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Do laws shape attitudes? Evidence from same-sex relationship recognition policies in Europe ☆

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ABSTRACT

Understanding whether laws shape or simply reflect citizens' attitudes is important but empirically difficult. We provide new evidence on this question by studying the relation between legal same-sex relationship recognition policies (SSRRPs) and attitudes toward sexual minorities in Europe. Using data from the European Social Surveys covering 2002–2016 and exploiting variation in the timing of SSRRPs across countries, we show that legal relationship recognition is associated with statistically significant improvements in attitudes toward sexual minorities. These effects are widespread across demographic groups but are consistently larger for more conservative groups in countries with less gender equality. Our results suggest that laws can exert a powerful influence in shaping societal attitudes.

1. Introduction

Scholars have long recognized the importance of understanding whether laws shape or simply reflect societal attitudes (Downs 1957; Besley and Case, 2003, and others), but providing credible empirical evidence on this question has proven difficult. We present new evidence on this topic by using the gradual rollout of same-sex relationship recognition policies throughout Europe as plausibly exogenous policy variation to understand whether laws shape attitudes toward sexual minorities. Studying these policy changes is timely because advancements in civil rights for lesbian, gay, and bisexual (LGB) individuals throughout Europe and the Americas have been some of the most striking social changes in recent decades. As recently as 2000, same-sex marriage was not legal in any European country; as of the time of this writing, same-sex couples can legally marry in 17 countries throughout Europe while same-sex registered domestic partnerships/civil unions are available in 12 other countries (Lipka and Masci, 2019). Fig. 1 shows that over this same period, the share of citizens who agree with the statement that "*Gay men and lesbians should be free to live their own life as they wish*" increased considerably – by about ten percentage points.

How might same-sex marriage and same-sex registered domestic partnership policies (henceforth: same-sex relationship recognition policies, or SSRRPs) affect attitudes toward sexual minorities? Flores and Barclay (2016) discuss four

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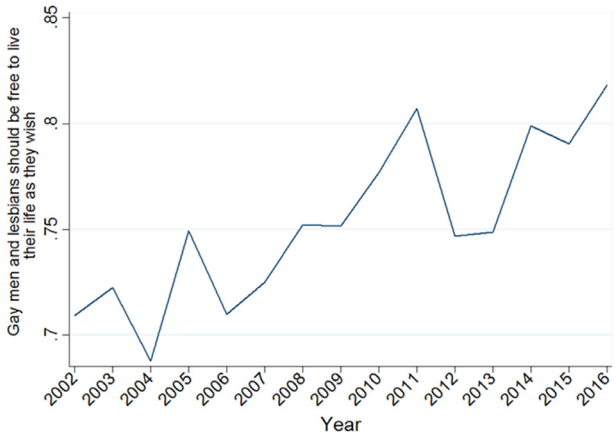

Fig. 1. Trends in attitudes toward sexual minorities.
Outcome is the share of people in the country who agree that "*Gay men and lesbians should be free to live their own life as they wish*"
2002–2016 European Social Surveys data, adults age 18+.
Note: This figure includes all countries that were observed during at least 10 years of the ESS. We further restrict the sample to observations used in the full-sample estimation.

possibilities: backlash, legitimacy, polarization, and consensus. A backlash model predicts that attitudes toward LGB people might become substantially more negative following legal recognition of same-sex relationships, especially in the case of judicial rulings. A legitimacy model predicts that legal rulings may increase the acceptance and approval of LGB populations as laws increase social legitimacy. A polarization model predicts that focusing on events such as major same-sex relationship policies may reduce ambivalence toward LGB people and increase both social approval and disapproval of sexual minorities. Finally, a consensus model predicts that attitudes shape policy, but that policy has no effects on attitudes. These alternative hypotheses make clear that ultimately, the relationship between legal same-sex marriage and attitudes towards gay men and lesbians is an empirical question. We provide direct evidence on this question by using variation in the timing of the adoption of SSRRPs across a large set of European countries.

SSRRPs remain high on the policy agenda across the world, including in Australia, Europe, and Latin America. Understanding the impact of such policies on public attitudes is important for policymakers trying to gauge their social implications – particularly with respect to the risk of backlash and/or polarization. Our data allow us to examine whether relationship recognition policies have unintended negative effects on views toward sexual minorities for particular demographic groups such as men, rural populations, and religious individuals. Knowing whether there are adverse attitudinal effects for specific groups can help design policies to counterbalance any such spill-over effects from SSRRPs.

Our analysis uses data from the 2002–2016 European Social Surveys which asked over 325,000 individuals across Europe identically worded questions about a range of social and economic issues. Of interest is a specific question on whether the respondent agrees that "*Gay men and lesbians should be free to live their own life as they wish*." We use cross-country variation in the timing of SSRRP adoption to estimate difference-in-differences models while controlling for individual demographic characteristics, country characteristics, other LGB policies (such as non-discrimination laws, adoption policies, and hate crimes legislation), country, year, and month fixed effects, and linear country-specific time trends.

We find that – consistent with a legitimacy model – laws significantly improve attitudes toward sexual minorities. The introduction of a relationship recognition law for same-sex couples is associated with a statistically significant 3.5 percentage point increase in the likelihood that a respondent agreed that gay men and lesbians should be free to live their own life as they wish. This effect is about five percent of the baseline average. These results mean that the adoption of expanded relationship recognition policies for same-sex couples can explain 35 percent of the ten-percentage point increase over our sample period in the share of adults agreeing that gay men and lesbians should be free to live their own life as they wish (Fig. 1). We also show that the effects of same-sex relationship policies are unique to LGB attitudes: there is no systematic relationship between these policies and people's views on other social and economic issues (such as attitudes toward other minority groups like immigrants). Moreover, we document that the effects we identify are widespread across many demographic groups. Finally, we show that the effects of SSRRPs are larger in countries with less gender equality, and within those relatively gender unequal societies the effects are larger among traditionally more conservative groups (less educated, partnered, rural, and religious individuals). This suggests that SSRRPs improved attitudes more for people that held more negative attitudes toward sexual minorities at the beginning of the sample period. Again, these patterns are broadly consistent with a legitimization model of attitudes.

Our results also illustrate the importance of accounting for time-invariant country-specific effects. Models that rely only on cross-sectional differences in the presence of SSRRPs across countries return associations between policies and attitudes

that are three to ten times larger than our two-way fixed effects estimates. Thus, we find that policies both reflect *and* affect attitudes.

We proceed as follows. Section 2 reviews the literature on same-sex relationship recognition policies and attitudes toward LGB people. Section 3 then describes the data and outlines our empirical approach. Section 4 presents the results after which Section 5 concludes.

2. Related literature

Our study is related to literature in economics and political science that examines the impact of significant legal and political events on public opinion in a variety of areas. For example, several papers have studied the shift in attitudes towards abortion following a landmark decision of the U.S. Supreme Court in 1973 (*Roe v. Wade, 410 U.S. 113*) that ruled the US constitution protects a woman's right to have an abortion (Arney and Trescher, 1976; Uslaner and Weber, 1979; Ebaugh and Haney, 1980; Rosenberg, 1991; Hanley et al., 2012).

Other papers have analyzed how elections and changes in electoral systems affect attitudes towards minorities or disadvantaged groups in society. Beaman et al. (2012) find that gender quotas for leadership positions in Indian village councils – which were generated by random assignment – led to improved attitudes toward female leader effectiveness and weaker stereotypes about gender roles in public and private life. Crandall et al. (2018) show that the November 2016 Presidential election in the United States increased prejudiced attitudes toward groups that were targeted by the Trump campaign (e.g., Muslims, immigrants) relative to groups that were not. Relatedly, Dekeyser and Freedman (2018) use European Social Survey (ESS) data to show that attitudes toward immigrants in Europe become more polarized, and on average more negative, closer to elections.

Within the context of LGB rights, most scholarship has examined how relationship recognition and marriage equality policies in the United States affected attitudes toward sexual minorities.[1] Bishin et al. (2016) use a series of online and natural experiments about marriage equality as well as large-sample survey data. They find no evidence of opinion backlash following the introduction of marriage equality. In contrast, Ofosu et al. (2019) find that while attitudes toward sexual minorities improved faster after states granted legal same-sex marriage, the opposite was true for states that were 'forced' to recognize same-sex marriage via the 2015 US Supreme Court ruling. In those states, implicit and explicit bias against sexual minorities actually *increased* after 2015, consistent with a backlash response in states where the federal policy was 'imposed upon the local culture.' Flores and Barclay (2016) examine the effects of the 2013 rulings on same-sex marriage in the United States on attitudes toward LGBT people as measured by 'feeling thermometers' (in addition to questions about support for same-sex marriage). They find that people in states that introduced same-sex marriage saw the largest reduction in anti-gay attitudes. They interpret this evidence as consistent with a legitimacy model and inconsistent with backlash or polarization models. Tankard and Paluck (2017) measure the attitudes of 1063 individuals before and after the 2015 US Supreme Court decision that legalized same-sex marriage. Although they find that the ruling increased support for gay marriage, they detect no change in more general attitudes toward sexual minorities.[2]

Thus, well-identified research from the United States suggests that across the board legal same-sex relationship recognition has either had no (Tankard and Paluck, 2017) or positive (Flores and Barclay, 2016) effects on general attitudes towards sexual minorities. Yet, an important nuance is that where and when federal legislation is enforced on states, backlash may occur (Ofosu et al., 2019).

There is less work on the relationship between LGB rights and attitudes toward sexual minorities in Europe, which is somewhat surprising given the extent of European LGB public policy adoption. Moreover, the European literature on these topics is methodologically weaker than studies from the US. For example, Takács and Szalma (2011) and Hooghe and Meeusen (2013) use ESS data to study how SSRRPs affect attitudes toward sexual minorities, but they both rely on cross-sectional designs. They find that individuals in countries with marriage equality had significantly more pro-LGB attitudes than individuals in countries without relationship recognition for same-sex couples.[3]

To our knowledge, no prior published work on same-sex relationship recognition policies in Europe and their link to attitudes toward sexual minorities addresses time-invariant country-specific factors. We not only leverage the timing variation across countries but also take pre-trends seriously. Exploiting variation in policy timing allows us to show that prior work on Europe, by failing to account for time-invariant and smooth time-varying country-specific factors, has likely dramatically

[1] Other studies have examined LGB policies more broadly (i.e., not focusing on relationship recognition policies). For example, Kenny and Patel (2017) use the 1989–2014 World Values Survey data and the 2006–2016 Gallup World Poll data to estimate difference-in-differences models that link the *criminalization* of homosexuality to attitudes toward sexual minorities. They find that when countries make homosexuality illegal, individuals are significantly more likely to state that they would not like to have a gay neighbor, less likely to state that homosexuality is justifiable, and more likely to state that their area is a bad place for gay men and lesbians to live.

[2] Our work also contributes to recent research examining the determinants of homophobia and transphobia more broadly. Broockman and Kalla (2016) perform a randomized experiment and find that conversations with residents in South Florida that asked participants to take the perspective of others significantly reduced prejudice, and that the effect persisted for three months. They also show that the intervention increased support for a non-discrimination law.

[3] Takács et al. (2016) use the 2008–2010 European Values Survey (EVS) to show that legislation permitting same-sex couples to adopt children is associated with respondents' views about whether homosexual couples should be allowed to adopt children, though again that study relies on a cross-sectional research design.

overstated the true effect of same-sex relationship recognition policies on attitudes towards gays and lesbians. Relative to such prior work, we can also explore heterogeneity along several dimensions in the effects of policies, including possible backlash, on attitudes toward sexual minorities.

3. Data description and empirical approach

Our data on attitudes toward sexual minorities come from the 2002–2016 ESS. These surveys are fielded every year in over 30 European countries and include questions on a range of topics.[4] Our main sample includes over 325,000 respondents, age 18 and older from 32 European countries.[5] The key outcome variable in this paper comes from a question asked to all ESS respondents: "*Do you believe that gay men and lesbians should be free to live their own life as they wish?*".[6] Responses were coded on a 5-point Likert scale, ranging from "strongly agree" (1) to "strongly disagree" (5). We code "strongly agree" and "agree" as 1 and *zero* otherwise. We also examine responses to other questions about immigration and related social issues as placebo outcomes.

To estimate the effect of relationship recognition policies for same-sex couples on attitudes toward sexual minorities, we estimate standard difference-in-differences models that rely on plausibly exogenous variation in the timing of policy adoption across countries. These models take the form:

$$\mathrm{Y_{ict}} = \beta_0 + \beta_1 \mathrm{X_{ict}} + \beta_2 \mathrm{SSRRP_{ct}} + \beta_3 \mathrm{Z_{ct}} + \beta_4 \mathrm{C_c} + \beta_5 \mathrm{T_t} + \beta_6 \mathrm{C_c} * \mathrm{Trend} + \varepsilon_{\mathrm{ict}} \quad (1)$$

where Y_{ict} is a variable indicating positive attitudes toward sexual minorities for individual i in country c at time t. X_{ict} is a vector of standard individual characteristics: a *Male* dummy; *Age* and its square; dummy variables for *Education* categories (secondary and tertiary schooling, with less than secondary education as the excluded category); dummy variables for *Marital/partnership status*; a dummy variable for living in an *Urban* area; and dummy variables for religion (*Orthodox Christian, Catholic, Protestant/Other Christian, Muslim*, and *Other religion*, with atheist/agnostic/None as the excluded category). We do not have information on the sexual orientation of ESS respondents, but most credible population-based surveys indicate that sexual minorities constitute a very small share of the overall population – generally between 1 and 3 percent of adults – (Joloza et al., 2010; Aksoy et al., 2019). Same-Sex Relationship Recognition Policy (*SSRRP*) is an indicator variable equal to one in the countries and periods when marriage and/or registered partnerships/civil unions are legally available to same-sex couples.[7]

We estimate linear probability models for ease of interpretation.[8] The coefficient of interest is β_2, which in the presence of country and year dummies and country-specific trends (described below) is identified from sharp within-country changes in outcomes coincident with variation in the timing of policy adoption across countries. The key identifying assumption is that attitudes about gays and lesbians would have evolved identically in countries with and without relationship recognition policies had they not been adopted.

Z_{ct} is a vector of other country-time varying policies and characteristics that may correlate with the policies we study. The data come from the International Lesbian, Gay, Bisexual, Trans and Intersex Association (ILGA) and various government webpages.[9] These variables indicate whether the country's anti-discrimination protections include sexual orientation, whether the country permits adoption by same-sex couples, whether the constitution explicitly protects sexual minorities, and whether the country allows sexual orientation-based crimes to be classified as hate crimes. Z_{ct} also includes the log of GDP per capita (in 2010 US Dollars).

C_c and T_t are a full set of country and year dummies, respectively. The former absorbs time-invariant variation in the outcome variable caused by factors that vary across countries while the latter eliminates time-varying shocks that affect all countries simultaneously. We also include calendar month-of-interview dummies (not shown in Eq. (1)). Lastly, we control for country-specific linear time trends by interacting each country fixed effect with a variable *Trend* that equals 1 in the

[4] The sample is an unbalanced panel because not all countries contribute data in every year.

[5] See Appendix Table A2 for the list of countries in our sample and the corresponding dates on which same-sex relationship recognition policies were adopted.

[6] Other European surveys also ask questions about homosexuality and/or sexual minorities but do not provide enough coverage, in terms of countries and years, to support the empirical framework we use. Despite this, we have confirmed that our ESS 'free to live their own life as they wish' question is strongly correlated with questions from other European surveys when aggregated by country-year. For example, the 1990, 1999, and 2008 European Values Survey (EVS) asked: "*On this list are various groups of people. Could you please sort out any that you would not like to have as neighbors?*" 'Homosexuals' was one response option, so we can identify individuals who would prefer not to live next to a gay person. The Life in Transition Survey (LiTS) includes a similar question. The EVS also included a question about the 'justifiability of homosexuality' on a scale of 1 to 10, with 1 being 'always justifiable' and 10 being 'never justifiable'. The Gallup World Polls asks respondents whether their city or area is '*a good place to live for gay men and lesbians*'. Appendix Table A1 presents a correlation matrix for our ESS measure and these other variables. It shows that they are all strongly correlated in predictable ways.

[7] We experimented with separate variables for same-sex marriage and same-sex registered partnerships/civil unions, but do not have enough power to separately identify their effects. Also, in a few countries there was a lag between the legalization of same-sex marriage (enactment date) and the issuance of the first marriage licenses (effective date). For example, Finland approved same-sex marriage in December 2014 while marriage licenses for same-sex couples only became available in March 2017. We code the policy variables according to the enactment dates, but unreported results based on the effective dates are qualitatively very similar (available upon request). This also reflects that in the vast majority of countries there was only a very short time lag between the enactment and effective dates.

[8] Estimates using ordered logit are virtually the same in terms of statistical and economic significance (see Appendix Table A3).

[9] The main sources are https://rainbow-europe.org/, https://en.wikipedia.org/wiki/Same-sex_union_legislation, ILGA (2016a, 2016b) and Waaldijk (2005).

Table 1
Sample characteristics.
2002–2016 European Social Surveys data.

Variables	(1) Full sample	(2) Countries that had relationship recognition for same-sex couples by 2016	(3) Countries that did not have relationship recognition for same-sex couples by 2016
LGB public policies			
Same-sex marriage/domestic partnerships legal	0.56 (0.49)	1	–
LGB employment protection	0.69 (0.46)	0.92 (0.27)	0.40 (0.49)*
Hate crimes law for sexual orientation	0.34 (0.47)	0.56 (0.49)	0.05 (0.22)*
Adoption legal for same-sex couples	0.25 (0.43)	0.45 (0.49)	0.01 (0.04)*
Constitutional protection for sexual minorities	0.20 (0.40)	0.36 (0.48)	0.01 (0.10)*
Attitudes toward minority groups			
Gay men and lesbians should be free to live their own life as they wish	0.62 (0.48)	0.80 (0.39)	0.40 (0.49)*
Better for a country if almost everyone shares customs and traditions	0.46 (0.49) – N: 75,281	0.41 (0.49) – N: 45,493	0.55 (0.49) – N: 29,788*
Immigrants put in more than they take out	0.15 (0.36) – N: 71,901	0.15 (0.36) – N: 43,951	0.15 (0.35) – N: 27,950
Immigrants make crime problems worse	0.06 (0.24) – N: 73,076	0.06 (0.24) – N: 44,573	0.06 (0.23) – N: 28,503
Immigration enriches cultural life	0.35 (0.47) – N: 310,764	0.41 (0.49) – N: 186,630	0.27 (0.44) – N: 124,134*
Individual demographics			
Age	48.70 (17.95)	49.64 (17.84)	47.51 (18.04)*
Male	0.45 (0.49)	0.47 (0.49)	0.43 (0.49)*
Less than degree level education	0.69 (0.46)	0.72 (0.44)	0.65 (0.47)
Partnered	0.53 (0.49)	0.53 (0.49)	0.54 (0.49)
Urban	0.33 (0.47)	0.30 (0.46)	0.36 (0.47)*
Any religion	0.84 (0.36)	0.79 (0.40)	0.91 (0.28)*
N	326,069	191,840	134,229

Weighted means (standard deviations). * Indicates the difference in means between column 2 and column 3 is significant at $p<.05$.

first year of the sample, 2 in the second, and so forth. These trends remove variation in within-country attitudes toward sexual minorities due to factors that are country-specific and that evolve linearly over time. Sample weights make the data representative at the country level, and we cluster standard errors by country (Bertrand et al., 2004).

4. Results

4.1. Descriptive statistics

We first present descriptive statistics for the policy variables, LGB attitudes, and individual demographic characteristics in Table 1.[10] We provide means for the full sample in column 1, for countries that had adopted SSRRPs by the end of our sample period in column 2, and for countries that did not adopt SSRRPs by the end of our sample period in column 3.

Most respondents in our sample live in a country that had adopted legal same-sex marriage and/or registered domestic partnership/civil unions by 2016. Table 1 also shows that countries with legal relationship recognition for same-sex couples by 2016 were much more likely to have adopted other pro-LGB policies such as employment protection for sexual minorities, the establishment of hate crimes laws covering sexual orientation, explicit constitutional protection for sexual minorities, and adoption rights for same-sex couples. Moreover, these differences are large, in the order of 30–50 percentage points between countries with and without legal relationship recognition policies for same-sex couples by the end of the sample period. This pattern suggests that unobserved fixed differences across countries may be important, an issue we address by using a quasi-experimental approach.

Table 1 also shows that individuals in countries with relationship recognition policies for same-sex couples were much more likely (40 percentage points or twice as likely) to agree with the statement that gay men and lesbians should be free to live their own life as they wish. These differences are much larger than those for questions related to immigrants (which are not very different across columns 2 and 3). We also see that differences in demographic characteristics across countries with and without legal relationship recognition for same-sex couples are small, with a few exceptions. One notable difference is the share of individuals who identify as religious: while less than 80 percent of individuals in countries that had same-sex marriage or registered domestic partnerships/civil unions by 2016 report a religion, the share reporting a religion in countries without legal relationship recognition for same-sex couples by 2016 is significantly higher at 91 percent. This pattern also underlines the importance of accounting for country fixed effects and controlling for respondent characteristics, including religiosity.

[10] Column 2 in Table 1 is based on data from 23 countries: Austria, Belgium, Czech Republic, Denmark, England, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Luxembourg, Netherlands, Northern Ireland, Norway, Portugal, Scotland, Slovenia, Spain, Sweden, Switzerland, and Wales. Column 3 in Table 1 reflects data from 12 countries: Bulgaria, Croatia, Cyprus, Greece, Israel, Italy, Lithuania, Poland, Russia, Slovak Republic, Turkey, and Ukraine.

Table 2
Relationship recognition policies for same-sex couples significantly improve attitudes toward sexual minorities.
2002–2016 European Social Surveys data, adults age 18+.
Outcome is indicator for agreeing with "*Gay men and lesbians should be free to live their own life as they wish*".

	(1) No controls	(2) (1) plus controls for individual Xs, country-specific X's, and other country-specific LGB policies	(3) (2) plus month and year FE, country FE, and linear country-specific time trends [Baseline model]	(4) (3) but exclude all other LGB policies	(5) (3) but only countries that ever adopted relationship recognition for same-sex couples	(6) (3) but only countries that adopted relationship recognition for same-sex couples within our sample window	(7) (3) but only countries observed in at least 12 of the 14 years	(8) (3) but use Wild cluster bootstrap with 999 repetitions
Mean, 2002–2004	0.691	0.691	0.691	0.691	0.729	0.683	0.716	0.691
Relationship recognition for same-sex couples	0.400***	0.098**	0.035**	0.030***	0.024*	0.024*	0.032**	0.035*
	(0.068)	(0.047)	(0.013)	(0.011)	(0.012)	(0.013)	(0.014)	(0.018)
R-squared	0.168	0.272	0.303	0.302	0.143	0.152	0.162	0.303
N	326,069	326,069	326,069	326,069	255,307	112,623	165,853	326,069

* Significant at 10%; ** Significant at 5%; *** Significant at 1%. The individual characteristics are: a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, and dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category). Country characteristics include GDP per capita (in 2010 US Dollars). Other LGB-related policies are: LGB employment protection, hate crimes law for sexual orientation, adoption legal for same-sex couples, and constitutional protection for sexual minorities. Results are weighted, and standard errors are clustered at the country level.

4.2. Main results

Table 2 presents our baseline estimates, based on Eq. (1), of the link between relationship recognition policies and attitudes toward sexual minorities. Each column reports a separate regression model, and we report the coefficient on the SSRRP indicator and the associated standard error. Column 1 reports results from a model where we only include the indicator for SSRRPs. We find that individuals in country/year combinations with same-sex relationship recognition have significantly more positive attitudes toward sexual minorities than individuals in country/year combinations without these policies. Specifically, we estimate that the presence of SSRRPs is associated with a statistically significant 40 percentage point higher likelihood of agreeing that gay men and lesbians should be free to live their own life as they wish. In column 2 we control for individual characteristics, country characteristics, and other LGB-related public policies. When we add those covariates, the size of the association between SSRRPs and attitudes toward sexual minorities declines substantially. Yet, we still find that individuals in country/year combinations with SSRRPs are 9.8 percentage points more likely to agree that gay men and lesbians should be free to live their own life as they wish, as compared with otherwise similar individuals in places without SSRRPs.

The results in column 3 of Table 2 speak directly to the importance of accounting for time-invariant country-specific unobserved heterogeneity as well as smooth country-specific linear time trends. In this augmented model, the SSRRP dummy is identified from sharp deviations off smooth trends in outcomes coincident with the timing of the relationship recognition policies across countries. These country-specific time trends are jointly significant predictors of the sexual minority attitude outcome (p-value < 0.01). Once we account for year and month fixed effects, country fixed effects, and linear country trends, we find that the association between same-sex relationship recognition policies and attitudes toward sexual minorities is reduced further in magnitude: it is about a third of the size of the model in column 2 and one-tenth of the size of the model in column 1. This is consistent with the idea that unobserved permanent cross-country differences and country-specific trends explain a substantial portion of the variation in support for sexual minorities or, put differently, that laws reflect attitudes. We nevertheless continue to find that same-sex relationship recognition is associated with a statistically significant increase in the likelihood of agreeing with the pro-LGB statement, an effect of about 3.5 percentage points. Relative to the base year sample mean, this is an effect of 5.1 percent. This pattern is consistent with the idea that laws *affect* attitudes.[11] We consider the estimate in column 3 of Table 2 as our baseline estimate.[12]

Fig. 2 shows event-study estimates of the relationship between the adoption of legal SSRRPs and improved LGB attitudes. The figure is based on our baseline specification (column 3 in Table 2) with linear country trends, a battery of individual

[11] Appendix Table A4 shows that our main result is not robust to including country and year fixed effects but excluding the linear country-specific time trends. This suggests that the introduction of same-sex relationship recognition policies correlates with other trends in the outcome variable, and it is only possible to disentangle the causal effect of the regulation from these underlying attitudinal trends (which again are jointly statistically significant) by removing the latter.

[12] In results not reported but available upon request we also controlled for a "frequency of religious ceremony attendance" variable and found similar patterns.

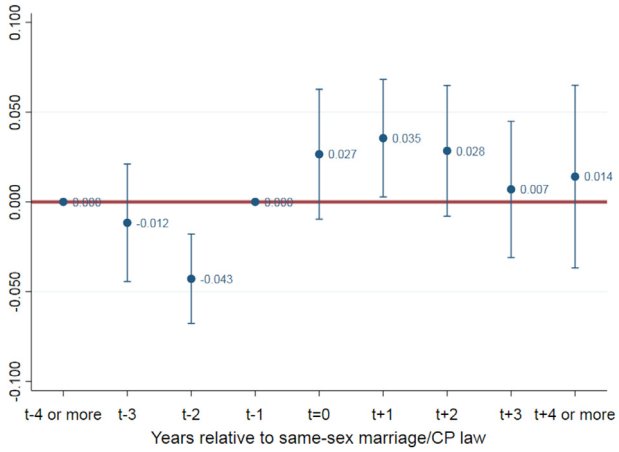

Fig. 2. Event study for same-sex relationship recognition.
2002–2016 European Social Surveys data, adults age 18+.
Note: This figure is based on the specification in column 3 of Table 2 which includes controls for individual characteristics, country characteristics, other LGB-related policies, month and year fixed effects, country fixed effects, and linear country-specific time trends. The individual characteristics include: a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, and dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category). Country characteristics include GDP per capita (in 2010 US Dollars). Other LGB-related policies are: LGB employment protection, hate crimes law for sexual orientation, adoption legal for same-sex couples, and constitutional protection for sexual minorities. Results are weighted, and standard errors are clustered at the country level. The sample consists of countries that ever adopted legal same-sex marriage between 2001 and 2016.

covariates, and the full set of fixed effects.[13] The sample consists of all countries that ever adopted a same-sex relationship recognition policy during our sample period. We follow Adukia et al. (2020) and exclude as our reference periods the year just prior to SSRRP adoption and the period for three or more years prior to SSRRP adoption.

The event study estimates in Fig. 2 provide evidence that relationship recognition of same-sex couples led to improved attitudes toward sexual minorities. The broad pattern and magnitude match the baseline difference-in-differences estimates of Table 2. One notable pattern in Fig. 2 is that the coefficient on the indicator for 'two periods before SSRRP legalization' is negative, sizable, and statistically significant. This raises some questions about the 'no pre-trends' assumption required for identification in event studies. To investigate this, we follow Borusyak and Jaravel (2017) who recommend excluding two pre-event dummies and then testing whether the remaining pre-event dummies are jointly significant. These tests return mixed evidence on the presence of differential pre-trends and are sensitive to the pre-periods we exclude. Importantly, however, reasonable modeling choices – such as excluding the *t-1* and *t-2* event time indicators as in Freyaldhoven et al. (2019) – do not indicate the presence of significant pre-trends. Extending the pre-periods further back does not change this pattern.[14]

Based on these patterns, we offer the following observations. First, our reading of the literature is that there is not yet a definitive consensus on how best to test for pre-trends in event study models such as ours.[15] Second, a growing number of papers suggest that 'passing' standard tests of no pre-event trends may give false comfort due to biases arising from finite samples (see, for example, Kahn-Lang and Lang, 2019). Third, our setting is not conclusive in either direction. Some specifications suggest that the parallel trends assumption may be violated while others do not.

We also note that even in the presence of this inconclusiveness it remains true that our results indicate that same-sex relationship recognition policies are associated with significant improvements in attitudes toward sexual minorities, either on average after policies are adopted in the standard DD model or soon after policy adoption in event-time. That

[13] Specifically, the estimation model includes all the controls we had in our baseline specification: linear country time trends and the full set of fixed effects, a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category), GDP per capita (in 2010 US Dollars), and dummy variables for LGB employment protection, hate crimes law for sexual orientation, adoption legal for same-sex couples, and constitutional protection for sexual minorities. These results are also weighted, and standard errors are clustered at the country level.

[14] We present these results in Appendix Tables A5 and A6. Appendix Table A7 shows that when we exclude observations from countries that we do not observe more than two periods before or after the legislation change, we find similar patterns to those in the original event study, which helps reduce concerns about sample composition bias.

[15] Roth (2019) reviews recently published papers in leading economics journals and concludes that the literature has not yet converged on the exact criteria to evaluate pre-trends.

Table 3
No effects on Placebo outcomes.
2002–2016 European Social Surveys data, adults age 18+.
Baseline model from column 3 of Table 2.

	(1) Mean of outcome (2002–2004)	(2) Coefficient on Relationship Recognition for same-sex couples (standard error)	(3) *N*
Gay men and lesbians should be free to live their own life as they wish	0.691	0.035** (0.013)	326,069
Better for a country if almost everyone shares customs and traditions	0.513	0.235* (0.122)	75,281
Immigrants put in more than they take out	0.137	−0.089 (0.256)	71,901
Immigrants make crime problems worse	0.053	0.088 (0.070)	73,076
Immigration enriches cultural life	0.408	−0.033 (0.021)	310,764
Important to understand different people	0.955	0.005 (0.008)	313,521
Good to have a law against ethnic discrimination at the workplace	0.626	−0.255 (0.247)	72,433

*Significant at 10%; ** significant at 5%; *** significant at 1%. See notes to Table 2.

is, event time dummies for one and two years after policy adoption consistently return evidence of statistically significant improvements in attitudes toward sexual minorities.

Fig. 2 also indicates that improvements in attitudes toward sexual minorities appear within the first two years following same-sex relationship recognition and then dissipate. Although the individual coefficient estimates are not sufficiently precisely estimated to make strong claims here, the pattern suggests that SSRRP-related improvements may be relatively short-lived, perhaps due to attention or salience effects. Notably, even if the dynamics indicate short-term improvements, these effects remain at odds with predictions stemming from, for instance, backlash models.

Returning to Table 2, we present in column 4 the results from a model where we exclude all the LGB policy controls except the relationship recognition variable to address possible concerns about collinearity among policies (these models retain all the fixed effects and country-specific time trends). We continue to find that same-sex relationship recognition policies are associated with statistically significant improvements in attitudes toward sexual minorities.[16]

Next, columns 5 and 6 of Table 2 show estimates based on a sample of only those 23 countries that ever adopted a relationship recognition policy (column 5)[17] or only the 13 counties that ever adopted a relationship recognition policy *within our sample period* (column 6).[18] Our core findings are robust to these sample restrictions.

Next, in column 7 of Table 2, we show estimates for the sample of individuals in countries that were observed for at least 12 years during the 2002–2016 ESS period. Our result is robust to this sample restriction as well. Lastly, in column 8 of Table 2, we report results from a model where we use the Wild Cluster bootstrap procedure with 999 repetitions to account for the small number of clusters (Cameron et al., 2008), and again our main finding is robust.[19]

Taken together, the results in Table 2, Fig. 2, and Appendix Tables A4–A8 are consistent with and suggestive of a true causal effect of SSRRPs on improving attitudes toward sexual minorities, with some explicit caveats due to our lack of airtight causal identification. We next turn to a variety of additional tests to further probe the nature of this relationship.

In Table 3, we show that the relationship between SSRRPs and attitudes toward sexual minorities is unique to the LGB domain. Specifically, we estimate similar models where we consider other (placebo) outcome variables related to attitudes about non-LGB issues such as immigration. If the timing of same-sex relationship recognition policies were correlated with other unobserved factors associated with more liberal or accepting societies in general, it would be incorrect to interpret the findings in Table 2 and Fig. 2 as the effect of the relationship recognition policies on improving attitudes toward LGB people. In this case, we might expect that the coefficient on same-sex marriage policies would be significantly related to more liberal attitudes on a range of issues and minority populations.[20]

[16] Appendix Table A8 demonstrates that excluding other country-specific LGB policies for the additional robustness analyses in the remaining columns of Table 2 also does not materially change the results. We keep these controls for other LGB policies in the baseline specification because of concerns that omitting them may attribute too much explanatory power to the same-sex relationship recognition policies, as well as to be consistent with prior research.

[17] These countries are Austria, Belgium, Czech Republic, Denmark, England, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Luxembourg, Netherlands, Northern Ireland, Norway, Portugal, Scotland, Slovenia, Spain, Sweden, Switzerland, and Wales.

[18] These countries are Austria, Czech Republic, England, Estonia, Hungary, Ireland, Luxembourg, Northern Ireland, Scotland, Slovenia, Spain, Switzerland, and Wales.

[19] In results not reported but available upon request we also examined robustness to controlling for SSRRPs of neighboring countries within the past year, and our main effect is robust to this additional control.

[20] It is of course also possible that there are 'real' spillover effects from the treatment effects of relationship recognition policies to attitudes about other social issues, but we would expect any such spillovers to be small relative to the findings in Table 2.

Table 4
Effect heterogeneity by demographics.
2002–2016 European Social Surveys data, adults age 18+.
Baseline model from column 3 of Table 2.

	(1) Average of '*gay men and lesbians should be free to live their own life as they wish*' (2002–2004)	(2) Coefficient on Relationship recognition for same-sex couples (standard error)
Full sample	0.678	0.035** (0.013)
Males	0.666[a]	0.039** (0.016)[b]
Females	0.714	0.033** (0.014)
Above median age	0.612	0.028 (0.020)[b]
Below median age	0.762	0.041*** (0.011)
Less than degree level	0.659[a]	0.030* (0.016)[b]
Degree level education	0.809	0.054*** (0.013)
Partnered	0.670[a]	0.046*** (0.016)[b]
Not partnered	0.717	0.023 (0.014)
Rural	0.675[a]	0.033** (0.016)
Urban	0.728	0.035** (0.015)
Any religion	0.672[a]	0.034** (0.013)[b]
Atheist or no religion	0.789	0.041** (0.015)

* Significant at 10%; ** Significant at 5%; *** Significant at 1%. See notes to Table 2; [a] Indicates statistically significant difference in each pair of means at $p<.05$; [b] Indicates a statistically significant difference in each pair of estimates at $p<.05$.

Each row of Table 3 presents a separate regression model using the fully saturated specification with country-specific linear trends as in column 3 of Table 2. We report the pre-reform outcome means in column 1. Column 2 shows the coefficient estimates for the variable of interest: whether the country has legal same-sex relationship recognition. We first replicate the baseline estimates for the "*gay men and lesbians should be free to live their own life as they wish*" question in the top row of Table 3. The following rows then show results for outcome variables that equal one if the individual agreed that the country would be better off if most people shared the same values (row 2); if the individual agreed that immigrants cause crime (row 3); if the individual agreed that immigrants put in more than they take out (row 4); if the individual agreed that immigration enriches cultural life (row 5); if the individual agreed that it is important to understand different people (row 6); or if the individual agreed that it is good to have a law against ethnic discrimination at the workplace (row 7).[21] Together, these results confirm that the significant associations documented in Table 2 are mainly observed for views about sexual minorities: apart from a marginally significant relationship between SSRRPs and views about everyone in a country sharing the same values, we do not find meaningful relationships between same-sex relationship recognition and the other attitudes in column 2 of Table 3. [22]

In Table 4, we investigate heterogeneity in the effects of same-sex legal relationship recognition policies on attitudes toward sexual minorities. The format is the same as that of Table 3 except that we now examine associations for various demographic groups. In each case, the outcome in Table 4 is the same as in Table 2 (that is, agreeing that gay men and lesbians should be free to live their own life as they wish). Column 1 reports the mean of the LGB attitude question for 2002–2004 (the beginning of the sample) for the sub-group identified in each row. We report the relevant coefficient estimates on the SSRRP indicator in column 2. As in Table 3, each row reflects a separate regression that is fully saturated with controls for individual and country characteristics, country and time fixed effects, and linear country-specific time trends.

Column 1 of Table 4 reveals interesting descriptive heterogeneity in attitudes toward sexual minorities. For example, there is a notable gender difference: men report significantly more negative attitudes toward sexual minorities than women. There is also a substantial age effect: older individuals have significantly more negative attitudes toward sexual minorities than younger ones. Partnership, education, religion, and urban/rural differences are also observed clearly in the data. All these differences are statistically significant at the 5 percent level.

The results in column 2 indicate that legal same-sex relationship recognition policies were associated with statistically and economically significant improvements in attitudes toward sexual minorities across a broad demographic spectrum. We do, however, find some interesting heterogeneity in the impact of these policies. For example, column 1 shows that partnered individuals (those married or with a cohabiting partner) hold significantly more negative attitudes toward sexual minorities than non-partnered people. Importantly, in column 2, we find that relationship recognition policies have larger

[21] Note that the questions use different scales. The "customs and traditions" question uses a 1 (strongly agree) to 5 (strongly disagree) scale. The "immigrants" questions use a 0 (most negative toward immigrants) to 10 (most positive) scale. The "important to understand" question uses a 1 (very much) to 6 (not at all) scale. The "good to have a law against ethnic discrimination" question uses a 0 (extremely bad) to 10 (extremely good) scale.

[22] There are limits to the range of 'placebo' questions we can examine because the ESS did not consistently ask questions about, for example, views on women or disabled individuals over the sample period. Appendix Table A9 shows that the null effects on placebo outcomes also hold when we estimate ordered logit models (again except for the fact that SSRRPs are associated with a marginally significant increased likelihood of agreeing with the statement that it is important to understand different people). If sexual minorities are 'different people', then it is possible that this outcome is not appropriately thought of as a placebo in this context. On the whole, the main takeaway from the exercises on the placebo outcomes is that SSRRPs are most strongly related to the most direct attitude question about sexual minorities; i.e., that gay and lesbian people should be free to live their life as they wish.

Table 5
Effect heterogeneity by country characteristics.
2002–2016 European Social Surveys data, adults age 18+.
Baseline model from column 3 of Table 2.

Interaction →	(1) Country mean DV at time of treatment	(2) EU Membership at treatment	(3) Core European countries	(4) Communist history	(5) Religiosity
Relationship recognition for same-sex couples	0.033	0.026*	0.054	0.030**	0.050***
	(0.068)	(0.013)	(0.035)	(0.014)	(0.015)
Relationship recognition* *Interaction*	0.003	0.009	−0.024	0.024	−0.034*
	(0.091)	(0.022)	(0.038)	(0.038)	(0.019)
Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Month dummies	Yes	Yes	Yes	Yes	Yes
Other legislation	Yes	Yes	Yes	Yes	Yes
Country-specific linear time trends	Yes	Yes	Yes	Yes	Yes
Observations	326,069	326,069	326,069	326,069	326,069
R-squared	0.303	0.303	0.303	0.303	0.303

* Significant at 10%; ** Significant at 5%; *** Significant at 1%. All models include country fixed effects, year fixed effects, country-specific linear time trends, a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category)], GDP per capita (in 2010 US Dollars), and dummy variables for LGB employment protection, hate crimes law for sexual orientation, adoption legal for same-sex couples, and constitutional protection for sexual minorities. These results are also weighted, and standard errors are clustered at the country level.

effects at improving attitudes toward sexual minorities for partnered people than for non-partnered people. In contrast, we do not find similar evidence that relationship recognition policies help to "close the gaps" associated with age, education, or religious affiliation.

In Table 5, we also investigate country-level heterogeneity along several dimensions. In Column 1, we interact the country mean of attitudes towards sexual minorities (measured at the time of the change in same-sex relationship recognition policies) with the treatment indicator. We find that the two coefficients of interest are not statistically significant. The sign of the interaction term suggests, however, that legislative impacts are weaker in countries where initial attitudes towards sexual minorities were already more permissive. In Column 2, we investigate heterogeneity by a country's EU membership status at the time of the policy change. The interaction term is very small and not statistically significant, suggesting that there is no heterogeneity with respect to EU vs non-EU countries. Likewise, in Column 3, we investigate heterogeneity between "core" versus "non-core" European countries as defined by Chase-Dunn et al. (2000). The interaction term is not statistically significant, but the point estimates suggest that the effect may be lower in core European countries.

In Column 4, we investigate heterogeneity by whether countries have a communist history. Previous literature has found that post-Communist societies display less liberal attitudes toward sexual minorities than societies that never experienced Communist rule (Andersen and Fetner, 2008). Although the interaction term is not statistically significant, the sign of the point estimate suggests that the treatment effect might be larger in post-communist countries. This is at least suggestive of same-sex relationship recognition policies being able to bridge the attitudinal gap between former Communist countries and European countries without a history of communism.[23] The last column of Table 5 examines heterogeneity along religious lines. To do so, we calculate the country-level mean of the share of respondents that state that they adhere to a religion. We calculate these means over the entire sample. The estimates suggest that the effect of the introduction of same-sex relationship recognition policies is higher in countries with a higher share of religious people. In other words, the payoff of same-sex recognition policies in terms of increased tolerance towards sexual minorities appears to be higher in countries where more people identify as religious.

Finally, in Table 6 we investigate heterogeneity in the effects of SSRRPs by the level of gender equality in a country. To measure gender equality we use the United Nations Development Programme's Gender Inequality Index (GII). The GII measures gender equality of a country using three areas of human development: reproductive health, empowerment, and labor market participation. The value of GII ranges from 0 to 1, and we split countries into two categories based on the median GII value in the sample: those with relative gender equality, where women fare equally compared to men, and those with relative gender inequality, where women fare poorly compared to men. Of the 14 countries we identify as having relatively high gender equality, four adopted SSRRPs over our sample period. Of the 21 countries we identify as having relatively low gender equality, nine adopted SSRRPs over this period. We then estimate models using our baseline specification of the effect of SSRRPs on attitudes toward sexual minorities separately for the low and the high gender equality countries.

[23] We also investigated heterogeneity across political systems. However, when we use the Polity Score and Freedom House scores, we find that there is little variation across the countries that introduced SSRRP. Therefore, there is no heterogeneity along this dimension.

Table 6
Effect heterogeneity between countries with low and high gender inequality, by demographics.
2002–2016 European Social Surveys data, adults age 18+.
Baseline model from column 3 of Table 2.

	(1) Average of outcome (2002–2004)	(2) Coefficient on relationship recognition for same-sex couples (standard error)	(3) Average of outcome (2002–2004)	(4) Coefficient on relationship recognition for same-sex couples (standard error)
Sample ➔	Countries with low gender inequality (below sample median: GII<0.156)		Countries with high gender inequality (above sample median: GII≥.156)	
Full-sample	0.773	0.008 (0.019)	0.642	0.036** (0.014)
Males	0.707	−0.011 (0.023)	0.617	0.036** (0.016)
Females	0.757	0.003 (0.018)	0.663	0.038* (0.021)
Above median age	0.650	−0.027 (0.028)	0.561	0.035 (0.024)
Below median age	0.813	0.006 (0.019)	0.706	0.035** (0.015)
Less than degree level	0.703	−0.021 (0.024)	0.609	0.040** (0.018)[a]
Degree level education	0.831	0.029* (0.013)	0.777	0.019 (0.020)
Partnered	0.717	−0.014 (0.021)	0.612	0.071*** (0.017)[a]
Not partnered	0.753	−0.006 (0.020)	0.677	0.007 (0.016)
Rural	0.719	−0.013 (0.025)	0.623	0.046** (0.019)[a]
Urban	0.764	0.000 (0.016)	0.685	0.010 (0.013)
Any religion	0.722	−0.016 (0.018)	0.617	0.044** (0.019)[a]
Atheist or no religion	0.779	0.033 (0.023)	0.805	−0.001 (0.017)

* Significant at 10%; ** Significant at 5%; *** Significant at 1%. See notes to Table 2. The Gender Inequality Index (GII) is an index for measurement of gender disparity that was introduced by the United Nations Development Programme. It measures gender inequalities in three aspects of human development: reproductive health, empowerment, and labor market participation. The value of GII ranges between 0 and 1, with 0 being no inequality, indicating women fare equally in comparison to men and 1 being perfect inequality, indicating women fare poorly in comparison to men. 2005 GII index scores are used in the analysis. Countries included in below median sample are (14): Austria, Belgium, Cyprus, Czech Republic, Denmark, Finland, Germany, Iceland, Netherlands, Norway, Slovenia, Spain, Sweden, and Switzerland. Countries included in above median sample are (18): Bulgaria, Croatia, Estonia, France, Greece, Hungary, Ireland, Israel, Italy, Lithuania, Luxembourg, Poland, Portugal, Russia, Slovak Republic, Turkey, Ukraine and the United Kingdom; [a] indicates statistically significant difference in each pair of estimates at $p<.05$.

In Table 6 each row presents results for a separate subsample (we present full sample results in the top row. Column 1 reports the 2002–2004 mean of the outcome variable, the indicator for agreeing with the statement that gay men and lesbians should be free to live their own life as they wish, for individuals in countries with relatively high gender equality. We then present the coefficient estimate and standard error on the SSRRP indicator for individuals in those relatively gender equal countries in column 2 (from a model with the individual characteristics, country characteristics, country and year fixed effects, and linear country trends). Likewise, column 3 presents the mean of the outcome variable for individuals in countries with relatively low gender equality while column 4 presents the associated point estimate and standard error on the SSRRP indicator for individuals in those countries.

We first note that the patterns in columns 1 and 3 of Table 6 support the idea that the gender equality measure has internal validity. The share of respondents in countries with more gender equality that agrees with the statement that gay men and lesbians should be free to live their own life as they wish (column 1) is consistently larger than the associated share of respondents in countries with less gender equality (column 3).

The results in Table 6 clearly indicate that the effects of SSRRPs on improving attitudes toward sexual minorities are driven by individuals in countries with relatively low gender equality. Specifically, we estimate that SSRRPs increased the likelihood of agreeing that gay men and lesbians should be free to live their own life as they wish for individuals in low gender equality countries by a statistically significant 3.6 percentage points. This compares to an insignificant 0.08 percentage points for individuals in high gender equality countries. This is consistent with the results of Table 5 showing that there are bigger effects of SSRRPs in more conservative countries that had more room for improvement in attitudes toward sexual minorities.

Importantly, the estimates by demographic characteristics in the lower rows of Table 6 reveal a consistent pattern. In most cases the more conservative groups – and the groups with less positive attitudes toward sexual minorities in the base period – saw bigger improvements in attitudes associated with SSRRP adoption. For example, less educated people, partnered people, rural individuals, and individuals who claim a religion all saw significantly larger improvements in attitudes toward sexual minorities than their more educated, non-partnered, urban, and non-religious counterparts *in those same countries with relatively low gender equality*. These patterns are very interesting in that – when combined with the full sample pattern in the top row of Table 6 – they indicate that SSRRPs were particularly effective at closing the gaps between relatively conservative countries (here, as measured by gender inequality) as well as relatively conservative demographic groups within these relatively conservative societies.[24]

[24] Appendix Table A10 shows similar patterns when we split countries according to political conservativism. We use data from the Manifesto Project (https://manifesto-project.wzb.eu/), which uses content analysis of political parties' manifestos to create measures of parties' conservatism. We use a vari-

5. Discussion and conclusion

Do laws shape attitudes? Or do they simply reflect them? We provide evidence that cross-country variation in policies toward sexual minorities reflects attitudes of the citizenry but also that such policies do have real effects in terms of shaping attitudes. Over our sample period, 13 European countries adopted relationship recognition policies for same-sex couples. Our 2002–2016 data return evidence that such policies significantly improved attitudes toward sexual minorities. We also show that cross-sectional designs used in some of the prior literature tend to dramatically overstate the true causal relationship between policies and attitudes. The effects we identify are unique to attitudes about sexual minorities and are broad-based across gender, age, education, and relationship status.

Moreover, we find that the effects of SSRRPs on attitudes were larger in countries with relatively less gender equality. In those countries, the effects of SSRRPs at improving attitudes toward sexual minorities were also consistently larger for self-identified religious individuals compared to non-religious individuals; for partnered individuals compared to non-partnered individuals; and for individuals in rural areas compared to those in urban areas. That is, we consistently estimate that the largest effects of SSRRPs on improving attitudes toward sexual minorities were driven by the individuals that are likely to be the most conservative even within relatively conservative countries. This is consistent with – and further illuminates – the basic finding that those groups that had the most room to improve (i.e., the furthest to go) are those that saw the largest effects of same-sex relationship recognition policies.

What do our results suggest about the underlying structure of policies and attitudes? Recall that the literature on same-sex marriage and attitudes toward sexual minorities has considered four largely competing models of how legal same-sex marriage might be related to attitudes: backlash, legitimacy, polarization, and consensus (Flores and Barclay, 2016). Our findings provide direct commentary on these candidate models. First, the findings from Europe – like those in Flores and Barclay (2016) for a single state in the United States but unlike Ofosu et al. (2019) for states that did not adopt same-sex marriage 'locally' (2019) – do not support the backlash model. In no case do we find that policies to legally recognize same-sex relationships are associated with a significant worsening of attitudes toward LGB people. Second, the results also are broadly inconsistent with a model of polarization. That model would predict that some groups' attitudes would worsen while others would improve. We did not find much evidence for this, at least as proxied by base period differences in attitudes toward sexual minorities. An interesting avenue for future research would be to study possible polarization by collecting individual-level panel data. This would allow one to observe the development over time (before and after SSRRP adoption) of individuals' views. Third, the findings are also generally not supportive of the consensus model, which predicts that there will be no effect on attitudes as the policies simply reflect changes in attitudes (and not vice versa). Instead, we find evidence that legal adoption of same-sex relationship recognition increases agreement with pro-LGB views, at least in the short run. This finding is most consistent with the legitimacy model whereby legal status confers legitimacy toward a group (here, sexual minorities), and attitudes adjust in response.

Marriage equality and other relationship recognition policies continue to expand throughout the world, with Costa Rica, Chile, the Czech Republic, Japan, Mexico, and Switzerland all recently adopting or considering expanded relationship recognition rights for sexual minorities. Our results suggest that these actions may contribute to continued improvements in attitudes towards sexual minorities. This could translate into less discrimination (or more inclusion) in labor and housing markets, improved mental health for sexual minorities, and a range of other benefits associated with less anti-LGB sentiment.

Declaration of Competing Interest

None.

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able that measures the right-left position of the party in the political spectrum. If the variable is greater or equal to ten, we classify the party as conservative. This variable is roughly centered around zero. We therefore exclude center-right parties from our definition of conservative parties. Next, we calculate the combined share of parties classified as conservative at the election closest to and before the treatment. Finally, we calculate the country-level median of this share and split the countries based on whether they are above or below the median. We then define as 'conservative' countries those that are above the median. Split sample estimates from this exercise are reported in Appendix Table A10, and the format follows Table 6. The results are generally in line with those in Table 6 and suggest that the effects of SSRRPs at improving attitudes sexual minorities are driven by individuals in relatively conservative countries. Specifically, we estimate that SSRRPs increased the likelihood of agreeing that gay men and lesbians should be free to live their own life as they wish for individuals in relatively more conservative countries by a statistically significant 6 percentage points as compared to an insignificant 0.2 percentage points for individuals in less conservative countries. Moreover, we also find a similar though less pronounced pattern across demographic groups.

Appendix

Appendix Table A1
ESS measure is strongly correlated with LGB attitudes questions from other surveys.

	ESS '*Gay men and lesbians should be free to live their own life as they wish*' question	LiTS '*don't want homosexuals as neighbors*' question	Gallup '*area is a good place to live for gay or lesbian people*' question	EVS '*justifiability of homosexuality*'	EVS '*homosexuality is never justified*'	EVS '*homosexuality is always justified*'
ESS 'free to live' question	1	–	–	–	–	–
LiTS 'neighbor' question	−0.939***	1	–	–	–	–
Gallup 'area' question	0.964***	−0.906***	1	–	–	–
EVS 'justifiability' question	0.889***	−0.881***	0.923***	1	–	–
EVS 'never justified'	−0.890***	0.878***	−0.925***	−0.974***	1	–
EVS 'always justified'	0.803***	−0.781***	0.834***	0.947***	−0.853***	1

*** Significant at 1%. Authors' calculations using the European Social Surveys, European Values Survey, Gallup World Polls, and Life in Transition Survey.

Appendix Table A2
Timing of the adoption of SSRRPs.

	First SSRRP	Same-sex domestic partnerships	Same-sex marriage
Austria	Dec 30, 2009	Dec 30, 2009	–
Belgium	Dec 23, 1999	Dec 23, 1999	Feb 13, 2003
Bulgaria	–	–	–
Croatia	Aug 5, 2014	Aug 5, 2014	–
Cyprus	Nov 26, 2015	Nov 26, 2015	–
Czech Republic	Mar 1, 2006	Mar 1, 2006	–
Denmark	Jun 7, 1989	Jun 7, 1989	Jun 7, 2012
England	Nov 18, 2004	Nov 18, 2004	Jul 1, 2013
Estonia	Oct 9, 2014	Oct 9, 2014	–
Finland	Sep 28, 2001	Sep 28, 2001	Dec 12, 2014
France	Nov 15, 1999	Nov 15, 1999	May 18, 2013
Germany	Feb 16, 2001	Feb 16, 2001	–
Greece	Dec 23, 2015	Dec 23, 2015	–
Hungary	Jul 1, 2009	Jul 1, 2009	–
Iceland	Jun 4, 1996	Jun 4, 1996	Jun 27, 2010
Ireland	Jul 8, 2010	Jul 8, 2010	May 22, 2015
Israel	–	–	–
Italy	May 21, 2016	May 21, 2016	–
Lithuania	–	–	–
Luxembourg	May 12, 2004	May 12, 2004	Jun 18, 2014
Netherlands	Jan 1, 1998	Jan 1, 1998	Dec 19, 2000
Northern Ireland	Nov 18, 2004	Nov 18, 2004	–
Norway	Apr 30, 1993	Apr 30, 1993	Jun 17, 2008
Poland	–	–	–
Portugal	May 11, 2001	May 11, 2001	May 17, 2010
Russia	–	–	–
Scotland	Nov 18, 2004	Nov 18, 2004	Dec 16, 2014
Slovak Republic	–	–	–
Slovenia	Jul 23, 2005	Jul 23, 2005	–
Spain	Jun 30, 2005	–	Jun 30, 2005
Sweden	Jun 23, 1994	Jun 23, 1994	Apr 1, 2009
Switzerland	Jan 1, 2007	Jan 1, 2007	–
Turkey	–	–	–
Ukraine	–	–	–
Wales	Nov 18, 2004	Nov 18, 2004	Jul 1, 2013

Sources: Rainbow Europe, ILGA-Europe, Institut National d'Etudes Démographiques, International Lesbian, Gay, Bisexual, Trans and Intersex Association. The dates shown are the law adoption dates. Policy changes that provide identification in the context of our fixed-effects models are marked in **bold**.

Appendix Table A3
Main results on attitudes are robust to ordered logit estimation
2002–2016 European Social Surveys data, adults age 18+, ordered logit estimation, adjusted odds ratios reported.
Outcome is: 1 (strongly disagree) to 5 (strongly agree) to the statement *"Gay men and lesbians should be free to live their own life as they wish"*.

	(1) No controls	(2) (1) plus controls for individual Xs, country-specific X's, and other country-specific LGB policies	(3) (2) plus month and year FE, country FE, and linear country-specific time trends [Baseline model]	(4) (3) but exclude all other LGB policies	(5) (3) but only countries that ever adopted relationship recognition for same-sex couples	(6) (3) but only countries that adopted relationship recognition for same-sex couples within our sample window	(7) (3) but only countries observed in at least 12 of the 14 years
Relationship recognition for same-sex couples	5.538***	1.633***	1.258***	1.175**	1.179**	1.175***	1.185***
	(1.540)	(0.325)	(0.078)	(0.078)	(0.065)	(0.057)	(0.068)
N	326,069	326,069	326,069	326,069	255,307	112,623	165,853

*Significant at 10%; ** significant at 5%; *** significant at 1%. The individual characteristics are: a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, and dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category). Country characteristics include GDP per capita (in 2010 US Dollars). Other LGB-related policies are: LGB employment protection, hate crimes law for sexual orientation, adoption legal for same-sex couples, and constitutional protection for sexual minorities. Results are weighted, and standard errors are clustered at the country level.

Appendix Table A4
Sensitivity of main estimates to country-specific trends.
2002–2016 European Social Surveys data, adults age 18+.
Outcome is indicator for agreeing with "*Gay men and lesbians should be free to live their own life as they wish*".

	(1) No controls	(2) (1) plus controls for individual Xs, country-specific X's, and other country-specific LGB policies	(3) (2) plus month and year FE and country FE	(4) (3) plus linear country-specific time trends [Baseline model]	(5) (4) but without countries with treatment dates in 2002, 2003, 2015, or 2016
Relationship recognition for same-sex couples	0.400***	0.098**	0.003	0.035**	0.029**
	(0.068)	(0.047)	(0.009)	(0.013)	(0.011)
R-squared	0.168	0.272	0.301	0.303	0.313
N	326,069	326,069	326,069	326,069	300,644

*Significant at 10%; ** significant at 5%; *** significant at 1%. The individual characteristics are: a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, and dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category). Country characteristics include GDP per capita (in 2010 US Dollars). Other LGB-related policies are: LGB employment protection, hate crimes law for sexual orientation, adoption legal for same-sex couples, and constitutional protection for sexual minorities. Results are weighted, and standard errors are clustered at the country level.

Appendix Table A5
Sensitivity of event study estimates to excluding alternate event time dummies (accounting for 4 or more years before or after treatment).
2002–2016 European Social Surveys data, adults age 18+.
Outcome is indicator for agreeing with "*Gay men and lesbians should be free to live their own life as they wish*".

	(1) Baseline event study	(2) (1), but excluding alternate event time dummies
4 years or more before treatment	**Excluded**	−0.021
		(0.022)
3 years before treatment	−0.012	−0.008
	(0.016)	(0.019)
2 years before treatment	−0.043***	**Excluded**
	(0.012)	
1 year before treatment	**Excluded**	**Excluded**
0 years after treatment	0.027	0.039**
	(0.018)	(0.017)

(*continued on next page*)

Appendix Table A5 (*continued*)

	(1) Baseline event study	(2) (1), but excluding alternate event time dummies
1 years after treatment	0.035**	0.046***
	(0.016)	(0.016)
2 years after treatment	0.028	0.041**
	(0.018)	(0.018)
3 years after treatment	0.007	0.020
	(0.019)	(0.020)
4 years or more after treatment	0.014	0.027
	(0.025)	(0.026)
N	293,159	293,159
Pre-Trend F	8.97	0.46
Pre-Trend *p*	0.00	0.63

*Significant at 10%; ** significant at 5%; *** significant at 1%. All models include country fixed effects, year fixed effects, country-specific linear time trends, a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category)], GDP per capita (in 2010 US Dollars), and dummy variables for LGB employment protection, hate crimes law for sexual orientation, adoption legal for same-sex couples, and constitutional protection for sexual minorities. These results are also weighted, and standard errors are clustered at the country level. The sample consists of countries that ever adopted legal same-sex marriage between 2001 and 2016.

Appendix Table A6
Sensitivity of event study estimates to excluding alternate event time dummies (accounting for 5 or more years before or after treatment).
2002–2016 European Social Surveys data, adults age 18+.
Outcome is indicator for agreeing with "*Gay men and lesbians should be free to live their own life as they wish*".

	(1) Excluding 5 or more years before/after treatment	(2) Excluding 5 or more years before/after treatment
5 years or more before treatment	**Excluded**	−0.044
		(0.032)
4 years before treatment	−0.005	−0.015
	(0.017)	(0.018)
3 years before treatment	−0.015	−0.012
	(0.015)	(0.018)
2 years before treatment	−0.047***	**Excluded**
	(0.011)	
1 year before treatment	**Excluded**	**Excluded**
0 years after treatment	0.021	0.033**
	(0.015)	(0.014)
1 years after treatment	0.031**	0.035**
	(0.015)	(0.015)
2 years after treatment	0.022*	0.029**
	(0.011)	(0.013)
3 years after treatment	0.005	0.009
	(0.014)	(0.015)
4 years after treatment	0.004	0.001
	(0.010)	(0.010)
5 years or more after treatment	0.016	0.019
	(0.017)	(0.017)
N	293,159	293,159
Pre-Trend F	7.79	0.68
Pre-Trend *p*	0.00	0.57

* Significant at 10%; ** Significant at 5%; *** Significant at 1%. All models include country fixed effects, year fixed effects, country-specific linear time trends, a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category)], GDP per capita (in 2010 US Dollars), and dummy variables for LGB employment protection, hate crimes law for sexual orientation, adoption legal for same-sex couples, and constitutional protection for sexual minorities. These results are also weighted, and standard errors are clustered at the country level. The sample consists of countries that ever adopted legal same-sex marriage between 2001 and 2016.

Appendix Table A7
Results are robust to dropping countries that we do not observe more than two periods before or after SSRRP change.
2002–2016 European Social Surveys data, adults age 18+.
Outcome is indicator for agreeing with "*Gay men and lesbians should be free to live their own life as they wish*".

	(1) As reported in the original submission	(2) Excluding observations from countries that we *do not* observe more than two periods before or after legislation change
4 years or more before treatment	**Excluded**	**Excluded**
3 years before treatment	−0.012	−0.018
	(0.016)	(0.015)
2 years before treatment	−0.043***	−0.044***
	(0.012)	(0.011)
1 year before treatment	**Excluded**	**Excluded**
0 years after treatment	0.027	0.019
	(0.018)	(0.015)
1 years after treatment	0.035**	0.028*
	(0.016)	(0.016)
2 years after treatment	0.028	0.020
	(0.018)	(0.018)
3 years after treatment	0.007	−0.001
	(0.019)	(0.018)
4 years or more after treatment	0.014	0.000
	(0.025)	(0.023)
N	293,159	263,468

*Significant at 10%; **significant at 5%; ***significant at 1%. All models include country fixed effects, year fixed effects, country-specific linear time trends, a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category)], GDP per capita (in 2010 US Dollars), and dummy variables for LGB employment protection, hate crimes law for sexual orientation, adoption legal for same-sex couples, and constitutional protection for sexual minorities. These results are also weighted and standard errors are clustered at the country level.
The sample consists of countries that ever adopted legal same-sex marriage between 2001 and 2016.

Appendix Table A8
Main results on attitudes are robust to dropping controls for other LGB policies.
2002–2016 European Social Surveys data, adults age 18+.
Outcome is indicator for agreeing with "*Gay men and lesbians should be free to live their own life as they wish*".

	(1) No controls	(2) (1) plus controls for individual Xs, country-specific X's but excluding other country-specific LGB policies	(3) (2) plus month and year FE, country FE, and linear country-specific time trends [*Baseline model*] but excluding other country-specific LGB policies	(4) (3) but only countries that ever adopted relationship recognition for same-sex couples but excluding other country-specific LGB policies	(5) (3) but only countries that adopted relationship recognition for same-sex couples within our sample window but excluding other country-specific LGB policies	(6) (3) but only countries observed in at least 12 of the 14 years but excluding other country-specific LGB policies
Mean, 2002–2004	0.691	0.691	0.691	0.729	0.683	0.716
Relationship recognition for same-sex couples	0.400*** (0.068)	0.164*** (0.057)	0.030*** (0.011)	0.022** (0.009)	0.021* (0.010)	0.024** (0.011)
R-squared	0.168	0.264	0.302	0.142	0.152	0.162
N	326,069	326,069	326,069	255,307	112,623	165,853

* Significant at 10%; ** Significant at 5%; *** Significant at 1%. The individual characteristics are: a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, and dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category). Country characteristics include GDP per capita (in 2010 US Dollars). Results are weighted, and standard errors are clustered at the country level.

Appendix Table A9
Placebo estimates, ordered logit estimation.
2002–2016 European Social Surveys data, adults age 18+.
Outcome is level of agreement with each statement; adjusted odds ratios of being in the next highest level of agreement reported.

Outcome is ➔	(1) Better for a country if almost everyone shares customs and traditions	(2) Immigrants put in more than they take out	(3) Immigrants make crime problems better	(4) Immigration enriches cultural life	(5) Important to understand different people	(6) Good to have a law against ethnic discrimination in the workplace
Relationship recognition for same-sex couples	0.941	0.373	1.442	0.852	1.147*	1.162
	(0.509)	(0.647)	(1.739)	(0.086)	(0.082)	(1.396)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Month dummies	Yes	Yes	Yes	Yes	Yes	Yes
Other legislation	Yes	Yes	Yes	Yes	Yes	Yes
Country-specific lin. TT	Yes	Yes	Yes	Yes	Yes	Yes
Observations	75,281	71,901	73,076	310,764	313,521	72,433
Mean DV (2002–2004)	3.37	4.18	3.09	5.74	3.59	6.99

*Significant at 10%; ** significant at 5%; *** significant at 1%. All models include country fixed effects, year fixed effects, country-specific linear time trends, a male dummy, age and its square, a dummy variable for being unemployed, dummy variables for education categories (secondary and tertiary schooling, with less than secondary education as the excluded category), a dummy variable for being partnered (married or living with a partner), a dummy variable for living in an urban area, dummy variables for religion (Orthodox/Catholic, Protestant, Jewish, Islamic, and other, with no religion as the excluded category)], GDP per capita (in 2010 US Dollars), and dummy variables for LGB employment protection, hate crimes law for sexual orientation, adoption legal for same-sex couples, and constitutional protection for sexual minorities. These results are also weighted, and standard errors are clustered at the country level.

Appendix Table A10
Effect heterogeneity between more and less conservative countries by demographics.
2002–2016 European Social Surveys data, adults age 18+.
Baseline model from Column 3 of Table 2.

	(1) Average of outcome (2002–2004)	(2) Coefficient on Relationship recognition for same-sex couples (standard error)	(3) Average of outcome (2002–2004)	(4) Coefficient on Relationship recognition for same-sex couples (standard error)
Sample ➔	Countries below the median on the conservative scale (i.e., less conservative countries)		Countries above the median on the conservative scale (i.e., more conservative countries)	
Full-sample	0.727	0.002 (0.016)	0.668	0.060*** (0.012)
Males	0.712	0.001 (0.020)	0.637	0.069*** (0.018)
Females	0.740	0.003 (0.016)	0.697	0.054*** (0.015)
Above median age	0.637	−0.023 (0.021)	0.596	0.063*** (0.014)
Below median age	0.803	0.027 (0.023)	0.734	0.054*** (0.016)
Less than degree level	0.698	−0.008 (0.019)	0.633	0.064*** (0.015)
Degree level education	0.854	0.040* (0.020)	0.785	0.056*** (0.018)
Partnered	0.711	0.009 (0.020)	0.643	0.078*** (0.017)[a]
Not partnered	0.718	−0.009 (0.019)	0.699	0.044*** (0.012)
Rural	0.713	−0.005 (0.017)	0.649	0.061*** (0.014)
Urban	0.763	0.021 (0.017).	0.709	0.057*** (0.016)
Any religion	0.707	0.001 (0.018)	0.650	0.056*** (0.013)
Atheist or no religion	0.834	0.016 (0.025)	0.761	0.077*** (0.015)[a]

*Significant at 10%; ** significant at 5%; *** significant at 1%. See notes to Table 2. The Manifesto Project (https://manifesto-project.wzb.eu/) uses content analysis of political parties' manifestos to create measures of how conservative the parties are within a country. We use a variable from the Manifesto Project that measures the right-left position of the party in the political spectrum; if the variable is greater or equal to ten, we classify the party as conservative. This variable is roughly centered around zero; we, therefore, exclude center-right parties from our definition of conservative parties. Next, we calculate the combined share of parties classified as conservative at the election closest before the treatment. Finally, we calculate the country-level median of this share and split the countries based on whether they are above or below the median. We then define as 'more conservative' countries those that are above the median. More conservative countries according to this classification are (14): Cyprus, Czech Republic, Denmark, Finland, Germany, Greece, Israel, Iceland, Norway, Poland, Slovak Republic, Sweden, Switzerland, and the United Kingdom. Less conservative countries according to this classification are (18): Austria, Belgium, Bulgaria, Croatia, Estonia, France, Hungary, Ireland, Italy, Lithuania, Luxembourg, Netherlands, Portugal, Russia, Slovenia, Spain, Turkey, Ukraine. [a] indicates statistically significant difference in each pair of means at $p<.05$.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.euroecorev.2020.103399.

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