

Effects of lower ages of majority on oral contraceptive use: Evidence on the validity of The Power of the Pill

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Abstract

With the Australian Family Project and 1970 National Fertility Survey, this paper uses between-states variation in the timing of youth consent laws in Australia and the US in the 1960s and 1970s to show that women in Australia who had never used the pill were 2 percentage points more likely to start at age 19 under an age of majority of 18 instead of 21 (from a base rate around 2%). Women living under liberalized youth consent and legal access to the pill in the US were 10 percentage points more likely to start the pill at age 20.

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1 Introduction

How much does a lower age of majority increase oral contraceptive (the pill) use among young women and is it reasonable to use youth consent laws as if they are instruments for the costs of obtaining the pill?

Laws governing the rights of youth to control their choices (medical, marriage, career, and educational choices, for example) matter for their life outcomes, and economists have linked the effects of these laws to costs of oral contraceptive and abortion use. Goldin and Katz (2002) made a groundbreaking contribution to our understanding of women's economic freedom by using differently-timed changes in state laws determining the age at which someone is considered a legal adult (the age of majority) and mature minor doctrines (the Common Law idea that a minor can give consent to treatment if she is mature enough to understand the consequences of her choices) in the United States as potentially exogenous variation in the cost of obtaining and using oral contraceptives ("the pill"). Their work, and others' extensions of this framework (in what I will call the "Power of the Pill literature") suggest that women who gained the ability to legally make their own medical decisions in late adolescence and early adulthood (among other effects)

- had later fertility (Ananat and Hungerman 2012; Bailey 2006; Guldi 2008),
- had higher incomes later in life (Bailey 2013; Bailey, Hershbein, and Miller 2012; Cragun and Chatterjee 2018),
- had greater educational attainment (Bailey, Hershbein, and Miller 2012; Cragun and Chatterjee 2018; Hock 2007),
- were less likely to experience poverty (Browne and LaLumia 2014),
- were more likely to participate in the labor force (Bailey 2006),
- were more likely to enter careers that had been historically male (Bailey, Hershbein, and Miller 2012; Goldin and Katz 2002; Steingrimsdottir 2016),

- had children that received more schooling (Bailey 2013), and
- used the pill earlier and with greater frequency (Bailey, Hershbein, and Miller 2012; Goldin and Katz 2002).

Myers (2017b) presents empirical evidence that some of the effects of these laws have been conflated with the effects of abortion legalization. However, there still exists some ambiguity in the evidence, and not all of these effects have yet been re-analyzed with Myers' methodology.

The pill provided a safe method to reduce uncertainty about fertility without the high cost of sexual abstinence. Theory suggests that increased certainty about fertility timing should increase human capital investments, as these can be timed to be disrupted less by fertility, childbirth, and child-rearing (Goldin and Katz 2002). The link between consent laws and human capital outcomes is that the pill requires a prescription in the US (the country that has been the target of most of the research with this methodology) and Australia (analyzed in this report), there can be legal penalties for physicians who treat patients without their consent, and these laws allowed young women to give consent when they previously could not. Additionally, some of the legal changes in past research have been repeals of bans on sales of contraceptives, and the relevance of a ban on a good to reduced consumption of that good is obvious. Based on this reasoning, past work that showed important impacts on life outcomes from changes in youth consent laws and contraception sales bans interpreted these effects as effects of access to the pill.

Despite the theoretical arguments, reducing the cost of pill access is just one possible mechanism for youth consent laws' effects. I provide new evidence on the validity of this methodology by estimating effects of plausibly-exogenous age of majority law changes in Australia using representative surveys that asked women to recall pill use. Specifically, I construct panels of women's age, state of residence, marital status, and oral contraceptive use from the Australian Family Project (M. D. Bracher 1987) and estimate effects of the legal environment on the probability that a woman starts pill use for the first time in a given month. The results provide evidence on the extent to which such laws really do represent reductions in the cost of obtaining oral contraceptives for young women.¹ I also produce estimates for the US using the 1970 National Fertility Survey and

¹This research should not be taken as an analysis of whether such laws matter in general except

variation in contraception sales bans and youth consent laws in the 1960s but argue that these estimates should not be seen as causal.

One quality of the existing Power of the Pill literature is that the treatment conditions are often somewhat arbitrarily defined (for good reasons) and vary substantially depending on the time period studied. Treatment is usually described as “access”, and the policy changes granting “access” take many forms:

- Age of majority changes
- A court ruling saying that mature minors can give consent for medical treatment (a mature minor doctrine)
- Codification of a mature minor doctrine in law
- Repeal of a law against buying or selling (or even using) contraceptives (Comstock laws)
- A family planning law that explicitly allows for provision of contraception to minors
- Medical consent statutes that allow physicians to assume that minors are mature

Some of these policies are relevant to a subfield within the Power of the Pill literature that deals with the ability of unmarried young women to consent to receiving the pill, a condition referred to by Bailey (2006) as “Early Legal Access” (or ELA), and this paper focuses on that subset of the literature, which I call the ELA literature.²

What all of these identification strategies share is their emphasis on using policies as if they to the extent that I provide evidence on the exogeneity of the laws, which is essential for estimating their causal effects.

²Myers (2017b) promotes the term “confidential access” to reflect the importance of getting medical treatments without parental consent. An example of work in the Power of the Pill literature that does not focus on early legal access is Bailey (2010), who uses variations in laws banning sales of contraceptives to married adult women to identify effects of pill access costs on fertility choices.

produce random assignment of the *costs* of obtaining and using the pill.³ One such cost is the threat of criminal prosecution to a physician who treats a minor without the consent of her parents. Another cost is the humiliation a minor might feel when discussing sexual activity with a physician in front of her parents. The ELA literature is implicitly attempting to describe effects of reductions in the cost of obtaining oral contraceptives and is using policy variation as if it were an instrument for those cost reductions but is only estimating the overall effect of the policy because measuring pill use costs is daunting. This is illustrated in Figure 1. The solid black lines from “Policy” to “Pill cost” to “Outcome” represent the hypothesized relationship in the ELA literature, while the measured relationship in that literature is indicated by the dashed grey line at the bottom. I have further indicated that I, too, am not measuring the hypothesized first stage with the dashed grey “This research” line pointing to “Pill use”. Pill use may be just another outcome that follows from pill cost reductions, but it is a special outcome in that own-price elasticities of demand are usually not zero, whereas the elasticity for any arbitrary outcome with respect to pill costs could easily be functionally indistinguishable from zero. Thus, if policies affect outcomes through pill costs, pill use should be one of the outcomes affected.

Given so many sources of policy variation, it is important to determine which policies that produce variation in pill access costs are the most likely to be exogenous. The arguments for exogeneity of policies in the literature have taken two forms:

1. Goldin and Katz originally argued that the Vietnam War and associated conscription of young men who were not yet legal adults to participate in the war led to a nation-wide reduction in the age at which people in the US were considered adults and that variations in the state-specific timing of these changes was a result of idiosyncratic bureaucratic factors that were unrelated to the desire for contraception (and that contraceptive outcomes were an unexpected side effect of the laws).

³We might also be concerned with the effects of the policies themselves rather than with using those policies as instruments, but I focus here only on the case of treating policies as instruments, as this is the methodology in all of the papers showing the effects in the list above.

2. Other authors (e.g. Bailey, Guldi, Davido, et al. 2011) use policy variation that clearly was related to desire for contraception (e.g. repeal of “Comstock” laws that banned contraceptive sales) but argue that the policy timing is probably exogenous because it is uncorrelated with a large set of relevant pre-treatment observables after conditioning on state and year fixed effects.

The second argument suffers from the problem that there is no particular reason to believe that the set of observables used in the tests for pre-treatment correlations is representative of pre-treatment conditions in general and because insignificant effects are not always zero effects. Thus, I consider age of majority laws as better candidates for exogenous treatment variation than Comstock laws, mature minor doctrines, or state family planning policies are. This illustrates the value of extending the analysis to Australia. Like the US, Australia sent conscripted military forces to Vietnam and experienced protests over the fact that conscripted minors could not vote, leading to a nationwide effort to reduce the voting age and general age of majority, with state-specific timing of legal changes dependent on bureaucratic factors. Unlike the US, there are Australian data on state-specific pill use among young women at the affected ages (18–20) over the time period when the age of majority changes occurred (the 1970s).⁴ Thus, the focus of this paper is on estimating effects of Australia’s age of majority reductions on rates of oral contraceptive uptake, but I also show estimates for the US with a broader set of pill access laws. The primary weaknesses of relying on age of majority changes are that age of majority laws may have other mechanisms of action besides their effects on pill access costs (contracting for student loans or for home mortgages, for instance) that may not be present with policy changes explicitly tied to contraceptive desires and that focusing on age of majority laws does not allow for identifying effects of pill access costs on women at ages outside the age range covered by the age of majority change (18–20) in any meaningful way and may not allow for assessing effects on married women (Goldin and Katz 2002, argue that because marriage in the US typically emancipates minors, giving them equivalent

⁴The 1965 and 1970 National Fertility Surveys in the US allow for observing pill use by state over time but occurred before the widespread age of majority changes in the 1970s and only sampled married women.

status to adults, that age of majority laws should have little impact on the costs of obtaining the pill for married women). Thus, even if I show that pill use increased as a result of lowered age of majority, it does not follow that age of majority laws are valid instruments for pill costs.

It might be tempting to claim that the results of this paper using Australian data apply only to Australia. However, the US, UK, and other former British colonies also reduced their ages of majority at the same time as Australian states were doing so, the US and Australia both reduced their ages of majority because of the Vietnam War, the language of the Australian age of majority reductions was based on laws from the US and UK, and there are shared cultures in these countries. Although external validity is a concern, if my estimates represent the best available estimates of effects of exogenous variation in pill use costs, it would be unwise to assume that they are irrelevant for similar countries. Research on life outcomes for American women in the ELA literature often relies on variations in age of majority laws in the 1970s, which is the same time period and class of laws that I use for Australian estimates, while the existing evidence (and my estimates) for effects of relevant policies on pill uptake in the US rely on variation in policies from the 1960s that are not age of majority changes. Furthermore, much of the Power of the Pill literature is about how young, unmarried women made choices for their lives (e.g. Goldin and Katz (2002) looked at the probability of marriage before age 23 and Myers (2017b) looked at the probability of a shotgun marriage). The estimates for Australia in this paper using age of majority changes in the 1970s may be *more* relevant to those analyses than estimates of effects of very different kinds of laws from the 1960s USA are. Furthermore, by isolating age of majority laws from other legal changes, the Australian context offers a fruitful area for future research duplicating (or not) results for the US.

In addition to theory, there is some existing empirical evidence for the the claim that pill costs are the mechanism of action for policies in the Power of the Pill literature:

- The effects of the legal changes appear to be mostly concentrated in the experiences of women rather than men (e.g. Hock 2007).
- Effects on men appear to be mediated by female partners' fertility (Hock 2007) and effects

on women's labor supply are also mediated by their own fertility (Bailey 2006).

- Bailey (2010) showed that women in US states with bans on the sales of contraceptives were less likely to have used the pill by 1965 than other women in the same Census region and were no less likely to have used the pill by 1970. Most states with sales bans repealed those bans in the 1965-1970 period, so the results suggest that repeal of the sales bans increased use.
- Goldin and Katz (2002) showed that among unmarried respondents to the 1971 National Survey of Young Women, oral contraceptive use was higher for women who lived in US states where young women could legally obtain the pill.
- Bailey, Hershbein, and Miller (2012) (hereafter BHM) used the 1970 National Fertility Survey to show that the probability of using the pill before age 21 was higher among cohorts of women treated with liberalized pill access laws even when conditioning on (US) state of residence and birth cohort characteristics shared across states, but only one of the states had policy variation due to an age of majority reduction during the time period studied.

I extend the empirical work in the following ways:

1. I extend the analysis to Australia and document the legal changes granting ELA in Australia. The novel legal history presented here for Australia is a valuable contribution that can drive future research.
2. By relying on Australian data, I isolate effects of age of majority laws from other legal changes whose exogeneity is suspect.
3. Rather than looking at the cumulative probability of use by particular ages (as in BHM), I estimate the effect of the laws in the woman's current state of residence on the probability that she starts using the pill for the first time.

2 Theory and hypotheses

Oral contraceptives became available in Australia in 1961 and in the US (for contraceptive purposes) in 1960, and, as seen in Figure 2A, their use quickly spread among 18–20-year-olds in Australia in the early 1970s—when Australian states were lowering their ages of majority from 21 to 18. The figure shows estimates of the proportion of women in Australia using the pill during each month from the early 1960s to the early 1980s with data from the Australian Family Project. The bottom panel (Figure 2B) shows estimates for the US from the 1970 National Fertility Survey, illustrating that the patterns are similar. The question in this paper is how much of the increase is due to the changes in policy environment around youth consent. An immediate concern is that the start of the big increase in use for 18–20-year-olds predates the first age of majority reduction in 1971 and its finish ends before the last age of majority reduction in 1978. Thus, the age of majority changes in Australia cannot explain the majority of the change in pill use.

Although 18–20-year-olds should have the greatest direct effect from a change in the age of majority from 21 to 18, there could be effects on older women. First, there is likely a great deal of persistence in pill use over time, and treatment with a lower age of majority at one age is correlated with treatment at earlier ages. Thus, we should expect apparent treatment effects after age 21, and this persistent effect should be considered part of the treatment effect for youths rather than a confound. Second, some past research suggests that access to medical contraceptives should not impact completed fertility (e.g. Bailey 2006; Becker 1991). If oral contraceptives allow women to delay fertility during early years, then they will be pursuing pregnancy during later years. Before the 1970s in the US, women tended to drop out of the labor force in their 20s and re-enter as their children grew up (See Fig. III in Bailey 2006). The 1950 birth cohort, on the other hand, increased their labor force participation rate throughout their 20s. These later cohorts of women would be expected to decrease pill use later to reach their desired fertility after completing valuable human capital investments.

There could also be effects on women under age 18. First, some of the legal changes studied directly extended rights to younger women (or to their physicians). The AoM reduction bill in

New South Wales had a clause that additionally extended mature minor capacity to girls over age 14. In the six US states with variation in ELA for 19-year-olds during the studied period, only three had legal changes that applied only to people over age 18, and one of those changes occurred in the last month of data collection for the 1970 National Fertility Survey used here and so is largely irrelevant. Second, liberalized youth consent laws may have changed the age of first sexual activity. Suggestive evidence for earlier sexually activity is described by [][Myers2017. If physicians routinely prescribed contraceptives to women they perceived as about to become sexually active or if young women became more likely to seek a prescription before age 18 because they expected to become sexually active earlier, we should see increases in pill use before age 18 as a results of the laws. On the other hand, the laws might induce some young women under age 18 to delay sexual activity in anticipation of making human capital investments. Fourth, the legal changes could have lowered the cost to young women of deceiving physicians about their age to obtain a prescription (it is easier to pretend to be 18 than to pretend to be 21 when you are 16). Finally, the laws might also have altered parents' willingness to provide consent for their daughters to get contraception or have altered their daughters' willingness to make this request of their parents by changing attitudes about youth and sex.

Because of the theoretical ambiguity in effects, it is difficult to establish sharp discriminating tests. However, the general pattern should be that, conditional on birth cohort and state of residence, treatment with a lower age of majority will

1. increase oral contraceptive use among 18–20-year-olds and
2. increase oral contraceptive use more among 18–20-year-olds than among those at other ages.

3 Overview of youth consent and abortion laws in Australia

Much research has already presented the evidence that changes to legal consent laws in the US were exogenous with respect to women's desire for contraception Bailey (2006), Bailey, Guldi, and Hershbein (2013), Bailey, Hershbein, and Miller (2012), Browne and LaLumia (2014), Goldin and Katz (2002), and Guldi (2008, and many others), and I argue that, as in the US, Australia's

federalist political system and participation in the Vietnam War (including a draft) made reduced state ages of majority plausibly-exogenous shocks to the costs of obtaining the pill for Australian women at ages 18–20 (inclusive). Because the extension to Australia is new, the first part of the paper focuses on establishing the relevant legal context in Australia.

This paper describes three major classes of Australian legal rules—age of majority laws, mature minor doctrines, and laws and court decisions regarding abortion—but only the age of majority laws are used as treatment variation in the empirical analyses because the timing of the different classes of laws differs substantially. I have found no evidence of anti-obscenity laws in Australia that would have made sales of oral contraceptives illegal during the period studied in this paper, although multiple states had bans on *advertisement* of contraceptives (Siedlecky and Wyndham 1990), which probably raised the costs of obtaining them.⁵ As will be shown, consent laws in Australia do not clearly provide “Early Legal Access” to oral contraceptives and not abortion. Furthermore, young women could legally obtain the pill in some cases before these laws were passed if the physician had their guardian’s consent or if the Common Law did not outlaw accepting the consent of minors (in other words, a court ruling stating that a behavior is legal generally describes the court’s opinion of existing law rather than creating new law, whereas the ELA literature codes access as beginning at the time of the court ruling). However, the laws that lowered the age of majority from 21 to 18 still represent reductions in costs.

3.1 Age of majority and mature minor doctrines

Every state and major territory has its own age of majority law (hereafter “AoM18”) lowering the age of majority from 21 to 18 years old. Table 1 gives the dates when each law came into force (“commenced”). Two states (New South Wales and South Australia) have separate statutory minimum ages for medical consent, but SA’s was passed after the AFP data were collected, and

⁵Bailey (2010), Myers (2017b), and others treat advertising bans in the US as not preventing access.

NSW's was built in to an age of majority reduction.⁶ For further discussion of the legal environment by state, see Appendix A. More liberal states (South Australia and Victoria) are represented at both the early and late end of legal changes. This is somewhat true for more conservative states (Western Australia and Queensland, for instance). States or territories with very different cultural climates have legal changes around the same time (e.g. Northern Territory and Australian Capital Territory).

Most states and territories have a mature minor doctrine that is based on the English case *Gillick v West Norfolk and Wisbech Area Health Authority* (1986) and the "Fraser Guidelines" developed in that case. The ruling from *Gillick* was approved in Australia on 6 May 1992 in *Secretary, Department of Health and Community Services v JWB and SMB (Marion's Case)* (1992) 175 CLR 218, FC 92/010. and states that "A minor is capable of giving informed consent when he/she achieves a sufficient understanding and intelligence to enable him/her to understand fully what is proposed".

Before Marion's Case, there was some confusion surrounding whether a physician could accept the consent of a minor. The Law Reform Commission of Western Australia (1988) stated that "The common law has already given minors under 16 the right to consent to medical treatment if they are mature" and pointed out that the decision had been used in Australian courts as early as 1987 and that medical organizations in Australia used *Gillick* as the basis for their guidelines. The Family Planning Association of Western Australia is a particularly relevant organization whose 1986 guidelines for medical practitioners incorporated the *Gillick* rules. But this claim that the right to consent already existed does not imply that physicians and patients recognized that fact. First, the age of majority changes used in this paper predate *Gillick* in every case by over seven

⁶The law was a result of a years-long effort to identify what rights an adult should have and when someone should be considered an adult. As in other states, the parliament of NSW asked its Law Reform Commission to report on the rights and obligations associated with adulthood and whether those should be extended to any minors (New South Wales Law Reform Commission 1969). Although the statutory mature minor doctrine was not an unintended consequence of the law, it was not part of the original intent of the reform process.

years. Second, there is evidence from primary sources that there were substantial barriers to minors consenting to their own medical treatment before this. In 1962, Western Australia amended the Health Act “to enable a doctor to perform a blood transfusion upon a person who is or appears to be under the age of 21 years, without the consent of the person’s parent or guarding” (The Law Reform Commission of Western Australia 1972a), suggesting that a physician could not legally do so before this date. The Law Reform Commission of Western Australia (1972b) further suggests that medical treatment for wards of the state (in WA) required the consent of the Director of the Child Welfare Department. In 1971, the Family Planning Association of Australia (NSW) claimed that they would provide the pill to anyone over the age of consent (Siedlecky and Wyndham 1990). Presumably, this was the age at which a girl could consent to sex (16). On the other hand, a 1973 *MJA* editorial suggested that “there exists a possible threat to a doctor of committing a felony by prescribing contraception to a minor.” There were many calls for clarification of the law in the 1970s and early 1980s. The Royal Commission on Human Relationships (Evatt, Arnott, and Deveson 1977) was formed in 1974 by the Australian Commonwealth government and recommended that the law should be explicit about consent of minors: that physicians should be able to accept the consent of anyone over 14 and that mature minor ideas should be used for patients under 14. For some reason, these recommendations were not adopted, and another commission addressed the same question a few years later. The Australian Law Reform Commission was asked to look at the question in 1978 and subsequently asked the Standing Committee of Attorneys General to take over, who then asked the Law Reform Commission of Western Australia to look at the question (this illustrates the extensive federalism in law-making that characterizes the Australian system). Finally, even if the Common Law gave the right of consent to mature minors as early as the 1970s, it is the uncertainty about the law that drives the argument that clarifications in the law reduced the cost of pill access, and this uncertainty is clear in the evidence presented here and in the fact that, according to its authors, the *Medical Treatment for Minors* inquiry received more public comment than almost any other (both for and against mature minor doctrines).

Whether physicians could prescribe the pill to minors was a different matter from whether physicians *should* do so. Siedlecky and Wyndham (1990) document a 1971–1973 exchange in

editorial letters in the *Medical Journal of Australia* showing extensive disagreement about the morality of prescribing the pill to unmarried minors. The legal changes may partially have changed costs of getting the pill by altering physicians' perceptions of morality of prescribing the pill to minors.

One benefit of Australian data over US data is that mature minor doctrines were not clearly-established case law in Australia until much later than the age of majority changes, whereas in the US these changes occurred over the same time period. Because litigation over mature minor concepts often involved questions of contraception, the exogeneity of mature minor doctrines with respect to desire for contraception is more suspect than age of majority exogeneity is. This paper thus looks only at behavior in Australia over the time period covered by changes in age of majority laws and does not use variation in mature minor doctrines to identify effects of youth consent on Pill use. Bailey (2006) and Bailey, Guldi, and Hershbein (2013) make the opposite claim—that the fact that their ELA measure is based on many different sources of variation (legislation, judicial decisions, and family planning polices, for example) makes the argument for their exogeneity stronger because this means that it is hard to think of unobserved factors that would correlate with all of these. However, it is not necessary for the unobserved factors to correlate with *all* sources of policy variation—just with the overall measure of ELA. Barring some extremely improbable correlation structure between the sources of ELA variation, correlation between any one of them and pre-treatment shocks to desire for contraception is sufficient to induce bias in the estimated effects.⁷ There is a good reason to suspect this is happening: most of the sources of legal changes in the US are *not* age of majority changes but are policies enacted with the explicit goal of increasing access to medical services (and often to contraceptives specifically). There cannot be a court decision that a minor can consent to contraceptive treatment without someone with standing bringing the case to court.

⁷I say “shocks” because time-invariant or smoothly-changing contraceptive desires could be captured by state fixed effects or time trends.

3.2 AoM changes as a federalist response to the Vietnam War

3.2.1 “Constructive federalism”

The Australian age of majority changes started as a nationwide effort to lower the voting age (although only Tasmania used the same Act for both purposes). For instance, the Attorney General of NSW requested on 11 March 1966 that the NSW Law Reform Commission consider the question of lowering both the voting age and age of majority. The Attorneys General of the various states and of the Commonwealth agreed that voting age laws would need to be uniform throughout the nation. The issue was discussed at a conference of state Premiers and a conference of Attorneys General in 1968 and was subject to a great deal of discussion and cooperation between the national Attorney General and the governments of the individual states in the following years. The original recommendation for the lower voting age was from a committee in New South Wales in a report that was then considered by the Standing Committee of Commonwealth and State Attorneys-General, and it was agreed that *all states would adopt the recommendations of the report if there was overall agreement to the terms of the report*. The Canberra Times reported that the national Attorney General called the efforts “constructive federalism”. The point here is that the age of majority changes were products of one national-level motivation, whereas the differential timing of the laws might be due to bureaucratic issues. For instance, NSW passed a law lowering the voting age to 18 in 1970, but it did not come into force until 1973—*after* the Commonwealth lowered the voting age for Federal elections. The reason for the delay is that NSW—like other states—used the federal elections rolls for state elections and did not want to bear the cost of maintaining separate rolls “Votes at 18: no move before next election” (1972). After New South Wales passed the lower voting age in 1970, the Canberra Times reported that the Attorney General of Tasmania, Max Bingham, predicted that a voting age of 18 would be “Australia-wide policy within 18 months” (“NSW in favour of voting age cut” 1970). Although this prediction was wrong, it was not due to poor support for the policy among state governments. All state premiers had expressed support for the policy. See Appendix A.4 for a list of voting age laws by state and when they commenced.

3.2.2 “Votes for troops”

The case for exogeneity of these legal changes is strengthened by the reasons for their adoption. As in the United States, Australia participated in the war in Vietnam starting in the 1960s. Like the US, Australia conscripted soldiers to fight in Vietnam, and like in the US this led to intense public opposition. As in the US, males under the age of majority were eligible for conscription in Australia but were ineligible to vote due to their age. The apparent injustice of this led to the extension of voting rights for members of the armed forces under age 21 serving in South Asia starting in 1966 *Commonwealth Electoral Act 1966* (1966, and other state-level Acts), and this move was the origin of the general voting age change. Although there was a little discussion in newspapers and parliament of lowering the voting age to 18 as early as 1962, a search for “voting age” in the archives of the Sydney Morning Herald and the Canberra Times shows that votes for military members overseas broke into public discourse in 1965 right when the government was transitioning into sending men to war. The Sydney Morning Herald reported on 1 April 1966 that “the move to reduce the voting age has been given top priority and the Government hopes to introduce a bill amending the Electoral Act immediately after the Easter recess” (“Fast action on votes for troops”). There was even some concern that soldiers would need parental consent to be stationed overseas (“A Time for Concern”, Sydney Morning Herald, 3 April 1966), but the government reasoned that most drafted 20-year-olds would reach 21 before being sent overseas (“A.L.P Fails to Bar Overseas Service”, Sydney Morning Herald, 13 May 1965).

Background on the Australian draft for the Vietnam conflict can be found in Langford (1997). The draft ran from 1964 to 1972. 20-year-old males were required to register for potential conscription (the US required younger men to register, but the ages at which men in both countries would go to war were similar). The government selected birthdays randomly until the number of 20-year-old men with birthdays selected would be sufficient for their estimated military staffing needs. Men who were balloted in (and did not receive deferments or exemptions) became “National Servicemen” and were liable to serve full-time for two years (18 months after 1971) and could be required to serve overseas and in combat areas.⁸

⁸However, after 1971, national policy was that National Servicemen would not be required

The government planned to conscript 8,400 men per year. Over the eight years of ballots, 63,735 National Servicemen served in the Army from 1965 to 1972, 15,381 served in Vietnam (usually for one year)⁹, and 200 were killed and 1,279 wounded. But some of these were volunteers (Langford 1997). Ville and Siminski (2011) estimate from Australian Censuses that 868,605 men turned 20 during this period. This means that slightly more than 2% of 20-year-old men in Australia were conscripted and served in Vietnam. Not all military members in Vietnam were National Servicemen, so the proportion of all 20-year-old men who served in Vietnam is higher than this 2% figure. 53% of men turning 20 in Australia in the first half of 1965 (the first birthday ballot), and approximately 25% of 20-year-olds were balloted in (selected by the randomization mechanism for potential mandatory National Service) in each subsequent draft until 1972 (Langford (1997) reported the birth dates balloted in, and Ville and Siminski (2011) calculated the proportions).

Although the numbers of Australians who were stationed or died in Vietnam were low relative to comparable numbers of Americans, around a quarter of men born within an 8-year span were exposed to some aspect of the war effort beyond simply registering for the draft (sometimes only a health screening). Further, the fact that this was the first time that the government enacted policy giving themselves the power to compel National Servicemen to participate in an overseas conflict¹⁰ and the fact that opposition parties campaigned on opposition to the draft (and particularly to compelling drafted men to serve overseas), the war could not have been a minor public issue. Cragun and Chatterjee (2018) conducted a search of Australian newspapers throughout the 1960s and 1970s for results related to synonyms for “conscription”, “voting age”, and “age of majority” to serve in Vietnam if they opposed doing so, and before this time, Servicemen who desired to not serve in Vietnam could often avoid it through informal means (requests to be stationed within Australia rather than in Vietnam were often granted, as the number of Servicemen wanting to go to Vietnam was usually sufficient to cover staffing needs).

⁹A separate number of 18,654 has been reported by Ville and Siminski (2011).

¹⁰The only exception was a minor case from WWII where conscripts were required to serve in the South-West Pacific in Dutch territories, but this was still viewed as defense of Australian territory because Japanese forces there were close to Australian territory.

and debates about lowering the voting age and the age of majority often mentioned military service but never mentioned a desire by young women to obtain contraception or consent to medical treatment (although the right to consent to marriage was discussed).¹¹ Thus, perceptions of an unjust conflict between conscription at age 20 and voting at age 21 likely led to lowering the voting age and age of majority.

3.3 Abortion policy changes attenuate estimates

A potential confound is abortion policy. Abortion and oral contraceptives are likely substitutes (Levine et al. 1999), so liberalization of abortion laws and rules at the same time as age of majority changes should attenuate estimates of the effects of the age of majority changes on pill use. On the other hand, if the goal were to interpret the effect of lowering the age of majority on other life outcomes as primarily working through its effect on pill use, not controlling for simultaneous increases in abortion might bias estimates of the effect of pill access to be larger in absolute value (Ananat and Hungerman 2012; Bailey 2006; Bailey, Guldi, Davido, et al. 2011; Bailey, Guldi, and Hershbein 2013; Bailey, Hershbein, and Miller 2012; Goldin and Katz 2002; Guldi 2008; Hock 2007; Myers 2017a,b).

Abortion laws in Australia followed four major regimes.

1. Early on, all states banned “unlawful” abortions, but these laws did not specify which abortions were unlawful. Presumably, interpretation of these laws would be based on English common law.
2. South Australia legalized abortion if the risk of the pregnancy was greater than the risk of termination in 1969 through legislation (and did not permit women from other states to receive abortions in SA).
3. Most other states clearly had common law allowances for “lawful” abortions to protect the pregnant woman that flowed from Australian court decisions starting in 1969. Victoria, for

¹¹The articles came mostly from the Canberra Times and The Australian Women’s Weekly but included some smaller publications.

instance, had a 1969 ruling upholding common law protections for abortions, and NSW had a 1971 ruling doing the same.

4. Most (but not all) states liberalized their abortion laws within the last 20 years. These changes are outside the scope of analysis for this research.

Thus, we should think of the cost of abortion as decreasing in 1969 (possibly throughout Australia, but more so in South Australia and Victoria than in other states) and as decreasing in some states over subsequent years. Luckily for this paper, all of the age of majority changes in Australia were a few years after 1969. The timing of the exact changes in abortion costs is nebulous for most states (only NSW had a clearly-timed court ruling within the range of times when states were reducing their ages of majority), so I do not control for abortion policies in Australia. Thus, the estimates provided in this paper should be seen as lower bounds on effects of age of majority on pill use, as simultaneous liberalized abortion rules should encourage substitution away from Pill use.

Even though there is likely some bias due to abortion environment changes, *the extant research on the US would code no Australian state as having abortion access* over this period because even the South Australia legalization is closer to a “reform” state in the US (allowing abortion to preserve the safety of the pregnant woman) than to a “repeal” state (allowing abortion under most circumstances). Thus, we should expect the bias should be small. For further details on abortion laws, regulations, and practices, see the appendix.

4 US Legal environment

The legal environment by state varies more in the US than in Australia. Unlike in Australia, where the legal changes were generic age of majority changes (except in NSW), in the US, they take many forms. This raises the question of exactly which policy’s effects this paper measures. The codings in Table 2 give the first date when a physician in that state had a positively stated right to accept the consent of an unmarried 19-year-old woman for medical treatment and the unmarried 19-year-old woman could legally obtain that pill from a pharmacist. I give only the dates of legal

changes before 1971 (when the National Fertility Survey data that I use were collected) and after 1960 (when the pill was approved for contraception by the FDA).¹² I follow Bailey (2006) and call this “Early Legal Access” or ELA while acknowledging that “access” is a vague term and that confidentiality may be an important component of the treatment. The dates are based on work from Bailey, Guldi, Davido, et al. (2011) (“BGDB”) and Myers (2017b) (“Myers”) with exact dates added by me when only years were available in those sources.¹³ In addition to choices about the exact age for coding ELA (Bailey, Hershbein, and Miller 2012, use the ability to consent at any age under 21, for instance), there are four major reasons for ambiguity in the timing of ELA:

- Some Comstock laws (laws banning the sale of obscenities) had exceptions for physicians in their “legitimate practice” of treating patients, and whether this included contraceptive services for minors was not clear. I assume that legitimate practice exemptions are equivalent to broad exemptions for physicians, in line with evidence from Bailey (2010) that this comparability could not be rejected.
- *Griswold v. Connecticut* struck down Connecticut’s Comstock law, but whether enforcement of Comstock laws ceased after *Griswold* in some states is unclear. *Griswold* did not invalidate sales bans in general. Rather, the ruling was that *use* of the pill could not be illegal for married people. This leaves open two questions. Laws banning sales of the pill might still be legal, and laws exclusively targeting sales to or use by unmarried women might still be legal. However, these states also tended to not allow young women to consent to medical treatments over the period I study, so this potentially difficult problem is irrelevant in this paper except in the case of Mississippi.

¹²I also present only the dates for states that have at least one resident in the NFS. This excludes Alaska, Colorado, Hawaii, Idaho, Rhode Island, and Wyoming .

¹³Tennessee lowered the age of majority from 21 to 18 on 11 May 1971 and also passed the Family Planning Act 1971 in that year (or in 1972), but I was not able to determine the effective date of the Family Planning Act. As long as it was not signed into law long before May, this should not matter much. I have also not yet determined the effective date of Montana’s 1971 age of majority law.

- Some states had ages of majority that differed for men and women. BGDB suggest that the (typically lower) age of majority for women may not have governed contraceptive consent and code ELA as beginning when the age of majority is equalized (or when some other change grants access). Myers points out some evidence against this interpretation. The differences for my analysis are minor because sex-specific ages of majority were typically enacted before the pill was available and equalized after the data I use were collected, so I show only estimates for the case where female-specific ages of majority govern medical consent.
- Many states had family planning programs that were directed to provide contraceptive services to anyone regardless of age (or with a lower bound on ages that is well below the ages I study). Whether we should think of this as providing broad access is an open question, but I follow Bailey, Guldi, Davido, et al. (2011) and treat such programs as not granting broad access to the pill.
- There are some cases where the age of majority was lowered to 20 from 21 during the time period I study. My estimates use panels where ELA is determined by whether the woman can currently consent to treatment based on a comparison of the woman's age in that month to the legal treatment of women her age in that month. However, using only the ELA at age 19 dates does not substantially change estimates.

While Myers codes confidential access as starting in 1961 in Illinois, the Illinois Criminal Code 1961 was not in force until 1 January 1962, the date I use for Illinois. Nevada has a Comstock-style obscenity law, but it had an exception for physicians “in the legitimate practice of their profession”, which I take as allowing physicians to prescribe contraceptive services, in line with BGDB.

The timing of legality of pill sales in California and Mississippi is ambiguous. The key point for pill use in Bailey (2010) is that the gap in pill use between states without a sales ban and states with a sales ban shrank between 1965 and 1970. BGDB interpret this as evidence that Griswold induced states with sales bans to stop enforcing them. This is only one possible interpretation. Most of the states with sales bans that did not have an exception for physicians repealed their

sales bans no later than 1966.¹⁴ Massachusetts, Wisconsin, and Mississippi and maybe California and Nebraska are the exceptions. Massachusetts and Wisconsin modified their sales bans after *Griswold* to apply only to unmarried women and must have been enforcing them at least partially until the early 1970s, when each faced a court case challenging the law.¹⁵ Given that the data used by Bailey (2010) sampled only married women, we should suspect that the Massachusetts and Wisconsin laws were not relevant to her analysis.¹⁶ There is some possibility that California had a post-1965 sales ban, but the existence of family planning clinics in California before 1965 suggests that the law was already not in force (Myers 2017b) by at least 1964. Nebraska also had a sales ban that was still in the code after 1965, but the State Supreme Court ruled in 1965 that this law only applied to “secret” drugs (Myers 2017b) (and the decision makes it clear that oral contraceptives would not be “secret”). Mississippi repealed its sales ban in 1970, and there is little evidence on enforcement between 1965 and 1970. Bailey (2010) does not show estimates specifically for how the gap between other states and Mississippi evolved from 1965 to 1970. Thus, while *Griswold* may very well have driven other states to modify their laws, there is no evidence that the case caused other states to stop enforcing their laws. This does not affect conclusions about the importance of Comstock laws for pill use and fertility, but it does affect the choices of legal coding used in this paper for Mississippi. I follow Bailey (2010) in assuming the *Griswold* made the pill legal in Mississippi.

For abortion laws in the US, I follow Myers (2017a) and use the dates in the last column of

¹⁴Bailey 2010 has separate indicators for sales bans and physician exceptions in the regressions, but we should expect results to be driven by treatment variation only within states without physician exceptions because the pill requires a prescription, which is provided by a physician.

¹⁵Wisconsin actually did have a physician exception in the law, but it only applied to treatment of married people.

¹⁶Some people in the samples would not have been married at the time they started using the pill, but they must have been married by at least 1 April 1971, after the last survey was completed. Bailey (2010) even communicates her results as being an analysis of the effects of pill access on married women.

Table 2 as the date on which abortion was legal for most purposes in the state and women aged 18 and up could consent to their own abortion. States not in the table legalized abortion (through *Roe v. Wade*) after the NFS data were collected or were not included in the NFS data (Alaska and Hawaii). For all states in the table, 18–20-year-olds became able to legally consent to abortion at the same time, so I do not differentiate between ages. Only Washington has variation in both ELA and abortion laws during the studied time period. However, controlling for abortion policy would be important even if no states had variation in both if abortion and the pill are substitutes. For instance, if pill use fell in New York in 1970 due to abortion legalization, that variation in pill use would be a poor counterfactual for states with pill use variation due to changes in ELA.

5 Data: Australian Family Project

The Australian Family Project (hereafter “AFP”) (M. Bracher and Carmichael 2018) asked 2,547 women aged 20 to 59 in a nationally-representative sample of households¹⁷ in Australia in 1986 and 1987 to recall detailed information about where they had lived throughout their lives, which contraceptive methods they used (and when), and when they were married.¹⁸ The information on state of residence, contraceptive use, marriages, and births was usually reported with monthly precision, so I reconstruct monthly panels of individual lifetimes. With these panels, we can observe in which state each person was living, whether she was using the pill, whether she was married,

¹⁷The sample methodology left out some very sparsely-populated areas.

¹⁸It might be possible to use the 1995 and 2001 Australian National Health Surveys to estimate the effect of a lower age of majority on the probability that a woman used the Pill because the surveys asked when the respondent first started taking oral contraceptives, but this question was only asked to women who were currently taking oral contraceptives, and that gives an impractically small sample of women who would have been 18–20 in the 1970s. Furthermore, making inferences about the entire population of women based on these extremely truncated data would require strong assumptions about the distribution of the underlying data even if were many women using the Pill at the time of the survey who would have been 18–20 in the 1970s.

whether she had given birth or had living children, and how old she was in each month of her life. The details of the panel construction can be seen in the online replication package available from the author.¹⁹

Figure 3 gives the counts of women in the AFP living in each state (including overseas) during each month. As in the Australian population overall, most sampled women lived in NSW and Victoria. When looking at historical state of residence for these women, the proportions by state are fairly stable except that as many as 15% and as few as 0% might be living overseas. The sample may not be representative of women who lived in Australia during age 18–20 because some women would have died or moved out of Australia before 1986 and thus been ineligible for the survey. To the extent that early death or international migration is correlated with treatment

¹⁹Two of the women were dropped from the sample because they did not remember their month of birth. Seven women who reported using some birth control method in their lives declined to give dates of use and were also excluded from my sample. The AFP survey used a life history chart methodology, which has been shown to improve recall of timing of events (M. D. Bracher 1987). As a check on participants' honesty, the interviewers were asked to rate the degree to which respondents seemed reluctant to answer questions and reported their (subjective) sense that participants had little problem with answering questions about contraception (as opposed to, say, financial matters, where resistance was common).

Over 91% of respondents who no longer lived in their childhood family home reported the month they moved out. Months for subsequent moves were not reported unless they were moves to Australia from overseas. Out of 8,542 reported moves, 3,198 had no reported month. Over half could be thrown out because all moves in that year were to residences within the same state as the respondent's state of residence before that year. Some of the rest were taken from the month the respondent reported moving in with a romantic partner or from marriage dates and a spouse's report of moving in together, but the majority were imputed based on the frequencies of observed moves out of childhood homes by month. Approximately 83% of birth control use spells were reported with starting and ending months (only 0.7% of spells were missing both the starting and ending months).

with a lower age of majority, this will bias estimates. The sign of the correlation is not obvious, so the direction of bias is unknown. The counts start at zero on the left of the figure because the panels are unbalanced; The youngest women in the sample were born in October 1966 (indicated in the figure), while the oldest were born in May 1926.

Figure 4 shows the counts of women in the AFP living in each state (including overseas) at each month of age. If there were no migration, counts would not change before age 20 (the youngest age of women surveyed). Immigration from overseas picks up at age 18 and appears to mostly be directed toward NSW, Victoria, and WA (although migration into NT is the largest in proportional terms, followed by WA and ACT).

Figure 5A shows the number of women in the AFP born during each year and emphasizes the cohorts that will turn 18 during the years of the first and last age of majority changes. Because every woman born before 1950 would have turned 21 before her state lowered the age of majority and women born in 1950 would turn 36 in 1986, estimates of effects for women over age 36 can never be due to previous treatment during ages 18–20.

6 Data: National Fertility Surveys

The 1970 National Fertility Survey sampled ever-married women in the US and asked them to recall pill use over their lives with monthly precision. The 1965 survey sampled currently-married white women. Unlike the AFP, the NFS did not ask women to report where they had lived in the past, so all treatment conditions for the US are determined by the state in which the person was interviewed. BHM used the sample of women born from 1942 through 1948. For the analyses in this paper, I use subsamples of women who reached particular ages (16–25) after the pill was approved for contraceptive purposes by the FDA. Figure 5B shows the number of women in the NFS born during each year and emphasizes the cohorts that will turn 18 after the pill was introduced and that turn 21 before the survey. I do not show estimates of the proportion of women living in each state at each age or month as I did for the AFP because there are too many states to show these data compactly, because women in the NFS did not report where they had lived in the past,

and because these data are already well-known from their use in past research.

7 Time Series Evidence

Over 82% of women in the AFP used some sort of contraception, and the most commonly reported method by a wide margin was oral contraception.²⁰ Figure 6A shows estimates of the proportion of women aged 18–20 using the Pill as a function of the number of months since their state lowered the age of majority from 21 to 18 in Australia and shows little evidence of an effect. However, panel 6B shows the same thing for only 19-year-olds and shows weak evidence for a jump in use after the laws changed.

Figure 6C shows the same for ELA in the US with the NFS. The patterns of use are quite different from in Australia. Pill use in US states tended to *fall* after ELA. Because of the potential endogeneity of the US laws, we might reasonably suspect that the increase in use before the laws passed was partially responsible for the changing legal environment.

However, because pill use is likely to persist over time, initial pill uptake may be a more relevant outcome measure than concurrent pill use. Figure 7A shows the rate of pill uptake for women aged 18–20 in the AFP who have never before used the pill as a function of years since the date the age of majority fell from 21 to 18 in their state. Year 0 ends on the day before the month in which the law changed. Because starting pill use is a low-frequency event and because there is no guarantee that any given woman aged 18–20 in the sample would be observed living for the entire year in the same state while also aged 18–20, the height of the line is the average of the monthly uptake proportions (averaged within each year since the law changed) multiplied by 12. The rate of initial uptake is higher after the age of majority falls.²¹

Figure 7B shows the rates of pill uptake for the US (using the NFS data) as a function of years

²⁰Abortion was not one of the options in this question.

²¹It would be nice to look at similar figures for condom use, as condoms do not require a prescription and thus can serve as a discriminating test. However, the reported rates of condom use are so low as to be uninformative. For instance, the sample contained slightly more than 200 women aged 18–20 in each of the 60 months centered at the age of majority changes, but none of those

since the law changed in the woman’s state. As in the case of proportions of women using the pill (Figure 6C), we again see pill use accelerating a few years before the laws changed.

8 Regression Evidence on Initial Pill Uptake

Figures 7A and 7B do not control for state-specific and time-specific differences in uptake. To do so, I estimate a set of difference-in-difference linear probability models and proportional hazard models of the choice by an individual to start or not start using the pill at a given age as a function of the legal environment in her state during that month. At the beginning of each month of age in either model, a woman who has not yet used the Pill observes the laws in her current state and then chooses whether to start using the Pill.

I specify a proportional hazard model for months until first Pill use:

$$\ln \theta_{ia} = \ln \theta_{0a} + \delta \times AoMI\delta_{ia} + X + \eta_{ia} \quad (1)$$

where θ_{ia} is the probability that person i will start the pill at month of age a given that she has never used the pill (the hazard), θ_{0a} is the baseline hazard at age a , $AoMI\delta_{ia}$ is 1 if the woman’s state had lowered its age of majority to 18 before the month in which she was age a (and 0 otherwise), η_{ia} is normally distributed, and X contains state of residence and birth year indicators and state-specific months had more than 3 women reporting condom use during that time. The question wording may have encouraged this result. Respondents were asked when they started and stopped using contraception and what kind they used, but the respondent was allowed to define what constituted a period of use. Asking for extended periods of use may bias respondents against reporting condom use because respondents might view each use of a condom as a separate event. For instance, a woman could report that she started using condoms at 7:52 pm on May 3 and that she stopped using condoms at 8:24 pm on that same day. She could then report that she started using condoms again the next day. But reports of contraceptive spells starting and stopping within the same month are rare in the data. Also, although female condoms exist, they are much less common than male condoms, and women may not view their selves as using male condoms. It may also be true that oral contraceptive use is easier to recall than condom use, as the timing of condom use is irregular.

linear birth month trends. For estimates for the US, $AoM18_{ia}$ is replaced with $ELA19_{ia}$, which equals 1 if the woman's state had ELA for 19-year-olds before the month in which she was age a . Using Cox's partial likelihood estimation procedure (Cox 1972), we do not need to specify θ_{0a} in order to estimate δ , the approximate proportional increase in the hazard due to being in a state with a lower AoM.²²

The linear probability model is

$$Pill_{ia} = \alpha \times AoM18_{ia} + X + \varepsilon_{ia} \quad (3)$$

where $Pill_{ia} = 1$ if person i used the pill for the first time at month of age a and 0 otherwise and X contains state of residence and birth year indicators, state-specific linear birth month trends, and month of age indicators. The month of age indicators are analogs to the baseline hazard.

Estimating these models on women aged 18–20 (inclusive) would impose the assumption that the effect of $AoM18$ is constant over that age range (either additively or proportionally, depending on whether the linear or proportional hazard model is used). This may be a strong assumption given the big life transitions that young adults face. Thus, I separate the data by year of age (for each of ages 16–25) and estimate both models separately on sets of person \times month observations for women who are the given age in the AFP and NFS.²³ For the AFP, I limit the sample to those

²²For imaginary women i and j of the same age from the same state such that i is treated with a lower AoM while j is not, $\frac{\theta_{ia}}{\theta_{ja}} = e^{\delta} e^{\eta_{ia} - \eta_{ja}}$. While it is not true that $\frac{E(\theta|AoM18=1)}{E(\theta|AoM18=0)} = e^{\delta}$ because $E[e^{\eta_{ia} - \eta_{ja}}] \neq e^{E[\eta_{ia} - \eta_{ja}]}$, δ is a useful approximation for the proportional treatment effect (the hazard for treated women is approximately $e^{\delta} - 1 \approx \delta$ higher in proportional terms than the hazard for untreated women is). For large negative coefficients, $e^{\delta} - 1$ is a better approximation. To be exact, δ is the ratio of the expected values of the log hazard for unmarried treated and unmarried untreated women:

$$E(\ln \theta | AoM18 = 1) - E(\ln \theta | AoM18 = 0) = \delta \quad (2)$$

²³The reason for using separate regressions is to make the randomization inference procedure described below tractable.

women who never lived outside Australia at the age used in the regression, who have not used the Pill in the past, and who turned the given age after 1968 and before 1981. 1968 is three years before the first AoM reduction, and 1981 is three years after the last AoM reduction, so this gives a small windows of cohorts with no treatment variation on either end of the period of legal changes. For the NFS, I limit the sample to person \times month observations after June 1960 for women who had never used the pill before.

For inference, I use 90% confidence intervals based on the larger of the standard OLS variance estimator and a cluster-robust variance estimator (CRVE). The variance estimator used is

$$\max \left\{ \frac{G(N-1)}{(G-1)(N-k)} (\mathbf{X}'\mathbf{X})^{-1} \left(\sum_{g=1}^G \mathbf{X}'_g \hat{\varepsilon}_g \hat{\varepsilon}'_g \mathbf{X}_g \right) (\mathbf{X}'\mathbf{X})^{-1}, \frac{\hat{\varepsilon}'\hat{\varepsilon}}{N-k} (\mathbf{X}'\mathbf{X})^{-1} \right\} \quad (4)$$

where G is the number of states, N is the number of observations, k is the number of regressors, \mathbf{X}_g is the sub-matrix of regressors for state g , $\hat{\varepsilon}$ is the vector of residuals, and $\hat{\varepsilon}_g$ is the vector of residuals for state g .

The CRVE-based standard errors are almost certainly too low (Bertrand, Duflo, and Mulainathan 2004), so I also get P-values from a randomization inference (RI) procedure with at least 300 placebo draws of treatment dates. The idea behind RI is that randomly-selected dates for placebo policy changes should have no effect on average, so we can approximate the sampling distribution of the estimated effects under the null hypothesis of no effect with the distribution of estimated effects from placebo laws (or get the exact sampling distribution if we know the underlying distribution from which the policy dates are drawn). The procedure used is as follows.

1. For each state, randomly select a placebo policy date.
2. Estimate the model with the placebo laws.
3. Repeat steps 1 and 2 many times.
4. Calculate the p-value as the proportion of placebo-based estimates that are further from 0 than the estimates with the actual policies are.

RI assumes that we know the distribution from which the policy dates were drawn (Ferman and Pinto 2019). That assumption is violated in this paper, but the violation may be small. For the

US case, there are many policy dates to choose from, and the observed empirical distribution of dates may be a good approximation to the underlying distribution. For the Australia case, the dates are almost uniformly (empirically) distributed across the 1970s. For both countries, the p-value estimates based on placebo draws from the observed dates and from uniformly-distributed dates are almost identical, so not knowing the exact underlying distribution is probably unimportant here. For the US, I report p-values by sampling from the existing policy dates. For Australia, the p-values are based on placebo laws sampled from a uniform mass function over the months of January 1970 through December 1979.

Another concern in using RI is that heteroskedasticity due to treated clusters being smaller (or larger) than untreated clusters can lead to over(or under)-rejection (Ferman and Pinto 2019). Every Australian state is treated in this analysis, and the largest states are treated both early and late in the 1970s. For the US, the treated states are about average in size.

Fig. 8 shows estimates of the linear model (Equation 3) for ages 15–25 with the AFP. The top panel plots the coefficients from the LPM with state-specific linear time trends. The shaded bands give 90% confidence intervals based on the larger of the standard OLS variance estimator and a cluster-robust variance estimator (CRVE). P-values from the randomization inference procedure are in the middle panel. The bottom panel shows the number of women in the sample who have never used the pill before the first month when they are observed at that age.²⁴

Fig. 9 gives the proportional hazard estimates of effects of the lower age of majority on uptake by age for Australia. The pattern is similar. Sampling error is amplified in the multiplicative (proportional) model. Although this is not shown in the figure, I estimated the hazard model for all ages from 14 to 24, and there is extreme variability in the hazard estimates at higher ages. This is consistent with there being a nearly constant additive effect, as this effect would be compared to a much lower base rate of uptake for older women (this is in no way a formal test of the model specification, but the LPM used the same data and did not have those extreme swings, so this is not

²⁴The p-values implied by the CRVE are slightly smaller than those given by the RI procedure, but the difference is not as great as in some recent research on inference in difference-in-difference applications (e.g. Bertrand, Duflo, and Mullainathan 2004).

simply a case of more sampling variability at extreme ages). There is also no reason in the theory in extant research why the effect should be proportional to the base rate of uptake.

Being exposed to an age of majority of 18 instead of 21 is associated with increased uptake at age 19 in Australia. The lack of an effect at ages 18 and 20 is somewhat puzzling. Perhaps sexual activity at 18 may not have been great enough to drive important changes in contraceptive use at that age, but I lack data on sexual activity to perform the needed tests. Estimates with the data for women aged 18–20 (inclusive) pooled still show an increase in uptake of about half a percentage point at these ages.²⁵

We might reasonably be concerned that the population at risk at age 19 contains women who were putting off starting the pill until after age 18 as a result of the lower age of majority because the cost of waiting until you are considered an adult is lower if you will be considered an adult sooner and that this explains the uptick in uptake at age 19. However, the estimates show no evidence of this behavior. If uptake is being moved from one age to another, it is probably from the early 20s to 19. There is weak evidence for a decrease in uptake for women slightly older than 21. A negative effect could be because the women who would have started the pill during ages 21–23 in the absence of an age of majority change were induced to start earlier by the lower age of majority and, hence, are no longer at risk (in the sample and eligible to start the pill for the first time). Women in their early 20s may also be less likely to start using the pill under the lower AoM because of how the law affected other choices they made (marriage, childbearing, schooling, or career choices, for example). Regardless, the evidence that the coefficients truly are negative is quite weak, so the possibility that the increase in uptake at 19 is from women who would not have used the pill at all without the AoM reduction remains.

If we take the point estimates as the actual coefficients (admittedly, a very restrictive assumption given the standard errors), we can make some calculations about effect sizes. A 20% yearly rate of pill uptake among 18–20-year-olds (an approximation from Figure 7A) implies a monthly rate of uptake of 1.84%. The 1.84 percentage point increase in monthly uptake at age 19 is a 99.9% increase (almost identical to the estimate of the effect on the proportional hazard) and implies a

²⁵These estimates are available from the author on request.

16.3 percentage point increase in the cumulative probability of uptake over age 19.

The LPM estimates for the US (in Figure 10) with the NFS give larger point estimates. This should be expected because the legal changes in the US were often contraceptive-specific and because the laws may be endogenous to positive shocks to desire for contraception. There is an increase in uptake at age 20. Although not shown, estimates of effects at higher ages are sometimes as large (and precisely estimated) as the apparent effect at age 20. This is, again, expected because the legal changes in the US do not just grant ELA—most of them were changes to broad regulations on contraception that would have applied to all ages. When compared to the RI p-values, the CRVE-based confidence intervals do a poor job of representing the uncertainty from sampling error. Proportional hazard estimates for the US are in Figure 11 and give at most very weak evidence of an increase in uptake at age 20.

9 Conclusions for the validity of youth consent laws as “Early Legal Access” to the pill

The results presented here suggest that there may be some value to using age of majority laws as if they produce variation in the costs of obtaining oral contraceptives. A lower age of majority increases the monthly rate of pill uptake among women at age 19 by around 2 percentage points, approximately doubling the rate of uptake. This estimator is likely biased downward by changes in abortion regulations around the same time. The estimate of a 10 percentage point increase in the monthly rate of uptake for the US is likely biased upward by endogeneity of the laws to shocks to desire for contraception. An effect size between 2 and 10 percentage points per month is non-trivial, but the increase in uptake is short-lived and generally does not last over the entire period of age 18–20 (which suggests that researchers must be careful about how they define treatment variables using these laws, as being exposed to a law before age 19 might have no effect, while being exposed before age 21 might have a large effect).

Even if the results here show that age of majority reductions represent meaningful reductions in pill uptake costs, readers should use caution in attempting to use such laws as instrumental vari-

ables. This research has made little attempt to evaluate the exclusion restriction needed to use the laws as instruments for pill costs. If age of majority reductions reduce the costs of contracting for home loans (one of the primary discussions about the meaning of legal minority in Australia when these laws were changing), registering for higher education, or getting student loans or change cultural attitudes about early sexual activity (other than by their effect on contraceptive costs), the instrument will be invalid. Results showing that effects of similar legal changes in the US on educational attainment are mediated by fertility may increase our confidence that age of majority laws are valid instruments for pill costs but are not sufficient. Policies specifically designed to alter contraceptive costs (e.g. repeal of Comstock laws in the US) represent an alternative strategy for looking at the “power of the pill” (Goldin and Katz 2002) and produce larger effects on pill uptake if the estimates presented here are unbiased estimates of the causal effect, but these legal changes may suffer from endogeneity to shocks in attitudes about contraception despite heroic attempts by researchers to subject them to tests for pre-treatment correlations (Bailey, Hershbein, and Miller 2012, for instance). This endogeneity also represents a violation of the exclusion restriction.

Because potential violations of the exclusion restriction abound, the most fruitful application of this research may be in identifying effects of youth autonomy on life outcomes rather than in arguing that such effects are results of pill access costs.

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Table 1: Dates of age of majority laws and mature minor doctrines by Australian state and territory

State or territory	AoM of 18 Commenced	MM commenced
New South Wales	*1 Jan 1971	6 May 1992
South Australia	15 Apr 1971	1 May 1987
Western Australia	1 Nov 1972	6 May 1992
Tasmania	1 Aug 1973	6 May 1992
Australian Capital Territory	1 Nov 1974	6 May 1992
Northern Territory	1 Nov 1974	6 May 1992
Queensland	1 Mar 1975	6 May 1992
Victoria	1 Feb 1978	6 May 1992

Note — MM is “mature minor doctrine” and AoM is “age of majority”.

* *Minors (Property and Contracts) Act 1970* was an age of majority reduction but also included a clause specifying that mature minors over age 14 could consent to medical treatment.

Table 2: Dates of ELA and when abortion was first legal (for most purposes) and confidentially available to 19-year-olds by US state

State	ELA at age 18	ELA at age 19	ELA at age 20	Abortion legal
Kansas	1970-05-09	1970-05-09	1970-05-09	After NFS
Kentucky	1965-01-01	1965-01-01	1965-01-01	After NFS
Maine	After NFS	After NFS	1969-10-01	After NFS
Mississippi	1965-06-07	1965-06-07	1965-06-07	After NFS
Nebraska	After NFS	After NFS	1969-12-25	After NFS
New York	After NFS	After NFS	After NFS	1970-07-01
North Carolina	1971-03-02	1971-03-02	1971-03-02	After NFS
Pennsylvania	1970-04-14	1970-04-14	1970-04-14	After NFS
Washington	1970-02-20	1970-02-20	1970-02-20	1970-12-03

Note — The table includes only the states where laws changed after June 1960 and before April 1971.

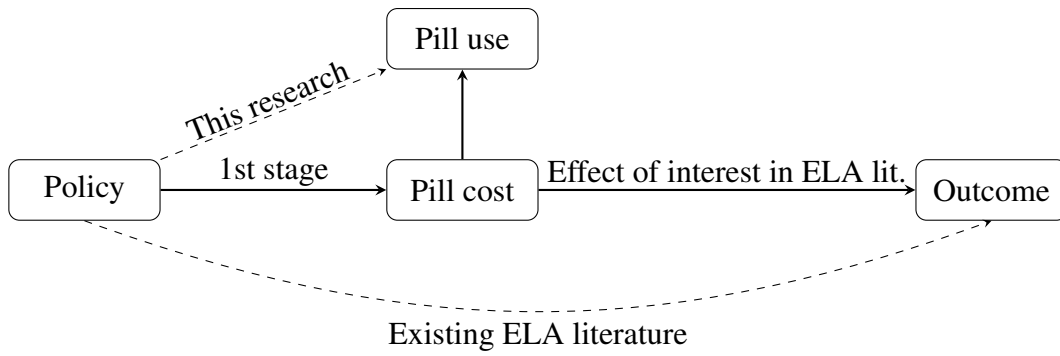
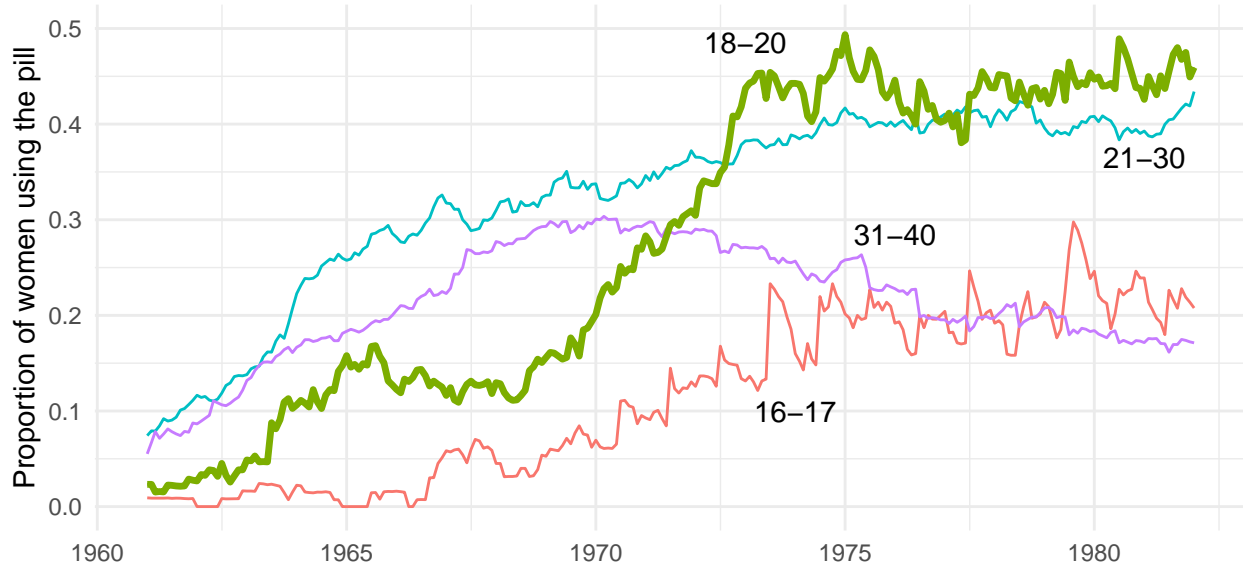
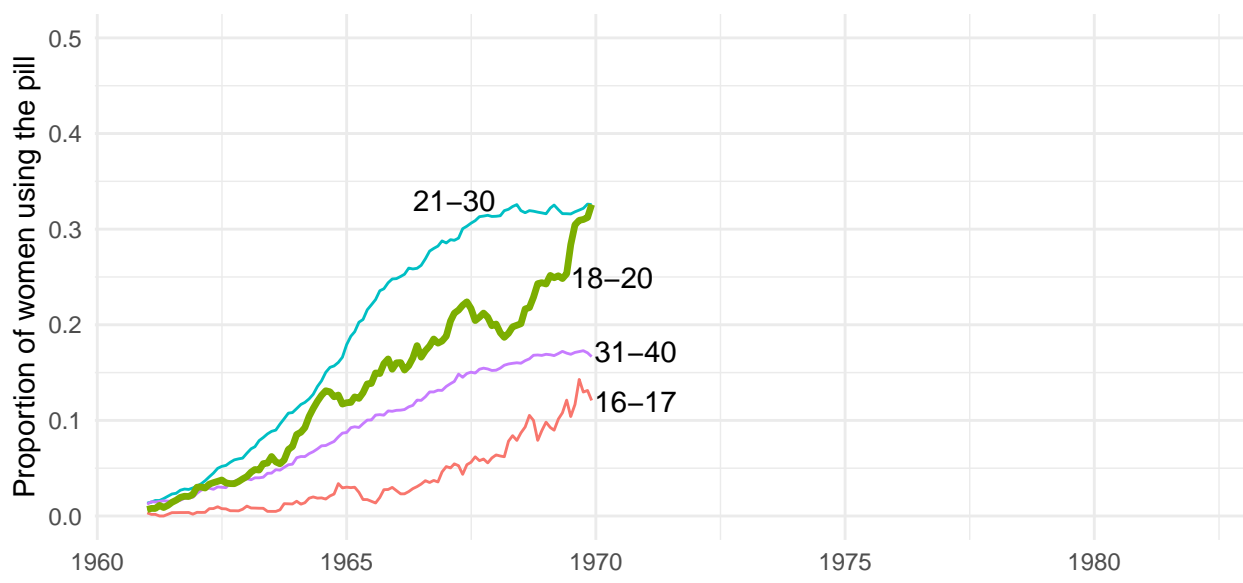


Figure 1: Characterization of the “Early Legal Access” literature



(A) Australia (Australian Family Project)



(B) USA (1970 National Fertility Survey)

Figure 2: Estimates of the proportion of women using the pill in each month by age group (weighted by sample weights)

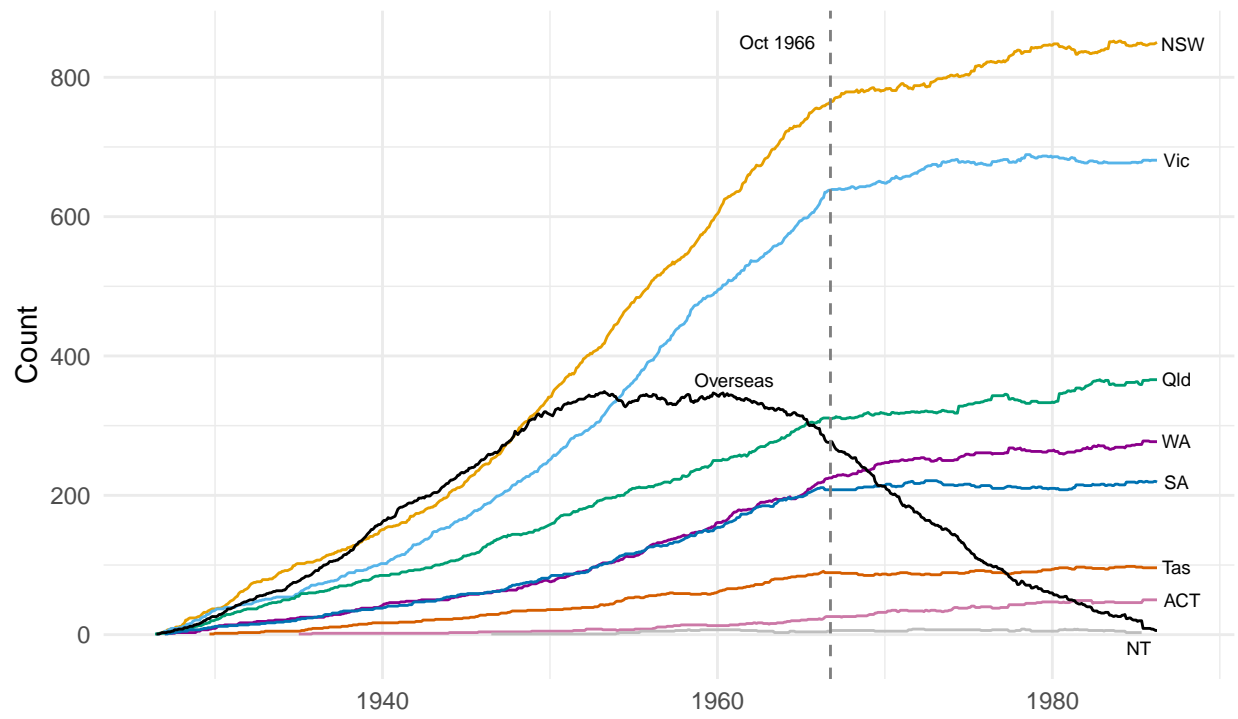


Figure 3: Counts of women in the Australian Family Project data living in each state during each month

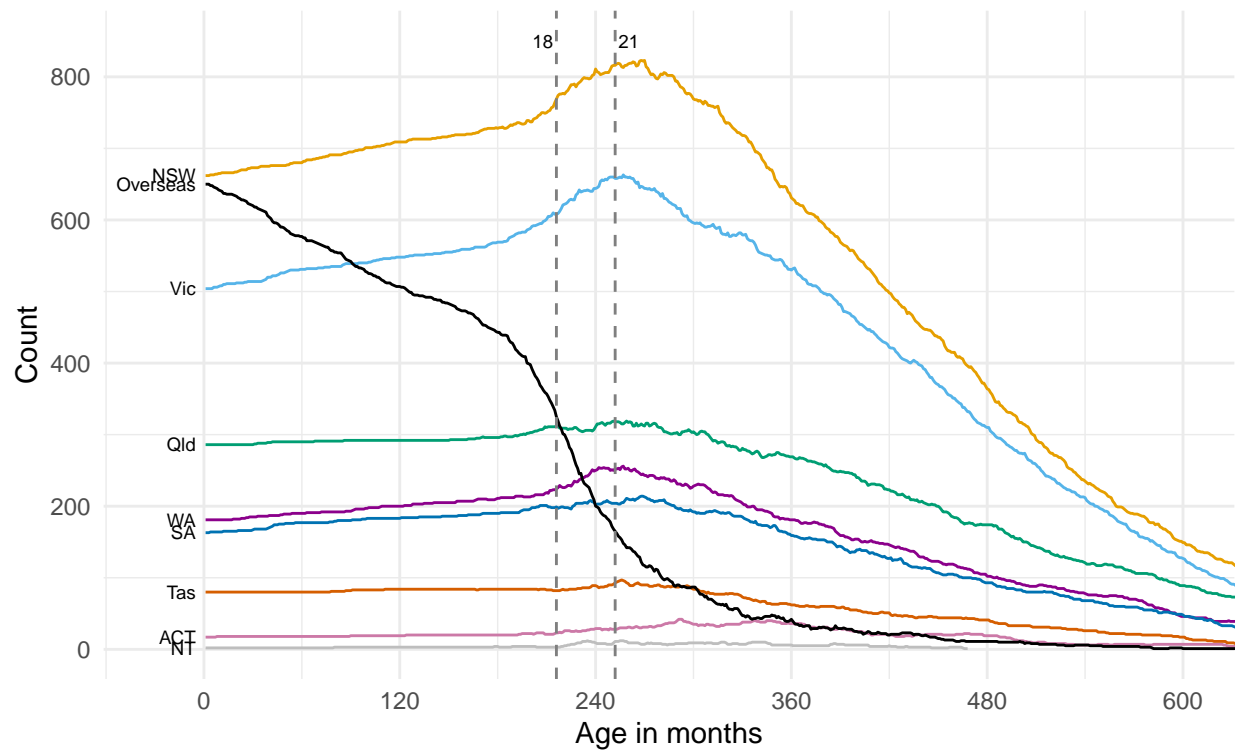
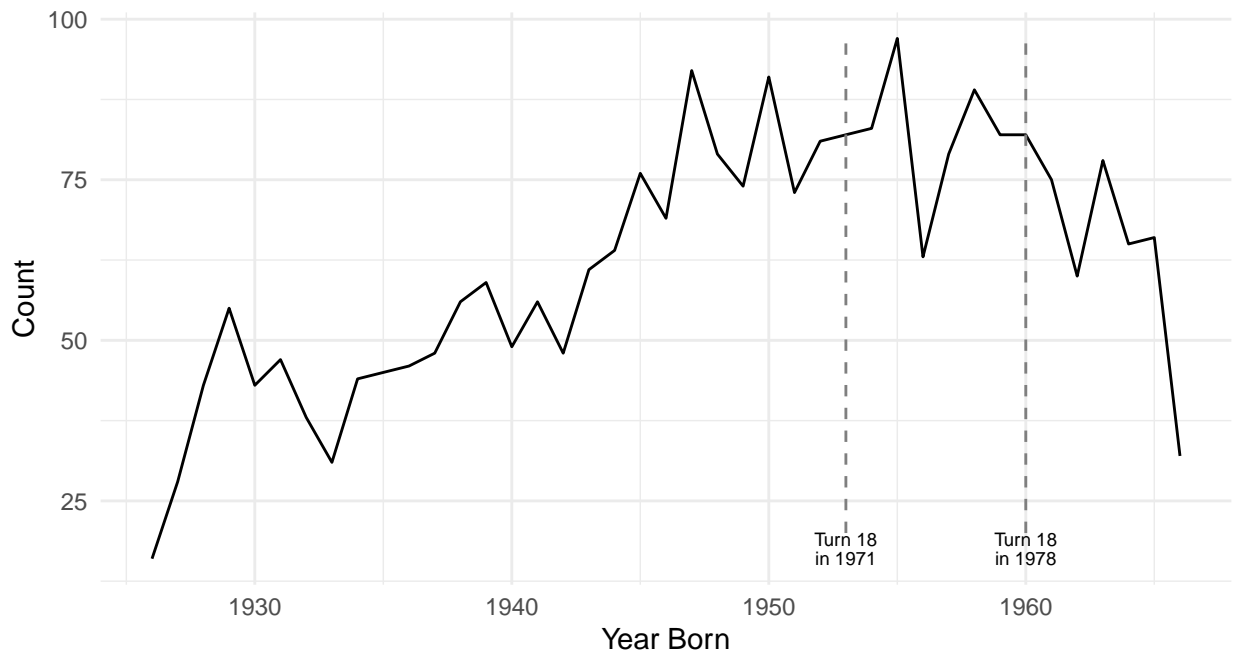
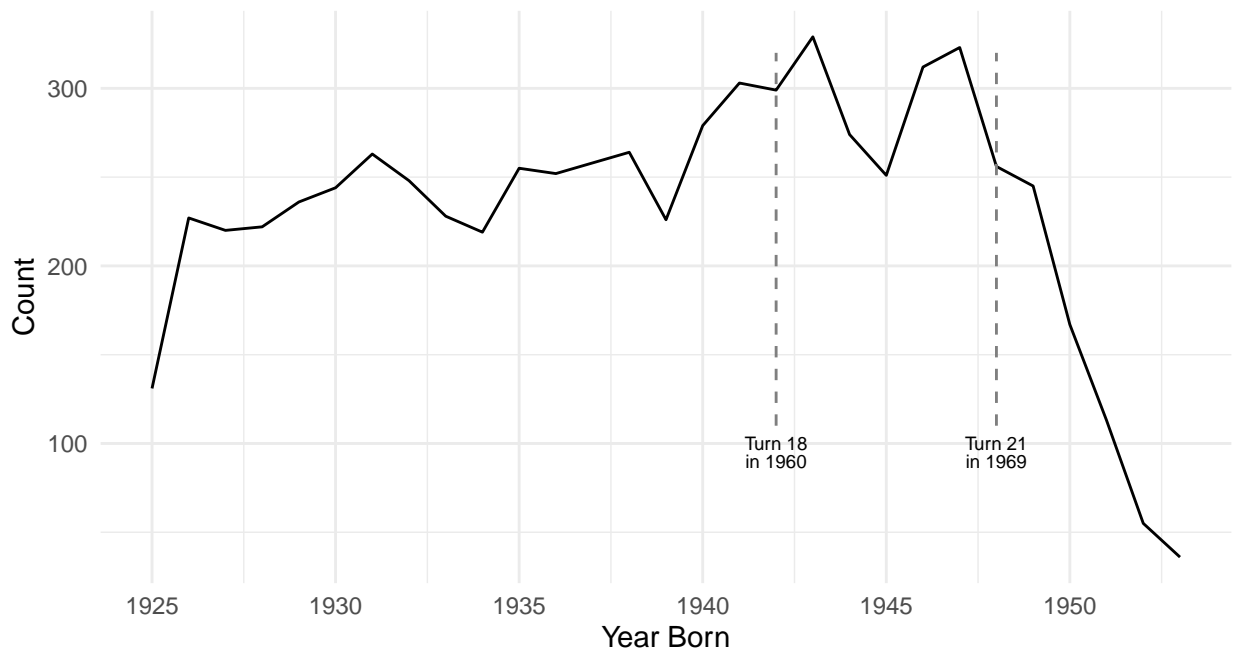


Figure 4: Counts of women in the Australian Family Project data living in each state at each month of age

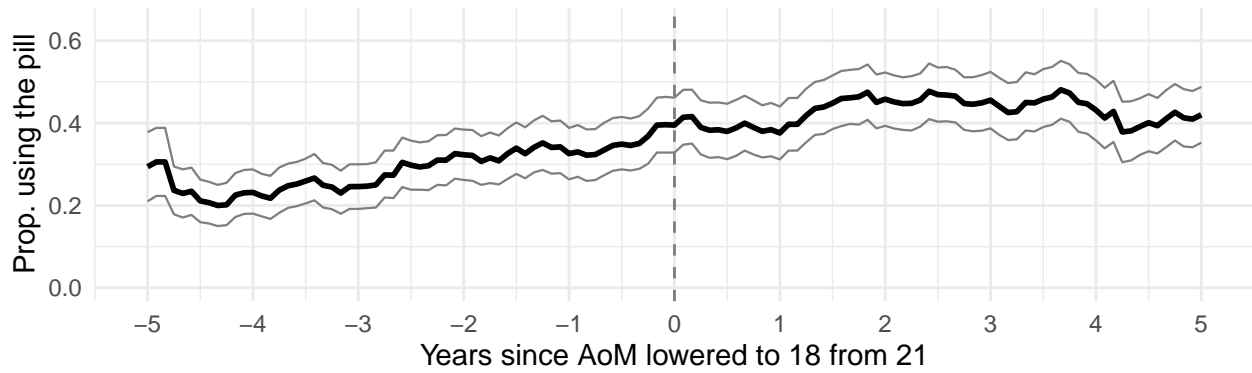


(A) AFP

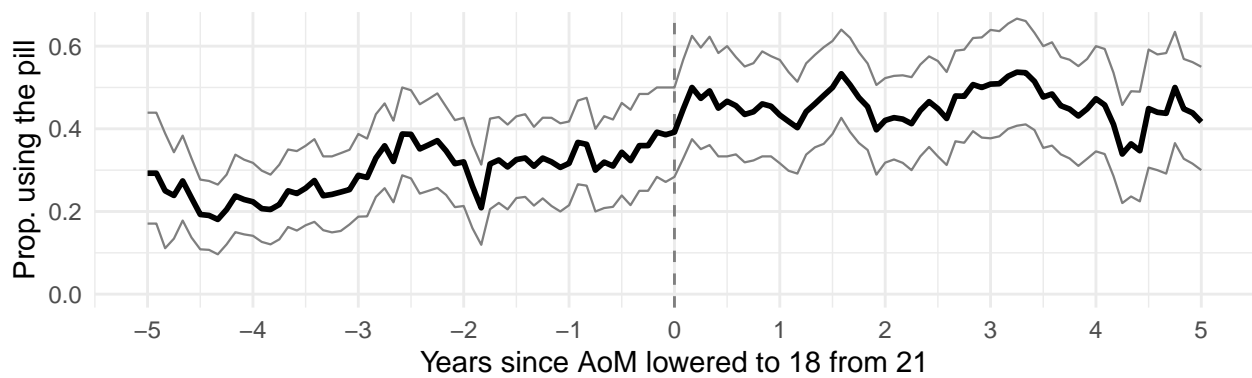


(B) NFS

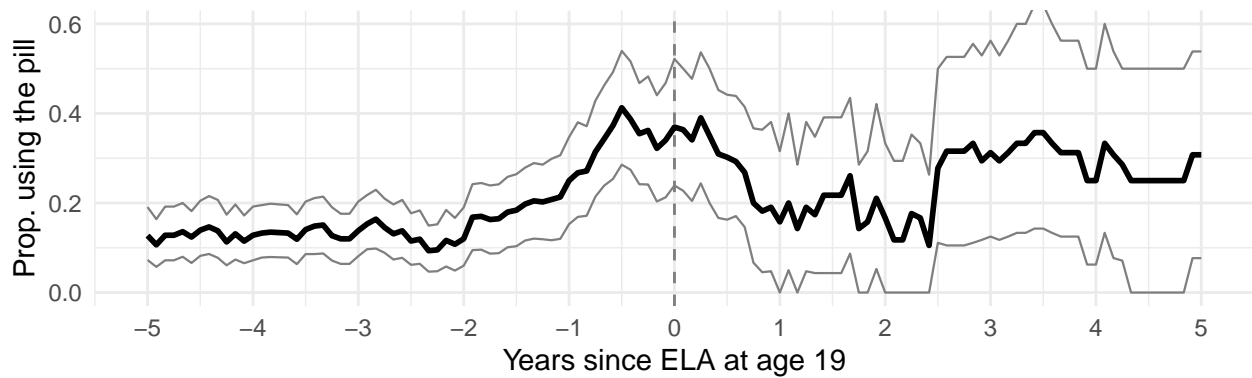
Figure 5: Counts of women in the sample born during each year



(A) AFP (ages 18–20)

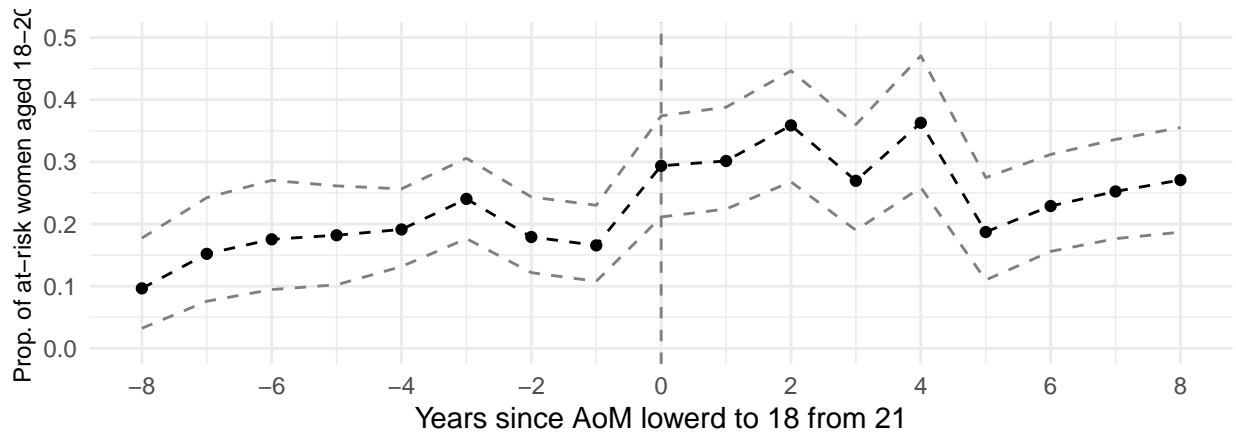


(B) AFP (age 19)

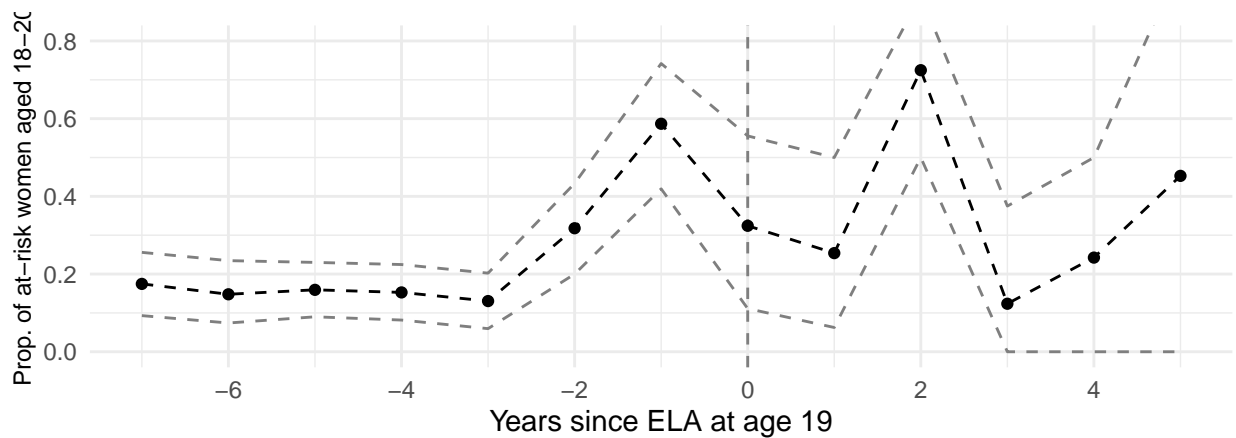


(C) NFS (ages 18–20)

Figure 6: Proportion of women aged 18–20 in the Australian Family Project and 1970 National Fertility Survey data using the Pill during each month with 95% confidence intervals. NFS estimates include only women living in states that enacted ELA during the study period (after the pill was approved by the FDA for contraceptive purposes and before the last NFS data were collected).



(A) AFP



(B) NFS

Figure 7: Proportion of women aged 18–20 in the AFP and NFS data who have never before used the pill (“at-risk”) who start using the pill as a function of years since her state enacted liberalized youth consent laws with 95% confidence intervals. Year 0 ends on the day before the month in which the law changed. Because there is no guarantee that any given woman aged 18–20 in the AFP would be observed living for the entire year in the same state while also aged 18–20, the height of the line is the average of the monthly uptake proportions multiplied by 12 (for instance, if a state changed its laws on 1 July 1971, a person who turned 18 on 12 Sept 1971 would only be observed at ages 18–20 for part of the year following the legal change and she might furthermore move to another state during that year). NFS estimates include only women living in states that enacted ELA during the study period (after the pill was approved by the FDA for contraceptive purposes and before the last NFS data were collected). The horizontal axes differ because of data availability.

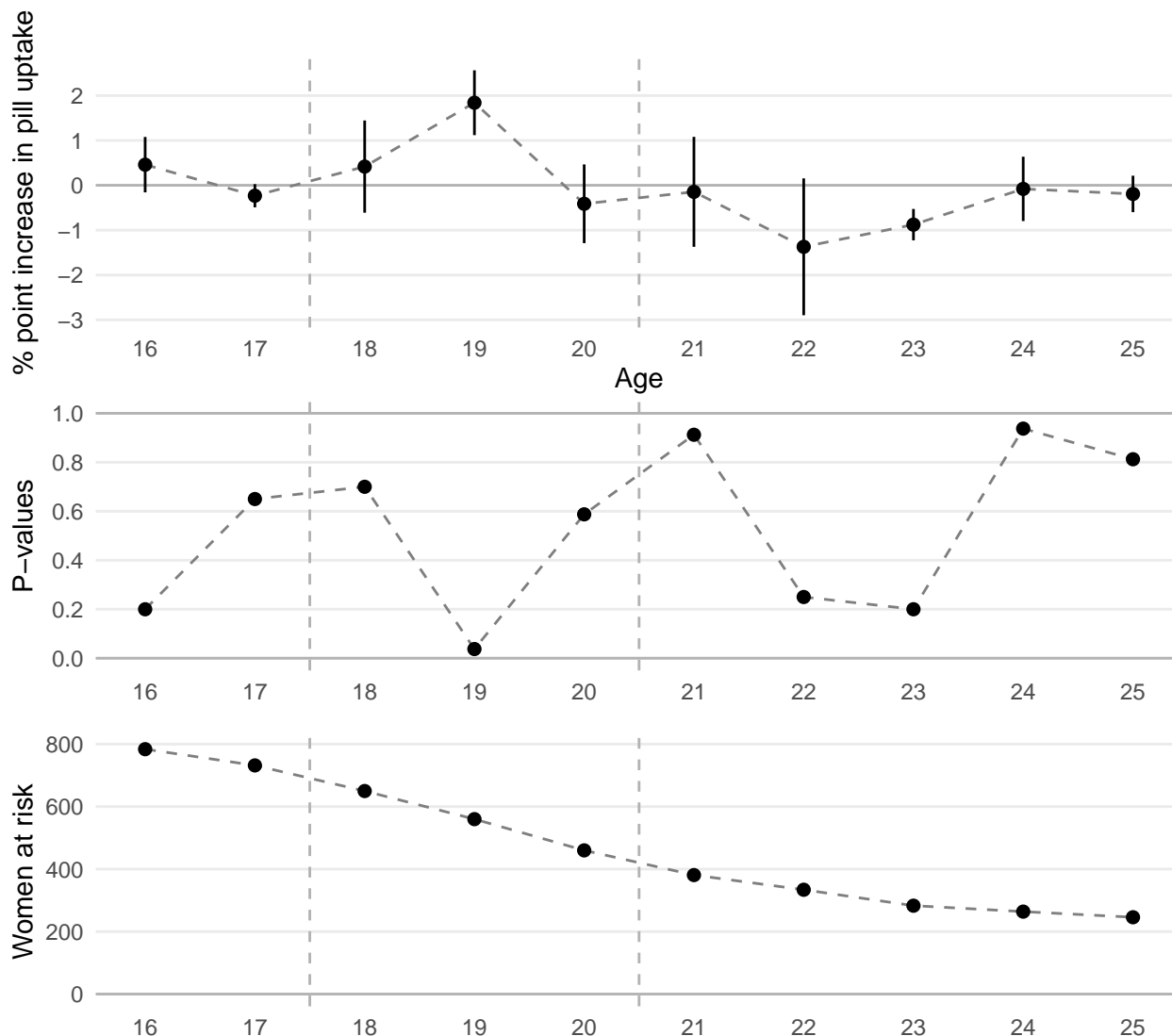


Figure 8: Age-specific increase in the monthly rate of pill uptake (in an LPM) as a result of living under an age of majority of 18 instead of 21 among women in the AFP who have never previously used the pill. The middle panel gives p-values from the randomization inference procedure, and the bottom panel shows how many women were in the sample. Vertical lines through each point indicate 90% confidence intervals based on the larger of cluster-robust variance estimators with clustering by state and the standard OLS variance estimator (whichever is larger). Each point and confidence interval is from a separate regression on women who reached the given age after 1968 and before 1981, who never used the pill before that age, and who did not live overseas at any time while that age.

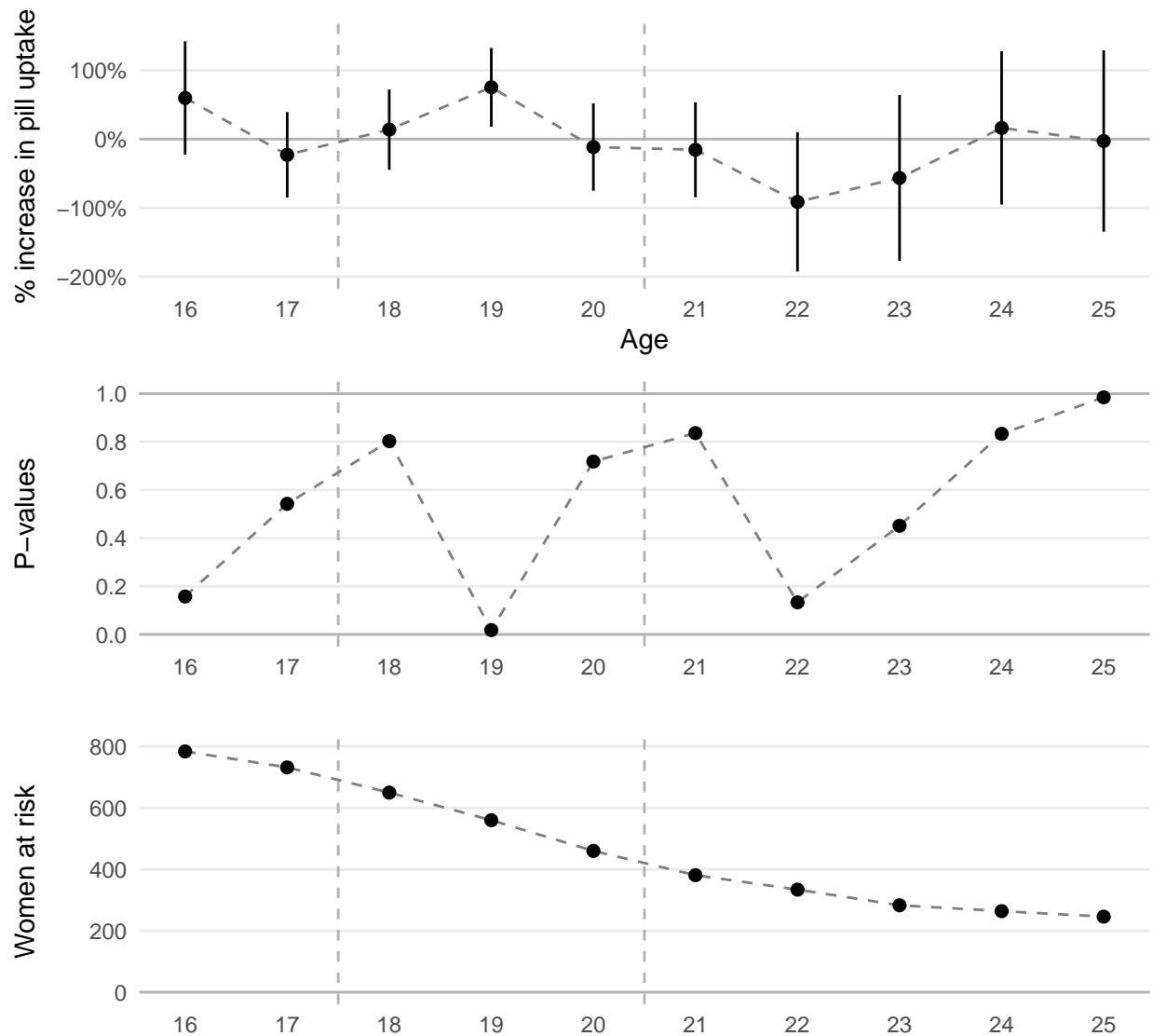


Figure 9: Age-specific increase in the monthly rate of pill uptake (in a proportional hazard model) as a result of living under an age of majority of 18 instead of 21 among women in the AFP who have never previously used the pill. The middle panel gives p-values from the randomization inference procedure, and the bottom panel shows how many women were in the sample. Vertical lines through each point indicate 90% confidence intervals based on the larger of cluster-robust variance estimators with clustering by state and the standard OLS variance estimator (whichever is larger). Each point and confidence interval is from a separate regression on women who reached the given age after 1968 and before 1981, who never used the pill before that age, and who did not live overseas at any time while that age.

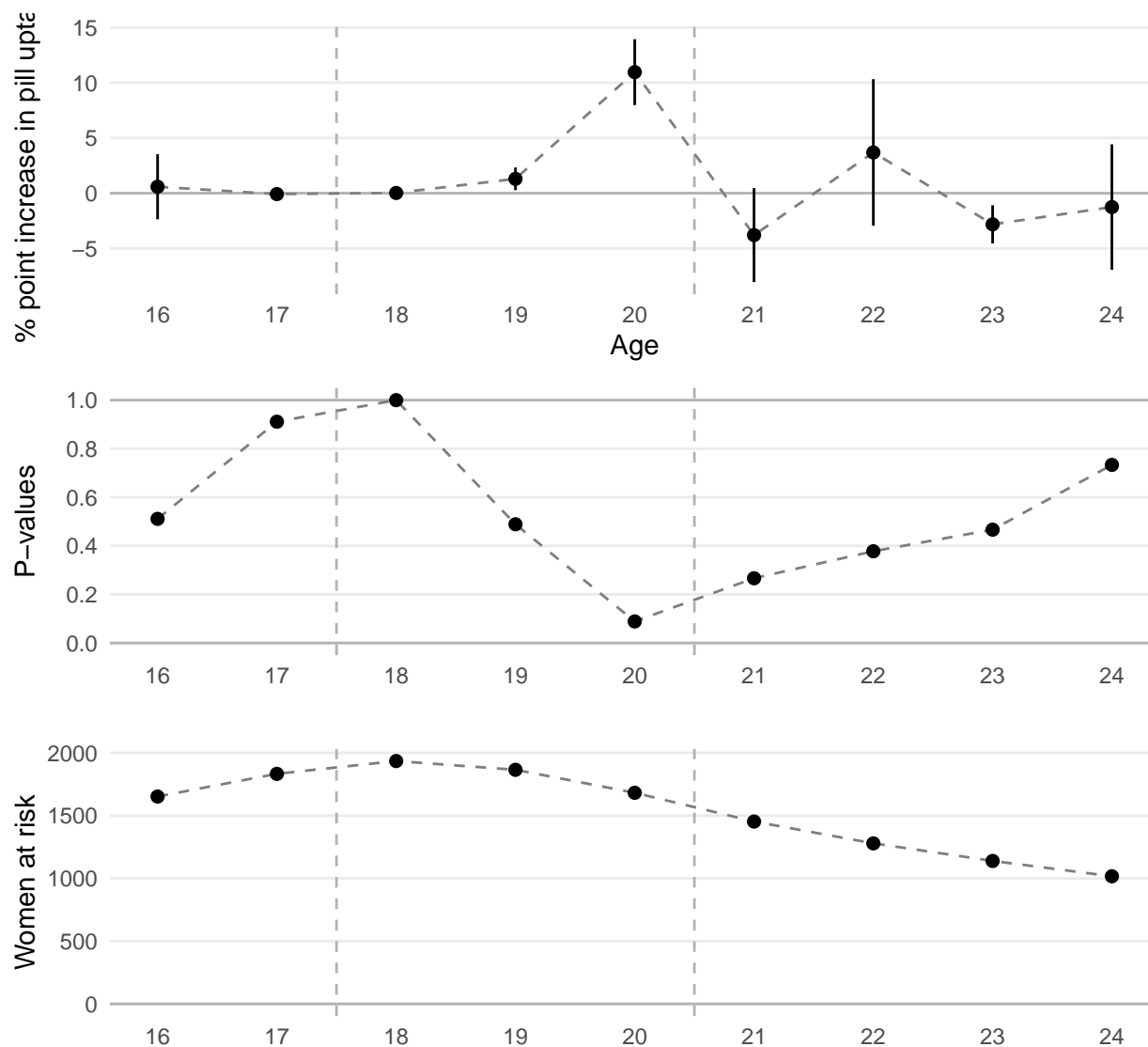


Figure 10: Age-specific increase in the monthly rate of pill uptake (in an LPM) as a result of living under ELA among women in the NFS who have never previously used the pill. The middle panel gives p-values from the randomization inference procedure, and the bottom panel shows how many women were in the sample. Vertical lines through each point indicate 90% confidence intervals based on the larger of cluster-robust variance estimators with clustering by state and the standard OLS variance estimator (whichever is larger). Each point and confidence interval is from a separate regression on women who reached the given age after the pill was approved for contraception by the FDA and who never used the pill before that age.

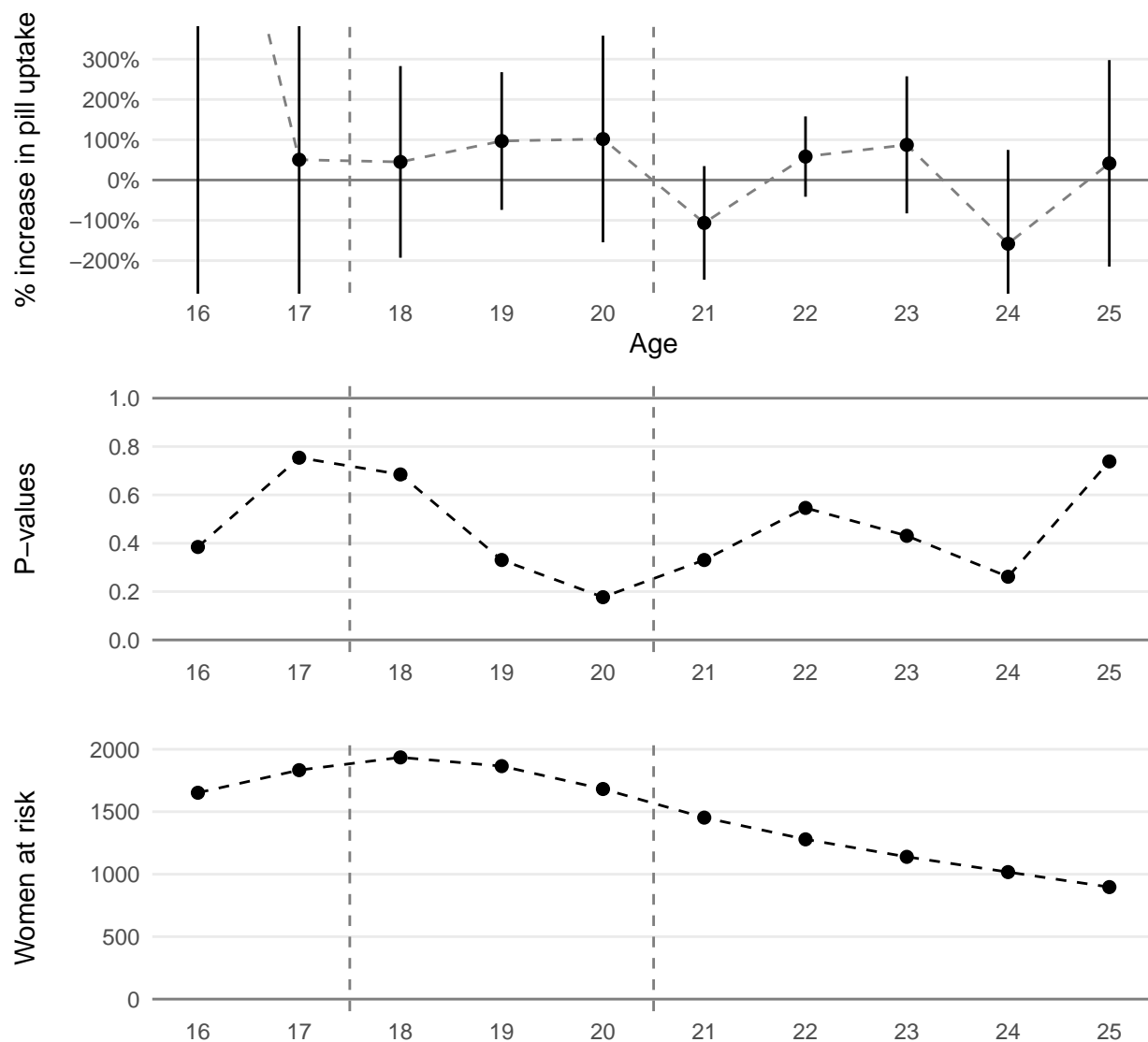


Figure 11: Age-specific increase in the monthly rate of pill uptake (in a proportional hazard model) as a result of living under ELA among women in the NFS who have never previously used the pill. The middle panel gives p-values from the randomization inference procedure, and the bottom panel shows how many women were in the sample. Vertical lines through each point indicate 90% confidence intervals based on the larger of cluster-robust variance estimators with clustering by state and the standard OLS variance estimator (whichever is larger). Each point and confidence interval is from a separate regression on women who reached the given age after the pill was approved for contraception by the FDA and who never used the pill before that age.

A Appendix: history of medical consent for youths by Australian state

A.1 Mature minor doctrines

A.1.1 Nationwide in 1992: Gillick competence

Most states and territories have a mature minor doctrine that is based on *Gillick v West Norfolk and Wisbech Area Health Authority* (1986) and the “Fraser Guidelines” developed in that case. The ruling from *Gillick* was approved in Australia on 6 May, 1992, in *Secretary, Department of Health and Community Services v JWB and SMB (Marion’s Case)* (1992) 175 CLR 218, FC 92/010 and states that “A minor is capable of giving informed consent when he/she achieves a sufficient understanding and intelligence to enable him/her to understand fully what is proposed”. Interestingly, *Gillick* was a question of whether children under 16 could give consent, whereas no Australian state at the time had a law explicitly granting consent privileges to children aged 16 to 18 (although New South Wales already had a law that would have granted this power to most children over 14). The decision in *Marion’s Case* also stipulated that a child (and also the parent) could *not* give consent for some treatments that were not medically necessary and had severe, long-term consequences for the child’s wellbeing (e.g. sterilization and gender reassignment), but these considerations are unlikely to be relevant in the case of oral contraceptives or abortion.

A.1.2 South Australia in 1985

South Australia had a mature minor doctrine in place before other states. The *Consent to Medical and Dental Treatment Act 1985 (SA)* (1985) (commenced 1 May 1987: *Gaz.* 30 April 1987, p. 1115) specified that

6. 1. The consent or the refusal or absence of consent of a minor who is of or above the age of sixteen years in respect of a medical procedure or dental procedure to be carried out on the minor or any other person has the same effect for all purposes as if the minor were of full age. 2. The

consent of a minor who is less than sixteen years of age in respect of a medical procedure or dental procedure to be carried out on the minor has the same effect for all purposes as if the minor were of full age where, in the opinion of a medical practitioner or a dentist supported by the written opinion of one other medical practitioner or dentist, as the case may be— a. the minor is capable of understanding the nature and consequences of the procedure; and b. the procedure is in the best interests of the health and well-being of the minor.

The *Consent to Medical Treatment and Palliative Care Act 1995 (SA)* (1995) updated these rules:

12. A medical practitioner may administer medical treatment to a child if— a. the parent or guardian consents; or b. the child consents and— i. the medical practitioner who is to administer the treatment is of the opinion that the child is capable of understanding the nature, consequences and risks of the treatment and that the treatment is in the best interest of the child’s health and well-being; and ii. that opinion is supported by the written opinion of at least one other medical practitioner who personally examines the child before the treatment is commenced.

A.1.3 Tissue donation

The Australian Law Reform Commission recommended in 1977 that a child’s consent should be necessary (but not sufficient) for that child to be a tissue donor and did not give any lower bound age below which a child would be considered incapable of giving consent. The recommendations of the commission were encoded in law in every state (WA: Human Tissue and Transplant Act 1982).

A.2 Age of majority laws

A.2.1 Age of majority for general purposes: state by state

Every state and major territory has its own Age of Majority Act (hereafter AoM) setting the age of majority at 18 years old. Table 1 gives the dates when each law was proposed and came into force (“commenced”). Two states (New South Wales and South Australia) have separate minimum ages

for medical consent.

A.2.2 Age of majority for medical consent in New South Wales in 1971

In addition to setting 18 as the AoM and stating that consent by someone over age 18 would be equivalent to consent by someone over age 21 “in matters of tort”, a 1971 NSW law (passed in 1970) allowed doctors to presume that children over 14 could give consent for medical treatments. Section 49 states

Where medical treatment... of a minor aged fourteen years or upwards is carried out with the prior consent of the minor, his or her consent has effect in relation to a claim by him or her for assault or battery in respect of anything done in the course of that treatment as if, at the time when the consent is given, he or she were aged twenty-one years or upwards. *Minors (Property and Contracts) Act 1970 (NSW) 1970*

Note that this provides protections to medical practitioners but in no way guarantees a right for children to make their own medical choices (New South Wales Law Reform Commission 2008). Whether this law resulted in doctors extending that right to children is an empirical and historical question. If, however, doctors simply relied on the common law rules outlined above, then the proportion of minors who could choose to get contraceptives would likely be lower than if 14-year-olds were treated as adults under this law. Note also that this law was designed specifically to allow minors to give consent, so its exogeneity is suspect.

A.2.3 Age of majority for medical consent in South Australia in 1987

The *Consent to Medical and Dental Treatment Act 1985 (SA)* (1985) (assented to 14 March 1985, commenced 1 May 1987: Gaz. 30 April 1987, p. 1115) specified that

6. 1. The consent or the refusal or absence of consent of a minor who is of or above the age of sixteen years in respect of a medical procedure or dental procedure to be carried out on the minor or any other person has the same effect for all purposes as if the minor were of full age. 2. The consent of a minor who is less than sixteen years

of age in respect of a medical procedure or dental procedure to be carried out on the minor has the same effect for all purposes as if the minor were of full age where, in the opinion of a medical practitioner or a dentist supported by the written opinion of one other medical practitioner or dentist, as the case may be— a. the minor is capable of understanding the nature and consequences of the procedure; and b. the procedure is in the best interests of the health and well-being of the minor. *Minors (Property and Contracts) Act 1970 (NSW) 1970*

The *Consent to Medical Treatment and Palliative Care Act 1995 (SA)* (1995) updated the rules:

6. A person of or over 16 years of age may make decisions about his or her own medical treatment as validly and effectively as an adult. *Minors (Property and Contracts) Act 1970 (NSW) 1970*

A.3 Abortion laws

Abortion laws in Australia follow four major regimes.

1. Early on, all states banned “unlawful” abortions, but these laws did not specify which abortions were unlawful. Presumably, interpretation of these laws would be based on English common law.
2. South Australia legalized abortion in many cases in 1969 through legislation.
3. Most other states clearly had common law allowances for “lawful” abortions to protect the pregnant woman that flowed from Australian court decisions starting in 1969. Victoria, for instance, had a 1969 ruling upholding common law protections for abortions, and NSW had a 1971 ruling doing the same.
4. Most (but not all) states liberalized their abortion laws within the last 20 years. These changes are outside the scope of our analysis.

A.3.1 Abortion in the common law

Early in the 20th century, Australian states had criminal laws based on the English *Offences Against The Person Act 1861 (England)* (1861), which made “unlawful” abortions a crime. An English case, (*King v Bourne* 1939), established that abortion was lawful to protect the life of the pregnant woman (broadly defined by Justice MacNaghten to include protecting her from becoming a “physical or mental wreck”). British common law applied to Australia into the 1960s (Castles 1963), so this case should have been the legal framework for Australian courts. The test came in 1969 when police in Melbourne, Victoria, raided abortion clinics (in response to doctors failing to pay bribes, according to Gleeson 2009) leading to the case of *R v Davidson* (1969). The “Menhennitt ruling” in this case followed *Bourne* and specified that abortion could be lawful if it were “necessary to preserve the woman from a serious danger to her life or her physical or mental health (not being merely the normal dangers of pregnancy and childbirth)” and became the basis for subsequent rulings in other states.

The ruling still implies great ambiguity, and we must look to medical history to know what impact it had on actual provision of abortion services. It is possible that physicians interpreted this as an indication that as long as they discussed the costs of pregnancy with patients that they were defended from prosecution. In NSW, whose courts adopted nearly identical rules in 1972 (*R v Wald*), a doctor was convicted of unlawful abortion in 2006 precisely because she did not discuss the possible costs of not terminating the pregnancy with the patient before the procedure. The implication was that if a physician made a decision about abortion after deliberation and discussion with the patient that the abortion would be lawful, and in this case the only reason a jury could claim that the termination was not lawful was that there was evidence that the physician had not treated the case with sufficient concern. This implies de facto legal authority of physicians over whether to allow abortions.

A.3.2 South Australia

Since 1969, South Australia has allowed abortions if “continuing the pregnancy would involve *greater* risk of injury to the physical or mental health of the woman, or involve *greater* risk to the life of the woman than termination” (Criminal Law Consolidation Act 1935, emphasis added; this was a 1969 amendment based on English common law in *Bourne*, and I have not found the exact date of commencement for the amendment) or to end pregnancies where the child would likely “suffer from such physical or mental abnormality as to be seriously handicapped”.

Although the standard in SA is to compare the risk of continuing the pregnancy to not continuing the pregnancy, and the standard in other states is to compare the risk of continuing the pregnancy to the risk of a typical pregnancy, in practice the two standards are often treated similarly by medical practitioners (Victorian Law Reform Commission 2008). A patient must have lived in SA for at least two months before the abortion unless the abortion is needed to preserve the life of the patient or due to some serious expected abnormality of the child. Abortions are generally only allowed after 28 weeks to preserve the life of the mother.

South Australia has been publishing abortion statistics since 1971, and SA was the only state with abortion reporting requirements in the 1970s (because it was the only state with legislation legalizing abortion).

A.3.3 Victoria

In Victoria, the Crimes Act 1958 specified that it was a crime (a felony and later in 2006 an indictable offense) to “unlawfully” terminate a pregnancy, but it was left up to courts to decide what constituted an unlawful abortion (Victorian Law Reform Commission 2007, 2008).

The 1969 Menhennitt ruling in *R v Davidson* (1969) led to the framework used in most other states and specified that abortion could be lawful if it were “necessary to preserve the woman from a serious danger to her life or her physical or mental health (not being merely the normal dangers of pregnancy and childbirth)”.

That final caveat implies that Menhennitt was not upholding the same rules as in SA. However,

the difference between abnormal “serious danger” and “greater risk” may have become blurred as doctors could argue that giving birth and having a child when the patient does not desire that outcome constitutes an unusual and serious danger precisely because the outcome is not desired. This possibility is reinforced by the fact that it proved difficult for courts to *show* that a particular abortion was unlawful because prosecutors had the burden of showing that the doctor could not reasonably have expected serious harm to the patient. In NSW, whose courts adopted nearly identical rules in 1972 (*R v Wald*), a doctor was convicted of unlawful abortion in 2006 precisely because she did not discuss the possible costs of not terminating the pregnancy with the patient before the procedure. The implication was that the only reason a jury could claim that the termination was not lawful was that there was evidence that the physician had not treated the case with sufficient concern. This implies de facto legal authority of physicians over whether to allow abortions, but despite the nearly-uniform common law throughout Australia (Castles 1963), Queensland police raided abortion clinics in the 1980s (Victorian Law Reform Commission 2008), so perhaps the matter was not so settled.

The *Abortion Law Reform Act 2008* (Vic) removed almost all legal restrictions on abortion, allowing a medical practitioner to “perform an abortion on a woman who is not more than 24 weeks pregnant” or to perform an abortion after 24 weeks when at least two medical practitioners agree that the abortion is appropriate.

A.3.4 New South Wales

R v Wald (1972) (the Levine ruling) in 1971 specified rules similar to the 1969 Menhennitt ruling. *Wald* was upheld in *CES v Superclinics (Australia) Pty Ltd* (1995). One of the appeals court judges stated that the standard of harm to the mother that would justify abortion should include harm that might occur after pregnancy due to not terminating the pregnancy.

A doctor was convicted of unlawful abortion in NSW in 1981 and another in 2006 (*R v Sood* 2006) because they did not discuss the possible costs to the patients of not terminating their pregnancies and thus could not have knowledge about how the Menhennitt rules applied to their patients. There was also a sense that high-risk abortions (especially if they led to harm to the patient)

were not lawful because it was specifically the avoidance of danger that made abortions lawful. Even before *R v Wald* (1972), most prosecutions for abortion were in cases where the patient was seriously injured, but the doctors were almost always acquitted (Coleman 1991; Gleeson 2009).

A.3.5 Queensland

As in Victoria and New South Wales, Queensland (before 2019) allowed abortions to protect the life or wellbeing of the mother, but in 1986 a judge specified that only medical protections for the mother were a valid defense (*R v Bayliss & Cullen* 1986). In other words, it was no longer lawful to terminate a pregnancy on the grounds that having a child would be a financial strain on someone who did not want to have a child. This implies more strict limits on abortions in Queensland than in NSW or SA. It seems likely that doctors would have expected the Menhennitt ruling to hold in Queensland from 1969 to 1986 (or at least following *Wald* in 1972), as Queensland's law also only made "unlawful" abortion a crime, and Australia tends to have a nearly uniform common law (Castles 1963), but police raided abortion clinics and arrested physicians earlier in the 1980s and had not prosecuted any doctors for abortions between the 1986 ruling and 2008 (Victorian Law Reform Commission 2008), so there is not a clear answer.

A.3.6 Western Australia

Western Australia also had police raids on abortion doctors that led to legal clarification and no convictions. The WA Attorney General in 1974 specified that the Menhennitt and Levine rulings applied in WA and that doctors could perform abortions to prevent the patient from becoming a "physical and emotional wreck" (Gleeson 2009) (this wording is based based on the MacNaghten ruling from *King v Bourne* (1939)).

In 1998, two physicians were charged with unlawfully procuring an abortion based presumably on their failure to properly consult with the patient (as in *R v Sood* 2006). The case did not go to trial, and WA enacted new laws that made the previous case law statutory by allowing for abortion to prevent "serious personal, family or social consequences" or "serious danger to the physical or mental health of the woman" (*Acts Amendment (Abortion) Act 1998 (WA)* 1998).

A.3.7 Tasmania

A 2001 amendment (*Criminal Code Amendment Act (No. 2) 2001 (No. 123 OF 2001) (Tas) 2001*) to the *Criminal Code Act 1924 (Tas)* in Tasmania allows abortions in cases where not terminating the pregnancy is more dangerous than terminating it and allowed for consideration of “physical and mental health” and “any matter which [the medical practitioners] consider to be relevant”. It is unclear whether doctors would have interpreted the previous wording as allowing such abortions. Because bans against “unlawful” abortions in other states have been interpreted more narrowly than this (e.g. the “serious danger” test from *Menhennitt*), it is likely that doctors in Tasmania before 2001 would have expected that Tasmania’s ban on “unlawful” abortions prevented them from giving abortions in cases where there was no immediate threat to the mother.

A.3.8 Australian Capital Territory

Abortion was decriminalized in the ACT in 2002 with the *Crimes (Abolition of Offence of Abortion) Act 2002 (ACT)* (2002). The common law status of abortion before this time is unclear, but the *Menhennitt* and *Levine* rulings were probably in force.

A.3.9 Northern Territory

In the Northern Territory, the *Medical Services Act* allows for abortions

- before 14 weeks if “the continuance of the pregnancy would involve greater risk to her life or greater risk of harm to her physical or mental health than if the pregnancy were terminated” or
- before 23 weeks if “termination of the pregnancy is immediately necessary to prevent serious harm to [the mother’s] physical or mental health” or
- any time if the intent of the abortion is to preserve the life of the mother.

Only women over age 16 are allowed to consent under the law. Abortions for reasons other than preventing serious harm to the mother must be performed in hospitals.

As far as I can tell, these conditions were added to the Act in 2006, and before this the *Criminal Code Act* made abortion a crime except as specified in the common law (e.g. *Menhennitt* and *Levine*).

A.3.10 Australia overall

Members of the High Court of Australia spoke favorably of the *CES* (NSW) decision in *Harriton v Stephens* (2006) 80 ALJR 791. The High Court is a court of appeal for the states, so the court may have implied in 2006 that abortion would be allowed throughout Australia if “necessary to preserve the woman from a serious danger to her life or her physical or mental health (not being merely the normal dangers of pregnancy and childbirth)” with the additional stipulation that long-term harm to the pregnant woman (e.g. mental anguish or economic hardship from having an unwanted child) should be considered. Note that some states already had more liberal rules before this (e.g. SA since 1969 and Tasmania since 2001).

What constitutes a “serious danger to... life or... physical or mental health”? The lack of abortion prosecutions in recent decades throughout Australia suggests that either patients do not seek unlawful abortions, that doctors turn them down, that prosecutors neglect abortion cases, or that “danger” to the patient is interpreted liberally by medical practitioners. This last interpretation seems likely. Even in states with seemingly narrow statutes there is de facto legalization because the law leaves evaluation of the patient’s care to the doctor. In actual applications, a doctor must speak with a patient about the dangers of not terminating a pregnancy and then may be able to specify any non-common medical danger as justification for the termination.

A.4 Legal history of voting age by state

The following catalogs the laws changing the voting age from 21 to 18 and the dates of commencement of those laws by state:

A.4.1 National:

The *Commonwealth Electoral Act 1973* (1973) was assented to on 16 March 1973 (“Acts of Parliament Assented to” 1973) and commenced 21 March 1973 (“Proclamation” 1973). As far as I can tell, this law also determined the voting ages for ACT and NT.

A.4.2 WA:

Electoral Act Amendment Act (No. 2), 1970 (No. 94 of 1970) (WA) (1970) was assented to on 30 November 1970 and commenced in 1970 (“Electoral Act Amendment Act (No. 2), 1970. Proclamation.” 1970). This Act lowered the voting age for statewide elections but not for local elections (The Law Reform Commission of Western Australia 1972a).

A.4.3 NSW:

The voting age of 18 (*Parliamentary Electorates and Elections (Amendment) Act 1970 (NSW)* 1970) was assented to on 6 November 1970 (“Acts of Parliament Assented to” 1970) and commenced on 21 March 1973 (“Parliamentary Electorates and Elections (Amendment) Act, 1970.—proclamation.” 1973). The commencement was announced in the Gazette on the same date as the commencement, but it should not have been a surprise. Newspapers were saying that the voting age “has been lowered” as far back as January 1970.

A.4.4 SA:

Sections 6 and 16 of South Australia’s *The Constitution Act (SA)* (1856) specified that only men over age 21 could vote. This section was repealed by *The Constitution Further Amendment Act, 1913 (SA)* (1913) and replaced by sections 17.1 and 20 of the same Act, which kept the age requirement intact. This was superseded by Sections 21 and 33 of *The Constitution Act 1934 (SA)* (1934), which maintained the requirement that electors be at least age 21 except in the case of military members who served “outside the Commonwealth” during WWI (Section 20).²⁶

²⁶This might seem like an absurd exception if 1934 were when it was first enacted because to be under age 21 by 1934, someone would have had to be under age 5 while fighting in the war. I

The Constitution Act Amendment Act, 1969 (SA) (1969) included a provision that allowed for military service outside the Commonwealth to grant voting rights regardless of residency or age requirements if the location of the service was declared by proclamation to be such an area. This extended the rights of WWI veterans to military members to whom the government decided to extend them (specifically people fighting in Vietnam). The provision also gives the vote to spouses of men affected.

The Constitution Act Amendment Act (No. 2), 1970-1971 (SA) (1971) reduced the voting age in South Australia from 21 to 18 for everyone who was not eligible due to military employment.

A.4.5 Vic:

The Constitution Act Amendment (Qualifications) Act 1973 (Vic) (1973) was passed on 20 March 1973 and commenced 21 March 1973 (“The Constitution Act Amendment (Qualifications) Act 1973. Date of Coming Into Operation.” 1973).

A.4.6 Tas:

Tasmania’s act lowering the voting age from 21 to 18 was the same as its act lowering the age of majority from 21 to 18. Section 5 in the *Age of Majority Act 1973 (Tas)* (1973) amended the *Constitution Act 1934 (Tas)* (1934) to reduce the voting age to 18.

A.4.7 Qld:

Elections Act and The Criminal Code Amendment Act 1973 (Qld) (1973) was assented to on 11 April 1973 and commenced 1 July 1973 (“Elections Act and The Criminal Code Amendment Act 1973 (Qld)—proclamation” 1973).

have seen suggestions that this exception was added by an earlier law (probably), but finding the law is not needed for this paper. However, the exception was also to residency and land ownership requirements, which would have been binding for many veterans in 1934.