



Maryland Population Research Center

WORKING PAPER

Restrictions to Abortion Access and Racial - Ethnic Disparities in Contraceptive Use among US Teenagers

PWP-MPRC-2019-002

March 2019



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Abstract

We assessed the relationship between state parental involvement (PI) laws, sexual activity and contraceptive use among White, Black, and Hispanic female adolescents. We used the 2001-2015 State Youth Risk Behavior Surveys, which are representative of high school students in 33 states, and generalized difference-in-difference models to assess the association between PI laws and sexual activity, birth control pill use, and condom use, while controlling for other state reproductive health policies and state SES conditions. Our findings show that PI laws are associated with about 5 percentage points of higher pill use among White adolescents, but have no relationship with pill use among Black and Hispanic adolescents. Overall, PI laws are associated with greater Black and Hispanic disadvantage in pill use relative to White adolescents. PI laws are not significantly associated with sexual activity or with using condom as the only contraceptive method for any of the analyzed racial and ethnic groups. Our findings suggest that White teenagers are able to adjust their behaviors in the context of restrictive abortion environments, while Black and Hispanic teenagers are not. PI laws account for a substantial part of the Black-White and Hispanic-White disparities in birth control pill use.

Keywords: Adolescent contraceptive use, family planning, abortion restrictions, race and ethnicity

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1. Introduction

As of 2018, the majority of states in the US have put in place laws requiring parental consent or notification for minors to obtain an abortion. The proponents of such regulations argue that allowing minors to have abortions without parental involvement (PI) could represent risks for themselves, that parents have a right to be part of a minor's decision to terminate a pregnancy, and that such restrictions would contribute to reducing teenage pregnancy rates.(1) According to rational choice theory, tighter abortion restrictions may lead to increased contraceptive use if women take additional precautionary actions to avoid an unintended birth when abortion services become harder to access.(2) Although existing research has assessed the relationship between abortion restrictions and birth rates(3-5), we know little about how abortion restrictions impact adolescent women's contraceptive behavior. In particular, previous studies(6-9) have not evaluated whether PI laws are related to racial and ethnic *disparities* in contraceptive use and sexual activity among teenagers. This is a question of substantial importance. Policies designed to modify a particular outcome, such as reducing teenage pregnancy rates by incentivizing greater contraceptive use or reducing sexual activity might have heterogeneous effects across different populations, which could either aggravate or alleviate existing disparities between groups.(10)

There are large documented disadvantages in contraceptive use among Black and Hispanic teenagers (11). According to the 2006-2010 National Survey of Family Growth, among never married female adolescents of ages 15-19, 11% of Whites did not use contraception in their last sexual intercourse, whereas Blacks and Hispanics were almost twice as likely to not use contraception (19% and 21%, correspondingly) (12). Using state-fixed effects models and

gonorrhea rates as a measure of risky sex, Klick and Stratmann (13) provide evidence that requiring parental involvement for a minor to obtain an abortion reduces gonorrhea rates by 12% for White female teenagers and by 20% for Hispanic female adolescents. In contrast, they found small and non-significant effects for their Black counterparts. These findings are consistent with the notion that abortion restrictions can have heterogeneous effects across racial and ethnic groups.

The few existing studies that have analyzed how restrictions to abortion access relate to sexual and contraceptive behavior have focused on overall changes, without investigating heterogeneous associations by race and ethnicity. These studies have found either null associations (6, 7, 14, 15), or positive associations(3, 9, 16-19) between abortion restrictions and contraceptive behavior, and null associations with sexual activity(3, 14, 15, 20). Among those studies that have specifically assessed the relationship between PI laws and adolescent sexual and contraceptive behavior, the majority have relied on cross-sectional data and analyzed either a single year, or several years of data in separate models (9, 14, 15). These strategies are unable to account for unobserved heterogeneity across states, which is a potential source of bias. Some of the few studies that have analyzed how adolescent women's contraceptive use responds to PI laws over time have used pooled cross sectional surveys with only two points in time (3, 6), while others have used longer time series(16, 20, 21). Whereas Jacobs and Stanfors (2015) and Levine (2003) pooled several waves of the National Survey of Family Growth (NSFG), Colman, Dee and Joyce (2013) and Levine (2001) pooled multiple waves of the National Youth Risk Behavior Survey (NYRBS). A major limitation in Jacobs and Stanfors (2015), Colman, Dee, and Joyce (2013), and Levine (2001, 2003) is the limited sample sizes by state-year, due to using survey data designed to be representative at the national level, but not at the state level. Although

these studies reported either null or positive associations between PI laws and contraceptive use, and null relationships with sexual activity, their analytical strategies suffer from statistical power limitations that may prevent them from obtaining reliable estimates, due to the non-representative and small samples within states.

Only Sabia and Anderson (2016) have evaluated the implications of PI laws for adolescent contraceptive behavior by analyzing survey data that is representative of public high school students in every state and over multiple years. They used the 1992-2011 State Youth Risk Behavior Surveys (SYRBS), which are collected biannually in multiple states. Sabia and Anderson provide the most robust evidence of a positive association between abortion restrictions and contraceptive use after controlling for time-varying and time-invariant sources of unobserved heterogeneity at the state level, and using state-representative data. They focus on adolescent women, and find evidence that PI laws are associated with an increase in the probability of any contraceptive use, but have a null relationship with sexual activity. With the exception of the Sabia and Anderson study, other previous analyses are designed to evaluate associations between PI laws and contraceptive use, but lack the statistical power or the research design characteristics that would allow a more reliable test of causality. More importantly, none of the existing studies have addressed the potential heterogeneous implications of PI laws across racial and ethnic groups.

In this paper, we examine the extent to which PI laws relate to the probability of being sexually active, and the probabilities of using the hormonal pill and condom alone (without another method) for White, Black, and Hispanic female adolescents younger than 18. Then we investigate how PI laws relate to Black-White and Hispanic-White disparities for each the outcomes of interest. Because White young women face the least barriers to contraception,(11)

we expect them to be more likely to adapt their contraceptive behavior to restrictions in abortion access. For Black and Hispanic women who face greater obstacles to obtain contraception,(11) PI laws may not be related to contraceptive behavior. If this is the case, then PI laws may contribute to racial disparities in contraceptive use by altering White but not Black or Hispanic women's behavior. Other reasons that may result in heterogeneous behavioral associations with PI laws are racial and ethnic differences in attitudes towards abortion, and in financial access to it. That is, PI laws may be more binding on White adolescents than their peers.

We pooled eight waves of biennial cross-sectional data from the State Youth Risk Behavior Surveillance (SYRBS), spanning 2001-2015. The SYRBS is a survey of high school students conducted in multiple states and representative at the state-level(22). We used state and year fixed effects models for White, Black, and Hispanic adolescents, and estimated the extent to which these laws may alter the White-Black and White-Hispanic disparities in sexual activity and, among the sexually active, contraceptive use. In contrast to most existing studies, our models control for both time-invariant and time-varying sources of unobserved bias at the state-level, and our estimates represent a more reliable approximation to causal inference relative to the existing literature.

2. Methods

We use data from the 2001-2015 biennial waves of the state-level Youth Risk Behavior Survey (SYRBS)(22). The state-level surveys were based on separately drawn samples, designed to produce a state-representative sample of public school students (grades 9-12) in each participating state and year. The exception to this rule was South Dakota, which interviewed students in both public and private schools. The surveys were conducted by the Centers for

Disease Control and Prevention in collaboration with local health and education agencies. We use publicly available data for 33 states that conducted the survey in at least two years between 2001 and 2015, met the minimum response threshold (60%), gave the CDC permission to release their micro data(23), and asked the four questions that are essential for our study.

2.1. Contraceptive use and sexual activity

To measure contraceptive use and sexual activity, we relied on the following questions: “During the past 3 months, with how many people did you have sexual intercourse?;” “The last time you had sexual intercourse, did you or your partner use a condom?;” and “The last time you had sexual intercourse, what one method did you or your partner use to prevent pregnancy?” Our outcomes of interest are whether respondents were sexually active in the last 3 months; and among those who were, whether they used the hormonal pill (with or without condom), or a condom alone in their last intercourse. We focus on these three outcomes because they can be consistently coded across the 2001-2015 waves based on the response options in the contraceptive use questions, which ensures comparability over time.

2.2. Race

There were two questions in the YRBS that captured race and ethnicity: “Are you Hispanic or Latino? (Yes/No)” and “What is your race? (American Indian or Alaska Native / Asian/Black or African American / Native Hawaiian or Other Pacific Islander / White).” Respondents could choose more than one race. The CDC classified respondents into mutually exclusive categories that we use in our analysis: Hispanic, Non-Hispanic White, Non-Hispanic Black, and Non-Hispanic Other. The “Non-Hispanic Other” category included any Non-Hispanic respondent who reported multiple races. All respondents who identified as Hispanic were categorized as such,

regardless of what race(s) they selected. In our analyses, we included respondents who were identified as Hispanic, Non-Hispanic White, or Non-Hispanic Black. For simplicity, we refer to these groups as "White," "Black," and "Hispanic" throughout the paper. We excluded respondents in the Non-Hispanic Other category because the heterogeneity within this group complicates a meaningful interpretation. The YRBS surveys did not ask questions about respondents' socioeconomic status or family background, but we included single-year age and grade indicators as additional individual-level covariates in all models.

2.3. PI Laws and Other State Controls

Our predictor of interest is a state-specific binary variable indicating whether parental notification or consent was required for a minor to obtain an abortion during the year previous to the interview. In addition, the models control for other time-varying state policies related to family planning: whether all or some minors are allowed to consent to contraceptive services; and whether sex education is mandated and the state requires that it covers contraception topics. These policy variables were coded based on retrospective policy reports made available by the Guttmacher Institute(24) and NARAL Pro-Choice(25). See Table A1 in Online Appendix for details on the status of PI laws over the period of interest. We also included a measure of reproductive health infrastructure in the state, as captured by the percentage of counties without abortion providers, published by the Guttmacher Data Center(26). These percentages were only available for years 2000, 2005, 2008, 2011, 2014, so we interpolated them to estimate values for the entire period of interest. PI, minor consent, and sex education laws were coded as inactive or "0" when they were not in effect due to court enjoinders. We attached these state-level policy indicators to each respondent in our sample based on their state of residence and year of interview. All of the aforementioned policy variables varied by state and year, and were

introduced in the models with a one-year lag, to account for the time that respondents might take to become aware of policy changes and adjust their behaviors accordingly.

We also control for a series of time-varying group-specific socioeconomic conditions at the state and year level. Although these variables are too broad to capture neighborhood characteristics, they intend to measure the different average SES profiles that White, Black, and Hispanic teenagers and their families have across observed states. Using the 1-year samples of the American Community Survey for years 2000-2014 (27), we identified households with at least one resident adolescent (ages 14-18). For each racial/ethnic group within living in these households in each state and year, we estimated the percentage of adults (ages 25-55) with at least some college education, and the percentage of adults born in a foreign country. We also calculated the percentage of these households in which any member received welfare income, and the percentage with a resident father figure. Finally, we calculated the race-specific percentage of unemployed population living in these households. These indicators were matched to respondents based on their state of residence, race-ethnicity, and year of interview. As in the case of policy indicators, they were introduced with a one-year lag into our models.

We dropped 10% of respondents across all waves due to missing values for sex, age, grade, race and ethnicity, sexual activity, or contraceptive use. We restricted our analyses of contraceptive use to female adolescent respondents who reported having sexual intercourse in the 3 months previous to the interview. The share of sexually active respondents was similar for Whites and Hispanics, but higher for Blacks: 30% of White, 34% of Black, and 28% of Hispanic teenagers reported sexual activity in the previous 3 months. Our final analytical samples comprise 165,197 White (47,723 sexually active), 39,388 Black (11,957 sexually active), and 41,027 Hispanic

(11,950 sexually active) adolescent females of ages 14 to 17 who were enrolled in high school at the time of the interview.

2.4. Analytical Strategy

To estimate the effect of abortion restrictions on contraceptive behaviors we used a generalized difference-in-differences design that compared changes in contraceptive use in states that changed their abortion policies (7 states), before and after a change was implemented, to changes in states that did not adopt a change (26 states) (see Table A1 in Online Appendix). The assumption of our approach is that the timing of PI policy changes is not correlated with unobserved shocks that also affect the outcomes. We implemented this design using linear probability models with state and year fixed effects. Linear probability models, in contrast to logits, allow us to compare coefficients across models (28). And since the probability of observing the outcome is neither close to 0 or 1, linear probability models represent a good approximation to the estimates from a logistic model (29). Our models include state binary variables (fixed effects) that control for unobserved, time-invariant characteristics of each state, in addition to year fixed effects, to capture national changes in contraceptive use. The time-varying state policy controls described earlier are included in the model to account for alternative policies relevant to teenage reproductive health that might change around the same time than PI laws. Finally, we control for the SES conditions of each racial and ethnic group per year and state in order to estimate PI laws coefficients with greater statistical precision.

To evaluate the existence of associations specific to White, Black or Hispanic respondents, we estimated separate models by race. The Black subsample excluded respondents from Montana, North Dakota and South Dakota, because their sample sizes for Black sexually active female

high school students were smaller than 20 over the period (see Tables A2 and A3 in Online Appendix for details on states included in the sample). In order to evaluate how Black-White and Hispanic-White gaps in sexual activity and contraceptive use changed after the introduction of PI laws, we estimated separate models for the pooled Black and White samples, and for the pooled Hispanic and White samples, in which we included interactions between Black (or Hispanic) and PI laws, as well as interactions between Black (or Hispanic) and all reproductive health policies and infrastructure. These models also include interactions between year dummies and race, and state and race, to control for race-specific unobserved trends in contraceptive use, and time-invariant state-specific levels of contraceptive use by race.

As opposed to logistic regression, linear probability models allow for coefficients to be read directly as percentage point changes, and thus simplify the interpretation of results. All continuous predictors are centered to either the national mean, or the mean for the 33 analyzed states, depending on available information for states not included in the sample.¹ Thus, intercepts approximate the national average use level of condom alone and hormonal pill for the individual reference categories (17-year old White girls enrolled in 12th grade in 2011). All of our models use survey weights that make our data representative at the state-year levels, and clustered standard errors by state.

3. Results

3.1. Models for White, Black, and Hispanic Adolescents

Table 1 shows the individual characteristics and state context of the average White, Black, and Hispanic sexually active respondent in the sample, as well as the unadjusted Black-White and

¹ The percentage of counties without abortion providers is centered at the mean of states in the sample.

Hispanic-White disparities in each variable, and the statistical significance of such mean differences. Previous studies in the United States have found large disparities in use of moderately- to highly-effective between White and minority adolescents (11). Consistently, Table 1 shows that White adolescents are more than twice as likely to use the birth control pill in their last intercourse (25.9% probability of use among Whites, compared to 10.1 and 11.1% for Blacks and Hispanics, correspondingly). The Black-White and Hispanic-White unadjusted differences in probability of pill use are -15.8, and -14.8 percentage points, and they are both significant at the 1% level (see Table 1). The probabilities of using a less effective method such as condom alone in the last intercourse for White, Black, and Hispanic adolescents are 45%, 53.1%, and 48.1%, correspondingly. Black-White and Hispanic-White differences in use of condom alone are proportionally more modest than disparities in pill use, with Blacks showing an advantage of about 8 percentage points relative to Whites ($p < 0.001$), and Hispanics showing an advantage of about 3 percentage points relative to Whites ($p < 0.001$).

Table 2 shows nine linear probability models predicting sexual activity in the last 3 months, with state and year fixed effects, and estimated separately for White, Black, and Hispanic teenagers. Each set of three models progressively adds policy variables and state-level SES characteristics to a model with individual-level covariates (age, grade, and race/ethnicity). According to these models, in all racial-ethnic groups younger teenagers are less likely to be sexually active, compared to their older counterparts. A similar trend emerges in school grade. Adolescents in lower grades are less likely to be sexually active, compared to students in 12th grade, for all three racial and ethnic groups. PI laws have no significant association with the probability of being sexually active for neither White, Black, nor Hispanic adolescents. Similarly, the rest of the state

policy and SES variables have non-significant or weakly significant (at the 10% level) relationships with this outcome once all controls are in the models.

Table 3 shows analogous linear probability models predicting pill use in the last sexual intercourse. Whereas PI laws are not significantly associated with pill use for Hispanics and Blacks, they have a positive and significant association ($p < 0.05$) with pill use for White teenage women. Exposure to PI laws increases the probability of pill use by about 5 percentage points, even after controlling for other reproductive health policies and state SES variables. As would be expected, compared to 17-year old women, younger adolescents were less likely to use the pill, and those in lower school grades were also less likely to use it in the last intercourse.

The birth control pill is known for being disproportionately used by White teenagers, in contrast to Blacks and Hispanics.(12) Assuming this disparity reflects underlying differences in access and preference, it could be that Black and Hispanic teenagers are adapting their behavior to recently introduced PI laws by using a contraceptive method other than the pill. Table 4 shows linear probability models by race predicting use of condom alone as the main strategy to prevent pregnancy in the last intercourse. Condoms are the most popular and more accessible contraceptive method for adolescents(12), so we would expect that any adjustments in the contraceptive behavior of Black and Hispanic teenagers would be at least partially reflected in condom use. However, the models in Table 4 show that PI laws have no significant association with using condom alone in the last intercourse, for neither White, Black, or Hispanic adolescents. In general, condom use is not significantly predicted by any of the state-level policy or state SES variables in the model.

3.2. Robustness Checks of Group-Specific Models

As a robustness check, we estimated these models using condom use in general (regardless of whether it was paired with another method) as an outcome, but did not find significant associations with PI laws either (results not shown, available upon request). As an additional robustness check, we reproduced the models for pill use in Table 3 separately for teenagers of ages 14-16 and those of age 17. According to previous studies, compared to their older counterparts, younger teenagers are more likely to inform their parents if they need an abortion, regardless of their state PI laws.⁽¹⁾ Thus, if results are indeed reflecting behavioral responses to PI laws, one would expect them to be driven by older teenagers. We find that the positive association between PI laws and pill use among Whites is even larger (8 percentage points) and significant ($p < 0.05$) among 17-year old adolescents, whereas it remains non-significant for Blacks and Hispanics in this same age group. As expected, PI laws have no significant associations with pill use for any racial and ethnic group amongst 14-16 year-olds (results not shown, available upon request). These results are consistent with a behavioral response to abortion restrictions among White adolescents. In addition, we conducted a supplementary analysis of the probability of birth control pill use using a time-relative-to-event version of our predictor of interest, PI laws, and found positive and significant effects on the years after PI laws came into effect for White adolescents, but not for their Black or Hispanic counterparts. Details can be found in the Online Appendix. These robustness checks are all consistent with PI laws increasing hormonal pill use among White adolescents, but not among their Black or Hispanic counterparts.

3.3. PI laws and Black-White and Hispanic-White Disparities in Contraceptive Use

Table 5 presents analogous state- and year-fixed effects models that pool the Black and White samples. The table presents three models for each outcome (sexual activity, hormonal pill use, and condom use). The first model controls for age, and grade, in addition to including interactions between Black and state, and Black and year fixed effects. The next model adds the PI laws indicator and its interaction with Black, as well as the reproductive health policy controls mentioned in Section 2, and their interactions with Black. The following model adds the race-specific state SES controls.

Models 1, 2, and 3 predict sexual activity. The adjusted Black coefficient in model 1 shows that Black adolescents are about 13 percentage points more likely to be sexually active than their White counterparts ($p < 0.05$). The coefficients for PI laws and its interaction with Black in models 2 and 3 are non-significant, which is consistent with findings in Table 2. PI laws are not associated with sexual activity for Black or White adolescents, and thus do not explain any of the Black-White gap in this outcome, even after controlling for state policy and SES context.

Models 4, 5, and 6 in Table 5 predict birth control pill use. Model 4 suggests that there is an adjusted Black-White gap of about -11 percentage points ($p < 0.001$) in birth control pill use prior to adding the PI law indicator and its interaction with Black. Models 5 and 6 include the interaction between PI laws and Black race, which is negative and statistically significant ($p < 0.05$) in both models. The interaction coefficient has a magnitude of 7 percentage points in model 6, which includes all state-level policy and SES controls, suggesting that the Black-White difference in pill use is larger in the presence of PI laws than in their absence. Given that pill use among Blacks is not responsive to PI laws (Table 3), the growth in the disparity appears to be

almost completely driven by the 5 percentage point increase in pill use among Whites (as suggested by the coefficient on PI laws in Table 5, model 6). The marginal -7-percentage-point Black disadvantage in pill use that is attributable to PI laws accounts for about 63% of the -11-percentage point Black-White adjusted disparity in oral contraceptive use estimated in model 4 (Table 5). Comparing the -7-percentage point disparity induced by PI laws to the unadjusted Black-White difference in pill use (see Table 1) suggests that PI laws are responsible for about 44% of the overall difference.

Models 7, 8 and 9 in Table 5 predict use of condom alone. Model 7 shows that there is an adjusted Black-White difference in use of condom only of about 11 percentage points ($p < 0.05$), prior to including the PI law indicator and its interaction with Black. However, as it was the case with sexual activity, models 8 and 9 suggest no evidence that PI laws affect the Black-White disparity in use of condom alone.

Finally, Table 6 shows state- and year-fixed effects models that pool the Hispanic and White samples. The table presents three models for each outcome. The first model controls for age, and grade, in addition to including interactions between Hispanic and state, and Hispanic and year fixed effects. The next model adds the PI laws indicator and its interaction with Hispanic, as well as the reproductive health policy controls discussed in Section 3, and their interactions with Hispanic. The following model adds the race-specific state SES controls.

Models 1, 2, and 3 in Table 6 predict sexual activity. Prior to including the interaction term between Hispanic and PI laws, the Hispanic coefficient in model 1 shows that there are is a non-significant Hispanic-White adjusted difference in the probability of being sexually active. As expected, the coefficient for PI laws and its interaction with Hispanic is non-significant to predict

sexual activity in models 2 and 3, which add controls for reproductive health policies and infrastructure, and state SES controls, correspondingly.

Models 4, 5, and 6 in Table 6 predict birth control pill use. Model 4 shows that there is a non-significant adjusted Hispanic-White gap of about -5 percentage points in birth control pill use. The interaction between PI laws and Hispanic in models 5 and 6 suggest that PI laws are associated with a change of -6.5 percentage points ($p < 0.05$) in the Hispanic-White disparity in use, after controlling for state reproductive health policies and infrastructure, and race-specific SES characteristics. This marginal advantage for Whites accounts for about the entire Hispanic-White adjusted disparity in oral contraceptive use estimated in the baseline model 4 (Table 6), or about 44% of the unadjusted Hispanic-White gap in pill use (see Table 1).

Models 7, 8, and 9 in Table 6 predict use of condom alone. According to the adjusted Hispanic coefficient in model 7, Hispanic adolescents are about 18 percentage points less likely to use only condom in their last intercourse ($p < 0.05$), compared to Whites. But as expected from earlier results, PI laws are not relevant to explain this Hispanic-White difference in use, as shown by the non-significant interaction between PI laws and Hispanic, estimated after controlling for state reproductive health policies and infrastructure, and race-specific SES controls (models 8 and 9).

4. Discussion

Understanding the association between state-level reproductive health care policies and racial and ethnic inequalities in prescription contraception use is key to reproductive equity. To our knowledge, this is the first study to assess heterogeneous effects of PI laws on the contraceptive behavior of White, Black, and Hispanic adolescents, and their implications for Black-White and Hispanic-White gaps in sexual activity, pill and condom use. We find that requiring parental

consent or notification for abortions is associated with a higher probability of using prescription contraception among White adolescents, consistent with the idea that adolescents use more and/or better contraceptive methods when the non-pecuniary costs of abortion increase (2). However, our models suggest no significant relationship with the probability of using oral contraception for Black and Hispanic adolescents. As a result of these differential effects, PI policies appear to exacerbate racial disparities in pill use. We found no comparable pattern in sexual activity or condom use.

There are several potential mechanisms that could explain the effects we observed to pill use. Better awareness of PI laws among Whites is one possible channel. However, existing evidence from Texas has shown that about 4/5 of women of reproductive age had heard about the current abortion restrictions in their state, and that Black and US-born Hispanic women were more likely to be aware of such regulations, compared to Whites (30). But it is unclear how this finding might generalize to adolescent women or other reproductive health policies.

Another potential mechanism is differential access to prescription contraception. Black and Hispanic women face substantial obstacles to obtain the most effective contraceptive methods, which usually require a prescription. These barriers are related to lack of insurance coverage, greater geographic distance to fertility clinics, and lack of information about more effective methods (11). Conversely, our findings might be explained by racial and ethnic differences in family structures and/or group specific family processes. Past studies have found that Black adolescents show little changes in risky sexual activities as a response to parental involvement laws for abortion (13), possibly because they have a lower likelihood of living in a household with both parents present (13). Living with a single parent or a guardian, who is in most cases the mother, may reduce the psychological cost of notifying them, seeking advice, or asking for

consent to obtain an abortion. Black parents also tend to be more accepting of teenage sexual activity and use of family planning services, and might be more willing to provide consent or council (13). Such family background conditions may reduce the relevance of parental involvement laws for Black adolescents' contraceptive behavior.

A final and related mechanism to consider is differential demand for abortion among adolescents that are pregnant, particularly amongst Hispanics. Hispanic adolescents might have less desire to obtain an abortion and thus PI policies are less binding on them compared to Whites. According to our own calculations using the 2011-13 National Survey of Family Growth, 19% of Hispanic ever-pregnant teenage women of ages 15-19 reported their first pregnancy occurred at the "right time," whereas only 11% of Black and 2% of White adolescents felt the same way (31). These patterns suggest the existence of group-specific preferences for early childbearing. Such differences in pregnancy intent may contribute to explain that Hispanic adolescents are also substantially less likely than Blacks or Whites to seek an abortion once they are pregnant. In 2011, 41% of pregnancies to Black teenagers and 28% of pregnancies to White teenagers ended up in abortion, whereas only 20% of those to Hispanic adolescents were terminated(32). Thus, it is plausible that requiring parental involvement is less relevant for the use of a more effective contraceptive method among Hispanic girls because they are less likely to seek an abortion in the first place.

Overall, our evidence suggests that abortion restrictions are relevant to explain racial and ethnic inequalities in teenage contraceptive use, which is a proximate determinant of teenage birth rates. In particular, we have shown that abortion restrictions have important implications for racial-ethnic disparities in use of a more effective contraceptive method, the hormonal pill. PI laws exacerbate Black and Hispanic teenagers' disadvantage in contraceptive use relative to White

adolescents. The disparities associated with such laws account for over 40% of the unadjusted Black-White and Hispanic-White gaps in pill use in the analyzed states in 2001-2015. However, a deeper understanding of the mechanisms we suggest is needed to fully understand the underlying public health impact of our findings and potential policy responses.

A limitation of this study is that the YRBS did not ask questions to assess respondents' socioeconomic background and family structure. Thus, our analyses do not include these controls. However, our research questions are mainly interested in the effect of state policy environments and state-level conditions on contraceptive use, which we assess using state-level covariates, and state- and year-fixed effects. Our analyses show that the relationship between policy environments and racial-ethnic disparities in contraceptive use is complex and should continue to be analyzed in future research.

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Table 1. Average Characteristics of Sexually Active Female Adolescents Enrolled in Public High Schools by Race, Ages 14-17, State YRBS 2001-15

	<u>Unadjusted differences</u>				
	<u>White</u>	<u>Black</u>	<u>Hispanic</u>	<u>Black-White</u>	<u>Hispanic-White</u>
CONTRACEPTIVE METHOD USED IN LAST INTERCOURSE†					
Pill	25.90	10.10	11.10	-15.80 ***	-14.80 ***
Condom only	45.00	53.10	48.10	8.10 ***	3.10 ***
INDIVIDUAL CHARACTERISTICS†					
Age					
14 or younger	5.00	6.30	7.40	1.30	2.40 ***
15	20.00	23.10	22.10	3.10	2.10
16	32.90	32.00	32.50	-0.90	-0.40
17	42.20	38.60	38.00	-3.60	-4.20 **
Grade					
9th	16.80	22.50	21.30	5.70	4.50 **
10th	27.70	28.40	28.40	0.70	0.70
11th	36.10	31.60	30.50	-4.50	-5.60 ***
12th	19.40	17.50	19.80	-1.90	0.40
STATE REPRODUCTIVE HEALTH INFRASTRUCTURE					
% Counties without abortion providers	77.80	77.30	66.20	-0.50	-11.60 ***

STATE REPRODUCTIVE HEALTH POLICIES

Parental notification/consent previous to abortion	68.50	70.00	49.60	1.50		-18.90	***
Mandatory sex ed covering contraceptives	10.20	12.90	7.80	2.70	***	-2.40	***
Minors' ability to consent to contraceptive services							
None	34.3	38.4	33.6	4.10	***	-0.70	***
Some minors can consent	21.80	16.40	14.10	-5.40	***	-7.70	***
All minors can consent	43.90	45.20	52.30	1.30	**	8.40	***

RACE-SPECIFIC STATE-LEVEL CHARACTERISTICS

% Adults with BA or more ◇	13.40	5.90	5.40	-7.50	***	-8.00	***
% Foreign-born adults ◇	5.00	13.50	71.50	8.50	***	66.50	***
% Households with a resident father figure ◇	83.30	50.50	73.90	-32.80	***	-9.40	***
% Households receiving welfare income ◇	63.00	72.80	74.40	9.80	***	11.40	***
% Unemployed adults ◇	7.90	18.30	11.50	10.40	***	3.60	***
Observations	47,723	11,957	11,950				

◇ Group-specific controls. Values reflect the characteristics of population of respondents' race and ethnicity in her state. Thus, White, Black, and Hispanic respondents in the same state have different values in these variables.

† Percentages in subsample.

+ p<0.1 * p<0.05 ** p<0.01 *** p<0.001

Table 2. Linear Probability Models Predicting Sexual Activity in Last 3 Months Among WHITE, HISPANIC, and BLACK Female Adolescents Enrolled in Public High Schools, Ages 14-17, with State and Year FE, State YRBS 2001-15

	White			Black			Hispanic		
	1	2	3	4	5	6	7	8	9
STATE REPRODUCTIVE HEALTH POLICIES (Y-1)									
Parental notification/consent previous to abortion	0.003 (0.012)	0.003 (0.012)	-0.001 (0.013)	0.007 (0.020)	0.003 (0.019)	0.009 (0.019)	-0.015 (0.022)	-0.014 (0.022)	-0.018 (0.022)
Mandatory sex ed covering contraceptives	0.017 (0.014)	0.018 (0.014)	0.016 (0.015)	0.082* (0.034)	0.070* (0.034)	0.065+ (0.036)	0.002 (0.037)	0.005 (0.038)	-0.000 (0.039)
Minors' capacity to consent to contraceptive services	0.009 (0.011)	0.009 (0.011)	0.004 (0.012)	-0.006 (0.025)	-0.004 (0.025)	-0.019 (0.026)	0.039 (0.025)	0.039 (0.026)	0.034 (0.027)
Some minors can consent	0.009 (0.013)	0.010 (0.013)	0.004 (0.014)	0.011 (0.033)	0.005 (0.032)	-0.005 (0.033)	-0.026 (0.028)	-0.025 (0.027)	-0.037 (0.029)
All minors can consent									
STATE REPRODUCTIVE HEALTH INFRASTRUCTURE (Y-1)									
% Counties without abortion providers		0.000 (0.001)	0.000 (0.001)		-0.004+ (0.003)	-0.003 (0.003)		0.001 (0.002)	0.001 (0.002)
RACE-SPECIFIC STATE-LEVEL CHARACTERISTICS (Y-1)									
% Adults with BA or more ◇			0.008 (0.017)			-0.030+ (0.016)			0.001 (0.014)
% Foreign-born adults ◇			0.048 (0.040)			-0.030+ (0.018)			-0.000 (0.007)
% Households with a resident father figure ◇			-0.007 (0.014)			0.008 (0.009)			0.010 (0.012)
% Households receiving welfare income ◇			-0.012 (0.012)			0.015 (0.015)			-0.020* (0.010)
% Unemployed adults ◇			0.004			0.015			0.005

			(0.025)			(0.019)			(0.015)
INDIVIDUAL CHARACTERISTICS									
Age (Ref: 17)									
14 or younger	-0.237***	-0.237***	-0.237***	-0.253***	-0.254***	-0.254***	-0.216***	-0.216***	-0.216***
	(0.011)	(0.011)	(0.011)	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)	(0.019)
15	-0.175***	-0.175***	-0.175***	-0.159***	-0.160***	-0.160***	-0.155***	-0.155***	-0.155***
	(0.008)	(0.008)	(0.008)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
16	-0.085***	-0.085***	-0.085***	-0.076***	-0.076***	-0.076***	-0.057***	-0.057***	-0.057***
	(0.007)	(0.007)	(0.007)	(0.014)	(0.014)	(0.014)	(0.015)	(0.015)	(0.015)
Grade (Ref: 12th)									
9th	-0.124***	-0.124***	-0.125***	-0.073**	-0.072**	-0.073**	-0.108***	-0.108***	-0.108***
	(0.011)	(0.011)	(0.011)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
10th	-0.083***	-0.083***	-0.083***	-0.061**	-0.061**	-0.061**	-0.088***	-0.088***	-0.088***
	(0.010)	(0.010)	(0.010)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
11th	-0.047***	-0.047***	-0.047***	-0.036*	-0.036*	-0.036*	-0.063***	-0.063***	-0.064***
	(0.008)	(0.008)	(0.008)	(0.015)	(0.015)	(0.015)	(0.017)	(0.017)	(0.017)
Constant	0.531***	0.527***	0.707***	0.618***	0.689***	0.537***	0.531***	0.518***	0.543***
	(0.024)	(0.029)	(0.145)	(0.038)	(0.056)	(0.086)	(0.055)	(0.060)	(0.070)
YEAR FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	165,197	165,197	165,197	39,388	39,388	39,388	41,027	41,027	41,027

State and year fixed effects coefficients are omitted to preserve space. Standard errors clustered by state are shown in parentheses.

◇ Group-specific controls. Values reflect the characteristics of population of respondents' race and ethnicity in her state. Thus, White, Black, and Hispanic respondents in the same state have different values in these variables.

+ p<0.1 * p<0.05 ** p<0.01 *** p<0.001

Table 3. Linear Probability Models Predicting Pill Use Among WHITE, HISPANIC, and BLACK Sexually Active Female Adolescents Enrolled in Public High Schools, Ages 14-17, with State and Year FE, State YRBS 2001-15

	White			Black			Hispanic		
	1	2	3	4	5	6	7	8	9
STATE REPRODUCTIVE HEALTH POLICIES (Y-1)									
Parental notification/consent previous to abortion	0.048* (0.021)	0.050* (0.021)	0.046* (0.023)	-0.015 (0.022)	-0.012 (0.022)	-0.020 (0.022)	0.003 (0.021)	0.004 (0.021)	-0.000 (0.021)
Mandatory sex ed covering contraceptives	-0.009 (0.022)	-0.007 (0.022)	-0.010 (0.022)	0.059 (0.052)	0.068 (0.056)	0.069 (0.055)	-0.043 (0.039)	-0.037 (0.039)	-0.040 (0.039)
Minors' capacity to consent to contraceptive services									
Some minors can consent	0.022 (0.018)	0.023 (0.018)	0.015 (0.018)	-0.020 (0.022)	-0.021 (0.022)	-0.007 (0.022)	-0.009 (0.030)	-0.010 (0.031)	-0.012 (0.031)
All minors can consent	0.022	0.024	0.016	-0.029	-0.024	-0.013	-0.023	-0.022	-0.014
STATE REPRODUCTIVE HEALTH INFRASTRUCTURE (Y-1)									
% Counties without abortion providers		0.001 (0.002)	0.001 (0.002)		0.003 (0.003)	0.002 (0.003)		0.001 (0.002)	0.001 (0.002)
RACE-SPECIFIC STATE-LEVEL CHARACTERISTICS (Y-1)									
% Adults with BA or more ◇			0.047* (0.024)			0.045* (0.020)			0.009 (0.013)
% Foreign-born adults ◇			-0.047 (0.054)			0.006 (0.018)			-0.018+ (0.011)
% Households with a resident father figure ◇			-0.044+ (0.023)			-0.009 (0.014)			-0.023+ (0.013)
% Households receiving welfare income ◇			-0.032 (0.020)			-0.013 (0.013)			0.013 (0.012)
% Unemployed adults ◇			0.028 (0.041)			-0.004 (0.017)			0.025 (0.024)

INDIVIDUAL CHARACTERISTICS

Age (Ref: 17)

14 or younger	-0.084*** (0.018)	-0.084*** (0.018)	-0.083*** (0.018)	0.009 (0.026)	0.010 (0.026)	0.011 (0.026)	-0.049* (0.020)	-0.049* (0.020)	-0.048* (0.020)
15	-0.070*** (0.013)	-0.070*** (0.013)	-0.070*** (0.013)	-0.020 (0.017)	-0.019 (0.017)	-0.020 (0.017)	-0.019 (0.014)	-0.019 (0.014)	-0.018 (0.014)
16	-0.024* (0.010)	-0.024* (0.010)	-0.024* (0.010)	0.010 (0.015)	0.010 (0.015)	0.010 (0.015)	-0.010 (0.010)	-0.010 (0.010)	-0.010 (0.010)

Grade (Ref: 12th)

9th	-0.132*** (0.018)	-0.132*** (0.018)	-0.132*** (0.018)	-0.051* (0.024)	-0.051* (0.024)	-0.051* (0.024)	-0.064** (0.022)	-0.064** (0.022)	-0.065** (0.022)
10th	-0.102*** (0.015)	-0.102*** (0.015)	-0.101*** (0.015)	-0.034 (0.021)	-0.034 (0.021)	-0.034 (0.021)	-0.045* (0.020)	-0.045* (0.020)	-0.046* (0.020)
11th	-0.048*** (0.011)	-0.048*** (0.011)	-0.048*** (0.011)	-0.029 (0.018)	-0.029 (0.018)	-0.028 (0.018)	-0.038* (0.017)	-0.038* (0.017)	-0.038* (0.017)

Constant	0.279*** (0.030)	0.258*** (0.041)	0.122 (0.192)	0.159*** (0.040)	0.106+ (0.056)	0.169+ (0.090)	0.218*** (0.060)	0.200** (0.068)	0.298*** (0.081)
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YEAR FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Observations	47,723	47,723	47,723	11,957	11,957	11,957	11,950	11,950	11,950
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State and year fixed effects coefficients are omitted to preserve space. Standard errors clustered by state are shown in parentheses.

◊ Group-specific controls. Values reflect the characteristics of population of respondents' race and ethnicity in her state. Thus, White, Black, and Hispanic respondents in the same state have different values in these variables.

+ p<0.1 * p<0.05 ** p<0.01 *** p<0.001

Table 4. Linear Probability Models Predicting Condom (Alone) Use Among WHITE, HISPANIC, and BLACK Sexually Active Female Adolescents Enrolled in Public High Schools, Ages 14-17, with State and Year FE, State YRBS 2001-15

	White			Black			Hispanic		
	1	2	3	4	5	6	7	8	9
STATE REPRODUCTIVE HEALTH POLICIES (Y-1)									
Parental notification/consent previous to abortion	-0.025 (0.020)	-0.021 (0.020)	-0.022 (0.022)	0.023 (0.042)	0.021 (0.042)	0.023 (0.043)	-0.025 (0.040)	-0.024 (0.040)	-0.028 (0.040)
Mandatory sex ed covering contraceptives	0.009 (0.030)	0.012 (0.029)	0.014 (0.029)	0.084 (0.066)	0.078 (0.072)	0.074 (0.073)	-0.031 (0.061)	-0.025 (0.064)	-0.026 (0.064)
Minors' capacity to consent to contraceptive services									
Some minors can consent	-0.019 (0.020)	-0.019 (0.020)	-0.014 (0.021)	0.011 (0.035)	0.011 (0.035)	0.010 (0.039)	-0.007 (0.052)	-0.009 (0.052)	-0.016 (0.053)
All minors can consent	-0.013	-0.010	-0.009	-0.040	-0.044	-0.044	-0.011	-0.010	-0.026
STATE REPRODUCTIVE HEALTH INFRASTRUCTURE (Y-1)									
% Counties without abortion providers		0.002 (0.002)	0.002 (0.002)		-0.002 (0.004)	-0.002 (0.004)		0.001 (0.003)	0.001 (0.003)
RACE-SPECIFIC STATE-LEVEL CHARACTERISTICS (Y-1)									
% Adults with BA or more ◇			-0.048+ (0.027)			0.005 (0.030)			0.008 (0.021)
% Foreign-born adults ◇			0.009 (0.065)			-0.013 (0.028)			0.027* (0.012)
% Households with a resident father figure ◇			0.047+ (0.025)			-0.007 (0.019)			-0.007 (0.018)
% Households receiving welfare income ◇			-0.004 (0.020)			0.009 (0.026)			-0.026 (0.022)
% Unemployed adults ◇			-0.020 (0.045)			-0.005 (0.028)			-0.007 (0.031)

INDIVIDUAL CHARACTERISTICS

Age (Ref: 17)

14 or younger	0.132*** (0.025)	0.132*** (0.025)	0.131*** (0.025)	0.078+ (0.047)	0.077+ (0.047)	0.077+ (0.047)	0.034 (0.050)	0.034 (0.050)	0.035 (0.050)
15	0.125*** (0.015)	0.125*** (0.015)	0.125*** (0.015)	0.051 (0.031)	0.050 (0.031)	0.050 (0.031)	0.035 (0.028)	0.035 (0.028)	0.036 (0.028)
16	0.051*** (0.011)	0.051*** (0.011)	0.050*** (0.011)	0.017 (0.022)	0.017 (0.022)	0.017 (0.022)	0.003 (0.021)	0.003 (0.021)	0.003 (0.020)
Grade (Ref: 12th)									
9th	0.023 (0.020)	0.023 (0.020)	0.024 (0.020)	0.053 (0.040)	0.054 (0.040)	0.053 (0.040)	0.040 (0.039)	0.040 (0.039)	0.039 (0.039)
10th	0.018 (0.016)	0.019 (0.016)	0.019 (0.016)	0.045 (0.033)	0.045 (0.033)	0.045 (0.033)	0.003 (0.026)	0.003 (0.026)	0.003 (0.026)
11th	0.016 (0.011)	0.015 (0.011)	0.015 (0.011)	0.018 (0.025)	0.018 (0.025)	0.018 (0.025)	0.019 (0.024)	0.020 (0.024)	0.020 (0.024)
Constant	0.406*** (0.035)	0.377*** (0.051)	0.365 (0.250)	0.516*** (0.057)	0.554*** (0.085)	0.491** (0.151)	0.282** (0.101)	0.262* (0.110)	0.189 (0.124)
YEAR FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,723	47,723	47,723	11,957	11,957	11,957	11,950	11,950	11,950

State and year fixed effects coefficients are omitted to preserve space. Standard errors clustered by state are shown in parentheses.

◇ Group-specific controls. Values reflect the characteristics of population of respondents' race and ethnicity in her state. Thus, White, Black, and Hispanic respondents in the same state have different values in these variables.

+ p<0.1 * p<0.05 ** p<0.01 *** p<0.001

Table 5. Linear Probability Models Predicting Sexual Activity and Contraceptive Use in Last Intercourse Among BLACK and WHITE Female Adolescents Enrolled in Public High Schools, Ages 14-17, State YRBS 2001-15

	Sexual Activity			Pill			Condom only		
	1	2	3	4	5	6	7	8	9
RACE (Ref: White)									
Black	0.130***	0.193***	0.166**	-0.114***	-0.064	-0.046	0.110**	0.157	0.148
	(0.031)	(0.057)	(0.064)	(0.030)	(0.067)	(0.078)	(0.043)	(0.102)	(0.119)
STATE REPRODUCTIVE HEALTH POLICIES (Y-1)									
Parental notification/consent previous to abortion		0.003	0.004		0.053*	0.050*		-0.021	-0.019
		(0.013)	(0.013)		(0.022)	(0.023)		(0.021)	(0.022)
Black * Parental notification/consent previous to abortion		-0.001	-0.001		-0.063*	-0.070*		0.042	0.047
		(0.020)	(0.020)		(0.031)	(0.032)		(0.049)	(0.049)
Mandatory sex ed covering contraceptives		0.018	0.017		-0.007	-0.008		0.012	0.014
		(0.014)	(0.015)		(0.022)	(0.021)		(0.029)	(0.029)
Black * Mandatory sex ed covering contraceptives		0.052	0.049		0.074	0.075		0.068	0.069
		(0.032)	(0.033)		(0.059)	(0.058)		(0.072)	(0.073)
Minors' capacity to consent to contraceptive services									
Some minors can consent		-0.015	-0.023		-0.052+	-0.027		0.034	0.023
		(0.024)	(0.024)		(0.029)	(0.029)		(0.039)	(0.040)
Some minors can consent		-0.007	-0.013		-0.053	-0.035		-0.033	-0.043
		(0.030)	(0.030)		(0.038)	(0.038)		(0.046)	(0.045)
Minors' capacity to consent to contraceptive services									
Black * Some minors can consent		0.009	0.012		0.025	0.016		-0.018	-0.014
		(0.012)	(0.012)		(0.018)	(0.018)		(0.021)	(0.021)
Black * Some minors can consent		0.011	0.013		0.025	0.017		-0.009	-0.006
		(0.013)	(0.013)		(0.023)	(0.024)		(0.026)	(0.025)

STATE REPRODUCTIVE HEALTH INFRASTRUCTURE (Y-1)

% Counties without abortion providers	0.000	0.000		0.001	0.001		0.002	0.002
	(0.001)	(0.001)		(0.002)	(0.002)		(0.002)	(0.002)
Black * % Counties without abortion providers	-0.005	-0.004		0.001	0.001		-0.004	-0.004
	(0.003)	(0.003)		(0.003)	(0.003)		(0.005)	(0.005)

RACE-SPECIFIC STATE-LEVEL CHARACTERISTICS (Y-1)

% Adults with BA or more ◇						0.050**			-0.027
						(0.018)			(0.022)
% Foreign-born adults ◇						-0.008			-0.007
						(0.019)			(0.025)
% Households with a resident father figure ◇						-0.020			0.009
						(0.013)			(0.016)
% Households receiving welfare income ◇						-0.023+			0.006
						(0.014)			(0.017)
% Unemployed adults ◇						0.006			-0.011
						(0.017)			(0.024)

Constant	0.532***	0.520***	0.475***	0.308***	0.234***	0.210*	0.388***	0.381***	0.345***
	(0.020)	(0.029)	(0.060)	(0.020)	(0.042)	(0.084)	(0.025)	(0.052)	(0.104)

YEAR FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RACE*YEAR FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RACE*STATE FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Observations	189,246	189,246	189,246	55,348	55,348	55,348	55,348	55,348	55,348
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Coefficients for age and grade dummies, state and year fixed effects, and state-Black and year-Black interactions are omitted to preserve space. Standard errors clustered by state are shown in parentheses.

◇ Group-specific controls. Values reflect the characteristics of population of respondents' race and ethnicity in her state. Thus, White, Black, and Hispanic respondents in the same state have different values in these variables.

+ p<0.1 * p<0.05 ** p<0.01 *** p<0.001

Table 6. Linear Probability Models Predicting Sexual Activity and Contraceptive Use in Last Intercourse Among HISPANIC and WHITE Female Adolescents Enrolled in Public High Schools, Ages 14-17, State YRBS 2001-15

	Sexual Activity			Pill			Condom only		
	1	2	3	4	5	6	7	8	9
RACE (Ref: White)									
Hispanic	-0.027 (0.059)	-0.035 (0.101)	-0.035 (0.101)	-0.052 (0.055)	0.245* (0.124)	0.245* (0.124)	-0.177* (0.089)	-0.322+ (0.179)	-0.322+ (0.179)
STATE REPRODUCTIVE HEALTH POLICIES									
Parental notification/consent previous to abortion		0.001 (0.012)	0.001 (0.012)		0.048* (0.022)	0.048* (0.022)		-0.024 (0.021)	-0.024 (0.021)
Hispanic * Parental notification/consent previous to abortion		-0.018 (0.025)	-0.018 (0.025)		-0.065* (0.028)	-0.065* (0.028)		0.009 (0.043)	0.009 (0.043)
Mandatory sex ed covering contraceptives		0.017 (0.014)	0.017 (0.014)		-0.010 (0.022)	-0.010 (0.022)		0.013 (0.029)	0.013 (0.029)
Hispanic * Mandatory sex ed covering contraceptives		-0.014 (0.041)	-0.014 (0.041)		-0.033 (0.042)	-0.033 (0.042)		-0.039 (0.071)	-0.039 (0.071)
Minors' capacity to consent to contraceptive services									
Some minors can consent		0.006 (0.011)	0.006 (0.011)		0.017 (0.018)	0.017 (0.018)		-0.017 (0.021)	-0.017 (0.021)
All minors can consent		0.006 (0.013)	0.006 (0.013)		0.019 (0.023)	0.019 (0.023)		-0.013 (0.025)	-0.013 (0.025)
Minors' capacity to consent to contraceptive services									
Hispanic * Some minors can consent		0.029 (0.026)	0.029 (0.026)		-0.040 (0.034)	-0.040 (0.034)		0.011 (0.054)	0.011 (0.054)
Hispanic * All minors can consent		-0.037 (0.030)	-0.037 (0.030)		-0.059+ (0.033)	-0.059+ (0.033)		-0.002 (0.056)	-0.002 (0.056)

STATE REPRODUCTIVE HEALTH INFRASTRUCTURE (Y-1)

% Counties without abortion providers	0.000	0.000		0.001	0.001		0.002	0.002
	(0.001)	(0.001)		(0.002)	(0.002)		(0.002)	(0.002)
Hispanic * % Counties without abortion providers	0.001	0.001		0.000	0.000		-0.001	-0.001
	(0.002)	(0.002)		(0.003)	(0.003)		(0.004)	(0.004)

RACE-SPECIFIC STATE-LEVEL CHARACTERISTICS

% Adults with BA or more ◇	0.007	0.007		0.034+	0.034+		-0.031	-0.031
	(0.013)	(0.013)		(0.018)	(0.018)		(0.021)	(0.021)
% Foreign-born adults ◇	0.010	0.010		-0.018	-0.018		0.016	0.016
	(0.009)	(0.009)		(0.012)	(0.012)		(0.015)	(0.015)
% Households with a resident father figure ◇	-0.002	-0.002		-0.030*	-0.030*		0.019	0.019
	(0.009)	(0.009)		(0.014)	(0.014)		(0.015)	(0.015)
% Households receiving welfare income ◇	-0.014	-0.014		-0.019	-0.019		-0.012	-0.012
	(0.009)	(0.009)		(0.014)	(0.014)		(0.015)	(0.015)
% Unemployed adults ◇	0.006	0.006		0.024	0.024		-0.013	-0.013
	(0.014)	(0.014)		(0.023)	(0.023)		(0.027)	(0.027)

Constant	0.534***	0.559***	0.559***	0.317***	0.209***	0.209***	0.389***	0.422***	0.422***
	(0.020)	(0.043)	(0.043)	(0.020)	(0.063)	(0.063)	(0.024)	(0.082)	(0.082)

YEAR FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RACE*YEAR FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RACE*STATE FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Observations	206,224	206,224	206,224	59,673	59,673	59,673	59,673	59,673	59,673
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Coefficients for age and grade dummies, state and year fixed effects, and state-Hispanic and year-Hispanic interactions are omitted to preserve space. Standard errors clustered by state are shown in parentheses.

◇ Group-specific controls. Values reflect the characteristics of population of respondents' race and ethnicity in her state. Thus, White, Black, and Hispanic respondents in the same state have different values in these variables.

+ p<0.1 * p<0.05 ** p<0.01 *** p<0.001

ONLINE APPENDIX

Table A1. Parental involvement (PI) laws for minors to obtain an abortion by state and year, for states included in the YRBS 2001-2015 sample (lagged by one year)

	2000	2002	2004	2006	2008	2010	2012	2014
Alabama	1	1	1	1	1	1	1	1
Alaska	0	0	0	0	0	0	1	1
Arizona	0	0	1	1	1	1	1	1
Arkansas	1	1	1	1	1	1	1	1
Connecticut	0	0	0	0	0	0	0	0
Delaware	1	1	1	1	1	1	1	1
Florida	0	0	0	1	1	1	1	1
Illinois	0	0	0	0	0	0	0	1
Iowa	1	1	1	1	1	1	1	1
Kansas	1	1	1	1	1	1	1	1
Kentucky	1	1	1	1	1	1	1	1
Maine	0	0	0	0	0	0	0	0
Maryland	1	1	1	1	1	1	1	1
Michigan	1	1	1	1	1	1	1	1
Mississippi	1	1	1	1	1	1	1	1
Missouri	1	1	1	1	1	1	1	1
Montana	0	0	0	0	0	0	0	1
Nebraska	1	1	1	1	1	1	1	1
Nevada	0	0	0	0	0	0	0	0
New Hampshire	0	0	0	0	0	0	1	1
New Jersey	0	0	0	0	0	0	0	0
New York	0	0	0	0	0	0	0	0
North Carolina	1	1	1	1	1	1	1	1
North Dakota	1	1	1	1	1	1	1	1
Oklahoma	0	1	0	1	1	1	1	1
Pennsylvania	1	1	1	1	1	1	1	1
Rhode Island	1	1	1	1	1	1	1	1

South Carolina	1	1	1	1	1	1	1	1
South Dakota	1	1	1	1	1	1	1	1
Tennessee	1	1	1	1	1	1	1	1
West Virginia	1	1	1	1	1	1	1	1
Wisconsin	1	1	1	1	1	1	1	1
Wyoming	1	1	1	1	1	1	1	1

Note: States in gray did not experience changes in PI laws in the observed period.

Parental involvement means either required parental notification or consent for a minor to obtain an abortion.

Coding of PI laws was based on archived annual state policy reports provided by the Guttmacher Institute and NARAL Pro-Choice after request.

Table A2. States Included in White, Black and Hispanic Analytical Samples

State	White	Black	Hispanic
Alabama	1	1	1
Alaska	1	1	1
Arizona	1	1	1
Arkansas	1	1	1
Connecticut	1	1	1
Delaware	1	1	1
Florida	1	1	1
Illinois	1	1	1
Iowa	1	1	1
Kansas	1	1	1
Kentucky	1	1	1
Maine	1	1	1
Maryland	1	1	1
Michigan	1	1	1
Mississippi	1	1	1
Missouri	1	1	1
Montana	1	0	1
Nebraska	1	1	1
Nevada	1	1	1
New Hampshire	1	1	1
New Jersey	1	1	1
New York	1	1	1
North Carolina	1	1	1
North Dakota	1	0	1
Oklahoma	1	1	1
Pennsylvania	1	1	1
Rhode Island	1	1	1
South Carolina	1	1	1
South Dakota	1	0	1
Tennessee	1	1	1
West Virginia	1	1	1
Wisconsin	1	1	1
Wyoming	1	1	1

Note: "1" indicates the state was included in the sample, and "0" that it was excluded.

Table A3. Available state-years in the YRBS 2001-2015 working sample

	2001	2003	2005	2007	2009	2011	2013	2015
Alabama	0	1	1	0	1	1	1	1
Alaska	0	1	0	1	1	1	1	1
Arizona	0	1	1	1	1	1	1	1
Arkansas	1	0	1	1	1	1	1	1
Connecticut	0	0	0	1	1	1	1	1
Delaware	1	1	1	1	1	1	1	1
Florida	1	1	1	1	1	1	1	1
Illinois	0	0	0	1	1	1	1	1
Iowa	0	0	1	1	0	1	0	0
Kansas	0	0	1	1	1	1	1	0
Kentucky	0	1	1	1	1	1	1	1
Maine	1	1	1	1	1	1	1	1
Maryland	0	0	0	0	0	0	1	1
Michigan	1	1	1	1	1	1	1	1
Mississippi	1	1	0	1	1	1	1	1
Missouri	1	1	1	1	1	0	1	1
Montana	1	1	1	1	1	1	1	1
Nebraska	0	1	1	0	0	1	1	1
Nevada	1	1	1	1	1	0	1	1
New Hampshire	0	1	1	1	1	1	1	1
New Jersey	1	0	1	0	1	1	1	0
New York	0	1	1	1	1	1	1	1
North Carolina	0	1	1	1	0	0	0	1
North Dakota	1	1	1	1	0	0	0	0
Oklahoma	0	1	1	1	1	1	1	1
Pennsylvania	0	0	0	0	1	0	0	1
Rhode Island	1	1	1	1	1	1	1	1
South Carolina	0	0	1	1	1	1	1	1

South Dakota	1	1	1	1	1	1	1	1
Tennessee	0	1	1	1	1	1	1	0
West Virginia	0	1	1	1	1	1	1	1
Wisconsin	1	1	1	1	1	1	1	0
Wyoming	1	1	1	1	1	1	1	1

Note: States in gray experienced change in PI laws during the observed period.

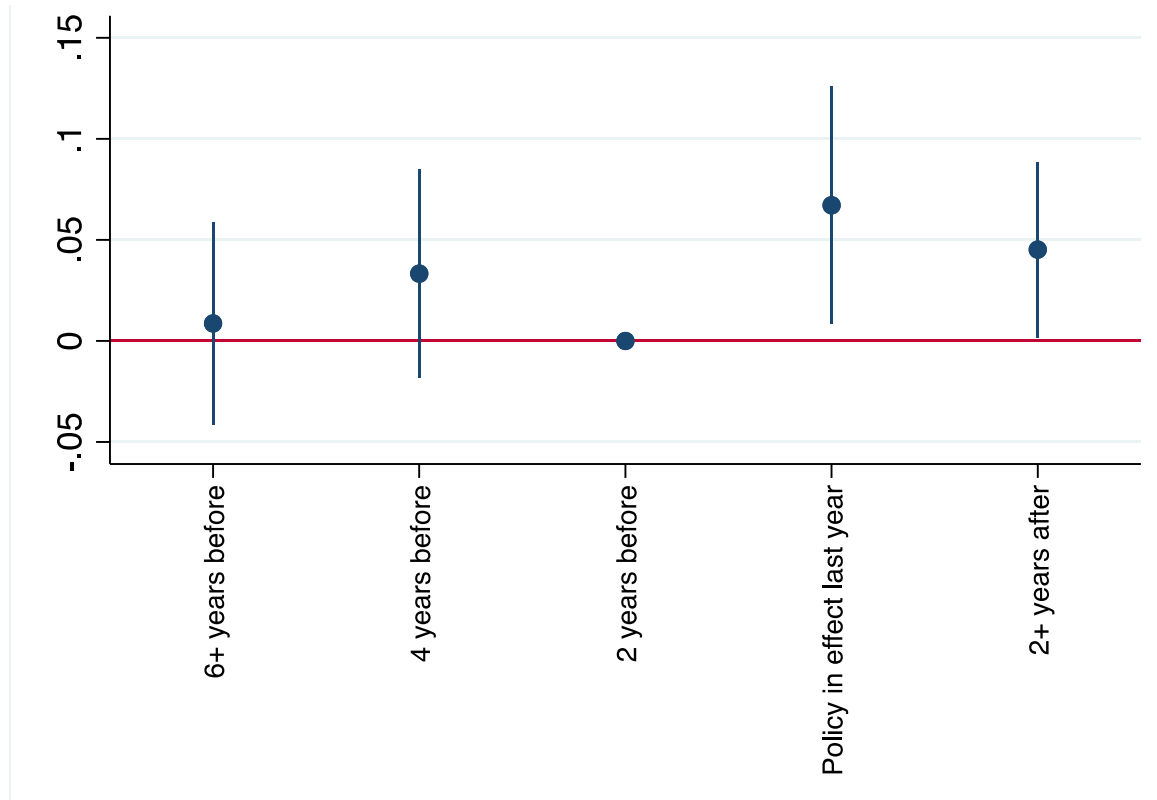
A1. Supplementary Analysis Using a Time-Relative-to-Event Predictor

We conducted a supplementary analysis to analyze the probability of birth control pill use in the years before and after PI laws went into effect, for White, Black, and Hispanic adolescents. To do so, we coded a variable that equals 1 on the year immediately after the PI laws went into effect (which we will refer to as “time 1”), similarly to the predictor of interest in our main models. Because the YRBS data were collected every two years, the years before and after time 1 were coded as follows: with value -1 at two years before time 1, -2 at four years before time 1, and -3 at six years before time 1. In addition, this variable was coded as 2 at two or more years after time 1. We used this time-relative-to-event predictor in a linear probability model with state and year fixed effects, and with all of our state reproductive health policy, infrastructure, and SES context controls. We used “Two years before” time 1 as the reference category. All observations for states that had no variation in PI laws during the observed period were also coded in this reference category.

The coefficients for this time-relative-to-event predictor in each of the White, Black, and Hispanic models are shown in Figures 1, 2, and 3. In these models, we continue to find positive and significant effects of PI laws on the probability of pill use for White teenagers. The coefficient for the year immediately after PI laws went into effect (time 1) indicates an increase of 6.7 percentage points in pill use ($p < 0.05$) among White teenagers, whereas the coefficient for two years after or more indicates an increase of 4.5 percentage points in use ($p < 0.05$). None of the coefficients for periods before PI laws went into effect are significant, which is consistent with a behavioral *response* to such laws among White adolescents. In contrast, and consistently with the results in our main models, none of the time-relative-to-event categories are significant

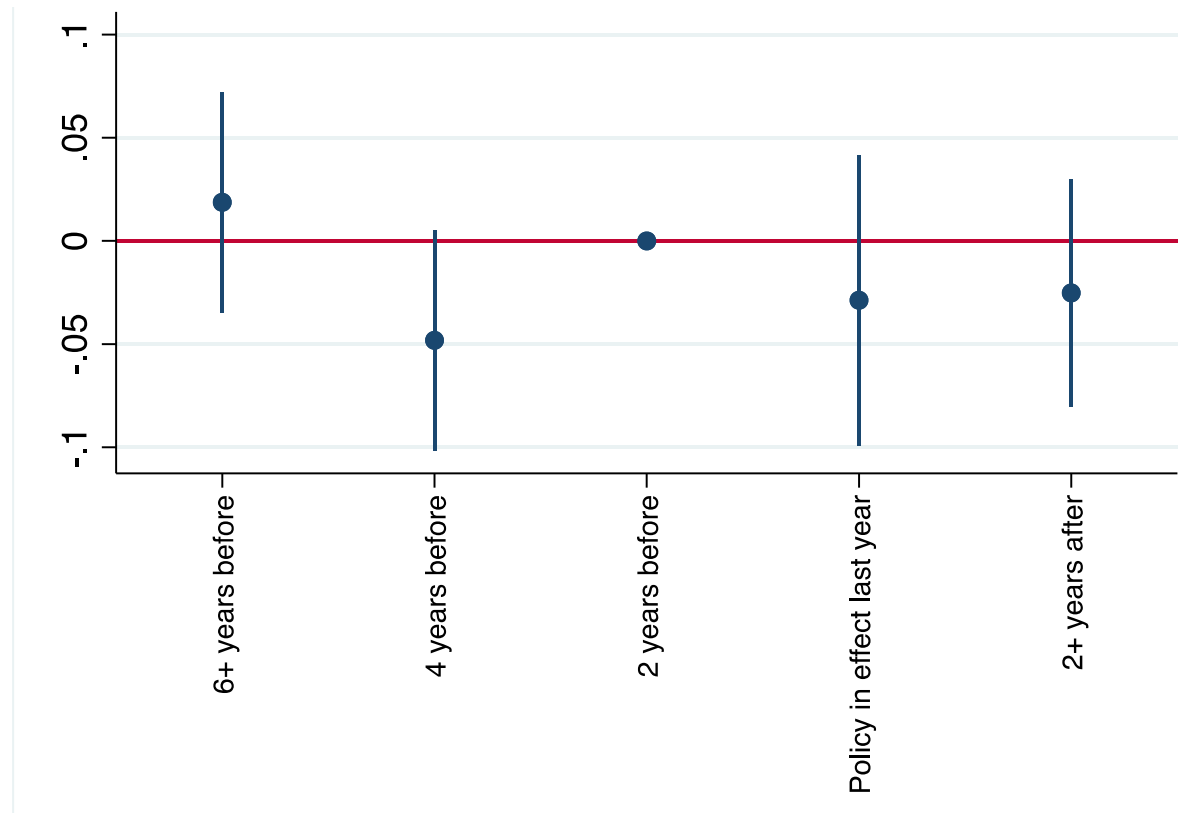
in the Black and Hispanic models, which suggests no response to PI laws in terms of birth control pill use.

Figure 1. Effects of Time Relative to Parental Involvement Abortion Laws on Birth Control Pill Use, Sexually Active WHITE Female Adolescents Enrolled in Public High Schools, Ages 14-17, Models with State and Year FE, State YRBS 2001-15



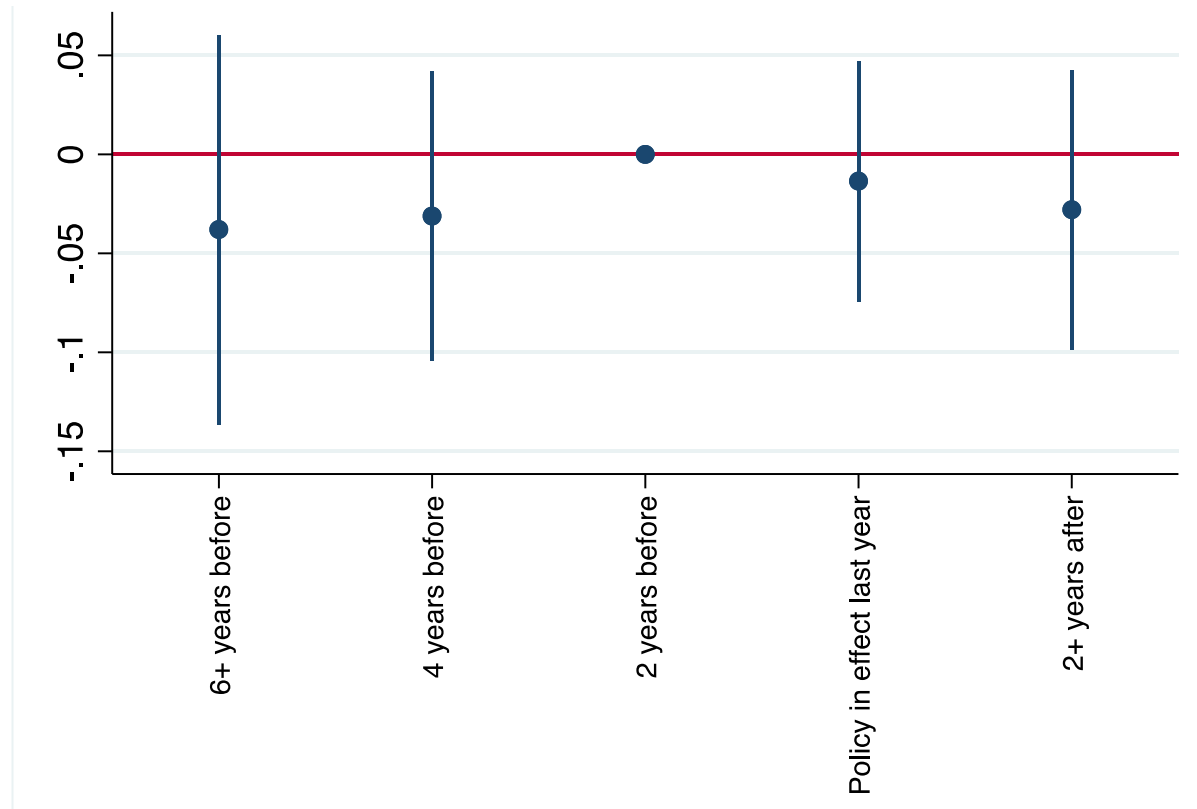
Notes: 95% confidence intervals. Estimates from a state- and year-fixed effects linear probability model that controls for related reproductive health state policies (whether all or some minors are allowed to consent to contraceptive services; and whether sex education is mandated and the state requires that it covers contraception topics), and for reproductive health infrastructure in the state, as captured by the percentage of counties without abortion providers. These controls were obtained from retrospective reports from the Guttmacher Institute(24) and NARAL Pro-Choice(25). Additional controls from the American Community Survey(27) 1-year samples include a series of race-specific state-level SES measures: the percentage of adults (ages 25-55) with at least some college education, the percentage of adults born in a foreign country, the percentage households in which any member received welfare income, the percentage of households with a resident father figure, and the percentage of unemployed population. See Section 2 for more details. Time-relative-to-event categories are defined with respect to the year immediately after the policy went into effect. The reference category is “2 years before.”

Figure 2. Effects of Time Relative to Parental Involvement Abortion Laws on Birth Control Pill Use, Sexually Active BLACK Female Adolescents Enrolled in Public High Schools, Ages 14-17, Models with State and Year FE, State YRBS 2001-15



Notes: 95% confidence intervals. Estimates from a state- and year-fixed effects linear probability model that controls for related reproductive health state policies (whether all or some minors are allowed to consent to contraceptive services; and whether sex education is mandated and the state requires that it covers contraception topics), and for reproductive health infrastructure in the state, as captured by the percentage of counties without abortion providers. These controls were obtained from retrospective reports from the Guttmacher Institute(24) and NARAL Pro-Choice(25). Additional controls from the American Community Survey(27) 1-year samples include a series of race-specific state-level SES measures: the percentage of adults (ages 25-55) with at least some college education, the percentage of adults born in a foreign country, the percentage households in which any member received welfare income, the percentage of households with a resident father figure, and the percentage of unemployed population. See Section 2 for more details. Time-relative-to-event categories are defined with respect to the year immediately after the policy went into effect. The reference category is “2 years before.”

Figure 3. Effects of Time Relative to Parental Involvement Abortion Laws on Birth Control Pill Use, Sexually Active HISPANIC Female Adolescents Enrolled in Public High Schools, Ages 14-17, Models with State and Year FE, State YRBS 2001-15



Notes: 95% confidence intervals. Estimates from a state- and year-fixed effects linear probability model that controls for related reproductive health state policies (whether all or some minors are allowed to consent to contraceptive services; and whether sex education is mandated and the state requires that it covers contraception topics), and for reproductive health infrastructure in the state, as captured by the percentage of counties without abortion providers. These controls were obtained from retrospective reports from the Guttmacher Institute(24) and NARAL Pro-Choice(25). Additional controls from the American Community Survey(27) 1-year samples include a series of race-specific state-level SES measures: the percentage of adults (ages 25-55) with at least some college education, the percentage of adults born in a foreign country, the percentage households in which any member received welfare income, the percentage of households with a resident father figure, and the percentage of unemployed population. See Section 2 for more details. Time-relative-to-event categories are defined with respect to the year immediately after the policy went into effect. The reference category is “2 years before.”