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ABSTRACT

Since the landmark ruling in Goodridge v. Department of Public Health in 2004, the legalization of same-sex marriage (SSM) has proliferated throughout the United States via either legislative action or court order. Advocates of SSM laws argue that marriage equality will generate important health benefits not only for adult same-sex couples, but also for LGBQ-identifying youths. Using data from the State Youth Risk Behavior Surveys, we explore the relationship between marriage equality and suicidal behaviors among LGBQ-identifying youths. Despite previous research suggesting otherwise, we find little evidence that SSM laws have reduced suicide attempts among teen sexual minorities, nor have they decreased the likelihood of suicide planning, suicide ideation, or depression. Instead, we find some evidence that SSM legalization via judicial mandate is associated with worse mental health for these individuals, consistent with a story of social backlash.

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1. Introduction

Growth in public acceptance of same-sex couples and support for same-sex marriage (SSM) represents one of the most dramatic social changes in recent American history. In 1999, just 35 percent of Americans supported SSM (Gallup 1999), there was strong bipartisan support for the Defense of Marriage Act (DOMA),[1] and state bans on equal marriage rights for same-sex couples were becoming widespread. During his 2004 re-election campaign, President George W. Bush proposed an amendment to the U.S. Constitution to ban same-sex marriage nationwide. But in a landmark Massachusetts State Supreme Court ruling handed in *Goodridge v. Department of Public Health* (2004), the Commonwealth of Massachusetts became the first U.S. state to recognize the right of same-sex couples to obtain a marriage license. By May 2015, 35 states and the District of Columbia had legalized SSM, 11 states and D.C. through legislative action and 24 states through court rulings. On June 26, 2015, in *Obergefell v. Hodges*, the U.S. Supreme Court ruled that same-sex couples had a Constitutional right to marry, legalizing SSM nationwide. In two decades time, public support for same-sex marriage has nearly doubled.[2]

While SSM laws are relatively new in the United States, economists have already begun studying their labor market and health effects on Lesbian, Gay, and Bisexual (LGB) Americans, as well as their families.[3] Emerging evidence suggests that SSM laws are associated with increases in same-sex couples' earnings and decreases in occupational segregation (Sansone 2018), results that are consistent with the notion that SSM laws reduce discrimination against

[1] DOMA denied Federal marriage benefits to same-sex couples and allowed states to deny recognition of other states' same-sex marriage licenses.

[2] Currently, 63 percent of Americans support marriage equality (Gallup 2019).

[3] There is also research on the "first stage" effects of SSM laws. Carpenter et al. (2018) find that access to SSM is associated with increases in the probability of marriage for individuals residing in households with a same-sex partner.

and stigma toward same-sex couples.[4] Indeed, Aksoy et al. (2018) find that same-sex relationship recognition policies in Europe are associated with improvements in attitudes toward sexual minorities. The legalization of SSM may also generate important benefits for adult same-sex couples through increases in health insurance coverage and health care service utilization (Carpenter et al. 2018), lower STI rates (Eppink 2019; Dee 2008), and decreases in mental healthcare costs (Hatzenbuehler et al. 2012).[5, 6]

While the existing empirical research focuses on adults, advocates of SSM have argued that the benefits of legalization may extend to adolescent sexual minorities, who are at an elevated risk of depression and suicide due to social stigma, homophobia, and discrimination (Meyer 2003). Such spillovers may occur through a number of channels. First, youths' mental health may improve if SSM legalization changes social attitudes and reduces stigmatization (Aksoy et al. 2018).[7] Second, legalization expands future choice sets and may change expectations of future family formation for younger generations of homosexuals, improving current psychological health. Moreover, forward-looking lesbian, gay, bisexual, or questioning (LGBQ) teens may be more discerning in their relationship choices, which could also generate

[4] Relatedly, Ciscato (2018) finds evidence that SSM legalization may induce greater household specialization among lesbian couples.

[5] Langbein and Yost (2009) find no evidence that SSM laws affect marriage, divorce, or abortion rates, nor do they find evidence for effects on the proportion of children born to single women or the percent of children in female-headed households. However, both Allen and Price (2015) and Langbein and Yost (2015) agree that the estimates reported in Langbein and Yost (2009) rely on too little policy variation to reach definitive conclusions.

[6] In related work, Raifman et al. (2018) find that anti-gay rights measures are associated with higher rates of mental distress among adult sexual minorities. Raifman et al. (2018) focus on three laws: (1) a law in Utah that allows government officials to refuse to participate in the issuance of marriage licenses to same-sex couples; (2) a Michigan law that allows adoption and child welfare agencies to deny same-sex couples the opportunity to adopt; and (3) North Carolina's law that prohibits localities from passing LGBQ anti-discrimination laws.

[7] Upon striking down the Defense of Marriage Act (DOMA), Supreme Court Justice Anthony Kennedy claimed that DOMA "humiliates tens of thousands of children now being raised by same-sex couples" (Jayson 2013).

mental health benefits. Third, the psychological benefits of SSM afforded to adult same-sex couples may spill over to youths in their family or social network.[8] Finally, legally married same-sex couples may serve as strong role models for LGBQ youths.

On the other hand, marriage equality could have unintended consequences that harm youths' mental wellbeing. SSM may create a backlash whereby heated political, religious, or social commentary adversely affects the mental health of teens. Such backlash may be more likely if SSM is legalized in communities where the median voter opposes gay rights. Legalization is more likely to be unpopularly imposed by judicial order rather than legislative action taken by elected representatives, and it could create unrealistic expectations about social acceptance that are at variance with reality. Finally, SSM may induce earlier teen relationship formation or sexual initiation, which has been shown to adversely affect mental health (Sabia and Rees 2008).

A recent article published by Raifman et al. (2017) produces the first empirical evidence on the relationship between SSM legalization and youth mental health. Using data from the State Youth Risk Behavior Surveys (YRBS) for the period 1999-2015, Raifman et al. (2017) find that legalization is associated with a 0.6 percentage-point (7 percent) decline in self-reported suicide attempts among all high school students, and a 4 percentage-point (14 percent) decline in suicide attempts among those who identified as LGBQ relative to suicide attempts among heterosexual-identifying youth. The authors conclude that future policymakers should take into account the fact that SSM legalization may save LGBQ youths' lives. This widely-cited study was the highest-impact article published in 2017 in *JAMA Pediatrics*, the flagship journal in

[8] Children of legally recognized same-sex parents also benefit through expanded access to insurance and various other government benefits. Recent estimates indicate that as many as 6 million people in the United States have an LGBT parent (Jayson 2013).

pediatric medicine (Christakis 2018). While there is much to admire about the pioneering efforts of Raifman et al. (2017), we believe their conclusions deserve closer scrutiny for a number of reasons, which we outline in detail in Section 2.2.

Our results provide little evidence to support the notion that marriage equality reduces suicide attempts among U.S. high school students in general and LGBQ-identifying students in particular. The estimated relationship between SSM laws and youth suicide attempts becomes smaller in magnitude and statistically indistinguishable from zero when we properly weight regressions, cluster the standard errors at the appropriate level, and allow covariate effects to differ for sexual minorities versus heterosexual students. Furthermore, we find little evidence to suggest that legalization reduces depression, suicidal ideation, or suicide planning among LGBQ-identifying youth. Estimated coefficients are also sensitive to the inclusion of an additional year of data from the newly available 2017 State YRBS. Specifically, the sign on estimated mental health effects often flips when including the new data, even for the original 9 states examined by Raifman et al. (2017). Lastly, we find evidence that SSM laws via judicial order are actually associated with *increases* in the likelihood that LGBQ-identifying youths planned or seriously considered suicide in the past year.

The remainder of the paper is organized as follows. We begin with an overview of same-sex marriage in the United States and detail why the study by Raifman et al. (2017) deserves a reinvestigation; in Section 3, we describe our data and empirical strategy; and in Section 4 we report our results. Section 5 concludes.

2. Background

2.1 Same-Sex Marriage Legalization in the United States

Same-sex marriage gained national attention in the United States when the U.S. Supreme Court declined to hear *Baker v. Nelson*. In 1972, Jack Baker and Michael McConnell requested the Supreme Court to find a constitutional right to SSM, while the county in Minnesota that denied them a license argued in opposition. The Supreme Court rejected their appeal "for want of a substantial federal question" (Baker v. Nelson: The Legal Briefs 2015). Following this decision, a number of states passed laws that explicitly banned same-sex marriage, including Maryland in 1973, Virginia in 1975, and Florida, California, and Wyoming in 1977 (History.com Editors 2018).

While activism for marriage equality grew during the 1980s and 1990s, Congress passed, and President Clinton signed, the Defense of Marriage Act (DOMA) in 1996, which effectively excluded same-sex couples whose marriages were recognized by their home state from receiving federal marriage benefits (Reilly and Siddiqui 2013). Between 1996 and 2015, 16 states and the District of Columbia passed civil union or domestic partnership laws that recognized same-sex relationships, but (initially) stopped short of full marriage recognition (Civil Unions and Domestic Partnership Statutes 2019). These laws provided same-sex partners many of the same rights as married couples, such as spousal employment benefits and the ability to file state taxes jointly, but denied other rights, such as spousal Social Security benefits, estate tax exemptions, and the ability to file family-based immigration petitions (Civil Marriage v. Civil Unions 2019).

On May 17, 2004, Massachusetts became the first state to legalize SSM when the Massachusetts Supreme Court ruled in *Goodridge v. Department of Public Health* that denying marriage licenses to same-sex couples violated provisions of the state constitution that

guarantees individual liberty and equality (Iannacci 2016). Between 2004 and 2015, 34 additional states and the District of Columbia legalized SSM; 22 of these laws went into effect through judicial ruling and 12 went into effect through legislative efforts (Raifman et al. 2017). On June 26, 2015, in *Obergefell v. Hodges*, the U.S. Supreme Court struck down DOMA and the 14 state laws banning gay marriage, ruling that SSM bans violated the due process and equal protection clauses of the 14th Amendment to the Constitution (Obergefell v. Hodges 2019). This landmark case effectively legalized SSM nationwide.

2.2 A Reinvestigation of Raifman et al. (2017)

Using data from the State YRBS for the period 1999-2015, Raifman et al. (2017) produce the first empirical evidence that SSM legalization may improve the mental health of youth, particularly among those who identify as LGBQ. We believe the results from this study warrant a reinvestigation for at least 6 reasons.

First, Raifman et al. (2017) observe limited post-treatment data. For the period 1999-2015, 9 states contribute observations to the State YRBS before and after SSM legalization. Of these states, 5 have data for only one post-treatment survey wave (Arizona, Delaware, Hawaii, Illinois, and New Mexico), 3 have data for two post-treatment survey waves (Maine, Rhode Island, and Vermont), and one has data for more than two post-treatment survey waves (Massachusetts). Furthermore, because most states did not collect information on sexual orientation until more recent waves of the YRBS, only 6 states have more than two waves of pre-treatment data on suicidality, limiting the ability to conduct even cursory event studies.[9]

[9] In 1999, only one state collected information on sexual orientation as part of their State YRBS (Massachusetts). This number rose to 2 states in 2003, 3 states in 2005, 5 states in 2007, 7 states in 2009, 10 states in 2011, 16 states in 2013, and 25 states in 2015. By 2017, 30 states asked students questions about their sexual orientation.

In the analysis below, we include newly available data from the 2017 State YRBS wave, which offer a number of advantages: (i) a longer post-treatment period for each of the original 9 treated states examined by Raifman et al. (2017), (ii) an additional 6 states contribute identifying variation, (iii) the ability to meaningfully test lead and lagged effects of legalization on youth mental health, (iv) a 63 percent increase in the number of respondents who identified as sexual minorities, and (v) exploitation of a new source of identifying variation generated by the *Obergefell v. Hodges* decision.[10]

Second, the authors' central difference-in-difference-in-difference (DDD) specification, which estimated the effects of SSM laws for self-identified LGBQ youths relative to heterosexuals, restricted the partial effects of all covariates — including race/ethnicity, state LGB employment discrimination laws, and state and year fixed effects — to be identical for sexual minorities and heterosexuals. This is a strong assumption given the growing literature on intersectionality in discrimination (Bostwick et al. 2014), potentially heterogeneous effects of LGB anti-discrimination employment laws on sexual minorities and heterosexuals (Leppel 2009), and differences in the LGB-heterosexual mental health gradient across states and over time during a period of massive social change. Allowing the effects of the covariates to differ across these groups may be important for isolating the effects of SSM legalization on youth mental health.

Third, Raifman et al. (2017) adjust standard errors by clustering at the state-by-class level[11] rather than state-level, where the policy variation occurred. This decision may result in

[10] For the period 1999-2017, a total of 15 states contribute observations before and after SSM legalization. Of these states, six have a single wave of post-treatment data (Arkansas, Florida, Kentucky, Michigan, North Dakota, and Wisconsin), five have two waves of post-treatment data (Arizona, Delaware, Hawaii, Illinois, and New Mexico), and four have more than two waves of post-treatment data (Maine, Massachusetts, Rhode Island, and Vermont).

[11] In addition, in Table 2 (Raifman et al. 2017; p. 17) the authors state that they "clustered standard errors by school and by classroom."

estimated standard errors that are downwardly biased, leading to an increased likelihood of rejecting the null hypothesis when there is insufficient evidence to do so (Bertrand et al. 2004).

Fourth, the regressions in Raifman et al. (2017) were weighted using a state-specific YRBS-provided weight. However, the weights provided in each state's survey are not designed to be comparable across states or even within states over time, and they are certainly not designed to make a sample of pooled states nationally representative. The provided weights were designed to make the sample from each state survey wave representative of that state's population of high school students. Indeed, the Centers for Disease Control and Prevention (CDC) cautions users against pooling State YRBS data across states for this very reason (Centers for Disease Control and Prevention 2014). To make these data nationally representative, the weights provided by the YRBS must be comparably rescaled within and across state waves (e.g., to sum to 1) and any estimated regressions should be weighted by the product of this rescaled weight and the state-by-year population of U.S. high school students.

Fifth, SSM legalization may affect whether teens choose to identify as sexual minorities, either to themselves or on a survey. If the choice to identify is related to mental health, estimated effects of SSM laws on sexual minorities may reflect, in part or in whole, compositional changes in the population of sexual minorities. Moreover, a state's inclusion of survey questions on sexual identity may be related to SSM legalization. For instance, Massachusetts was the first state to legalize same-sex marriage (in 2004) and was also the first state to include a question about sexual identity on its state survey (in 1990). At minimum, one should examine whether SSM legalization is related to self-reports of sexual orientation as well as the inclusion of a sexual identity question in the YRBS.

Finally, in addition to self-reports of attempted suicide, the YRBS contains information on suicidal ideation, suicide planning, and depression. Raifman et al. (2017) were silent on each of these alternative measures of mental health status. An examination of these outcomes would (i) allow an exploration of other dimensions of suicidality, as well as (ii) permit the inclusion of additional sources of identifying variation because data on these outcomes are available for more state-waves than are data on suicide attempts.[12]

3. Data and Methods

3.1 YRBS Data

We begin by calling upon data from the State YRBS for the period 1999-2015, the same data used in Raifman et al. (2017). After analyzing data from the 47 states that administered the YRBS between 1999 and 2015, we append data from the newly available 2017 State YRBS. The school-based State YRBS is coordinated by the CDC and administered biennially by state education and health agencies to track trends in teen behaviors including physical activity, unhealthy eating, substance use, sexual activity, and violence.[13] The surveys also contain information on self-reported mental health and, in certain state-years, sexual identity. Appendix Table 1 shows the state-by-year number of observations included in the full State YRBS sample, as well as the State YRBS sub-sample that has non-missing information on suicide attempts and sexual orientation.

To classify respondents as sexual minorities, we use recently collected data on self-reported sexual identity from the State YRBS. As discussed above, the number of states asking

[12] In analyses on suicidal ideation, suicide planning, and depression, two additional states (Maryland and North Carolina) contribute to identification.

[13] For further details on the YRBS data-collection protocols, see Centers for Disease Control and Prevention (2013).

this question on their survey rose steadily between 2009 and 2017. A total of 7 states included this question in 2009, 16 by 2013, 25 by 2015, and 30 by 2017. Respondents were asked:

> *"Which of the following best describes you? Possible answers: Gay or Lesbian, Bisexual, Heterosexual (straight) or Not Sure."*

Following Raifman et al. (2017), we set *Sexual Minority* equal to 1 if the respondent answered "Gay or Lesbian," "Bisexual," or "Not Sure", and equal to 0 if the respondent answered "Heterosexual (straight)." For the sample of all high school students with non-missing information on this question, 10 percent identified as LGBQ (1.7 percent identified as gay/lesbian, 5.1 percent as bisexual, and 3.2 percent as not sure).[14]

Our primary analyses focus on the same outcome explored by Raifman et al. (2017), namely *Suicide Attempt*. Respondents to the YRBS were asked:

> *"During the past 12 months, how many times did you actually attempt suicide?"*

Suicide Attempt is set equal to 1 if a student reported having attempted suicide at least once within the past 12 months, and set equal to 0 otherwise. Eight percent of high school students reported attempting suicide in the last year (Table 1). Consistent with Raifman et al. (2017), we find that reports of attempted suicide were four times higher for those who identified as a sexual minority as compared to heterosexuals (24.8 percent for sexual minorities versus 6.2 percent for heterosexuals).

[14] We find that 3.3 percent of the sample did not respond to this survey question.

In addition, we supplement our measure of *Suicide Attempt* with three other indicators of mental health. Respondents were asked:

> *"During the past 12 months, did you make a plan about how you would attempt suicide?"*

Suicide Plan is set equal to 1 if the respondent answered in the affirmative, and set equal to 0 otherwise. We find that 33.6 percent of self-reported sexual minorities and 10.9 percent of heterosexuals reported suicide planning. In addition, respondents were asked:

> *"During the past 12 months, did you ever seriously consider attempting suicide?"*

Suicide Ideation is set equal to 1 if a student reported seriously considering suicide in the past 12 months, and set equal to 0 otherwise. Suicide ideation for sexual minorities was over three times larger as compared to heterosexual students (39.1 percent versus 12.8 percent).

Finally, respondents were asked:

> *"During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?"*

Depression is set equal to 1 if the student responded in the affirmative, and set equal to 0 otherwise. We find that 53.5 percent of LGBQ-identifying and 24.6 percent of heterosexual-identifying high school students reported frequent sadness.

In extensions discussed in Section 4.5 below, we examine a number of other health behavior outcomes that could be affected by SSM laws, including alcohol use, tobacco use, marijuana use, and bullying victimization.

3.2 Same-Sex Marriage Laws

We searched state SSM statutes to generate our policy variable of interest, *SSM Law*, which is identical to the indicator used in Raifman et al. (2017). Table 2 shows the effective dates for SSM laws, including whether SSM was legalized via court order or legislative action. One might expect heterogeneous effects of SSM laws by the degree of popular support for the law. Figure 1 shows the rollout of SSM laws over time. Early enacting states include Massachusetts, Connecticut, and Vermont, while the latest adopting states (prior to the U.S. Supreme Court decision in June 2015) include Arizona, Colorado, and Utah.

3.3 Methodology

We begin by using State YRBS data for the period 1999-2015 to replicate Raifman et al. (2017) and estimate the following equation via ordinary least squares (OLS):

$$Suicide\ Attempt_{ist} = \beta_0 + \beta_1 SSM\ Law_{st} + \boldsymbol{X'_{st}\beta_2} + \boldsymbol{Z'_{ist}\beta_3} + v_s + \omega_t + \varepsilon_{ist}, \quad (1)$$

where $Suicide\ Attempt_{ist}$ is a binary indicator of whether individual i in state s during year t reported attempting suicide within the past 12 months. Following Raifman et al. (2017), we initially estimate equation (1) for the entire sample of respondents, regardless of whether there is information on sexual identity. The variable of interest, $SSM\ Law_{st}$, is an indicator for whether

state s was enforcing a SSM law during year t.[15] We use the identical control variables employed by Raifman et al. (2017): $\boldsymbol{X_{st}}$ contains the state unemployment rate and an indicator for whether the state has an LGB anti-discrimination employment policy[16]; $\boldsymbol{Z}_{ist}$ contains individual-level covariates including age, sex, race, and gender; v_s is a time-invariant state effect; and ω_t is a state-invariant year effect.

In equation (1), β_1 is interpreted as the relationship between SSM laws and suicide attempts among all high school students. Next, Raifman et al. (2017) limit the sample to the state-year combinations that contain information on self-reported sexual identity and estimate their primary model of interest, which we also replicate:

$$\begin{aligned} &Suicide\ Attempt_{ist} = \alpha_0 + \alpha_1 SSM\ Law_{st} + \alpha_2 Sexual\ Minority_{ist} \\ &+ \alpha_3 SSM\ Law_{st} * Sexual\ Minority_{ist} + \boldsymbol{X'_{st}\alpha_4} + \boldsymbol{Z'_{ist}\alpha_5} + v_s + \omega_t + \varepsilon_{ist}. \end{aligned} \quad (2)$$

The key parameter of interest in equation (2), α_3, is interpreted by Raifman et al. (2017) as the effect of SSM laws on those students who identify as sexual minorities. However, there are at least two concerns with this interpretation.

First, equation (2) does not allow the effects of the covariates, state fixed effects, or year fixed effects to differ for sexual minorities as compared to heterosexuals. As noted above, there

[15] Because the YRBS is generally distributed to students during the spring of the academic year, we followed Raifman et al. (2017) and "turned on" *SSM Law* in the first wave of available data following the year the law went into effect. Alternative coding strategies produced qualitatively similar results, including assuming the YRBS was distributed evenly throughout the year and responses to questionnaire items reflected current behavior. With one exception, the mental health outcomes we observe correspond to behaviors occurring in the past 12 months. The variable *Suicide Attempt* is based on a self-report that is retrospective of the past 30 days. The variables *Suicide Planning*, *Suicide ideation*, and *Depression* are retrospective of the past 12 months.

[16] Data on unemployment rates come from the Federal Reserve Bank of St. Louis, while information on state LGB anti-discrimination laws is available at: https://www.lgbtmap.org/img/maps/citations-nondisc-employment.pdf.

are a number of theoretical reasons why we might expect this to be the case. To allow for a more flexible specification, we first estimate equation (1) where we limit the sample to self-identified sexual minorities, and second estimate equation (2) where we fully interact *Sexual Minority* with every variable on the right-hand side, thereby estimating a fully-interacted DDD model, rather than the partially-interacted DDD model estimated by Raifman et al. (2017).

Second, a youth's willingness to identify as a sexual minority could, itself, be affected by SSM laws, which creates the potential for sample selection bias. While sexual orientation may be exogenous to mental health, the decision to *identify* as a sexual minority — to oneself, one's friends and family, or on a survey — could be influenced by SSM laws. If, for example, the marginal youth who chooses to identify as a sexual minority as a result of SSM is more emotionally fragile, then estimates of any beneficial mental health effects of SSM will be biased toward zero and any adverse effects exacerbated. On the other hand, if the marginal adolescent, who is likely to self-identify as a sexual minority due to the legalization of SSM, is more politically aware and forward looking, then the beneficial psychological effects of SSM laws will be overstated.

To test for sample selection, we regress *Sexual Minority* on *SSM Law* and estimate the following equation:

$$Sexual\ Minority_{ist} = \beta_0 + \beta_1 SSM\ Law_{st} + \boldsymbol{X'_{st}\beta_2} + \boldsymbol{Z'_{ist}\beta_3} + \nu_s + \omega_t + \varepsilon_{ist} \quad (3)$$

A caveat to this approach is that it cannot determine whether SSM laws affect the distribution of mental health among those who identify as sexual minorities.

3.4 Identification

Identification of β_1 comes from within-state variation in the legalization of SSM. Between 1999 and 2015, 35 states and the District of Columbia enacted SSM laws. The remaining states were required to issue marriage licenses to same-sex couples following *Obergefell v. Hodges*. For our analyses where we include data from the 2017 State YRBS and require information on self-reported sexual identity, 15 states contribute to identification (Table 2). Of these 15 states, 9 states (AZ, AR, FL, KY, MA, MI, NM, ND, and WI) legalized SSM through a court ruling and 6 states (DE, HI, IL, ME, RI, and VT) legalized SSM legislatively.

The common trends assumption may be violated if (i) there are state-level time-varying unobservables (e.g., anti-LGB sentiment) that are correlated with both suicide attempts and SSM laws, (ii) pre-trends in LGB suicide attempts differ in SSM states versus non-SSM states, or (iii) SSM laws are passed in response to suicide attempts among LGB adolescents.

We take three approaches to address the possibility that the common trends assumption does not hold. First, we examine lead, contemporaneous, and lagged effects of SSM laws. Second, we experiment with augmenting equations (1) and (2) with controls for census division-by-year effects and state-specific linear time trends. This approach will control for any unmeasured geographic time shocks that could coincidentally be related to the legalization of SSM and adolescent suicide attempts. Finally, as discussed above, we estimate a fully-interacted DDD specification to control for state-specific shocks common to LGBQ and non-LGBQ identifying youth.

4. Results

4.1 Suicide Attempts

In column (1) of Table 3, we attempt to replicate the original findings of Raifman et al. (2017). Following Raifman et al. (2017), we estimate equation (1), adjusting standard errors for clustering at the state-by-grade level and weighting regressions using the State YRBS-provided sampling weights. As discussed above, clustering at the state-by-grade level may lead to standard errors that are too small and the State YRBS weights are not designed to be comparable across states or even within states over time. Based on this specification, we find that SSM laws are associated with a 0.66 percentage point decrease in suicide attempts among U.S. high school students. This estimate is statistically distinguishable from zero at the 5 percent level and is nearly identical to the estimate reported in Raifman et al. (2017).[17]

In column (2), we correct the standard errors by adjusting them for clustering them at the level of policy variation (i.e., the state). This adjustment results in a 56 percent increase in the estimated standard error, rendering the estimate statistically indistinguishable from zero at conventional levels.

In column (3), we correct the weighting variable. Here, we normalize each State YRBS-provided weight (designed to make the sample of each state representative of that state's population in a given year) to sum to 1 across students within state-years. We then multiply this rescaled weight by the state-by-year population of individuals ages 13 to 18 (i.e., roughly the population of high school students).[18] This "adjusted weight" ensures that our estimate of β_1 is

[17] Raifman et al. (2017) report a point estimate of -0.006 that is statistically significant at the 5 percent level.

[18] The population data come from the National Cancer Institute's Surveillance Epidemiology and End Results Program (http://seer.cancer.gov/popdata/).

representative of the average U.S. high school student. Our estimate of β_1, and its standard error, change little when making this correction.[19]

In panel I of Table 4, we present estimates of α_3 from equation (2), and attempt to replicate Raifman et al.'s (2017) "partially-interacted" DDD model. Again, our estimate is nearly identical to the one reported in Raifman et al (2017). Specifically, we find that SSM laws are associated with a statistically significant 4.1 percentage-point reduction in suicide attempts among LGBQ identifying youths.[20] The estimated effect remains statistically significant at the 5 percent level when we cluster the standard errors appropriately (column (2)) and changes little when we use corrected weights (column (3)).

In panel II of Table 4, we restrict the sample to sexual minorities, allowing the effects of the covariates to differ for this subgroup. In this case, the absolute magnitude of the estimated policy impact falls by 67 percent; we consistently find that SSM laws are associated with a statistically insignificant 1.4 to 1.5 percentage-point reduction in suicide attempts. In panel III, we find no evidence that SSM laws affect suicide attempts among self-identified heterosexuals, and estimates from fully-interacted DDD models (panel IV) are in line with those shown in panel II, suggesting that forcing coefficients on covariates to be equal for sexual minorities and heterosexuals may not be appropriate.[21]

[19] We also calculated p-values from the wild cluster bootstrap method suggested by Cameron et al. (2008) and Cameron and Miller (2015). Wild cluster bootstrap critical values provide an asymptotic refinement and may work better than other inference methods for OLS when the number of clusters is small. Neither of the estimates reported in columns (2) or (3) of Table 3 were statistically significant at conventional levels when using the wild cluster bootstrap procedure (column (2) p-value = 0.126; column (3) p-value = 0.131).

[20] Raifman et al. (2017) report a point estimate of -0.040 that is statistically significant at the 1 percent level.

[21] Coefficient estimates on the variables included in $\boldsymbol{X_{st}}$, $\boldsymbol{Z_{ist}}$, and the year fixed effects are shown in Appendix Table 2. They suggest that many of the covariate effects on suicide attempts differ for sexual minorities versus heterosexuals (columns (1) and (5)).

When we further probe which covariate interactions affect the marginal impact of *Sexual Minority*SSM Law*, we find that failing to account for differential year effects vastly overstates the effect of SSM laws on suicide attempts among sexual minorities (Appendix Table 3).[22] This is consistent with a period of massive national social change that improved social conditions for sexual minorities.

4.2 Sample Selection Bias

In Table 5, we explore the possibility of sample selection bias by estimating the impact of SSM laws on self-identification as a sexual minority. Our results provide evidence that SSM legalization leads to a reduction in the likelihood that a respondent reports being "not sure" of his or her sexual orientation. This effect appears to be driven by an increase in the share of youths who report to be gay, lesbian, or bisexual, although these estimated effects are not statistically distinguishable from zero. One interpretation is that SSM laws push those on the margin of identifying as a sexual minority (or in transition to that identification) over that threshold.[23] This possibility raises concerns about sample selection bias. If SSM laws increase the probability that youth identify as sexual minorities and these individuals have systematically better (worse) mental health, then the estimated mental health benefits of SSM would be biased upward (downward). However, given that the effects mostly occur within LGBQ-identifying

[22] Joint significance tests on the interactions between *Sexual Minority* and year fixed effects yielded an F-statistic of 113 and a p-value < 0.0001.

[23] If we restrict the samples in columns (2), (3), and (4) to exclude those identifying as bisexual and "not sure", gay/lesbian and "not sure", and gay/lesbian and bisexual, respectively, the estimates are very similar to those currently reported in Table 5. Likewise, the results are similar if we do not require non-missing information on suicide attempts.

respondents, rather than across LGBQ and heterosexual-identifying respondents, these effects should be relatively small.

Finally, we explore the possibility that SSM laws influence a state's choice to include a sexual identity question in their YRBS, another form of potential sample selection bias. These results, which are shown in Appendix Table 4, provide no evidence that SSM laws affected the likelihood that a state's YRBS included information on the sexual identity of its respondents.

4.3 Other Mental Health Outcomes

As noted above, a number of other mental health outcomes are available in the YRBS, but were unexplored by Raifman et al. (2017). In Table 6, we explore the relationship between SSM laws and *Suicide Planning* (column (1)), *Suicide Ideation* (column (2)), and *Depression* (column (3)).[24] From this point forward, we present estimates that are weighted by the preferred adjusted YRBS weights and correct standard errors for clustering at the state level. Across the sample of sexual minorities (panel I), DD estimates show no evidence that SSM laws affected the probability of planning suicide, seriously contemplating suicide, or frequent sadness or depression. The estimates are uniformly small in magnitude and are statistically indistinguishable from zero at conventional levels. Fully-interacted DDD estimates (panel II) also show no evidence that SSM laws improved youth mental health.[25]

[24] See Table 1 for variable definitions and descriptive statistics.

[25] Appendix Table 2 shows coefficient estimates on all the covariates and year effects for DD models estimated separately by sexual minority status. They suggest that many of the covariate effects on these other mental health outcomes differ for sexual minorities versus heterosexuals (columns (2)-(4) and (6)-(8)).

4.4 Expanding the Sample and Examining Heterogeneous Treatment Effects

Next, we append data from the 2017 State YRBS to our analysis sample.[26] This allows us to increase the post-treatment period for many states that legalized SSM, allows the *Obergefell* decision to contribute identifying variation, and expands our sample of LGBQ-identifying youths. The results in Table 7 suggest that the inclusion of the 2017 YRBS data renders the estimated effects of SSM laws on LGBQ-identifying youths' suicidal behaviors and depression to be uniformly positive. Fully-interacted DDD estimates now show that SSM laws are associated with a statistically significant 4.8 percentage-point *increase* in the probability of suicide planning among sexual minorities and a 2.9 percentage-point *increase* in suicide ideation. Furthermore, when we restrict the set of treatment states to only the original 9 states included in Raifman et al.'s analysis (Appendix Table 6), we see a similar pattern of results. Thus, we are not capturing heterogeneous treatment effects relative to prior findings. In sharp contrast with Raifman et al. (2017), our results suggest no evidence of a reduction in suicide behaviors among LGBQ youths and are consistent with possible backlash from SSM legalization or, perhaps, expectations of acceptance that are at variance with social reality.

Conducting a long event study is not feasible given that data on mental health for LGBQ-identifying youth has only been consistently provided in more recent waves of the State YRBS, with the number of states asking about sexual identity increasing over time.[27] In light of this, we simply replace *SSM Law* with a lead that indicates two or more waves prior to legalization, an indicator for the year of the law change, and a lag that indicates one or more years after

[26] Appendix Table 5 presents descriptive statistics for the period 1999-2017.

[27] Eight states have one wave of data on self-reported sexual identity, nine states have two waves, five states have three waves, two states have four waves, and seven states have five or more waves of data (Appendix Table 1).

legalization (Table 8).[28] The results from this exercise show little evidence of systematic pre-trends for three of the four mental health outcomes of interest. For suicide planning, in both the DD (panel I) and fully-interacted DDD (panel II) models, the coefficient estimate on *Two or More Waves Prior to SSM Law* is negative and statistically significant. In the post-treatment period, we find no evidence of mental health benefits of SSM laws. Instead, we find that SSM legalization is associated with increases in the probability of suicide planning and suicide ideation for LGBQ-identifying youths, a pattern not seen in the pre-treatment period.[29]

In Table 9, we control for spatial heterogeneity. This approach is designed to disentangle the effects of SSM laws from unobserved geographic-specific time shocks, including sentiment toward LGBQ-identifying youths. We find that estimates are similar to those reported above when including census division-by-year effects (panels I and II) and state-specific linear time trends (panel III and IV) on the right-hand side of our estimating equations.[30, 31]

In Table 10, we replace *SSM Law* with two mutually exclusive indicators, *SSM Law by Legislative Action* and *SSM Law by Court Order*. Here, we explore whether the effects of SSM laws on youth mental health differ by the political process through which legalization occurred,

[28] The omitted category is the wave prior to legalization.

[29] Fifteen states identify the coefficient on *Two or More Waves Prior to SSM Law*, 15 states identify the coefficient on *Wave Prior to SSM Law*, 14 states identify the coefficient on *Year of Law Change*, and 10 states identify the coefficient on *One or More Waves After SSM Law*.

[30] There are nine census divisions, Pacific (AL, CA, HI, OR, WA), Mountain (AZ, CO, ID, MT, NM, NV, UT, WY), West North Central (IA, KS, MN, MO, NE, ND, SD), West South Central (AR, LA, OK, TX), East North Central (IN, IL, MI, OH, WI), East South Central (AL, KY, MS, TN), South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV), Middle Atlantic (NJ, NY, PA), and New England (CT, ME, MA, NH, RI, VT).

[31] In Appendix Table 7, we present unweighted State YRBS estimates and the results are qualitatively similar. In Appendix Table 8, we pool the State and National YRBS (which includes identifying variation from 3 additional states) and again confirm our general pattern of results. See Anderson and Sabia (2018) for a description of the differences between the State and National YRBS. In Appendix Table 9, we estimate effects separately for gay/lesbian, bisexual, and questioning youths. We find little evidence of heterogeneous effects by type of sexual minority.

namely whether it was through judicial ruling or a legislatively-initiated law change. Our results indicate some heterogeneity in effects by path to adoption. In particular, we find that court-ordered SSM legalization has worse mental health effects on LGBQ-identifying youths than legislatively enacted SSM legalization. This result is consistent with the hypothesis that LGBQ-identifying youths may face harsher social backlash in places where SSM is less popular and hence not enacted by the state's popularly elected representatives. Interestingly, when we disaggregate court-ordered legalization by whether it occurred at the state versus federal level, we find that *Obergefell v. Hodges* is associated with the largest adverse mental health effect (Appendix Table 10). However, this latter effect is identified off of only four states in our sample, suggesting caution in interpretation.

In Table 11, we examine whether there are heterogeneous effects of SSM legalization by gender (panels I and II), race (panels III and IV), and age (panels V and VI) among sexual minorities. Across all demographic groups, we find little evidence to suggest that SSM laws are associated with improvements in mental health.

4.5 Other Health and Risky Behaviors

Finally, in Table 12, we explore whether SSM laws are associated with changes in any other risky behaviors to which marginalized LGBQ youths may turn when coping with stigma: alcohol consumption, tobacco use, and marijuana use.[32] If SSM laws were effective at creating

[32] Respondents were asked:

"During the past 30 days, on how many days did you have at least one drink of alcohol?"

"During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?"

"During the past 30 days, on how many days did you smoke cigarettes?"

"safer spaces" for sexual minorities and improved their mental health, one might expect a reduction in risky health behaviors. In addition, SSM law-induced reductions in substance abuse could be a pathway through which SSM legalization improved youth mental health. Our findings, however, lend little support to either hypothesis. In fact, DDD estimates show that SSM legalization was associated with a 3.4 percentage-point *increase* in binge drinking among self-identifying LGBQ youths. Moreover, we also find little evidence that SSM legalization reduced bullying victimization among LGBQ-identifying youths.[33] In summary, there is little support for the hypothesis that SSM legalization reduced adolescent risky health behaviors or bullying victimization at school, outcomes strongly related to youth mental health.

5. Conclusion

The growth in public support for same-sex couples and the legalization of SSM represents one of most dramatic and rapid social changes in American history. While there is emerging evidence that SSM legalization has generated important financial and health-related benefits for adult same-sex couples, advocates of SSM argue that the benefits may extend to the psychological health of LGBQ-identifying youth. Using data from the State Youth Risk

"During the past 30 days, how many times did you use marijuana?"

Alcohol Use, *Binge Drinking*, *Cigarette Use*, and *Marijuana Use*, are coded as equal to 1 if respondents answered the above items by reporting a positive number of occasions of use, respectively, and set equal to 0 otherwise.

[33] During the 2009-2017 waves of the YRBS, respondents were asked:

"During the past 12 months, have you ever been bullied on school property?"

Bullied is set equal to 1 if respondents answered the above item in the affirmative, and set equal to 0 otherwise. Means for the outcomes considered in Table 12 are reported in Appendix Table 11.

Behavior Surveys for the period 1999-2017, we examine the relationship between marriage equality and suicidal behaviors of LGBQ-identifying youths.

Our results suggest that prior evidence showing that SSM laws reduce youth suicide attempts can be explained by (i) underestimated standard errors, (ii) a failure to account for differential trends in suicidal behaviors between LGBQ-identifying and heterosexual-identifying youth, (iii) a focus on one measure of suicidal behavior, and (iv) insufficient post-treatment data for youths exposed to SSM legalization. After accounting for each of these concerns, we find little evidence that SSM laws have reduced suicide behaviors of self-identifying sexual minorities. When we include additional years of post-treatment data and new sources of identifying variation, we actually find some evidence that SSM legalization is associated with worse mental health outcomes for LGBQ youth, particularly when legalization occurs through judicial ruling rather than legislative action by popularly elected representatives. This finding is consistent with a story of social backlash against LGBQ youths in jurisdictions where support for SSM is weak.

While the debate over SSM has been a controversial and contentious one, there is now reasonably strong support for SSM among the current median American voter. In the hurry to embrace social change, it is incumbent upon scientists to be cautious in the interpretation of early evidence. To echo Allen and Price (2015, pg. 154), "[r]ushing into empirical work before the data are ready or before an appropriate empirical strategy can be identified, is likely to cause more harm than good." We close that, while there appears to be important benefits of SSM for adult same-sex couples, it is too soon to conclude that the legalization of SSM reduces suicide attempts among LGBQ-identifying youths.

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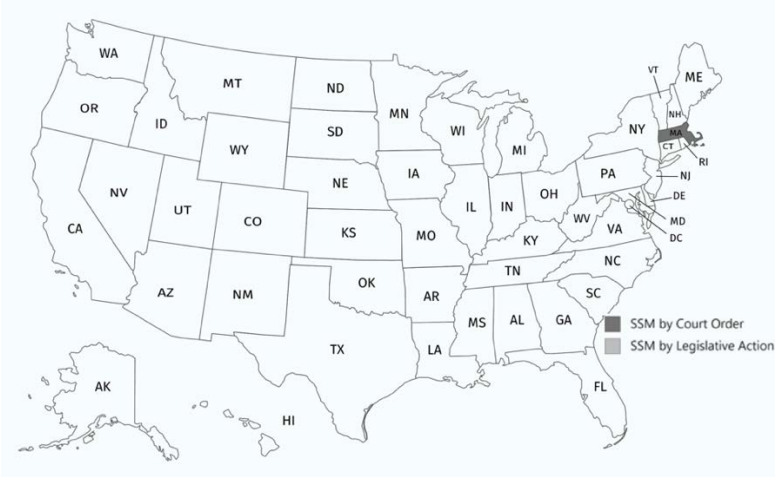
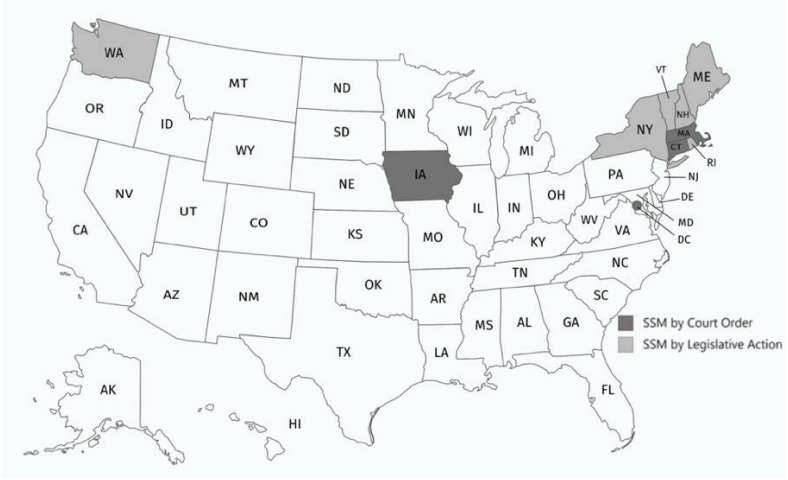
Figure 1. Same Sex Marriage Legalization Over Time

2004

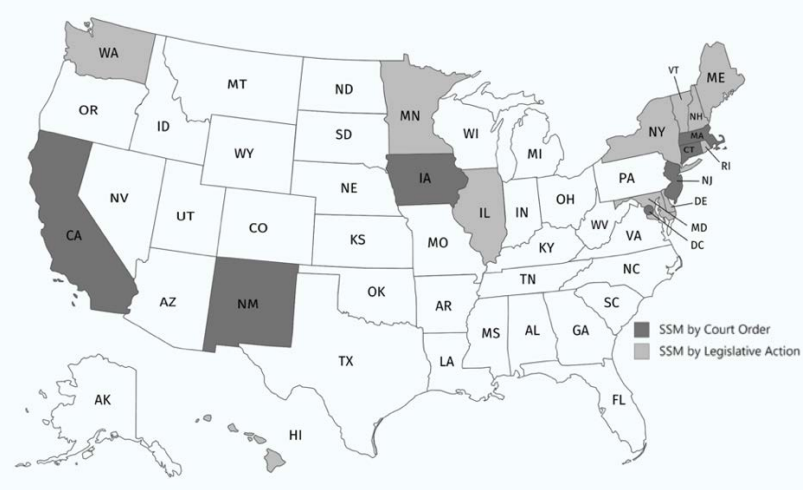


2008

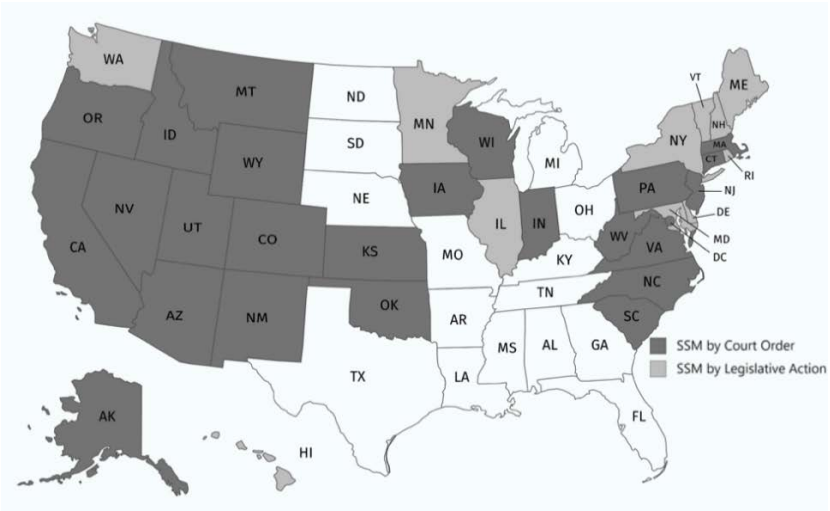
2012



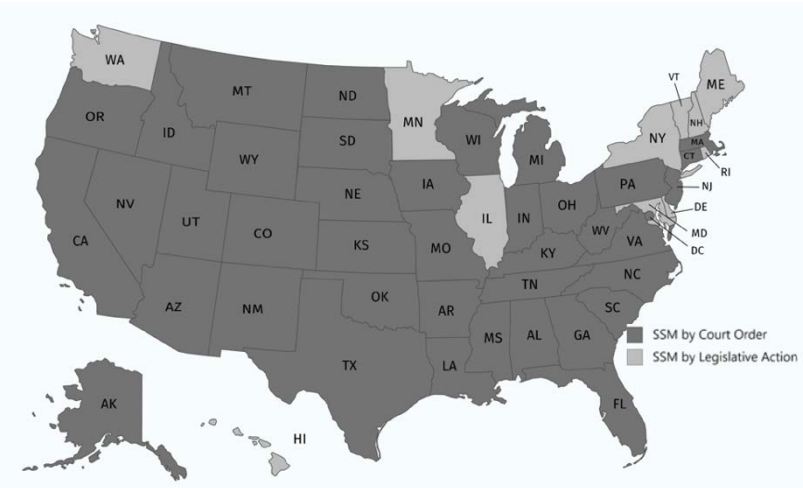
2013



2014



2015



Notes: States are shaded if SSM was legalized at any point during the indicated calendar year.

Table 1. Means by Self-Reported Sexual Identity, State YRBS (1999-2015)

	Pooled	Heterosexual	LGBQ	Description
Dependent Variables				
Suicide Attempt	0.080 (N = 232,019)	0.062 (N = 209,024)	0.248 (N = 22,995)	= 1 if respondent attempted suicide at least once in past 30 days, = 0 otherwise
Suicide Planning	0.132 (N = 341,289)	0.109 (N = 304,585)	0.336 (N = 36,704)	= 1 if respondent made a plan about how to attempt suicide in past 12 months, = 0 otherwise
Suicide Ideation	0.155 (N = 309,921)	0.128 (N = 275,449)	0.391 (N = 34,472)	= 1 if respondent seriously considered attempting suicide in past 12 months, = 0 otherwise
Depression	0.275 (N = 357,887)	0.246 (N = 318,983)	0.535 (N = 38,904)	=1 if respondent felt sad or hopeless almost every day for two weeks or more in a row in past 12 months, = 0 otherwise
Independent Variables				
SSM Law	0.513	0.507	0.561	=1 if state enacted same-sex marriage law
Male	0.495	0.512	0.340	= 1 if respondent is male, = 0 if respondent is female
Age 14 or Younger	0.114	0.112	0.125	= 1 if respondent is 14 years old or younger, = 0 otherwise
Age 15	0.256	0.255	0.264	= 1 if respondent is 15 years old, = 0 otherwise
Age 16	0.256	0.257	0.251	= 1 if respondent is 16 years old, = 0 otherwise
Age 17	0.236	0.238	0.222	= 1 if respondent is 17 years old, = 0 otherwise
Age 18	0.138	0.138	0.138	= 1 if respondent is 18 years or older, = 0 otherwise
Black	0.108	0.105	0.127	= 1 if respondent is black, = 0 otherwise
Non-Hispanic White	0.584	0.592	0.507	= 1 if respondent is non-Hispanic white, = 0 otherwise
Hispanic	0.216	0.212	0.254	= 1 if respondent is Hispanic, = 0 otherwise
Other Race	0.093	0.091	0.112	= 1 if respondent is an “other” race, = 0 otherwise
Sexual Minority	0.100	0	1	= 1 if respondent reported as LGB or “not sure”, = 0 otherwise
Gay or Lesbian	0.017	0	0.173	= 1 if respondent reported as gay or lesbian, = 0 otherwise

Bisexual	0.051	0	0.511	= 1 if respondent reported as bisexual, = 0 otherwise
Not sure	0.032	0	0.316	= 1 if respondent reported as "not sure", = 0 otherwise
LGB Employment Policy	0.678	0.681	0.651	= 1 if state has an LGB anti-discrimination employment law, =0 otherwise
Unemployment	6.465	6.470	6.414	State unemployment rate

Notes: Means for the mental health outcomes are based on the state-year combinations where information on sexual identity is available. Means for the independent variables are based on the state-year combinations where information on sexual identity and suicide attempts is available. All means are weighted to be nationally representative.

Table 2. State Same-Sex Marriage Laws

State	Date of Legalization	Court Ordered vs. Legislative Action	State	Date of Legalization	Court Ordered vs. Legislative Action
Alabama	06/26/15	Court Ordered	Montana	11/09/14	Court Ordered
Alaska	10/12/14	Court Ordered	Nebraska	06/26/15	Court Ordered
Arizona[ab]	10/17/14	Court Ordered	Nevada	10/09/14	Court Ordered
Arkansas[b]	06/26/15	Court Ordered	New Hampshire	01/01/10	Legislative Action
California	06/26/13	Court Ordered	New Jersey	10/22/13	Court Ordered
Colorado	10/17/14	Court Ordered	New Mexico[ab]	12/19/13	Court Ordered
Connecticut	11/12/08	Court Ordered	New York	07/24/11	Legislative Action
Delaware[ab]	07/01/13	Legislative Action	North Carolina	10/10/14	Court Ordered
D.C.	03/03/10	Legislative Action	North Dakota[b]	06/26/15	Court Ordered
Florida[b]	01/06/15	Court Ordered	Ohio	06/26/15	Court Ordered
Georgia	06/26/15	Court Ordered	Oklahoma	10/06/14	Court Ordered
Hawaii[ab]	12/02/13	Legislative Action	Oregon	05/19/14	Court Ordered
Idaho	10/15/14	Court Ordered	Pennsylvania	05/20/14	Court Ordered
Illinois[ab]	11/20/13	Legislative Action	Rhode Island[ab]	07/01/11	Legislative Action
Indiana	10/06/14	Court Ordered	South Carolina	11/12/14	Court Ordered
Iowa	04/03/09	Court Ordered	South Dakota	06/26/15	Court Ordered
Kansas	06/26/15	Court Ordered	Tennessee	06/26/15	Court Ordered
Kentucky[b]	06/26/15	Court Ordered	Texas	06/26/15	Court Ordered
Louisiana	06/26/15	Court Ordered	Utah	10/06/14	Court Ordered
Maine[ab]	12/29/12	Legislative Action	Vermont[ab]	09/01/09	Legislative Action
Maryland	01/01/13	Legislative Action	Virginia	10/06/14	Court Ordered
Massachusetts[ab]	05/07/04	Court Ordered	Washington	12/06/12	Legislative Action
Michigan[b]	06/26/15	Court Ordered	West Virginia	10/09/14	Court Ordered
Minnesota	07/01/13	Legislative Action	Wisconsin[b]	10/06/14	Court Ordered
Mississippi	06/26/15	Court Ordered	Wyoming	10/07/14	Court Ordered
Missouri	06/26/15	Court Ordered			

[a] These states contribute observations before and after SSM legalization in the State YRBS sample that contains information on suicide attempts and self-reports of sexual identity for the period 1999-2015.

[b] These states contribute observations before and after SSM legalization in the State YRBS sample that contains information on suicide attempts and self-reports of sexual identity for the period 1999-2017.

Table 3. SSM Laws and Suicide Attempts for Full Sample, State YRBS (1999-2015)

	(1)	(2)	(3)
	Suicide Attempt	*Suicide Attempt*	*Suicide Attempt*
SSM Law	-0.0066*	-0.0066	-0.0064
	(0.0027)	(0.0042)	(0.0041)
N	757,977	757,977	757,977
Mean of dependent variable	0.080	0.080	0.083
Level of SE clustering	State-by-grade	State	State
Sample weights	YRBS	YRBS	Adjusted YRBS

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2015. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. Regressions are weighted by the type of weights indicated above. Standard errors, clustered at the level indicated above, are in parentheses.

Table 4. SSM Laws and Suicide Attempts for Sample with Information on Self-Reported Sexual Identity, State YRBS (1999-2015)

	(1)	(2)	(3)
	Suicide Attempt	*Suicide Attempt*	*Suicide Attempt*
	Panel I: Replication of Raifman et al.'s (2017) partially-interacted DDD estimate		
*SSM Law*Sexual Minority*	-0.0418**	-0.0418*	-0.0425*
	(0.0130)	(0.0170)	(0.0174)
N	232,019	232,019	232,019
Mean of dependent variable	0.248	0.248	0.248
	Panel II: DD estimates for sexual minorities		
SSM Law	-0.0138	-0.0138	-0.0145
	(0.0173)	(0.0119)	(0.0121)
N	22,995	22,995	22,995
Mean of dependent variable	0.248	0.248	0.248
	Panel III: DD estimates for heterosexuals		
SSM Law	0.0022	0.0022	0.0022
	(0.0056)	(0.0067)	(0.0067)
N	209,024	209,024	209,024
Mean of dependent variable	0.061	0.061	0.062
	Panel IV: Fully-interacted DDD estimates		
*SSM Law*Sexual Minority*	-0.0160	-0.0160	-0.0167
	(0.0167)	(0.0119)	(0.0121)
N	232,019	232,019	232,019
Mean of dependent variable	0.248	0.248	0.248
Level of SE clustering	State-by-grade	State	State
Sample weights	YRBS	YRBS	Adjusted YRBS

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2015. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panel IV also control for interactions between *Sexual Minority* and all right-hand-side variables. Regressions are weighted by the type of weights indicated above. Standard errors, clustered at the level indicated above, are in parentheses.

Table 5. SSM Laws and Youth LGBQ Identification, State YRBS (1999-2015)

	(1)	(2)	(3)	(4)
	Sexual Minority	*Gay or Lesbian*	*Bisexual*	*Not Sure*
SSM Law	-0.0070	0.0005	0.0003	-0.0078**
	(0.0052)	(0.0022)	(0.0031)	(0.0016)
N	232,019	232,019	232,019	232,019
Mean of dependent variable	0.100	0.017	0.051	0.032

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2015. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Table 6. SSM Laws and Other Mental Health Outcomes, State YRBS (1999-2015)

	(1)	(2)	(3)
	Suicide Planning	*Suicide Ideation*	*Depression*
	Panel I: DD estimates for sexual minorities		
SSM Law	-0.0035	0.0139	-0.0200
	(0.0146)	(0.0141)	(0.0207)
N	36,704	34,472	38,904
Mean of dependent variable	0.336	0.391	0.535
	Panel II: Fully-interacted DDD estimates		
*SSM Law*Sexual Minority*	-0.0016	0.0244	0.0024
	(0.0123)	(0.0152)	(0.0171)
N	341,289	309,921	357,887
Mean of dependent variable	0.336	0.391	0.535

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2015. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panel II also control for interactions between *Sexual Minority* and all right-hand-side variables. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Table 7. SSM Laws and Mental Health, State YRBS (1999-2017)

	(1)	(2)	(3)	(4)
	Suicide Attempt	*Suicide Planning*	*Suicide Ideation*	*Depression*
	Panel I: DD estimates for sexual minorities			
SSM Law	0.0017	0.0517**	0.0323**	0.0069
	(0.0132)	(0.0160)	(0.0103)	(0.0132)
N	38,600	56,679	56,068	63,145
Mean of dependent variable	0.234	0.325	0.392	0.547
	Panel II: Fully-interacted DDD estimates			
*SSM Law*Sexual Minority*	0.0005	0.0477**	0.0294*	0.0160
	(0.0120)	(0.0142)	(0.0109)	(0.0150)
N	333,880	473,857	446,666	513,803
Mean of dependent variable	0.234	0.325	0.392	0.547

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2017. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. Regressions are weighted by the adjusted YRBS weights. The models in panel II also control for interactions between *Sexual Minority* and all right-hand-side variables. Standard errors, corrected for clustering at the state level, are in parentheses.

Table 8. Leads and Lags of *SSM Law*, State YRBS (1999-2017)

	(1) *Suicide Attempt*	(2) *Suicide Planning*	(3) *Suicide Ideation*	(4) *Depression*
	Panel I: DD estimates for sexual minorities			
Two or More Waves Prior to SSM Law	-0.0435	-0.0398*	-0.0256	-0.0186
	(0.0218)	(0.0150)	(0.0154)	(0.0225)
Wave Prior to SSM Law	-	-	-	
Year of Law Change	0.0056	0.0450**	0.0353**	0.0071
	(0.0137)	(0.0128)	(0.0090)	(0.0161)
One or More Waves After SSM Law	0.0473	0.0302	0.0563**	0.0138
	(0.0261)	(0.0180)	(0.0114)	(0.0265)
N	38,600	56,679	56,068	63,145
Mean of dependent variable	0.234	0.325	0.392	0.547
	Panel II: Fully-interacted DDD estimates			
Two or More Waves Prior to SSM Law	-0.0343	-0.0360**	-0.0136	-0.0069
**Sexual Minority*	(0.0192)	(0.0108)	(0.0145)	(0.0183)
*Wave Prior to SSM Law*Sexual Minority*	-	-	-	
*Year of Law Change*Sexual Minority*	0.0051	0.0414**	0.0340**	0.0176
	(0.014)	(0.0110)	(0.0100)	(0.0166)
One or More Waves After SSM Law	0.0433	0.0276	0.0597**	0.0279
**Sexual Minority*	(0.0298)	(0.0153)	(0.0156)	(0.0221)
N	333,880	473,857	446,66	513,803
Mean of dependent variable	0.234	0.325	0.392	0.547

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2017. The omitted category is the wave prior to legalization. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panel II also control for interactions between *Sexual Minority* and all right-hand-side variables. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Table 9. Controlling for Spatial Heterogeneity, State YRBS (1999-2017)

	(1)	(2)	(3)	(4)
	Suicide Attempt	*Suicide Planning*	*Suicide Ideation*	*Depression*
	Panel I: Controlling for census division-by-year effects (DD estimates for sexual minorities)			
SSM Law	0.0070	0.0298*	0.0353**	0.0080
	(0.0144)	(0.0116)	(0.0100)	(0.0135)
N	38,600	56,679	56,068	63,145
Mean of dependent variable	0.234	0.325	0.392	0.547
	Panel II: Controlling for census division-by-year effects (Fully-interacted DDD estimates)			
*SSM Law*Sexual Minority*	0.0017	0.0268**	0.0376**	0.0102
	(0.0090)	(0.0088)	(0.0105)	(0.0131)
N	333,880	473,857	446,666	513,803
Mean of dependent variable	0.234	0.325	0.392	0.547
	Panel III: Controlling for census division-by-year effects and state-specific linear time trends (DD estimates for sexual minorities)			
SSM Law	-0.0093	0.0115**	0.0255	-0.0171
	(0.0126)	(0.0041)	(0.0133)	(0.0130)
N	38,600	56,679	56,068	63,145
Mean of dependent variable	0.234	0.325	0.392	0.547
	Panel IV: Controlling for census division-by-year effects and state-specific linear time trends (Fully-interacted DDD estimates)			
*SSM Law*Sexual Minority*	-0.0077	0.0121**	0.0327*	-0.0064
	(0.0093)	(0.0033)	(0.0151)	(0.0180)
N	333,880	473,857	446,666	513,803
Mean of dependent variable	0.234	0.325	0.392	0.547

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2017. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panels II and IV also control for interactions between *Sexual Minority* and all right-hand-side variables. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Table 10. SSM Laws by Court Order versus Legislative Action, State YRBS (1999-2017)

	(1)	(2)	(3)	(4)
	Suicide Attempt	*Suicide Planning*	*Suicide Ideation*	*Depression*
	Panel I: DD estimates for sexual minorities			
SSM Law by Legislative Action	0.0021	0.0280	0.0132	0.0042
	(0.0193)	(0.0195)	(0.0142)	(0.0209)
SSM Law by Court Order	0.0032	0.0633**	0.0403**	0.0087
	(0.0148)	(0.0173)	(0.0129)	(0.0129)
N	38,600	56,679	56,068	63,145
Mean of dependent variable	0.234	0.325	0.392	0.547
	Panel II: Fully-interacted DDD estimates			
SSM Law by Legislative Action	0.0030	0.0334*	0.0144	0.0142
**Sexual Minority*	(0.0156)	(0.0156)	(0.0125)	(0.0182)
SSM Law by Court Order	0.0011	0.0544**	0.0353*	0.0184
**Sexual Minority*	(0.0151)	(0.0156)	(0.0148)	(0.0157)
N	333,880	473,857	446,666	513,803
Mean of dependent variable	0.234	0.325	0.392	0.547

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2017. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panel II also control for interactions between *Sexual Minority* and all right-hand-side variables. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Table 11. Heterogeneous Effects and SSM Laws, State YRBS (1999-2017)

	(1)	(2)	(3)	(4)
	Suicide Attempt	*Suicide Planning*	*Suicide Ideation*	*Depression*
	Panel I: DD estimates for male sexual minorities			
SSM Law	0.0005	0.0387	0.0479*	0.0121
	(0.0188)	(0.0191)	(0.0231)	(0.0227)
N	12,546	18,916	18,555	20,897
Mean of dependent variable	0.216	0.260	0.312	0.402
	Panel II: DD estimates for female sexual minorities			
SSM Law	0.0019	0.0571*	0.0237	0.0055
	(0.0144)	(0.0278)	(0.0159)	(0.0132)
N	26,054	37,763	37,513	42,248
Mean of dependent variable	0.242	0.357	0.432	0.619
	Panel III: DD estimates for non-Hispanic white sexual minorities			
SSM Law	0.0174	0.0522*	0.0377*	-0.0065
	(0.0209)	(0.0202)	(0.0164)	(0.0185)
N	20,148	27,878	24,864	30,470
Mean of dependent variable	0.222	0.341	0.426	0.572
	Panel IV: DD estimates for non-white sexual minorities			
SSM Law	-0.0224	0.0315	0.0213	0.0167
	(0.0253)	(0.0278)	(0.0146)	(0.0174)
N	18,452	28,801	31,204	32,675
Mean of dependent variable	0.244	0.311	0.363	0.525
	Panel V: DD estimates for sexual minorities 12 to 15 years of age			
SSM Law	0.0073	0.0391	0.0078	-0.0177
	(0.0185)	(0.0296)	(0.0216)	(0.0224)
N	15,270	23,396	23,498	26,196
Mean of dependent variable	0.250	0.360	0.423	0.553
	Panel VI: DD estimates for sexual minorities 16 years of age and older			
SSM Law	-0.0048	0.0543*	0.0430	0.0203
	(0.0198)	(0.0233)	(0.0255)	(0.0154)
N	23,330	33,283	32,570	36,949
Mean of dependent variable	0.224	0.304	0.374	0.543

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2017. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Table 12. SSM Laws and Youth Risky Behavior, State YRBS (1999-2017)

	(1)	(2)	(3)	(4)	(5)
	Alcohol Use	*Binge Drinking*	*Cigarette Use*	*Marijuana Use*	*Bullied*
	Panel I: DD estimates for sexual minorities				
SSM Law	0.0060	0.0320**	0.0087	0.0195	-0.0193
	(0.0174)	(0.0110)	(0.0168)	(0.0185)	(0.0315)
N	57,152	55,032	60,821	61,518	54,377
Mean of dependent variable	0.373	0.185	0.180	0.295	0.322
	Panel II: Fully-interacted DDD estimates				
*SSM Law*Sexual Minority*	0.0121	0.0341*	0.0165	0.0191	0.0255
	(0.0127)	(0.0145)	(0.0163)	(0.0171)	(0.0192)
N	484,270	458,882	503,240	508,395	421,066
Mean of dependent variable	0.373	0.185	0.180	0.295	0.322

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2017. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panel II also control for interactions between *Sexual Minority* and all right-hand-side variables. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Appendix Table 1. Number of Observations by State-Year, State YRBS (1999-2017)

	1999	2001	2003	2005	2007	2009	2011	2013	2015	2017
Alabama	1,827	1,351	916	858	-	1,214	1,148	1,279	1,291	-
Alaska	-	-	1,283	-	1,105	1,047	1,096	1,034	1,165	1,102
Arizona	-	-	2,895	2,649	2,447	2,207	2,436	**1,388**	**2,094**	**1,720**
Arkansas	1,302	1,531	-	1,290	1,336	1,344	1,091	1,296	**2,321**	**1,353**
California	-	-	-	-	-	-	-	-	**1,675**	**1,470**
Colorado	-	-	-	1,320	-	1,348	1,153	-	-	**1,417**
Connecticut	-	-	-	2,183	1,984	1,906	**1,996**	**2,282**	**2,269**	**2,289**
Delaware	1,950	2,594	**2,536**	**2,324**	**2,088**	**1,888**	**1,850**	**2,272**	**2,260**	**2,428**
District of Columbia	-	-	-	-	-	-	-	-	-	-
Florida	-	3,583	3,507	3,749	3,777	4,791	5,198	**5,117**	**5,308**	**5,128**
Georgia	-	-	1,739	1,460	2,041	1,582	1,582	1,637	-	-
Hawaii	1,115	-	-	1,376	989	1,252	**3,462**	**3,819**	**4,969**	**4,852**
Idaho	-	1,512	1,507	1,279	1,227	1,913	1,541	1,697	1,546	1,545
Illinois	-	-	-	-	1,970	**2,475**	**2,868**	**2,648**	**2,630**	**4,040**
Indiana	-	-	1,468	1,342	2,000	1,290	2,351	-	**1,702**	-
Iowa	-	-	-	1,267	1,288	-	1,374	-	-	**1,436**
Kansas	-	-	-	1,462	1,484	1,785	1,658	1,666	-	2,004
Kentucky	-	-	1,364	2,770	3,176	1,474	1,451	1,387	**2,119**	**1,722**
Louisiana	-	-	-	-	1,089	842	945	886	-	933
Maine	-	1,111	1,462	1,193	**1,188**	**8,276**	**8,764**	**8,203**	**9,027**	**8,921**
Maryland	-	-	-	1,229	1,237	1,314	2,075	**-**	**-**	**-**
Massachusetts	**3,741**	**3,623**	**3,093**	**2,911**	**2,620**	**2,277**	**2,263**	**2,331**	**2,577**	**2,775**
Michigan	2,281	3,047	2,924	2,784	2,908	2,872	3,523	**3,641**	**3,991**	**1,435**
Minnesota	-	-	-	-	-	-	-	-	-	-
Mississippi	1,292	1,529	1,257	-	1,220	1,438	1,418	1,240	1,616	-
Missouri	1,472	1,518	1,412	1,669	1,344	1,390	-	1,408	1,286	1,553

Montana	2,549	2,254	2,344	2,617	3,411	1,591	3,617	4,259	3,912	4,116
Nebraska	-	-	2,514	3,276	-	-	2,397	1,517	1,286	**1,250**
Nevada	1,540	1,317	1,773	1,350	1,485	1,755	-	1,845	**1,238**	**1,375**
New Hampshire	-	-	1,185	1,154	1,467	1,376	1,286	**1,518**	13,505	**10,448**
New Jersey	-	1,817	-	-	-	-	1,443	1,660	-	-
New Mexico	-	-	-	4,484	2,103	4,214	4,941	**4,653**	**7,106**	**4,902**
New York	3,066	-	7,614	7,997	10,530	11,557	10,352	8,437	**8,493**	**8,761**
North Carolina	-	-	-	3,800	3,371	5,533	-	-	-	**2,564**
North Dakota	1,552	1,448	1,481	1,523	1,718	**1,607**	**1,859**	**1,915**	**2,062**	**2,056**
Ohio	1,810	-	1,017	-	-	-	-	1,263	-	-
Oklahoma	-	-	1,257	1,476	2,279	1,208	1,019	1,331	**1,430**	**1,355**
Oregon	-	-	-	-	-	-	-	-	-	-
Pennsylvania	-	-	-	-	-	1,836	-	-	**2,396**	**3,036**
Rhode Island	-	1,249	1,567	1,951	**1,838**	**2,693**	**3,364**	**2,350**	**2,961**	**1,854**
South Carolina	3,573	-	-	1,094	1,036	870	1,216	1,310	1,053	**1,044**
South Dakota	1,465	1,564	1,569	1,421	1,403	1,916	1,312	1,265	1,127	-
Tennessee	-	-	1,731	1,329	1,689	1,857	2,228	1,584	3,487	1,753
Texas	-	6,105	-	3,539	2,707	3,026	3,263	2,679	-	**1,747**
Utah	1,320	933	1,206	1,286	1,678	1,359	1,452	1,898	-	1,541
Vermont	6,484	6,630	5,690	**6,700**	**5,466**	**7,736**	**8,239**	-	**18,991**	**19,544**
Virginia	-	-	-	-	-	-	1,208	5,738	3,731	3,264
Washington	-	-	-	-	-	-	-	-	-	-
West Virginia	1,193	-	1,523	1,169	1,211	1,383	1,846	1,560	**1,382**	**1,278**
Wisconsin	1,255	1,873	1,961	2,191	1,827	2,125	**2,610**	**2,483**	-	**1,820**
Wyoming	1,484	2,524	1,385	2,209	1,902	2,447	2,047	2,590	**2,045**	-

Notes: Boldface font denotes state-year combinations that include information on both sexual identity and suicide attempts.

Appendix Table 2. Estimated Coefficients on Covariates and Year Effects for DD Models by Self-Reported Sexual Identity, State YRBS (1999-2015)

	Sexual minorities				Heterosexuals			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Suicide Attempt	*Suicide Planning*	*Suicide Ideation*	*Depression*	*Suicide Attempt*	*Suicide Planning*	*Suicide Ideation*	*Depression*
SSM Law	-0.0145	-0.0035	0.0139	-0.0200	0.0022	-0.0019	-0.0105	-0.0224**
	(0.0121)	(0.0146)	(0.0141)	(0.0207)	(0.0067)	(0.0044)	(0.0053)	(0.0076)
Age 15	0.0007	-0.0243	-0.0212	0.0103	0.0079	0.0089	0.0083	0.0269**
	(0.0198)	(0.0188)	(0.0258)	(0.0210)	(0.0045)	(0.0050)	(0.0051)	(0.0038)
Age 16	-0.0273	-0.0869**	-0.0757	0.0117	0.0032	0.0067	0.0084*	0.0411**
	(0.0191)	(0.0260)	(0.0294)	(0.0129)	(0.0028)	(0.0033)	(0.0031)	(0.0060)
Age 17	-0.0445	-0.0918**	-0.0582**	0.0087	-0.0067**	-0.0094	-0.0034	0.0388**
	(0.0260)	(0.0159)	(0.0185)	(0.0144)	(0.0019)	(0.0058)	(0.0022)	(0.0064)
Age 18	-0.0763*	-0.1019*	-0.1324**	-0.0298	-0.0056	-0.0101	-0.0103*	0.0360**
	(0.0298)	(0.0381)	(0.0429)	(0.0198)	(0.0034)	(0.0057)	(0.0050)	(0.0046)
Black	0.0215	-0.0724**	-0.1213**	-0.0915**	0.0224**	-0.0003	-0.0101**	0.0070
	(0.0269)	(0.0215)	(0.0212)	(0.0184)	(0.0049)	(0.0051)	(0.0031)	(0.0056)
Hispanic	0.0635**	-0.0071	-0.0332**	0.0125	0.0241**	0.0114*	0.0007	0.0431**
	(0.0132)	(0.0147)	(0.0106)	(0.0080)	(0.0059)	(0.0047)	(0.0065)	(0.0100)
Other Race	0.0257	0.0268	-0.0338	-0.0358*	0.0157**	0.0164**	0.0057	0.0192*
	(0.0208)	(0.0233)	(0.0231)	(0.0153)	(0.0056)	(0.0031)	(0.0048)	(0.0086)
Female	0.0361	0.1110**	0.1290**	0.2141**	0.0221**	0.0450**	0.0627**	0.1341**
	(0.0193)	(0.0223)	(0.0100)	(0.0136)	(0.0040)	(0.0056)	(0.0040)	(0.0041)
Unemployment	0.0100	0.0135	0.0204*	-0.0305*	0.0052	0.0036	0.0036	-0.0049
	(0.0110)	(0.0085)	(0.0088)	(0.0144)	(0.0035)	(0.0030)	(0.0040)	(0.0042)
LGB Employment Policy	-0.0043	-0.0657**	-0.0976**	-0.0351*	-0.0032	-0.0078	0.0021	-0.0126*
	(0.0148)	(0.0097)	(0.0153)	(0.0170)	(0.0055)	(0.0041)	(0.0042)	(0.0055)
Year 1999	0.1120**	0.1139**	0.1334**	-0.0521	0.0304*	0.0530**	0.0794**	0.0325*
	(0.0227)	(0.0217)	(0.0203)	(0.0436)	(0.0110)	(0.0061)	(0.0104)	(0.0137)
Year 2001	0.0446*	0.0742**	0.1161**	-0.0527	0.0255*	0.0326**	0.0700**	-0.0132
	(0.0183)	(0.0224)	(0.0206)	(0.0387)	(0.0108)	(0.0066)	(0.0103)	(0.0135)
Year 2003	0.0866*	0.0272	0.0376	0.0348	0.0158	0.0011	0.0197*	0.0114
	(0.0325)	(0.0327)	(0.0243)	(0.0317)	(0.0101)	(0.0090)	(0.0089)	(0.0078)
Year 2005	0.0144	0.0037	-0.0695**	-0.0130	0.0074	0.0027	0.0030	0.0251**
	(0.0147)	(0.0130)	(0.0123)	(0.0156)	(0.0043)	(0.0039)	(0.0038)	(0.0059)

Year 2007	0.0290	-0.0499**	-0.0335	0.0001	0.0039	-0.0050	-0.0065	-0.0181**
	(0.0163)	(0.0152)	(0.0177)	(0.0281)	(0.0102)	(0.0040)	(0.0051)	(0.0052)
Year 2009	-0.0139	-0.0636	-0.0463	0.0974	-0.0208	-0.0304	-0.0198	0.0042
	(0.0475)	(0.0516)	(0.0250)	(0.0498)	(0.0141)	(0.0192)	(0.0163)	(0.0139)
Year 2011	-0.0183	-0.0858	-0.1027*	0.0175	-0.0205	-0.0147	-0.0146	0.0044
	(0.0696)	(0.0592)	(0.0478)	(0.0476)	(0.0122)	(0.0121)	(0.0148)	(0.0122)
Year 2013	0.0256	-0.0083	-0.0233	0.0167	-0.0055	-0.0059	-0.0030	0.0052
	(0.0247)	(0.0214)	(0.0179)	(0.0324)	(0.0055)	(0.0057)	(0.0068)	(0.0097)
N	22,995	36,704	34,472	38,904	209,024	304,585	275,449	318,983
Mean of dependent variable	0.248	0.336	0.391	0.535	0.062	0.109	0.128	0.246

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2015. All models control for state fixed effects. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Appendix Table 3. Sensitivity of Estimated Relationship Between *SSM Law*Sexual Minority* and *Suicide Attempt* to Interacting Covariates with *Sexual Minority*, State YRBS (1999-2015)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Suicide Attempt	*Suicide Attempt*	*Suicide Attempt*	*Suicide Attempt*	*Suicide Attempt*	*Suicide Attempt*	*Suicide Attempt*
*SSM Law*Sexual Minority*	-0.0425*	-0.0466*	-0.0420*	-0.0414*	-0.0482**	-0.0221	-0.0167
	(0.0174)	(0.0186)	(0.0174)	(0.0154)	(0.0080)	(0.0135)	(0.0121)
N	232,019	232,019	232,019	232,019	232,019	232,019	232,019
Mean of dependent variable	0.248	0.248	0.248	0.248	0.248	0.248	0.248
$\boldsymbol{Z_{ist}}$**Sexual Minority*	No	Yes	No	No	No	No	Yes
*Unemployment*Sexual Minority*	No	No	Yes	No	No	No	Yes
*LGB Employment Policy*Sexual Minority*	No	No	No	Yes	No	No	Yes
v_s**Sexual Minority*	No	No	No	No	Yes	No	Yes
ω_t**Sexual Minority*	No	No	No	No	No	Yes	Yes

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2015. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Appendix Table 4. SSM Laws and Inclusion of Sexual Minority Question on State YRBS (1999-2015)

	(1)	(2)
	Sexual Minority Question Included	*Sexual Minority Question Included*
SSM Law	0.155	0.149
	(0.099)	(0.102)
N	313	304
Mean of dependent variable	0.224	0.217
Sample of states	All states	State-years with non-missing information on suicide attempts

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2015. The dependent variable is equal to 1 if state *s* included a question on sexual minority status in their YRBS during wave *t*, and equal to 0 otherwise. All models control for state fixed effects and year fixed effects. Standard errors, corrected for clustering at the state level, are in parentheses.

Appendix Table 5. Means by Self-Reported Sexual Identity, State YRBS (1999-2017)

	Pooled	Heterosexual	LGBQ
Dependent Variables			
Suicide Attempt	0.084	0.064	0.234
	(N = 333,800)	(N = 295,280)	(N = 38,600)
Suicide Planning	0.134	0.110	0.325
	(N = 473,857)	(N = 417,178)	(N = 56,679)
Suicide Ideation	0.159	0.128	0.392
	(N = 446,666)	(N = 390,598)	(N = 56,068)
Depression	0.290	0.256	0.547
	(N = 513,803)	(N = 450,658)	(N = 63,145)
Independent Variables			
SSM Law	0.703	0.693	0.771
SSM: Court Mandate	0.551	0.545	0.600
SSM: Legislative	0.139	0.135	0.165
Male	0.495	0.518	0.326
Age 14	0.117	0.116	0.123
Age 15	0.255	0.255	0.254
Age 16	0.256	0.255	0.264
Age 17	0.237	0.238	0.228
Age 18	0.135	0.136	0.132
Black	0.113	0.110	0.135
White	0.552	0.560	0.487
Hispanic	0.240	0.237	0.269
Other Race	0.096	0.094	0.109
Sexual Minority	0.117	0	1
Gay or Lesbian	0.0206	0	0.177
Bisexual	0.0613	0	0.525
Not sure	0.0348	0	0.298
LGB Employment Policy	0.606	0.611	0.574
Unemployment	5.673	5.700	5.467

Notes: Means for the mental health outcomes are based on the state-year combinations where information on sexual identity is available. Means for the independent variables are based on the state-year combinations where information on sexual identity and suicide attempts is available. All means are weighted to be nationally representative.

Appendix Table 6. Restricting Sample to Non-SSM Adopting States and Raifman et al.'s (2017) Original Nine SSM Adopting States, State YRBS (1999-2017)

	(1)	(2)	(3)	(4)
	Suicide Attempt	*Suicide Planning*	*Suicide Ideation*	*Depression*
	Panel I: DD estimates for sexual minorities			
SSM Law	0.0045	0.0317	0.0398**	0.0100
	(0.0183)	(0.0209)	(0.0091)	(0.0203)
N	33,301	50,793	50,173	57,240
Mean of dependent variable	0.231	0.324	0.394	0.545
	Panel II: Fully-interacted DDD estimates			
*SSM Law*Sexual Minority*	-0.0052	0.0297	0.0366**	0.0232
	(0.0182)	(0.0174)	(0.0112)	(0.0145)
N	287,141	422,225	394,931	462,053
Mean of dependent variable	0.231	0.324	0.394	0.545

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2017. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panel II also control for interactions between *Sexual Minority* and all right-hand-side variables. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Appendix Table 7. Unweighted Estimates, State YRBS (1999-2017)

	(1)	(2)	(3)	(4)
	Suicide Attempt	*Suicide Planning*	*Suicide Ideation*	*Depression*
	Panel I: DD estimates for sexual minorities			
SSM Law	0.0002	0.0097	0.0157	-0.0035
	(0.0077)	(0.0114)	(0.0101)	(0.0089)
N	38,600	56,679	56,068	63,145
Mean of dependent variable	0.227	0.321	0.381	0.526
	Panel II: Fully-interacted DDD estimates			
*SSM Law*Sexual Minority*	-0.0037	0.0087	0.0106	-0.0041
	(0.0073)	(0.0087)	(0.0091)	(0.0070)
N	333,880	473,857	446,666	513,803
Mean of dependent variable	0.227	0.321	0.381	0.526

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2017. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panel II also control for interactions between *Sexual Minority* and all right-hand-side variables. Standard errors, corrected for clustering at the state level, are in parentheses.

Appendix Table 8. Unweighted Estimates, State and National YRBS Combined (1999-2017)

	(1)	(2)	(3)	(4)
	Suicide Attempt	*Suicide Planning*	*Suicide Ideation*	*Depression*
	Panel I: DD estimates for sexual minorities			
SSM Law	-0.0011	0.0085	0.0149	-0.0034
	(0.0075)	(0.0112)	(0.0098)	(0.0089)
N	41,366	60,206	59,634	66,716
Mean of dependent variable	0.227	0.323	0.383	0.528
	Panel II: Fully-interacted DDD estimates			
*SSM Law*Sexual Minority*	-0.0056	0.0072	0.0089	-0.0045
	(0.0069)	(0.0087)	(0.0092)	(0.0073)
N	355,253	501,109	474,259	541,310
Mean of dependent variable	0.227	0.323	0.383	0.528

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State and National YRBS for the period 1999-2017. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panel II also control for interactions between *Sexual Minority* and all right-hand-side variables. Standard errors, corrected for clustering at the state level, are in parentheses.

Appendix Table 9. Heterogeneous Effects by Sexual Minority Type, State YRBS (1999-2017)

	(1)	(2)	(3)	(4)
	Suicide Attempt	*Suicide Planning*	*Suicide Ideation*	*Depression*
	Panel I: DD estimates for gay/lesbian teens			
SSM Law	0.0050	0.0266	0.0865**	0.0374
	(0.0452)	(0.0444)	(0.0291)	(0.0345)
N	6,663	10,684	10,605	11,580
Mean of dependent variable	0.268	0.313	0.370	0.493
	Panel II: DD estimates for bisexual teens			
SSM Law	-0.0061	0.0669*	0.0185	0.0315
	(0.0174)	(0.0326)	(0.0198)	(0.0221)
N	20,239	29,385	28,617	32,452
Mean of dependent variable	0.231	0.368	0.451	0.624
	Panel III: DD estimates for questioning teens			
SSM Law	0.0195	0.0592**	0.0408*	-0.0414
	(0.0177)	(0.0200)	(0.0167)	(0.0243)
N	11,698	16,610	16,846	19,113
Mean of dependent variable	0.183	0.256	0.305	0.448
	Panel IV: Fully-interacted DDD estimates for gay/lesbian teens			
*SSM Law*Sexual Minority*	0.0039	0.0226	0.0837**	0.0464
	(0.0432)	(0.0453)	(0.0279)	(0.0373)
N	301,943	427,862	401,203	462,238
Mean of dependent variable	0.268	0.313	0.370	0.493
	Panel V: Fully-interacted DDD estimates for bisexual teens			
*SSM Law*Sexual Minority*	-0.0072	0.0630*	0.0156	0.0405
	(0.0166)	(0.0304)	(0.0180)	(0.0233)
N	315,519	446,563	419,215	483,110
Mean of dependent variable	0.231	0.368	0.451	0.624
	Panel VI: Fully-interacted DDD estimates for questioning teens			
*SSM Law*Sexual Minority*	0.0184	0.0552**	0.0380*	-0.0325
	(0.0204)	(0.0205)	(0.0195)	(0.0216)
N	306,978	433,788	407,444	469,771
Mean of dependent variable	0.183	0.256	0.305	0.448

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2017. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panels IV, V, and VI also control for interactions between *Sexual Minority* and all right-hand-side variables. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Appendix Table 10. SSM Laws by State versus U.S. Supreme Court Mandate, State YRBS (1999-2017)

	(1)	(2)	(3)	(4)
	Suicide Attempt	*Suicide Planning*	*Suicide Ideation*	*Depression*
	Panel I: DD estimates for sexual minorities			
SSM by Legislative Action	0.0020	0.0232	0.0119	-0.0003
	(0.0195)	(0.0189)	(0.0139)	(0.0209)
SSM by State Court Order	0.0027	0.0483**	0.0356*	-0.0073
	(0.0151)	(0.0144)	(0.0140)	(0.0185)
SSM by U.S. Supreme Court Order	0.0040	0.0899**	0.0490**	0.0385*
	(0.0164)	(0.0185)	(0.0122)	(0.0184)
N	38,600	56,679	56,068	63,145
Mean of dependent variable	0.234	0.325	0.392	0.547
	Panel II: Fully-interacted DDD estimates			
SSM Law by Legislative Action	0.0029	0.0301	0.0152	0.0129
**Sexual Minority*	(0.0158)	(0.0147)	(0.0120)	(0.0176)
SSM by State Court Order	0.0011	0.0455**	0.0404*	0.0172
**Sexual Minority*	(0.0154)	(0.0154)	(0.0179)	(0.0149)
SSM by U.S. Supreme Court Order	0.0009	0.0684**	0.0232	0.0160
**Sexual Minority*	(0.0188)	(0.0173)	(0.0163)	(0.0261)
N	333,880	473,857	446,666	513,803
Mean of dependent variable	0.234	0.325	0.392	0.547

* Significant at the 5 percent level; ** Significant at the 1 percent level

Notes: Each column within each panel represents results from a separate OLS regression based on data from the State YRBS for the period 1999-2017. All models control for the covariates listed in Table 1, state fixed effects, and year fixed effects. The models in panel II also control for interactions between *Sexual Minority* and all right-hand-side variables. Regressions are weighted by the adjusted YRBS weights. Standard errors, corrected for clustering at the state level, are in parentheses.

Appendix Table 11. Means for Risky Behaviors by Self-Reported Sexual Identity, State YRBS (1999-2017)

	Pooled	Heterosexual	LGBQ	Description
Alcohol Use	0.321 (N = 484,270)	0.314 (N = 427,118)	0.373 (N = 57,152)	= 1 if respondent drank alcohol in past 30 days, = 0 otherwise
Binge Drinking	0.166 (N = 458,882)	0.163 (N = 403,850)	0.185 (N = 55,032)	= 1 if respondent had five or more drinks in a row on the same day in past 30 days, = 0 otherwise
Cigarette Use	0.108 (N = 503,240)	0.0991 (N = 442,419)	0.180 (N = 60,821)	= 1 if respondent smoked a cigarette in past 30 days, = 0 otherwise
Marijuana Use	0.210 (N = 508,495)	0.199 (N = 446,877)	0.295 (N = 61,518)	= 1 if respondent used marijuana in past 30 days, = 0 otherwise
Bullied	0.196 (N = 421,066)	0.179 (N = 366,689)	0.322 (N = 54,377)	= 1 if respondent has been bullied on school property in past 12 months, = 0 otherwise

Notes: Means are weighted to be nationally representative and are based on the state-year combinations where information on sexual identity is available.