The Intergenerational Transmission of War*

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Abstract

We study whether war service by one generation affects service by the next generation in later wars, in the context of the major US theaters of the 20th century. To identify a causal effect, we exploit the fact that general suitability for service implies that how close to age 21 an individual's father happened to be at a time of war is a key determinant of the father's likelihood of participation. We find that a father's war service experience has a positive and significant effect on his son's likelihood of service. We estimate an intergenerational transmission parameter of approximately 0.1, across all wars, and that each individual war had a substantial impact on service in those that followed. We find evidence consistent with cultural transmission of war service from fathers to sons, and with the presence of substitutability between this direct transmission and oblique transmission (from society at large). In contrast, father's war service increases sons' educational achievement and actually reduces the likelihood of military service outside of wartime, suggesting that the results cannot be explained by material incentives or broader occupational choice. Taken together, our results indicate that a history of wars helps countries overcome the collective action problem of getting citizens to volunteer for war service.

Keywords: War; Conflict; Military Service; Intergenerational Links; Cultural Transmission; Occupational Choice.

JEL Classification: D74, D90, I20, J12, J13, O15, Z10.

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"My father's pride in his service as a pilot in the Army Air Corps [during World War II] helped shape my own decision to serve [in Vietnam] (...). Generations were linked by service and those values were passed down from father to son to a new generation."

– John F. Kerry[1]

1 Introduction

Wars are immensely costly endeavors, both from economic and human perspectives, and very often bring about important consequences for the countries and societies that engage in them. It is thus unsurprising that a long literature in the social sciences has focused on studying the determinants of war, mostly looking at the issue from the perspective of leaders or policy-makers.[2]

Yet if countries go to war, it is individuals who actually do the fighting, at obviously enormous risk and cost even for those who survive physically unscathed. It follows that a full understanding of the determinants of war has to be microfounded on the decisions of individuals on whether to serve in a time of war.

Indeed, participation in war is a classic case of a collective action problem, where the benefits accrue to the general population while the risks and costs are disproportionately borne by the relativey few who fight (Olson 1971). While part of the answer has often involved compulsion, the fact is that individual decisions are ultimately at the heart of the matter – not least because conscription can always be avoided or resisted, at some cost, and is typically unpopular (Simon and Abdel-Moneim 2011) – and as such they must affect the calculations political leaders face in choosing whether to pursue war.[3]

This paper studies one key element in those individual decisions: is war service transmitted across generations? In other words, does a father's war experience affect the likelihood that his sons will also serve in subsequent wars?[4] And if so, what forces give rise to such transmission?

To the best of our knowledge, this is the first attempt to answer these questions. The main empirical challenge is that any intergenerational correlation one may find does not imply a causal effect: a higher likelihood of service among the sons of veterans could reflect, for instance, a

[1]This is an excerpt from Kerry's blurb for Takiff (2003), a book on "American Fathers and Sons in World War II and Vietnam."

[2]For overviews of the literature and issues involved, see for instance Vazquez (2000) and Van Evera (2013), from the perspective of international relations, or Jackson and Morelli (2011), from a political economy perspective.

[3]As we will discuss in greater detail, many conscripted individuals avoid going to war (Kasinsky 1976; Rotsker 2006), conscription typically involves many exceptions, and volunteers have historically been a major part of war efforts involving conscription.

[4]We refer to "fathers" and "sons," since war service was overwhelmingly male over the 20th century.

physical or psychological aptitude or inclination that correlates across generations, perhaps due to genetic factors. It could even mask a negative causal effect, say, if the horrors of war would generate an aversion to following that path oneself.

We study these questions in the context of the four major US theaters of the 20th century – World War I, World War II, Korea, and Vietnam.[5] Our strategy for causal identification relies on the fact that whether someone's father is a war veteran depends on the father's age at the time of war. In particular, because suitability for service and draft eligibility vary with age, the likelihood that the father participated in a war peaks for 21-year old individuals, and declines in essentially monotonic fashion as the distance to age 21 increases. Our key premise is that there is no reason why individuals born 21 years before wartime would have particular characteristics – compared to those born symmetrically, say, 25 or 17 years before that same war – directly affecting the likelihood of war service by their offspring.

We apply this strategy to US Census micro data linking the behavior and outcomes of fathers and sons.[6] We first show the reduced-form effect across all four wars, whereby the father's year-of-birth distance to the peak year reduces the likelihood of the son's serving in war: on average, an additional five years of distance implies that sons are 1.5 percentage point less likely to go to war, a 13% drop relative to the mean likelihood in the sample. Similarly, the first-stage relationship shows that the additional five years would reduce the probability of a father having gone to war by 15 percentage points, corresponding to a decline of just over one-third with respect to the mean.

In the two-stage least squares (2SLS) context, these magnitudes imply, across all wars, an intergenerational transmission parameter of around 0.1. In other words, under the exclusion restriction that the father's year-of-birth distance to peak year only affects the son's war service decision through the likelihood that the father has gone to war himself, inducing the father to serve increases by about 10 percentage points the likelihood of his military-age son serving in the next generation's war.

The positive relationship holds for each of the four major wars taken separately, suggesting a persistent and robust phenomenon. While the size of the estimated parameter declined over the 20th century, the relatively smaller scale of the war efforts post-World War II implies that the aggregate effects are always non-trivial, and rather stable. For instance, our estimates would imply that the service of World War I fathers explains up to 12% of World War II service members in our sample, while World War II fathers account for about 20% of Vietnam veterans, who in turn

[5]We will also examine the intergenerational effects over Gulf War service, separately from the four major wars, for reasons we will discuss in detail.

[6]Linking fathers and sons is only feasible for a non-random subsample of the Census. We will discuss in depth the issues of external validity with respect to the population, but we find, in essence, that our results are likely to be, if anything, a slight underestimate of the effects for the population. Similarly, we also show that they are not much affected by attrition due to war casualties.

account for around 14% of Gulf War soldiers. This indicates that intergenerational transmission remained an important factor explaining war service throughout the century.

Our finding has immediate implications for the dynamics of war over time. In fact, calibrating our estimates into the demographic trajectory of the US male population indicates that US wars over the 20th century provided a sizable boost in terms of available manpower for subsequent wars – in the cases of World War II, Korea, and Vietnam, the wars turned out to be well-timed to seize that boost. These aggregate estimates should be interpreted cautiously, as the very existence of intergenerational effects could lead to general equilibrium and political economy forces affecting the scale, duration, and composition of subsequent wars. Still, they illustrate the potential dynamic links between wars over time, and how they are affected by the size and spacing of those wars.

We then look at the specific nature of the mechanism behind that intergenerational transmission. We first consider the possibility of a "cultural transmission" channel: the war service experience could affect individual beliefs and attitudes, which a father could then choose to transmit to his sons, and which may induce them to serve in war. While we do not have direct evidence on individual attitudes across generations, a simple model of purposeful transmission of cultural traits, in the spirit of Bisin and Verdier (2001), predicts that such changes in attitudes would induce changes in parenting strategies, with increased effort in transmitting one's traits to his offspring. It also predicts that the intergenerational transmission within the familiy and the "oblique transmission" from society at large should be "cultural substitutes": fathers may invest less in inculcating values related to war service if there is a strong chance that those values will be passed on by a society where they are widespread.

Consistent with this mechanism of cultural transmission at the individual level, we document evidence, in the context of the National Longitudinal Survey of Youth (NLSY), of an effect of war service on parenting strategies, as perceived by sons – and not by daughters. Specifically, sons become more likely to report that their fathers adopted an authoritative parenting style, which has been defined as one where parents "mold their children's preferences so as to align them with their own" (Doepke and Zilibotti 2014, p. 3) We also find that the intergenerational transmission is weaker in counties where there is a larger share of war veterans in the population, consistent with cultural substitutability.

We also show that our results cannot be explained as a mere instance of a broader kind of occupational choice decisions, whereby military careers "run in the family," as many other professions might, and wartime service simply triggers military careers. Instead, and quite remarkably, there is a negative effect of father's war service on the likelihood of the son's serving outside of wartime. As it turns out, on net, we find no effect of father's war service on the overall likelihood of sons having been in the military. In other words, our results speak to the intergenerational transmission of war, not of military service in general.

We further consider the possiblity of wartime service affecting the decisions of the next generation through material incentives. In principle, war service could have an effect on parents' decisions in ways that worsen the economic opportunities available to their progeny, thereby increasing the latter's likelihood of war service. However, we find a positive causal effect of father's war service on sons' education, consistent with the intergenerational transmission of the achievement induced by the many programs supporting veterans' educational pursuits (Angrist 1993; Bound and Turner 2002). This finding is of independent interest, in that it underscores the cross-generational effects of the war experience, as well as the long-run, dynamic effects of war on the evolution of human capital. It also helps us make sense of the negative effect on non-wartime service by the sons of veterans. In line with those patterns, we also find that father's war service increases the likelihood that teenage sons will aspire to a military career, but actually decreases that likelihood at the young adult stage.[7]

In sum, we find evidence consistent with the intergenerational transmission of war service being at least in part driven by a mechanism of individual cultural transmission. While it is plausible that this cultural transmission could ultimately increase the propensity to join the military in general, it seems that it takes the call of war for that impulse to trump the improved labor market prospects.[8]

More broadly, we look at our finding as a vivid example of intergenerational transmission of life experiences. This point is important, for instance, if we are interested in the economic effects of culture. If, following Guiso, Sapienza and Zingales (2006, p.24), we define culture as "those customary beliefs, values, and social constraints that [...] groups transmit fairly unchanged from generation to generation," then understanding its evolution requires understanding this dynamic process of intergenerational transmission. In particular, the extent to which whatever changes emerge in that process can be attributed to the accummulation of individual experiences – as opposed to, say, genetic drift – matters a great deal for policy and for whether we should expect it to affect the evolution of culture. We provide individual-level evidence on how this evolution takes place across generations.[9]

Our paper relates directly to the literature that has investigated the intergenerational links in economic decisions and outcomes, such as education (Currie and Moretti 2003, Holmlund, Lindahl, and Plug 2011), earnings (Solon 1999), or welfare dependence (Dahl, Kostol, and Mogstad 2014). In particular, we also speak to the literature that has looked at the intergenerational transmission of occupational choices, especially in sociology (see Erikson and Goldthorpe 2002) but

[7] We also assess and rule out explanations running through purely demographic channels.

[8] The example of John Kerry, already mentioned in the epigraph, is illustrative. The son of a World War II veteran, he enlisted in the Navy in 1966, as he was about to graduate from Yale, and requested duty in Vietnam. He obviously had a high opportunity cost, and it seems unlikely that he would have joined the military in the absence of war. He did not pursue a military career, leaving active duty in 1970.

[9] A complementary strand within the literature on the evolution of culture has studied long-term effects of individual experiences (e.g. Malmendier and Nagel 2011; Giuliano and Spilimbergo 2014), with a within-generation focus.

also in economics (Dal Bó, Dal Bó, and Snyder 2009). Our paper underscores, in the context of a stark and consequential decision, that life experiences have effects that are transmitted across generations, while showing evidence for a specific channel related to cultural transmission.

We also contribute to the literature on the determinants of participation in conflict, which has mostly been concerned with civil war (Humphreys and Weinstein 2008, Blattman and Miguel 2010). One of its central themes has been precisely the mechanisms for solving the collective action problem inherent in that participation. This literature has focused on the impact of economic circumstances affecting the material costs and benefits of individuals from engaging in war, and on elements of intrinsic motivation (e.g. grievances, in the context of civil war) or social sanctions. Along similar lines, the literature on the determinants of miltary enlistment in the US has also mostly focused on the socio-economic environment at the time of the decision (Kleykamp 2006).[10]

We add to these strands a perspective on the cultural aspect of that decision, and its transmission across generations, which also underscores the dynamic effects of conflict. To the extent that our findings would extend to other contexts, this may also help us understand the possibility of "conflict traps" (Collier 2003; Besley and Reynal-Querol 2014), and of war begetting war, as pointed out by observers of international politics (Singer and Small 1974, Maoz 2004): fighting a war today helps countries or groups solve the collective action problem in finding volunteers in the future.

In addition, we speak to the strand of literature that has studied the effects of military service, in the US, on a number of outcomes, ranging from earnings (Angrist 1990; Angrist and Krueger 1994) and education (Angrist 1993; Bound and Turner 2002) to health (Dobkin and Shabani 2009; Lillard and Fahringer 2014) or political attitudes (Jennings and Markus 1977).[11] This literature has not focused on intergenerational transmission, which is our main object of analysis.

The paper is organized as follows. Section 2 provides background on US war service over the 20th century. Section 3 describes the data and the empirical strategy. Section 4 shows the key results on intergenerational transmission of war, and Section 5 presents the results broken down by war, to examine the linkages between different wars over time. Section 6 then provides evidence on the mechanisms behind the intergenerational transmission. Section 7 concludes.

2 Background: US War Service in the 20th Century

In addition to numerous troop deployments for combat all over the world, the US fought in four major wars over the 20th century: World War I, World War II, Korea, and Southeast Asia (Viet-

[10] This literature has recognized and studied the intuitive idea that military service "runs in the family" (Faris 1981, Stander and Merrill 2000), but without addressing war service specifically, or dealing with causal identification.

[11] A related literature has studied the effects of conscription avoidance on various outcomes, from education (Card and Lemieux 2001) to political attitudes (Erikson and Stoker 2011). Yet another strand has focused on the effect of forced recruitment in the context of developing countries (e.g. Blattman and Annan 2010).

nam). The period of involvement, number of service members involved, and casualties in each of these conflicts, along with the briefer but also important Gulf War ("Desert Shield / Desert Storm") are displayed in Table 1.[12] The number of service members refers to all who served during the time of war, as distinct from those who actually saw combat. This is also what the Census data on veteran status, which we will use in our empirical analysis, refers to. (This means that our results should be interpreted as speaking broadly to the effects of wartime service.)

[TABLE 1 HERE]

The first observation coming out of this table is the sheer scale of the engagements: more than 37 million Americans were engaged in war service over the 20th century. The personal risk involved in that service is also of note: about 5% of those service members ended up dead or wounded – a number that does not account for psychological effects that are now known to be very important (Tanielian and Jaycox 2008). While a risk of this magnitude is most likely to weigh heavily in the average individual decision to go to war, it is worth mentioning that the numbers are small from the standpoint of sample attrition due to war deaths, a theme we will return to when discussing our results.

Not surprisingly, in light of the scale of US involvement, the four major wars involved a component of conscription (Simon and Abdel-Moneim 2011). In World War I, the Selective Service Act of 1917 authorized a draft of all male citizens between 21 and 31 years of age (later expanded to 18 to 45). Later, the 1940 Selective Training and Service Act ("Burke-Wadsworth Act") imposed peacetime conscription, meaning that men between the ages of 21 and 35 were required to register with local draft boards so that the military could fill their personnel needs via a draft lottery. Entry into World War II expanded the registration age range to age 18 to 65, with those aged 18 to 45 being immediately liable for service. In 1948, the peacetime draft was revised to cover ages 18 to 26, establishing a system that would survive (with amendments) until the end of conscription and the move to an all-volunteer military, in 1973, in the aftermath of the Vietnam War.[13]

In spite of the role of conscription, individual decisions regarding whether to serve or not have always been a central element in determining wartime service. First and foremost, a large component of all war efforts was voluntary, as can be readily seen by contrasting the figures in Table 1 with those depicted in Figure 1, which compiles the number of draft inductees for all years in which conscription was in place. Even in the case of the largest of them all, namely World War

[12]We exclude the Spanish-American War, which lasted between 1898 and 1902, since it will not be part of our empirical analysis.

[13]There still is mandatory registration with the Selective Service System, for men aged 18 to 25, for possible conscription. In practice, while most do register, many do not or fail to comply with mandates such as registering changes of address; such violations have typically not been prosecuted at least since 1986 (see http://hasbrouck.org/draft/prosecutions.html). That said, the last men to be conscripted were brought into the military in June 1973 (born in 1952), and the last draftee on active duty retired in November 2014 (Brown 2014).

II, when the need for conscripted soldiers was at its highest, just under 40% of service members were classified as volunteers. By the time of Vietnam, a significant majority of service members were in fact volunteers (Rotsker 2006).

[FIGURE 1 HERE]

In addition, all conscription episodes involved exceptions – ranging from "conscientious objector" or dependency or "essential occupation" exemptions, to medical and general fitness exemptions – which naturally afforded leeway to avoid service.[14] In the limit, draft evasion was always an option that, albeit costly, was taken by a non-negligible number of individuals: the number of "apparent draft offenders" in the Vietnam era is estimated in excess of half-a-million individuals (Rotsker 2006), and most were eventually pardoned (Simon and Abdel-Moneim 2011).

For all these reasons, it makes sense to study war service as an individual decision that can be affected by factors such as a family history of service.

Still, the possibility of conscription should naturally affect the decisions even of those who were not drafted and thus choose whether to volunteer. Since data issues lead us to focus on the four major wars, our main analysis will keep uniformity with respect to the presence of conscription. It follows that our main results should be interpreted as quantifying the importance of intergenerational transmission of war service under a system where fathers may well be induced to serve largely because they are drafted, and sons later decide whether to volunteer or whether to comply with a conscription order. We will then look separately at the post-Vietnam data, to assess whether a father's service in the conscription era has an impact on his son's decision to serve in war during the all-volunteer era.

Another salient aspect of war service at the time of the four major 20th-century wars is that it was in essence, though not entirely, a male endeavor. In World War II, for instance, there were just under 400,000 women in service – all volunteers, since there has never been female conscription in the US. In addition, up until 1973, after the end of the Vietnam War, women were not allowed in the field of combat, and had a very limited role in combat zones in general (Holm 1993). We will thus focus on the links between fathers and sons, while using differences across genders occasionally as a source of contrast.

[14] As a particularly salient example, in the Vietnam era a draftee could obtain deferment as long as he was a full-time student working towards a degree. As noted by Takiff (2003, p. 2) in his collection of stories told by Vietnam veterans, "most of the Vietnam veterans in this book had at least some choice in the matter [of serving]".

3 Empirical Framework

3.1 Data

Our primary analysis is based on micro data from the decennial US Census of 1950-2000, acquired through IPUMS-USA. For the main US theaters we will study – namely, World War I, World War II, the Korean War, and the Vietnam War – the Census contains veteran status information on whether each individual served in the U.S. Armed Forces during each war.[15]

In contrast, perhaps as a result of the smaller scale of the Gulf War compared to its predecessors, the subsequent Census did not ask about wartime service specifically: the questions related to veteran status were instead framed in terms of time periods. This introduces additional measurement error, in that some of the respondents will not have served during wartime. For this reason, we will focus our analysis on the four major wars, and then look separately at Gulf War-era service by looking at the 1990-1995 period, which is the available range covering the period of the war.[16]

A key challenge is to match data across fathers and sons. Unfortunately, the Census does not provide data on the universe of father-son relationships, but rather only for those cases where fathers and sons are in the same household.[17] The vast majority of adult sons do not live with their fathers, of course, and moreover our sample is, unsurprisingly, not representative of the overall population. For instance, the likelihood of being in our sample is strongly and negatively related with age. This can be seen very clearly in the density functions depicted in Figure A1, in the Appendix, aggregating all Census years in our time range.

This selection into cohabitation would be particularly problematic if it were related to the willingness to serve in wars. To probe for this, in Figure A2 we plot the likelihood of being a war veteran for each cohort in the male population, versus in the matched sample. Consistently, across all censuses, the likelihood is approximately similar, suggesting that selection based on latent willingness to serve in war is not a key concern.[18]

[15] Obviously, each Census only contains information on service in wars that preceded it, so we cannot use those before 1950, which would only cover participation in World War I. The censuses do not contain information on the branch of the armed forces, or what type of battles the individuals experienced, if any at all. The definitions of war periods all come straight from the Census.

[16] We will not consider the effect of Vietnam veteran fathers on service in the later, 21st-century wars in Afghanistan and Iraq. This is because the available sample size is rather small: the length of time between Vietnam and these conflicts is long enough that there are few 21st-century soldiers who have Vietnam-era fathers. In addition, among those who do, the distribution of father years of birth is quite asymmetric around the Vietnam peak year of 1947 – quite naturally, a lot more fathers of Afghanistan and Iraq veterans were born after 1947 than before. Needless to say, the time between the Gulf War and the later wars is much too short for there to be many children of those veterans fighting in Iraq or Afghanistan.

[17] We link fathers and sons using the variable "poploc," which according to the Census "identifies social relationships (such as stepfather and adoptive father) as well as biological relationships."

[18] Note that the 1950 Census is an outlier when it comes to the likelihood of service, both for our sample and the overall population. This is due to the inconsistent implementation of the census, where many enumerators did not ask

We can repeat this visual exercise for other demographic characteristics. As it turns out, sample and population are largely similar, across all censuses, as can be seen in Figure A3 in the Appendix. The one exception is single status: in short, it is essentially the young and single who are disproportionately likely to be living with their fathers.

We can use this wealth of available demographic characteristics in more systematic fashion, to further check the determinants of selection into the sample. Specifically, we run a set of bivariate regressions in the full sample, with a dummy indicating son living with father as the dependent variable, and different observable characteristics on the right-hand side. The resulting (standardized) coefficients are plotted in Figure A4.[19] They confirm that age and single status are the key correlates of the likelihood of living with one's father. A couple of other variables (socio-economic status, unemployed status) are also relevant predictors, though on a much smaller scale. We will later exploit these predictors to assess the external validity of our key findings.

3.2 Identification Strategy

The key idea behind our empirical strategy is that, due to features such as draft eligibility and general suitability for service, the likelihood of war service peaks around age 21, and declines as distance to that age increases. This can be seen in Figure 2, which plots the likelihood of wartime service across birth cohorts of the 20th century, in the US Census data. Across all wars, cohorts born around 21 years before the midpoint of the war have the highest likelihood.[20]

[FIGURE 2 HERE]

Since there is no obvious reason why individuals born around 21 years before a war breaks out will have particular observable or unobservable characteristics that directly affect the likelihood of war service by their offspring, it follows that a father's year of birth – or more precisely, its absolute distance to the closest year that happens to be 21 years before the midpoint of a subsequent war – is a plausibly exogenous source of variation for the likelihood of the father serving in a war. This strategy thus allows us to estimate the effect of the latter on the son's likelihood of going to the subsequent generation's war.

This is best understood with a simple example. Consider three individuals, A, B and C, all born in the same year. Individual A's father was born in 1896, and was 21 years-old at the time of World

the veteran status question. It is unclear what bias this would introduce in our context, since any random measurement error in son veteran status will primarily lead to larger standard errors, and random measurement error in father veteran status will be purged by the instrument. Nevertheless, our results are robust to dropping the 1950 Census altogether, as we show in Table A2 in the Appendix.

[19]The corresponding regression results are in Table A1 in the Appendix.

[20]For a descriptive account of war service across generations over the 20th century in the US, see Carlson and Andress (2009).

War I; Individual B's father, in contrast, was born five years earlier, in 1891; and Individual C's father was born five years later, in 1901. The key idea is that the distance of their fathers' year of birth relative to 1896 should not systematically affect A's decision to serve in World War II, relative to B and C, other than through the likelihood of the fathers serving in World War I. The same is true, *mutatis mutandis*, for 1922 (21 years before the mid-point of US involvement in World War II), 1931 (Korea), or 1947 (Vietnam).

To implement the strategy, we study the following (first-stage) relationship, in the matched subsample of fathers and sons:

$$(1) \quad FatherWarService_{ict} = \beta_{FS} * FatherYOBdist_{ict} + f(FatherYOB_{ict})\theta + X'_{ijct}\gamma + \varepsilon_{ijct},$$

where $FatherWarService_{ict}$ is a dummy indicating whether the father of individual i born in cohort c, observed in Census year t, reported to have served in any of the wars under analysis, $FatherYOB_{ict}$ is the father's year of birth, and X_{ijct} is a vector of additional control variables.

The main independent variable of interest is $FatherYOBdist_{ict}$: the absolute distance between the father's year of birth and the closest year that happens to be 21 years before the midpoint of a subsequent war. This variable is depicted in Figure 3, in which the key peak-age cohort years are marked. By contrasting the figure with Figure 2, we see that they are essentially mirror images of one another: the likelihood of war service by cohort peaks in those key years. In short, the main idea of our empirical strategy is that the likelihood of war service is strongly decreasing in $FatherYOBdist_{ict}$: $\beta_{FS} < 0$.

[FIGURE 3 HERE]

The variable $FatherYOBdist_{ict}$ makes clear that our strategy is exploiting the symmetry around the peak-age cohort years, as already suggested by our simple example. In other words, we are not simply comparing individuals whose fathers were 21 at the midpoint of the previous war to others whose fathers were x years older; rather, we are comparing that first set of individuals, simultaneously, both to those whose fathers were x years older and to those whose fathers were x years younger. While older parents are likely to be systematically different, our premise is that there is little reason to think that both older and younger parents will be systematically different, in the same way, from those born in certain years that are, for all intents and purposes, as good as randomly picked.

We can go one step further by controlling for father's year of birth, $FatherYOB_{ict}$, to address concerns of broad changes in the determinants of war service across cohorts over the long time span we study. We do so by including a function $f(\cdot)$, experimenting with linear and third-order polynomial specifications. The vector X_{ijct} includes Census year fixed effects and son birth-year

fixed effects. This means that our variation is comparing sons who were born in the same year, controlling for any cohort effects.[21] Finally, for additional robustness, we will also show specifications that include demographic controls and state fixed effects in X_{ijct}.

To focus on the relevant variation, we restrict the baseline sample to cohorts that were born in the relevant time period. Specifically, since young children and elderly men are highly unlikely to serve in wars, we restrict the sample to fathers born after 1880, and to cohorts of sons no younger than age 16 by the end of the Vietnam War.

We also estimate the reduced-form equation:

$$(2) \qquad WarService_{ict} = \beta_{RF} * FatherYOBdist_{ict} + f(FatherYOB_{ict})\theta + X'_{ijct}\gamma + \nu_{ijct},$$

where $WarService_{ict}$ is a dummy indicating whether individual i (i.e. the son) actively served in any of the wars under analysis, using the same set of covariates and fixed effects as in (1). Note that, when we include son birth-year fixed effects and control for the year of birth of fathers, we effectively control for the difference in age between fathers and sons; by the same token, the combination of birth-year fixed effects and Census year fixed effects also implies that we effectively control for the age of the sons at the time of the censuses.

We can also estimate the following equation, via IV/2SLS, in order to scale the reduced-form effect, β_{RF}:

$$(3) \qquad WarService_{ict} = \beta_{IV} * FatherWarService_{ict} + f(FatherYOB_{ict})\theta + X'_{ijct}\gamma + \tilde{\varepsilon}_{ijct}.$$

Under the exclusion restriction that the distance in the father's year of birth to the peak cohorts only influences the likelihood of the son's war service through its effect on whether the father served in war, β_{IV} captures the parameter for what we may label "pure" intergenerational transmission of war: the difference in the likelihood of war service between sons whose fathers went to war, and sons whose fathers did not go to war. A weaker version of the exclusion restriction would state that the influence works only through the likelihood of service, which could also encompass choices made in order to counteract that increased likelihood. The interpretation of β_{IV} would then refer to a "broad" intergenerational transmission: the effect of increasing a father's probability of serving in war over the son's decision.

Another possibility consistent with our reduced-form specification would allow for the possibility of social effects. For instance, it could be the case that a father's proximity to peak age at the time of war also increases the likelihood of his friends and peers going to war. Contact with those

[21] It is not obvious that one should include son cohort fixed effects, since it may be endogenous to whether the father went to war: for example, veteran fathers could choose to delay when to have children. However, as we will show, the estimates are very similar with and without these fixed effects, indicating this is not a concern in practice.

war-exposed friends and peers could in turn affect the father in ways that eventually get transmitted to his sons.[22] In short, the experience of war service could get transmitted across generations in both direct and indirect ways, both of which are important from a policy perspective.

Finally, we should note that our instrument estimates the intergenerational transmission parameter for individuals whose fathers were induced to serve because of their appropriate age at the time of war (the "compliers"). If treatment effects are heterogenous, the local average treatment effect we estimate may therefore be different from the average treatment effect. In other words, we cannot estimate the effect among those fathers who never serve regardless of their age at the time of war (the "never-takers"), or fathers who always serve regardless of their age ("always-takers"). The latter group is arguably non-existent, since it is extremely rare for very old people or young children to serve in war; the group of never-takers is likely to be substantially larger, but of limited policy interest.[23]

4 Main Results: The Intergenerational Transmission of War

We first pool together all the available data from the four major war theaters. Because sons effectively only serve in subsequent wars relative to their fathers, this estimation will exploit variation arising from fathers serving in the first three wars – World War I, World War II, and Korea – and the effects on service by sons in later wars: World War II, Korea, and Vietnam. It will therefore be a weighted average of the intergenerational transmission parameter across the wars during the 20th century. This parameter will provide an estimate of the overall importance of the intergenerational mechanism during the long time period of the major U.S. wars of the 20th century, covering the conscription era.

4.1 First-Stage and Reduced-Form Results

Table 2 displays the first-stage and reduced-form estimates from a linear specification. The estimates on father's year-of-birth distance to the war peak cohort are statistically significant (at the 1% level) across all specifications; in fact, it is rather clear, from inspection, that the first stage is very strong. Columns 1-2 show the basic first-stage specification linking our instrument to the likelihood that the father is a war veteran, first with linear and then polynomial father-year-of-birth controls. The estimate implies that each additional year of distance from the father's birth relative

[22] Another possibility is that the father's friends could directly influence the son, but it seems far-fetched that this would be a quantitatively meaningful channel in comparison to the father-to-son transmission.

[23] We use these terms loosely, in the spirit of the LATE framework (Angrist, Imbens, and Rubin 1996). For example, strictly speaking, the "always-takers" are defined for a dummy instrument, but in our main specification the instrument is continuous.

to the closest peak year for war service implies a decrease of 3 percentage points in that likelihood.

[TABLE 2 HERE]

Columns 6-7 in turn show the same basic specifications for the reduced form. The estimate entails that an individual is about 0.3 percentage points less likely to go to war than another comparable individual whose father happened to be born one year closer to the peak. Put differently, a five-year difference in terms of father distance to peak cohort induces a 1.5 percentage-point decrease in the probability of war service, which corresponds to a decline of about 13% relative to the sample mean.

It is instructive to consider a visual representation of the residuals from these basic specifications, in Figure 4, in order to gain intuition about the nature of the variation that is driving our results. (The upper panel showcases the residuals from the first-stage regression, as in Column 2, while the lower panel does the same for the reduced form in Column 7.)[24] The negative correlations between both father's and son's war service, on one hand, and the instrument, on the other, is rather easy to grasp from a visual inspection of each panel. Contrasting the two panels, we see the immediate implication: the war service dummies for the two generations move very much in tandem. Last but not least, we can see that the actual variation in the instrument, in the data, is indeed essentially symmetric around the peak war-cohort years, in line with the premise that motivates our empirical strategy.

[FIGURE 4 HERE]

Table 2 also considers additional specifications. First, Columns 3 and 8 add son year-of-birth fixed effects, so that we identify the effect off the comparison between individuals born in the same year, and additionally control for factors such as the age difference between fathers and sons, or the age of sons at the time of war. The estimates barely change. This reassures us that the effect we find is not meaningfully affected by mechanical demographic patterns triggered by the specific timing of wars – such as, say, veterans being more likely to have war-age sons at the time of the subsequent war, simply because of their age.[25] Columns 4-5 and 9-10 then show that the estimates are also robust when we exclude from the sample the fathers who are very unlikely to have gone to war, because they are far removed from peak age at the time of conflict, or when we control for state fixed effects and race.

[24] We trim the plot at 1941, because the number of fathers with birth years greater than 1941 gets dramatically smaller – typically less than 1,000, when we have about 5-10 times more for earlier years. Trimming those later years leaves out only 0.7% of the sample.

[25] It could also be that the effect of war service actually works partly through demographic channels, in a non-mechanical way, to the extent that war service may affect, for instance, fertility decisions (e.g. Vandenbroucke 2014). We will discuss this possible demographic channel later in the paper.

The last column introduces the mother's year-of-birth distance to the peak war year. Since very few mothers would have been war veterans – and even those who are would have had a very different wartime experience, as discussed in Section 2 – it is reassuring that the coefficient on mother's year-of-birth distance is essentially zero: an order of magnitude smaller than the one on father's distance. This provides further confidence that the results we find are not linked to parental cohort effects, although any such effects could only be a confounding factor if they happened to consistently find their peak precisely 21 years before the midpoint of a war.[26]

The specifications in the table assume a linear effect in distance to peak year, but we can also estimate a more flexible specification with dummies for each number of years of distance. The results from this alternative are depicted in Figure 5. The first stage effect is essentially monotonic in distance (as would have been suggested by Figure 2). The reduced form in turn shows that the effect on sons is being driven essentially by fathers born more than four years away from the peak, which is reassuring in that we would not expect so much of a difference between 21- and 22-year-olds, as opposed to the contrast between 21 and 16, or 26.[27]

[FIGURE 5 HERE]

4.2 IV/2SLS Results

Given our exclusion restriction, we can then consider the IV/2SLS results, for causal estimates of the "intergenerational transmission of war" parameter. This is what we show in Table 3. The estimate is positive, and statistically significant at the 1% level, across all specifications.[28] It is also very stable, around 0.1, no matter whether the IV is a linear function of father's distance to peak year (Column 1), or else a 2nd- or 3rd-order polynomial (Columns 2-3), or even a simple dummy for whether the father was born within three years of the peak year (Column 4). In short, when a father has been induced to go to war because he happened to be around peak military age, the likelihood of his son serving in the next generation's war goes up by about 10 percentage points.

[TABLE 3 HERE]

The next few columns further test the sensitivity of the basic result. Column 5 restricts the sample of sons to those who were between the ages of 16 and 30 at wartime, to make sure that the

[26] Note that mother and father year of birth are highly correlated with one another, which is unsurprising but entails that a specification including mother year of birth only would be very hard to interpret. In addition, the mother's year of birth could be endogenous to father's war service, as the war experience may well impact who the individual chooses to marry.

[27] Figure A5 (Appendix) adds the reduced-form effect estimated using mother's year of birth We see essentially no effect, underscoring that the our result is indeed driven by the impact on the likelihood of father's war service.

[28] Perhaps surprisingly, the raw correlation between having a veteran father and serving in war oneself is negative. As soon as we start including our control variables, in an OLS context, the coefficient grows larger and becomes positive, suggesting the omitted variable bias is in fact negative.

result is not driven by individuals outside prime military age. Column 6 further drops observations where the father was born within a one-year distance from the peak years, to make sure that our estimate is not overly affected by other shocks that happen to occur for those specific cohorts. Reassuringly, the estimated coefficient remains very stable across all specifications. Column 7 then includes controls for fathers' educational achievements. We do not include them in the baseline specifications because education may be endogenous with respect to war service. That said, Column 7 shows that the estimate is unaffected by these controls, indicating that pre-determined socio-economic conditions are not confounding our results.[29]

We can also assess the extent to which attrition from the sample could affect our results, with a simple back-of-the-envelope calculation. As we have seen in Table 1, on average 1.9% of wartime service members did not return from the four major 20th-century theaters. Let us assume a worst-case scenario in which every single son of those who died during war service would have been induced not to serve in future wars, with a "true" β_{IV} coefficient equal to -1. Since in our sample about 40% of fathers went to war, we could predict that the size of the counterfactual sample would be 0.76% (0.019×0.4) of the sample of sons (assuming that each of the dead fathers would have had one son, on average). If we combine the coefficient from this counterfactual population with our estimate of 0.1, we would obtain an effect around 0.092.[30] Quite simply, attrition due to death is far too small to much affect our estimates, even if the opposing effect on the children of dead soldiers were extremely large.

4.3 External Validity

We now turn to the question of the external validity of our estimates. In particular, since our sample is not randomly drawn, we want to assess the extent to which our estimates would translate into a local average treatment effect for the population as a whole.

For that we rely on the observable demographic characteristics that we have shown, in Section 3.1, to predict the likelihood of living with one's father. In order to gain intuition, we first estimate, for each of the demographic variables, the following specification, via IV/2SLS:

$$\begin{aligned} WarService_{ict} &= \beta_{1H} * FatherWarService_{ict} + \\ +\beta_{2H} * FatherWarService_{ict} &\times \widehat{Demo}_{ict} + f(FatherYOB_{ict})\theta + X'_{ijct}\gamma + \tilde{\varepsilon}_{ijct}, \end{aligned} \tag{4}$$

[29] The results are also robust to many different ways of clustering the standard errors – by state, father year of birth, and son cohort, as well as two-way combinations of those. These can be seen in Table A3 in the Appendix. Similarly, the results do not vary much at all if estimated separately by Census region, as shown in Table A4.

[30] Specifically, $\frac{-1*(0.019*0.4)+.1}{1+(0.019*0.4)} \approx 0.0917$. Note that the assumption of an average of one son per dead father is also a worst-case scenario: put simply, many of them would simply be too young to have many (or any) children. Of course, our individual estimates of intergenerational transmission are conditional on the son being born, but we will return to the issue of unborn sons when considering aggregate effects.

where $\widehat{Demo}_{ict}$ stands for the demographic variable in question, demeaned at the sample mean. In other words, the coefficient β_{1H} now captures the intergenerational transmission parameter evaluated at the sample mean for the demographic variable, while β_{2H} captures the potentially heterogeneous effect according to the level of that variable.

We can use those estimates to project what the effect would be if evaluated at the population mean of the variable. This is depicted in Figure 6, where the first bar represents, for ease of comparison, the baseline intergenerational transmission coefficient estimated in Table 3 (Column 1). The subsequent shaded bars in turn display the results from estimating the heterogeneous treatment effect for each of the demographic variables we have previously considered in Section 3.1. The last bar summarizes all the variables in a multivariate context: we predict for each observation in the sample the ex ante probability of being in the sample, based on a probit regression, use that predicted probability in the role of $Demo_{ict}$ in a regression like (4), and evaluate the parameter of interest at the population mean for that probability. (The estimation results underlying these results are presented in Table A5 in the Appendix.)

[FIGURE 6 HERE]

The central message from the picture is that, for most variables in question, the estimated coefficient is rather similar to the baseline effect. For a couple of them, such as age, it is actually slightly larger – the estimated effect actually increases with age, so that the higher mean age in the population translates into a bigger effect. This suggests that, if anything, our results may slightly underestimate the strength of intergenerational transmission in the population.

We can pursue the intuition behind these depictions in more systematic fashion, by estimating the intergenerational transmission parameter using inverse probability weighting (IPW) methods (Kang and Schafer 2007; Solon, Haider, and Wooldridge 2015). To achieve population-consistent estimates, these methods weigh each observation in the sample by $\frac{1}{Pr(Sample)}$, where $Pr(Sample)$ is the probability of the observation being in the sample as estimated from demographic characteristics. Intuitively, the idea is to ensure that observations that are "unlikely" contribute more to the estimation, as they are more comparable to the data points that were left out of the sample.

In practice, we first estimate, over the full male population of the Census across all years in our analysis, a probit regression with a dummy for living with father as the dependent variable, and a set of pre-determined demographic variables on the right-hand side. (Details are available in Table A6.) We then use the predicted propensity scores in IPW regressions. Note that these methods are known to be sensitive to near-zero probabilities – the weight on an observation grows very large as the ex ante probability of it being in the sample approaches zero – as well as model misspecification. Particularly since there turns out to be a non-trivial number of low-probability observations in our sample, we will assess robustness using a few alternative approaches.

The results are in the last four columns of Table 3. Column 8 gives us the baseline IPW estimate, which is substantially larger than the comparable result in Column 1. This underscores the message from Figure 6, in that incorporating the information conveyed by the demographic characteristics on the probability of being in our sample tends to magnify the estimate. As we remove observations with very low probability, in Columns 9 and 10 (less than 0.5% and less than 1%, respectively), the coefficient gets smaller, and eventually very close to the estimates in Columns 1-7. That remains true in Column 11, where we use a broader set of demographic characteristics to predict $Pr(Sample)$, not limited to those that are predetermined.

In sum, after taking into account the observable differences between sample and population, and doing so in a few different ways, we still end up with an estimated effect that is very close to our baseline. While unobservable differences cannot be ruled out, this evidence suggests that the baseline estimates represent a good approximation of the treatment effect in the broader population. Perhaps most importantly, it seems unlikely that they would overestimate the latter.

5 War-by-War Results

5.1 From World War I to Vietnam

Our baseline results represent an average effect over all four major wars. As shown in Figure A6 in the Appendix, which displays the size of father birth cohorts in our sample, we have more observations with fathers who served in the more recent wars.[31] This means that, in practice, the baseline results implicitly give more weight to those more recent wars. In doing so, they may mask important heterogeneities in the strength of the intergenerational transmission over time and across wars.

We thus look at patterns of the intergenerational transmission of war service over time, by estimating IV/2SLS results for each of the major war theaters separately. To estimate the effects on the relevant population for each war, we use the three censuses following the end of each (outcome) war, and restrict the sample to sons that were at least age 16 by the end of the war and at most age 30 by the beginning of it, and to fathers born within ten years of the peak cohort of the preceding war.

These patterns are interesting for two reasons: first, they will let us assess whether that intergenerational transmission changed substantially over the century. Second, and no less important, they will open a window into the links between the different wars, by considering each war's effect on the likelihood of service in the subsequent generation's war effort.

[31] This is largely as a result of the fact that we look at the censuses from the second half of the century, as well as Census sample sizes increasing over time.

The results of the exercise are in Table 4. The first two columns show that World War I had a substantial impact on World War II service, with an estimated parameter for intergenerational transmission that is considerably larger than the average for the full sample. While the sample size is small relative to that from subsequent wars – and the standard errors correspondingly large – we can still conclude that there was a strong intergenerational transmission of war service between World War I and World War II.[32]

[TABLE 4 HERE]

Note that, as shown by Columns 3-4, the intergenerational transmission parameter is substantially smaller when it comes to the link between World War I and Korea, though still positive and statistically significant at the 5% level. (All other estimates in the table are significant at the 1% level.) The small sample issue is even more prominent here, as relatively few Korean War veterans had World War I-era fathers, given the time elapsed between the two events.

There is also a significant effect of both World War II and Korea veterans on Vietnam-era service (Columns 5-8). The intergenerational transmission parameter here is more precisely estimated, and substantially smaller when compared to World War I: of the order of 0.04 for the World War II-Vietnam link, and 0.015 for Korea-Vietnam. In other words, having a father who served in World War II or Korea increases the likelihood of a son being a Vietnam veteran by about 4 percentage points and 1.5 percentage points, respectively.

While the intergenerational transmission parameter thus seems to have decreased over time through the 20th century, one should keep in mind that it speaks to the individual likelihood of transmission of the war service experience from fathers to sons. However, the aggregate implications for any given parameter value will obviously be vastly different if a large-scale war precedes a smaller-scale one, or vice-versa. It follows that, for a better sense of the quantitative implications of our results, it is important to benchmark the effect using the scale of the war efforts in question.

The last line of the table displays the benchmarked results, as the percentage of the total number of veterans involved in a war, within our sample, that our estimates would ascribe to the previous generation's war. Specifically, taking the example of Columns 1-2, we do a back-of-the-envelope calculation multiplying the estimated coefficient by the share of fathers in our sample who are World War I veterans, and dividing the resulting figure by the share of sons who are World War II veterans. For that case, it turns out that about 12% of the latter can be estimated to have served because their fathers had previously been induced to serve in World War I.

The effects post-World War I are also very substantial when we benchmark it by the scale of the war efforts in question, in spite of the decline in the absolute magnitude. This can be seen from

[32]Note that the father year-of-birth control here is linear only, in order to have meaningful variation in the instrument in the smaller samples.

the fact that a 4 percentage-point estimated effect, when considering the massive scale of World War II, translates into just under 20% of Vietnam veteran sons in our sample being accounted for by World War II fathers. Adding the 5% attributable to Korean War fathers, one can wonder how much harder it would have been for the US government to sustain the relatively unpopular Vietnam war effort, at least on the scale it reached, in the absence of the boost in numbers coming from the "Greatest Generation" wars.[33]

This latter point underscores a note of caution in interpreting the aggregate numbers. In particular, the very existence of an important intergenerational transmission mechanism can give rise to general equilibrium and political economy effects that affect subsequent wars. It follows that the effects we estimate are not a comparison between, say, a world in which World War II happened, and fathers served in it, against a world in which it did not: the response by sons of fathers who did not serve in World War II can be different than what it would have been if no fathers served in World War II at all. They will be different, for example, in the presence of dynamic incentives for the US government that we hinted at in the previous paragraph. In short, what we estimate is the effect of having a father go to war, rather than the father not going to war, in a world where many fathers did go to war. Our aggregate numbers should be seen as benchmarking the size of the intergenerational parameter we estimate, rather than as quantitative predictions in their own right.

5.2 Post-Vietnam: All-Volunteer Force

We can also inquire about the effect of Vietnam on the subsequent generation, which we have hitherto left aside from the analysis because of the aforementioned measurement issues. Bearing those issues in mind, we should nevertheless note that studying this effect is of additional interest, because it might be rather different from what came before.

This is for at least two reasons: first, the one major war in the last quarter of the 20th century was the relatively brief Gulf War in 1990-1991. Aside from being smaller, it was a rather different kind of war, as illustrated by the much lower casualty rates displayed in Table 1. Second, but just as important, the US military was now a fully professional, all-volunteer force, whereas before the possibility of conscription would likely have affected the choices even of the individuals who eventually chose to volunteer.

Table 5 shows, in Columns 1-2, that the first-stage relationship for Vietnam is, if anything, slightly stronger than the average coefficient in Table 2. However, the reduced-form effect (Columns 3-4) is about an order of magnitude smaller than for the main sample. This still translates into a sta-

[33] In the words of Vince Way, Army intelligence sergeant in Vietnam and son of a World War II veteran, as quoted by Takiff (2003, p.2): "Before I went into service, World War II was huge. It was ingrained in us that it was a grand and heroic thing that our country did and our fathers did. Military service was grand and heroic – if the country needed you, you went off to war."

tistically significant estimated intergenerational transmission (at the 1% level), but its size became even smaller relative to previous wars, namely of the order of 0.012 (Columns 5-6).[34]

[TABLE 5 HERE]

Interestingly, Columns 5-6 also show that, in spite of the smaller intergenerational transmission parameter linking Vietnam to the Gulf War, the smaller size of the military in the latter era implies an aggregate effect that is very much on a par with what we report, in Table 4, for the four major 20th century wars. This suggests that the intergenerational transmission mechanism remained as important as ever in understanding wartime service in the all-volunteer era.

5.3 Aggregate Dynamics

The quantitative benchmarks we have obtained in the previous subsections provide a useful illustration of the continued relevance of the intergenerational transmission of war service. They also hint at the links between wars across generations, as exposure to a given war induces some descendants of those exposed to join future war efforts. We can exploit those links in greater depth, by jointly considering the intergenerational transmission of war service and its interaction with demographic trends, in order to paint a more complete picture of the aggregate dynamics of wars over time.

To do that in the simplest possible fashion, we first compute the size of each year-of-birth cohort, based on the full Census sample, as opposed to our subsample of matched sons and fathers.[35] (This is shown in Figure A7 in the Appendix.) We then obtain for each war, from our pooled sample, the share of "treated" sons for each year-of-birth cohort (Figure A8) – that is, for any given year, we compute the fraction of sons, across all Censuses, who were born in that year and whose father went to the war in question.[36]

We use these two pieces of data to generate an estimate of the total number of sons "treated" by each individual war. The result can be seen in Figure 7. The figure makes clear that different wars generated vastly different numbers of sons of veterans, in accordance with the number of people involved in each war, as well as with the size of the cohorts born in the years after. In particular, the sheer size of World War II, plus the famous "baby boom" that followed, means that it generated

[34]We could also consider the effect of Vietnam veteran fathers in the wars in Afghanistan and Iraq. The estimate (available upon request) turns out to be insignificant, but due to the sample issues we have discussed, we consider this result to be relatively unreliable.

[35]For that we look at Censuses starting in 1930, as the year-of-birth data in previous Censuses was not as reliable, and for each year we take the three subsequent Censuses and average the number of individuals reported to have been born in that year.

[36]We adjust the figures from the 1950 Census, to account for its unusually low response rate to the questions on veteran status.

by far the largest "wave" of sons of veterans. The figure also makes clear that the length of an individual war also matters for the shape of the wave that follows: the sons of Vietnam veterans are spread out over a wider range of years.

[FIGURE 7 HERE]

We can then apply our estimated intergenerational transmission effect in order to predict the evolution over the years of the number of individuals that would potentially be induced to serve by each war. We impose the following structure for that prediction, for war w started in year t^w:

$$N_t^w = \beta^w * \sum_{\tau=20}^{22} S_{t-\tau} + 0.75\beta^w * \sum_{\tau=23}^{25} S_{t-\tau}, \tag{5}$$

for all $t \geq t^w + 20$. N_t^w is the number of sons induced to serve in year t by war w, S_t is the size of the cohort born in year t, and β^w is the intergenerational transmission coefficient estimated for war w, as per Tables 4 and 5.[37] We focus attention on the individuals between ages 20 and 25, because estimating the intergenerational transmission separately by age groups shows that the effect is significant only for individuals within that range (Appendix Table A7). We then introduce the factor 0.75 for the individuals between 23 and 25, because the age specific regressions show that the effect over that range is about three-quarters of the effect for 20- to 22-year-olds.

Figure 8 plots the evolution of N_t^w over the years, for all four major wars. We see a massive effect of World War II, driven essentially by the scale of the war, whereas the effect of World War I is large mostly because of the strong intergenerational transmission coefficient we estimate for that war. The smaller size of the demographic waves of potential volunteers induced by Korea and Vietnam is, by the same token, due to the declining estimate for that coefficient.

[FIGURE 8 HERE]

The figure displays vertical lines marking the timing (midpoint) of World War II, Korea, Vietnam, and the Gulf War. From that we can see that World War II and Korea were in fact well-timed to seize the wave of potential soldiers induced by World War I. While the peak of the World War II wave was actually in the mid-1970s, the sheer size of that wave meant that Vietnam could use a boost of a similar size. The Gulf War, in contrast, was poorly timed in that regard: it came too late to seize the Korea wave, but too early to fully benefit from the service members potentially induced by Vietnam.

[37] Specifically, the numbers for World War I, World War II, Korea, and Vietnam come from Table 4 (Column 2), Table 4 (Column 6), Table 4 (Column 8), and Table 5 (Column 6), respectively.

A few central messages come out of this exercise, even though the specific numbers we present are obviously based on rather rough back-of-the-envelope calculations.[38] First and foremost, it is clear that the interaction between intergenerational transmission and demographic forces means that a war can have a substantial impact on the availability of volunteers for future wars. Second, this impact obviously depends on the scale of the war in question, but also on the distance between the wars in time. A war that occurs about thirty years after another war – that is, the space of one generation – would be ideally positioned to enjoy a boost in the number of individuals volunteering.

Needless to say, in practice wars are not timed deliberately in order to maximize that impact. Still, it stands to reason that the dynamic links between wars might affect policy calculations: the greater the individual willingness to fight, the cheaper it is to recruit soldiers, the smaller is the need to conscript individuals against their will, and presumably the easier it will be to maintain support from the public for a given war effort.

6 What Drives the Intergenerational Transmission of War?

Our findings establish a causal effect of fathers' war service experience over their sons' propensity to serve in future wars. Still, they beg the question of what drives the intergenerational transmission of those experiences.

We can think of the father's experience potentially affecting the son's behavior in three distinct ways. First, war service could have an impact on an individual that affects what he chooses to transmit to his sons, in ways that increase the utility (or equivalently, reduce the disutility) that they derive from serving in war. In other words, it could affect preferences or beliefs in a process of *cultural transmission*. Second, it could affect the *material incentives* facing the son, by changing the set of economic opportunities available to them, which then affects the decision to serve. Third, it could affect some characteristics of the son that are relevant to service (e.g. age at the time of war), but not related to cultural transmission or material incentives, in what we may call a purely *demographic* channel.

We now turn to these channels, and to how we can shed light on their empirical relevance in explaining our results.

[38] In particular, a full account of the aggregate impact of a war on future wars would have to incorporate other possible effects that go beyond the scope of this paper. For instance, we have pointed out that our individual-level estimates are obviously conditional on the individuals having been born (male) in the first place. It could be, however, that the decision to have children is affected by war service – say, if individuals who are very traumatized by it are more likely to choose to remain childless, even conditional on surviving, not to mention those who were killed and did not get the chance to have more children. This could counteract the individual intergenerational transmission effect. Similarly, there could be social multipliers affecting how the individual transmission aggregates up, and so on.

6.1 Cultural Transmission

Let us start with the potential effect via preferences and beliefs regarding war service. A key challenge to empirically assess this channel is the dearth of data with which we could directly connect beliefs, values, and attitudes, on the one hand, and family history on the other. Specifically, standard sources of survey data on the former typically do not contain information on father's year of birth, which is required to implement our empirical strategy.[39]

To make progress, we have to connect the transmission of cultural traits across generations with its implications for observable behavior. We build this connection around the idea of parenting strategies. Psychologists classify the way parents deal with their children according to the standard Baumrind typology, proposed by Baumrind (1968) and extended by Maccoby and Martin (1983). It distinguishes parenting styles according to whether they are responsive/unresponsive and demanding/undemanding, producing the following types: "authoritative" (responsive and demanding), "authoritarian" (unresponsive and demanding), "permissive" (responsive and undemanding), and "uninvolved" (unresponsive and undemanding) parenting.

The key insight from the voluminous literature around this typology, as far as our purposes are concerned, lies in the connection between authoritative parenting and intergenerational transmission.[40] As put by Doepke and Zilibotti (2014, p. 3), this parenting style can be defined in terms of "parents [molding] their children's preferences so as to align them with their own," thereby inducing choices that parents regard as desirable. It thus seems natural to assume that purposeful cultural transmission across generations would be related with parental strategies, and specifically with the prevalence of certain styles of parenting.

6.1.1 A Simple Framework

To analyze these connections more systematically, and guide our empirical analysis, we borrow from the standard framework of cultural transmission developed by Bisin and Verdier (2001). It will let us think through both what distinguishes the behavior of parents who have been exposed to a major life experience such as war service, when it comes to that intergenerational transmission, as well as the ways in which that behavior might be affected by the broader social environment.

Let us assume, for simplicity, that cultural traits are binary, $i \in \{a, b\}$ – say, "pro-service" and "anti-service." Individual preferences are captured by a utility function $u^i(x)$, which depends on which trait the individual happens to possess. We assume $u^i(x)$ is concave and monotonically increasing, and defined over a compact and convex set of outcomes. For instance, we can think of $x \in [0, 1]$ as the probability of not serving in war – parents would rather not see their children go

[39] For instance, the General Social Survey (GSS) only asked about it in 1994, thus yielding very small samples.

[40] Authoritative parenting has also been linked to a broad array of positive outcomes (e.g. Steinberg et al 1992).

to war, but anti-service parents dislike any given probability more than pro-service parents.

Parents of type i can choose to invest in transmitting traits to their children: they can choose an investment $\tau^i \in [0,1]$, which increases the probability P^i that the children will hold the same traits, paying some convex cost $C(\tau^i)$ that is increasing in τ^i. The probability may also depend on the prevalence of trait i in the population, q^i, to capture the possibility of what Bisin and Verdier (2001) call "oblique socialization" (from society at large), in addition to the "direct vertical socialization" from parents to children.

Consider parents who have already been exogenously exposed (or not) to war service, so that their only relevant decision is about cultural transmission. The key point for our purposes is that altruistic but "imperfectly empathetic" parents of type i will evaluate the intergenerational transmission problem according to the following expected utility function (leaving aside intergenerational discount rates):

$$-C(\tau^i) + \left(P^i(\tau^i;q^i)u^i(x^i) + (1 - P^i(\tau^i;q^i))u^i(x^{-i})\right), \tag{6}$$

where $x^j \equiv argmax_{x \in X} u^j(x)$ is the choice that a type-j child will make.

Parental Strategies For simplicity, let us start by assuming that $P^i(\tau^i;q^i) = \tau^i$, independent of q^i, so that we leave oblique socialization aside in order to focus on the intergenerational transmission within the family. Motivated by our previous discussion about parenting strategies, we can interpret the investment τ^i as capturing authoritative parenting strategies, since it increases the likelihood that preferences get transmitted. Our central question then becomes: how does war service affect that process of transmission?

We conceptualize the shock of being (exogenously) exposed to a major life experience, such as war service, in the following way: the individual comes out of the experience feeling more strongly about his preferences – or in terms of the model, the difference between $u^i(x^i)$ and $u^i(x^{-i})$ increases. Note that this does not rule out that the experience is actually transformative, in the sense of the individual switching types: an individual can switch from "anti-service" to "pro-service," or vice-versa, as a result of the experience of service, but the experience makes him more convinced about whatever type he ends up with. In short, all we are assuming is that being exposed to a major life experience makes one feel strongly about the cultural traits that relate to it.

It follows immediately from (6) that, all else equal, individuals exposed to war will choose a higher τ^i: an individual exposed to a major life experience will choose to invest more in transmitting to his children his preferences as they relate to that experience.

We can translate this into the following testable prediction, with respect to the behavior of war veterans as parents: veteran fathers are more likely to adopt authoritative parenting strategies, in

order to transmit their preferences to their children. This process could in turn affect the behavior of sons and their choices regarding war service. In particular, to the extent that war service would on average make individuals more likely to have a "pro-service" attitude, and to the extent that authoritative parents are more effective role models, this would constitute a cultural mechanism for the intergenerational transmission of war service.[41]

Cultural Substitutability Now consider the possibility of interactions between parental decisions and the social environment. In particular, assume that oblique socialization is possible: sons may acquire traits not only via intergenerational transmission, but also from interacting with others outside the family. Specifically, let us adopt what Bisin and Verdier (2001) call the "benchmark cultural transmission technology," and assume that the probability of the child acquiring the same trait as a type-i parent is given by:

$$P^i(\tau^i, q^i) = \tau^i + (1 - \tau^i)q^i, \tag{7}$$

where q^i is the prevalence of trait i in the population. In other words, parental effort again translates (linearly) into a probability of direct transmission, but even if it fails (with probability $1 - \tau^i$) there is a chance that the child will pick up the trait from others. The chance that this happens in turn increases with the prevalence of that trait in the broader population.

With these natural assumptions, we can directly apply Bisin and Verdier's (2001) Proposition 2 and conclude that direct transmission and oblique transmission will be "cultural substitutes": direct transmission will decrease as the prevalence of the trait in the population grows. In our example, this means that the intergenerational transmission of war service would be weaker in places where war service is more prevalent.

This prediction may seem surprising at first, since it runs against a natural intuition that might have expected the intergenerational transmission of war service to be particularly strong in an environment where there could well be a community-level tradition of war service. This intuition turns out to be naive, however: in places where a culture of war service is pervasive, fathers might feel less of a need to inculcate their sons with those values, as they expect the environment to do that job. We should thus expect the intergenerational component to be less important in those environments.[42]

[41] As suggestive evidence, Pew Research Center (2011) finds that veterans (from the post-9/11 era) are more likely than non-veterans to self-describe as "more patriotic than most," and that very large majorities report that their time in the military has "helped them mature," "taught them how to work with others," "helped build self-confidence," and that they "would advise a young person close to them to join the military." None of that implies a causal relationship, of course. On parenting styles, it has also been argued that authoritative parenting is advantageous in preparing children for military environments (Mayseless, Scharf, and Sholt 2003), and also more likely to be adopted by military parents, relative to civilian parents (Speck and Riggs 2013). This could further stengthen the connection with war service.

[42] As discussed in Bisin and Verdier (2001), there could be transmission technologies that would give rise to com-

This result is of particular interest because of what it entails in terms of the long-term prevalence of cultural traits (Bisin and Verdier 2001, Proposition 1). Specifically, cultural substitution leads to long-run heterogeneity: if it holds, we should expect cultural values conducive to war service to be neither ubiquitous nor entirely absent in any given population. This seems consistent with casual observation, but whether there is indeed substitution between intergenerational transmission and oblique channels is an empirical question.

6.1.2 Evidence

We now turn to the evidence on the two issues flagged by our simple framework: parental strategies and cultural substitution. Let us address them in order.

Since the Census does not include questions about parental strategies, we must resort to other data sources to provide evidence for this particular implication of the cultural transmission mechanism. As it turns out, the National Longitudinal Survey of the Youth of 1997 (NLSY97) asks directly about parenting, as perceived from the standpoint of the young respondents (aged between 12 and 17 as of the survey) regarding their own parents. We can thus investigate whether father's war service has an impact on (his children's perception of) his parental strategies.

In particular, we create a dummy equal to one if the respondent replies that his (or her) father's parenting was "authoritative." The NLSY97 asks "In general, would you say that he is permissive or strict about making sure you did what you were supposed to do?," and codes the "Strict" response as a dummy for "Demanding" parenting; similarly, it asks "When you think about how your father acts towards you, in general, would you say that he is very supportive, somewhat supportive, or not very supportive?," and codes "Very Supportive" as a dummy for "Responsive". The product of these two dummies constitutes the dummy for "Authoritative" parenting.

The results are in Table 6. In spite of the relatively small sample size as compared to the Census data, we find reduced-form evidence that father's year-of-birth distance to war peak is negatively related with boys' perception of an authoritative parenting style (significant at the 1% level).[43] The relationship holds also when we control for a battery of (race and geographic) controls, as well as the mother's reported parenting style (Column 3).

[TABLE 6 HERE]

Columns 2 and 4 in turn display the two-sample IV estimate (Angrist and Krueger 1992) for the effect of the father's war service on perceived parenting style. Specifically, we use a first-stage

plementarities instead – for instance, if direct socialization happens only if there is homogeneity between the family and "role models" drawn from the population.

[43] Because of the small sample size, we choose to include the full sample, instead of restricting it to fathers born within 10 years of the relevant war peak cohorts. Such restriction would drop about 20% of the sample.

estimate computed from the 1990 and 2000 Censuses, randomly drawing a subsample such that father cohort sizes match the relative proportion from the NLSY97 sample, to scale the reduced-form estimates. We see a positive coefficient, implying that a veteran father increases the likelihood of authoritative parenting by about 1/3 of the sample average.[44]

Columns 5-8 show, in contrast, that the results are entirely absent for the girls' subsample: fathers' year of birth distance from war peak has no impact on daughters' perception of their parenting style. In other words, it seems as if the effects of war service over parenting style are essentially restricted to the children for whom the decision regarding war service happens to loom larger, as is the case for boys even in the more gender-diverse all-volunteer era.

As for cultural substitution, we need a measure of the prevalence of war service at the community level. We construct it by considering, for each individual in our sample, the share of men, in the individual's county, who served in one of the four major 20th-century wars. In other words, we pool together all the censuses in our baseline sample (1950-2000), and compute for each county, using the entire available male sample (that is to say, not just the subsample for which we can match fathers and sons), the share of individuals who are war veterans, out of those who report to live in that county. We label that variable $WarVeterans$.

We are ultimately interested in estimating the following specification:

$$\begin{aligned} WarService_{icst} = \beta_{1C} * FatherWarService_{icst} + \\ + \beta_{2C} * FatherWarService_{icst} \times WarVeterans_s + \beta_{3C} * WarVeterans_s + \\ + f(FatherYOB_{icst})\theta + X'_{icst}\gamma + \tilde{\varepsilon}_{icst}, \end{aligned} \tag{8}$$

where s stands for the county where individual i, born in year c, lives at the time t of the Census. β_{2C} will tell us whether the interegnerational transmission is affected by the local prevalence of war service over time. In particular, $\beta_{2C} < 0$ would correspond to the case of cultural substitutability.

We estimate (8) using our instrument $FYOBdist_{ictst}$, and its interaction with $WarVeterans_s$, as instruments in a 2SLS specification. Needless to say, $WarVeterans_s$ is an endogenous variable, so we refrain from a causal interpretation of the coefficients. We are instead interested in assessing the possibility of heterogeneity with respect to the local prevalence of war service.

The results are in Table 7, which reproduces the specification with all controls and the sample limited to fathers born within 10 years of the peak cohorts (as in Columns 5 and 10 in Table 2, or Column 1 in Table 3).[45] We see that the first-stage relationship is stronger in counties in which

[44] As a contrast, we find no significant effect on the perception of "permissive" parenting, which is the other strategy that we can presume to be costly (since it is responsive), but not concerned with molding preferences.

[45] Note that here we have fewer observations, because some individuals do not have information on county, as it is withdrawn to maintain anonymity. The variable is also unavailable for the 1960 Census. Details can be found in https://usa.ipums.org/usa-action/variables/COUNTY#description_section

war service is more prevalent (Column 1), a pattern that holds unaltered upon controlling for service outside of wartime (Column 2) or for a set of county-level demographic variables and their interactions with father's year-of-birth distance. In contrast, however, when it comes to the reduced form the relationship is actually weaker in those counties (Columns 4-6). Recovering the β_{2C} parameter using 2SLS (without controls for ease of interpretation), this translates into a negative interaction effect, as displayed in Column 7. Given the estimated magnitudes, the intergenerational transmission would essentially vanish in counties where the prevalence of war service is highest, which is around 0.4 in our sample.

[TABLE 7 HERE]

In sum, we have two distinct pieces of evidence that are consistent with the kind of cultural transmission mechanism we have discussed. First, war service seems to affect parental strategies, in the direction that one would have expected from the model. Second, we find that, when it comes to war service, direct and oblique transmission are indeed cultural substitutes: in places where war service is more prevalent – and presumably, where a culture of war service is stronger at the societal level – intergenerational transmission from father to son is weaker.

Of course, parental strategies or oblique transmission affect children's decisions insofar as they have an impact on children's preferences. What exactly is being transmitted could encompass a plethora of different traits. For instance, it could be that fathers transmit beliefs and attitudes – say, patriotism, or a sense of civic duty. Alternatively, but relatedly, it could be specific skills that are acquired as a result of war service – say, handling guns, survival skills, even grit or endurance – and that enhance one's ability in war. Or it could even be the case that fathers transmit information – say, about the risks and potential future benefits associated with war – thereby affecting how their sons perceive war service. Distinguishing between these different possibilities seems to be a fruitful topic for future research.[46]

6.1.3 Culture of War vs Occupational Choice

Our evidence is consistent with war service triggering a mechanism of cultural transmission that eventually affects the next generation's decisions regarding war service. On the other hand, it

[46]The different possibilities are vividly illustrated by the personal stories collected in Takiff (2003), from Vietnam veterans talking about their World War II veteran fathers. A few quotes can convey the ideas of *values* or *attitudes* ("Our family has a tradition that service is a way of life. And there is no greater service you can perform than to serve your country, particularly in a time of war."), *role models* ("In my mind Dad was a hero. As kids growing up in the fifties, we used to play army all the time, and we'd talk about what our dads had done."), *skills* ("I was always around airplanes and people that flew. So it was a natural progression. That's what I wanted to do. (...) My dad gave me training to make sure that I could do everything."), *information* ("[My dad] told me: 'Don't join the Marines.' He said that my chances of dying would be greater there. 'Go down and talk to the Army recruiter."').

seems that most of the traits that one could imagine would increase the likelihood of serving in war, would also increase the likelihood of military service in general.

More broadly, it is intuitive to think that individual career choices are affected by one's family. As such, might it be that the intergenerational transmission of war is but an example of a more general phenomenon of intergenerational transmission of professional careers, applied to military service? Or is it the expression of something specific to war?

To answer these questions, we can revisit the effect of fathers' war experience over sons' choice of military service, now outside the context of wartime. Fortunately, the Census did ask (in 1980, 1990, and 2000) about veteran status with reference to periods over which there was no major war.

The IV/2SLS results are displayed in Table 8. Since the information regarding non-wartime service is available only for the 1980-2000 Censuses, we start by reestimating, for the sake of comparison, the intergenerational transmission of war parameter for the four major 20th century wars, but restricted to those Census years only. This yields the coefficient in Column 1; unsurprisingly, in light of the declining parameter over the course of the century, the coefficient is smaller than in the baseline (Table 3), since the Census years in question naturally place greater weight on the more recent wars. It is nevertheless positive and sizeable, indicating the persistently significant intergenerational transmission of war service.

[TABLE 8 HERE]

But how about the impact of war service on military service outside of war? Column 2 displays the result considering the available non-wartime periods in the years surrounding the major 20th-century wars, namely 1954-64, and 1975-80. Remarkably, we estimate a significantly *negative* effect: inducing fathers to go to war made their sons *less* likely to serve in the military outside of wartime. This effect also holds for each of the two specific sub-periods taken separately (Columns 3 and 4). This is true even though the data show a positive correlation, at the individual level, between wartime and non-wartime service: individuals who serve in war are more likely to have served outside of war, as was to be expected from the fact that some people choose to stay in the military.[47]

Columns 5 and 6 then show that there is no effect of an individual's father's war service on the likelihood of that individual having ever served in the military in both wartime and non-wartime, or of his having ever served at all. This is consistent with the two opposite effects on wartime and non-wartime essentially canceling each other out when it comes to the broader likelihood of military service.

[47] Specifically, regressing a dummy for non-wartime service on a dummy for the same individual's having served in one of the major wars (as well as birth year fixed effects) produces a positive coefficient of 0.063, with a t-statistic over 42.

Last but not least, we see in Column 7 that the negative effect on the likelihood of non-wartime service holds also for the 1980-1990 period, that is to say, after the all-volunteer force was firmly established. This means that father's war service did not induce broader military service over the period for which the choice of service would have most resembled other types of occupational choice decisions.

In sum, we find no evidence that the intergenerational transmission of war service is matched by an effect of fathers' war service on the likelihood of military service as such for their sons. This suggests, rather emphatically, that our key results are not a manifestation of a broader mechanism of intergenerational transmission of occupational choice. It does leave us with the puzzle of why war service would induce war service in the next generation, while at the same time having a negative effect on the likelihood of military service outside of war. We will return to that shortly.

6.2 Material Incentives

Let us now turn to a second possible mechanism: that the experience of war service might affect individual decisions in ways that change the economic environment facing the subsequent generation. This could in turn affect the set of economic opportunities available to their children, and how enlisting for war service compares with whatever outside options are available. In short, it could affect their material incentives.

We can check directly whether a father's war service has an impact on the set of labor market opportunities available to their children. The most natural factor to consider in that regard is education, which is a key determinant of those opportunities.

Table 9 considers whether there is a causal impact of father's war service on sons' education.[48] We find a clear positive effect, always significant at the 1% level. Columns 1-3 show the results measuring educational achievement by total years of education, while Columns 4-6 consider the likelihood of attending college. We find a strong reduced-form effect of father's year of birth distance to war peak on both measures (Columns 1 and 4). The IV/2SLS estimates indicate that the sons of fathers induced to go to war have just under an extra half-year of education (Column 2), and are about 5 percentage points more likely to attend college (Column 5) – a strong effect compared to a baseline mean of 36%. Columns 3 and 6 show that the effect is slightly stronger if we limit the sample to the Census years used in Table 8.

[TABLE 9 HERE]

This is very much in line with the many policies designed to increase the opportunities for war veterans to acquire education – best exemplified by the G.I. Bill of 1944 and its many successors

[48] We look at the baseline sample except that restricting it only to individuals at least 25 years-old at the time of the Census, who presumably have had time to complete their education.

– as well as with the evidence linking human capital accumulation across generations (Currie and Moretti 2003; Holmlund, Lindahl, and Plug 2011).[49] The broader literature has found that the benefits had a positive impact on educational achievement (Angrist 1993; Bound and Turner 2002), and our sample confirms that result: Columns 7-10 show evidence of a causal effect of fathers' wartime service on their own educational achievement.[50]

The evidence thus suggests that wartime service had a positive impact on the educational achievements of those who were induced to serve. This impact, in turn, was transmitted to their sons, who ended up with higher educational achievements as well.

We must then conclude that the intergenerational transmission of war service occurred in spite of the fact that war service actually improved the set of economic opportunities available to the next generation. In other words, that transmission cannot be understood as the outcome of a channel in which the sons of veterans are induced to choose war service because of a lower opportunity cost of foregone options in the labor market.

In particular, this evidence helps us make sense of the finding that father's war service has a negative impact on military service by sons outside of wartime. The comparative economic appeal of a military career is actually weaker, in light of the better opportunities bequeathed to these sons in the broader labor market.

This evidence is further underscored by looking back at a couple of different versions of the National Longitudinal Survey of the Youth, which ask youngsters about their professional aspirations. Specifically, we merge the 1966 and 1979 surveys, which ask "What kind of work would you like to be doing when you are 30 years old?" (35 years old, in the 1979 version). We then consider, out of the sample of young men aged 14-24 at the time of the survey, whether they reply "Armed Forces" as their preferred answer to that question.

The results are in Table 10. Column 1 looks at the reduced-form specification for the full sample, and we see no statistically significant effect. However, this masks a heterogeneous effect, as evidenced by Column 2: the effect of father's year-of-birth distance to war peak is negative (statistically significant at the 10% level) for the youngest individuals, but declines in absolute value (significant at the 5% level) as age increases. Similarly, Column 3 indicates an average effect that is negative (significant at the 10% level) for individuals below 20 years of age, while the effect for those above age 20, as given by the linear combination of the two coefficients, is positive

[49]The G.I. Bill, officially known as the Servicemen's Readjustment Act of 1944, included provisions for cash payments of tuition and living expenses for university, high school or vocational education, for every veteran who had been on active duty during the war years for at least ninety days and had not been dishonorably discharged. A similar bill was enacted in 1952 for Korea veterans, and in 1966 the benefits were extended to peacetime veterans as well. In the post-Vietnam era, the Veterans Educational Assistance Program (VEAP) was introduced in 1976, followed by the Montgomery G.I. Bill of 1985, which brought benefits to a comparable level to the Korean-era bill.

[50]Quantitatively, the effect we find is quite consistent with the literature – Bound and Turner (2002), for instance, find an effect in the range of 5-8 percentage points on the likelihood of completing college.

and significant (at the 5% level). Columns 4-6 then translate these results into (two-sample) IV estimates, which suggest that having a veteran father increases the likelihood that a teenager aspires to a military career by about 6 percentage points, but in turn decreases that likelihood for young adults, by a similar amount.

[TABLE 10 HERE]

In other words, the results are consistent with father's exposure to war service increasing aspirations to a military career. However, as sons get close to completing their education, the effect is reversed and the sons of veterans end up less likely to see themselves in a career in the armed forces – consistent, of course, with the findings from Table 8 regarding service outside of wartime.

We are left with the following, rather plausible picture: war service induces the transmission of cultural attitudes that positively influence the inclination towards military service. However, in normal times this would be more than compensated by the fact that veterans' sons have better outside options in the labor market as a result of their fathers' service. It takes a war to trump that counteracting force, and tip the balance in favor of service.

6.3 Demography

We now briefly consider, as a final possibility, that our results could be partly driven by demographic factors. We have already argued that we can rule out potential mechanical explanations involving the specific timing of the wars: our results cannot be explained by cohort effects, such as there being a large number of veteran sons happening to be of peak age at the time of a subsequent war, since they are robust to controlling for cohort fixed effects. However, it could conceivably be the case that the experience of war service would affect decisions related to fertility or marriage (e.g. Elder 1986, Vandenbroucke 2014), which could in turn have an impact on future patterns of service.

One possible mechanism is that war service entails a delay in fertility decisions: war veterans might choose to have children later, and if the sons of older parents are somehow more likely to serve in war, part of our effect could be due to that. That said, we can also rule out that any story predicated on the age of fathers or sons, or on the difference between them, is a meaningful part of the explanation for our results: we have seen in Table 2 that adding son year-of-birth fixed effects, which together with Census fixed effects and father year-of-birth controls account for all these factors, the estimates are essentially unaffected.

Similarly, explanations that are based on effects of war service on the quality of children via a demographic channel – say, if there are effects of war service on matching in marriage markets (e.g. Larsen et al. 2014) – must contend with the same issue that arises in the material incentives channel

we have analyzed: in the data, it seems that a father's veteran status increased the quality of children when it comes to labor market opportunities. More generally, any demographic explanation would have to be consistent with the opposite effects we find for service during and outside of wartime.

7 Concluding Remarks

We have established causal evidence of intergenerational transmission of war service, in the context of the major US wars in the 20th century: inducing fathers to serve, because of their distance to peak service age at the time of the war in question, increases the likelihood that their sons will serve in subsequent wars. While the size of the intergenerational transmission parameter declined over the century, the smaller scale of later war efforts implies that the effect remained quantitatively important throughout the period. It thus seems that fighting wars could well help countries in solving the collective action problem for fighting future wars.

We presented evidence that a key mechanism behind our key result works through cultural transmission. In particular, we found an impact of war service on parenting decisions, and a weaker intergenerational transmission in places where war service is more prevalent, both consistent with a standard model of cultural transmission. In other words, it seems that our results can be interpreted as indicative of a culture of war service, transmitted across generations. This provides a vivid example, in the context of a life-altering decision, of how life experiences can be "inherited" by future generations, which is at the heart of how cultural traits evolve over time. We should nevertheless stress that our findings do not imply that cultural transmission is the only channel through which the intergenerational transmission of war service takes place, and the possibility of complementary mechanisms remais an open question for future research.

Our findings also open other promising avenues for future research. On the one hand, there is the question of what specific traits are being affected and transmitted. Progress in this direction would be valuable in further establishing the microfoundations underlying the individual decision over war service. On the other hand, more remains to be learned about how exactly it is that those individual decisions affect the constraints faced by political leaders when deciding whether to take their countries to war. Put simply, it would be interesting to understand the extent to which the fact that war service begets war service could affect whether war begets war.

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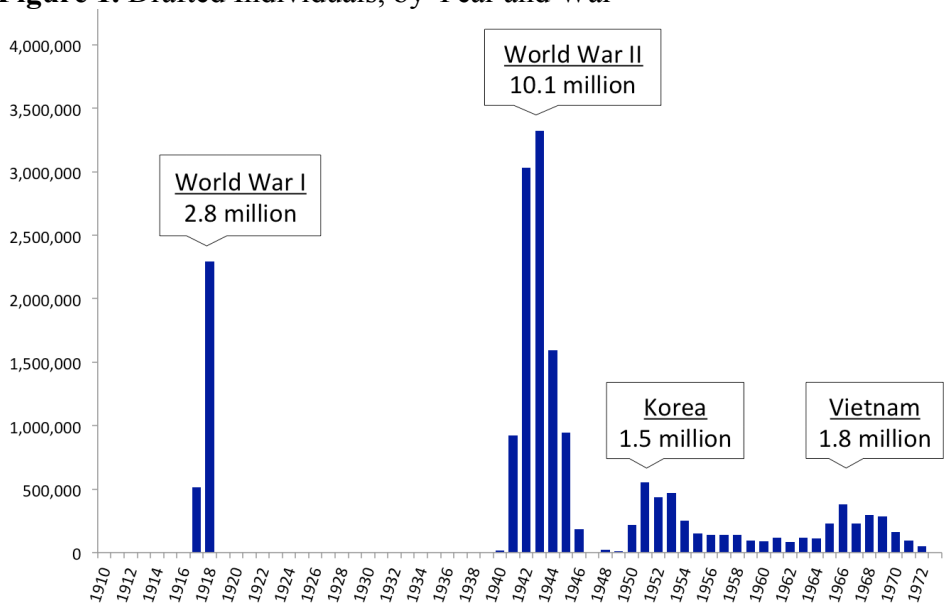
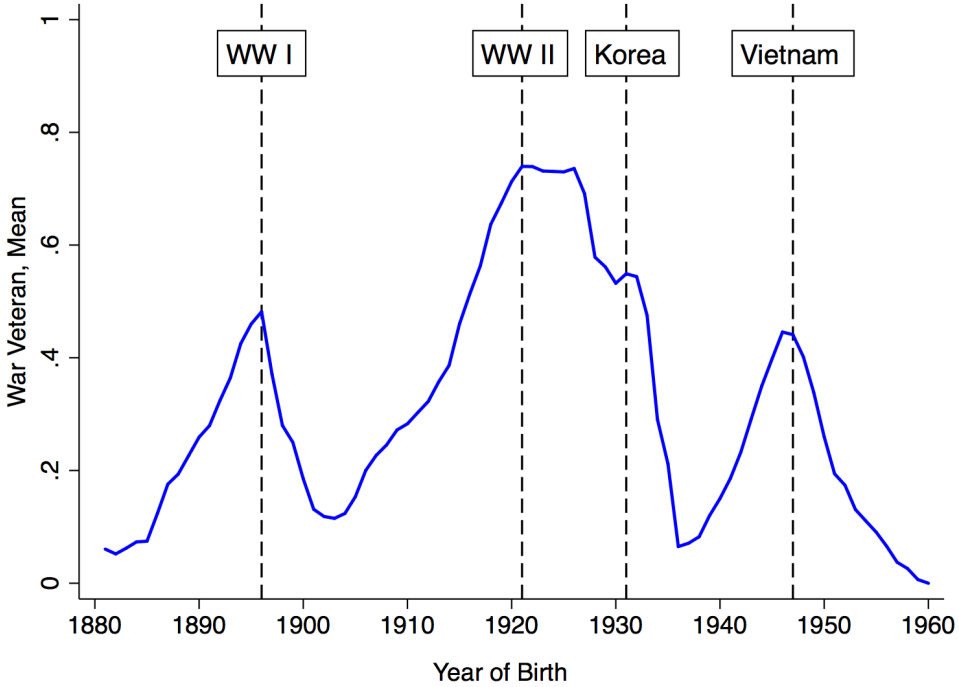
Figure 1. Drafted Individuals, by Year and War



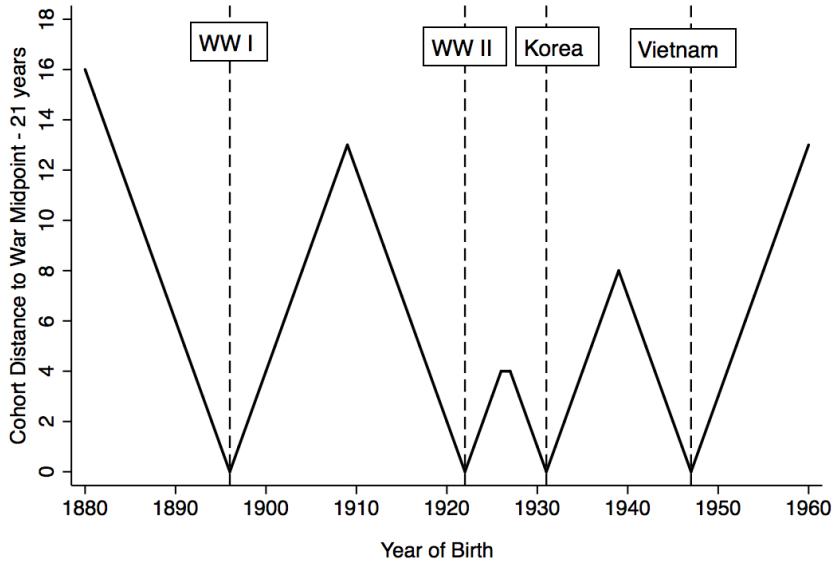
Note: The orange bars indicate the number of drafted individuals in any given year. The cumulative number for each war is given above. Source: Selective Service System (http://www.sss.gov/induct.htm).

Figure 2. War Service Likelihood by Birth Cohort



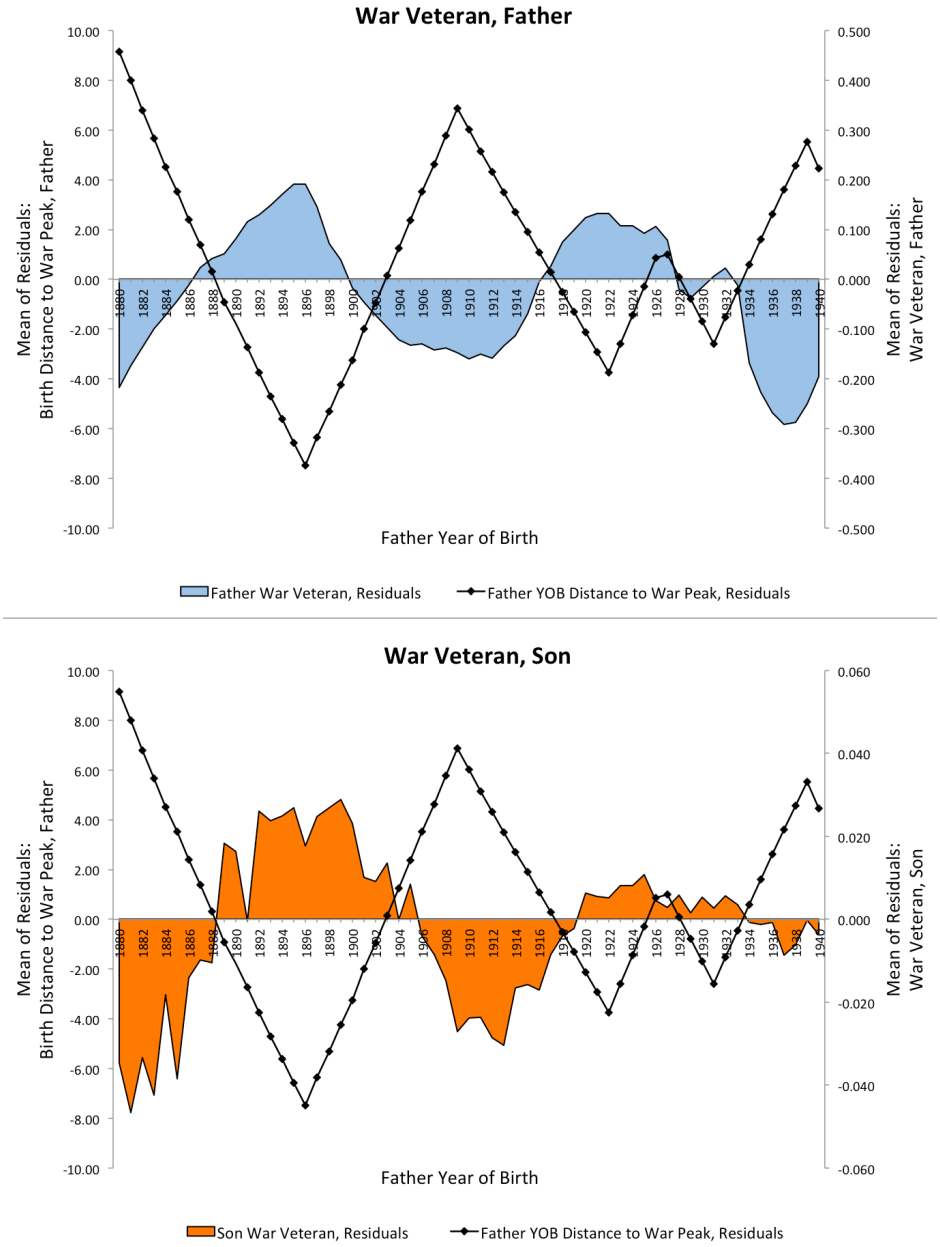
Note: The graph plots the likelihood that males served in at least one of the big four wars of the 20th Century. The vertical lines indicate cohorts born 21 years before the midpoint of each war (the "peak cohorts"). To avoid double counting, for World War I, World War II and Korea veterans we use the 1960 Census and cohorts up to 1935, while for Vietnam veterans we use the 1980 Census for cohorts born after 1935. Source: U.S. Census data from IPUMS.

Figure 3. The Instrument



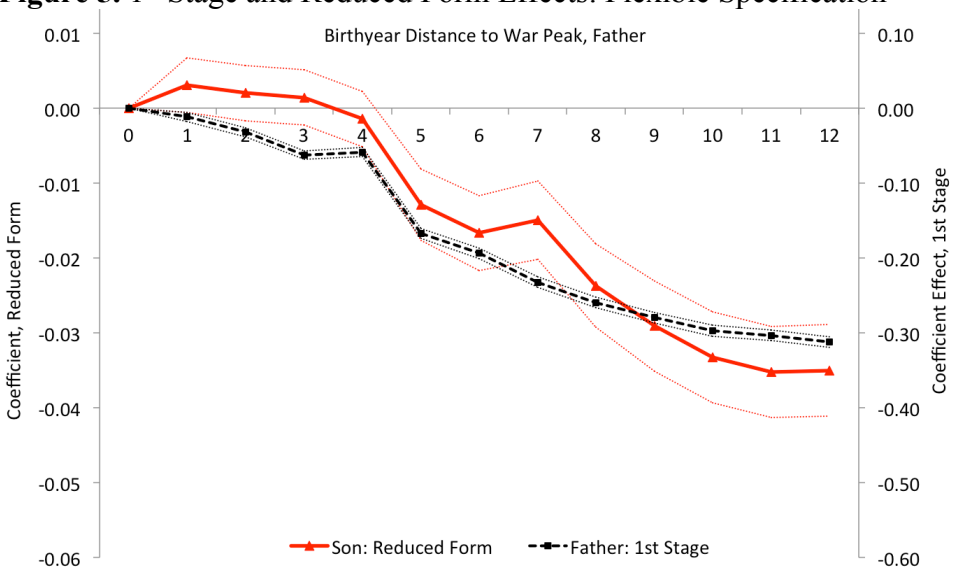
Note: The figure plots the value of the instrument across birth cohorts of fathers. The instrument is the number of years to the closest peak cohort, i.e. 21 years before the war midpoints (1896, 1922, 1931, 1947). It takes value zero for fathers of the peak cohorts, and monotonically increases in the distance to those cohorts.

Figure 4. Identifying Variation Across Cohorts, Main Regressions



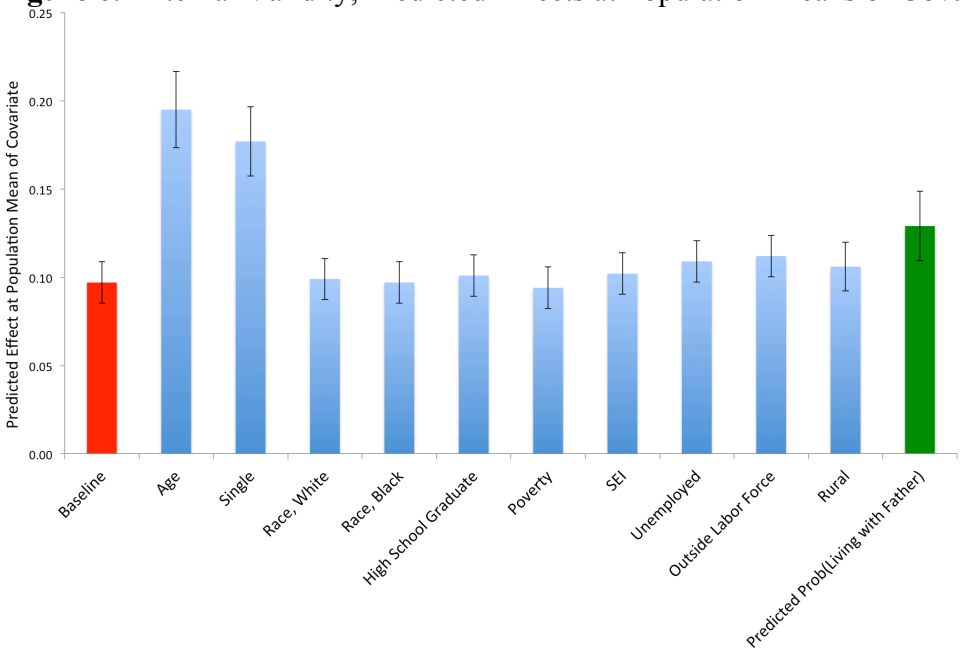
Note: The figure shows the identifying variation across father birth cohorts, from the main regressions in Table 2. In both graphs, the black dotted line plots the residual variation of the instrument, conditional on Census fixed effects and a third-order polynomial in father year of birth. The upper graph jointly plots the residual variation for the father being a war veteran (1st stage, column 2 of Table 2), and the bottom graph for the son being a war veteran (Reduced Form, column 7 of Table 2). The graph includes only cohorts with at least 1000 observations in the baseline sample, corresponding to a total 99.2 percent of the sample, which avoids inclusion of prohibitively noisy and uninformative cohorts.

Figure 5. 1st Stage and Reduced Form Effects: Flexible Specification



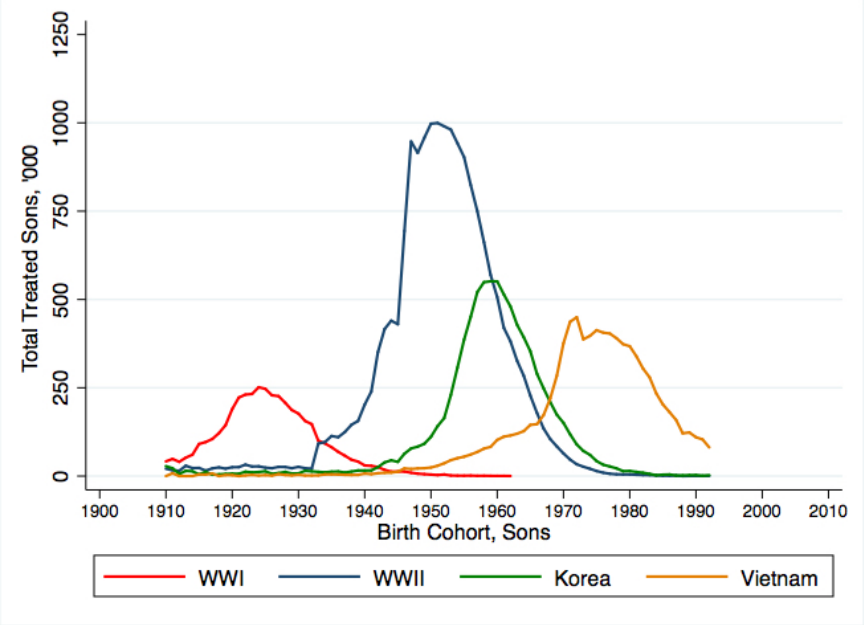
Note: The figure plots the point estimates and confidence intervals of the reduced form (in red) and the 1st stage (in black) from a flexible specification of the baseline sample, using dummy variables indicating the distance to the peak cohort. The left y-axis refers to the reduced form, and the right y-axis to the 1st stage. The graph shows that both effects essentially monotonically decrease in distance from the peak cohort, and that the ratio between the reduced form and the 1st stage is relatively constant.

Figure 6. External Validity, Predicted Effects at Population Means of Covariates



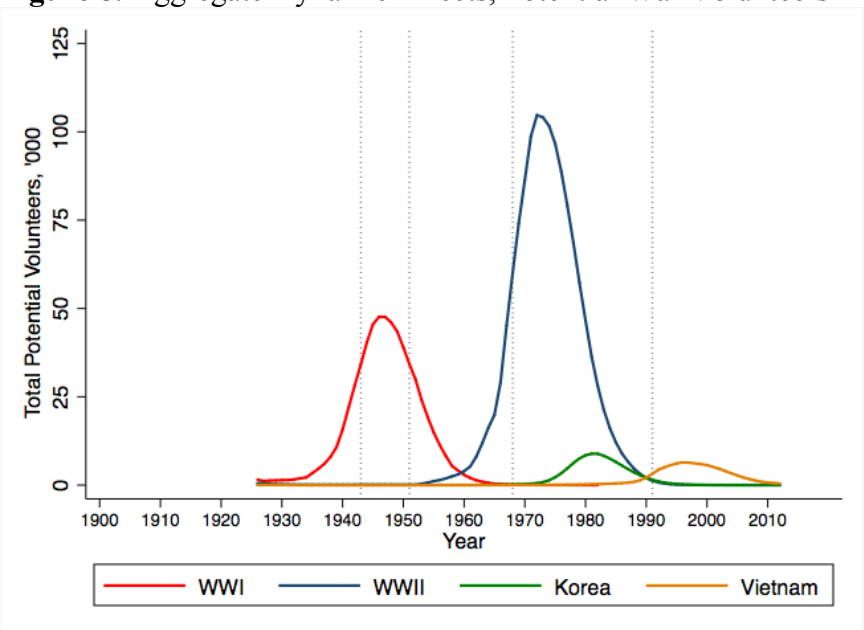
Note: The first bar represents the baseline IV/2SLS estimate of intergenerational transmission of war service, from table 3 column 1. The other bars show the predicted effects from table A.3, for the observable predictors of living with one's father. They represent the predicted effect at the mean value of the covariate in the population (full census). The last column (green) refers to the mean likelihood of living with one's father, based on the predicted value from a probit regression of all the predictors, census fixed effects and age fixed effects. It shows that the predicted effect in the population is similar in magnitude, if not larger. For inverse probability weighted regressions, yielding similar results, see table 3.

Figure 7. Treated Cohorts



Note: The graph plots the number of "treated" males across birth cohorts, for each war of the previous generation. It is the product of the estimated number of males born in each cohort from the US Censuses, times the share of fathers of that cohort that are war veterans in the sample. For the underlying distributions, see the appendix.

Figure 8. Aggregate Dynamic Effects, Potential War Volunteers



Note: The graph plots the estimated number of potential war volunteers over time, induced by each war of the previous generation. The calculations are based on the number of treated sons and the estimated effects of intergenerational transmission. See Section 5.3 for the details. The gray vertical lines refer to the midpoints of WWII, Korea, Vietnam, and the Gulf War.

Table 1. US Wars in the 20th Century

	Number of service members	Deaths (%)	Deaths in Battle/Theater (%)	Wounded (%)
World War I (1917-1918)	4,734,991	116,516 (2.5%)	53,402 (1.1%)	204,002 (4.3%)
World War II (1941-1945)	16,112,566	405,399 (2.5%)	291,557 (1.8%)	670,846 (4.2%)
Korean War (1950-1953)	5,720,000	54,246 (0.9%)	36,574 (0.6%)	103,284 (1.8%)
Vietnam War (1964-1973)*	8,744,000	90,220 (1.0%)	58,220 (0.7%)	153,303 (1.8%)
Gulf War (1990-1991)	2,322,000	1,948 (0.1%)	383 (0.02%)	467 (0.02%)
Total	37,633,557	668,329 (1.8%)	440,136 (1.2%)	1,131,902 (3.0%)
Total (minus Gulf War)	35,311,557	666,381 (1.9%)	439,753 (1.2%)	1,131,435 (3.2%)

Source: U.S. Department of Veterans Affairs. * The Vietnam dates are based, in the absence of a formal declaration of war, on the Gulf of Tonkin resolution authorizing the use of military force in Southeast Asia, and on the Paris Peace Accords suspending hostilities. Casualty figures go up to 1975.

Table 2. First Stage and Reduced Form Effects, Main 20th Century Wars

	1st Stage: War Veteran, Father					Reduced Form: War Veteran, Son					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Birth Distance to War Peak, Father	-0.033	-0.029	-0.029	-0.033	-0.033	-0.0028	-0.0038	-0.0035	-0.0032	-0.0032	-0.0031
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
Birth Distance to War Peak, Mother											-0.0004
											(0.0002)
Observations	510,653	510,653	510,653	458,181	458,181	510,653	510,653	510,653	458,181	458,181	383,944
R-squared	0.20	0.24	0.25	0.23	0.25	0.08	0.08	0.15	0.16	0.16	0.15
Census FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Polynomial	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
State FE	No	No	No	No	Yes	No	No	No	No	Yes	Yes
Race Controls	No	No	No	No	Yes	No	No	No	No	Yes	Yes
Sample Restriction, Father Birthyear	No	No	No	+/-10 year	+/-10 year	No	No	No	+/-10 year	+/-10 year	+/-10 year
Dependent Variable, Mean	0.417	0.417	0.417	0.449	0.449	0.119	0.119	0.119	0.114	0.114	0.100

Notes: US Census Data from IPUMS, 1950-2000. War Veteran is a dummy indicating if the individual served in at least one of the major wars: World War I, World War II, Korea, or Vietnam. The sample consists of father cohorts born after 1880 and adult son cohorts no younger than age 16 by the end of the Vietnam War. Farther birth-year polynomial consist of a third order polynomial in the year of birth of the father. Race controls are dummies for race, as defined in the US Censuses. Robust standard errors in parentheses.

Table 3. Main Effects, IV/2SLS

	Dep. Var.: War Veteran, Son										
								External Validity: Inverse Probability Weighted Regressions			
Sample	Baseline	Baseline	Baseline	Baseline	Son Age is 16-30 at Time of War	Son Age + Excl. Peak Cohorts	Baseline	Baseline	Baseline, Excl. <0.5% Prob.	Baseline, Excl. <1% Prob.	Baseline, Excl. <1% Prob.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
War Veteran, Father	0.097	0.101	0.099	0.092	0.093	0.108	0.100	0.208	0.140	0.098	0.101
	(0.006)	(0.006)	(0.006)	(0.008)	(0.006)	(0.008)	(0.006)	(0.012)	(0.012)	(0.012)	(0.015)
High School Graduate, Father							-0.004				
							(0.000)				
Went to College, Father							-0.007				
							(0.001)				
Years of Education, Father							-0.004				
							(0.001)				
Observations	458,181	458,181	458,181	458,181	456,877	350,320	458,181	458,181	443,098	425,083	350,114
Census FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV-variable	Linear	2-Poly.	3-Poly.	Dummy	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Sample Predictors	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Baseline	Baseline	Baseline	Baseline+
Dependent Variable, Mean	0.114	0.114	0.114	0.114	0.114	0.119	0.114	0.114	0.103	0.097	0.092

Notes: The sample and variables definitions are the same as Table 2. All samples restricts the father year of birth to +/- 10 years around the peak cohort. The instrument is: in column 1, it is baseline instrument and the same variable as in Table 2; in column 2, a second order polynomial; in column 3, a third order polynomial; in column 4, a dummy equal to one if the father is born within three years of a peak cohort, and; in columns 5-7 the baseline linear instrument. The sample in column 5 restricts the sons to at least age 16 by the end of at least one war, and at most age 30 by the beginning of at least one war. Column 6 adds the additional sample restriction of dropping fathers who are within one year of a peak cohort. In columns 8-11, observations are inverse-probability weighted by the likelihood of being in the sample (cohabitation with the father), which is estimated from the full Census data using Probit regression (see table A6 in the appendix). The baseline predictors (columns 8-10) use pre-determined variables only: second-order polynomial in age, race dummies, census dummies and high school graduate dummy, from table A6 column 1. In column 11 the predictors are: age dummies (fully saturated), race dummies, census dummies, poverty status dummy, socio-economic index, unemployment dummy, and in labor force dummy, from table A6 column 2. The sample size in column 11 is lower due to lack of data on socio-economic characteristics. To deal with the issue of the inverse of near-zero probabilities, we use propensity-based stratification (Kang and Shafer, 2007), stratifying the probabilities in five percentage point bins, and including only age dummies with at least twenty observations in order to achieve convergence (dropping in total 182 observations, generally very old individuals). Column 8 includes observations of all cohabitation probabilities, column 9 excludes observations with less than 0.5% probability of cohabitation, and columns 10-11 exclude those with less than 1% probability. Robust standard errors in parentheses.

Table 4. War-by-War Effects, IV/2SLS

	Dep. Var.: War Veteran, Son							
	World War II		**Korean War**		**Vietnam War**			
U.S. Census Sample	1950/60/70		1960/70/80		1980/90/00			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WW I Veteran, Father	0.280	0.271	0.056	0.059				
	(0.037)	(0.037)	(0.026)	(0.026)				
WW II Veteran, Father					0.038	0.038		
					(0.003)	(0.003)		
Korea Veteran, Father							0.013	0.014
							(0.003)	(0.003)
Observations	59,992	59,992	28,120	28,120	250,220	250,220	218,817	218,817
Census FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	Yes	No	Yes	No	Yes	Yes	No
Race Controls	No	Yes	No	Yes	No	Yes	Yes	No
Dep. Var., Mean	0.138	0.138	0.209	0.209	0.091	0.091	0.065	0.065
Indep. Var. Mean	0.063	0.063	0.162	0.162	0.474	0.474	0.246	0.246
Total Effect, %	12.8%	12.4%	4.3%	4.6%	19.8%	19.8%	4.9%	5.3%

Notes: All samples use the baseline instrument, restricting the sample to sons to at least age 16 by the end of the war and at most age 30 by the beginning of it, with fathers within the +/- 10 years window of father YOB distance to war peak cohort. Same control variable definitions as before, except that the father birth-year control is a linear control and not a polynomial, for meaningful variation in the baseline instrument. Robust standard errors in parentheses.

Table 5. The Effects of the Vietnam War on the Gulf War Era

Dep. Var.:	Vietnam Veteran, Father		Gulf War Era Veteran (90-95), Son			
	1st Stage	1st Stage	RF	RF	IV/2SLS	IV/2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Birth Distance to Vietnam Peak, Father	-0.039	-0.039	-0.00048	-0.00049		
	(0.0003)	(0.0003)	(0.00012)	(0.00012)		
Vietnam Veteran, Father					0.0124	0.0127
					(0.0032)	(0.0032)
Observations	165,241	165,241	165,241	165,241	165,241	165,241
R-squared	0.08	0.10	0.02	0.02	N/A	N/A
Census FE	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	Yes	No	Yes	No	Yes
Race Controls	No	Yes	No	Yes	No	Yes
IV-variable	N/A	N/A	N/A	N/A	Linear	Dummy
Dep. Var., Mean	0.239	0.239	0.051	0.051	0.022	0.022
Indep. Var. Mean	4.465	4.465	4.465	4.465	0.239	0.239
Total Effect, %	N/A	N/A	N/A	N/A	13.4%	13.7%

Notes: US Census data from 2000. All samples use +/- 10 years window of father YOB distance to war peak cohort. All outcome variables are dummies, equal to one if the son served in the Gulf War era, and zero otherwise. The Gulf War era refers to the 1990-95 period (not 1990-91), per the census-specified time periods of service. The sons are restricted to be at most age 30 by the beginning of the time period, and at least age 16 by the end of it. Baseline instrument in IV/2SLS. Control variables have the same definitions as in Table 4. Robust standard errors in parentheses.

Table 6. The Effects on Parenting

	Dep. Var.: Father's Parenting is Authoritative, Dummy							
	Boys				Girls			
	RF	RF	IV/2SLS	IV/2SLS	RF	RF	IV/2SLS	IV/2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Birth Distance to War Peak, Father	-0.012	-0.011			-0.001	0.001		
	(0.004)	(0.003)			(0.004)	(0.004)		
War Veteran, Father			0.223	0.192			0.015	-0.012
			(0.070)	(0.061)			(0.072)	(0.067)
Mother's Parenting is Authoritative, Dummy		0.459		0.459		0.434		0.434
		(0.019)		(0.019)		(0.020)		(0.020)
Observations	2,476	2,476	2,476	2,476	2,241	2,241	2,241	2,241
Child Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Race and geographic controls	No	Yes	No	Yes	No	Yes	No	Yes
Mean Dependent Variable	0.61	0.61	0.61	0.61	0.55	0.55	0.55	0.55

Notes: National Longitudinal Survey of the Youth 1997 (NLSY97) data. The outcome is a dummy indicating if the father's parenting style is authoritative at any time during childhood, available for children during age 14-17. Columns 1-4 include boys and columns 5-7 include girls. The controls are: father year of birth, and dummies for race, region and urban-rural. The IV estimates are based on two-sample IV (Angrist and Krueger, 1992), where the second-stage use fitted values from a first stage estimated from the 1990/00 Censuses with the sample of father year of birth cohorts sizes proportional to the NLSY97 sample. The first-stage specification is the same as in Table 2 column 2. Robust standard errors in parentheses.

Table 7. Heterogenous Effects, Oblique Transmission

Dep. Var.:	Father is War Veteran			Son is War Veteran			
	1st Stage	1st Stage	1st Stage	RF	RF	RF	IV/2SLS
	(1)	(2)	(3)	(4)	(6)	(7)	(8)
Father's Birth Distance to War Peak * War Veterans in County	-0.118	-0.116	-0.122	0.015	0.017	0.020	
	(0.009)	(0.011)	(0.011)	(0.007)	(0.008)	(0.008)	
Father's Birth Distance to War Peak * Non-War Veterans in County		-0.003	0.031		-0.004	-0.014	
		(0.015)	(0.017)		(0.011)	(0.012)	
Father's Birth Distance to War Peak * % High School Graduates in County			-0.057			0.013	
			(0.007)			(0.005)	
Father's Birth Distance to War Peak * % Unemployed in County			-0.100			0.044	
			(0.039)			(0.029)	
Father's Birth Distance to War Peak * % Not in Labor Force in County			0.015			-0.011	
			(0.010)			(0.007)	
Father's Birth Distance to War Peak	-0.007	-0.008	0.036	-0.006	-0.006	-0.015	
	(0.002)	(0.002)	(0.007)	(0.002)	(0.002)	(0.006)	
Father is War Veteran * War Veterans in County							-0.492
							(0.150)
Father is War Veteran							0.178
							(0.038)
Observations	190,863	190,560	190,560	190,863	190,560	190,560	190,863
R-squared	0.194	0.193	0.197	0.151	0.151	0.151	N/A
Census FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dep. Var., Mean	0.513	0.513	0.513	0.100	0.100	0.100	0.100

Notes: US Census data, 1950-2000, except 1960. All regressions include the country controls include the share of war veterans in the county, from across the 1950-2000 Censuses, except 1960 for which there is no county identifier available. For columns 2, 3, 6 and 7 the county controls also include the corresponding county-level variables of the interaction terms. The county variables take values from zero to 1. Column 8 shows the IV/2SLS estimates, where the instruments are Father's Birth Distance to War Peak and its interaction with War Veterans in County. All the other controls are the same as in Table 3 and all regressions restricts the father year of birth to +/- 10 years around the peak cohort. Robust standard errors in parentheses.

Table 8. The Effects on Military Service Outside of War

Dep. Var.:	War Veteran, Son	Non-War Veteran, Son	Non-War Veteran 1955-64, Son	Non-War Veteran 1975-80, Son	Both War & Non-War Veteran, Son	Never Served, Son	Non-War Veteran 1980-90, Son
	IV/2SLS	IV/2SLS	IV/2SLS	IV/2SLS	IV/2SLS	IV/2SLS	IV/2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(6)
War Veteran, Father	0.054	-0.053	-0.040	-0.014	-0.004	-0.006	-0.014
	(0.007)	(0.005)	(0.003)	(0.004)	(0.002)	(0.008)	(0.007)
Observations	319,556	319,556	319,556	319,556	319,556	319,556	96,556
Census Samples	80/90/00	80/90/00	80/90/00	80/90/00	80/90/00	80/90/00	90/00
Census FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dependent Variable, Mean	0.100	0.058	0.014	0.045	0.010	0.853	0.024

Notes: Census data from 1980/90/2000. Baseline instrument in all regressions. In columns 1- 6, the sample includes all three censuses. The outcome variables are dummies indicating the veteran status for different time periods. In column 1 it is the same as in Table 3; in column 2 it indicates having served in 1955-64 or 1975-80; in column 3 having served in 1955-1964; in column 4 having served in 1975-1980; in column 5 having served in both a war period and a non-war period; in column (6) never having served in any period. In column 7, the outcome indicates having served in 1980-1990 and the sample includes the 1990 and 2000 Censuses. Control variables are the same as in Table 3. Robust standard errors in parentheses.

Table 9. The Effects on Education

	Education of Sons						Education of Fathers			
	Years of Education			Went to College			Years of Education		Went to College	
	RF	IV/2SLS	IV/2SLS	RF	IV/2SLS	IV/2SLS	IV/2SLS	IV/2SLS	IV/2SLS	IV/2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Birth Distance to War Peak, Father	-0.013			-0.002						
	(0.002)			(0.000)						
War Veteran, Father		0.406	0.443		0.050	0.092	0.595	0.904	0.075	0.086
		(0.073)	(0.081)		(0.010)	(0.012)	(0.079)	(0.088)	(0.008)	(0.010)
Observations	225,924	225,924	197,161	225,924	225,924	197,161	225,924	197,161	225,924	197,161
Census Samples	All	All	80/90/00	All	All	80/90/00	All	80/90/00	All	80/90/00
Census FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Race Controls	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Dependent Variable, Mean	12.04	12.04	12.22	0.36	0.36	0.38	10.13	10.38	0.19	0.21

Note: US Census Data, 1950-2000. Baseline sample, except that all individuals are at least 25 years old in the Census. Columns 3, 6, 8 and 10 restrict the sample to Census years 1980/90/2000, for comparisons with the results in Table 8. Baseline instrument in IV/2SLS. Control variables are defined as in Table 2. Robust standard errors in parentheses.

Table 10. The Effects on Military Aspirations among Young Men

	Dep. Var.: Occupational Aspiration: Armed Forces					
	RF			IV/2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Birth Distance to War Peak, Father	-0.0009	-0.0023	-0.0017			
	(0.0008)	(0.0013)	(0.0010)			
Birth Distance to War Peak, Father * Age		0.0004				
		(0.0002)				
Birth Distance to War Peak, Father * Age>=20			0.0039			
			(0.0013)			
War Veteran, Father				0.032	0.081	0.059
				(0.030)	(0.046)	(0.033)
War Veteran, Father * Age					-0.015	
					(0.008)	
War Veteran, Father * Age>=20						-0.134
						(0.044)
Observations	6,355	6,355	6,355	6,355	6,355	6,355
NLS Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes
Race and geographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dependent Variable	0.018	0.018	0.018	0.018	0.018	0.018

Notes: Pooled data from two datasets, NLS of Young Men 1966 and NLSY 1979 data, males aged 14-24 at the time of the surveys. The outcome is a dummy indicating if the male's stated occupational desire as an adult is to be in the armed forces, and zero otherwise. In NLS of Young Men 1966 the survey question is "What kind of work would you like to be doing when you are 30 years old?" and in NLSY 1979 "What kind of work would you like to be doing when you are 35 years old?" The Age variable in columns 2 and 5 is the number of years from age 14 of the male at the time of the survey. The Age>=20 in columns 3 and 6 is a dummy indicating whether the male is at least age 20, and zero otherwise. All samples use +/- 10 years window of father YOB distance to war peak cohort. The father birth-year controls are third-order polynomials in the father year of birth, and the geographical controls are dummies for region. The IV estimates are based on two-sample IV (Angrist and Krueger, 1992), where the second-stage use fitted values for War Veteran from a first stage estimated from the 1970/1980 Censuses with the sample of father year of birth cohorts sizes proportional to the pooled NLS samples. The first-stage specification is the same as in Table 2 column 2. Robust standard errors in parentheses.

Online Appendix

Figure A1. Age Distribution, Full Census vs. Sample Living with Father

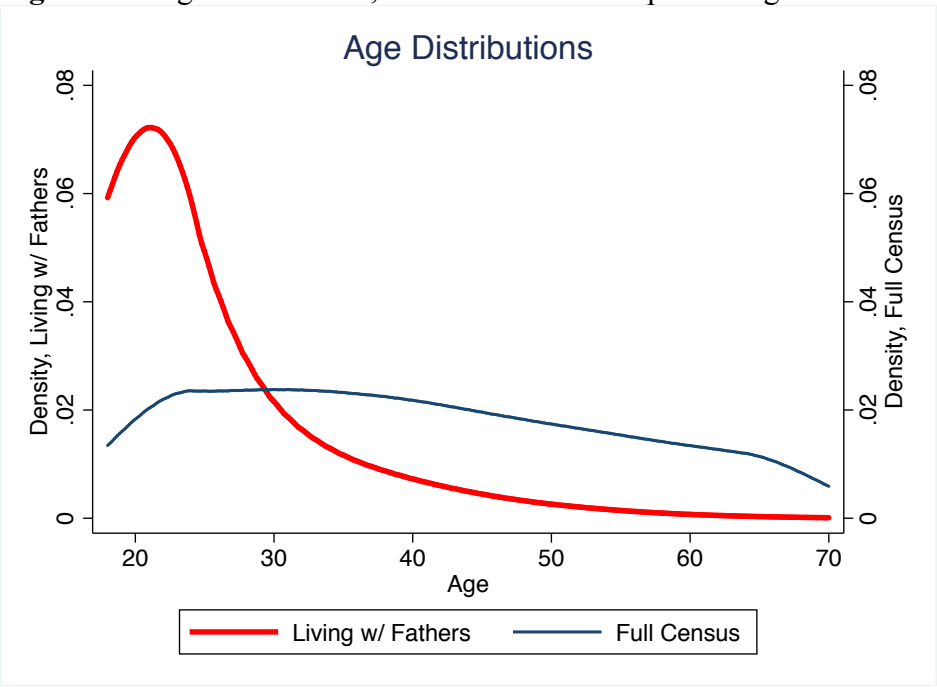
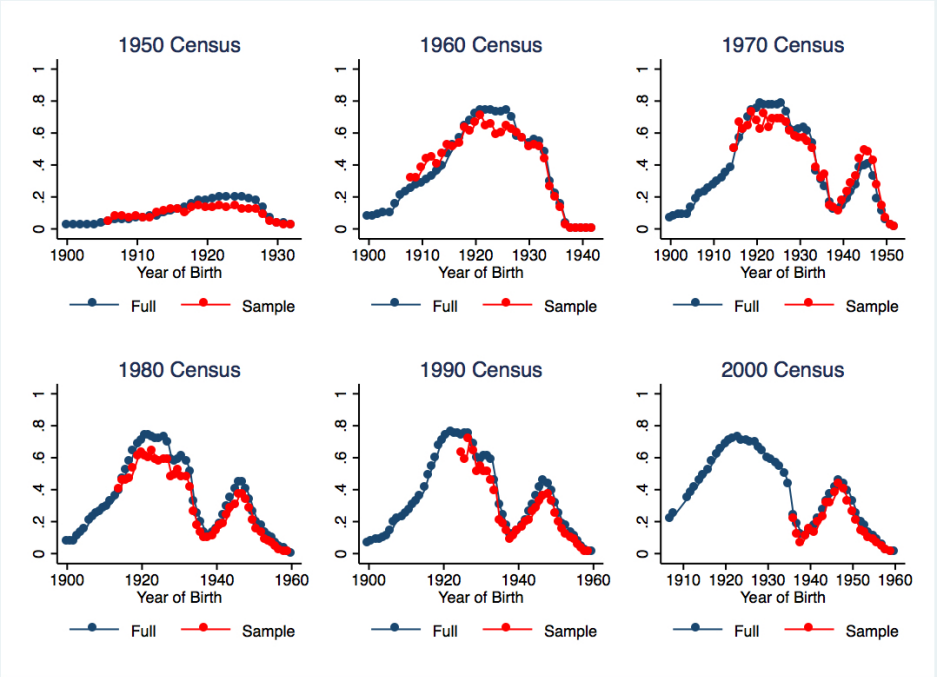
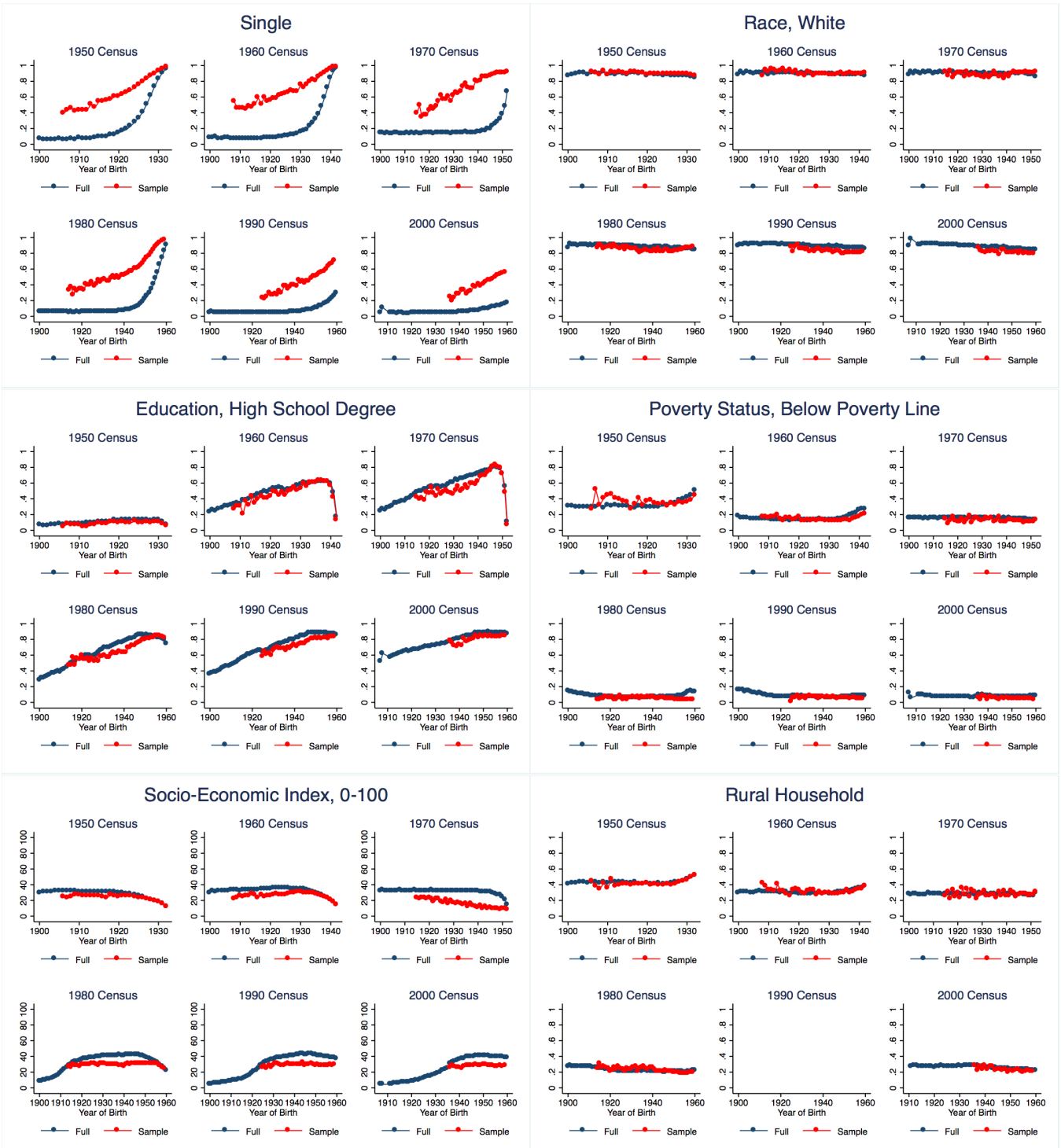


Figure A2. War Veteran Status, Full Census vs. Sample Living with Father



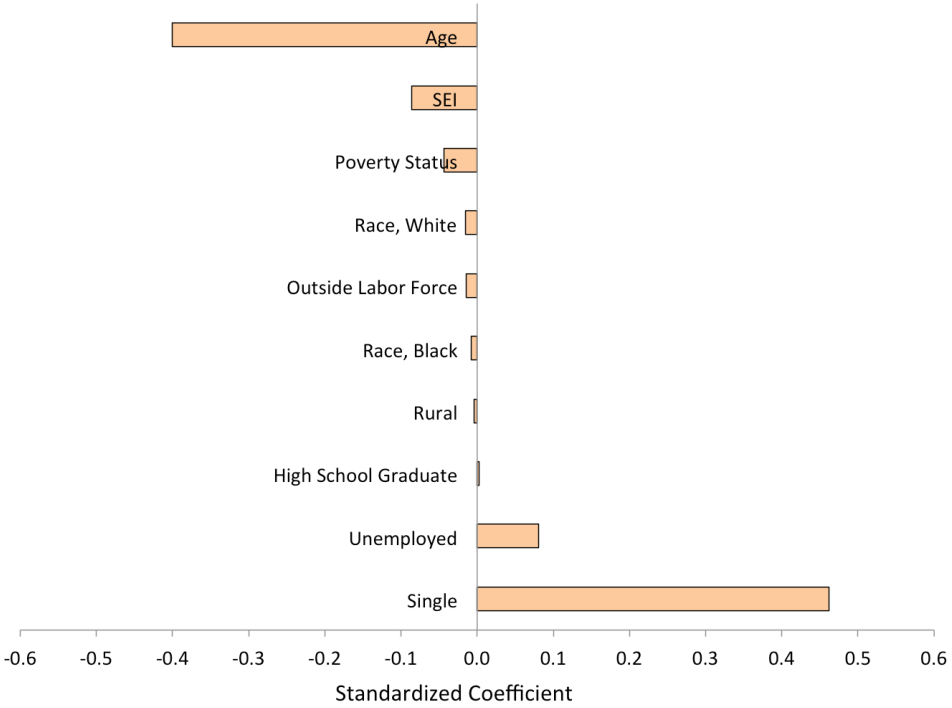
Note: The figure plots the mean of the war service dummy (WWII, Korea, Vietnam) in the full census data and our sample of sons living with their fathers. The blue dots refer to the full census means, and the red dots refer to the sample means. The data is restricted to cohorts with at least 100 observations. The figure shows the likelihood of serving in the population is approximately similar in the sample.

Figure A3. Demographics and Socio-Economic Outcomes, Full Census vs. Sample, Means



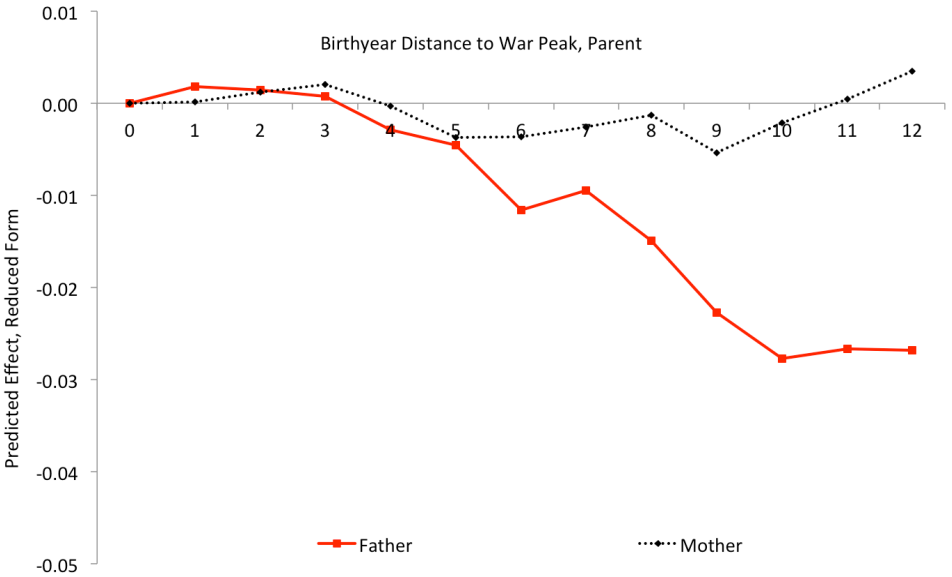
Note: The figure plots the mean of socioeconomic characteristics in the full census data of adult men, and in the sample of sons living with their fathers, across cohorts within the same census. The blue dots refer to the full census means, and the red dots refer to the sample means. The data is restricted to cohorts with at least 100 observations. The figure shows the characteristics in the population are approximately similar in the sample, with the exception of single status.

Figure A4. Predictors of Living with Father, Standardized Coefficients



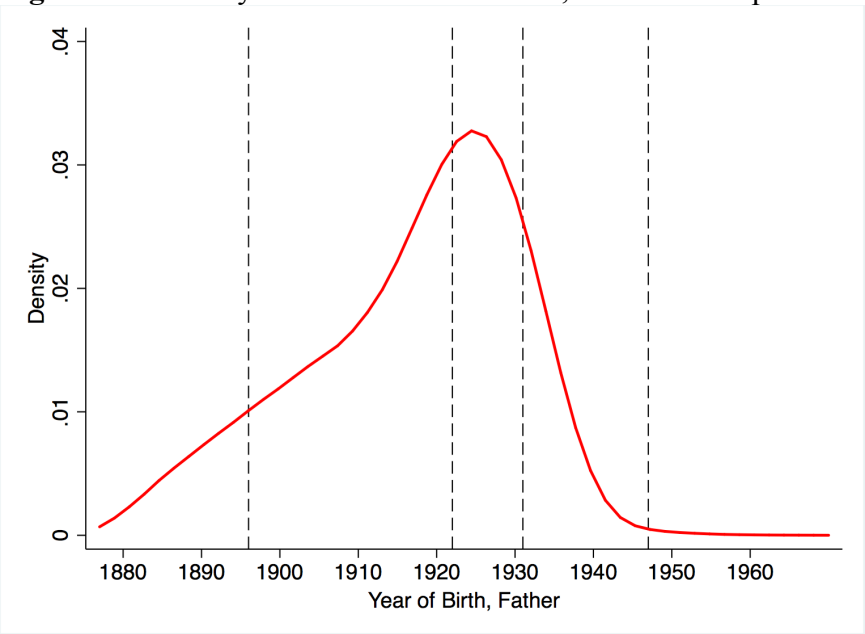
Note: Standardized coefficients from a bivariate regression predicting likelihood of living with the father, using the full census data from 1950-2000. The figure shows that that two strongest predictors are age at the time of the census and single status (never married).

Figure A5. Reduced Form Effects, Fathers and Mothers



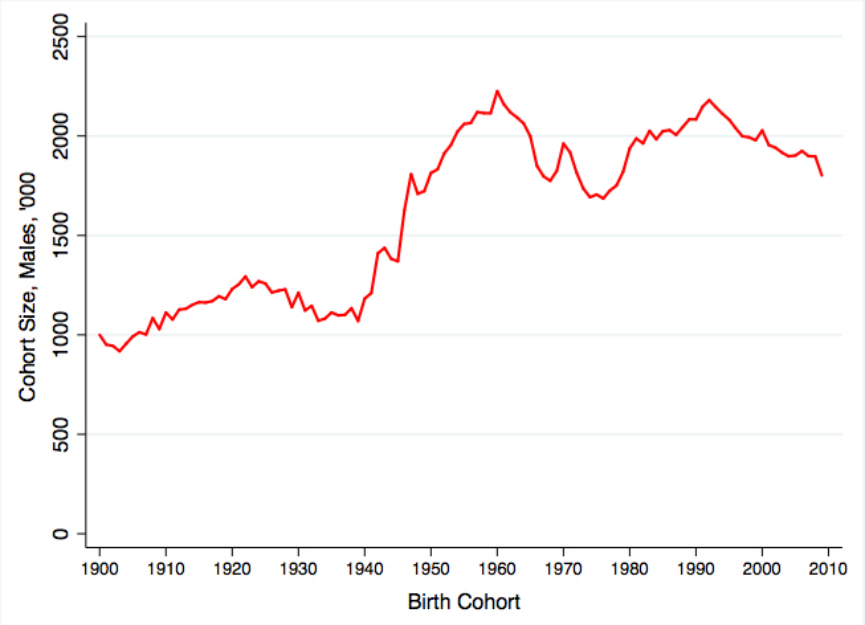
Note: The figure plots the coefficient estimates from the flexible specification using dummies to indicate the parent year of birth distance to the peak cohorts. The reduced form effect refers to the father, and the placebo to the mother. The figure shows that fathers - not mothers - drive the reduced form effects.

Figure A6. Density of Father Birth Cohorts, Baseline Sample



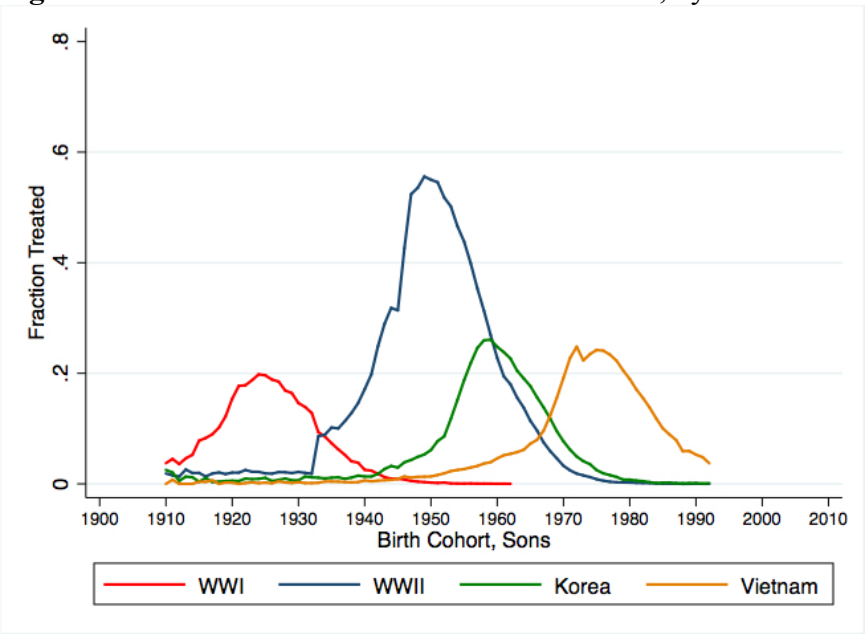
Note: The graph plots the distribution of father cohorts in the baseline sample used in Table 2 regressions. The dashed lines indicate the war peak cohorts.

Figure A7. Cohort Size of Males



Note: The graph plots the estimated total number of males born in each cohort, using the full U.S. Census data.

Figure A8. Share of Fathers who are War Veterans, by Cohort



Note: The figure shows the estimated share of fathers who served in each war, for each cohort among sons in the sample.

Table A1. Sample Selection, Predictors of Likelihood of Living with Father

Dependent Variable:	Living with Father, Dummy									
SAMPLE:	**Full Census**									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Age, Log	-0.278									
	(-0.400)									
Single		0.310								
		(0.462)								
Race, White			-0.013							
			(0.000)							
Race, Black				0.003						
				(0.000)						
High School Graduate					-0.005					
					(0.000)					
Poverty Status, Below Poverty Line						-0.042				
						(0.000)				
Socio-Economic Index							-0.092			
							(0.000)			
Unemployed								0.115		
								(0.001)		
Outside Labor Force									-0.010	
									(0.000)	
Rural										-0.002
										(0.000)
Observations	14,901,322	14,901,322	14,901,322	14,901,322	14,901,322	13,940,463	14,901,322	14,901,322	14,901,322	9,527,601
R2	0.160	0.213	0.000	0.000	0.000	0.002	0.007	0.007	0.000	0.000
Age FE	No	No	No	No	No	No	No	No	No	No
Census FE	No	No	No	No	No	No	No	No	No	No
Standardized Effects	**-0.400**	**0.462**	**-0.016**	**-0.008**	**0.003**	**-0.043**	**-0.086**	**0.081**	**-0.014**	**-0.004**

Note: Sample using full Census data from 1950-2000, males age 18 and above. Bivariate regressions in all columns. The corresponding standardized effects are available in the bottow row, and plotted in Figure A4. Robust standard errors in parentheses.

Table A2. Robustness, Dropping 1950 Census

	Dep. Var.: War Veteran, Son										
								External Validity: Inverse Probability Weighted Regressions			
Sample	Baseline	Baseline	Baseline	Baseline	Son Age is 16-30 at Time of War	Son Age + Excl. Peak Cohorts	Baseline	Baseline	Baseline, Excl. <0.5% Prob.	Baseline, Excl. <1% Prob.	Baseline, Excl. <1% Prob.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
War Veteran, Father	0.075	0.081	0.079	0.066	0.071	0.083	0.078	0.187	0.111	0.065	0.095
	(0.006)	(0.006)	(0.006)	(0.008)	(0.006)	(0.008)	(0.006)	(0.012)	(0.012)	(0.013)	(0.015)
High School Graduate, Father							-0.017				
							(0.002)				
Went to College, Father							0.002				
							(0.000)				
Years of Education, Father							-0.022				
							(0.001)				
Observations	398,295	398,295	398,295	398,295	397,297	300,406	398,295	398,295	383,230	365,239	339,016
Census FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IV-variable	Linear	2-Poly.	3-Poly.	Dummy	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Sample Predictors	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Baseline	Baseline	Baseline	Baseline+
Dependent Variable, Mean	0.121	0.121	0.121	0.121	0.121	0.127	0.121	0.121	0.108	0.101	0.094

Notes: The sample, specifications and variables definitions are the same as Table 3, except that the 1950 Census is dropped. Robust standard errors in parentheses.

Table A3. Main Effects, Alternative Standard Errors

	War Veteran, Son						
Sample	Baseline Sample	Baseline Sample	Baseline Sample	Baseline Sample	Son Age is 16-30 at Time of War	Son Age + Excl. Peak Cohorts	Baseline Sample
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
War Veteran, Father	0.098	0.101	0.099	0.092	0.100	0.108	0.100
Clustered SE: State	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)	(0.007)	(0.007)
Clustered SE: Father YOB	(0.015)	(0.015)	(0.015)	(0.022)	(0.017)	(0.012)	(0.015)
Clustered SE: Father YOB + State	(0.015)	(0.015)	(0.015)	(0.021)	(0.017)	(0.012)	(0.015)
Clustered SE: Father YOB + Son YOB	(0.017)	(0.017)	(0.019)	(0.015)	(0.017)	(0.013)	(0.017)
Observations	458,181	458,181	458,181	458,181	456,877	350,320	458,181
Census FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Education Controls	No	No	No	No	No	No	Yes
IV-variable	Linear	2-Polynomial	3-Polynomial	Dummy	Linear	Linear	Linear

Note: This table is identical to columns 1-7 of Table 3, except it uses alternative ways to calculate the standard errors, clustered at different levels. State refers standard errors clustered at the state level, Father YOB refers to clustering at the level of the father year of birth. Father YOB + State refers to two-way clustered standard errors at both levels, as does Father YOB + Son YOB.

Table A4. Main Effects By Region

	Dep. Var.: War Veteran, Son							
	Northeast		**Midwest**		**South**		**West**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
War Veteran, Father	0.119	0.120	0.090	0.090	0.092	0.091	0.087	0.088
	(0.012)	(0.012)	(0.011)	(0.011)	(0.010)	(0.010)	(0.016)	(0.016)
Observations	127,721	127,721	116,281	116,281	141,666	141,666	72,513	72,513
Census FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	Yes	No	Yes	No	Yes	No	Yes
Race Controls	No	Yes	No	Yes	No	Yes	No	Yes
Dependent Variable, Mean	0.147	0.147	0.144	0.144	0.135	0.135	0.154	0.154

Note: IV/2SLS estimates, baseline instrument. Same sample and variable definitions as in Table 3. Baseline instrument. Robust standard errors in parentheses.

Table A5. Extrapolation of Effects to the Population, IV/2SLS

Dependent Variable:	War Veteran, Son											
SAMPLE:	**Baseline Sample**											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
War Veteran Father	0.099	0.112	0.100	0.098	0.107	0.091	0.110	0.110	0.111	0.107	0.096	0.129
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.010)
War Veteran Father * Age, Log	0.240											
	(0.016)											
War Veteran Father * Single		-0.120										
		(0.011)										
War Veteran Father * Race, White			-0.113									
			(0.012)									
War Veteran Father * Race, Black				0.098								
				(0.013)								
War Veteran Father * High School					-0.137							
					(0.009)							
War Veteran Father * Poverty						0.098						
						(0.019)						
War Veteran Father * SEI							-0.123					
							(0.015)					
War Veteran Father * Unemployed								0.019				
								(0.011)				
War Veteran Father * Outside Labor Force									0.033			
									(0.008)			
War Veteran Father * Rural										0.015		
										(0.008)		
War Veteran Father * Predicted Prob(cohabit)											-0.143	-0.143
											(0.017)	(0.017)
Observations	458,181	431,131	458,181	458,181	458,181	382,253	431,131	431,131	431,131	331,932	382,253	382,253
Census FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Predictor Demeaned at Mean of:	Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample	Pop.
Std. Effect of Predictor on Prob(cohabit)	-0.400	0.462	-0.016	-0.008	0.003	-0.043	-0.086	0.081	-0.014	-0.004	N/A	N/A
Predicted Effect at Population Mean	**0.195**	**0.177**	**0.099**	**0.097**	**0.101**	**0.094**	**0.102**	**0.109**	**0.112**	**0.106**	**0.129**	**0.129**
	(0.011)	**(0.010)**	**(0.006)**	**(0.006)**	**(0.006)**	**(0.006)**	**(0.006)**	**(0.006)**	**(0.006)**	**(0.007)**	**(0.010)**	**(0.010)**

Note: Baseline sample, US Census data from 1950-2000, men age 18 and above. IV/2SLS estimates using the baseline instrument and the interaction with the predictor. Each regression includes the predictor of the interaction term as a control variable. All other controls are the same as in Table 3. All predictors are demeaned at the sample mean in columns 1-10. The standardized effects of predictors on Prob(cohabit), i.e. the likelihood of living with the father, are from bivariate regressions in Table A1. The bottom row shows the predicted effect of War Veteran Father at the population mean (full Census) of the predictor. Column 11 shows the regressions when the interaction is the predicted likelihood of living with the father, estimated from the full census (see table A6, column 2), and demeaned at the sample mean. In column 12, it is demeaned at the population mean from the full census data 1950-2000 of men age 18 and above. The estimates are plotted in Figure 6. Robust standard errors in parentheses.

Table A6. Estimating Prob(Living w/ Father), Census Data 1950-2000

Dependent Variable:	Living with Father, Dummy	
SAMPLE:	**Full Census**	
	(1)	(2)
Age	-0.159***	
	(0.000180)	
Age, squared	0.00120***	
	(1.82e-06)	
Race, White	-0.177***	-0.210**
	(0.00280)	(0.00327)
Race, Black	-0.291***	-0.408**
	(0.00330)	(0.00388)
Single		1.173**
		(0.00155)
High School Graduate	-0.111***	0.0134**
	(0.00139)	(0.00175)
Socio-Economic Index		-0.00550**
		(2.94e-05)
Poverty Status, Below Poverty Line		-0.987**
		(0.00285)
Unemployed		0.260**
		(0.00263)
Outside Labor Force		0.285**
		(0.00194)
Observations	14,991,322	13,939,518
R-squared	0.160	0.213
Census FE	Yes	Yes
Age FE	No	Yes

Note: Sample using full Census data from 1950-2000, on males age>=18. Probit regressions, from which predicted likelihood of living with father is estimated (Prob(Living w/ Father), used in inverse probability weighted regressions in Table 3 and A5. Column 1 includes pre-determined variables (before potentially enlisting in the armed forces), while column 2 add additional socio-economic characteristics. Robust standard errors in parentheses. ** p<0.01, * p<0.05.

Table A7. The Effects by Son Age at War Midpoint

	War Veteran, Son					
Sample: Son's age at War Midpoint	Age: 14-16	Age: 17-19	Age: 20-22	Age: 23-25	Age: 26-28	Age: 29-31
	(1)	(2)	(3)	(4)	(5)	(6)
War Veteran, Father	0.0206	0.0342	0.0791	0.0600	0.0193	-0.0371
	(0.0140)	(0.0191)	(0.0205)	(0.0246)	(0.0268)	(0.0205)
Observations	97,039	76,675	64,869	45,848	20,376	17,059
Census FE	Yes	Yes	Yes	Yes	Yes	Yes
Father Birthyear Controls	Yes	Yes	Yes	Yes	Yes	Yes
Son Birthyear FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes	Yes

Note: The variables definitions are the same as Table 3. Each sample is restricted to sons that were in the specified age range for at least one of the 20th Century wars, with the age at war midpoint specified at the top of each column. Robust standard errors in parentheses.

The Intergenerational Transmission of War
Data Appendix

Filipe Campante* David Yanagizawa-Drott†

June 2015

In this appendix we describe in detail the data sets and procedures used in the paper.

1 US Census

We start from the US Census' Integrated Public-Use Microdata Series (IPUMS-USA), using the 5% sample whenever available (1980-2000), and the 1% sample otherwise. We merge together the data for each Census year between 1950 and 2000.

We obtain the information on fathers using the "*poploc*" variable, which for any individual indicates the number ascribed to that individual's father within the household. In other words, for each Census variable x described below, the father's information comes from "*x_pernum_i*", where $poploc = i$. This yields" *x_father*." Note that, as described by the Census, $poploc$ identifies "social relationships (such as stepfather and adoptive father) as well as biological relationships." The procedure is similar, using *momloc*,for information on mothers.

The key variables are: *birthyear* (for year of birth), *vetstat* (for veteran status), *vetwwi* (World War I veteran, from 1950-1980), *vetwwii* (World War II veteran, from 1950-2000), *vetkorea* (Korean War veteran, from 1960-2000), *vetvietn* (Vietnam War veteran, from 1970 to 2000), $vet90x95$ ("Gulf War" veteran). We also use the variables $vet55x64$, $vet75x80$, $vet80x90$ to look at service outside of wartime, and demographic variables – *educ* (years of education).

We define the key years (1896, 1922, 1931, 1947), subtract each of these numbers from *birthyear* (as long as the latter is within 20 years of the key year in question), and take the absolute value. The year-of-birth distance is the minimum over the four numbers thus generated. For our main regressions, we drop all observations for which we cannot define "*birthyear_father*,"

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which leaves us with the sample of individuals who live with their fathers at the time of the Census, and keep adult male individuals at least aged 18.

The individual (son) is coded as a veteran of each war according to the aforementioned war-specific variables. He is coded as a "Big 3" veteran if he is a veteran of any of the three major wars (WWII, Korea, Vietnam). The father is coded as a "Big 4" veteran if he is a veteran of any of these wars, or WWI.

2 National Longitudinal Survey (NLS)

We use three NLS datasets: The Young Men Survey, which includes 5225 men who were ages 14-24 when first interviewed in 1966; NLSY79, with 6403 males of age 14-22 when first interviewed in 1979, and; NLSY97, containing 4599 males of ages 12-17 when first interviewed in 1997.

In the Young Men Survey, the year of birth of the father is not a variable in the dataset. We first use the 1966 household roster to identify the father in the household, if present, and create a variable for his age. We then calculate his year of birth as the survey year (1966) minus his age. For those who have missing values, we search for the father by repeating the procedure in the surveys up to 1970. This procedure results in identified fathers for 66% of the observations. We use a similar procedure in NLSY97, resulting in identified year of birth of fathers for 55% of the male observations. In NLSY79, the age of the father is available as a variable for 75% of the males, enabling us to calculate father year of birth in those cases. In all three datasets, we then create the same instrumental variable as we did in the US Census data, described above.

The parenting style variables in NLS97 are available for the years 1997-2000. We create the authoritative parenting style dummy that equals one if the parenting is authoritative at any time in that time period, and zero otherwise. For the military aspirations data, we pool the Young Men of 1966 and the NLSY79 surveys. The former contains geographic identifiers at the census division level, while the latter only includes identifiers for region. We thus construct aggregated geographic identifiers at the region level in the Young Men survey, in order to have homogeneously defined geographical controls in the regressions.