The Unwanted:
Negative Outcomes Over the Life Cycle*

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Abstract

We quantify the impact of abortion legalization on the incidence of unwanted births. While underlying much of the literature on abortion legalization, this effect had only been approximated by previous work. We find a strong decline in the prevalence of unwanted births. Moreover, we find that this decline is mainly driven by "Pro-Choice" women. We then propose an empirical strategy to recover the causal effect of being "unwanted" on life cycle outcomes. We use the differential timing of abortion legalization across states and the mother's religion (which facilitates or hinders legal abortion take up) to instrument for endogenous "unwantedness". We find that being unwanted causes negative outcomes (higher crime, lower schooling, lower earnings) over the life cycle. Our paper provides an initial step towards quantifying this key mechanism behind many of the well documented long term effects associated with changes in reproductive health policy.

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1 Introduction and Motivation

Unwanted pregnancies are likely to be associated with negative life cycle outcomes for the individuals that grow out of those pregnancies. However, it is unclear how much of this effect is causal. If those who tend to have unwanted pregnancies also have below average unobserved parenting traits, then the effect of being unwanted on later outcomes will be confounded by such traits. Fortunately, policy changes that enhance women's ability to avoid and/or terminate unwanted pregnancies can be used as exogenous sources of variation in prevalence of unwanted fertility to identify the effect of being unwanted on outcomes throughout the life cycle. Much of the renewed interest in the analysis of unwanted fertility stems from recent work that points out its potential implications for crime, an outcome that most societies care deeply about.[1] While the validity of these controversial findings remains heavily debated, they single out unwanted fertility as a potentially important determinant of a cohort's crime rate. The literature has examined other important life cycle outcomes and there is some consensus around the idea that reproductive policy changes that enhance human control over fertility outcomes improve cohort characteristics, at least along some dimensions.

While the literature has done a good job at documenting these effects, distinguishing the alternative mechanisms becomes problematic. The effects of reduced unwantedness (i.e. the improvement in a cohort's average quality induced by the avoidance of undesired children that would have had worst outcomes) cannot be easily separated from cohort size effects (i.e. the better opportunities that arise from less competition for a given set of resources). The latter will improve outcomes across individuals from all types of pregnancies, including those born out of *wanted* ones. In this case, improvement in outcomes occurs even if the reduced cohort is a random sample of the original cohort. Understanding these mechanisms is important from a policy perspective. If what matters is mostly the induced cohort size effect, then any reproductive policy that induces such cohort size declines would achieve the same results. On the other hand, if the key mechanism is the improvement in the cohort's

[1] Indeed, Donohue and Levitt (2001,2004,2006) and Pantano (2007) suggest that unwanted children might be at risk of higher crime propensity. They provide evidence that abortion legalization and early access to the birth control pill reduce future crime once impacted cohorts reach their criminal prime.

mean quality, that also can be achieved in alternative ways, which do not necessarily involve truncating out the bad tail of the distribution.

In this paper we exploit pregnancy intention self-reported data from the Panel Study of Income Dynamics (PSID) to estimate the impact of being unwanted on a variety of outcomes. Here, the exogenous variation in abortion legal status coupled with maternal religion's attitudes towards abortion can be used to instrument for unwantedness status in models of life cycle outcomes. Our paper provides two distinct contributions. First, we are able to quantify the impact of abortion legalization on the prevalence of unwanted births, a magnitude that has not been pinned down in previous work. This is important as a sizable strand of the literature that explores the effects of abortion legalization on the quality of exposed cohorts explicitly or implicitly builds upon the assumption that this effect is sizable. Second, we propose an empirical strategy based on rich longitudinal data on individual outcomes and maternal self-reports of pregnancy intention to isolate the "unwantedness" mechanism for negative life cycle outcomes that underlies many of the analyses of the impact of abortion legalization. Here we use the timing of abortion legalization and its interaction with the mother's religion (which facilitates or precludes take up) to instrument for the endogenous measure of unwantedness. In this case, we build upon the rigorous literature that documents in great detail the overall effects of abortion legalization but go beyond it by taking an important step towards understanding the mechanisms driving existing results.

To preview our findings, we document a strong decline in the prevalence of unwanted births. By any measure, as a fraction of total births or in absolute levels, there were fewer unwanted births after abortion became legal. Conditional on being born, the probability of being the by-product of an unwanted pregnancy declined by approximately 15 percentage points in repeal states immediately after early legalization and by about 10 percentage points in the other (non-repeal) states after Roe v. Wade. Given the baseline level of unwantedness in each of these two groups of states before the corresponding policy changes, the two reductions in prevalence of unwantedness are substantial: a 46 percent decline in repeal states and a 27 percent decline in non-repeal states. Moreover, these effects were much stronger for (and perhaps even completely accounted for by) children born to mothers with religions more sympathetic to a "Pro-Choice" stand on abortion. Our instrumental

variables estimates indicate that being unwanted causes negative outcomes (higher crime, lower schooling , lower earnings) over the life cycle. For example, being unwanted causes a child to accumulate approximately 2 less years of completed education.

The rest of the paper is organized as follows. The next section briefly summarizes related work and highlights our contributions in light of the previous literature. Section 3 describes the data and Section 4 presents the empirical strategy and our results. Conclusions follow.

2 Related Literature

There exists a careful empirical literature in economics that aims at tracing the short and long run consequences of significant changes in reproductive health policy. It is beyond the scope of this paper to provide a systematic and detailed review of this literature, which started analyzing abortion legalization and has recently focused on access to the birth control pill.[2] The book by Levine (2004) provides an excellent overview of empirical research related to abortion policy, guided by simple economic models of fertility and including plenty of institutional detail. Building upon early work in models of fertility by Willis (1973) and Becker and Lewis (1973), the contributions by Kane and Staiger (1996), Akerlof, Yellen and Katz (1996) and Levine and Staiger (2004) provide useful theoretical frameworks more tailored to think about abortion policy.

Here we limit ourselves to provide a brief summary of relevant work to provide some context for our contributions. Most empirically focused contributions by economists regarding the effects of abortion legalization in the United States can be divided into a) those examining the immediate impact of abortion legalization on women's outcomes and b) those examining outcomes for the children born to affected women.

Regarding effects on women's outcomes, Levine et al. (1999) focus on the immediate fertility effects of legalization and document a strong decline in the contemporaneous total

[2] Goldin & Katz (2000,2002) seminal contributions on the effects of the Pill were consolidated and magnified by Bailey (2006). A small but growing number of articles build upon these initial insights to examine the impact of The Pill along different dimensions: See Ananat & Hungerman (2008), Guldi(2008), Hock (2007), Pantano (2007) and Edlund & Machado (2009).

birth rate while Ananat, Gruber and Levine (2007) extend the analysis to completed life cycle fertility. They find no effects on completed fertility at the intensive margin. Abortion legalization seems to have affected completed fertility only at the extensive margin, by increasing the rate of childless women. Thus, the average child did not end up growing up with fewer siblings and quantity-quality substitution could not occur within families. Angrist and Evans (1996) focus on the effects of early legalizations in the Repeal states and find positive labor market and schooling effects, especially for blacks. Providing a linkage between the abortion and contraception literatures, Guldi (2008) compares the fertility effects of abortion legalization and access to the birth control pill for minors.

Regarding effects of abortion legalization on the quality of children in the next generation, Joyce (1987) and Joyce and Grossman (1990) look at effects on prenatal care and birth weight whereas Gruber, Levine and Staiger (1999) document effects on the living circumstances of birth cohorts exposed to legalization and coin the useful concept of "Marginal Child". Donohue and Levitt (2001,2004,2006) spurs substantial debate by exploring effects on crime. Indeed, Foote and Goetze (2005), Joyce (2004,2008,2009a,2009b) and Lott and Whitley (2008) among others challenge Donohue and Levitt's findings. Ananat et al. (2009), encompass and contrast the methodologies used by Gruber, Levine and Staiger (1999) and Donohue and Levitt (2001) and highlight the differential effect on pregnancy rates in Repeal states. More recently, Charles and Stephens (2006) document the effects on birth cohorts' substance use while Ozbeklik (2007) and Donohue, Grogger and Levitt (2009) analyze the impact on teen pregnancy rates.

Finally, more closely related to our first contribution, Bitler and Zavodny (2002) focus on the effects on adoptions and find that legalization led to a decline in the adoption rate. Under certain assumptions this decline can be used to gauge the impact on unwanted births.

As can be seen from this brief review of empirical work by economists, few (if any) dimensions of the abortion legalization issue escaped analysis. Given the sizable literature on the topic, the question is: Why another paper on the effects of abortion legalization? We now make the case for our two contributions.

The Missing Link in the Abortion Literature: Effects on Unwanted Births. As suggested by Bitler and Zavodny (2002) and Levine (2004), the effect of abortion legalization

on unwanted births can be approximated by looking at what happens with adoptions. While this is a clever idea and the effect on adoptions is interesting in its own right, it is likely to be a rough proxy if we are interested in using it to get at the effects of abortion legalization on the proportion of unwanted births.

To our knowledge, despite more than three decades of research, the impact of abortion legalization on *unwanted* births remains unknown. Moreover, a substantial part of the literature briefly summarized above depends on this key mechanism for abortion legalization to have a lasting effect on cohort outcomes. The work of Bitler and Zavodny (2002) and its re-analysis by Levine (2004) look for hints to quantify this missing link in adoptions data. These two studies, which are somewhat overlooked in the literature, currently stand as the main pieces of evidence on which most of the related research implicitly relies upon.

However, the effect on adoptions may not be a very precise proxy based on which we can gauge the approximate magnitude of the effect on unwanted births because of the following four reasons: First, Bitler and Zavodny use changes in adoptions granted to non-relative petitioners. This measure is an *equilibrium* observation from the adoptions market and may not closely track the changes in the *supply* of unwanted babies put up for adoption. Second, only a small fraction of unwanted babies are put up for adoption. Third, the impact of abortion legalization on unwanted births that are *not* put up for adoption is likely to be different from that on unwanted births put up for adoption. We formalize these last two points in the Appendix.

The first part of the paper is devoted to fill this important gap in the literature. Once we establish the effects of abortion legalization on the probability of being unwanted, the natural question is then: What is the effect of being unwanted? Surprisingly, little is known (even at a descriptive level) about the relationship between being unwanted and several birth, child and adult outcomes.[3] This motivates our second contribution.

The Unwantedness Mechanism: Donohue and Levitt (2001) conduct a "back of the envelope" calculation to gauge the potential impact of abortion that can be explained

[3]Outside economics, we are aware of some articles that look at the effect of pregnancy intention on maternal behavior during pregnancy, prenatal care and birth weight outcomes. See Marsiglio and Mott (1988), Weller et al. (1987) and Joyce, Kaestner and Korenman (2002)

through reduced unwantedness, but, beyond that, they do not provide compelling evidence supporting this particular mechanism. In an important piece that takes stock and brings some order into the literature, Ananat et al. (2009) conclude that they *"... find evidence of selection effects of abortion on young adult outcomes. ....."* but are *" unable to sharply distinguish the mechanisms through which selection occurs..."*

Our empirical strategy allows us to disentangle one of the most important channels that have been conjectured in the literature: unwantedness. The basic idea behind the unwantedness mechanism is that unwanted children receive less parental input, which is why they end up having worse life cycle outcomes. However, this story is sometimes difficult to empirically isolate from other competing hypotheses. For example, the *Cohort Size* mechanism would account for the fact that growing up in a cohort that is exogenously smaller (or bigger) will have a distinct effect on several outcomes over the life cycle regardless of pregnancy intention.

There are three additional potential channels or mechanisms that have been entertained in the literature: a) *Mechanical Effect* (not to be confused with "Cohort Size" effect) in which the level or absolute number of, say, crimes, declines just because there are fewer people to commit them, even if the propensity to commit a crime doesn't change at all. We believe this is a fairly obvious and uninteresting channel that does not merit additional analysis; b) *Selection Effect*, by which we mean that the kind of potential mothers that take up legal abortion are better or worse on average, so we have disproportionately fewer children from those types of mothers after legalization[4] and c) *Family Size Effect,* where abortion legalization provides more control over completed fertility and therefore might benefit the children who compete with fewer siblings for fixed parental input. However, Ananat, Gruber and Levine (2007) find no effect on completed fertility at the intensive margin so it is unlikely that this could be an important channel. Still, it could be that legal abortion alters the timing and spacing if not the final quantity of children, and these dimensions of fertility might have an effect on its own. In particular, timing could be important as there could be maternal dynamics in the sense that abortion legalization, by providing more control over fertility, allows these eventual mothers to accumulate more human capital and be in better position to provide for their children once they are born.

[4]See Pop-Eleches (2006) for an example of how this mechanism may operate.

A detailed quantitative assessment of these alternative mechanisms, while relevant, is beyond the scope of this paper. Our focus will be on carefully documenting the effects of being unwanted while allowing for the combined impact of these alternative explanations in a reduced form fashion.

3 The Data

Our empirical strategy combines the state level timing of abortion legalization with microdata from the Panel Study of Income Dynamics (PSID) on life cycle outcomes. Moreover, we link individual outcomes to maternal assessments of pregnancy intention and information on maternal religion.

The Timing of Abortion Legalization. We use state level data on the timing of abortion legalization. In particular, we follow the literature in dividing the states into two groups: a) Repeal states and b) Non-Repeal states. The Repeal states are the five states that effectively legalize abortion in 1970 by repealing the existing bans. These early legalizers are California, Hawaii, New York, Alaska and Washington. The non-repeal states are all the remaining states (i.e. those in which abortion becomes legal after Roe v. Wade).

PSID. We exploit data from the Panel Study of Income Dynamics. In particular, we use unwanted fertility assessments, measures about the household environment during childhood such as growing up in a poor household, a household receiving welfare, or a single-headed household[5], and other life cycle outcomes such as completed levels of schooling[6], engagement in crime[7] and labor income. We focus on children born between 1966 and 1980 to mothers

[5] We collect these measures characterizing the kind of household each child was growing up in 1980 to facilitate comparison with previous work, notably Gruber, Levine and Staiger (1999) that relies on Census data.

[6] We collect completed years of education after age 27, when the process of human capital accumulation is most likely to be over.

[7] Our measure of engagement in crime comes from a supplemental question asked to PSID respondents in 1995 regarding their contact with the criminal justice system. It is only a proxy for crime and more linked to whether the individual has been ever arrested. The specific wording of the question is the following: *"...For a variety of reasons, many young people come into contact with the police or with the court system. Sometimes, these contacts with the police are very serious. Other times, the reason may be a minor problem*

20 to 34 years old.[8] Table 1 shows summary statistics for our PSID sample. We present descriptive statistics for the overall sample and also for subsamples of wanted and unwanted children. Almost 30% of the children in our sample were unwanted in the sense that, at the time of conception, their parents didn't plan or intend to have a baby at that time or, worse, didn't plan to have a baby at all. The raw unconditional means already show some signs of disadvantage for unwanted children. They accumulate less years of completed education, are more likely to drop out of high school and less likely to graduate from college. On average, unwanted children are born into less well-off households and are more likely to grow up in a disadvantaged environment. By 1980, they are more likely to have been growing up in poverty, in a household that receives AFDC and/or in a household that is single-headed. They are also more likely to have engaged in (actually, ever been booked or charged for a) crime by 1995. In addition, unwanted girls are more likely to become teenage mothers.

Our measure of unwantedness considers both, children directly assessed as unwanted as well as those who are defined as wanted but mis-timed in the sense that they were conceived much earlier than planned (i.e. "too soon"). Our definition includes both types of pregnancies because in both cases the pregnancy can be considered an accident, a surprise or shock that disrupts the optimal fertility plan.[9] Then both types of pregnancies, those that occurred to parents who didn't intend to have a baby at all and those who occurred

or misunderstanding. Not counting minor traffic offenses have you ever been booked or charged for breaking a law?.." The cummulative nature of the question of course requires that we control for age or birth cohort whenever we analyze this variable.

[8] Following the literature we exclude those children born in 1970 and 1973 to avoid mis-assigning exposure to legal abortion while *in utero.* Adolescent (ages 15-19) and older age (ages 35-44) childbearing follow different processes and there are not enough observations in the PSID to analyze these subgroups. For a careful analysis of the effects of incentives (including, but not limited to abortion legalization) on adolescent childbearing see Lundberg & Plotnick (1995). See Guldi (2008) for a detailed analysis of the laws governing minor's access to abortion services.

[9] Here we depart from the demography tradition and follow Levine (2004) in classifying pregnancies as wanted or unwanted with reference to an economic model where what matters is whether the pregnancy generates a cost (unwanted) or a benefit (wanted) to the parents. See Santelli (2006) for a detailed explanation of the terminology in the demography literature and in particluar the differences between unintended, unplanned, mistimed, etc.

to parents who were planning a pregnancy much further into the future are defined as "unwanted" according to our definition. Those conceived "too late", on the other hand, are coded as "wanted" along with those conceived "about the right time". Again, here it is reasonable to assume that parents have been trying unsuccessfully but still want the pregnancy when it finally occurs (otherwise they could have stopped trying). Our maternal assessment of pregnancy wantedness is retrospective and it was collected several years after our sample children were born. One needs to be careful when using retrospective assessments of unwantedness.[10] While such retrospective assessments of pregnancy intention are always suspected to be biased by ex-post rationalization, a recent validation study suggests that these assessments do not produce misleading estimates of the number and consequences of unintended births.[11] Moreover, the wording of the pregnancy intention question specifically instructs the respondent to go back in time and mentally situate herself at the moment just before conception occurred. The self-report we exploit then elicits the maternal assessment of pregnancy intention *at the time of conception.*

In addition to providing us with these critical assessments of pregnancy intention, the longitudinal nature of the PSID is extremely helpful for our purposes. We are able to track the lives and life cycle outcomes of those children who were born before and after abortion legalization and whose unwantedness status at conception is provided by their respective mothers.

We also exploit data on maternal religion available in the PSID. We use these data to construct our Pro-Choice indicator, a key measure that we exploit to generate exogenous treatment variation across women exposed to abortion legalization. A small literature in sociology exploits data from the General Social Survey and documents religious differences in attitudes toward abortion. We base our "Pro-Choice" classification using the findings in this literature. In particular, we follow the classification in Evans (2002) that distinguishes

[10] See Rosenzweig and Wolpin (1993). They find that retrospective reports of the type used in this paper may overstate the true prevalence of unwantedness by up to 26%. However, to the extent that such overstatement is more or less constant over time we should still be able to identify the effects of interest given that we will be looking at changes in prevalence of unwantedness.

[11] See Joyce, Kaestner and Korenman (2002)

between Catholics, evangelical Protestants and mainline Protestants.[12] Our data on religion attempts to capture the underlying attitude towards abortion.[13]

4 Empirical Strategy and Results

In this section we investigate the impact of abortion legalization on unwanted births and examine the differential impact for children born to "Pro-Choice" mothers. In Subsection 4.2 we then go on to re-analyze in a reduced form fashion some of the outcomes explored in the abortion legalization literature. Finally, in Subsection 4.3 we provide estimates of the causal effect of being unwanted on life cycle outcomes.

4.1 The Impact on the Number of Unwanted Births

Despite substantial research on abortion legalization, there remains a missing link in the literature. We are not aware of any direct results establishing the impact of abortion legalization on the rate of unwanted births. Indeed, the literature recognizes the need for a more direct assessment of this issue. For example, when discussing the impact of abortion legalization on the number of unwanted births, Levine (2004) argues,

> *"...unfortunately, no direct observations of wanted and unwanted births are available, so indirect methods are required to assess this issue..."*

In the same vein, Bitler and Zavodny (2002) rely on adoption data as an indirect way of looking at unwanted births.

[12] The following religions are coded as not having a sympathetic attitude towards abortion: Roman Catholic, Protestant, Other Protestant, Other Non-Christian, Latter Day Saints; Mormon, Jehovah's Witnesses, Greek/Russian/Eastern Orthodox, Lutheran, Christian, Christian Science, Seventh Day Adventist, Pentecostal, Jewish, Amish and Mennenite. Other religions along with agnostics and atheis are coded as Pro-Choice.

[13] While religion denomination is fairly stable over the life cycle, it is always possible that some women change their religious denomination over time. In particular, this might happen when a woman realizes that that their core attitude towards abortion stands in contrast to the official position of their own church. We circumvent this problem by using religion reported in 1976, after the policy changes regarding the legal status of abortion. This allows us to ameliorate this type of misclassification problem.

We are able to tackle this question directly by considering the following model for a child being reported as unwanted. Consider both, the impact of early legalization *and* the impact of Roe v. Wade in a single model, estimated on a sample of births from Repeal and Non-Repeal states using data from 1966-69, 1971-72 and 1974-80. We work with a single variable, call it, AbortLegal_{ic}, that switches from 0 to 1 in each state when abortion becomes legal in that state (i.e. in 1970 for Repeal states and in 1973 for Non-Repeal states). Let $\text{Unwanted}_{ic} = 1$ if the pregnancy that ended up with individual i's live birth into cohort c was assessed as unwanted by i's mother. Let $\text{Unwanted}_{ic} = 0$ otherwise. We divide birth cohorts in three groups. Those cohorts born before the early legalization (1966-1969), those born in between early legalization and Roe v. Wade (1971-1972) and those born after Roe v. Wade (1974-1980). We create three indicators to classify these birth cohort groups:

$$D6669_c = \begin{cases} 1 & \text{if } 1966 \leq \text{year of birth} \leq 1969 \\ 0 & \text{otherwise} \end{cases}$$

$$D7172_c = \begin{cases} 1 & \text{if } 1971 \leq \text{year of birth} \leq 1972 \\ 0 & \text{otherwise} \end{cases}$$

$$D7480_c = \begin{cases} 1 & \text{if } 1974 \leq \text{year of birth} \leq 1980 \\ 0 & \text{otherwise} \end{cases}$$

We will either use these cohort group "D dummies" or unrestricted cohort effects in our analyses below. Let

$$\text{Repeal}_i = \begin{cases} 1 & \text{if } i \text{ was born in a "Repeal" state} \\ 0 & \text{otherwise} \end{cases}$$

be an indicator for the group of "Repeal" states. We will use this indicator to group those states exposed to early legalization with treatment in 1970 and distinguish them from the other states (the Non-Repeal states) who obtain access to legal abortion in 1973 with Roe v. Wade. We will also allow for unrestricted state effects in some of our specifications. Given this notation we consider a linear probability model to examine the impact of abortion legalization on the probability of being unwanted. Our basic specification is given by

$$\begin{aligned} \text{Unwanted}_{ic} &= \beta_0 + \beta_1 \text{AbortLegal}_{ic} + \beta_2 \text{Repeal}_i \\ &\quad + \beta_3 \text{D7172}_c + \beta_4 \text{D7480}_c + \varepsilon_{ic} \end{aligned} \tag{1}$$

The first column of Table 2 presents estimates of this equation. Columns 2, 3 and 4 successively add individual level demographic controls as well as replace the Repeal state indicator and the group cohort dummies with unrestricted state and cohort effects. The results are quite stable across specifications and indicate a significant 10 percentage point drop in the incidence of unwantedness.

The AbortLegal variable forces the impact of the two natural experiments to be the same. However, there is ample evidence that the effects of the early legalization might have been different from the effects of Roe v. Wade.[14] Therefore Table 3 presents a simple difference-in-differences analysis of the proportion of unwanted births in the PSID separately for each quasi-experiment. Panel A compares the change between 1966-69 and 1971-72 in the proportion of unwanted births among Repeal States (early legalizing states) vis-a-vis the same change in Non-Repeal States. As can be seen, the causal impact of this early legalization is a decline of about 50 percent, a 16 percentage point reduction. Panel B examines the impact of Roe v. Wade by comparing 1974-80 against 1971-72. In this case, it is the Non-Repeal states who gain access to legal abortion, with the Repeal states now acting as controls. The impact turns out to be of somewhat smaller magnitude, with an 11 percentage point (33 percent) decline in the prevalence of unwanted births in Non-Repeal states that can be attributed to the Roe v. Wade ruling. The smaller effect of the Roe v. Wade experiment relative to that of the early legalization experiment is consistent with previous findings.[15] Moreover, the magnitude of the effect itself is consistent with some implications of the previous literature.[16]

We now examine these basic results more formally in a regression framework by adding controls as well as state and cohort effects and using robust standard errors clustered at

[14] See Levine (2004), among others.

[15] See Levine (2004) and the references cited there.

[16] Indeed, once we include individual controls and adjust for state and cohort effects (see column 4 of Table 4) we find that Roe v. Wade generated a 9 percentage points (26 percent), decline in the prevalence of unwanted births, relative to a baseline unwantedness of 34% in Non-Repeal states in 1971-72. In other words, roughly 1 out of 4 unwanted children were averted. Non-Repeal states accounted for about 80% of births. Since there were 2,449,576 births for this age agroup in 1972, this implies that $2{,}449{,}576 \times 0.80 \times 0.34 \times 0.26 = 176{,}369$ unwanted births were averted annually, a number in the same order of magnitud as the one implied by previous findings.

the state level. We follow Bitler and Zavodny's (2002) specification that allows direct examination of the separate effects and statistical significance of the two abortion legalization quasi-experiments in the corresponding coefficients. We construct two indicators two capture this differential timing of legalization in the two groups of states. First, to capture the effects of early legalization in Repeal states we define the $\text{AbortLegal}_{ic}^{EARLY}$ indicator, that switches on from 0 to 1 forever (only for repeal states) after 1970. Second, to capture the effects of Roe v. Wade we define the $\text{AbortLegal}_{ic}^{ROEWADE}$ indicator, that switches on from 0 to 1 forever (only for Non-Repeal states) after 1973. The model is

$$\begin{aligned} \text{Unwanted}_{ic} &= \alpha_0 + \alpha_1 \text{AbortLegal}_{ic}^{EARLY} + \alpha_2 \text{AbortLegal}_{ic}^{ROEWADE} \\ &\quad + \alpha_3 \text{Repeal}_i \\ &\quad + \alpha_4 \text{D7172}_c + \alpha_5 \text{D7480}_c \\ &\quad + \alpha_6 X_{ic} + \varepsilon_{ic} \end{aligned} \tag{2}$$

where X_{ic} include exogenous characteristics for individual i such as gender and mother's race and religion which are available in the PSID. We also estimate this equation allowing for unrestricted state effects and cohort effects. If *in utero* exposure to legal abortion leads to a decline in the probability of being an unwanted child in a sample of live births, we expect $\alpha_1 < 0$ and $\alpha_2 < 0$.[17]

[17] Indeed, the impact of early legalization is

$$\begin{aligned} \gamma^{EARLEG} &= E\left[\text{U}_{ic} | \text{Repeal}_i = 1; \text{D7172}_c = 1\right] - E\left[\text{U}_{ic} | \text{Repeal}_i = 1; \text{D6669}_c = 1\right] \\ &\quad - \left(E\left[\text{U}_{ic} | \text{Repeal}_i = 0; \text{D7172}_c = 1\right] - E\left[\text{U}_{ic} | \text{Repeal}_i = 0; \text{D6669}_c = 1\right]\right) \\ &= \alpha_1 \end{aligned}$$

and the impact of Roe v. Wade is given by

$$\begin{aligned} \gamma^{ROEvWADE} &= E\left[\text{U}_{ic} | \text{Non-Repeal}_i = 1; \text{D7480}_c = 1\right] - E\left[\text{U}_{ic} | \text{Non-Repeal}_i = 1; \text{D7172}_t = 1\right] \\ &\quad - \left(E\left[\text{U}_{ic} | \text{Repeal}_i = 1; \text{D7480}_t = 1\right] - E\left[\text{U}_{ic} | \text{Repeal}_i = 1; \text{D7172}_t = 1\right]\right) \\ &= \alpha_2 \end{aligned}$$

In the first column (no controls) of Table 4 we can see that the key coefficients $\widehat{\alpha}_1$ and $\widehat{\alpha}_2$ corresponding to the unadjusted differences-in-differences estimates in Table 3 are negative and significant. Moreover, these magnitudes are quite robust across specifications that successively include individual level controls, state effects and cohort effects in columns 2, 3 and 4 of Table 4. Indeed, our preferred estimates for α_1 and α_2 in column 4 are -0.156 and -0.091, respectively.[18] Given that the baseline level of unwantedness in Repeal and Non-Repeal states was 31% and 34%, the magnitude of the effect is substantial (implying 46 and 27 percent declines, respectively). Also note that there are strong racial and birth order effects on unwantedness and the *ex-post* indicator of gender ("Female") is not significant. While retrospective, note that because of the question's wording, these pregnancy intention assessments should capture intentions at the time of conception, before a child's gender could possibly be known. Therefore, it is reassuring that the female indicator is insignificant in our model of unwantedness.

While the effects documented in Tables 2, 3 and 4 are large, it is unlikely that they are homogenous across the population. In particular, it is likely that some subgroups in the population may have experienced a more substantial change in their effective ability to terminate unwanted pregnancies. We now take a specific look at this heterogeneity by exploiting maternal religious affiliation.

It is well known that people from different religious and cultural backgrounds have strong normative feelings about the legal status of abortion. In particular, we know that religious affiliation can be a powerful predictor of an individual's stance on this controversial moral issue. For our purposes what matters is that, at the individual level, maternal religion can be considered exogenous to the policy changes and, therefore, can be used to test the results from Table 2. In particular, we expect the proportion of unwanted births to decline only (or in a more pronounced way) among "Pro-Choice" mothers. We use maternal religious affiliation and each religion's *de facto* stand on abortion to create an indicator of maternal

[18] Then, the overall decline of 10 percentage points documented in column 4 of Table 2 actually combines a 9 percentage points decline in unwantedness (among the aproximately 80% of births originating in Non-Repeal states) with a more pronounced decline of 15 percentage points (among the 20% of births originating in Repeal states)

positive attitude toward abortion. We implement this with a "Pro-Choice" indicator which equals 1 if maternal religion is one more favorable to abortion, and 0 otherwise. We then consider the following augmented linear probability model for the probability that individual i in cohort c was assessed as the outcome of an unwanted pregnancy by his/her own mother (Unwanted$_{ic} = 1$). The augmented model then includes an interaction for the "AbortLegal" variable with the abortion attitude indicator "Pro-Choice$_i$".

$$\begin{aligned} \text{Unwanted}_{ic} &= \delta_0 + \delta_1 \text{AbortLegal}_{ic} \\ &\quad + \delta_2 \text{AbortLegal}_{ic} \times \text{Pro-Choice}_i \\ &\quad + \delta_3 \text{Repeal}_i \\ &\quad + \delta_4 \text{D7172}_c + \delta_5 \text{D7480}_c \\ &\quad + \delta_6 \text{Pro-Choice}_i \\ &\quad + \delta_7 \text{Pro-Choice}_i \times \text{Repeal}_i \\ &\quad + \delta_8 \text{Pro-Choice}_i \times \text{D7172}_c \\ &\quad + \delta_9 \text{Pro-Choice}_i \times \text{D7480}_c \\ &\quad + \delta_{10} X_{ic} + \varepsilon_{ic} \end{aligned} \tag{3}$$

By noting that the AbortLegal variable is itself an interaction of the Repeal indicators and time effects, the augmented model is essentially a diff-in-diff-in-diff specification. The coefficient on the AbortLegal$_{ic}\times$ Pro-Choice$_i$ interaction, δ_2, captures the effect of early legalization on the probability of being unwanted among those children born to Pro-Choice mothers.

There are two possible interpretations of δ_2. First, if the new opportunities created by abortion legalization can only be taken up by "Pro-Choice" mothers, these estimates capture such an effect in a robust way that controls for potentially different trends in unwantedness across repeal and non-repeal states. If there are differential trends in unwantedness across these two groups of states and those differential trends across repeal and non-repeal states are common across mothers of all religions, taking the extra difference across groups of children who were born to "Pro-Choice" mothers and children who were not born to such mothers will net out these differential trends. This will more cleanly identify the effects of these

policies on the incidence of unwantedness. Alternatively, if abortion legalization affects all women to some extent, regardless of religion, then these coefficients capture the differential effect for the sub-population ("Pro-Choice" mothers) who are most likely to take advantage of the new legal status for abortions.

The results in Table 5 are more consistent with the first interpretation. While the baseline effects of the policy captured by the coefficient δ_1 on AbortLegal_{ic} is not significant, the "Pro-Choice" interaction, δ_2 is clearly negative, strongly significant, sizable in magnitude and stable across specifications. Our preferred point estimate in column 4 indicates a decline of 26 percentage points in the prevalence of unwanted births. This is consistent with our results from Table 2. The overall effects of abortion legalization are actually a weighted average of a sizable effect for Pro-Choice mothers and a zero effect for the other mothers, weighted by the shares of these two types of mothers in the sample. For example, the -10% in column 4 of Table 2 is the result of averaging a sizable decline in unwantedness of 27.5 percentage points for the Pro-Choice mothers with a much more negligible decline of -1.4 percentage points for the remaining mothers.[19]

4.2 Reduced Form Effects of Abortion Legalization

Having established the significant effects of abortion legalization on unwanted births, and before examining what the consequences of being unwanted actually are, we explore with our data whether the policy changes themselves had any visible effects on outcomes. We investigate this by looking at several outcomes collected or evaluated at different points in the life cycle and asking whether *in-utero* exposure to legal abortion had (through whatever mechanisms) any effect on those outcomes.

We begin our analysis by presenting a few reduced form results linking the abortion

[19] We get 27.5% by adding the baseline effect of 1.4% with the differential effect of 26.1% in column 4 of Table 5

policy variation to several outcomes. Our reduced form specification for outcome Y_{ic} is

$$\begin{aligned} Y_{ic} &= \delta_0 + \delta_1 \text{AbortLegal}_{ic}^{EARLY} \times \text{Pro-Choice}_i \\ &+\delta_2 \text{AbortLegal}_{ic}^{ROEWADE} \times \text{Pro-Choice}_i \\ &+\delta_3 \text{AbortLegal}_{ic}^{EARLY} \\ &+\delta_4 \text{AbortLegal}_{ic}^{ROEWADE} \\ &+\delta_5 \text{Repeal}_i + \delta_6 \text{D7172} + \delta_7 \text{D7480}_c \\ &+\delta_8 \text{Pro-Choice}_i \\ &+\delta_9 \text{Pro-Choice}_i \times \text{Repeal}_i \\ &+\delta_{10} \text{Pro-Choice}_i \times \text{D7172}_c \\ &+\delta_{11} \text{Pro-Choice}_i \times \text{D7480}_c \\ &+\delta_{12} X_{ic} + \varepsilon_{ic} \end{aligned} \tag{4}$$

We estimate this equation exploiting the longitudinal nature of the PSID that allow us to link the state and the year of birth (and thus *in-utero* exposure to legalized abortion) to several outcomes measured at later points in the lives of each individual. The results of estimating the above equation are shown in Table 6. While the sample used in our paper, the definition of outcome variables and the empirical specification are not fully comparable, these results echo some of the earlier findings in the literature. For example we find that abortion legalization is associated with lower crime, more schooling (measured as additional years of completed education) and higher labor incomes. We also find improvements in child living circumstances by 1980 along dimensions such as lower probability of growing up in a single headed household and in a household receiving AFCD as in Gruber, Levine and Staiger (1999). Again, what's noticeable is that most of the results are driven by the improved outcomes of individuals born to "Pro-Choice" mothers.

4.3 Empirical Strategy to Recover The Effect of Being Unwanted

Because we can link measures of unwantedness and life cycle outcomes for children conceived before and after the abortion legalization, this novel data strategy allows us to consider the alternative mechanisms through which abortion can have an impact in any of the future

outcomes. For example, in the case of crime, we can examine whether unwantedness is the key driver for the results.

In this subsection we focus on actual individual outcomes as opposed to childhood living circumstances. While it makes sense to estimate the reduced form effects of reproductive policy changes on the marginal child's living circumstances, it is not clear why those outcomes would be relevant when looking at the causal effect of being unwanted. The fact that abortion legalization affects the marginal child's living circumstances reflects a selection process (what kind of households are disproportionately avoiding unwanted births when abortion becomes legal), rather than an unwantedness process (i.e. because the child is unwanted the household becomes poorer, single headed or on welfare).

Using the PSID data we then consider the following specification for outcome Y_{ic}, of individual i, in cohort c, in state of birth s, as a function of his/her wantedness status (Unwanted_{ic}) as retrospectively assessed by his/her mother

$$\begin{aligned} Y_{ic} &= \alpha_0 + \alpha_1 \text{Unwanted}_{ic} \\ &\quad + \delta_5 \text{Repeal}_i \\ &\quad + \delta_6 \text{D7172} + \delta_7 \text{D7480}_c \\ &\quad + \delta_8 \text{Pro-Choice}_i \\ &\quad + \delta_9 \text{Pro-Choice}_i \times \text{Repeal}_i \\ &\quad + \delta_{10} \text{Pro-Choice}_i \times \text{D7172}_c \\ &\quad + \delta_{11} \text{Pro-Choice}_i \times \text{D7480}_c \\ &\quad + \alpha_3 X_{ic} + \varepsilon_{ic} \end{aligned} \tag{5}$$

where again, X_{ic} include exogenous individual characteristics available in the PSID. Depending on the outcome of interest, unwantedness is likely to affect Y_{ic} for different reasons. Since it is likely that there are omitted variables correlated with both, Y_{ic} and Unwanted_{ic}, we use abortion legalization and the Pro-Choice interactions to instrument for unwantedness. In a sense, our model of unwantedness becomes the first stage of a 2SLS estimator for the outcome equation (5). Table 7 shows simple OLS estimates while Table 8 shows the 2SLS estimates that treat Unwanted_{ic} as endogenous, using the two quasi-experiments, and their

interactions with the Pro-Choice indicator as instruments.[20] It should be emphasized that we are not using the religion itself (i.e. the stand alone Pro-Choice indicator) as instrument. Rather, we only exploit the abortion legalization indicators ($\text{AbortLegal}_{ic}^{EARLY}$ and $\text{AbortLegal}_{ic}^{ROEWADE}$) and their interactions with the Pro-Choice indicator as the four excluded instruments. By controlling for a level effect of the Pro-Choice indicator in the main equation we allow for children with different maternal religions to have different outcomes independently of the effects operating through abortion legalization and the associated decrease in the likelihood of being unwanted. This is important because religion itself may have an effect on life cycle outcomes and/or religion indicators may capture differences in other determinants of these outcomes. Moreover, as can be seen in equation (5) not only we control for the main effect of Pro-Choice_i but also for its interactions with the Repeal_i indicator and the cohort group dummies D7172_c and D7480_c .It should then be clear that we are not using religion itself as an instrumental variable.

The OLS estimates in Table 7 suggest that an unwanted child accumulates less schooling. Table 8 uses the IV strategy to get at the effect of being unwanted shows that the causal effects of being unwanted go beyond education and also include crime and labor income.[21] We find that being unwanted causes a reduction of 1.4 to 2 completed years of education. Not surprisingly, then, being unwanted makes an individual more likely to be a high school dropout. Education is one of the most significant investments parents usually make in their children. It is likely that parents are unwilling (or unable) to make sizable investments in children they didn't want (or didn't expect) to have. This strong education effect provides evidence along these lines and it is likely to drive in part some of other unfavorable effects on life cycle outcomes, such as higher probability of engaging in crime and lower labor market earnings, found in Table 8. Results are similar when we use a more flexible specification

[20] The quasi-experiments induce obvious compositional changes in the sample of live births. So our estimates should be interpreted as the overall effect, gross of compositional changes.

[21] F-Statistics for the null of irrelevant excluded instruments in the first stage for the unwanted indicator are well above 10. We experimented trying to include other endogenous mechanisms in the main equation, but the Stock-Yogo test for the case with more than one endogenous variable indicated that our instruments were not strong enough for those specifications. Therefore we limit our analysis to specifications where Unwanted_{ic} is the only endogenous variable

that replaces Repeal_i, D7172_c and D7480_c with unrestricted state effects and cohort effects (λ_s, λ_c)

Still, by excluding the abortion legalization indicators from the main equation and using them as instruments, we are forcing the effects of legalized abortion to operate only through the unwanted variable. However, as discussed above, if abortion legalization affects outcomes through other channels, its indicators should not be excluded from the main equation. To capture the effects of unwantedness and still allow for alternative mechanisms for abortion legalization to have an impact on life cycle outcomes we include the $\text{AbortLegal}_{ic}^{EARLY}$ and $\text{AbortLegal}_{ic}^{ROEWADE}$ indicators in the main equation and reserve their interactions with the Pro-Choice indicator as instruments for Unwanted_{ic}. This allows for any macro effects of abortion legalization at the state-cohort level in the outcome equation. It also allows for differential cohort trends in outcomes across Repeal and Non-Repeal states that might be operating in the background. These differential trends could reinforce or go against the true effects of legal abortion. The specification then only exploits individual level variation in maternal attitudes towards abortion (Pro-Choice_i) interacted with the indicators for exposure to legalized abortion ($\text{AbortLegal}_{ic}^{EARLY}$ and $\text{AbortLegal}_{ic}^{ROEWADE}$) to identify the effects of being unwanted, net of alternative mechanisms that have been controlled for. Table 9 and Table 10 show that the OLS and IV estimates of the model in (5) are similar once the outcome equation is augmented with the AbortLegal indicators. Moreover, Tables 11 and 12 show that similar results are obtained if we replace the $\text{AbortLegal}_{ic}^{EARLY}$ and $\text{AbortLegal}_{ic}^{ROEWADE}$ indicators with a more flexible specification that allows for a full set of state-by-cohort effects λ_{sc}

5 Conclusions

Using PSID data we find that abortion legalization leads to a substantial decline in the probability of being assessed as the result of an unwanted pregnancy (in a sample of live births). While these findings are consistent with standard arguments, previous evidence was only indirect, using adoption data to infer the impact of abortion legalization on the number of unwanted births.

In our second contribution we show that a novel data strategy allows us to potentially disentangle alternative mechanisms through which changes in reproductive health policy affect life cycle outcomes. In particular, we show that it is possible to isolate the "unwantedness" mechanism while separately accounting for other ways in which abortion legalization might affect outcomes. We find that being unwanted *causes* unfavorable outcomes such as lower levels of completed education, lower labor income and higher odds of being involved with the criminal justice system. Our causality claim is tied to a particular empirical strategy. We use the exogenous state-level timing of exposure to abortion legalization. This exposure is magnified by maternal religion, which proxies for predetermined attitudes towards legal abortion, and thus provides individual level variation in willingness to take up legal abortion, should one be needed. We believe that the results have some external validity. They can be extrapolated more broadly when looking at the likely benefits of other changes in reproductive health policy that also generate declines in the prevalence of unwantedness in a given birth cohort.

References

[1] Akerlof, G. Yellen, J., and Katz (1996) " An Analysis of Out-of-Wedlock Childbearing the United States", Quarterly Journal of Economics, 111(2): 277-317

[2] Ananat, E. O., J. Gruber, and Levine, P. (2007). "Abortion Legalization and Lifecycle Fertility." Journal of Human Resources 42(2): 375-397.

[3] Ananat, E. O., J. Gruber, Levine, P. and Staiger,D. (2009). "Abortion and Selection." Review of Economics and Statistics 91(1): 124-136.

[4] Ananat, E. O. and D. M. Hungerman (2006). The Power of the Pill for the Next Generation. NBER National Bureau of Economic Research. : W13402.

[5] Angrist, J. D. and W. N. Evans (1996). "Schooling and Labor Market Consequences of the 1970 State abortion Reforms", NBER Working Paper 5406

[6] Bailey, M. J. (2006). "More Power to the Pill: The Impact of Contraceptive Freedom on Women's Labor-Force Participation." Quarterly Journal of Economics 121 (1): 289-320.

[7] Becker, G. and Lewis, H.G. (1973) "On the Interaction between Quantity and Quality of Children", Journal of Political Economy 81(2):S279-S288

[8] Bitler, M. and M. Zavodny (2002). "Did Abortion Legalization Reduce the Number of Unwanted Children? Evidence from Adoptions." Perspectives on Sexual and Reproductive Health 34(1): 25-33.

[9] Charles, K. K. and M. J. Stephens (2006). "Abortion Legalization and Adolescent Substance Use." Journal of Law and Economics 49(2): 481-505.

[10] Donohue, J., J. Grogger, and S. Levitt (2009). "The Impact of Legalized Abortion on Teen Childbearing." American Law and Economics Review 11(1): 24-46.

[11] Donohue, J. and S. Levitt (2001). "The Impact of Legalized Abortion on Crime." Quarterly Journal of Economics 116(2): 379-420.

[12] Donohue, J. and S. Levitt (2004). "Further Evidence that Legalized Abortion Lowered Crime: A Reply to Joyce." Journal of Human Resources 39(1): 29-49.

[13] Donohue, J. and S. Levitt (2006). "Measurement Error, Legalized Abortion, the Decline in Crime: A Response to Foote and Goetz (2005)" Politics & the Life Sciences, 2008, 123(1), pp. 425-440.

[14] Evans, John H. (2002). "Polarization in Abortion Attitudes in U.S. Religious Traditions, 1972-1998." Sociological Forum, 17(3):397-422.

[15] Edlund, L. C. and C. Machado (2009). Marriage and Emancipation in the Age of the Pill. Social Science Quarterly, Centre for Economic Policy Research.

[16] Foote, C. L. and C. F. Goetz (2005). Testing Economic Hypotheses with State-Level Data: A Comment on Donohue and Levitt (2001). America Becoming: Racial Trends and Their Consequences, Federal Reserve Bank of Boston.

[17] Goldin, C. and L. Katz (2000). "Career and Marriage in the Age of the Pill." American Economic Review 90(2): 461-465.

[18] Goldin, C. and L. Katz (2002). "The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions." Journal of Political Economy 110(4): 730-770.

[19] Grossman, M., and T. Joyce. (1990). "Unobservables, Pregnancy Resolutions, and Birthweight Production Functions in New York City." Journal of Political Economy 98: 983-1007.

[20] Gruber, J. P. Levine and D. Staiger (1999). "Abortion Legalization and Child Living Circumstances: Who is the 'Marginal Child'," The Quarterly Journal of Economics, 114(1), 1999, 263-291

[21] Guldi, M. (2008). "Fertility Effects of Abortion and Birth Control Pill Access for Minors." Demography 45(4): 817-827.

[22] Hock, H. S. (2007). The Pill and the College Attainment of American Women and Men. , Florida State University Working Papers. : .

[23] Joyce, T. (1987). "The Impact of Induced Abortion on White and Black Birth Outcomes in the U.S." Demography 24: 229-244.

[24] Joyce, T. (2004). "Did Legalized Abortion Lower Crime?" Journal of Human Resources 39(1): 1-28.

[25] Joyce, T. (2009a). Abortion and Crime: A Review. , National Bureau of Economic Research. : W15098.

[26] Joyce, T. (2009b). "A Simple Test of Abortion and Crime." Review of Economics and Statistics 91(1): 112-123.

[27] Joyce, T., and M. Grossman.(1990). "Pregnancy Wantedness and the Early Initiation of Prenatal Care." Demography 27: 1-17.

[28] Joyce, T., R. Kaestner, et al. (2002). "On the Validity of Retrospective Assessments of Pregnancy Intention." Demography 39(1): 199-213.

[29] Kane, T. J. and D. Staiger (1996). "Teen Motherhood and Abortion Access." Quarterly Journal of Economics 111(2): 467-506.

[30] Levine, P. B. (2004). Sex and Consequences: Abortion, Public Policy, and the Economics of Fertility. Princeton, NJ, Princeton University Press.

[31] Levine, P. B., T. Kane, D. Staiger and Zimmerman (1999). "Roe v. Wade and American Fertility." American Journal of Public Health 13(1): 63-84.

[32] Levine, P. B. and D. Staiger (2004) "Abortion Policy and Fertility Outcomes: The Eastern European Experience," Journal of Law and Economics, 47(1):223-243

[33] Lott, J. R. and J. Whitley (2007). "Abortion and Crime: Unwanted Children and Out-of Wedlock Births." Economic Inquiry 45(2): 304-324.

[34] Lundberg, S. and Plotnick, R. D. (1995) "Adolescent Premarital Childbearing: Do Economic Incentives Matter?", Journal of Labor Economics, 13 (2) 177-200

[35] Marsiglio, W. and F. L. Mott (1988). "Does Wanting to Become Pregnant with a First Child Affect Subsequent Maternal Behaviors and Infant Birth Weight?" Journal of Marriage and Family 50(4): 1023-1036.

[36] Ozbeklik, I. S. (2007). The Effect of Abortion Legalization on Teenage Out-of-Wedlock Childbearing in Future Cohorts, working paper

[37] Pantano, J. (2007). Unwanted Fertility, Contraceptive Technology and Crime: Exploiting a Natural Experiment in Access to The Pill, working paper.

[38] Pop-Eleches, Christian (2006) "The Impact of an Abortion Ban on Socio-Economic Outcomes of Children: Evidence from Romania". Journal of Political Economy 114(4)

[39] Rosenzweig, M. R. and K. I. Wolpin (1993). "Maternal Expectations and Ex Post Rationalizations: The Usefulness of Survey Information on the Wantedness of Children." The Journal of Human Resources 28(2): 205-229.

[40] Santelli, J. Rochat, R., Hatfield-Timajchy, B., Colley Gilbert, B.Curtis, K.Cabral, R., Hirsch, J.S. and Schieve, L. "The Measurement and Meaning of Unintended Pregnancies" Perspectives on Sexual and Reproductive Health. 35(2): 94-101

[41] Willis, Robert, (1973) " A New Economic Approach to the Economic Theory of Fertility Behavior", Journal of Political Economy 81 (2): S14-S64

[42] Weller, R. D., I. W. Eberstein, et al. (1987). "Pregnancy Wantedness and Maternal Behavior during Pregnancy." Demography 24(3): 407-412.

Appendix

Let $b_t = \frac{B_t}{F_t} \times 1000$ be the Birth Rate at time t defined as the number of live births per 1000 women.We can decompose this birth rate into its "wanted" and "unwanted" components

- $w_t = \frac{B_t^W}{F_t} \times 1000 =$ Wanted Birth Rate$_t$
- $u_t = \frac{B_t^U}{F_t} \times 1000 =$ Unwanted Birth Rate$_t$

Moreover, we can further distinguish within unwanted births, B_t^U, those who will be put for adoption, B_t^A from those who will not be put for adoption, B_t^N. The corresponding rates are

- $a_t = \frac{B_t^A}{F_t} \times 1000 =$ For Adoption Birth Rate$_t$
- $n_t = \frac{B_t^N}{F_t} \times 1000 =$ Not For Adoption Birth Rate$_t$

Note that

$$b_t = w_t + u_t \tag{6}$$

$$u_t = a_t + n_t \tag{7}$$

Let's denote by α^y the percent causal effect of abortion legalization on a generic birth rate y for $y = b, w, u, a$

$$y_{legal} = y_{illegal}\,(1 + \alpha^y) \tag{8}$$

As explained in the body of the paper, one of the missing links in the study of the effects of abortion legalization is its (percent) causal impact, α^u, on the rate of unwanted births. We expect $\alpha^u < 0$. Note that since

$$u_{illegal} = a_{illegal} + n_{illegal} \tag{9}$$

we have

$$\alpha^u = \frac{B_t^A}{B_t^U}\alpha^a + \frac{B_t^N}{B_t^U}\alpha^n \tag{10}$$

This makes clear that while the impact on adoption rates, α^a (which Bitler and Zavodny (2002) and Levine (2004) identify) is an important part of the story, we still need two key

parameters to estimate the impact of abortion legalization on the rate of unwanted births α^u:

a) the share of unwanted births that are being put for adoption, $\frac{B_t^A}{B_t^U}$, and

b) the impact of abortion legalization on the number of unwanted births that are *not* being put for adoption, α^n

Say only 1.5 out of 10 unwanted births are put for adoption. Then $\frac{B_t^A}{B_t^U} = 0.15$ and the actual impact of abortion legalization on the rate of unwantedness ranges from -5% to -90%[22], depending upon the extent of decline on unwanted births not relinquished for adoption, α^n. Clearly, this range is not very informative. One option is to assume that $\alpha^n = \alpha^a$. Alternatively one could conjecture that legalization had a stronger effect on unwanted births put for adoption than on unwanted births not put for adoption (i.e. $|\alpha^n| < |\alpha^a|$). In this case, the impact on the overall rate of unwantedness would be lower, $|\alpha^u| < |\alpha^a|$. The Bitler-Zavodny-Levine estimate of a 32% decline would then be an upper bound for $|\alpha^u|$. In particular, this would be true if unwanted births who are put for adoption are "more unwanted" than unwanted births *not* put for adoption. And, the higher the degree of unwantedness in a pregnancy, the higher the probability that it will be terminated by abortion. Alternatively, one could argue that the more responsible parents, or those who have moral problems with the use of abortion, are the ones who put unwanted children for adoption. In this case legalization would have a stronger effect on unwanted births *not* put for adoption. In this case the Bitler-Zavodny-Levine estimate would be a lower bound for $|\alpha^u|$.

[22] The feasible range for α^n is from 0 to 1. So the minimum of value of α^u is 0.0514 ($0.161 \times 0.32 + 0 = 0.05$) and the maximum value of α^u is 0.89 ($0.161 \times 0.32 + (1 - 0.161) \times 1 = 0.89$).

Table 1

PSID Descriptive Statistics

Variable	All	Unwanted	Wanted
Unwanted	0.29	1.00	0.00
Mom's age at delivery	25.92	25.13	26.23
Mom's Religion Pro-Choice	0.43	0.44	0.43
White	0.84	0.75	0.87
Hispanic	0.03	0.04	0.03
Black	0.11	0.18	0.08
Other Race	0.02	0.02	0.02
Cohort	1975	1975	1975
Female	0.48	0.49	0.48
High School Dropout	0.13	0.16	0.13
Completed Years of Education	13.29	12.87	13.46
Engage in Crime by 1995	0.07	0.09	0.06
Grow up in Poverty (1980)	0.09	0.15	0.07
Grow up in HH receiving AFDC (1980)	0.06	0.12	0.04
Grow up in a single headed HH (1980)	0.12	0.22	0.09
Log Real Labor Income	10.06	9.95	10.02
Observations (N)	2169	733	1436

Note: Authors' calculation based on PSID sample using PSID sampling weights.

Table 2

The Impact of Abortion Legalization on the Probability of Being an Unwanted Child

	No Controls	**Controls**	**Controls & State Effects**	**Controls, State Effects & Cohort Effects**
AbortLegal	**-0.117****	**-0.100****	**-0.106****	**-0.101****
	[0.046]	**[0.048]**	**[0.047]**	**[0.046]**
Repeal	-0.037*	-0.027		
	[0.022]	[0.021]		
D7172	0.027	0.039	0.047	
	[0.058]	[0.054]	[0.053]	
D7480	0.081	0.086	0.09	
	[0.066]	[0.066]	[0.065]	
Pro-Choice		-0.006	-0.016	-0.013
		[0.024]	[0.026]	[0.025]
Hispanic		0.1	0.082	0.083
		[0.063]	[0.072]	[0.071]
Black		0.181***	0.190***	0.186***
		[0.043]	[0.051]	[0.050]
Other Race		0.048	0.044	0.046
		[0.096]	[0.099]	[0.100]
Birth Order = 2		-0.129***	-0.138***	-0.136***
		[0.021]	[0.023]	[0.023]
Birth Order = 3		0.048	0.045	0.044
		[0.056]	[0.059]	[0.060]
Birth Order = 4		0.225***	0.224***	0.221***
		[0.054]	[0.055]	[0.057]
Female		0.008	0.01	0.012
		[0.026]	[0.026]	[0.026]
Constant	0.314***	0.279***	0.138***	0.196***
	[0.042]	[0.046]	[0.044]	[0.060]
State Effects			✓	✓
Cohort Effects				✓
Observations	2169	2169	2169	2169
Mean	0.34	0.34	0.34	0.34

Robust standard errors in brackets accounting for clustering at the state level and PSID weights

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3

The Impact of Abortion Legalization on Unwanted Births:
Early Legalization and Roe v. Wade

	Panel A: The Impact of Early Legalization		
	Repeal States (R)	Non-Repeal States (NR)	(R) - (NR)
1966-69 (Before)	31%	31%	0.4%
1971-72 (After)	19%	34%	-15.4%
After - Before	-12%	3%	**-16%**
	Panel B: The Impact of Roe v. Wade		
	Non-Repeal States (NR)	Repeal States (R)	(NR) - (R)
1971-72 (Before)	34%	19%	-15.4%
1974-80 (After)	28%	23%	-4.6%
After - Before	-6%	5%	**-11%**

Note: Authors' calculation based on PSID data using PSID sampling weights.

Table 4

The Impact of Abortion Legalization on the Probability of Being an Unwanted Child: Differential Effects of Early Legalization and Roe v. Wade

	No Controls	**Controls**	**Controls & State Effects**	**Controls, State Effects & Cohort Effects**
Abortlegal-Early	**-0.158****	**-0.160****	**-0.166****	**-0.156****
	[0.065]	**[0.064]**	**[0.063]**	**[0.064]**
Abortlegal-Roe v Wade	**-0.108****	**-0.087***	**-0.095***	**-0.091***
	[0.047]	**[0.050]**	**[0.050]**	**[0.048]**
Repeal	0.004	0.033		
	[0.049]	[0.047]		
D7172	0.033	0.047	0.055	
	[0.062]	[0.057]	[0.056]	
D7480	0.08	0.085	0.088	
	[0.065]	[0.065]	[0.064]	
Pro-Choice		-0.005	-0.015	-0.012
		[0.024]	[0.026]	[0.026]
Hispanic		0.101	0.082	0.083
		[0.063]	[0.072]	[0.071]
Black		0.181***	0.192***	0.187***
		[0.044]	[0.051]	[0.051]
Other Race		0.05	0.044	0.047
		[0.096]	[0.099]	[0.100]
Birth Order = 2		-0.130***	-0.139***	-0.137***
		[0.021]	[0.023]	[0.023]
Birth Order = 3		0.048	0.044	0.044
		[0.056]	[0.060]	[0.061]
Birth Order = 4		0.224***	0.222***	0.220***
		[0.054]	[0.055]	[0.057]
Female		0.008	0.009	0.012
		[0.026]	[0.026]	[0.026]
Constant	0.309***	0.270***	0.131**	0.185***
	[0.048]	[0.050]	[0.049]	[0.066]
State Effects			✓	✓
Cohort Effects				✓
Observations	2169	2169	2169	2169
Mean	0.34	0.34	0.34	0.34

Robust standard errors in brackets accounting for clustering at the state level and PSID weights

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5

The Differential Impact of Abortion Legalization on the Probability of Being an Unwanted Child For Chidren with "Pro-Choice" Maternal Religious Affiliation

	No Controls	Controls	Controls & State Effects	Controls, State Effects & Cohort Effects
AbortLegal x Pro-Choice	**-0.293*** **	**-0.239*** **	**-0.257*** **	**-0.261*** **
	[0.078]	**[0.068]**	**[0.061]**	**[0.060]**
AbortLegal	-0.024	-0.02	-0.022	-0.014
	[0.065]	[0.062]	[0.060]	[0.057]
Pro-Choice	-0.024	-0.02	-0.037	-0.031
	[0.081]	[0.074]	[0.072]	[0.069]
Pro-Choice x Repeal	0.16	0.16	0.172	0.175
	[0.127]	[0.109]	[0.114]	[0.116]
Pro-Choice x D7172	0.063	0.047	0.045	0.046
	[0.110]	[0.105]	[0.097]	[0.094]
Pro-Choice x D7480	0.297**	0.222*	0.246**	0.244**
	[0.130]	[0.114]	[0.108]	[0.105]
Repeal	-0.091	-0.081		
	[0.056]	[0.050]		
D7172	-0.004	0.015	0.024	
	[0.087]	[0.079]	[0.078]	
D7480	-0.017	0.011	0.006	
	[0.106]	[0.095]	[0.093]	
Hispanic		0.105*	0.093	0.094
		[0.061]	[0.071]	[0.070]
Black		0.182***	0.189***	0.184***
		[0.042]	[0.049]	[0.048]
Other Race		0.036	0.03	0.032
		[0.094]	[0.096]	[0.098]
Birth Order = 2		-0.126***	-0.135***	-0.133***
		[0.021]	[0.023]	[0.023]
Birth Order = 3		0.052	0.049	0.049
		[0.055]	[0.057]	[0.059]
Birth Order = 4		0.227***	0.226***	0.223***
		[0.053]	[0.054]	[0.056]
Female		0.009	0.011	0.013
		[0.026]	[0.026]	[0.026]
Constant	0.328***	0.286***	0.156**	0.125**
	[0.061]	[0.061]	[0.064]	[0.061]
State Effects			✓	✓
Cohort Effects				✓
Observations	2169	2169	2169	2169
Mean	0.34	0.34	0.34	0.34

Robust standard errors in brackets accounting for clustering at the state level and PSID weights

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6

Reduced Form Impact of Abortion Legalization on Life Cycle Outcomes and Childhood Circumstances

	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)	Grow up in poverty (1980)	Grow up in HH receiving AFDC (1980)	Grow up in a single headed HH (1980)
Abortlegal-Early x Pro-Choice	**2.287****	**-0.068**	**-0.501*****	**0.771*****	**-0.028**	**-0.076****	**-0.213****
	[0.919]	**[0.087]**	**[0.123]**	**[0.250]**	**[0.095]**	**[0.037]**	**[0.087]**
Abortlegal-Roe v Wade x Pro-Choice	**1.247**	**-0.059**	**-0.14**	**-0.028**	**-0.037**	**-0.072**	**-0.180****
	[1.018]	**[0.071]**	**[0.102]**	**[0.264]**	**[0.057]**	**[0.053]**	**[0.085]**
Abortlegal-Repeal	-2.760***	0.113	-0.005	-1.205***	-0.091***	-0.032	0.09
	[0.525]	[0.076]	[0.075]	[0.224]	[0.031]	[0.024]	[0.072]
Abortlegal-Roe v Wade	-0.492	0.001	-0.027	0.535**	-0.027	-0.001	0.001
	[0.534]	[0.052]	[0.081]	[0.243]	[0.037]	[0.029]	[0.041]
Pro-Choice	0.031	-0.019	0.045	-0.227	0.045	-0.011	-0.023
	[0.475]	[0.053]	[0.058]	[0.231]	[0.042]	[0.017]	[0.064]
Pro-Choice x Repeal	-1.197	-0.077	0.417***	-0.309	0.062	0.024	0.126**
	[0.907]	[0.075]	[0.075]	[0.286]	[0.070]	[0.017]	[0.060]
Pro-Choice x D7172	-0.416	0.143	-0.096	0.101	-0.047	0.041	0.043
	[0.582]	[0.092]	[0.077]	[0.231]	[0.060]	[0.032]	[0.085]
Pro-Choice x D7480	-1.183	0.146	0.106	0.274	-0.007	0.120**	0.251**
	[1.070]	[0.090]	[0.111]	[0.174]	[0.063]	[0.054]	[0.109]
Hispanic	0.028	-0.124**	0.006	-0.495**	0.024	0.057	0.108
	[0.658]	[0.049]	[0.042]	[0.189]	[0.060]	[0.055]	[0.071]
Black	0.024	0.025	0.01	-0.13	0.210***	0.206***	0.291***
	[0.567]	[0.037]	[0.019]	[0.176]	[0.036]	[0.046]	[0.058]
Other Race	-0.376	-0.028	0.047	-0.141	-0.063**	0.103	-0.025
	[0.694]	[0.081]	[0.086]	[0.130]	[0.029]	[0.091]	[0.083]
Female	0.499**	-0.014	-0.085***	-0.456***	0.009	0.012	0.042**
	[0.215]	[0.029]	[0.017]	[0.083]	[0.015]	[0.011]	[0.017]
Birth Order = 2	0.14	-0.012	0.000	0.001	0.002	-0.005	-0.022
	[0.258]	[0.024]	[0.014]	[0.109]	[0.011]	[0.008]	[0.019]
Birth Order = 3	-0.178	0.037	-0.017	0.039	0.038	0.001	-0.021
	[0.321]	[0.030]	[0.024]	[0.101]	[0.024]	[0.019]	[0.025]
Birth Order = 4	-1.030***	0.073	0.042	-0.295*	0.094**	0.036*	-0.005
	[0.361]	[0.046]	[0.043]	[0.149]	[0.036]	[0.021]	[0.037]
Constant	13.042***	0.171*	0.078	9.185***	0.211***	0.049	-0.236***
	[0.687]	[0.090]	[0.055]	[0.382]	[0.044]	[0.033]	[0.059]
State Effects	✓	✓	✓	✓	✓	✓	✓
Cohort Effects	✓	✓	✓	✓	✓	✓	✓
Observations	464	464	1879	599	2266	2266	1973
Mean	13.66	0.07	0.07	9.83	0.13	0.09	0.17

Robust standard errors in brackets accounting for clustering at the state level and PSID weights

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7

OLS estimates of the Impact of Being Unwanted on Life Cycle Outcomes

	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)
Unwanted	**-0.683****	**0.024**	**0.019**	**-0.097**	**-0.639****	**-0.001**	**0.02**	**-0.104**
	[0.271]	**[0.035]**	**[0.017]**	**[0.097]**	**[0.290]**	**[0.046]**	**[0.017]**	**[0.119]**
Pro-Choice	-0.143	-0.052	0.055	-0.225	-0.09	-0.011	0.065	-0.355
	[0.475]	[0.069]	[0.054]	[0.244]	[0.507]	[0.045]	[0.055]	[0.295]
Pro-Choice X Repeal	-0.541	-0.015	0.091*	0.182	-0.156	-0.083**	0.061	0.331**
	[0.357]	[0.042]	[0.049]	[0.136]	[0.344]	[0.038]	[0.057]	[0.134]
Pro-Choice X D7172	-0.042	0.156*	-0.112	0.213	-0.214	0.125	-0.124*	0.224
	[0.618]	[0.087]	[0.072]	[0.263]	[0.630]	[0.083]	[0.074]	[0.325]
Pro-Choice X D7480	0.264	0.071	-0.056	0.258	0.153	0.069	-0.057	0.429
	[0.623]	[0.079]	[0.054]	[0.310]	[0.612]	[0.071]	[0.053]	[0.340]
Hispanic	-0.751	0.183	0.05	-0.288	0.665	-0.151***	0.02	-0.108
	[1.170]	[0.117]	[0.035]	[0.290]	[0.621]	[0.050]	[0.039]	[0.303]
Black	0.243	0.013	-0.003	0.054	0.046	0.039	0.01	-0.038
	[0.532]	[0.035]	[0.017]	[0.183]	[0.574]	[0.039]	[0.021]	[0.185]
Other Race	-0.879	-0.069**	0.094	-0.042	-0.708	-0.112	0.096	0.149
	[0.722]	[0.027]	[0.144]	[0.174]	[0.836]	[0.073]	[0.147]	[0.167]
Female	0.638***	-0.03	-0.086***	-0.379***	0.580**	-0.017	-0.083***	-0.431***
	[0.196]	[0.031]	[0.016]	[0.085]	[0.220]	[0.029]	[0.017]	[0.098]
Birth Order=2	0.161	-0.02	-0.01	-0.005	0.001	-0.01	-0.004	0.02
	[0.210]	[0.022]	[0.015]	[0.112]	[0.252]	[0.025]	[0.015]	[0.126]
Birth Order=3	0.049	0.023	-0.026	0.063	-0.04	0.039	-0.025	0.108
	[0.413]	[0.043]	[0.024]	[0.099]	[0.340]	[0.030]	[0.024]	[0.134]
Birth Order=4	-0.816**	0.074	0.04	-0.309*	-0.782**	0.05	0.03	-0.27
	[0.373]	[0.059]	[0.044]	[0.180]	[0.380]	[0.047]	[0.046]	[0.202]
Repeal	0.992*	-0.06	-0.019	0.085				
	[0.515]	[0.036]	[0.039]	[0.119]				
D7172	0.031	-0.053	0.075*	-0.388				
	[0.554]	[0.073]	[0.041]	[0.236]				
D7480	0.346	-0.061	-0.013	-0.856***				
	[0.477]	[0.068]	[0.033]	[0.267]				
Constant	13.681***	0.091	0.099**	10.632***	13.437***	0.149*	0.107**	9.022***
	[0.396]	[0.079]	[0.038]	[0.178]	[0.884]	[0.085]	[0.053]	[0.530]
State Effects					✓	✓	✓	✓
Cohort Effects					✓	✓	✓	✓
Observations	450	450	1751	478	450	450	1751	478
Mean	13.68	0.07	0.07	9.83	13.68	0.07	0.07	9.83
Mean (Unwanted=1)	13.07	0.12	0.09	9.71	13.07	0.12	0.09	9.71
Mean (Unwanted=0)	14.01	0.04	0.06	9.89	14.01	0.04	0.06	9.89

Robust standard errors in brackets accounting for clustering at the state level and PSID weights.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8

IV estimates of the Impact of Being Unwanted on Life Cycle Outcomes

	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)
Unwanted	**-2.039*** **	**0.151** **	**0.425*** **	**-0.898*** **	**-1.377** **	**0.033**	**0.446*** **	**-1.460*** **
	[0.572]	**[0.072]**	**[0.076]**	**[0.330]**	**[0.579]**	**[0.057]**	**[0.089]**	**[0.289]**
Pro-Choice	-0.084	-0.058	0.05	-0.177	0.01	-0.016	0.051	-0.165
	[0.511]	[0.076]	[0.070]	[0.237]	[0.509]	[0.048]	[0.071]	[0.275]
Pro-Choice X Repeal	-0.412	-0.027	0.045	0.309*	-0.149	-0.083**	0.011	0.551**
	[0.403]	[0.034]	[0.037]	[0.173]	[0.316]	[0.033]	[0.037]	[0.276]
Pro-Choice X D7172	-0.071	0.159*	-0.124*	0.13	-0.277	0.128	-0.127	-0.015
	[0.621]	[0.089]	[0.075]	[0.270]	[0.593]	[0.079]	[0.078]	[0.323]
Pro-Choice X D7480	0.068	0.09	-0.034	0.134	0.023	0.075	-0.026	0.167
	[0.644]	[0.091]	[0.074]	[0.318]	[0.573]	[0.074]	[0.072]	[0.301]
Hispanic	-0.642	0.173*	0.016	-0.188	0.672	-0.151***	-0.004	-0.028
	[0.995]	[0.095]	[0.037]	[0.217]	[0.525]	[0.049]	[0.039]	[0.181]
Black	0.371	0.001	-0.066***	0.034	0.121	0.035	-0.051**	-0.114
	[0.469]	[0.036]	[0.024]	[0.176]	[0.474]	[0.037]	[0.024]	[0.176]
Other Race	-0.777	-0.079***	0.082	-0.126	-0.707	-0.112*	0.082	-0.025
	[0.605]	[0.024]	[0.128]	[0.159]	[0.743]	[0.063]	[0.126]	[0.282]
Female	0.709***	-0.034	-0.087***	-0.325***	0.630***	-0.02	-0.083***	-0.322***
	[0.206]	[0.032]	[0.018]	[0.093]	[0.203]	[0.028]	[0.018]	[0.115]
Birth Order = 2	-0.137	0.008	0.040*	-0.123	-0.169	-0.002	0.051**	-0.208
	[0.258]	[0.023]	[0.022]	[0.143]	[0.300]	[0.024]	[0.022]	[0.155]
Birth Order = 3	0.143	0.015	-0.047	0.202*	0.035	0.036	-0.046	0.368***
	[0.431]	[0.049]	[0.031]	[0.118]	[0.334]	[0.032]	[0.032]	[0.141]
Birth Order = 4	-0.595*	0.053	-0.057	-0.08	-0.648*	0.047	-0.07	0.168
	[0.344]	[0.060]	[0.059]	[0.217]	[0.370]	[0.041]	[0.058]	[0.275]
Repeal	0.874*	-0.049	0.019	-0.037				
	[0.498]	[0.030]	[0.034]	[0.131]				
D7172	0.086	-0.059	0.069	-0.317				
	[0.603]	[0.081]	[0.054]	[0.265]				
D7480	0.376	-0.064	-0.017	-0.807***				
	[0.470]	[0.072]	[0.041]	[0.283]				
Constant	14.068***	0.055	-0.011	10.823***	13.410***	0.151*	0.013	9.562***
	[0.369]	[0.063]	[0.055]	[0.154]	[0.813]	[0.080]	[0.077]	[0.521]
State Effects					✓	✓	✓	✓
Cohort Effects					✓	✓	✓	✓
Observations	450	450	1751	478	450	450	1751	478
Mean	13.68	0.07	0.07	9.83	13.68	0.07	0.07	9.83
Mean (Unwanted=1)	13.07	0.12	0.09	9.71	13.07	0.12	0.09	9.71
Mean (Unwanted=0)	14.01	0.04	0.06	9.89	14.01	0.04	0.06	9.89
F - 1st Stage Unwanted	37.4	37.4	25.91	23.16	56.39	56.39	18.59	39.92

Robust standard errors in brackets accounting for clustering at the state level and PSID weights. * significant at 10%; ** significant at 5%; *** significant at 1% . Estimates use AbortLegal-Early, AbortLegal-Roe v. Wade, AbortLegal-Early x Pro-Choice and AbortLegal-Roe v Wade x Pro-Choice as IVs for Unwanted

Table 9

OLS estimates of the Impact of Being Unwanted on Life Cycle Outcomes adjusted for Abortion Legalization

	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)
Unwanted	**-0.698****	**0.024**	**0.019**	**-0.098**	**-0.644****	**-0.002**	**0.02**	**-0.088**
	[0.277]	**[0.036]**	**[0.017]**	**[0.099]**	**[0.295]**	**[0.047]**	**[0.017]**	**[0.123]**
Pro-Choice	0.096	-0.061	0.055	-0.082	0.076	-0.018	0.07	-0.236
	[0.451]	[0.075]	[0.057]	[0.213]	[0.470]	[0.048]	[0.057]	[0.255]
Pro-Choice X Repeal	-0.079	-0.035	0.087*	0.484***	0.231	-0.103**	0.06	0.508***
	[0.292]	[0.037]	[0.052]	[0.125]	[0.371]	[0.041]	[0.058]	[0.131]
Pro-Choice X D7172	-0.414	0.169*	-0.116	0.02	-0.457	0.135	-0.134*	0.095
	[0.572]	[0.094]	[0.075]	[0.215]	[0.578]	[0.087]	[0.078]	[0.280]
Pro-Choice X D7480	-0.059	0.083	-0.055	0.06	-0.088	0.079	-0.061	0.243
	[0.574]	[0.086]	[0.057]	[0.261]	[0.543]	[0.077]	[0.056]	[0.275]
Hispanic	-0.9	0.189	0.047	-0.352	0.482	-0.143***	0.016	-0.248
	[1.102]	[0.116]	[0.037]	[0.256]	[0.642]	[0.048]	[0.041]	[0.326]
Black	0.278	0.011	-0.004	0.05	0.076	0.037	0.01	-0.033
	[0.511]	[0.035]	[0.017]	[0.188]	[0.565]	[0.039]	[0.021]	[0.191]
Other Race	-0.943	-0.067**	0.092	-0.057	-0.762	-0.109	0.093	0.156
	[0.734]	[0.028]	[0.144]	[0.177]	[0.834]	[0.073]	[0.147]	[0.162]
Female	0.639***	-0.027	-0.087***	-0.386***	0.564**	-0.017	-0.083***	-0.462***
	[0.190]	[0.031]	[0.016]	[0.084]	[0.215]	[0.029]	[0.017]	[0.093]
Birth Order=2	0.066	-0.018	-0.011	-0.033	-0.02	-0.01	-0.01	0.03
	[0.220]	[0.020]	[0.015]	[0.114]	[0.263]	[0.025]	[0.015]	[0.132]
Birth Order=3	0.006	0.023	-0.026	0.021	-0.044	0.038	-0.026	0.069
	[0.405]	[0.043]	[0.024]	[0.096]	[0.333]	[0.031]	[0.024]	[0.128]
Birth Order=4	-0.986***	0.08	0.04	-0.369**	-0.895**	0.058	0.033	-0.341*
	[0.354]	[0.058]	[0.044]	[0.180]	[0.356]	[0.046]	[0.046]	[0.202]
Repeal	2.546***	-0.115	-0.02	0.872***				
	[0.424]	[0.070]	[0.030]	[0.177]				
D7172	0.553	-0.07	0.083*	-0.166				
	[0.524]	[0.086]	[0.048]	[0.193]				
D7480	0.92	-0.05	0.04	-1.075***				
	[0.605]	[0.084]	[0.076]	[0.360]				
AbortLegal-Early	-2.600***	0.079	-0.045	-0.997***	-2.329***	0.085	-0.091	-1.132***
	[0.542]	[0.071]	[0.084]	[0.223]	[0.466]	[0.064]	[0.061]	[0.222]
AbortLegal-Roe v Wade	-0.078	-0.028	-0.057	0.49	-0.086	-0.031	-0.062	0.607*
	[0.489]	[0.038]	[0.061]	[0.294]	[0.479]	[0.043]	[0.061]	[0.303]
Constant	13.405***	0.102	0.099**	10.478***	12.943***	0.172*	0.158**	8.431***
	[0.364]	[0.085]	[0.043]	[0.152]	[0.667]	[0.090]	[0.075]	[0.572]
State Effects					✓	✓	✓	✓
Cohort Effects					✓	✓	✓	✓
Observations	450	450	1751	478	450	450	1751	478
Mean	13.68	0.07	0.07	9.83	13.68	0.07	0.07	9.83
Mean (Unwanted=1)	13.07	0.12	0.09	9.71	13.07	0.12	0.09	9.71
Mean (Unwanted=0)	14.01	0.04	0.06	9.89	14.01	0.04	0.06	9.89

Robust standard errors in brackets accounting for clustering at the state level and PSID weights

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 10

IV estimates of the Impact of Being Unwanted on Life Cycle Outcomes
(only using AbortLegal x Pro-Choice interactions as IVs)

	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)
Unwanted	**-2.704*** **	**0.165***	**0.472*** **	**-0.982****	**-1.564****	**0.024**	**0.434*** **	**-0.987*** **
	[0.733]	**[0.089]**	**[0.099]**	**[0.411]**	**[0.759]**	**[0.062]**	**[0.103]**	**[0.362]**
Pro-Choice	0.194	-0.067	0.042	-0.025	0.204	-0.022	0.052	-0.113
	[0.564]	[0.084]	[0.077]	[0.225]	[0.505]	[0.052]	[0.072]	[0.250]
Pro-Choice X Repeal	0.086	-0.047	0.032	0.627**	0.224	-0.103***	0.01	0.644**
	[0.431]	[0.028]	[0.041]	[0.266]	[0.405]	[0.036]	[0.038]	[0.259]
Pro-Choice X D7172	-0.479	0.173*	-0.122	-0.079	-0.541	0.137*	-0.132	-0.065
	[0.689]	[0.099]	[0.082]	[0.269]	[0.585]	[0.083]	[0.080]	[0.303]
Pro-Choice X D7480	-0.358	0.104	-0.023	-0.081	-0.252	0.084	-0.026	0.076
	[0.667]	[0.103]	[0.083]	[0.287]	[0.544]	[0.080]	[0.075]	[0.265]
Hispanic	-0.741	0.177*	0.009	-0.242	0.491	-0.143***	-0.007	-0.188
	[0.874]	[0.093]	[0.040]	[0.189]	[0.527]	[0.046]	[0.041]	[0.188]
Black	0.46	-0.001	-0.073**	0.026	0.165	0.034	-0.050**	-0.085
	[0.447]	[0.036]	[0.029]	[0.182]	[0.464]	[0.036]	[0.025]	[0.170]
Other Race	-0.791	-0.077***	0.079	-0.15	-0.76	-0.109*	0.08	0.039
	[0.577]	[0.023]	[0.127]	[0.162]	[0.728]	[0.065]	[0.127]	[0.222]
Female	0.741***	-0.034	-0.087***	-0.327***	0.624***	-0.019	-0.084***	-0.390***
	[0.208]	[0.032]	[0.018]	[0.100]	[0.192]	[0.027]	[0.018]	[0.101]
Birth Order = 2	-0.389	0.014	0.046**	-0.167	-0.237	-0.004	0.049**	-0.129
	[0.310]	[0.023]	[0.022]	[0.155]	[0.335]	[0.025]	[0.021]	[0.163]
Birth Order = 3	0.126	0.015	-0.05	0.172	0.041	0.035	-0.046	0.242*
	[0.454]	[0.050]	[0.032]	[0.120]	[0.334]	[0.032]	[0.032]	[0.127]
Birth Order = 4	-0.668*	0.058	-0.066	-0.117	-0.730**	0.053	-0.067	-0.049
	[0.356]	[0.061]	[0.064]	[0.238]	[0.362]	[0.041]	[0.060]	[0.252]
Repeal	2.425***	-0.106	-0.019	0.756***				
	[0.469]	[0.066]	[0.048]	[0.185]				
D7172	0.675	-0.078	0.066	-0.075				
	[0.698]	[0.098]	[0.070]	[0.264]				
D7480	1.287	-0.079	0.023	-0.957**				
	[0.796]	[0.108]	[0.100]	[0.407]				
AbortLegal-Early	-2.822***	0.095	0.009	-1.055***	-2.419***	0.087	-0.046	-1.144***
	[0.744]	[0.085]	[0.098]	[0.302]	[0.510]	[0.064]	[0.081]	[0.233]
AbortLegal-Roe v Wac	-0.415	-0.004	-0.053	0.427	-0.253	-0.026	-0.054	0.489
	[0.544]	[0.045]	[0.081]	[0.323]	[0.479]	[0.039]	[0.077]	[0.313]
Constant	13.977***	0.062	-0.015	10.685***	15.356***	-0.015	0.092	9.267***
	[0.400]	[0.066]	[0.054]	[0.181]	[0.471]	[0.060]	[0.091]	[0.540]
State Effects					✓	✓	✓	✓
Cohort Effects					✓	✓	✓	✓
Observations	450	450	1751	478	450	450	1751	478
Mean	13.68	0.07	0.07	9.83	13.68	0.07	0.07	9.83
Mean (Unwanted=1)	13.07	0.12	0.09	9.71	13.07	0.12	0.09	9.71
Mean (Unwanted=0)	14.01	0.04	0.06	9.89	14.01	0.04	0.06	9.89
F - 1st Stage Unwante	26.47	26.47	19.16	19.3	51.51	51.51	18.81	31.42

Robust standard errors in brackets accounting for clustering at the state level and PSID weights. * significant at 10%; ** significant at 5%; *** significant at 1% . Estimates only use AbortLegal-Early x Pro-Choice and AbortLegal-Roe x Wade x Pro-Choice as IVs for Unwanted. The (level) indicators for abortion legalization (AbortLegal-Early and AbortLegal-Roe v. Wade) are not used as instruments as they are allowed to have independent effects in the main equation.

Table 11

OLS estimates of the Impact of Being Unwanted on Life Cycle Outcomes (Allowing for State-by-Cohort Effects)

	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)
Unwanted	**-0.948****	**0.081**	**0.048****	**-0.178**
	[0.393]	**[0.052]**	**[0.019]**	**[0.230]**
Pro-Choice	0.401	-0.046	0.08	-0.206
	[0.784]	[0.083]	[0.083]	[0.397]
Pro-Choice X Repeal	-0.346	-0.052	0.046	0.588*
	[0.391]	[0.054]	[0.068]	[0.325]
Pro-Choice X D7172	-0.725	0.131	-0.117	0.021
	[1.056]	[0.138]	[0.111]	[0.393]
Pro-Choice X D7480	0.065	0.09	-0.065	0.184
	[0.989]	[0.103]	[0.083]	[0.473]
Hispanic	-0.525	0.016	0.025	-0.134
	[0.512]	[0.022]	[0.048]	[0.849]
Black	-0.216	0.061	0.002	0.25
	[0.619]	[0.073]	[0.024]	[0.292]
Other Race	-0.365	-0.252	0.088	0.161
	[1.344]	[0.252]	[0.171]	[0.357]
Female	0.690*	-0.029	-0.062***	-0.426***
	[0.342]	[0.050]	[0.019]	[0.128]
Birth Order = 2	-0.239	0.018	-0.006	0.143
	[0.365]	[0.042]	[0.022]	[0.220]
Birth Order = 3	0.032	0.029	-0.024	0.207
	[0.511]	[0.031]	[0.026]	[0.286]
Birth Order = 4	-0.82	0.06	0.03	-0.27
	[0.534]	[0.089]	[0.050]	[0.290]
Constant	13.132***	-0.170**	-0.151*	6.970***
	[1.050]	[0.081]	[0.089]	[0.345]
State Effects	✓	✓	✓	✓
Cohort Effects	✓	✓	✓	✓
State-by-Cohort Effects	✓	✓	✓	✓
Observations	450	450	1751	478
Mean	13.68	0.07	0.07	9.83
Mean (Unwanted=1)	13.07	0.12	0.09	9.71
Mean (Unwanted=0)	14.01	0.04	0.06	9.89

Robust standard errors in brackets accounting for clustering at the state level and PSID weights. * significant at 10%; ** significant at 5%; *** significant at 1% . This specification allows for a set of unrestricted State-by-Cohort effects that flexibly capture the effects of abortion legalization and other unobserved factors that might affect outcomes and vary at the state-cohort level.

Table 12

IV estimates of the Impact of Being Unwanted on Life Cycle Outcomes
(Allowing for State-by-Cohort Effects)

	Completed Years of Education	High School Dropout	Engage in Crime by 1995	Log(Real Labor Income)
Unwanted	**-3.026*** **	**0.145** **	**0.427*** **	**-0.849*** **
	[0.589]	**[0.065]**	**[0.086]**	**[0.287]**
Pro-Choice	0.814	-0.059	0.043	0.004
	[0.575]	[0.066]	[0.073]	[0.291]
Pro-Choice X Repeal	-0.603	-0.044	0.008	0.512*
	[0.531]	[0.031]	[0.037]	[0.276]
Pro-Choice X D7172	-0.919	0.137	-0.114	-0.128
	[0.638]	[0.098]	[0.086]	[0.271]
Pro-Choice X D7480	-0.221	0.099	-0.014	-0.073
	[0.627]	[0.079]	[0.075]	[0.342]
Hispanic	-0.998**	0.030**	0.022	-0.239
	[0.420]	[0.014]	[0.043]	[0.522]
Black	0.002	0.054	-0.055**	0.202
	[0.453]	[0.050]	[0.026]	[0.219]
Other Race	-0.472	-0.249	0.053	0.1
	[0.604]	[0.165]	[0.123]	[0.339]
Female	0.785***	-0.032	-0.060***	-0.389***
	[0.263]	[0.036]	[0.017]	[0.093]
Birth Order = 2	-0.752**	0.034	0.041	0.027
	[0.351]	[0.032]	[0.028]	[0.169]
Birth Order = 3	0.082	0.027	-0.04	0.307*
	[0.453]	[0.025]	[0.028]	[0.163]
Birth Order = 4	-0.471	0.047	-0.069	-0.045
	[0.486]	[0.068]	[0.058]	[0.166]
Constant	14.942***	-0.226**	-0.336***	8.194***
	[1.043]	[0.096]	[0.066]	[0.551]
State Effects	✓	✓	✓	✓
Cohort Effects	✓	✓	✓	✓
State-by-Cohort Effects	✓	✓	✓	✓
Observations	450	450	1751	478
Mean	13.68	0.07	0.07	9.83
Mean (Unwanted=1)	13.07	0.12	0.09	9.71
Mean (Unwanted=0)	14.01	0.04	0.06	9.89
F - 1st Stage Unwanted	55.2	55.2	50.0	36.4

Robust standard errors in brackets accounting for clustering at the state level and PSID weights. *significant at 10%; ** significant at 5%; *** significant at 1% . Estimates only use AbortLegal-Repeal x Pro-Choice and AbortLegal-Roe v Wade x Pro-Choice as IVs for Unwanted. The (level) indicators for abortion legalization (AbortLegal-Repeal and AbortLegal-Roe v. Wade) are not used as instruments. This specification allows for a set of unrestricted State-by-Cohort effects that flexibly capture the effects of abortion legalization and other unobserved factors that might affect outcomes and vary at the state-cohort level