behaviors related to depression and suicide. Many articles assess these associations and the mediation or causal paths among sexual minority youth and adults (Corliss, Rosario, Wypij, Fisher, & Austin, 2008; Dermody et al., 2016; Lehavot & Simoni, 2011; Martin-Storey & Crosnoe, 2012; O’Cleirigh et al., 2015; Rosario et al., 2014; Sabri, 2012). Adolescent risk-behaviors tend to cluster, i.e., many students who participate in one type of health risk behavior tend to participate in many others (e.g., tobacco and alcohol use) (Brener & Collins, 1998; Coulter, Kinsky, Herrick, Stall, & Bauermeister, 2015). Moreover, the risk factors for school violence, such substance use (Temple, Shorey, Fite, Stuart, & Le, 2013; Vagi et al., 2013), and depression (Luk, Wang, & Simons-Morton, 2010) are more prevalent among LGB adolescents in Youth Risk Behavior Surveillance System data (Kann et al., 2016). The current study did not explore these potential confounders, which may have impacted the strength (i.e., overestimated) of the adjusted prevalence ratios.

## 7.2 Methodological Considerations

This research is strengthened by the high quality of the YRBSS data, which are produced via large, population-based, recent, and diverse samples of U.S. youth. At the time of their publishing, each article was the first or one of the first to use representative data to describe prevalence of school violence and victimization by sexual identity among youth.

## 7.2.1 Survey design and implementation

The greatest limitation of the YRBSS is that it is generalizable only to youth attending school and may not be representative of all youth. Specifically, state or district YRBS data are only generalizable to enrolled public students in jurisdictions that assessed sexual identity on their YRBS, and the results may not be representative of students in other jurisdictions or nationwide. Meanwhile, the teen dating violence analysis used national YRBS data which were only representative of students who attend school (public or private). Nationwide, in 2012, of persons aged 16 to 17 years, approximately 3% were not enrolled in a high school program and had not completed high school (Stark & Noel, 2015). A 2014 study suggests that sexual minority youth may be at greater risk of dropping out of school (Burton, Marshal, & Chisholm, 2014); even if they have not dropped out, they must be present at school with some regularity to complete the survey. The results of current thesis suggest that about 30% of LGB students nationally missed school at least one day during the last month. Therefore, it is possible that the results of this study underestimate the proportion of students missing school because they did not feel safe and may be biased towards students who experience less frequent at-school victimization.

The cross-sectional design of the YRBS introduces some restrictions on the interpretation of these results; that is, while YRBS data can describe the frequency and prevalence of risk behaviors and provide an indication of associations between sexual identity and peer victimization, it cannot provide an explanation of why or how this relationship exists. The results are also influenced by school and student nonresponse, which may add bias (i.e., selection bias) to the results. In the 2015 national YRBS, private school participation was dismal and there may be differences in the demographics and behaviors among the students attending schools that responded and did not respond. Additionally, students in lower grades, nonwhite students, and male students tend to be the least likely to complete YRBS questionnaires, which may also affect our external validity. Fortunately, the response rates for sexual identity were compared across sex and race/subgroups and did not differ statistically.

In addition to student non-response, it is important to consider the global trend of survey nonresponse. The Youth Risk Behavior Surveillance System has seen

increased school nonresponse in recent cycles, particularly among private schools. This is in line with declining response rates across other U.S. federal surveys (Czajka & Beyler, 2015). Additional research is urgently needed to develop methods for improving response and adjusting statistical sampling and analytical methods to overcome nonresponse while maintaining generalizability and data quality.

## 7.2.2 Survey items and measurement

It is important to consider the limitations introduced by the question wording and available response options for the sexual identity survey item as well as the school violence measures.

### *Sexual identity*

First, the YRBS question on sexual identity may not be capturing all sexual minority students. Some students might not have known their sexual identity; might have been unwilling to disclose it on the YRBS questionnaire; might have been unwilling to label themselves as heterosexual, gay, lesbian, or bisexual; or might not have understood the sexual identity question (although we do not have any evidence that the words used to describe sexual identity are unclear to young people today). As described in Section 2.2.1, measurement of sexual minority status is complex and includes three constructs: sexual identity, sexual attraction, and actual sexual behaviors. These analyses only considered sexual identity for determining sexual minority status; further analysis using sex of sexual contacts or sexual attraction may have yielded different results (Luo et al., 2014; Martin-Storey, 2015).

Extant literature explores best practices for assessing sexual orientation on surveys. Recommendations from the Williams Institute (2009) and S.B. Austin et al. (2007) recommend that surveys among youth assess sexual orientation by asking questions about attraction rather than identity (S. B. Austin, Conron, Patel, & Freedner, 2007; Badgett, 2009). However, sexual attraction is situational and non-heterosexual youth are often attracted to persons of the same and the opposite sex (Diamond, 1998). Additional discussion of appropriate questions and response options for assessing adolescent sexual orientation are discussed further below in the

section. Lastly, most of these analyses combined gay or lesbian with bisexual students, although it is possibly, if not likely, that their risk behavior patterns differ, particularly regarding violence victimization (and perpetration). For example, at least one study suggests that gay and lesbian adolescents may have different teen dating violence risk patterns from bisexual adolescents (Freedner et al., 2002); therefore, future studies could explore differences in teen dating violence between gay or lesbian and bisexual youth.

### *School violence*

Specific concerns with the YRBS school bullying questions are that the data are self-reported, do not account for perpetration, and therefore do not necessarily address more recent concepts of bullying which indicate important additional roles involved in school bullying (other than bully and victim) (Hamburger, Basile, & Vivolo, 2011; Salmivalli, Kaukiainen, Voeten, & Sinisammal, 2004; Schott & Søndergaard, 2014) Therefore the current study provides only one aspect of the prevalence of school bullying. Moreover, as previously stated, the YRBS school bullying question the item does not indicate *why* students were bullied; it is possible that LGB students in these surveys were bullied for reasons other than their real or perceived sexual orientation. Nonetheless, school bullying prevention should address all forms of bullying, not just those related to sexual orientation. That is, not knowing why students were bullied does not necessarily impact the results or implications of the current study.

There are three concerns regarding the teen dating violence measures in the context of the current study: first, that the measures do not indicate the sex of partner perpetrating and therefore the results cannot be interpreted that the teen dating violence victimization is happening within heterosexual or same-sex relationships. Evidence suggests that the majority of sexual minority youth participate in other-sex romantic relationships during their adolescence (Diamond, 2003b). Nonetheless, teen dating violence victimization is associated with several negative health consequences and is therefore important to measure regardless of whether the perpetrator is the same sex as the victim. Second, that the YRBS is missing a measure on two important aspects of teen dating violence victimization, which are emotional/psychological victimization and stalking; and third, that the survey does

not include perpetration and therefore may be overlooking an important aspect of teen dating violence. There exists a high degree of reciprocity of teen dating violence victimization (Pepler, 2012), as such, it may be useful to have additional information of perpetration among this population.

#### *Reliability of the YRBS survey questions*

YRBS data are self-reported, and the extent of underreporting or overreporting of health-risk behaviors cannot be determined, although the reliability of the YRBSS is generally believed to be sufficient (Brener et al., 2002). Of the seven violence variables included in the present study, four were included in a reliability study conducted by CDC in 2001. The study used test-retest methodology and calculated Kappa coefficients. The four included variables and their Kappa coefficients were: carried a weapon on school property on one or more days during the 30 days before the survey: 57.7%; felt too unsafe to go to school on one or more days during the 30 days before the survey: 42.0%; threatened or injured with a weapon on school property one or more times during the 12 months before the survey: 40.6%; and in a physical fight on school property one or more times during the 12 months before the survey: 64.4%. The reliability study also included a then-current survey item on physical teen dating violence that had a Kappa coefficient of 53.3%; however, that item was updated for the first time for the 2013 YRBS questionnaire. At the time of the CDC reliability study, the standard YRBS questionnaire did not assess bullying, sexual teen dating violence, or sexual orientation. The study found no significant differences in the mean Kappa coefficients by race/ethnicity, sex, or grade (Brener et al., 2002).

CDC has not yet tested the YRBS sexual identity question for reliability or face validity. The literature contains a few other studies of sexual orientation survey measures, some among adults and some among adolescents. The Williams Institute on Sexual Orientation and Gender (i.e., The Williams Institute) is a public policy institute and think tank at the University of California Los Angeles School of Law. In 2003, the Williams Institute formed the Sexual Minority Assessment Research Team (SMART) to develop best practices for scientific gathering of sexual orientation data. The group released a report in 2009 listing specific question wording and response options for use in assessing sexual orientation on surveys. The

report stated that stigma associated with sexual identity labels is highest during adolescents, therefore the response rates may be reduced (Badgett, 2009). The recommendation of this expert gathering was that adolescents should be asked about sexual attraction and one other sexual orientation dimension; in the cases where there is only room for one question surveys should assess sexual attraction (except in studies specifically focused on sexual health and sexual risks). A 2004 reliability study among 100 adolescents also confirmed that sexual attraction was central to adolescent sexual orientation (Friedman et al., 2004); similarly, S.B. Austin et al. conducted a cognitive processing study of 30 adolescents and concluded that participants found the sexual attraction question the easiest option to answer, while sexual identity was the most difficult (S. B. Austin et al., 2007). However, researchers such as Lisa Diamond and Ritch Savin-Williams have extensively described romantic attraction among adolescents as situational, fluid, and non-mutually exclusive (Diamond, 2003a; Diamond, 2003b; R. Savin-Williams & Diamond, 2000). Moreover, sexual identity and sexual attraction are not necessarily concordant, and, among adults, “respondents often conflate aesthetics with sexual desire in their interpretation of [sexual attraction]” (Ridolfo et al., 2012).

The sexual identity question and response options recommended by the Williams Institute are “Do you consider yourself to be: a) Heterosexual or straight, b) Gay or lesbian, or; c) Bisexual?” (Badgett, 2009). However, as described in the current literature review, it is well accepted that sexual identity develops during adolescence and at different times for individuals, therefore, it is both necessary and developmentally appropriate to include a “not sure” or questioning response option. Regarding the “not sure” response option, which has its own aforementioned limitations, the Williams Institute report noted that at least one study of adolescents indicated that a “not sure” response option provides a risk of response set bias (Badgett, 2009; Saewyc et al., 2004), and recommends that an identity question on adolescent surveys includes two “not sure” response options along the lines of “I am not sure yet” and “I am not sure what this question means” (Badgett, 2009 [page 9]). The particular recommendations in this 2009 report were not based on cognitive testing, or reliability or validity studies. A validity study of sexual identity questions among U.S. adults conducted by Ridolfo, Miller, and Maitland acknowledged that non-native English speakers may have more trouble with questions worded similarly

to that which is on the YRBS, namely because “straight” does not have similar translations in other languages like Spanish (Ridolfo et al., 2012). The cognitive processing study from S.B. Austin et al. recommended that sexual identity questions for adolescents include additional response options such as “mostly heterosexual” and “mostly homosexual,” which aligns with the “Kinsey Scale” (the common nickname of the Heterosexual-Homosexual Rating Scale) (Kinsey et al., 1948 [pg 636-659]).

Thus, the extant literature implies that the current YRBS survey item assessing sexual identity may not be optimal; however, the prevalence of each sexual identity category from the present study aligns with similar figures from similar age groups in other federal surveys (e.g., National Survey of Family Growth, (Copen, Chandra, & Febo-Vazquez, 2016)). Additionally, for surveillance purposes, sexual identity is an important demographic measure in a way that sexual attraction inherently cannot be. Future research that assesses test-retest reliability and validity of the YRBS sexual identity item is needed.

The bullying question in the current study was added to the YRBS in 2009, and therefore was not included in the CDC YRBS reliability test. There have been several reviews of the performance of school bullying questions (Hamburger et al., 2011; Vessey, Strout, Difazio, & Walker, 2014), however, these studies review scales and do not look at individual items such as the survey question on the YRBS. The YRBS school bullying question assesses bullying victimization and aligns with the Olweus definition of bullying in that it describes bullying as occurring when a person is repeatedly exposed to negative actions of others, excluding cases when the involved students are of equal standing or power (Olweus, 1994). The YRBS question is also similar to questions assessing school bullying on other global school-based surveys such as the Health Behaviours in School-aged Children (HBSC), which includes a question from the Olweus Bullying Questionnaire (Solberg & Olweus, 2003), “‘How often have you been bullied at school in the past couple of months?’; with the response options ‘I have not been bullied at school in the past couple of months’, ‘It has only happened once or twice’, ‘2–3 times a month’, ‘About once a week’ and ‘Several times a week’” (Cosma, Teutsch, & Walsh, 2015). The Olweus Bullying Questionnaire has good overall internal reliability (Cronbach’s  $\alpha=0.87$  for bullying victimization) (Solberg & Olweus, 2003); however, a study

that compared the performance of the HBSC's general and specific bullying questions among U.S. adolescents concluded that general bullying questions, such as the HBSC victimization question, does not agree well with lengthier, specific scales of bullying victimization (Roberson & Renshaw, 2017). Additionally, Roberson and Renshaw (2017) suggested that the general HBSC bullying question may result in underestimated prevalence of bullying compared to the specific questions. Additional research is needed to compare the YRBS question to more established formats for measuring school bullying.

At the time of the CDC reliability study, the YRBS contained a different survey question for physical dating violence. Starting in 2013 the YRBS added two items to assess teen dating violence victimization, one on physical teen dating violence victimization and one on sexual teen dating violence victimization. These questions have not been tested for reliability or validity. A 2016 review of adolescent dating violence behavior measure by Exner-Cortens et al. found that there were six dating violence measures with acceptable validity and/or reliability; however, all of these were scales (i.e., multi-item questions) and measured sexual and/or physical teen dating violence victimization (Exner-Cortens, Gill, & Eckenrode, 2016a); they also used internal consistency reliability. Exner-Cortens noted that the reviewed psychological/emotional teen dating violence victimization measures did not perform well. In conclusion, this review concluded that there is no "gold standard" for assessing teen dating violence victimization, and recommended that the literature expands to include rigorous testing of adolescent dating violence behavior measures (Exner-Cortens, Gill, & Eckenrode, 2016b).

Finally, any self-reported behaviors among adolescents are subject to limitations in that the over- and under-reporting cannot be determined. This was stated above (Section 7.2.2, page 80). Adolescent surveys in particular may be prone to mischievous responders, or "jokesters," and some previous studies indicate that mischievous responses are prevalent on these surveys and may distort associations, (Cornell, Klein, Konold, & Huang, 2012; Fan et al., 2006) including (and especially) those associations among sexual minority youth (Fish, Watson, Porta, Russell, & Saewyc, 2017; Robinson & Espelage, 2011; Robinson-Cimpian, 2014; R. Savin-Williams & Joyner, 2014). The YRBS questionnaire includes a plea for honesty;



however, the current study must acknowledge that the identified disparities in the study may be exaggerated.

### 7.2.3 Analytic considerations

Random error is the portion of variance in a given measurement that has no apparent connection to any other measurement or variable, and is generally thought to occur due to chance (Porta, 2008). One common statistical solution is to use multiple comparison methods and adjust the alpha and associated confidence intervals; although these processes were not used in the current analyses. Multiple comparisons adjustment may have affected the results of Study III in particular; which had many more comparisons than in the other studies. Therefore, the interpretation of the Study III results should be interpreted with some caution.

It is important to consider the effect that the large sample size has on generated  $p$ -values, particularly when adding the sizeable sampling weights in the local YRBS data. There exists some possibility that any analyses of large, weighted data could be “overpowered,” such that the large sample size may contribute to small  $p$ -values for practically negligible differences in results. Conversely, when studying sexual minority subgroups in a population-based sample design, it can be challenging to obtain an adequate sample ( $n$ ) of sexual minority students, which may yield underpowered analyses.

As described in Section 7.1.4, additional factors that modify, mediate, or otherwise explain the association between sexual identity and school violence were not tested in the analyses, which were generally descriptive. Future research should assess such potential factors, although cross-sectional data such as the YRBS may not be the most appropriate source to answer this type of research question.

Finally, the thesis analyses used several YRBS data types to assess prevalence of school violence by sexual identity, including national, state, large urban school district, and trend data from a single state. Some of these data are publicly available (national, some state and large urban school district) and some must be requested directly from the YRBS coordinator within the jurisdiction (e.g., Massachusetts).

Results from the data comparability analysis suggest that the prevalence of school violence variables and sexual identity vary by the YRBS jurisdiction type (i.e., national, state, or district), but not by the availability of the data. Similarly, the relative associations had the same direction for all data types (e.g.,  $>1.0$ ) but the magnitude of the associations differed. These results have important implications for researchers as the YRBSS sexual identity data become more widely used and offer a comparison of the same analysis performed across different data sets. The national data have a much smaller sexual minority  $N$  than the combined local data sets and, relatedly, larger variance, but they have the benefit of being nationally-representative and diverse. The state and district data sets, conversely, have substantial sexual minority sample sizes, which allow for more in-depth analysis (for example, prevalence of behaviors within one race/ethnicity by sex by sexual identity subgroup), but the generalizability of the results is difficult to describe. Further, one suspects that there may be inherent differences between the sites that include sexual orientation questions and sites that choose to remove them from their surveys, which is another strike against potential generalizability. Lastly, as stated above, it is possible that very large combined data sets could be overpowered, indicating strong statistical differences in analyses where the practical significance is negligible.

Although the seven school violence variables did not show conflicting results by data type, this is not true for some of the other 80 questions on the 2015 Standard YRBS. These data were not shown; however, they indicate that researchers should be cognizant of implications that accompany YRBSS data selection.

### 7.3 Public health implications

These results of the present study can be used to catalyze prevention efforts in schools across the United States. Surveillance provides information for action, yet still few nations assess adolescent sexual identity and therefore miss the opportunity to implement programs and policies that would benefit these students. Additionally, these surveillance data identify the problem, but there is an urgent need to understand *why* these disparities exist before adequate prevention can be developed.

Foremost, there is generally a dearth of evidence-based, school-based health promotion efforts aimed towards healthy sexual identity development. Although most sexual minority youth will reach adulthood successfully, the results of this study and others indicate that there remain too many who still are not getting the help and/or support at school that they may need. Positive self-esteem and self-concept, which can be hindered in LGB adolescents by internalized homophobia and homophobic microaggressions, are protective against school violence and may alleviate the magnitude of the long-term effects of victimization. Health promotion programs addressing sexual identity in adolescent are needed. Relatedly, social stigma and minority stress are common theories in the literature to explain the disproportion effect of victimization on health risk behaviors and outcomes among LGB youth (Hatzenbuehler, 2009; Meyer, 2003). As such, many experts are now focusing on integrating resiliencies and coping strategies into interventions among gay or bisexual individuals (e.g., (A. Austin & Craig, 2015; Herrick, Egan, Coulter, Friedman, & Stall, 2014; Mayer, Garofalo, & Makadon, 2014).

Prevention of school violence, including teen dating violence, requires involvement of schools, teachers, parents, and communities. Social and institutional support is important for the health and well-being of sexual minority youth. Important implications exist for intervention and prevention programming for schools and families. A positive school climate, defined as “individual perceptions that school was a good place to be, where students and teachers could be trusted, students were treated with respect, and rules were fair” (Guerra et al., 2011), is negatively associated with bullying perpetration and victimization. Regardless, research suggests schools with shared beliefs and attitudes supporting bullying and aggression endorse a negative school climate in which these behaviors become the norm (Unnever & Cornell, 2003). Further, in schools where teachers endorse attitudes that are permissive or dismissive of bullying occurrence, victimization rates are high (Holt M, Keyes M, Koenig B., 2011), and a negative environment has been linked to increased risk for suicide attempts among sexual minority youth (Hatzenbuehler, 2011). Sexual minority youth who reported receiving support from schools had fewer negative health outcomes such as depression, suicidality, and substance use (Espelage, Aragon, Birkett, & Koenig, 2008). Furthermore, another study found that youth perception of staff support had a buffering effect on sexual

minority youth suicide risk, making it even more important that school staff, including school counselors and mental health professionals, be supportive of the unique needs of sexual minority youth (Goodenow, Szalacha, & Westheimer, 2006). The 2015 National School Climate Survey report indicated that one major issue for LGBT teens at schools was not necessarily their peers, but rather the teachers – nearly 1 in 10 LGBT students surveyed reported hearing homophobic remarks from teachers themselves (Kosciw et al., 2016).

A comprehensive approach utilizing evidence-based programs and policies may be implemented to provide a positive school climate and reduce school violence and bullying broadly, but especially among sexual minority students. This comprehensive approach may include interventions with students in schools; among adults, parents, and families; and within communities. In schools, research has shown that systematic and environment-based interventions, rather than individually focused interventions are more effective (Hahn et al., 2007). Additionally, schools with higher levels of peer aggression were found to be associated with an increased risk of homophobic victimization compared to social climates than homophobic (but less aggressive) social climates (Poteat, 2008). Several reviews of existing comprehensive school-based programs, some of which included systematic and environment-based interventions, demonstrated that they are effective at preventing a substantial amount of violence and aggression (Hahn et al., 2007). In addition, antibullying policies that specifically address sexual minority students may benefit all students and reduce overall peer victimization and may reduce suicide attempts among sexual minority students (Hatzenbuehler & Keyes, 2013).

School Health Profiles (i.e., Profiles) is a system of surveys assessing school health policies and practices in all states and selected large urban school districts. Profiles data from 2012 showed that across 45 states and 17 large urban school districts, the median percent of schools with policies that prohibited harassment based on a student's perceived or actual sexual orientation or gender identity was 87.2% (range: 61.9%-95.5%) and 92.6% (54.7%-100.0%), respectively (Demissie et al., 2013).

Gay-straight alliances (GSAs) are another tool for improving school climate for sexual minority students. GSAs are “student led clubs open to youth of all sexual

orientations with the purpose of supporting sexual minority students and their heterosexual allies and also reducing prejudice, discrimination, and harassment within the school” (Goodenow et al., 2006). Sexual minority students in schools with GSAs report a greater sense of school connectedness (Kosciw et al., 2013) and lower rates of feeling unsafe than students in schools without a GSA (Kosciw et al., 2013; C. Lee, 2002). The presence of GSAs in schools has been shown to reduce truancy, violent incidents, and health risk behaviors including cigarette smoking, drinking alcohol, suicide attempts, and having sex with casual partners among all students, but these results were more pronounced among sexual minority students (Poteat, Sinclair, DiGiovanni, Koenig, & Russell, 2013). Unfortunately, Profiles found the median percent of schools across states and large urban school districts with a GSA or similar club was only 22.9% (range: 6.3%-53.2%) and 38.2% (range: 18.3%-88.9%), respectively (Demissie et al., 2013), although the 2015 National School Climate Survey indicated an increasing trend in GSAs (Kosciw et al., 2016).

For schools that do not have a GSA, implementing small-scale interventions may reduce at-school victimization. The 2009 School Crime Supplement of the National Crime Victimization Survey found that adding an adult supervisor in hallways was associated with a decrease in all victimization types (Blosnich & Bossarte, 2011). Having a single supportive adult at school can also have strong positive influence on sexual minority students (Kosciw et al., 2013), but Profiles results suggest teachers may not have the training they need to be supportive. The median percent of lead health education teachers across states who received professional development (PD) in the 2 years before completing the survey on teaching students of different sexual orientations or gender identities was only 12.6% (range: 7.5%-29.5%), compared with a median percent of 53.6% (range: 33.7%-77.8%) of teachers who wanted to receive PD on this topic; the corresponding numbers for the district data set were 30.5% (range: 13.5%-64.6%) of teachers who had received PD compared with a median of 70.9% (range: 45.0%-84.5%) of teachers who wanted to receive PD on this topic (Demissie et al., 2013).

Parents and communities may also improve school engagement and reduce victimization. Parents play a key role in preventing and responding to bullying and active parental monitoring yields better health outcomes and increased school engagement for adolescents (CDC, 2012; Hawkins J, Herrenkohl TI, Farrington DP,

et al., 2005). Parental involvement in schools and active parent-teacher associations, has been associated with positive academic and behavioral outcomes in children (Hill et al., 2004), and parent trainings/meetings have been shown to be among the most effective strategies to decrease school bullying (Farrington DP, 2009). Parental support has been associated with reduced suicidality and increased school engagement among sexual minority students facing school violence and bullying (Poteat et al., 2011), and sexual minority youth with positive support from families report less violence victimization (D'augelli, Grossman, & Starks, 2008; Espelage et al., 2008). However, sexual minority youth experiencing high rates of family rejection are also more likely to experience negative health outcomes (Ryan, Huebner, Diaz, & Sanchez, 2009); accordingly, intervention and counseling with parents to promote positive family reactions may decrease these negative experiences (Bouris et al., 2010).

There are several systematic reviews and meta-analyses of school-based interventions to prevent bullying and peer aggression (for example: (Cantone et al., 2015; Langford et al., 2015; S. Lee, Kim, & Kim, 2015; Merrell, Gueldner, Ross, & Isava, 2008; Park-Higgerson, Perumean-Chaney, Bartolucci, Grimley, & Singh, 2008; Polanin, Espelage, & Pigott, 2012; Ttofi & Farrington, 2011; Vreeman & Carroll, 2007), with inconsistent conclusions about the effectiveness of programs. The previous discussion describes general interventions for reducing general school violence and improving school climate; however, there are many specific school-based interventions to prevent bullying. Two of these programs are among the few that are well-studied and have an evidence base (Shetgiri, Espelage, & Carroll, 2015) and are described here.

The first is KiVa, a national bullying prevention program in Finland, which was developed in Finland by psychology professors at the University of Turku and has since been implemented successfully in 90% of schools in Finland (Salmivalli, Poskiparta, Ahtola, & Haataja, 2013). KiVa addresses all students through student lessons and virtual learning environments which primarily focus on bullying prevention. Second, KiVa includes directed actions towards bullying after it has emerged, which consists of discussions between the perpetrators, victims, and teachers. The primary aim of KiVa is to reduce bullying and victimization through bystander intervention and training (Yang & Salmivalli, 2015). KiVa has been

evaluated in Finland where it has significantly decreased bullying and victimization and increased empathy towards victims (Salmivalli et al., 2013), although the largest effects are in primary school. KiVa also has been shown to significantly increase teachers' self-efficacy for preventing and intervening in bullying (Ahtola, Haataja, Karna, Poskiparta, & Salmivalli, 2012). Beyond Finland, KiVa has been evaluated in the Netherlands (van der Ploeg, Steglich, & Veenstra, 2016) and Italy (Nocentini & Menesini, 2016) and was shown to have positive impact in both countries. As of February 2018, KiVa was undergoing evaluation in Chile, Estonia, Greece, South Africa, the United Kingdom and the United States (KiVa School programme, 2018).

The second is the Olweus Bully Prevention Program (OBPP), developed in 1983 and implemented throughout Norway. The hallmark of this program is bullying awareness that is comprehensive in its approach and implemented in classroom, school-wide, individual, and community components. A systematic review evaluated the effectiveness of various school-based bullying prevention programs and suggested that the hallmarks of OBPP were the most effective (Ttofi & Farrington, 2011). OBPP has been evaluated in the United States and results from one evaluation suggest the program is effective for reducing bullying, bullying victimization, and general antisocial behavior (e.g., vandalism) (Olweus, 2005); however, more broadly the results of the U.S. evaluations have been mixed (Bauer, Lozano, & Rivara, 2007).

A 2014 WHO report indicated that 68% of countries have dating violence prevention programs in schools (Butchart & Mikton, 2014). Lundgren and Amin (2015) describe evidence for teen dating violence prevention and conclude that school-based teen dating violence prevention programs are generally effective (Lundgren & Amin, 2015), and also recommended programs with long-term investment rather than programs with a single event. Lester's 2017 systematic review of school-based violence prevention interventions found some evidence for school-based prevention of teen dating violence victimization (Lester, Lawrence, & Ward, 2017). Although not specific to sexual minority youth, recently developed teen dating violence prevention programming has sought to use more gender-neutral language when teaching youth about dating violence. For example, programs such as CDC's Dating Matters© comprehensive prevention model (Tharp, 2012) and Shifting Boundaries (Taylor, Stein, Mumford, & Woods, 2013) focus on raising awareness of dating violence and teaching about healthy dating relationships without sex-specific

language (i.e., boys should not hit girls). Interventions such as these may also decrease dating violence in sexual minority youth; however, they have yet to be evaluated with this subsample of youth. Lastly, several studies have found evidence of an association between bullying and teen dating violence (perpetration and victimization) (Pepler, 2012; Vivolo-Kantor, Massetti, Niolon, Foshee, & McNaughton-Reyes, 2016) it follows logically that these aggressive youth may have similar targets/victims. Perhaps school bullying prevention programs that are effective for reducing bullying perpetration and victimization may simultaneously reduce TDV among students, particularly those that focus on empathy building and bystander intervention (Pepler, 2012).



## 8 SUMMARY AND FUTURE DIRECTIONS

School violence, including peer victimization, bullying, and teen dating violence, are prevalent among U.S. high school students, and disproportionately so among LGB students compared to their heterosexual peers. While these results may not be surprising, they contribute to the literature by providing evidence from large-scale, diverse, population-based samples of adolescents. Globally there are almost no other national surveys that are capable of estimating school violence by sexual identity because few (if any) national school-based surveys currently assess sexual identity, although a handful assess either sexual attraction or sex of sexual partners. Sexual identity is an important construct for assessing peer victimization and harmful social relationships by sexual orientation, because sexual identity is inherently “formed within a social context and defines for individuals their relationship to other individuals, groups, and sociopolitical institutions within that context” (Rust Paula, 1993; Ridolfo et al., 2012) The well-established sequelae of adolescent school victimization (including teen dating violence victimization) may prove to be even more severe among LGB individuals, whose victimizations can be compounded by social and structural stigma (Hatzenbuehler, 2009; Hatzenbuehler & Keyes, 2013; Hatzenbuehler, 2017; Meyer, 2003). Schools play an important role for primary prevention and intervention of peer aggression, victimization, and teen dating violence for all youth. Comprehensive school-based interventions may be effective in improving the overall school climate, and strategies implemented specifically to address the concerns of sexual minority students may play an even greater role.

Future studies are needed to assess etiology, risk factors, protective factors, and effective policies and programs for school violence that are specific to LGB adolescents. This should include school violence perpetration by sexual identity, not just victimization. Though the current data are not conducive to etiological research, it may be possible to utilize them (or similar data) for assessing school-level factors and contributions to the overall disparities in victimizations. For example, assessing the intra-class correlation of the schools may indicate if the variance in school

violence can be explained by the school-level factors such as norms or teachers. Future studies should also address racial/ethnic differences in LGB experiences at school, as well as the experiences of other intersectionalities. Lastly, global ascertainment of the prevalence of LGB-identified students is needed to better understand the unique experiences these students have at school around the world.

## 9 CONCLUSIONS

The prevalence of school violence remains high for all students despite violence prevention efforts.

- Compared to those identifying as heterosexual, students identifying as gay or lesbian experienced higher prevalence of school violence (peer victimization and bullying), particularly among male students. Being bullied at school was the most prevalent behavior among gay male students. Bisexual male students had similarly higher prevalence compared to heterosexual male students. The results of multiple logistic regression showed that LGB female students had higher prevalence of the behaviors compared to their straight counterparts.

- In Massachusetts during 1995 to 2015, the prevalence of two peer victimization behaviors decreased overall and among heterosexual and LGB students. During 2009 to 2015, having been bullied on school property decreased overall and among heterosexual students, but no secular trend was detected among LGB students. In 2015, the prevalence of being bullied on school property and the prevalence of having missed school because of safety concerns remained higher among LGB compared to heterosexual students.

- Generally, LGB youth had greater prevalence and frequency of teen dating violence victimization compared with heterosexual youth. Prevalence of teen dating violence victimization within sexual identity subgroups further differed by sex. Students who were not sure of their sexual identity had the highest risk of most

categories of teen dating violence victimization when adjusting for sex, race/ethnicity, and grade in school.

- A data comparability analysis assessing bivariate and adjusted associations between school violence and sexual identity by data type indicated that most data users could find results consistent with those above. Generally, YRBS analytic results may vary depending on the YRBS data source in both prevalence estimate and relative prevalence. The Youth Risk Behavior Surveillance System is not designed for local sites to aggregate up to national levels nor for the national results to allow for subnational estimates; this is clear from the results of the data type comparison. Researchers using Youth Risk Behavior Surveillance System data should select YRBS's and assemble analytic data sets with this expectation and should consider generalizability (i.e., external validity) when making these decisions. A further implication is that a single prevalence study should be interpreted with appropriate skepticism and multiple data sources and studies are necessary for consensus, even when studies are based on large-scale, population-based data.

- Sexual identity is but one component of sexual orientation, which is intangible and difficult to measure particularly among adolescents. The results and implications of the current study would likely differ in many ways if a different phenomenon of sexual orientation had been used as the primary measure. Additionally, the sexual identity question has several limitations and may have resulted in some misclassification (i.e., information bias).

- School violence, including peer victimization, bullying, and teen dating violence victimization is preventable, and school-based policies and programs have potential to greatly decrease bullying, teen dating violence victimization, and/or and general violence or improve school climate or engagement; however, more work is needed to identify interventions that are effective for non-heterosexual students.

- Although many nations around the world assess school violence among youth, especially bullying, relatively few nations assess sexual orientation among adolescents on large-scale surveys or in behavioral monitoring systems. This makes it difficult or impossible to monitor bullying among these particularly vulnerable youth. Globally, future studies that assess sexual orientation and school violence can provide information for action and make early progress towards eliminating disparities in these harmful social experiences that often have long-term negative impacts for many involved.



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## ORIGINAL PUBLICATIONS



# PUBLICATION

I

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Original article

## School Violence and Bullying Among Sexual Minority High School Students, 2009–2011

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 A B S T R A C T

**Purpose:** School-based victimization has short- and long-term implications for the health and academic lives of sexual minority students. This analysis assessed the prevalence and relative risk of school violence and bullying among sexual minority and heterosexual high school students.

**Methods:** Youth Risk Behavior Survey data from 10 states and 10 large urban school districts that assessed sexual identity and had weighted data in the 2009 and/or 2011 cycle were combined to create two large population-based data sets, one containing state data and one containing district data. Prevalence of physical fighting, being threatened or injured with a weapon, weapon carrying, and being bullied on school property and not going to school because of safety concerns was calculated. Associations between these behaviors and sexual identity were identified.

**Results:** In the state data, sexual minority male students were at greater risk for being threatened or injured with a weapon, not going to school because of safety concerns and being bullied than heterosexual male students. Sexual minority female students were at greater risk than heterosexual female students for all five behaviors. In the district data, with one exception, sexual minority male and female students were at greater risk for all five behaviors than heterosexual students.

**Conclusions:** Sexual minority students still routinely experience more school victimization than their heterosexual counterparts. The implementation of comprehensive, evidence-based programs and policies has the ability to reduce school violence and bullying, especially among sexual minority students.

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 IMPLICATIONS AND  
 CONTRIBUTION

Two large population-based data sets based on Youth Risk Behavior Survey (YRBS) data demonstrate that sexual minority students are at greater risk for school violence and bullying than heterosexual students. Comprehensive, evidence-based programs and policies to reduce violence and bullying on school property may decrease victimization and its associated negative consequences.

Schools are a place of learning and growth for most youth. However, they may also be a place for victimization from school violence and bullying. The 2012 Indicators of School Crime and Safety survey of high school students found that 7% reported being threatened with a gun or knife, 9% were targets of

hate-related words, and 28% reported bullying victimization [1]. Victimization that occurs on school grounds can create an atmosphere where students feel unsafe. Multiple studies have found that victims of school violence and bullying are more likely to feel unsafe at school [2], feel less connected to school [3], perform poorly academically [4], and drop out of school [5].

Research also indicates that specific subgroups of students including sexual minority (i.e., gay, lesbian, or bisexual) students are at increased risk for school violence and bullying. A 2011 study of a convenience sample of sexual minority students found that 82% were verbally harassed at school because of their sexual orientation, and more than 18% were physically assaulted [6].

**Disclaimer:** The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Sexual minority youth may experience short- and long-term health problems because of school violence and bullying, including increased risk for suicide and other mental health problems [7–9], cigarette smoking, alcohol and other drug use, and unsafe sexual behaviors [10,11].

The research on sexual minority youth and their experiences at school is emerging, but only a limited amount of the research uses population-based data [12,13]. Previous studies have had small sample sizes [8,14], have been based on convenience samples [6], were not inclusive of racial/ethnic minority students, or were conducted more than a decade ago [10,15]. Thus, an important next step is to better understand school violence and bullying among sexual minority students using large, racially/ethnically diverse, contemporary, population-based data sets. YRBSs conducted by some states and large urban school districts (i.e., districts) monitor priority health-risk behaviors among high school students, including school violence and bullying, and assess sexual identity. The purposes of this study are to establish the prevalence of school violence and bullying by sexual identity and quantify the increased prevalence of school violence and bullying among sexual minority students compared with heterosexual students using geographically and racially/ethnically diverse, recent, population-based data.

## Methods

### Sample and measures

The Centers for Disease Control and Prevention supports state and local education and health agencies to conduct YRBSs. This study was based on two data sets: one created by combining YRBS data from 10 states (Connecticut, Delaware, Hawaii, Illinois, Maine, Massachusetts, North Dakota, Rhode Island, Vermont, and Wisconsin) and the other created by combining data from 10 districts (Boston, Chicago, District of Columbia, Houston, Los Angeles, Milwaukee, New York City, San Diego, San Francisco, and Seattle). Each of these states and districts included a question on sexual identity in their YRBS questionnaire and had weighted data in the 2009 and/or 2011 cycle. The creation of these two data sets was done out of an abundance of caution to avoid potential overlap in populations (e.g., Chicago and Illinois). Additionally, the district samples include only urban students, while the state samples include both urban and rural students, so a single combined data set may have biased results towards the urban students. All surveys were conducted during the spring of 2009 and/or 2011 except in Chicago (fall of 2010), the District of Columbia (fall of 2010), and Seattle (fall of 2008 and 2010).

Each site used independent, cross-sectional, two-stage cluster samples designed to generate data representative of public school students in grades 9–12 in their jurisdiction. Students completed a site-specific, self-administered questionnaire. Participation in the surveys was anonymous and voluntary, and local parental consent procedures were followed. State and local health and education agencies followed local Institutional Review Board policies and procedures. Data from all sites were edited, cleaned, and weighted using a standardized process; this included editing and cleaning for logical inconsistencies and out-of-range responses [16]. Sampling weights were assigned to account for nonresponse and to weight the sampled population to the population size of the jurisdiction. Detailed information about the methodology of the state and district YRBSs, including all editing, cleaning, and weighting procedures, can be found elsewhere [16].

Most sites assessed sexual identity using the question “Which of the following best describes you?” with the response options “heterosexual (straight),” “gay or lesbian,” “bisexual,” and “not sure.” Some sites slightly varied the punctuation of the response options (e.g., “heterosexual, straight” instead of “heterosexual [straight]”). Washington, D.C., in 2009, assessed sexual identity using the same question, but with the response options “Heterosexual (straight),” “gay,” “lesbian,” “bisexual,” and “not sure.” In this case, “gay” and “lesbian” were combined for consistency with the other sites. For all sites and all years, students who responded “not sure” were excluded from analysis, as were students who did not answer this question.

Five items were used to measure school violence (i.e., physical fighting on school property, being threatened or injured with a weapon on school property, weapon carrying on school property, and not going to school because of safety concerns) and bullying on school property. Physical fighting on school property and being threatened or injured with a weapon on school property were assessed with the questions “During the past 12 months, how many times were you in a physical fight on school property?” and “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?” respectively. The response options for both questions were “0 times,” “1 time,” “2 or 3 times,” “4 or 5 times,” “6 or 7 times,” “8 or 9 times,” “10 or 11 times,” or “12 or more times.” For this analysis, responses to each of these two questions were collapsed into dichotomous responses as “0 times” or “1 or more times.”

Carrying a weapon on school property and not going to school because of safety concerns were assessed by asking “During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?” and “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?” respectively. The response options for each question were “0 days,” “1 day,” “2 or 3 days,” “4 or 5 days,” and “6 or more days.” For this analysis, responses to each of these two questions were collapsed into dichotomous responses as “0 days” or “1 or more days.” Being bullied on school property was assessed with one item, “During the past 12 months, have you ever been bullied on school property?” with the response options “yes” or “no.”

The standard YRBS questionnaire uses two questions to assess race and ethnicity [17]. This analysis uses a three-level race/ethnicity classification: white, non-Hispanic (referred to as “white”); black, non-Hispanic (referred to as “black”); Hispanic or Latino (referred to as “Hispanic”). The numbers of students from other racial/ethnic groups were too small for meaningful analysis; these students are included in the analyses, but their results are not shown separately.

### Statistical analysis

Because male and female adolescents may experience school violence and bullying differently [18], all analyses were stratified by sex. Statistical interaction testing did not indicate a need to stratify by race/ethnicity. Chi-squared tests were used to assess significant bivariate differences in school violence and bullying by sexual identity. Multiple logistic regression was used to separately model each school violence and bullying outcome variable on categorical race/ethnicity, grade, and sexual identity variables. Results from the multivariable analyses are reported as adjusted prevalence ratios (APRs) with 95% confidence intervals.

**Table 1**  
Sexual identity by demographic subgroup among high school students—selected sites, YRBSS, 2009–2011

	Subgroup	All students		Heterosexual			Gay or lesbian			Bisexual			Not sure			
		N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI
States <sup>a</sup>	<b>All</b>	<b>71,950</b>		<b>65,463</b>	<b>91.6</b>	<b>91.1–92.1</b>	<b>1,174</b>	<b>1.6</b>	<b>1.4–1.8</b>	<b>3,246</b>	<b>4.3</b>	<b>4.0–4.7</b>	<b>2,067</b>	<b>2.5</b>	<b>2.2–2.7</b>	
	Male	35,187	50.6	49.2–52.0	32,856	94.0	93.4–94.6	650	1.8	1.6–2.1	750	2.1	1.8–2.4	931	2.1	1.8–2.5
	Female	36,057	49.4	48.0–50.8	32,058	89.4	88.5–90.2	476	1.3	1.1–1.6	2,444	6.5	5.9–7.2	1,079	2.8	2.4–3.2
Districts <sup>c</sup>	White <sup>b</sup>	47,105	66.4	63.7–69.0	43,708	92.9	92.3–93.5	557	1.3	1.1–1.6	1,855	3.6	3.2–4.0	985	2.2	1.8–2.5
	Black <sup>b</sup>	5,263	12.3	10.4–14.5	4,749	90.3	88.8–91.7	114	1.6	1.2–2.3	231	5.4	4.4–6.7	169	2.6	2.0–3.5
	Hispanic	7,920	13.2	11.6–15.0	6,809	88.5	87.2–89.7	254	2.5	2.0–3.1	519	6.0	5.2–6.9	338	3.0	2.4–3.7
	<b>All</b>	<b>44,199</b>		<b>38,842</b>	<b>88.0</b>	<b>87.5–88.5</b>	<b>1,018</b>	<b>2.4</b>	<b>2.1–2.6</b>	<b>2,764</b>	<b>6.1</b>	<b>5.7–6.5</b>	<b>1,575</b>	<b>3.6</b>	<b>3.3–3.9</b>	
	Male	20,851	49.2	48.0–50.5	19,201	91.7	91.0–92.3	515	2.7	2.4–3.0	546	2.7	2.3–3.0	589	3.0	2.6–3.4
	Female	23,207	50.8	49.6–52.0	19,555	84.6	83.8–85.4	481	2.0	1.7–2.2	2,202	9.3	8.7–10.0	969	4.1	3.8–4.5
	White <sup>b</sup>	5,564	12.5	11.2–13.8	5,033	90.6	89.4–91.7	103	1.7	1.3–2.2	241	4.3	3.6–5.1	187	3.4	2.7–4.1
	Black <sup>b</sup>	10,746	29.5	27.2–31.8	9,457	87.8	86.7–88.7	288	2.8	2.4–3.3	653	6.0	5.3–6.8	348	3.5	3.0–4.0
	Hispanic	17,241	45.0	42.7–47.4	14,866	87.1	86.4–87.8	426	2.3	2.0–2.7	1,359	7.2	6.7–7.8	590	3.4	3.0–3.8

CI = confidence interval; YRBS = Youth Risk Behavior Survey.

<sup>a</sup> Combined data set includes data from the following YRBSS: Connecticut 2011, Delaware 2009, Delaware 2011, Hawaii 2011, Illinois 2009, Illinois 2011, Maine 2009, Maine 2011, Massachusetts 2009, Massachusetts 2011, North Dakota 2009, North Dakota 2011, Rhode Island 2009, Rhode Island 2011, Vermont 2009, Vermont 2011, and Wisconsin 2011.

<sup>b</sup> Non-Hispanic.

<sup>c</sup> Combined data set includes data from the following YRBSS: Boston, MA, 2009; Boston, MA, 2011; Chicago, IL, 2009, Chicago, IL, 2010; Washington, DC, 2010; Houston, TX, 2011; Los Angeles, CA, 2009; Los Angeles, CA, 2011; Milwaukee, WI, 2011; New York City, NY, 2009; New York City, NY, 2011; San Diego, CA, 2011; San Francisco, CA, 2009; San Francisco, CA, 2011; Seattle, WA, 2008; and Seattle, WA, 2010.

The reference group for all APRs was heterosexual students. Finally, interactions between the two datasets and sexual identity were tested for each school violence and bullying variable. All analyses were performed in SUDAAN version 11.0.0 (RTI, Research Triangle Park, NC) to accommodate the complex nesting structure and the student-level weights. The a priori significance level for all analyses was set at 5%.

**Results**

The overall response rates for the surveys in the state data set ranged from 60% to 84% (median: 68%), and the overall response rates for the surveys in the district data set ranged from 67% to 88% (median: 78%). The state data set had a combined sample size of 74,581 students. Among these students, 71,950 (96.5%) responded to the sexual identity question. The district data set had a combined sample size of 47,724 students. Among these students, 44,199 (92.6%) responded to the sexual identity question.

Table 1 lists the distribution by sex, race/ethnicity, and sexual identity in both data sets. The data sets had very similar distributions by sex but very different distributions by race/ethnicity. In the state data set, 66.4% of the students were white compared with 12.5% of the students in the district data set. In the state data set, 94.0% of the male students were heterosexual, 1.8% were gay, 2.1% were bisexual, and 2.1% were unsure, and 89.4% of the female students were heterosexual, 1.3% were lesbian, 6.5% were bisexual, and 2.8% were unsure. Similarly, in the district data set, 91.7% of the male students were heterosexual, 2.7% were gay, 2.7% were bisexual, and 3.0% were unsure, and 84.6% of the female students were heterosexual, 2.0% were lesbian, 9.3% were bisexual, and 4.1% were unsure.

Table 2 lists the prevalence estimates, confidence intervals, and chi-squared p-values of school violence and bullying behaviors by sexual identity and sex. All school violence and bullying behaviors were strongly associated with sexual identity for male and female students in both data sets. Male students

compared with female students across all types of sexual identity generally had at least equal, if not significantly higher, prevalence rates for all behaviors. In the state data set, being bullied on school property among gay (43.1%) and bisexual (35.2%) male students was the most commonly reported behavior. In contrast, 18.3% of heterosexual male students reported this behavior. About one quarter (26.1%) of bisexual male students had been in a physical fight on school property compared with 11.3% of heterosexual male students. Similarly, about one quarter of gay (24.8%) and bisexual (23.1%) male students had been threatened or injured with a weapon on school property compared with 7.8% of heterosexual male students.

In the district data set, being in a physical fight on school property (33.6%) and being bullied on school property (33.2%) among bisexual male students were the most commonly reported behaviors. In contrast, among heterosexual male students, 16.3% had been in a physical fight on school property and 11.4% had been bullied on school property. About one quarter of gay students had been in a physical fight on school property (24.7%), threatened or injured with a weapon on school property (25.0%), and been bullied on school property (25.7%), and 25.8% of bisexual male students had been threatened or injured with a weapon on school property. In contrast, among heterosexual male students, 16.3% had been in a physical fight on school property, 9.0% had been threatened or injured with a weapon on school property, and 11.4% had been bullied on school property.

Table 3 lists the APRs of school violence and bullying behaviors. In the state data set, gay male students were more likely than heterosexual male students to have been threatened or injured with a weapon on school property, not gone to school because of safety concerns, and been bullied on school property. Bisexual male students were more likely than heterosexual male students to have experienced all five school violence and bullying behaviors. Compared with heterosexual male students, gay students were about three times more likely to have been threatened or injured with a weapon on school property and not

**Table 2**

Prevalence of school violence and bullying by sexual identity and tests of bivariate association, by sex—selected sites, YRBSS, 2009–2011

Population	Behavior	Sex	Heterosexual		Gay or lesbian		Bisexual		p value <sup>g</sup>
			%	95% CI	%	95% CI	%	95% CI	
States <sup>a</sup>	In a physical fight on school property <sup>b</sup>	Male	11.3	10.5–12.1	12.7	9.0–17.8	26.1	20.4–32.8	.0001
		Female	5.2	4.7–5.9	16.9	11.7–23.9	13.2	9.9–17.4	<.0001
	Threatened or injured with a weapon <sup>c</sup> on school property <sup>b</sup>	Male	7.8	7.2–8.5	24.8	17.9–33.3	23.1	17.6–29.6	<.0001
		Female	4.0	3.5–4.6	16.2	10.6–23.9	10.7	8.0–14.0	<.0001
	Carried a weapon <sup>c</sup> on school property <sup>d</sup>	Male	6.1	5.4–6.8	8.7	5.7–13.0	15.5	11.0–21.4	.0009
		Female	1.5	1.2–1.9	10.9	6.7–17.5	8.9	6.6–12.0	<.0001
	Did not go to school because of safety concerns <sup>d</sup>	Male	4.2	3.7–4.8	13.0	8.6–19.1	13.6	9.7–18.6	<.0001
		Female	4.5	3.9–5.1	16.2	10.7–23.7	9.2	6.6–12.6	<.0001
	Bullied on school property <sup>e</sup>	Male	18.3	17.1–19.7	43.1	34.9–51.8	35.2	28.8–42.1	<.0001
		Female	19.9	18.7–21.2	29.5	21.4–39.1	35.3	31.1–39.7	<.0001
Districts <sup>f</sup>	In a physical fight on school property <sup>b</sup>	Male	16.3	15.3–17.3	24.7	18.4–32.2	33.6	26.4–41.7	<.0001
		Female	8.9	8.2–9.8	16.4	12.0–22.1	17.5	14.6–21.0	<.0001
	Threatened or injured with a weapon <sup>c</sup> on school property <sup>b</sup>	Male	9.0	8.3–9.8	25.0	20.2–30.6	25.8	20.3–32.1	<.0001
		Female	4.5	4.0–5.0	15.0	11.2–19.8	11.1	9.3–13.2	<.0001
	Carried a weapon <sup>c</sup> on school property <sup>d</sup>	Male	5.3	4.7–5.9	13.7	9.8–18.9	16.4	11.8–22.3	<.0001
		Female	1.8	1.5–2.3	11.0	7.3–16.1	6.7	5.3–8.5	<.0001
	Did not go to school because of safety concerns <sup>d</sup>	Male	7.4	6.7–8.2	21.5	16.3–27.9	21.1	16.7–26.4	<.0001
		Female	8.1	7.4–8.9	17.8	13.7–22.8	13.6	11.8–15.6	<.0001
	Bullied on school property <sup>e</sup>	Male	11.4	10.6–12.2	25.7	20.8–31.4	33.2	27.6–39.4	<.0001
		Female	11.8	11.0–12.6	14.0	9.9–19.6	18.8	16.2–21.7	<.0001

CI = confidence interval; YRBSS = Youth Risk Behavior Survey.

<sup>a</sup> Combined data set includes data from the following YRBSSs: Connecticut 2011, Delaware 2009, Delaware 2011, Hawaii 2011, Illinois 2009, Illinois 2011, Maine 2009, Maine 2011, Massachusetts 2009, Massachusetts 2011, North Dakota 2009, North Dakota 2011, Rhode Island 2009, Rhode Island 2011, Vermont 2009, Vermont 2011, and Wisconsin 2011.<sup>b</sup> One or more times during the 12 months before the survey.<sup>c</sup> Such as a gun, knife, or club.<sup>d</sup> On at least 1 day during the 30 days before the survey.<sup>e</sup> During the 12 months before the survey.<sup>f</sup> Combined data set includes data from the following YRBSSs: Boston, MA, 2009; Boston, MA, 2011; Chicago, IL, 2009; Chicago, IL, 2010; Washington, DC, 2010; Houston, TX, 2011; Los Angeles, CA, 2009; Los Angeles, CA, 2011; Milwaukee, WI, 2011; New York City, NY, 2009; New York City, NY, 2011; San Diego, CA, 2011; San Francisco, CA, 2009; San Francisco, CA, 2011; Seattle, WA, 2008; and Seattle, WA, 2010.<sup>g</sup> Based on chi-squared tests used to assess significant bivariate differences by sexual identity.

gone to school because of safety concerns and bisexual male students were about three times more likely to have not gone to school because of safety concerns.

In the district data set, gay male students and bisexual male students were more likely than heterosexual male students to have experienced all five school violence and bullying behaviors. Compared with heterosexual male students, gay students were about three times more likely to have not gone to school because of safety concerns and bisexual male students were about three times more likely to have carried a weapon and been bullied on school property.

In the state data set, lesbian and bisexual female students were more likely than heterosexual female students to have experienced all five school violence and bullying behaviors, although the increased risks were generally not as high among bisexual female students as they were for lesbian students. Compared with heterosexual female students, lesbian students were about three times more likely to have been in a physical fight on school property and not gone to school because of safety concerns, about four times more likely to have been threatened or injured with a weapon on school property, and about six times more likely to have carried a weapon on school property.

In the district data set, lesbian and bisexual female students were more likely than heterosexual female students to have been in a physical fight on school property, been threatened or injured with a weapon on school property, carried a weapon on school property, and not gone to school because of safety concerns. Bisexual female students were also more likely to have been bullied at school.

The associations between school violence and bullying outcomes and sexual identity were not statistically different between the two data sets for either sex, with the exception of bullying on school property among male students ( $p = .03$ ). Compared with heterosexual male students, bisexual male students in the state data set were at a lower risk of being bullied on school property than bisexual male students in the district data set (data not shown).

## Discussion

The results of this study suggest that sexual minority students still routinely experience increased school violence and bullying compared with their heterosexual counterparts. These data corroborate results of previous studies [10,12,13,15] and contribute to the literature in several ways, including establishing the relative risk of school violence and bullying behaviors for sexual minority students compared with heterosexual students using two large, recent, racially/ethnically diverse, population-based data sets of U.S. high school students. This is the first use of multiple combined YRBSSs to estimate contemporary school violence and bullying and is the first to analyze the relative risk of school violence and bullying for gay or lesbian and bisexual students separately for state and urban populations with sex-stratified models.

Despite media attention and increases in school prevention programs, these data identify that school violence and bullying victimization remains a widespread concern for sexual minority youth attending U.S. high schools. These results are concerning,

**Table 3**Adjusted associations<sup>a</sup> between sexual identity and school violence and bullying behaviors, by sex—selected sites, YRBSSs, 2009–2011

Population	Sex	Sexual identity	In a physical fight on school property <sup>b</sup>		Threatened or injured with a weapon <sup>c</sup> on school property <sup>b</sup>		Carried a weapon <sup>c</sup> on school property <sup>d</sup>		Did not go to school because of safety concerns <sup>d</sup>		Bullied on school property <sup>e</sup>	
			APR <sup>f</sup>	95% CI <sup>g</sup>	APR	95% CI	APR	95% CI	APR	95% CI	APR	95% CI
States <sup>g</sup>	Male	Gay	1.2	.8–1.7	3.1	2.2–4.3	1.3	.8–2.0	2.9	1.9–4.4	2.5	2.1–3.1
		Bisexual	2.2	1.7–2.8	2.7	2.0–3.7	2.6	1.7–3.8	2.9	2.0–4.3	2.0	1.6–2.5
		Lesbian	3.0	2.1–4.4	3.9	2.5–6.0	6.2	3.7–10.4	3.3	2.1–5.1	1.6	1.2–2.1
Districts <sup>h</sup>	Male	Bisexual	2.4	1.8–3.1	2.4	1.8–3.2	5.0	3.4–7.3	1.9	1.3–2.7	1.8	1.6–2.0
		Gay	1.6	1.2–2.1	2.6	2.1–3.3	2.5	1.7–3.6	2.9	2.1–3.9	2.3	1.8–2.8
		Bisexual	2.0	1.6–2.6	2.8	2.2–3.6	2.9	2.1–4.2	2.8	2.1–3.7	3.0	2.4–3.6
Female	Lesbian	1.7	1.2–2.4	3.2	2.4–4.4	5.3	3.3–8.6	2.0	1.5–2.6	1.2	.8–1.7	
	Bisexual	1.9	1.6–2.4	2.4	1.9–2.9	3.3	2.4–4.4	1.6	1.3–1.8	1.6	1.4–1.8	

APR = adjusted prevalence ratio; CI = confidence interval; YRBS = Youth Risk Behavior Survey.

<sup>a</sup> Adjusted for race/ethnicity and grade in school.<sup>b</sup> One or more times during the 12 months before the survey.<sup>c</sup> Such as a gun, knife, or club.<sup>d</sup> On at least 1 day during the 30 days before the survey.<sup>e</sup> During the 12 months before the survey.<sup>f</sup> Heterosexual is the reference group for all presented APR estimates.<sup>g</sup> Combined data set includes data from the following YRBSSs: Connecticut 2011, Delaware 2009, Delaware 2011, Hawaii 2011, Illinois 2009, Illinois 2011, Maine 2009, Maine 2011, Massachusetts 2009, Massachusetts 2011, North Dakota 2009, North Dakota 2011, Rhode Island 2009, Rhode Island 2011, Vermont 2009, Vermont 2011, and Wisconsin 2011.<sup>h</sup> Combined data set includes data from the following YRBSSs: Boston, MA, 2009; Boston, MA, 2011; Chicago, IL, 2009, Chicago, IL, 2010; Washington, DC, 2010; Houston, TX, 2011; Los Angeles, CA, 2009; Los Angeles, CA, 2011; Milwaukee, WI, 2011; New York City, NY, 2009; New York City, NY, 2011; San Diego, CA, 2011; San Francisco, CA, 2009; San Francisco, CA, 2011; Seattle, WA, 2008; and Seattle, WA, 2010.

as at-school victimization may increase the risk for suicide and other mental health problems [7,8] including depression and lowered self-esteem [19,20], multiple other health-risk behaviors [11], and poor academic performance [19,21] among all adolescents, but particularly among sexual minority adolescents. These related risks are associated with long-term negative health and economic outcomes.

At-school victimization has also been linked to school climate [22], although the direction of the relationship is unknown, and it may be cyclical in nature where a pre-existing negative school climate leads to increases in victimization that reinforces the negative school climate. However, a positive school climate, defined as “individual perceptions that school was a good place to be, where students and teachers could be trusted, students were treated with respect, and rules were fair” ([23] p. 307), is negatively associated with bullying perpetration and victimization. Regardless, research suggests schools with shared beliefs and attitudes supporting bullying and aggression endorse a negative school climate in which these behaviors become the norm [24]. Further, in schools where teachers endorse attitudes that are permissive or dismissive of bullying occurrence, victimization rates are high [25], and a negative environment has been linked to increased risk for suicide attempts among sexual minority youth [26].

A comprehensive approach utilizing evidence-based programs and policies may be implemented to provide a positive school climate and reduce school violence and bullying broadly, but especially among sexual minority students. This comprehensive approach may include interventions with students in schools; among adults, parents, and families; and within communities. In schools, research has shown that systematic and environment-based interventions, rather than individually focused interventions are more effective [27]. Several reviews of existing comprehensive school-based programs, some of which included systematic and environment-based interventions, demonstrated that they are effective at preventing a substantial

amount of violence and aggression [27,28]. In addition, anti-bullying policies that specifically address sexual minority students may benefit all students and reduce overall peer victimization and may reduce suicide attempts among sexual minority students [12]. School Health Profiles (i.e., Profiles) is a system of surveys assessing school health policies and practices in all states and selected large urban school districts. Profiles data from 2012 showed that across 45 states and 17 large urban school districts, the median percent of schools with policies that prohibited harassment based on a student's perceived or actual sexual orientation or gender identity was 87.2% (range: 61.9%–95.5%) and 92.6% (54.7%–100.0%), respectively [29].

Gay-straight alliances (GSAs) are another tool for improving school climate for sexual minority students. GSAs are “student-led clubs open to youth of all sexual orientations with the purpose of supporting sexual minority students and their heterosexual allies and also reducing prejudice, discrimination, and harassment within the school” [30]. Sexual minority students in schools with GSAs report a greater sense of school connectedness [6] and lower rates of feeling unsafe than students in schools without a GSA [6,31]. The presence of GSAs in schools has been shown to reduce truancy, violent incidents, and health risk behaviors including cigarette smoking, drinking alcohol, suicide attempts, and having sex with casual partners among all students, but these results were more pronounced among sexual minority students [32]. Unfortunately, Profiles found the median percent of schools across states and large urban school districts with a GSA or similar club was only 22.9% (range: 6.3%–53.2%) and 38.2% (range: 18.3%–88.9%), respectively [29].

For schools that do not have a GSA, implementing small-scale interventions may reduce at-school victimization. The 2009 School Crime Supplement of the National Crime Victimization Survey found that adding an adult supervisor in hallways was associated with a decrease in all victimization types [33]. Having a single supportive adult at school can also have strong positive influence on sexual minority students [21], but Profiles results

suggest teachers may not have the training they need to be supportive. The median percent of lead health education teachers across states who received professional development (PD) in the 2 years before completing the survey on teaching students of different sexual orientations or gender identities was only 12.6% (range: 7.5%–29.5%), compared with a median percent of 53.6% (range: 33.7%–77.8%) of teachers who wanted to receive PD on this topic; the corresponding numbers for the district data set were 30.5% (range: 13.5%–64.6%) of teachers who had received PD compared with a median of 70.9% (range: 45.0%–84.5%) of teachers who wanted to receive PD on this topic [29].

Parents and communities may also improve school engagement and reduce victimization. Parents play a key role in preventing and responding to bullying and active parental monitoring yields better health outcomes and increased school engagement for adolescents [34,35]. Parental involvement in schools, including in active parent-teacher associations, has been associated with positive academic and behavioral outcomes in children [36], and parent trainings/meetings have been shown to be among the most effective strategies to decrease school bullying [37]. Parental support has been associated with reduced suicidality and increased school engagement among sexual minority students facing school violence and bullying [9].

### Limitations

The findings in this analysis are subject to several limitations. First, the YRBS question on sexual identity may not be capturing all sexual minority students. It is possible that some students do not know their sexual identity, were unwilling to disclose it on the YRBS questionnaire, or did not understand the question. Additionally, students who were sexually attracted to persons of the same sex or who had had sexual contact with persons of the same sex might not have been willing to label themselves as gay, lesbian, or bisexual. Second, these data are self-reported and the extent of under- or over-reporting of health-risk behaviors and sexual identity cannot be determined, although many of the YRBS questions measuring health-risk behaviors demonstrate good test–retest reliability [38]. Third, the YRBS questionnaire has only a limited number of questions on school violence and bullying and only three of the five school violence questions in this study directly measured victimization. Future research may wish to explore the separate issues of victimization and perpetration further among sexual minority students. Fourth, these data only describe youth who attend school and are not representative of all people in this age group. In 2009, approximately 4% of people in the United States aged 16–17 years were not enrolled in a high school program and had not completed high school [39]. Nonetheless, sexual minority students might represent a disproportionate percentage of high school dropouts and other youths who do not attend school. Fifth, data are representative only of states and districts that assessed sexual identity in their YRBS and might not be representative of sexual minority students in other jurisdictions or nationwide. Sixth, these analyses are based on cross-sectional data and can only provide an indication of associations between sexual identity and school violence and bullying behaviors.

This research is among the first of its kind to quantify disparities in school violence and bullying by sexual identity using large, recent, diverse population-based surveys of U.S. high school students. Sexual minority students in the United

States face disproportionately difficult if not hostile school environments compared with their heterosexual peers. Comprehensive school-based interventions may be effective in improving the overall school climate, and strategies implemented specifically to address the concerns of sexual minority students may play an even greater role.

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# PUBLICATION II

## **Trends in victimization of gay, lesbian, and bisexual youth – Massachusetts, 1995-2015**

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# Trends in School-Related Victimization of Lesbian, Gay, and Bisexual Youths—Massachusetts, 1995–2015

Emily O'Malley Olsen, MSPH, Alana M. Vivolo-Kantor, PhD, MPH, Laura Kann, PhD, and Chiniqua N. Milligan, MPH

**Objectives.** To compare changes over time in prevalence of school victimization among lesbian, gay, and bisexual (LGB) students compared with heterosexual students.

**Methods.** We analyzed data from 11 Youth Risk Behavior Surveys conducted among representative samples of students in grades 9 through 12 in Massachusetts during 1995 to 2015. We used multivariable logistic regression models to identify trends over time by sexual identity.

**Results.** During 1995 to 2015, the prevalence of missing school decreased overall (from 5.6% to 4.8%) and among heterosexual (from 4.3% to 3.8%) and LGB (from 25.0% to 13.4%) students. The prevalence of having been threatened decreased overall (from 7.8% to 4.1%) and among heterosexual (from 6.5% to 3.5%) and LGB (from 32.9% to 6.7%) students.

**Conclusions.** We identified evidence of a significant decrease in victimization among all students regardless of sexual identity and a steep decline among LGB students. Additional actions to improve school climate may help eliminate the disparities and decrease victimization for all youths. (*Am J Public Health.* 2017;107:1116–1118. doi:10.2105/AJPH.2017.303761)

Lesbian, gay, and bisexual (LGB) youths routinely experience violence and bullying more frequently than do their heterosexual peers; this disparity is well-documented in the literature.<sup>1,2</sup> However, no studies have assessed long-term trends in victimization among LGB youths compared with heterosexual youths.

We compared changes over time in prevalence of school-related victimization by sexual identity by using Massachusetts Youth Risk Behavior Survey (MYRBS) data from 1995 to 2015. Based on the increased acceptance of LGB individuals<sup>3</sup> and improvements to school climate in recent years,<sup>4</sup> we hypothesized that school victimization has decreased during 1995 to 2015 for all sexual identity subgroups, but that the magnitude of the trend (i.e., the slope) may differ for heterosexual compared with LGB students.

## METHODS

The MYRBS has been conducted biennially since 1991 among population-based

representative samples of public school students in grades 9 through 12 in the state of Massachusetts. Participating students completed an anonymous, voluntary questionnaire during a single class period. More information about the survey methods, which are consistent between cycles, are published elsewhere.<sup>5</sup>

In 1995, 2 questions were added to the MYRBS to ascertain sexual orientation, including 1 question assessing sexual identity. The MYRBS was one of the first population-based surveys of youths to ascertain sexual orientation. Sexual identity was ascertained with the question, “Which of the following best describes you?” and response

options, “Heterosexual or straight,” “gay or lesbian,” “bisexual,” and “not sure.” For this analysis, “gay or lesbian” was combined with “bisexual” to create a LGB category. Students who selected “not sure” remained in the models but their results are not reported separately. The 1995 to 2015 MYRBSs also assessed having not gone to school because of safety concerns and having been threatened or injured with a weapon on school property; in addition, in 2009, a question was added to assess bullying victimization on school property.

With SUDAAN version 11 (Research Triangle Institute, Research Triangle Park, NC) to account for the complex sample design and sampling weights, we used the *t* test to assess differences in unadjusted prevalence estimates. The trend analysis used logistic regression to separately model secular trends in each school violence measure; all models set sexual identity as the exposure variable (with heterosexual students as the reference group) and adjusted for sex and race/ethnicity. We coded continuous linear and quadratic time variables by using orthogonal coefficients. Because the bullying measure was only assessed in 4 MYRBS cycles, we did not test for quadratic time components in this model only. Additional information about trend analysis methods can be found in Appendix A (available as a supplement to the online version of this article at <http://www.ajph.org>).

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**Note.** The findings and conclusions in this paper are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.  
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**TABLE 1—Prevalence and Trends of School-Related Victimization Among Students in Grades 9 Through 12, by Sexual Identity: Massachusetts Youth Risk Behavior Surveys, 1995–2015**

Year	Did Not Go to School Because of Safety Concerns, <sup>a</sup> Prevalence (95% CI)			Threatened or Injured With a Weapon on School Property, <sup>b</sup> Prevalence (95% CI)			Bullied on School Property, <sup>c</sup> Prevalence (95% CI)		
	Overall	Heterosexual	LGB	Overall	Heterosexual	LGB	Overall	Heterosexual	LGB
1995	5.6 (4.4, 7.2)	4.3 (3.4, 5.5)	25.0 (15.4, 37.8)	7.8 (6.6, 9.1)	6.5 (5.5, 7.7)	32.9 (24.3, 42.7)	...	...	...
1997	4.6 (3.9, 5.6)	3.9 (3.2, 4.8)	22.2 (13.5, 34.3)	7.5 (6.6, 8.5)	6.5 (5.7, 7.3)	31.2 (20.2, 44.8)	...	...	...
1999	6.4 (5.0, 8.0)	5.3 (4.1, 7.0)	20.0 (13.0, 29.4)	8.6 (7.7, 9.6)	7.6 (6.8, 8.5)	24.4 (16.2, 35.1)	...	...	...
2001	8.1 (6.1, 10.6)	7.7 (5.7, 10.3)	17.6 (11.9, 25.4)	8.2 (7.2, 9.3)	7.6 (6.7, 8.7)	17.4 (11.8, 25.0)	...	...	...
2003	4.6 (4.0, 5.3)	3.9 (3.3, 4.5)	16.3 (10.4, 24.6)	6.3 (5.3, 7.4)	5.4 (4.6, 6.3)	19.3 (13.3, 27.2)	...	...	...
2005	4.0 (3.4, 4.7)	3.3 (2.7, 4.0)	16.5 (11.4, 23.1)	5.4 (4.6, 6.4)	5.0 (4.2, 6.1)	10.3 (5.5, 18.7)	...	...	...
2007	4.7 (3.9, 5.7)	3.8 (3.0, 4.9)	13.0 (9.4, 17.7)	5.3 (4.5, 6.3)	4.3 (3.5, 5.3)	18.7 (13.4, 25.5)	...	...	...
2009	4.0 (3.1, 5.2)	3.1 (2.2, 4.2)	13.9 (8.4, 22.2)	7.0 (6.0, 8.2)	6.2 (5.1, 7.5)	17.3 (12.4, 23.7)	19.4 (17.7, 21.2)	17.3 (15.7, 19.0)	42.3 (35.6, 49.3)
2011	4.8 (3.9, 6.1)	4.2 (3.3, 5.5)	9.9 (6.2, 15.6)	6.8 (5.6, 8.2)	5.6 (4.5, 7.1)	15.2 (10.5, 21.5)	18.1 (16.1, 20.2)	16.4 (14.5, 18.5)	33.5 (26.7, 41.1)
2013	3.6 (2.9, 4.5)	2.9 (2.2, 3.8)	15.3 (9.6, 23.4)	4.3 (3.7, 5.2)	3.9 (3.2, 4.7)	14.0 (10.0, 19.3)	16.6 (14.7, 18.6)	15.5 (13.6, 17.6)	37.7 (29.9, 46.2)
2015	4.8 (4.0, 5.8)	3.8 (2.9, 4.8)	13.4 (8.9, 19.7)	4.1 (3.2, 5.1)	3.5 (2.7, 4.5)	6.7 (3.6, 12.3)	15.6 (14.0, 17.3)	13.8 (12.3, 15.4)	34.3 (27.4, 41.9)
Linear B <sup>d</sup> (SE)	-0.697 (0.147)	-0.702 (0.166)	-0.798 (0.347)	-0.879 (0.098)	-0.837 (0.104)	-1.275 (0.310)	-1.041 (0.286)	-0.867 (0.294)	-0.902 (0.789)
PB	<.001	<.001	.022	<.001	<.001	<.001	<.001	.003	.25
Conclusions <sup>e</sup>	Linear decrease	Linear decrease	Linear decrease	Linear decrease	Linear decrease	Linear decrease	Linear decrease	Linear decrease	No change

Note. CI = confidence interval; LGB = lesbian, gay, or bisexual. Ellipses indicate that data were not available for that year.

<sup>a</sup>Did not go to school on 1 or more days during the 30 days before the survey because they felt they would be unsafe at school or on the way to or from school.

<sup>b</sup>Were threatened or injured with a weapon (e.g., a gun, knife, or club) on school property 1 or more times during the 12 months before the survey.

<sup>c</sup>Were bullied on school property during the 12 months before the survey.

<sup>d</sup>Parameter estimate for the B associated with the linear time component regressed on the victimization outcome, stratified by sexual identity and controlled for sex and race/ethnicity.

<sup>e</sup>Interpretation of the linear time components.

## RESULTS

During 1995 to 2015, the MYRBS was conducted 11 times. The sample sizes ranged from 2707 (in 2009) to 4415 (in 1999; median = 3522); the school response rates ranged from 75% (in 2015) to 96% (in 1999 and 2001; median = 87%); the student response rates ranged from 77% (in 1995) to 88% (in 2013; median = 81%); and the overall response rates ranged from 61% (in 2015) to 77% (in 2001; median = 70%).

In 1995 and 2015, the prevalence of having not gone to school because of safety concerns was higher among LGB than heterosexual students (Table 1). In 2009 and 2015, the prevalence of having been bullied on school property was also higher among LGB than heterosexual students. However, although the prevalence of having been threatened or injured with a weapon on school property was higher among LGB than heterosexual students in 1995, in 2015 we detected no differences in the prevalence of this behavior by sexual identity.

During 1995 to 2015, when we controlled for race/ethnicity and sex, the prevalence of having not gone to school because of safety concerns decreased linearly overall (from 5.6% to 4.8%), among heterosexual students (from 4.3% to 3.8%), and among LGB students (from 25.0% to 13.4%). The prevalence of having been threatened or injured with a weapon on school property also decreased linearly overall (from 7.8% to 4.1%), among heterosexual students (from 6.5% to 3.5%), and among LGB students (from 32.9% to 6.7%). Furthermore, during 2009 to 2015, when we controlled for race/ethnicity and sex, the prevalence of having been bullied on school property decreased linearly overall (from 19.4% to 15.6%) and among heterosexual students (from 17.3% to 13.8%), but we did not detect a linear change among LGB students. We did not detect quadratic trends overall or by subgroup for any of the 3 behaviors.

## DISCUSSION

The results of this analysis support our hypotheses and indicate that school-related

violence victimization significantly declined among both heterosexual and LGB students during 1995 to 2015. However, this was not true for being bullied on school property. Although being bullied on school property was not assessed on the MYRBS until 2009, during the past 4 MYRBS cycles, being bullied on school property has declined significantly among heterosexual but not among LGB students. To note, current prevalence of some school victimization is still higher among LGB than heterosexual students.

This analysis is subject to several limitations. The data are only generalizable to Massachusetts students who are enrolled in public school; furthermore, LGB youths might represent a disproportionate percentage of high-school dropouts and other youths who are absent from or do not attend school.<sup>6</sup> In addition, some students might not have known their sexual identity; might have been unwilling to disclose it on the MYRBS questionnaire; might have been unwilling to label themselves as heterosexual, gay, lesbian, or bisexual; or might not have understood the sexual identity question. Next, the extent of underreporting or overreporting of health-related behaviors cannot be determined, although the survey questions demonstrate good test–retest reliability.<sup>7</sup>

Finally, possibly because of the small prevalence of LGB identity, we were unable to detect significant differences in the linear time components between heterosexual and LGB students. Replicating these analyses on larger data sets may yield more convincing results. Despite these limitations, these results are the first to assess secular trends of victimization by sexual identity among large, population-based samples of youths.

## PUBLIC HEALTH IMPLICATIONS

Since the mid-1990s, societal acceptance of LGB individuals has increased,<sup>3</sup> and school-related victimization of LGB students has decreased. Nonetheless, the prevalence of victimizations remains too high, and it is important to eliminate school-related victimization for all students. Previous studies suggest that victims of school violence and bullying are at greater risk for many other health-risk behaviors,<sup>8</sup> and may have worse

long-term outcomes compared with their nonvictimized peers,<sup>9</sup> especially for LGB youths.<sup>10</sup> Schools can take action to improve school climate, which may help eliminate disparities and decrease victimization for all youths.

In 2010, Massachusetts enacted comprehensive legislation to address bullying in public and nonpublic schools and require every school to have a bullying prevention plan (Mass Gen Laws, Ch 71, § 37O [2010, 2014]). The law was amended in 2014 to require schools to “recognize” in their bullying prevention plan that certain enumerated categories of students may be more vulnerable to being bullied based on actual or perceived differentiating characteristics. The Massachusetts Safe Schools Program for lesbian, gay, bisexual, transgender, and queer (LGBTQ) students is designated specifically to help schools implement all state laws that have an impact on LGBTQ students, including this antibullying law. A recent report suggests that Massachusetts schools increased their ability to facilitate access to health services for LGBTQ youths, implementation of “safe spaces,” prohibition of harassment on the basis of sexual orientation, and staff development on safe and supportive school environments.<sup>11</sup> These policies and practices aim to reduce victimizations and bullying for all students and particularly for LGB students, and recent research has indicated that they may be effective at preventing and decreasing bullying.<sup>12</sup> **AJPH**

## CONTRIBUTORS

E. O. Olsen originated the study, participated in its design and coordination, conducted all statistical analyses, and drafted the article. A. M. Vivolo-Kantor participated in the design of the study, assisted with analysis and interpretation of the data, helped draft the article and revisions, and provided content expertise. L. Kann participated in the design and coordination of the study, assisted with analysis and interpretation of the data, and helped to draft the article and revisions. C. N. Milligan provided the data, helped draft the article, and provided content expertise. All authors read and approved the final article.

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## HUMAN PARTICIPANT PROTECTION

The contractor for the MYRBS, the Center for Survey Research at UMASS Boston, determined that the MYRBS is surveillance and not research and therefore it

is exempt from full institutional review board review. Survey protocols were submitted to the institutional review board.

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# PUBLICATION III

## **Physical and sexual teen dating violence by sexual identity among U.S. high school students**

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# Physical and Sexual Teen Dating Violence Victimization and Sexual Identity Among U.S. High School Students, 2015

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## **Abstract**

Lesbian, gay, and bisexual (LGB) youth are at risk for many negative behaviors associated with teen dating violence victimization (TDVV). This study describes the prevalence of physical and sexual TDVV by sexual identity and quantifies the increased risk for TDVV among LGB youth compared with heterosexual youth. The participants for this study were students in Grades 9 to 12 participating in the 2015 national Youth Risk Behavior Survey (YRBS) who responded to questions ascertaining sexual identity and both physical and sexual TDVV. Data were analyzed by sexual identity, stratified by sex, and controlled for race/ethnicity and grade in school. Frequencies of physical and sexual TDVV and prevalence of TDVV from a combined TDVV measure were calculated. Associations between these behaviors and sexual identity were identified. Generally, LGB youth had greater prevalence and frequency of TDVV compared with heterosexual youth. Prevalence of TDVV within sexual identity subgroups further differed by sex. Students who were not sure of their sexual identity had the highest risk of most categories of TDVV when adjusting for sex, race/ethnicity, and grade in school. These results are the first to use a nationally representative sample to describe frequency of TDVV and to determine prevalence of a combined physical and sexual TDVV measure by sexual identity among youth. Schools, communities, and families can help prevent teen dating violence and ameliorate the potential impacts of these victimizations.

**Keywords:** sexual minority youth, teen dating violence, victimization, Youth Risk Behavior Survey

## **Introduction**

Sexual minority youth (SMY; for example, lesbian, gay, or bisexual youth, and youth who are unsure of their sexual identity) have an increased likelihood of many risk behaviors including depression and suicide (Marshal et al., 2011; Robinson & Espelage, 2011), alcohol abuse (Marshal et al., 2011; Talley, Hughes, Aranda, Birkett, & Marshal, 2014), and illicit drug use (Corliss et al., 2010; Newcomb, Birkett, Corliss, & Mustanski, 2014), as well as sexual risk behaviors (Herrick, Marshal, Smith, Sucato, & Stall, 2011). These behaviors also are associated with an increased risk of teen dating violence victimization (TDVV; Exner-Cortens, Eckenrode, & Rothman, 2013). The Centers for Disease Control and Prevention (CDC; 2014) defines teen dating violence as the physical, sexual, or psychological/emotional violence within a dating relationship; the definition also includes stalking. Teens who experience TDVV are also at risk for long-term negative health and behavioral outcomes, including suicide, poor academic performance, and intimate partner violence (Foshee, McNaughton Reyes, Gottfredson, Chang, & Ennett, 2013; Roberts, Klein, & Fisher, 2003).

In 2015, 11.7% of female and 7.4% of male high school students experienced physical TDVV and 15.6% of female and 5.4% of male high school students experienced sexual TDVV (Kann, McManus, et al., 2016). The literature on TDVV among U.S. SMY is limited yet developing. Of this emerging literature, six studies

have sought to understand the prevalence of TDVV among SMY. However, these studies are limited by sample size, the generalizability of the sample, and/or the components of TDVV measured. For example, three studies used data from convenience samples or small samples and did not compare heterosexual adolescents with sexual minority adolescents. Specifically, Freedner and colleagues analyzed data from a convenience sample of 521 youths aged 13 to 22 years attending a lesbian, gay, bisexual, and transgender rights rally during spring 2000 and concluded that SMY have rates of TDVV similar to their heterosexual counterparts based on prevalence estimates from other studies (Freedner, Freed, Yang, & Austin, 2002). Halpern and colleagues used data from the 1996 Wave II of the National Longitudinal Study of Adolescent Health to assess the prevalence of partner violence among 117 adolescents aged 12 to 22 years who reported same-sex intimate relationships (Halpern, Young, Waller, Martin, & Kupper, 2004). This study indicated the prevalence of any partner violence victimization among SMY was 24% but did not compare it with the prevalence among heterosexual youth from the same sample. Hipwell and colleagues (2013) used data from a longitudinal sample of 1,647 urban females aged 17 years to compare sexual risk-taking and TDVV by sexual minority status. Their findings demonstrated increased prevalence of TDVV among SMY females compared with heterosexual females; however, the findings are limited in their generalizability.

Three recent studies used large, school-based samples to examine TDVV among SMY. Dank, Lachman, Zweig, and Yahner (2014) analyzed data from 5,647 seventh- to 12th-grade students in the Northeast and found that SMY had a higher prevalence of multiple forms of TDVV compared with heterosexual students. Luo and colleagues analyzed Youth Risk Behavior Survey (YRBS) data from nine urban school districts that conducted surveys during 2001-2011 (Luo, Stone, & Tharp, 2014). This study assessed physical TDVV and sexual minority status and concluded that SMY had higher rates of physical TDVV than non-SMY. Martin-Storey (2015) used data pooled from Massachusetts YRBSs in 2003, 2005, 2007, and 2009, and had about 10,500 total respondents. The study assessed physical TDVV and sexual minority status, stratified by sex, and, like the previous studies, found higher prevalence of TDVV among sexual minority students compared with non-SMY students (Martin-Storey, 2015).

The main purpose of the current study is to use data from the 2015 national YRBS, which is the first national YRBS to include a question ascertaining sexual identity, to describe rates and frequencies of physical and sexual TDVV among U.S. lesbian, gay, and bisexual (LGB) students. Because male and female youth have been shown to experience TDVV at significantly unequal rates (Kann, McManus, et al., 2016; Vagi, Olsen, Basile, & Vivolo-Kantor, 2015), this analysis was stratified by sex. A second purpose is to quantify the prevalence of physical and sexual TDVV among LGB students compared with their heterosexual counterparts. The 2015 YRBS data used in this study are based on a single physical TDVV question and a single question on sexual TDVV. These TDVV questions were new to the YRBS in 2013 and were not used in the previous studies of TDVV among SMY described above. Given the few existing studies on TDVV by sexual identity, we expected LGB students to have a higher prevalence of all types of TDVV compared with heterosexual students. We hypothesized that this might extend beyond prevalence and therefore expected that, among students who experienced at least one instance of TDVV, LGB students would have a higher mean frequency of victimizations than heterosexual students.

## **Method**

The 2015 national YRBS was conducted during spring 2015 and used an independent, cross-sectional, three-stage cluster sample designed to generate data representative of public and private school students in Grades 9 to 12 in all 50 states and the District of Columbia. Students completed a self-administered questionnaire. Participation in the survey was anonymous and voluntary and local parental consent

procedures were followed. An Institutional Review Board at CDC approved the survey. A weight was applied to each student record to adjust for school and student nonresponse and the distribution of students by grade, sex, and race/ethnicity. Detailed information about the methodology of the national YRBS can be found elsewhere (Brener et al., 2013).

### *Measures*

*Sexual identity.* Sexual identity was assessed with the question “Which of the following best describes you?” with the response options “heterosexual (straight),” “gay or lesbian,” “bisexual,” and “not sure.” To obtain a sufficient sample size for analysis by sexual identity, students who responded “gay or lesbian” or “bisexual” were combined into “lesbian, gay, or bisexual” and are referred to as LGB students.

*TDVV.* Two questions assessed TDVV. Physical TDVV was assessed with the question “During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon).” Sexual TDVV was assessed with the question “During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse).” Both questions included the response options “I did not date or go out with anyone during the past 12 months,” “0 times,” “1 time,” “2 or 3 times,” “4 or 5 times,” and “6 or more times.” Continuous frequency variables were created for each TDVV measure based on the response options such that the values were 0, 1, 2.5, 4.5, or 6.5. Next, to better understand the individual and combined components of TDVV, we created a four-category combined TDVV measure: “physical TDVV only,” “sexual TDVV only,” “both physical and sexual TDVV,” and “none,” such that reporting  $\geq 1$  time for physical TDVV and 0 times for sexual TDVV was classified as “physical TDVV only,” reporting 0 times for physical TDVV and  $\geq 1$  time for sexual TDVV was classified as “sexual TDVV only,” reporting  $\geq 1$  time for physical TDVV and  $\geq 1$  time for sexual TDVV was classified as “both physical and sexual TDVV,” and reporting 0 times for physical TDVV and 0 times for sexual TDVV was classified as “none.” A dichotomous variable also was created to indicate any TDVV (i.e., reporting  $\geq 1$  time for either physical and/or sexual TDVV) and none (referred to as “any” TDV). Students who did not date during the past 12 months were excluded from the analyses.

*Race/ethnicity.* Race/ethnicity was computed from two questions: “Are you Hispanic or Latino?” and “What is your race?” For this analysis, respondents were classified as White, non-Hispanic (referred to as “White”); Black or African American, non-Hispanic (referred to as “Black”); and Hispanic or Latino (referred to as “Hispanic”). The numbers of students from other racial/ethnic groups were too small for meaningful analysis; these students are included in all analyses, but their results are not reported separately.

### *Statistical Analysis*

We conducted all analyses in SUDAAN version 11.0.1 (Research Triangle Institute, NC, USA) to account for the complex sample design. All point estimates reported herein reflect weighted estimates, although we report unweighted *N*s. The significance level for all analyses was 5%. We present stratified results by sex. Bivariate associations were tested using overall chi-square tests, followed by pairwise *t* tests; mean frequencies were also compared using pairwise *t* tests. Logistic regression models assessed the

association between TDVV and sexual identity, controlling for sex, race/ethnicity, and grade. These associations are reported as adjusted prevalence ratios (APRs) with 95% confidence intervals (CI; Bieler, Brown, Williams, & Brogan, 2010); the reference levels were varied to show adjusted pairwise comparisons across each type of sexual identity.

### *Participants*

For the 2015 national YRBS, 15,713 questionnaires were completed in 125 public and private schools. The national data set was cleaned and edited for inconsistencies, and missing data were not statistically imputed. Among the 15,713 completed questionnaires, 89 failed quality control and were excluded from analysis, resulting in 15,624 usable questionnaires. The school response rate was 69%, the student response rate was 86%, and the overall response rate was 60%.

Among participating students, 14,703 (94% of full sample) responded to the sexual identity question and 14,160 (90% of full sample) responded to the sexual identity question and both TDVV questions. Of those, 70% had dated or gone out with someone during the 12 months before the survey (i.e., had dated). The analytic *N* was 9,917 students, 63% of the full sample. The analytic sample was 55% White, 14% Black, and 22% Hispanic; 51% male; and 24% were in ninth grade, 25% were in 10th grade, 25% were in 11th grade, and 26% were in 12th grade.

## **Results**

Table 1 summarizes the distribution of sexual identity by sex among the 70% of students who had dated or gone out with someone during the 12 months before the survey. Among these male students, 94.5% identified as heterosexual, 3.6% as gay or bisexual, and 1.9% as not sure. Among these female students, 84.1% identified as heterosexual; 13.2% as lesbian, gay, or bisexual; and 2.7% as not sure.

### *Frequencies of Physical and Sexual TDVVs*

Table 2 displays the frequencies of physical TDVV and sexual TDVV by sex and sexual identity. Heterosexual male students had a significantly lower prevalence and lower mean frequencies of sexual TDVV (prevalence: 4.3%,  $M = 0.14$  times) and physical TDVV (6.2%, 0.18 times) compared with LGB (sexual TDVV: 20.9%, 0.46 times; physical TDVV: 19.9%, 0.59 times) and not sure male students (sexual TDVV: 21.7%, 1.07 times; physical TDVV: 30.5%, 1.41 times) and compared with heterosexual female students (sexual TDVV: 14.5%, 0.36 times; physical TDVV: 10.7%, 0.27 times). Among male students, not sure students were more likely to have experienced sexual and physical TDVV 6 or more times compared with heterosexual and LGB male students and physical TDVV 6 or more times compared with not sure female students. Among female students, heterosexual students experienced a lower prevalence and frequency of sexual TDVV and physical TDVV than LGB students and a lower frequency of physical TDVV than not sure students; we did not detect any significant differences in the mean frequency or prevalence between not sure and LGB female students.

Among those who experienced sexual TDVV  $\geq 1$  time, heterosexual male students had higher mean frequencies of sexual TDVV ( $M = 3.38$  times) compared with heterosexual female students ( $M = 2.51$  times;  $p < .0001$ ). Heterosexual male students had a lower prevalence of sexual TDVV 1 time

**Table 1.** Demographic Distributions Among Students Who Dated or Went Out With Someone During the 12 Months Before the Survey, by Sex—United States, 2015.

	All Students			Male		Female	
	<i>n</i>	Prevalence	95% CI	Prevalence	95% CI	Prevalence	95% CI
<b>Sexual identity</b>							
Heterosexual	8,769	89.3	[87.7, 90.7]	94.5	[92.7, 95.8]	84.1	[81.8, 86.3]
LGB	886	8.3	[7.2, 9.6]	3.6	[2.6, 5.0]	13.2	[11.3, 15.3]
Not sure	262	2.3	[2.0, 2.8]	1.9	[1.3, 2.6]	2.7	[2.2, 3.3]
<b>Race/ethnicity</b>							
White, non-Hispanic	4,490	55.3	[49.7, 60.8]	54.8	[48.7, 60.7]	56.0	[49.7, 62.1]
Black, non-Hispanic	1,094	13.9	[11.5, 16.6]	14.2	[11.3, 17.8]	13.5	[11.0, 16.3]
Hispanic	3,218	22.2	[17.9, 27.1]	22.0	[17.6, 27.1]	22.4	[17.8, 27.9]
<b>Teen dating violence victimization<sup>a</sup></b>							
Physical <sup>b</sup> only	544	5.0	[4.4, 5.6]	4.3	[3.6, 5.0]	5.7	[4.6, 7.0]
Sexual <sup>c</sup> only	600	6.0	[5.2, 6.9]	2.3	[1.7, 3.1]	9.7	[8.3, 11.3]
Both physical and sexual	448	4.6	[4.0, 5.2]	2.9	[2.3, 3.8]	6.0	[5.1, 7.1]
None	8325	84.5	[83.1, 85.8]	90.5	[89.3, 91.7]	78.6	[75.6, 81.2]

*Note.* 95% CI = 95% confidence interval; LGB = lesbian, gay, or bisexual.

<sup>a</sup>One or more times during the 12 months before the survey.

<sup>b</sup>Being physically hurt on purpose (counting being hit, slammed into something, or injured with an object or weapon) by someone they were dating or going out with.

<sup>c</sup>Being forced to do sexual things (counting kissing, touching, or being physically forced to have sexual intercourse) they did not want to do by someone they were dating or going out with.

**Table 2.** Prevalence (SE) and Mean (SE) of Frequencies of Teen Dating Violence Victimization, by Sex and Sexual Identity—United States, 2015.

	Among All Students						Among Students Who Experienced TDVV ≥1 Time					
	Male			Female			Male			Female		
	Heterosexual	LGB	Not sure	Heterosexual	LGB	Not sure	Heterosexual	LGB	Not sure	Heterosexual	LGB	Not sure
Sexual TDVV <sup>a</sup>												
0 times	95.7 (0.4) <sup>FGN</sup>	79.1 (4.9) <sup>H</sup>	78.3 (5.3) <sup>H</sup>	85.5 (1.0) <sup>MG</sup>	77.4 (2.5) <sup>H</sup>	78.8 (4.5)	—	—	—	—	—	—
1 time	1.5 (0.3) <sup>FG</sup>	13.2 (4.9) <sup>H</sup>	4.4 (2.4)	6.7 (0.5) <sup>MG</sup>	10.1 (1.3) <sup>H</sup>	7.8 (2.9)	34.3 (5.1) <sup>FG</sup>	63.2 (12.5) <sup>HN</sup>	20.3 (11.5) <sup>G</sup>	45.9 (2.7) <sup>M</sup>	44.7 (4.4)	36.8 (11.2)
2-5 times	1.6 (0.3)	5.1 (1.8)	3.2 (1.8)	6.1 (0.7)	8.4 (1.4)	7.8 (3.0)	38.2 (6.0)	24.4 (8.6)	14.9 (8.4)	42.1 (2.9)	37.2 (4.3)	36.9 (11.2)
6+ times	1.2 (0.2) <sup>N</sup>	2.6 (1.1) <sup>N</sup>	14.1 (5.3) <sup>HG</sup>	1.7 (0.3) <sup>G</sup>	4.1 (1.0) <sup>H</sup>	5.6 (2.5)	27.5 (3.7) <sup>FGN</sup>	12.4 (6.0) <sup>HN</sup>	64.9 (13.9) <sup>FHG</sup>	12.0 (1.8) <sup>M</sup>	18.1 (3.9)	26.2 (10.7) <sup>M</sup>
Mean frequency	0.14 (0.02) <sup>FGN</sup>	0.46 (0.10) <sup>H</sup>	1.07 (0.34) <sup>H</sup>	0.36 (0.03) <sup>MG</sup>	0.62 (0.09) <sup>H</sup>	0.67 (0.18)	3.38 (0.18) <sup>FGN</sup>	2.21 (0.43) <sup>HN</sup>	4.92 (0.69) <sup>FHG</sup>	2.51 (0.11) <sup>M</sup>	2.73 (0.21)	3.16 (0.53) <sup>M</sup>
Physical TDVV <sup>b</sup>												
0 times	93.8 (0.5) <sup>FGN</sup>	80.1 (4.1) <sup>H</sup>	69.5 (7.7) <sup>H</sup>	89.3 (1.0) <sup>MG</sup>	83.1 (1.6) <sup>H</sup>	83.2 (3.5)	—	—	—	—	—	—
1 time	2.5 (0.4) <sup>F</sup>	7.8 (3.1)	4.3 (1.6)	4.9 (0.6) <sup>M</sup>	5.8 (1.1)	4.6 (1.9)	40.8 (4.5) <sup>N</sup>	38.9 (14.2)	14.0 (6.5) <sup>H</sup>	45.7 (3.5) <sup>N</sup>	34.1 (5.3)	27.6 (8.5) <sup>H</sup>
2-5 times	2.4 (0.2)	9.8 (4.3)	10.0 (4.0)	4.4 (0.5)	7.8 (1.2)	7.7 (2.0)	39.2 (3.0)	49.1 (15.9)	32.8 (9.1)	40.8 (3.5)	46.0 (6.1)	45.6 (9.2)
6+ times	1.2 (0.2) <sup>N</sup>	2.4 (1.0) <sup>N</sup>	16.2 (5.6) <sup>FHG</sup>	1.4 (0.3)	3.3 (1.0)	4.5 (1.9) <sup>M</sup>	20.0 (3.8) <sup>N</sup>	12.0 (5.9) <sup>N</sup>	53.2 (9.3) <sup>FHG</sup>	13.5 (2.5)	19.9 (5.6)	26.7 (9.3) <sup>M</sup>
Mean frequency	0.18 (0.02) <sup>FGN</sup>	0.59 (0.13) <sup>H</sup>	1.41 (0.41) <sup>H</sup>	0.27 (0.03) <sup>MGN</sup>	0.51 (0.07) <sup>H</sup>	0.57 (0.14) <sup>H</sup>	2.88 (0.20) <sup>N</sup>	2.99 (0.39) <sup>N</sup>	4.62 (0.38) <sup>FHG</sup>	2.55 (0.13)	3.00 (0.27)	3.39 (0.45) <sup>M</sup>

Note. Among students who dated or went out with someone during the 12 months before the survey. TDVV = teen dating violence victimization; LGB = lesbian, gay, or bisexual.

<sup>a</sup>Being physically hurt on purpose (counting being hit, slammed into something, or injured with an object or weapon) by someone they were dating or going out with.

<sup>b</sup>Being forced to do sexual things (counting kissing, touching, or being physically forced to do have sexual intercourse) they did not want to do by someone they were dating or going out with.

<sup>H</sup>Significantly different from heterosexual students (*t* test, *p* < .05)

<sup>G</sup>Significantly different from LGB students (*t* test, *p* < .05)

<sup>N</sup>Significantly different from not sure students (*t* test, *p* < .05)

<sup>F</sup>Significantly different from female students with the same sexual identity (*t* test, *p* < .05)

<sup>M</sup>Significantly different from male students with the same sexual identity (*t* test, *p* < .05)

(34.3%) compared with heterosexual female students (45.9%;  $p = .04$ ) and a higher prevalence of TDVV  $\geq 6$  times (27.5%) compared with heterosexual female students (12.0%;  $p = .001$ ). No differences between LGB male and LGB female students were detected for sexual TDVV mean frequencies or prevalence. Not sure male students had a higher mean frequency ( $M = 4.92$  times) compared with not sure female students ( $M = 3.16$  times;  $p = .04$ ) and a higher prevalence of sexual TDVV  $\geq 6$  times (64.9%) compared with not sure female students (26.2%;  $p = .03$ ). Among male students, we detected significant differences between all sexual identity subgroups for mean frequencies and prevalence of sexual TDVV  $\geq 6$  times; we also detected differences between LGB male students compared with heterosexual and not sure male students for experiencing sexual TDVV 1 time. Conversely, among female students, we did not detect any differences in sexual TDVV between sexual identity subgroups.

Among students who experienced physical TDVV  $\geq 1$  time, no differences were detected in mean frequencies or prevalence between heterosexual male and heterosexual female students or between LGB male and LGB female students. Not sure male students experienced slightly higher mean frequencies ( $M = 4.62$ ) compared with not sure female students ( $M = 3.39$ ;  $p = .03$ ). Among male students, not sure students experienced the highest mean frequencies, and were the most likely to experience TDVV  $\geq 6$  times. Among female students who experienced physical TDVV  $\geq 1$  time, the only significant differences detected were between heterosexual and not sure students, in that heterosexual students were more likely to experience physical TDVV 1 time (45.7%) when compared with not sure students (27.6%;  $p = .04$ ).

### *Combined TDVV Measures*

Table 3 contains descriptive statistics for the four-level combined TDVV measure and the “any TDVV” measure. More than a quarter of LGB male and nearly 30% of LGB female students experienced “any TDVV,” compared with 8.3% of heterosexual male and 20.0% of heterosexual female students. Among male LGB students, 15.4% experienced both physical and sexual TDVV. Among female LGB students, 12.0% experienced sexual TDVV only and 10.6% experienced both physical and sexual TDVV. For three types of TDVV—sexual TDVV only, both physical and sexual TDVV, and “any TDVV”—heterosexual female students had a higher prevalence than heterosexual male students. However, sex differences were not detected among LGB students or students who were not sure of their sexual identity for physical TDVV only, both physical and sexual TDVV, or for “any TDVV.” A difference was detected between female LGB students (12.0%) and male LGB students (5.6%;  $p = .048$ ) for sexual TDVV only.

Among female students, the prevalence of physical TDVV only and sexual TDVV only did not differ significantly by sexual identity; however, the prevalence of both physical and sexual TDVV was higher among LGB female (10.6%) compared with heterosexual female (5.2%) students ( $p = .03$ ) and the prevalence of “any TDVV” was higher among LGB female (29.0%) than heterosexual female (20.0%) students ( $p = .02$ ).

Among male students, those who were not sure of their sexual identity had higher prevalence of physical TDVV only (14.0%), both physical and sexual TDVV (17.8%), and “any TDVV” (35.7%) than heterosexual male students (4.0%, 2.2%, and 8.3%, respectively). LGB students also had a higher prevalence of both physical and sexual TDVV (15.4%) and “any TDVV” (25.8%) compared with heterosexual students.

Controlling for sex, race/ethnicity, and grade, the APRs (Table 4) indicate that both LGB and not sure students were more likely to experience both physical and sexual TDVV and “any TDVV” compared with heterosexual students (see Table 4). Not sure students were also more likely to experience physical TDVV

**Table 3.** Prevalence of Combined Physical and Sexual Teen Dating Violence Victimization Among U.S. High School Students, by Sex and Sexual Identity—United States, 2015.

Sex	Sexual Identity	Physical TDVV <sup>a</sup> Only		Sexual TDVV <sup>b</sup> Only		Both Physical and Sexual		<i>p</i> <sup>c</sup>	Any TDVV		<i>p</i> <sup>d</sup>
		Prevalence	95% CI	Prevalence	95% CI	Prevalence	95% CI		Prevalence	95% CI	
Male	Heterosexual	4.0 <sup>N</sup>	[3.4, 4.8]	2.1 <sup>F</sup>	[1.5, 2.9]	2.2 <sup>FGN</sup>	[1.6, 2.9]	.0022	8.3 <sup>FGN</sup>	[7.3, 9.5]	.0001
	LGB	4.8	[2.5, 9.2]	5.6 <sup>F</sup>	[1.6, 17.3]	15.4 <sup>H</sup>	[8.4, 26.4]		25.8 <sup>H</sup>	[17.3, 36.6]	
	Not sure	14.0 <sup>H</sup>	[6.9, 26.5]	3.9	[1.1, 12.6]	17.8 <sup>H</sup>	[9.5, 31.1]		35.7 <sup>H</sup>	[21.7, 52.7]	
Female	Heterosexual	5.5	[4.3, 7.0]	9.3 <sup>M</sup>	[7.8, 11.0]	5.2 <sup>MG</sup>	[4.3, 6.4]	.0337	20.0 <sup>MG</sup>	[17.2, 23.2]	.0184
	LGB	6.5	[4.6, 8.9]	12.0 <sup>M</sup>	[8.5, 16.7]	10.6 <sup>H</sup>	[7.8, 14.1]		29.0 <sup>H</sup>	[24.0, 34.6]	
	Not sure	8.2	[4.5, 14.5]	12.4	[6.2, 23.1]	8.9	[4.6, 16.4]		29.4	[20.3, 40.6]	

Note. Among students who dated or went out with someone during the 12 months before the survey. TDVV = teen dating violence victimization; 95% CI = 95% confidence interval; LGB = lesbian, gay, or bisexual.

<sup>a</sup> Being physically hurt on purpose (counting being hit, slammed into something, or injured with an object or weapon) by someone they were dating or going out with.

<sup>b</sup> Being forced to do sexual things (counting kissing, touching, or being physically forced to do have sexual intercourse) they did not want to do by someone they were dating or going out with.

<sup>c</sup> *P* value from overall chi-square test of equal distribution of sexual identity by four-level TDVV (i.e., physical TDVV only, sexual TDVV only, both physical and sexual TDVV, and no TDVV).

<sup>d</sup> *P* value from overall chi-square test of equal distribution of sexual identity by "any TDVV."

<sup>H</sup> Significantly different from heterosexual students (*t* test, *p* < .05).

<sup>G</sup> Significantly different from LGB students (*t* test, *p* < .05).

<sup>N</sup> Significantly different from not sure students (*t* test, *p* < .05).

<sup>F</sup> Significantly different from female students with the same sexual identity (*t* test, *p* < .05).

<sup>M</sup> Significantly different from male students with the same sexual identity (*t* test, *p* < .05).



only compared with heterosexual students. No differences were detected between the sexual identity subgroups for sexual TDVV only, and no differences were detected between not sure and LGB students for any of the combined TDVV categories.

## **Discussion**

The results of this study suggest that generally, LGB students experience physical TDVV and sexual TDVV at higher rates than their heterosexual counterparts, especially male students. This corroborates previous studies (Dank et al., 2014; Luo et al., 2014) of adolescents and also follows patterns of intimate partner violence by sexual orientation in adults (Walters, Chen, & Breiding, 2013). Our results also indicate that male students who are not sure of their sexual identity have a higher frequency of TDVV than their heterosexual or even LGB counterparts, which is a new finding and may counter previous findings (Luo et al., 2014). An additional new finding is the lack of disparity in TDVV prevalence among LGB male and female students. A national study among U.S. high school students indicated that TDVV was twice as prevalent among female than male students, without considering sexual identity (Vagi et al., 2015). The current study suggests that this disparity exists among heterosexual students, consistent with the existing literature, but is not detected among subgroups of sexual minority students; in one case, male LGB students had higher prevalence of TDVV than female LGB students. Our results also suggest that sexual minority female students are not immune to TDVV and in fact are at greater risk for some of these victimizations than heterosexual female students.

The prevalence of “any TDVV” among sexual minority students was 25.8% among male LGB students and 29.0% among female LGB students. These estimates corroborate some previous estimates of violence among SMY within dating relationships. Halpern reported approximately 25% of SMY had experienced some victimization (Halpern et al., 2004), while Freedner estimated 43% to 45% of gay and lesbian adolescents had experienced victimization (Freedner et al., 2002). The four more recent studies estimated rates of physical TDVV among SMY to be between 19% and 30% in one study (Luo et al., 2014), 31% in another study (Hipwell et al., 2013), 43% in the third study (Dank et al., 2014), and between 19% and 44% in the fourth study (Martin-Storey, 2015). Our study extends the literature by using a combined measure of TDVV including both physical and sexual victimization, and by measuring frequency of victimizations for all students as well as among those who experienced TDVV at least once.

Our results suggest that, after controlling for sex, race/ethnicity, and grade, LGB students and not sure students are at highest risk of TDVV compared with heterosexual students. The adjusted results also indicate that LGB and not sure students are more likely than heterosexual students to experience both physical and sexual TDVV. This is concerning because a previous national study showed that youth who experienced both physical and sexual TDVV were at an increased risk for many other risky behaviors, including suicide ideation and fighting, compared with youth who experienced only physical or only sexual TDVV (Vagi et al., 2015).

Several potential explanations exist for why LGB students are at greater risk for TDVV. One explanation is that LGB youth become involved in a violent relationship because of low self-worth or feelings of helplessness for finding a romantic relationship. This is in line with the minority stress theory (Lewis, Milletich, Kelley, & Woody, 2012; Williams & Chapman, 2011), which posits that psychosocial stress comes from being a member of a minority group that is stigmatized and experiences discrimination and marginalization (DiPlacido, 1998; Meyer, 2003). The minority stress theory includes both internalized and externalized stressors that are not only said to both increase TDV victimization and perpetration risk (Lewis et al., 2012) but also associated with the negative risk behaviors that co-occur with TDV (e.g., anxiety, depression, and substance abuse; Edwards, Sylaska, & Neal, 2015; Hatzenbuehler, 2009).

**Table 4.** Adjusted Prevalence Ratios of Combined Teen Dating Violence Victimization Among U.S. High School Students, by Sexual Identity.

Comparison of TDVV <sup>a</sup>	Physical TDVV <sup>b</sup> Only		Sexual TDVV <sup>c</sup> Only		Both Physical and Sexual TDVV		Any TDVV	
	APR	95% CI	APR	95% CI	APR	95% CI	APR	95% CI
LGB vs. heterosexual	1.33	[0.91, 1.94]	1.55	[0.99, 2.42]	<b>2.53</b>	<b>[1.86, 3.45]</b>	<b>1.63</b>	<b>[1.28, 2.08]</b>
Not sure vs. heterosexual	<b>2.25</b>	<b>[1.36, 3.70]</b>	1.62	[0.93, 2.82]	<b>3.35</b>	<b>[1.96, 5.72]</b>	<b>2.07</b>	<b>[1.55, 2.77]</b>
Not sure vs. LGB	1.69	[0.91, 3.16]	1.04	[0.61, 1.78]	1.33	[0.74, 2.37]	1.27	[0.90, 1.81]

*Note.* Among students who dated or went out with someone during the 12 months before the survey and adjusted for sex, grade, and race/ethnicity. APRs that were significant at the 5% level are shown with bold font. TDVV = teen dating violence victimization; APR = adjusted prevalence ratio; 95% CI = 95% confidence interval; LGB = lesbian, gay, or bisexual.

<sup>a</sup>Written in the format: exposure subgroup versus referent subgroup.

<sup>b</sup>Being physically hurt on purpose (counting being hit, slammed into something, or injured with an object or weapon) by someone they were dating or going out with.

<sup>c</sup>Being forced to do sexual things (counting kissing, touching, or being physically forced to do have sexual intercourse) they did not want to do by someone they were dating or going out with.

Along with this psychological stress, it is possible that specific aspects of dating relationships for LGB youth play a role in increasing risk for TDV. To date, no research has been conducted to determine if specific relationship characteristics (e.g., engaging in sexual intercourse with a partner, relationship duration/brevity, monogamy, or the age difference of youth and partner) increase risk for LGB youth. Research does exist suggesting that dating violence occurs in teen relationships of longer duration (Gaertner & Foshee, 1999; Giordano, Soto, Manning, & Longmore, 2010), where sexual intercourse is occurring (Giordano et al., 2010; Kaestle & Halpern, 2005), where partners use manipulation tactics (Vivolo-Kantor, Massetti, Niolon, Foshee, & McNaughton Reyes, 2016), and where partners are older (Vivolo-Kantor et al., 2016). Of note, none of these analyses explicitly excluded same-sex or bisexual relationships. Thus, it is possible that some of these relationship characteristics are more salient for LGB youth and are significant drivers of the relationship between sexual minority status and TDVV. Future research should consider if these factors increase risk of TDVV for LGB students as compared with heterosexual students.

The results of these analyses also suggest that the prevalence and frequency of TDVV among students who selected “not sure” to the sexual identity question are more similar to the LGB students than the heterosexual students. These results are consistent with previous studies by Luo et al. and Martin-Storey, who used state YRBS data to assess TDVV prevalence by sexual orientation, and Kann et al., who examined the prevalence of other health-risk behaviors by sexual identity, including “not sure” students (Kann, Olsen, et al., 2016). In the current study, the “not sure” response option, although a credible choice for youth who might truly be unsure of their sexual identity at this point in their lives, might also have been selected by students who did not understand the question, may have understood the question but did not feel that the other response options were appropriate, or may not have felt comfortable identifying themselves on the questionnaire. Regardless, the results indicate that students who do not identify as heterosexual, lesbian, gay, or bisexual have a unique victimization pattern and additional research could provide more information about why these students are particularly vulnerable.

Important implications exist for intervention and prevention programming for schools and families. Social and institutional support is important for SMY health and well-being. SMY who reported receiving support from schools had fewer negative health outcomes such as depression, suicidality, and substance use (Espelage, Aragon, Birkett, & Koenig, 2008). Therefore, increasing support systems for SMY, including school support groups and Gay-Straight Alliances, may help to decrease victimization (Goodenow, Szalacha, & Westheimer, 2006; Saewyc, Konishi, Rose, & Homma, 2014). Furthermore, another study found that youth perception of staff support had a buffering effect on SMY suicide risk, making it even more important that school staff, including school counselors and mental health professionals, be supportive of the unique needs of SMY (Goodenow et al., 2006). SMY experiencing high rates of family rejection are also more likely to experience negative health outcomes (Ryan, Huebner, Diaz, & Sanchez, 2009); however, SMY with positive support from family report less violence victimization (D’Augelli, Grossman, & Starks, 2008; Espelage et al., 2008). Accordingly, intervention and counseling with parents to promote positive family reactions may decrease these negative experiences (Bouris et al., 2010). Although not specific to SMY youth, recently developed teen dating violence prevention programming has sought to use more gender-neutral language when teaching youth about dating violence. For example, programs such as CDC’s Dating Matters® comprehensive prevention model (Tharp, 2012) and Shifting Boundaries (Taylor, Stein, Mumford, & Woods, 2013) focus on raising awareness of dating violence and teaching about healthy dating relationships without sex-specific language (i.e., boys should not hit girls). Interventions such as these may also decrease dating violence in SMY youth; however, they have yet to be evaluated with this subsample of youth.

The disparate prevalence of TDVV by sexual minority status is an area ripe for future research. This study was limited to direct associations between TDVV prevalence and sexual identity, controlling only for available demographic measures in the YRBS: race/ethnicity, sex, and grade. Future studies could explore the impact or moderating effects of teen mental health issues, alcohol and other drug use, and perceived discrimination. In addition, the YRBS TDVV survey questions do not include information on partner gender, particularly transgender. Understanding these relationships could better inform the types of relationships and further elucidate TDVV among SMY, for example, the prevalence of TDVV among SMY in same-sex relationships versus SMY in opposite-sex relationships. It also may help us to understand which SMY are most at risk for specific types of TDVV—physical only, sexual only, both, or “any.” With a basic prevalence and etiology of these behaviors among SMY, researchers are better able to develop the most appropriate preventive intervention for this population.

Our study has some limitations in addition to those described above for the “not sure” response option in the sexual identity question. Some students may not know their sexual identity, may have been unwilling to disclose it on the YRBS questionnaire or label themselves as sexual minority, or may not have understood the question (although we do not have any evidence that the words used to describe sexual identity are unclear to young people today). The measurement of sexual minority status is complex and includes three constructs: sexual identity, sexual attraction, and actual sexual behaviors. These analyses only considered sexual identity for determining sexual minority status; further analysis using sex of sexual contacts or sexual attraction may have yielded different results (Luo et al., 2014; Martin-Storey, 2015). In addition, this study combined LGB students. At least one study suggests that gay and lesbian adolescents may have different TDVV risk patterns from bisexual adolescents (Freedner et al., 2002); therefore, future studies could explore differences in TDVV between gay or lesbian and bisexual youth. Next, the data are self-reported, and the extent of underreporting or overreporting of health-risk behaviors cannot be determined, although many YRBS health-risk behavior questions have shown good test–retest reliability (Brener et al., 2002). The data also only describe youth who attend school and therefore are not representative of all people in this age group. Nationwide, in 2012, of persons aged 16 to 17 years, approximately 3% were not enrolled in a high school program and had not completed high school (Stark & Noel, 2015). Finally, cross-sectional YRBS data can describe the magnitude and frequency of risk behaviors and provide an indication of associations between sexual identity and TDVV, but not an explanation of why or how this relationship exists.

This study is the first to quantify prevalence and frequency of physical and sexual TDVV among LGB students and to compare LGB to heterosexual students using nationally representative data. LGB teens and youth who are not sure of their sexual identity in the United States are at increased risk for TDVV compared with their heterosexual peers. The results highlight the continuing need for more research on TDVV within LGB youth populations in ways that are attentive to group differences and various types of violence exposure. Nonetheless, evidence-based programs and policies do exist that may combat this disparity and improve quality of life for all youth.

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