

War, Women, and the Violent Origins of Gender Equality^{*}

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States make war. But can war also make a state's citizenry? In this article, I develop a theory of how mass warfare can lead to lasting cultural legacies especially as they relate to gender. I argue that mass warfare transforms the gendered nature of labor markets by pulling women into the labor force. Complementarities between labor markets and attitudes suggest that increasing the public role of women in the labor force should have social spillovers into egalitarian beliefs around gender roles. These beliefs can persist through processes through socialization. To test the theory, I use the United States' involvement in WWI by combining data on mobilization rates with historical census and contemporary public opinion data. Using an instrumental variables identification strategy, I establish that historical war mobilization caused individuals today to become pro-choice, liberal, and identify with the Democratic Party. Results from a series of auxiliary tests provide evidence consistent with the causal mechanisms. At least in the United States, the march toward gender liberalization has bloody origins.

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INTRODUCTION

War has been a fundamental feature of politics throughout the course of much of history. Perhaps somewhat surprisingly, periods of mass violence such as World Wars I and II have been integral to the development of the state (Skocpol 1979; Ferejohn and Rosenbluth 2016), progressive taxation (Scheve and Stasavage 2010, 2012), income inequality (Piketty and Saez 2003; Piketty 2013), and social policy (Skocpol 1993) despite the steep cost in terms of human lives. In line with Tilly (1990)'s initial observation, war seems to have made the state.

While much of the focus on the impact of mass warfare focuses on the interaction between violence and the state, mass warfare can also be an important inflection point for social transformation. At least in the context of the United States, war seems to have created the space for marginalized groups such as women and African Americans to break some of the forces that perpetuated gender and racial stratification. Women went on to participate in manufacturing jobs that were traditionally held by men allowing for subsequent generations to move past, at least partially, sexist gender stereotypes (Fernandez, Fogli, and Olivetti 2004). For African Americans, wartime production provided the prospect for better wages and living conditions by moving from the repressive Jim Crow South to Northern industrialized cities (Wilkerson 2011; Boustan 2016).

In this article, I develop a theory of how mass warfare can lead to more gender egalitarian societies by facilitating the economic incorporation of women. The argument highlights the complementarities between the reduction of gender stratification in both the economic and political spheres. War mobilization, by increasing the demand for women in the workforce, increases local female labor force participation. This initial shock to female labor force participation leads to liberalization of gender attitudes through processes of vertical and horizontal transmission where individuals exposed to females in the workforce update their beliefs about women and transmit them to their children (vertical) and spread them among their social peers in their communities (horizontal). This shift in gender attitudes brought through increased female labor force participation spills over into political life as well with the aforementioned forces leading to persistence in liberal political attitudes especially with regard to gender.

To test the theory, I focus on the case of the United States' mobilization during WWI. Unlike WWII, mobilization during WWI did not involve subsequent state involvement in the lives of Americans through programs such as the G.I. Bill (Mettler 2002). This allows the researcher to isolate the effect of war mobilization independent of subsequent social policy developments that do not directly involve the gendered nature of labor markets. As a result, WWI provides an ideal context in which to study the ways in which mass warfare shapes cultural norms in economically developed societies. Combining survey data on over 100,000 Americans today with historical census

data on WWI veterans, I show that individuals from counties that experienced greater mobilization during WWI are now more likely to identify as Democrats and liberals in addition to indicating pro-choice attitudes with regards to abortion. To establish causality, I leverage plausibly exogenous variation in the composition of males who were at risk of service in U.S. counties prior to WWI as an instrumental variable for war mobilization. The logic behind this strategy is that the percentage of males “sufficiently close” to being age twenty-one—the point at which the likelihood of service reaches its maximum—during the midpoint of WWI is *as-if random* given the timing of WWI with respect to each birth cohort. Moreover, the existence of more men around this service peak in some counties than others primarily affects politics through the percentage of veterans in a county since the existence of this peak is not related to any other outcomes except the likelihood that a male serves in WWI.

I provide evidence consistent with the gender mechanism by showing that women from counties that experienced higher levels of war mobilization were more likely to participate in the labor force. Moreover, I also show that children of women who work are more likely to hold pro-choice views on abortion and egalitarian views around gender roles providing evidence in support of the hypothesized vertical transmission mechanism. Consistent with the horizontal socialization mechanism, I also show that these effects seem to be concentrated among young women who during the time of WWI were too young to be working, but joined the labor force once they came of age. Though warfare is shaped by existing roles, the evidence accumulated in this article shows that it can also fundamentally transform gender relations as well (Goldstein 2003).

This article makes several contributions to literatures in political science and economics. First, the theory and results highlights the understudied ways in which profound periods of mass violence such as the First World War can drive cultural transformation as much as institutional change (Skocpol 1993; Scheve and Stasavage 2010, 2012). In addition to spurring institutional change, wars can also fundamentally shape social identities (Mazumder 2017). Moreover, this article contributes to the political economy literature on the development and persistence of cultural norms. While much of this literature focuses on the impact of political institutions in shaping culture (Nunn and Wantchekon 2011; Acharya, Blackwell, and Sen 2016), this article builds on Alesina, Giuliano, and Nunn (2013) and Jha (2013) in showing how prodigious events in a society can reshape values through their impact on labor markets.

Though this article focuses specifically on the relationships between war mobilization, labor markets, and gender relations, the conceptual framework points out a fundamental, historical irony: periods of mass violence can lead to the incorporation of marginalized groups. Within the context of this article, I show how preparation for war on the home-front leads to status-leveling across gender. Yet, the implications of the article’s framework suggest many other ways in which mass warfare might lead to status-leveling across a variety of other dimensions. Though this study does not in-

investigate the impacts of direct experience on the war-front, I show how the processes that come with mass mobilization on the home-front can have spillovers into political life over the long-run. By bringing the importance of violence and warfare back into the study of American politics, this opens up future research to take the lenses of the political violence and state-building literatures that have largely taken root in the comparative context and apply them to understand the causes and consequences of violence in the United States.

The rest of this article proceeds as follows. First, I highlight a framework for understanding how warfare via mass mobilization can lead to shifts in gender attitudes over the long-run. Then, I go onto provide some brief background on the case used in this piece—the United States’ involvement in World War I. I then proceed to test the argument by combining a variety of contemporary and historical data sources and using an instrumental variables strategy for causal identification. Finally, I conclude by highlighting the implications of this study for understanding the intersection of war, gender, and social change.

WAR MOBILIZATION AND ECONOMIC INCORPORATION: CONSIDERING THE STATUS OF WOMEN

Mass warfare is one of the most destructive forces to develop in the history of modern nation-states. While mass warfare involves an prodigious loss of life and property, a long line of research establishes how this phenomenon has actually been integral to state formation (Tilly 1990), democracy (Levi 1997; Ferejohn and Rosenbluth 2016), progressive taxation (Scheve and Stasavage 2010, 2012), and economic equality (Piketty 2013; Scheidel 2017). These effects of war, which largely involve the relationship between war and institutions, overlook perhaps a more fundamental irony. Mass warfare, either direct participation in or indirect involvement with, can lead to the reduction in the stratification of social identities—a concept I hereby refer to as status-leveling. Essentially, wars can lead to status-leveling through the incorporation of marginalized groups.

Wars can lead to a variety of different types of status-leveling including cultural, political, and economic. On culture, participation of marginalized groups in war service lead these groups to assimilate into the dominant groups within their societies by exposing these groups to national culture, a more diverse set of groups, and by making the dominant group more accepting of those who were exposed to the costs of war (Weber 1976). The historical literature related to the Irish during the U.S. Civil War and Italians during World War I suggests that war did seem to lead to status-leveling through cultural assimilation (Ignatiev 1995; King 2005). War can also lead to political incorporation by providing further grounds for marginalized groups’ claims on political rights

or by actively leading these groups to become more politically mobilized themselves. Within the context of the United States, one of the more prominent examples of this is with African Americans' service in WWII as a stepping stone to convince whites to combat the Jim Crow system of racial apartheid in the U.S. South and by leading African American veterans to become more politically mobilized themselves (Klinkner and Smith 1999; Parker 2010).¹ To state this phenomenon broadly, mass warfare seems to lead to the incorporation of marginalized groups within a polity. Within this broad conceptual framework, this article articulates a theory in which mobilization for mass warfare can lead to economic incorporation specifically of a gendered dimension.

Particularly, I argue that mass warfare can not only lead to transitory economic incorporation of women, but also persist long after the end of the war. To briefly summarize, I argue that mobilization disrupts the gendered nature of labor markets by bringing women into economic roles previously held by men. This increase in female labor force participation, then, engenders men and women to update their beliefs about gender roles; particularly, I argue that both men and women can become more gender egalitarian. This change in mass attitudes accompanied by the change in social structure persists through processes of vertical and horizontal transmission of attitudes whereby these new gender egalitarian beliefs get passed down intergenerationally or diffuse across local social networks respectively.

War Mobilization Causes Female Labor Force Participation

Before discussing the empirical relationship between mobilization and female labor force participation, it is important to understand why females enter the labor market and the constraints that they face to joining the labor force. There are two broad ways to understand female labor market participation: (1) economic factors (2) social norms and cultural values around gender. While these two perspectives are certainly intertwined in many respects, it is still useful to discuss each separately.

The availability of males can shape the demand for female labor. The core logic behind this demographic argument is that when there are relatively fewer males than females, women end up taking on many roles that men traditionally hold. Recent empirical evidence provides support for this explanation. Angrist (2002) uses sex-specific shocks to immigration in the United States to show that areas that had a rise in the number of males relative to females tended to have lower female labor force participation

¹Though there are limits to which war can lead to cultural or political incorporation. The case of backlash against Germans during WWI and Japanese internment during WWII in the United States highlights how war can actually damage incorporation when these groups become politicized in the context of war (Hopkins 2010). For more evidence on how wars can create cultural backlash, see (Fouka 2016).

rates.² Using a natural experiment generated by the plausibly exogenous settlement of male convicts in Australia, Grosjean and Khattar (2016) show that areas in Australia that initially had male-dominated sex ratios now have lower rates of female labor force participation than areas that had more equal sex-ratios. In the African context, Teso (2016) uses exogenous variation in sex ratios across African ethnic groups resultant of the slave trade to show that these areas exposed greater amounts of slavery historically now have higher female labor force participation rates today. In short, the nature and demographics of economic production in a society shapes the demand for women to join the labor force.

An alternative, though certainly not mutually exclusive, perspective hones in on the ways in which culture and social norms shape the demand for women in the labor force. A growing literature in economics highlights how attitudes toward women in the workforce (and more broadly) form in response to the gendered contours of an economy. In particular, this line of literature argues that major shifts in the gendered patterns of production lead men and women to form beliefs consistent with that state of the world. So in societies where men dominate the economic sphere, men and women tend to form norms and beliefs that privilege men over women (Iversen and Rosenbluth 2006; Alesina, Giuliano, and Nunn 2013). These beliefs might persist in equilibrium despite changes in the underlying structure of production through psychological mechanisms of cognitive dissonance (Festinger 1957; Mullainathan and Washington 2009; Acharya, Blackwell, and Sen, *Forthcoming*) and/or processes of intergenerational socialization of preferences (Bisin and Verdier 2001; Fernandez, Fogli, and Olivetti 2004; Tabellini 2008; Alesina, Giuliano, and Nunn 2013; Fernandez 2013). To support this cultural perspective, Alesina, Giuliano, and Nunn (2013) show that immigrants from societies that historically relied on plough cultivation also tend to be more supportive of ensuring jobs for men over women. Relatedly, Fernandez, Fogli, and Olivetti (2004) demonstrates that men who had mothers who worked are more likely to marry women who also work suggesting that mothers inculcate their sons on the basis of their own experiences of being in the labor force.³ The upshot of this discussion is that gender divisions in the labor market can spillover into the beliefs that individuals might hold regarding the role of women in the workforce.

Either of these perspectives suggests that shifts to the demand for women—whether through the structure of economic production or social norms—will shape female labor force participation. In the above framework, then, we can understand why we should expect war mobilization to increase the demand for female labor in the short-run. First

²The reverse seems to hold as well. Qian (2008) and Carranza (2014) show that in areas where women have higher labor force participation rates and earnings tend to have more female biased sex ratios.

³It is not only the case that norms are held unequally by sex. Correll (2001) and Correll (2004) show that women also internalize egalitarian gender norms/stereotypes and that this leads women to reduce their aspirations.

and foremost, the loss of a significant amount of males especially during major wars where the economy must increase production of food, textiles, guns, and bombs increases the demand for females so as to meet these production requirements. Empirical evidence from the American experience during WWII supports this prediction: cohorts who were old enough to be working in states in the United States that experienced greater mobilization saw a significant increase in female labor force participation (Acemoglu, Autor, and Lyle 2004; Fernandez, Fogli, and Olivetti 2004; Goldin 1991; Goldin and Olivetti 2013). Second, the increase to female labor force participation induced by war mobilization can also be reinforced by shifts in attitudes norms and preferences. Given that Fernandez, Fogli, and Olivetti (2004) find that the shock to war female labor force participation induced by WWII caused the sons of these women who went to into the workforce to update their beliefs about the desirability of working women, then we should also expect war mobilization to also shape female labor force participation by reshaping attitudes, beliefs, and norms about women in the workforce. Thus, there are ex ante reasons and substantial empirical evidence to support the hypothesis that war mobilization should lead to increases in female labor force participation.

Increasing Female Labor Force Participation Shapes Beliefs about Gender

Shocks to female labor force participation should also shape broader beliefs about gender roles. Boyd and Richerson (2005) outline a theory for understanding cultural evolution that emphasizes how each successive generations develop their beliefs based on observable heuristics that they can observe in their society. This suggests that individuals who observe women working should develop beliefs more broadly about women that are consistent with this observation. In turn, these individuals should use the working women heuristic to make inferences about the ability of women to play leadership roles, make choices for themselves, etc. In societies where individuals do not observe working women, then we should expect these individuals to develop cultural beliefs that reflect more patriarchal notions of gender relations. From the observation of whether women in a society engage in formal economic production, individuals develop and transmit beliefs consistent with either state of the world (Fernandez, Fogli, and Olivetti 2004; Farre and Vella 2012; Alesina, Giuliano, and Nunn 2013).⁴

I further argue that these beliefs will also directly translate into political preferences along namely a gender direction. Following work by Iversen and Rosenbluth (2006) I relate the political preferences of individuals to the nature of gender roles; particularly, I argue that individuals from societies that have relatively egalitarian attitudes toward gender will develop more support for left-wing politics and particularly along a gender

⁴This general intuition underlies most models of cultural transmission in economics (Bisin and Verdier 2001; Tabellini 2008).

dimension.⁵ This should be the case for a number of reasons. First, many left-wing political parties tend to advertise themselves as proponents of major women's issues such as the size of the welfare state, sex discrimination, and abortion policy for example. Second, more egalitarian views toward gender roles should also raise support for the pro-choice position on abortion. Since more egalitarian views toward gender roles emphasize women's agency to make decisions for themselves, individuals who hold these beliefs should also apply them to major political issues such as abortion policy where one of the major sides highlights the right for women to choose whether they utilize abortion services. Third and finally, individuals who hold relatively more egalitarian beliefs about gender roles should also be more supportive of women taking on leadership roles such as holding political office. The upshot of this discussion is that societies with egalitarian beliefs around gender norms should become more left-wing especially on gender issues.

Persistence of Beliefs

The final step in the argument is that these new beliefs and political attitudes will persist after the initial shock to female labor force participation from war mobilization. I argue that beliefs can persist through complementarity processes of vertical (intergenerational) and horizontal (peer) transmission of beliefs. A long line of research across political science, economics, and sociology highlight the importance of these types of socialization processes.

Scholars have assembled a significant amount of theory and evidence for the basis of vertical transmission of beliefs. Formal models of intergenerational socialization show that when parents value the well-being of their own children, but are myopic in the sense that they evaluate their own children's utility with respect to their own beliefs, then the nature of the external environment (institutions, social structures, norms, etc.) can shape the long-run evolution of beliefs (Bisin and Verdier 2001; Tabellini 2008).⁶ Empirically, a number of studies find evidence consistent with parents transmitting their beliefs to their children. The literature on partisanship in American politics shows that an individual's partisan identification is highly correlated with their parent's (Jennings and Niemi 1968; Beck and Jennings 1975; Campbell et al. 1980). Jennings, Stoker,

⁵An alternate explanation for why women have become more left-wing is through the enactment of divorce laws (Edlund and Pande 2002). By divorcing their husbands, women tend to lose income (relative to men) and thus become more left-wing purely out of this income channel. While this explanation may explain the political preferences of women, it is insufficient to encompass *both* women's and men's adoption of left-wing beliefs.

⁶Intergenerational socialization can also run the other direction. Achen (2002) develops a model in which children rationally choose their parent's partisan identification rather than the other way around. Several papers also show, for example, that daughters can make fathers more left-wing especially on gender issues (Washington 2008; Oswald and Powdthavee 2010; Glynn and Sen 2014).

and Bowers (2009) provide further evidence that parental transmission seems to be strongest when parents are highly politicized and they provide consistent cues to their children. Moreover once individuals develop their partisan views, they tend to persist over their life-time (Sears and Funk 1999; Green, Palmquist, and Shickler 2002).

More broadly, a growing area of research documents the importance of cultural persistence in the study of social behavior. Nunn and Wantchekon (2011) demonstrate that individuals from ethnic groups exposed to the slave trade centuries ago now tend to have lower levels of trust and ethnic identity today. Voigtlander and Voth (2012) show that areas in Germany that experienced greater anti-semitic pogroms during Medieval times as a result of the Black Death had more violence against Jews and higher voting rates for the Nazis in the early 20th century. In the American context, Acharya, Blackwell, and Sen (2016) show that areas in the U.S. South that had a high prevalence of slavery today are more conservative especially with respect to racial issues. Finally, Nisbett and Cohen (1996) and Grosjean (2014) show the persistence of an honor culture in the U.S. South where individuals are much more likely to accept the use of violence as an acceptable means of dispute resolution. In sum, myriad studies provide convincing support for the persistence of attitudes, norms, and beliefs across generations.

Beliefs can also diffuse through one's broader social network—a phenomenon which I call horizontal transmission (Huckfeldt and Sprague 1987; Sinclair 2012; Klar and Shmargad 2017; Larson and Lewis 2017). Essentially, an individual's peers (and peers of peers) can influence that person either through direct persuasion, information transmission, or by exerting social pressure. For example, Huckfeldt and Sprague (1987) in their seminal study of South Bend, Indiana show that the composition of an individual's social network shapes what kinds of information they receive about politics. Pietryka and DeBats (2017) use historical, individual-level data on public voting records merged with social network data to show that proximity to elites is positively associated with voter turnout. Though these studies rely on observational data, experimental evidence is also consistent with the idea that social networks influence political attitudes and behavior. Using randomized housing assignment, Sacerdote (2001) provides causal evidence consistent with the existence of peer effects in education. Nickerson (2008) uses a field experiment to show that spouses influence each other's propensity to vote. Gerber, Green, and Larimer (2008) and McClendon (2014) provide experimental evidence showing that social pressure from one's peers can induce individuals to vote and engage in collective action respectively. With respect to political beliefs, Kertzer and Zeitzoff (2017) and Alt et al. use survey experiments and natural experiments to show how individuals formulate their own political beliefs based on their peers' own beliefs on foreign policy and redistribution matters respectively. Outside the western context, Banerjee et al. (2013) show that knowledge about a micro-finance program in India follows a diffusion process that flows through village social networks. Finally, Larson and Lewis (2017) use an experiment to show how the structure of ethnic networks shapes

the dissemination of information.

In addition to the influence of one's peers, the broader communities and social networks in which an individual is ensconced in can exert a powerful effect on attitudes (Klar and Shmargad 2017). Work by Putnam (2001) shows how social capital shapes the vitality of civic life in communities. Relatedly, the character and content of local education can also shape attitudes and behaviors within a community (Gimpel, Lay, and Schuknecht 2003; Campbell 2006). Using difference-in-difference identification strategies based on differential exposure to educational curriculum by cohort, Voigtlander and Voth (2015) and Cantoni et al. (2017) show that students exposed to sharp changes in the content of their school's curriculum were more likely to hold views consistent with these curricula later in life. Moreover, the racial or class context in which people live also shapes how individuals behave and what they believe (Oliver 2001; Cho, Gimpel, and Dyck 2006; Nall 2015; Hersh and Nall 2016; Enos 2016; Enos and Gidron 2016). This all suggests that shifting local context whether it is the vitality of civic life, the character of local education, or the racial and ethnic context in which individuals live can have an independent impact on political attitudes and behavior. Essentially, the horizontal transmission of attitudes and beliefs reinforces beliefs as they are passed down from generation to generation.

Testable Hypotheses

Figure 1: A Directed Acyclic Graph of the Theory



To put all of the components of the argument back together, the main implication of the argument is that war mobilization should lead to *more liberal* attitudes as they relate to gender. Since war mobilization tends to bring women into the workforce, an initial shift in female labor force engendered by mass warfare should also shift attitudes toward gender roles in the communities differentially affected by war mobilization. Moreover, updated beliefs about gender roles should also influence political preferences especially as they relate to gender. As the vertical and horizontal transmission mechanisms suggest, these new beliefs about gender roles and political attitudes

should also persist long after the war ends. This theory, graphically presented in Figure 1, makes several empirical predictions *all else equal*:

Hypothesis 1: *Individuals from areas that experienced higher rates of war mobilization during WWI should be more liberal today especially on gender-related issues.*

If it is the case that war mobilization shapes political attitudes through changes to the gendered nature of labor markets, then we should also observe increases in female labor participation to be positively related to increases in war mobilization. Thus, the theory predicts the following observable implication:

Hypothesis 2: *Females from counties that experienced higher rates of war mobilization during WWI should have higher rates of female labor force participation directly after the war.*

For beliefs to persist, parents must be transmitting their updated values to their children. If the core variable that shapes these new beliefs about gender roles is a mother's labor force status, then the theory suggests the following prediction:

Hypothesis 3 (Vertical Transmission): *Children of women who work should have more liberal attitudes especially on gender-related issues.*

If it is the case that war mobilization shifts the beliefs of local communities through processes of horizontal socialization, then we should expect individuals not directly affected by war mobilization but residing in these areas to shift their behavior. This suggests the following implication:

Hypothesis 4 (Horizontal Transmission): *Women who reside in areas with higher levels of war mobilization, but did not directly work during wartime should be more likely to work following the war.*

CONTEXT: THE U.S EXPERIENCE DURING WORLD WAR I

To test the theory, I focus on the context of the United States' involvement in WWI. Though WWI was smaller in scale than WWII, the First Great War provides a cleaner test to study the political and cultural legacies of war mobilization than the Second Great War because there were no mass veterans benefits programs like the G.I. Bill that followed WWII. Given the extensive literature on policy feedback effects, WWI allows one to isolate the labor market/attitudinal channels by shutting down the policy feedback channel (Mettler 2002). Moreover, the casualty rate was also quite low at about

less than two percent of the total number of men who either drafted or enlisted. This is important since it isolates the effect of mobilization itself and not more permanent sex-ratio effects that come as the result of war. Thus, this context allows the researcher to estimate the independent impact of local war mobilization.

WWI was one of the largest periods of mass military mobilization in U.S. history since the U.S. Civil War. During the course of America's two year involvement in the war (1917-1918), the U.S. state mobilized over four million men into the armed forces. This was an unprecedented scale of military mobilization in U.S. history. Through the institution of the Selective Service Act of 1917, which instituted compulsory military service for males above the age of 21, the United States transformed its small, voluntary force around 100,000 men into a national army.

Importantly for the identification strategy, features of this draft system provide plausibly exogenous variation in the likelihood that a male served in WWI. Ideally, one would use the full service records for the universe of all males who served in WWI to calculate the spatial distribution of war mobilization across the United States. Unfortunately because of a fire that destroyed approximately 80% of the service records from WWI, this is not possible. Instead, I rely on the 1930 Census (5% Sample), which was the first census following the war to ask about veteran status (Ruggles et al. 2015). Given that the casualty rate was quite low and assuming that the distribution of casualties is as-good-as random, then estimates of veteran status from the 1930 census should be unbiased for the true mobilization rate across localities in the United States. Following Campante and Yanagizawa-Drott (2015), I estimate the likelihood of war service at the individual-level across birth cohorts and plot the results in Figure 2. As one would expect from the features of the draft system, the likelihood of war service reaches its maximum for men born in 1896 who were age twenty-one during the midpoint of the United States' involvement in WWI. Furthermore, Figure 2 shows that the likelihood of war service decreases *symmetrically* around those born in 1896. Since the timing of the war is exogenous with respect to an individual's birth year, we can then view the distance from this "peak" as a plausibly exogenous encouragement to serve as a veteran (Campante and Yanagizawa-Drott 2015). These estimates indicate that the institution of this draft system did seem play a strong role in shaping whether males served in the war.

The war effort also led to profound societal changes on the home-front. With the increased demand for equipment and food and loss of white men from many communities, white women took on new roles in society.⁷ While ideas such as "Rosie the Riveter" from WWII capture popular and scholarly imagination, WWI featured many of these same core transformations. Many women went onto work in manufacturing

⁷WWI also transformed society by pulling many African Americans out of the South in search of manufacturing jobs in the North. For recent work on the Great Migration, see (Boustan 2016).

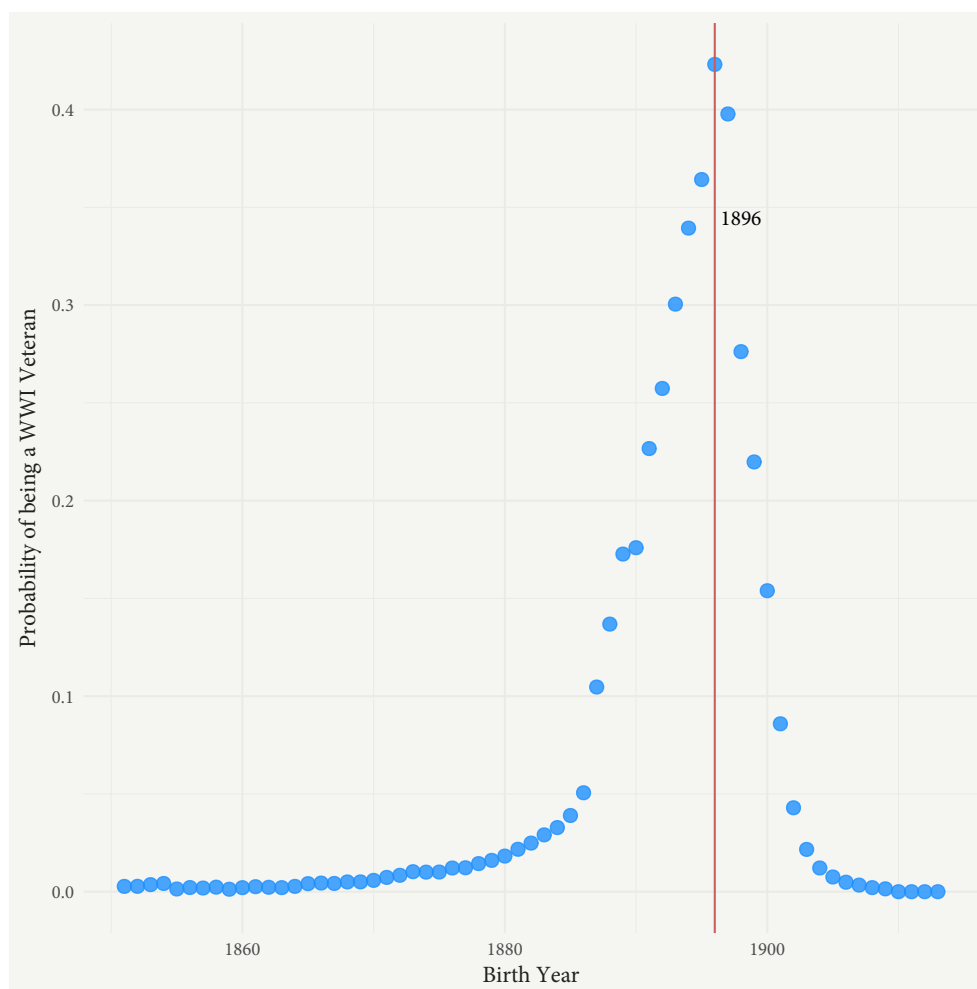


Figure 2: Likelihood of WWI service among males by birth cohort. **Source:** 1930 Census, 5% Sample. Accessed through IPUMS.

industries, which were traditionally dominated by men. Of course, women working in a ordinance factory in a few cities may not be indicative of any *systematic* relationship between war mobilization and female labor force participation; moreover, these ostensible changes might be driven by other unobservable factors or by reverse causality. To assuage these concerns, I provide evidence in the following section that war mobilization did seem to have a substantial impact on female labor force participation following the war and that these shifts to the gendered nature of labor markets left an indelible political legacy long-after the end of the war.

RESEARCH DESIGN

To briefly reiterate, I argue that war mobilization should lead to long-run liberalization in cultural attitudes especially as they relate to gender. For the theory to be plausible, it must also be the case that war mobilization increases female labor force participation and that children with mothers that worked should also be more liberal than children with mothers who did not work. In this section, I test these predictions by utilizing a rich set of data from the Cooperative Congressional Election Study (CCES), the General Social Survey (GSS), and historical U.S. Census data combined with an instrumental variables identification strategy.

Data

Dependent Variables: There are several core outcomes that I use to measure the public's liberalism today. First, I create an indicator for whether a respondent supports the pro-choice position on the abortion debate. While abortion is obviously not an issue that clearly divides the public along gender lines, it does tap into the ways in which ideas about gender roles can become politicized.⁸ Next, I use more standard measures of political liberalism that are not explicitly tied to specific policy debates on gender-related issues. These measures include whether the respondent marked him or herself as liberal on a five-point ideology scale and whether the respondent identifies as a Democrat. Liberal ideology and Democratic partisan identification, of course, do not perfectly tap into the gendered dimensions of political attitudes. Since liberalism and Democratic partisan identity are, in part, tied to less patriarchal political views and policy platforms such as affordable access to womens' health and equal pay, these measures still tap into the politics of gender attitudes albeit imperfectly. Further details on data construction can be found in the Online Appendix. While neither one of these outcomes

⁸I also verify that pro-choice attitudes tap into broader gender attitudes using the General Social Survey. I find that other gender attitudes such as attitudes regarding women in the work-force, women running for political office, and women as home-makers are all highly correlated with pro-choice attitudes.

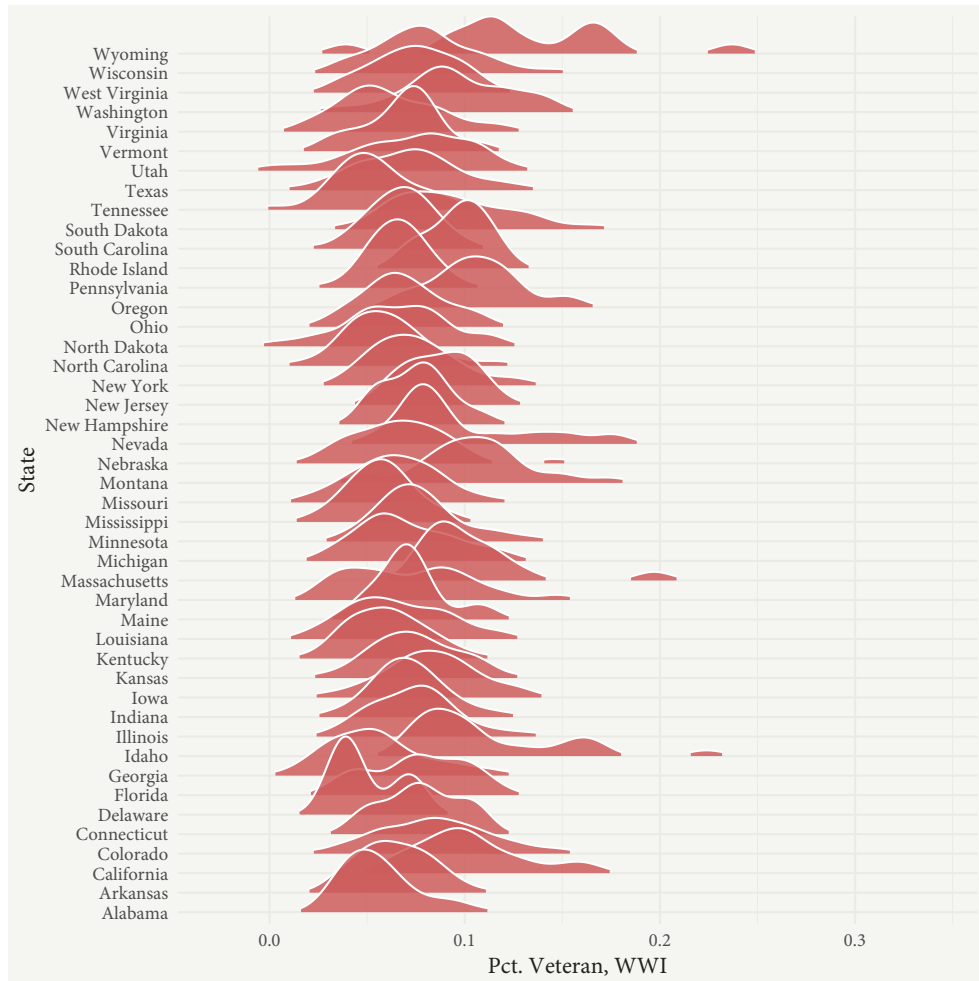


Figure 3: World War I Mobilization by State. **Source:** 1930 U.S. Census from IPUMS

by itself measures liberalism perfectly, the idea is that the amalgamation of these pieces of evidence provides a consistent story.

Independent Variable: To measure war mobilization, I take data from the 1930 U.S. Census 5% Sample provided by IPUMS and estimate the fraction of men (over the age of sixteen) in each county who served in WWI. The mobilization of a locality in terms of troops is obviously not the only component of a larger war effort: wars also require financing, construction, and production of goods. Given the theory, which emphasizes the consequences of a large out-flux of men, this measure most closely follows the larger

theoretical framework. On average, about seven percent of men over the age of sixteen served in WWI with a standard deviation of about two percent. Figure 3 plots the mobilization rate by state. As Figure 3 shows, the mean level of WWI mobilization is about the same in every state with substantial within-state variation.

It is also important to note that this variable is measured *after* WWI. As a result, there could be a number of biases in using the 1930 veteran proportion instead of the veteran proportion during the war. First, there could be bias as a result of differential casualty rates. Particularly, casualty rates would have to have been higher in more gender egalitarian counties than other counties. Since the casualty rate was quite low on the U.S. side (around two percent of veterans), it is unlikely like differential casualty rates could explain any findings (DeBruyne 2017). The second major source of bias could come from differential migration of veterans following the war. Again for this bias to invalidate the empirical strategy, veterans would have to move to more gender egalitarian or high female labor force areas relative to non-veterans. Estimating migration rates from the 1930 Census based on place of birth, I find that there are negligible differences between veterans and non-veterans in migration rates (at least between states). Thus, it does not seem that these two potential sources of bias are likely to affect the results.

Control Variables: Throughout the analyses, I also include a number of controls that could serve as confounding explanations. These variables include the log of total population (1910), percent female (1910), percent black (1910), female labor force participation (1910), and manufacturing prior to the war (1900). Though this is certainly not an exhaustive set of controls, these variables should account for pre-existing observable factors that might jointly explain war mobilization and contemporary liberalism.⁹

Identification Strategy and Estimation

Simply conditioning on observable variables is likely insufficient if unobservables such as culture, values, and history also shape war mobilization and long-run attitudes. As described before, I exploit a unique feature of war mobilization—the symmetry around the peak service likelihood at the age of twenty-one—as a plausibly exogenous encouragement into war service (Campante and Yanagizawa-Drott 2015). Concretely, this intuition can be captured by taking the absolute value of an individual’s birth year from 1896—the cohort who would have been twenty-one during the war. The use of the absolute value from 1896 ensures that I am not simply capturing the fact that older men might be more or less likely to serve; rather, nineteen and twenty-three year olds during the war are “encouraged” exactly the same. To translate this intuition to the county-level, I take the share of men who are “close” to this birth cohort peak. The main specifications in this paper define men with birth distances within four years (inclusive) of

⁹Summary statistics on all variables are available in the Online Appendix.

1896 as “close” to the service peak.¹⁰ This variable, the share of men close to being born in 1896, serves as the instrumental variable.

For this variable to be a suitable instrument, it must satisfy several assumptions. First, it must be independent of the potential outcomes of the endogenous variable and the outcomes of interest. As discussed before, the timing of the war suggests that this is a reasonable assumption. Second, the instrument must satisfy the exclusion restriction—that the instrument should only affect the outcomes through the endogenous variable. While the other major event that occurs when males turned twenty-one at the time was the ability to vote, this would only invalidate if for some reason the ability to vote *during* WWI affected political attitudes in the long-run. Since the possibility of war service is likely the only major shift in a male’s life specific to that time, it is reasonable to assume that the exclusion restriction holds. To assuage concerns over potential violations, I also run placebo tests using distance to being born in 1886 instead of 1896 and find little evidence supporting this exclusion restriction violation.¹¹ Next, the instrument must also satisfy a monotonicity assumption where being close to being born in 1896 only *positively* encourages into war service. One potential violation of this assumption would be if there were significant rates of draft avoidance. Historical accounts suggest that rates of draft-dodging were quite low making this assumption fairly reasonable. Finally, this design also requires the Stable Unit Treatment Violation Assumption (SUTVA). Essentially, SUTVA requires that the instrument does not exhibit network effects whereby the distance of one individual’s age to 1896 shapes the propensity of other individual’s to serve in WWI. If these assumptions are valid, then the instrumental variables can identify the Local Average Treatment Effect (LATE) of war mobilization on political attitudes.

Keeping these assumptions in mind, I aim to estimate the LATE of war mobilization on political attitudes using two-stage least squares (2SLS). In particular, I estimate equations of the following form for each respondent r in county i :

$$WarMobilization_i = \theta PctCloseTo21_i + \gamma X_i + \lambda S_i + \eta_i \quad (1)$$

$$Y_{r,i} = \beta \widehat{WarMobilization}_i + \gamma X_i + \lambda S_i + \epsilon_{r,i} \quad (2)$$

For these analyses, the parameter β represents the LATE of war mobilization on the outcome of interest. The term γX_i captures the effect of the aforementioned control variables. Next, the term λS_i represents a vector of state fixed-effects. The inclusion of state fixed-effects forces comparisons to be made between respondents within the same state. The terms η_i and $\epsilon_{r,i}$ are assumed to be uncorrelated disturbances. I estimate these equations using 2SLS weighted by the survey weights. Finally, I cluster the

¹⁰The main results are robust to reasonable perturbations of this cutoff.

¹¹Results can be found in the Online Appendix.

standard errors by county to allow for arbitrary within-county correlations in the error term.

Main Results

Table 1: Effect of WWI War Mobilization on Political Attitudes: Ordinary Least Squares

	Pro-Choice	Liberal	Democrat
	(1)	(2)	(3)
Pct. Veteran, WWI	0.683** (0.163)	0.324* (0.143)	0.485** (0.171)
Pct. Men Younger than 16, 1910	0.016 (0.073)	-0.089 (0.065)	0.185* (0.077)
Log (Total Population), 1910	-0.001 (0.009)	0.023** (0.007)	0.049** (0.010)
Pct. Female, 1910	-0.021 (0.194)	0.153 (0.160)	-0.143 (0.224)
Female LFP, 1910	0.205** (0.075)	0.255** (0.065)	0.274** (0.082)
Pct. Black, 1910	0.058 [†] (0.031)	0.009 (0.027)	0.128** (0.037)
Log (Mfg. Establishments), 1900	0.024** (0.008)	0.001 (0.006)	-0.008 (0.009)
Constant	0.154 (0.116)	-0.180 [†] (0.098)	-0.222 [†] (0.132)
State FE	Yes	Yes	Yes
N	126,708	122,468	126,826

[†]p < .1; *p < .05; **p < .01

Weighted least squares using sample weights.

Clustered standard errors at the county level in parentheses.

To begin, I show the initial Ordinary Least Squares (OLS) results in Table 1 to probe the initial plausibility of the argument. Across all outcomes, war mobilization is positively associated with liberalism today. Column 1 of Table 1 shows that a one percent increase in the proportion of WWI veterans in a county historically is associated with about a 0.7 percent increase in the probability that an individual identifies as pro-choice on the abortion debate. While this issue taps into the gendered dimension of left-right politics, I also investigate whether war mobilization seems to have broader ideological

implications for the electorate. Columns 2 and 3 of Table 1 shows that individuals from war mobilized areas are more likely to identify as liberals and Democrats. In short, there seems to be suggestive evidence in support of the notion that war mobilization seems to have lasting political legacies.

Table 2: Effect of WWI War Mobilization on Political Attitudes: Two-Stage Least Squares

	Pro-Choice	Liberal	Democrat
	(1)	(2)	(3)
Pct. Veteran, WWI	1.007** (0.300)	0.389 (0.252)	0.807** (0.308)
Pct. Men Younger than 16, 1910	-0.027 (0.078)	-0.097 (0.067)	0.143 [†] (0.084)
Log (Total Population), 1910	-0.003 (0.009)	0.023** (0.007)	0.048** (0.010)
Pct. Female, 1910	-0.006 (0.199)	0.156 (0.160)	-0.128 (0.228)
Female LFP, 1910	0.179* (0.078)	0.249** (0.067)	0.249** (0.085)
Pct. Black, 1910	0.055 [†] (0.031)	0.008 (0.027)	0.126** (0.037)
Log (Mfg. Establishments), 1900	0.024** (0.008)	0.001 (0.006)	-0.009 (0.009)
Constant	0.169 (0.119)	-0.177 [†] (0.098)	-0.207 (0.135)
State FE	Yes	Yes	Yes
N	126,573	122,338	126,690

[†]p < .1; *p < .05; **p < .01

Weighted least squares using sample weights.

Clustered standard errors at the county level in parentheses.

Though these OLS regressions show a clear association between historical war mobilization and contemporary public opinion, they do not necessarily establish that this association can be interpreted as *causal*. To isolate the plausibly exogenous variation in war mobilization, I present instrumental variables results in Table 2 using variation in the percent of men at-risk of serving in WWI as an instrument. The first-stage F statistic is well over the suggested value of 10 assuaging any concerns over weak instruments bias. Across all outcomes, the coefficient on war mobilization remains positive, though

it becomes statistically insignificant for the effect on liberal ideology. Given 2SLS's relative inefficiency to OLS, the inflation of the standard errors is not a major concern since the point estimates in 2SLS and OLS results are quite similar.

Concretely, these results suggest that in a counter-factual world where the United States never mobilized for WWI then the American public would be about six and seven percent less likely to identify as pro-choice and Democrats respectively. In the Appendix, I examine the heterogeneous effects of historical war mobilization among men and women and find that these effects are largely driven by women holding more liberal beliefs around gender. This suggests that the social effects of war mobilization (at least with respect to gender) seem to take hold amongst the subpopulation of individuals most affected by these changes.¹²

One concern might be that these estimates are only informative of the sub-population of compliers where these areas would have only mobilized if they had more men close to twenty-one during the war. Given that other factors such as patriotism and national identity also influence war mobilization are likely quite biased in terms of the subpopulations that they characterize, these instrumental variables results which exploit variation in demographic compositions are likely to reflect features of the overall population as well. Results from this exercise suggest that war mobilization during WWI did seem to have a long-run, causal effect on contemporary political attitudes especially as they relate to gender.

Causal Mechanisms

Thus far, I have established a robust link between historical war mobilization during WWI across U.S. counties and contemporary liberalism; yet, these results do not necessarily have to follow from the theory presented herein. To validate the theory, I also test hypotheses two, three, and four presented in the conceptual framework. That is, war mobilization should have caused an increase in female labor force participation, the children of women who work should have more egalitarian attitudes toward gender roles, and that women who live in areas affected by war. Using historical census and individual-level survey data, I find evidence consistent with both of these chains of the theory.

First, I test the hypothesis war mobilization should cause an increase in female labor force participation. To do so, I estimate female labor force participation rates at the county-level using data from the 5% sample of the 1930 U.S. Census provided by

¹²Obviously, war mobilization intimately affected men who went to fight in the war. For more on the political legacies of direct combat exposure, see Jha and Wilkinson (2012) and Grossman, Manekin, and Miodownik (2015).

IPUMS.¹³ I then estimate regressions—both OLS and 2SLS—with female labor force participation as the dependent variable. Table 3 displays the results of this exercise.

Table 3: Effect of WWI Mobilization on Female Labor Force Participation in 1930: County-Level Analysis

	Female LFP, 1930			
	(1)	(2)	(3)	(4)
Pct. Veterans (of males)	0.402** (0.057)	0.629** (0.059)	0.502** (0.058)	0.483** (0.119)
Log(Population), 1910			0.021** (0.003)	0.021** (0.003)
Pct. Female, 1910			0.100 (0.081)	0.095 (0.086)
FLP, 1910			0.184** (0.035)	0.184** (0.035)
Pct. Black, 1910			0.210** (0.012)	0.209** (0.012)
Log(Mfg. Estab), 1900			0.004 [†] (0.002)	0.004 [†] (0.002)
Constant	0.158** (0.005)	0.236** (0.016)	−0.149** (0.047)	−0.146** (0.049)
State FE	No	No	No	No
N	2,732	2,732	2,717	2,717

[†]p < .1; *p < .05; **p < .01

Robust standard errors in parentheses.

Across all models—OLS and 2SLS—I find consistent support for the prediction that war mobilization should increase female labor force participation. The simple bivariate correlation, presented in Column 1 of Table 3, shows a strong positive relationship between war mobilization and female labor force participation. These results also hold when including state fixed effects (Column 2) and adding in additional pre-treatment controls (Column 3). Moreover, the coefficient remains virtually unchanged when us-

¹³I use the labor force participation rate among white females given some of the issues with considering labor force participation rates among black females.

ing the instrumental variables design from above (Column 4). These results provide robust evidence consistent with the theory presented in this paper.

Table 4: Effect of Mother's LFP on Political Attitudes: Ordinary Least Squares

	Pro-Choice	Women Take Care Home	Women Unsuitable Politics	Women Should Work
	(1)	(2)	(3)	(4)
Mother Worked	0.063** (0.009)	-0.075** (0.008)	-0.065** (0.009)	0.058** (0.008)
Survey FE	Yes	Yes	Yes	Yes
N	14,903	14,802	13,225	14,958

[†]p < .1; *p < .05; **p < .01

Robust standard errors in parentheses

All models also include basic demographic controls for sex, race, age, and age squared.

It is not simply enough for war mobilization to induce female labor force participation: there must also be some sort of socialization mechanism for attitudes to persist. To test whether vertical transmission from mother to child seems to be in operation, I use data from the GSS Cumulative File from 1972-2016. The GSS provides an ideal platform to directly test vertical transmission since it asks a battery of questions about gender roles in the home and politics in addition to asking about a respondent's family's work history. In this exercise, then, I analyze whether having a mother who worked influences the respondent's conceptions of gender roles on a variety of questions including pro-choice attitudes, women's house work, women running for office, and whether women should also be working. I estimate a series of OLS regressions with an indicator for the respondent's mother's work history as the core explanatory variables and include controls for survey year fixed effects to net out overall time trends, sex, race, age, and age squared. All regressions are at the respondent-level with the key coefficient of interest being an indicator for whether that respondent's mother was ever in the labor force. Table 4 presents the results of this mechanism check.

Across all outcomes, I find that respondents with mothers who worked tend to have more egalitarian attitudes toward gender roles. They are more likely to be pro-choice, less likely to agree that women should only take care of the home, less likely to agree that women are unsuitable for politics, and more likely to agree that women should also work outside of the home. The magnitude of these effects are also all fairly consistent across outcomes at around six percent. Though these regressions rely on a selection-on-observables assumption for identification, they at least provide suggestive evidence consistent with the prediction that women who work should be transmitting more egalitarian gender roles to their children.¹⁴

¹⁴Results in the Appendix show that they hold within males and females.

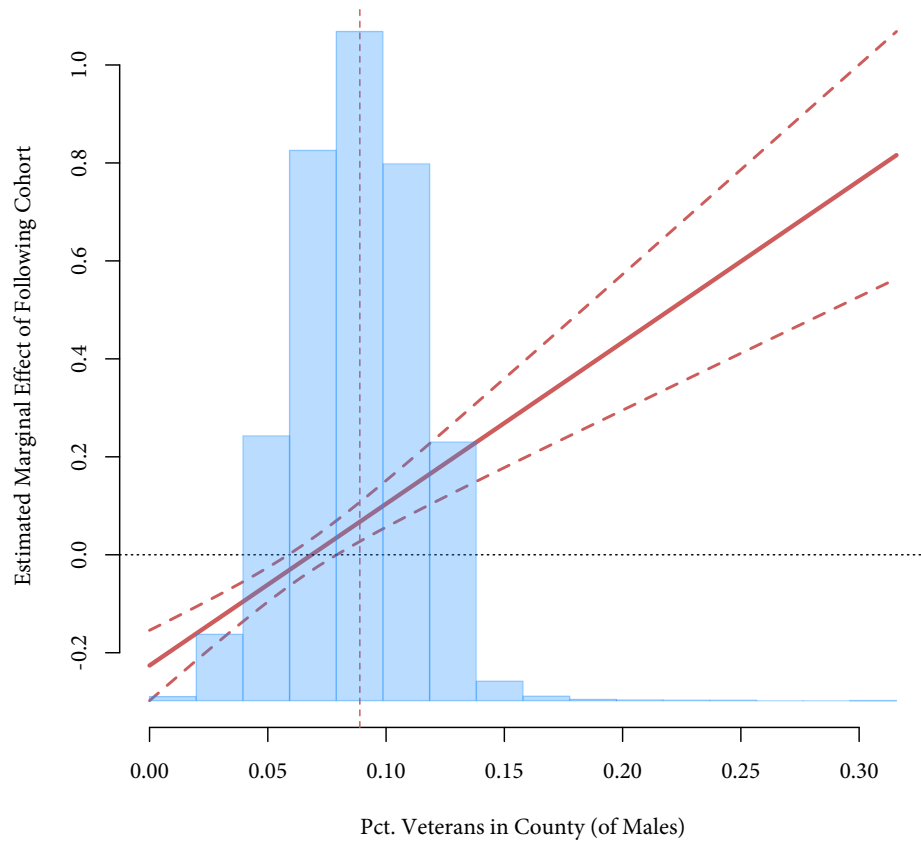


Figure 4: Effect of Following Cohort by County-Level War Mobilization, 1930

Finally, I go onto test Hypothesis 4—that war mobilization should increase female labor force participation among women who were not directly exposed to the war, but reside in areas with a legacy of war mobilization. To do so, I use the 1930 5% sample of women from the U.S. Census and use a difference-in-differences design to estimate the effect of war mobilization on female labor force participation. The intuition behind this design is that if war mobilization leads local communities to change their beliefs about women in the work force via processes of horizontal transmission, then we should expect the cohort of women who were too young to be able to work during the war to still have higher levels of labor force participation in high mobilization counties relative to low mobilization counties. If they were too young to have worked themselves during WWI, then this removes the possibility that war mobilization shapes their labor force participation by directly inducing them to go into the workforce; instead, changes within their communities must drive their behavior.

I estimate the effect of being too young to work during WWI (but were old enough to work in 1930) and its interaction with the percent of veterans in that female's county of residence using OLS. I define being too young to work during WWI if a female in 1930 was younger than 16 years old during 1918.¹⁵ The key identifying assumption is that all other cohorts would have trended in similar ways if not for the war. I also include state fixed effects and flexible functions of birth year to net out the effect of state-level variables and trends by birth cohort. For inference, I cluster standard errors by birth cohort.¹⁶ Figure 4 plots the estimated marginal effect of being too young to work WWI over the empirical support of the percent of veterans in a county.

Figure 4 provides evidence consistent with the horizontal transmission mechanism. For women of this cohort, their average labor force participation rate increases as the percent of WWI veterans in their county increases relative to women of other cohorts. Substantively, moving from being too young to work during WWI in a place with no mobilization to a place with about the average amount of war mobilization increases that woman's probability of being in the labor force by nearly twenty percentage points. These results suggest that among the cohort of women who could not have been in the labor force themselves during WWI, local war mobilization still increased their likelihood of being in the labor force. While these results do not directly capture the diffusion of new beliefs within a community, they are at least consistent with a story in which war mobilization led to horizontal transmission of new beliefs within local areas.

To summarize the results, I find that historical war mobilization leads to a more liberal public in the long-run especially with respect to gender attitudes as measured by support for the pro-choice position on the abortion debate. Moreover, I find that these results are likely to be driven by the specific gendered way in which war mobilization

¹⁵The results are robust to reasonable deviations from this definition.

¹⁶The results are robust to clustering at the county-level.

shapes labor markets and the subsequent complementarities between labor markets and political attitudes. The data show that both processes of vertical and horizontal transmission of beliefs are likely to explain these results. Thus, the results provide evidence consistent with the argument that wars can lead to lasting political legacies in a country and these legacies are shaped by the interplay between labor markets and cultural values.

CONCLUSION

Can war be a liberalizing force for politics? In this paper, I develop a theory of how war mobilization can lead to deep shifts in the ideology of the mass public and how these beliefs might persist until today. To test the theory, I honed in on the case of WWI, which provides similar variation to WWII, but holds pension programs and benefits such as the G.I. Bill constant in addition to limiting the influence of sex-ratio effects as a result of casualties. By combining historical census data with contemporary public opinion data, I show that there is a robust correlation between historical war mobilization at the county-level and the probability that an individual is pro-choice, liberal, and a Democrat today. To establish causality, I exploit exogenous variation in the proportion of men at risk of being mobilized to fight in WWI in an instrumental variables framework to show that the correlations can be interpreted as causal. Consistent with the theory, I show that these same areas also had higher rates of female labor force participation directly after WWI. Furthermore, I also show evidence consistent with the vertical transmission mechanism: children of women who worked tend to be more likely to be pro-choice, less likely to agree that women should be home-makers, less likely to agree that women are unsuited to run for office, and more likely to agree that women should be in the work-force. In sum, the theory and evidence assembled in this paper provide a systematic answer to the question posed above. Wars can cause lasting political legacies that can actually make for more liberal societies.

The argument proposed in this article joins Mayhew (2005) in pushing those who study American politics to take seriously the ways in which wars shape politics overtime or contemporaneously. With the rise of quantitative historical data and strategies for causal inference using observational data, scholars can build on top of existing historical work, which is largely qualitative, and investigate the systematic effects of warfare on American politics. While this article highlights the relationship between war and social structure, studying other relationships such as those institutions unique to the United States including the bureaucracy and the presidency (Howell, Jackman, and Rogowski 2013) could shed new light on the power and limits of state development during wartime. At its core, this research agenda is a re-articulation of the classic “second-image reversed” idea in International Relations where international factors can have

an independent influence on domestic political developments (Gourevitch 1978).

While this article emphasizes the status-leveling effects of war, wars and especially civil conflicts can actually increase stratification. Rather than incorporation individuals, warfare might reinforce ethnic identities (Besley and Reynal-Querol 2014), reduce economic development (Ray and Esteban 2017), or encourage sexual violence (Cohen 2013). Thus, not all wars and not all types of violence lead to status-leveling; rather, mass warfare typified by the types of conflicts such as World War I and World War II seem to have these status-leveling qualities domestically.

To situate the argument more broadly, I conceptualize war as a process that leads to status-leveling by incorporating marginalized groups. While existing research tends to highlight how war shapes institutions, the perspective outlined in this piece suggests that we ought to understand how mass warfare changes fundamental features of societies such as its values, identities, and beliefs. But this also highlights a difficult irony. If real status-leveling occurs during or in the wake of mass warfare, then this framework suggests a more pessimistic take on the ability of societies to reduce stratification not just in class, but also across a variety of different types of groups (Scheve and Stasavage 2016; Scheidel 2017; Mazumder 2017).

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