The Intergenerational Transmission of War*

Filipe Campante† David Yanagizawa-Drott‡

October 2016

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 wartime service; however, it reduces the likelihood of the son's serving in peacetime. We provide evidence consistent with the idea that war service increases the inclination to serve in wars via a process of cultural transmission 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 the opportunity cost of service for sons, consistent with the reduced peacetime service. 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.

*We thank Alberto Abadie, Daron Acemoglu, Alberto Alesina, Robert Barro, Sam Bazzi, Alberto Bisin, Ruben Enikolopov, John Friedman, Claudia Olivetti, and Andrei Shleifer for helpful conversations and suggestions, and seminar participants at Dartmouth, Georgetown, GWU, HKS, Harvard-MIT (Positive Political Economy), IPEG Barcelona, Middlebury, Northwestern (Kellogg), NYU, Sao Paulo School of Economics, Stanford GSB, UC Berkeley, UCLA Anderson, University of Toronto, University of Zurich, the NBER Summer Institute (Political Economy and Economics of National Security groups), and the Political Economy of Development and Conflict Workshop in Barcelona for many useful comments. All errors are our own.

†Harvard Kennedy School and NBER. Email: Filipe_Campante@harvard.edu
‡University of Zurich and NBER. Email: David.Yanagizawa-Drott@econ.uzh.ch

"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 people 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 relatively 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.[3]

Those individual decisions are especially interesting because they have an inherently social and cultural component. For an individual to decide to serve in war, there must be a war for him to serve in, and these are events that tend to leave a large social imprint.[4] Put simply, it is not so much individuals that face that decision, but rather entire generations.

This paper studies one key element in this context: is war service transmitted across generations? If so, what forces give rise to such transmission?

The main empirical challenge in addressing these questions is that the exposure of different generations to war service, as well as the links between generations, are not randomly assigned.

[1] From Kerry's blurb for Takiff (2003), 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 use male pronouns and terminology ("fathers" and "sons"), throughout the paper, since war service was overwhelmingly male in the context we will study.

The likelihood of exposure to service in a given war correlates with characteristics that impact economic decisions and outcomes. By the same token, the descendants of those who were exposed could be more likely to serve as a result, for instance, of a physical or psychological aptitude or inclination that correlates across generations, perhaps due to genetic factors. It follows that an intergenerational correlation in war service does not imply a causal effect.

We tackle this challenge in the context of the four major US theaters of the 20th century – World War I, World War II, Korea, and Vietnam.[5] This context is uniquely suitable, as the number, duration, and spacing of those wars ensure that a vast majority of individuals born in the relevant period could have plausibly served in a war over their lifetimes. It also lets us focus on the effect of war service, as opposed to the broader impact of war, since in none of these conflicts was the US civilian population nearly as affected as those who did serve.

Our strategy for causal identification relies on the fact that the likelihood of war service depends on age at the time of war. In particular, because suitability for service and draft eligibility vary with age, the likelihood of participation 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 men born 21 years before wartime would have particular characteristics directly affecting the likelihood of war service by their sons – compared to those born symmetrically, say, 25 or 17 years before that same war.

We apply this strategy to US Census micro data linking the behavior and outcomes of fathers and sons.[6] The first-stage relationship, across all four wars, shows that an additional five years of year-of-birth distance to the peak year reduces the probability of having gone to war by 15 percentage points, corresponding to a decline of just over one-third with respect to the mean. The reduced-form effect in turn implies that, on average, those additional five years translate into the next generation being 1.5 percentage point less likely to go to war, a 13% drop relative to the mean likelihood in the sample. In the two-stage least squares (2SLS) context, these magnitudes imply, across all wars, an intergenerational transmission parameter around 0.12: inducing a generation to serve increases by about 12 percentage points the likelihood of their military-age sons serving in the next generation's war. We further show that the positive intergenerational transmission of war service holds for each of the four major wars taken separately, suggesting a persistent and robust phenomenon throughout the century.[7]

[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 sample selection and external validity with respect to the population, but we find, in essence, that our results are likely to be, if anything, an underestimate of the effects for the population. Similarly, we also show that they are not much affected by attrition due to war casualties.

[7] 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

Notably, the results hold only for wartime service. It is unsurprising that our source of variation induces service during war, but we find that it does not have a major impact on military careers beyond that: breaking down our first stage into the different possibilities regarding time of service by fathers shows only a small positive spillover into peacetime. This shows that our findings pertain to war service, and 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.

More strikingly, we find a substantial negative impact on the likelihood of peacetime service by sons. The contrasting results are reassuring with respect to the risk of any omitted variable bias remaining in spite of our empirical strategy – it seems implausible that any such bias would work in opposite directions in wartime versus peacetime. Still, this poses a puzzle – why would having a war veteran father induce less service in peacetime?

To answer that, we turn to the specific nature of the mechanism behind that intergenerational transmission. We first consider a "cultural transmission" channel. The war service experience could affect beliefs and attitudes, which fathers could then choose to pass on to sons in a process of intra-family ("vertical") transmission, and which may induce them to serve in war. In addition, as we have argued, war service is an inherently social phenomenon, and as such the intergenerational transmission we detect could also encompass social effects of exposure: being around peak-age likely means that more of a father's friends went to war, which might affect him in ways that eventually get transmitted to his sons. Those friends may also affect the sons directly, as an instance of "oblique" cultural transmission outside the realm of the family.

While we do not have direct evidence on cultural 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 vertical and oblique transmission should be "cultural substitutes": fathers may invest less in inculcating values related to war service if there is a strong chance that these will be passed on by a society where they are widespread.

Consistent with this mechanism of cultural transmission at the individual level, we document, in the context of the National Longitudinal Survey of Youth (NLSY), 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 where there

estimates would imply that the service of World War I fathers explains about 15% of World War II service members in our sample, while World War II fathers account for up to 33% of Vietnam veterans, who in turn account for around 15% of Gulf War soldiers. The point is underscored when we calibrate our estimates into the demographic trajectory of the US male population, illustrating the potential dynamic links between wars over time, and how they are affected by the size and spacing of those wars.

is a larger share of war veterans in the population, consistent with cultural substitutability.

In contrast, we show that fathers' war service has a positive impact on the opportunity cost of sons' service, which rules out any mechanism of transmission centered on the possibility that war service by fathers induce war service by sons through worsening their economic prospects.[8] More specifically, 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, as 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 peacetime service by the sons of veterans.

In sum, we find evidence consistent with the intergenerational transmission of war service being at least in part driven by a mechanism of cultural transmission. While it is plausible that this "culture of war service" 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.[9]

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.[10]

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 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

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

[9] 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.

[10] 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.

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).[11]

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).[12] This literature has not focused on intergenerational transmission, which is our main object of analysis. On a similar vein, Bingley, Lundborg and Lyk-Jensen (2015) look at the effect of conscription into military (as opposed to war) service on the likelihood of military service by younger siblings (as opposed to subsequent generations).

One exception is Goodman and Isen (2015), which look at the impact of the natural experiment of the Vietnam draft lottery on the outcomes of subsequent generations. While they focus mostly on labor market outcomes, their results are consistent with ours: they find a positive reduced-form link between an individual's greater likelihood of war service on the likelihood that his sons will also choose to serve. In contrast with their strictly individual treatment, we instead focus on the question of what happens when cohorts are randomly exposed to war service. This lets us address the cultural and social aspects of the intergenerational transmission of war service that are the focus of our study. We are also able to look at the broader historical experience of wartime service, beyond the Vietnam era.

[11] 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.

[12] 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).

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. Section 5 provides evidence on the mechanisms behind the intergenerational transmission. Section 6 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 (Vietnam). 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 A1 in the Appendix.[13] 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.)

The first thing to note 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.[14]

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

[14] 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

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 A1 with those depicted in Figure A1, 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 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).

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.[15] 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 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. Our main results should thus 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.

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

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).

[15] 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]".

whether each individual served in the U.S. Armed Forces during each war.[16]

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.[17]

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.[18] The vast majority of adult sons do not live with their fathers, of course – 9.1% of men are in our sample – and moreover those who do are, 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 A2, 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 A3 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.[19]

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 A4 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.

[16]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.

[17]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 peak – 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.

[18]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."

[19]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 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.

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 A5.[20] 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

In order to causally identify the transmission of war service across generations, we would ideally have different cohorts of men randomly assigned different likelihoods of going to war, with the outcome of interest being whether the sons of those men eventually served. In practice, of course, the likelihood of service in a given war is not randomly determined.

Our empirical strategy isolates an exogenous component in that assignment. The key idea 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 1, 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.[21]

[FIGURE 1 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 his likelihood of exposure to war service. 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 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

[20] The corresponding regression results are in Table A3 in the Appendix.

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

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. We will cluster all standard errors by father's birth cohort, since this is the relevant level of variation.

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 2, in which the key peak-age cohort years are marked. By contrasting the figure with Figure 1, 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 2 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, con-

trolling for any cohort effects.[22] 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}:

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

3.3 Interpretation

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 "narrow" 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. We find this version more persuasive, as it is rather clear that changes in the likelihood of service would have often induced changes in behavior. Our preferred interpretation of β_{IV} thus refers to this "broad" intergenerational transmission: the effect of increasing a father's probability of serving in war over the son's decision.

Our empirical setting also allows us to capture social aspects of the intergenerational transmis-

[22] 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.

sion. 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 war-exposed friends and peers could in turn affect the father in ways that eventually get transmitted to his sons, or even affect the latter directly, though this is likely to be a less quantitatively meaningful channel in comparison to the father-to-son transmission. In short, the experience of war service could get transmitted across generations in direct and indirect ways, encompassing "direct vertical socialization" from parents to children and "oblique socialization" from society at large (to borrow the terminology from Bisin and Verdier (2001)), both of which are important from a policy perspective. This is our preferred interpretation of the mechanisms at play, and our analysis will probe for evidence regarding the possible interactions between these oblique and direct channels.[23]

Note also that our instrument estimates the intergenerational transmission parameter for individuals whose fathers belonged to cohorts that 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.[24]

Similarly, we should keep in mind that what we estimate is an average effect: it is plausible that some might experience a positive shock inducing war service in the next generation, while others could be so traumatized by the horrors of war that they might induce the opposite effect. Last but not least, the effect we estimate is necessarily context-specific, as made clear by the simple fact that there can only be an effect on the next generation's decision to serve in war if there actually is a war. We will explore this context-specificity by considering the evolution of intergenerational transmission across the different wars we analyze.

[23] Another interpretation consistent with our reduced form is that the occurrence of a war might have a broader effect beyond those who serve – say, due to its political or social implications – which could leave an especially deep imprint on young people going through their "impressionable years" between ages 18 and 25 (Giuliano and Spilimbergo 2014). While this is possible, any such broader effect would only be a concern for our empirical strategy insofar as it would follow a process with a sharp peak at exactly age 2, along the lines of Figures 1 and 2. Our full set of results also indicate, as we will see, that this mechanism would also have to operate only via fathers, and not mothers, and have different implications for service during versus outside of wartime.

[24] 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.

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 intergenerational transmission 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 1 displays the first-stage estimates from a linear specification. Columns 1-4 show that father's year-of-birth distance to the war peak cohort is a statistically significant predictor (at the 1% level) of father's wartime service 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 to the closest peak year for war service implies a decrease of 3 percentage points in that likelihood, corresponding to just under 7 percent of the sample mean in the bottom line of the table.

[TABLE 1 HERE]

Column 3 adds 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] Column 4 then shows that the estimate is also robust when we control for state fixed effects and race.

Columns 5-7 then break results down according to different possibilities of service, regarding timing. We first see that there is a rather small spillover into peacetime service: there is a statistically significant impact of the instrument on the likelihood of serving in peacetime as well as

[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.

wartime, but each additional year of distance reduces that likelihood by a mere 0.05 percentage points, which is about 2 percent of the sample mean. As a result, the increase in the likelihood of having ever served induced by being close to peak age (Column 6) is essentially driven by the increase of wartime service only (Column 7). In other words, our instrument induces war service, and not military careers.[26]

We then turn to the reduced-form results, which we show in Table 2. Columns 1-4 mimic the corresponding specifications in Table 1, and we find a rather stable estimate: 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.[27]

[TABLE 2 HERE]

It is instructive to consider a visual representation of the residuals from these basic specifications, in Figure A6 in the Appendix, 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, while the lower panel does the same for the reduced form, as in Columns 2 from Table 1 and 2, respectively.)[28] 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.

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 A7. The first-stage effect is essentially

[26]Unsurprisingly, since our instrument is designed to correlate with wartime service, closeness to peak age is negatively correlated with the likelihood of peacetime-only service (available upon request).

[27]Results are also robust to controlling for 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 (Holm 1993) – 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 (available upon request). 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. 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.

[28]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.

monotonic in distance (as would have been suggested by Figure 1). 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.

The second part of Table 2 (Columns 5-8) then considers the relationship between fathers' distance to peak age and the sons' likelihood of peacetime service. Remarkably, we find a strong positive relationship, i.e. in the opposite direction of the impact on sons' wartime service. This further establishes that the impact we find pertains to war service, and not to military careers in general.

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.[29] It is also quite stable, around 0.1-0.12, no matter whether the IV is a linear function of father's distance to peak year (Column 1), or else a 3rd-order polynomial (Column 2), or even a simple dummy for whether the father was born within three years of the peak year (Column 3). We also get a very similar result (Column 4) from an "asymmetric" version that interacts the baseline instrument with a dummy indicating whether the father was above age 21 at the war midpoint, thus allowing the effect of age on the likelihood of service to be different between the relatively young and old.[30] Column 5 then adds controls for fathers' educational achievements, and the estimate is essentially unaffected. We do not include these controls in the baseline specifications because education may be endogenous with respect to war service, but this indicates that pre-determined socio-economic conditions are not confounding our results.[31]

[TABLE 3 HERE]

[29] 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.

[30] Specifically, the set of instruments includes the interaction, as well as the two main effects, of the baseline instrument and the dummy.

[31] The results are also robust to many different ways of clustering the standard errors besides father year of birth – by state, and son cohort, as well as two-way combinations of those. These can be seen in Table A4 in the Appendix. Similarly, Table A5 in the Appendix further tests the sensitivity of the basic result. Results are robust to restricting the sample of sons to those who were between the ages of 16 and 30 at wartime, to make sure that the result is not driven by individuals outside prime military age, as well as to dropping 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. We alsodrop those fathers who were not born within a ten-year window around the peak cohorts, to ensure that the results are not unduly affected by fathers who would have been relatively unlikely to serve. Reassuringly, the estimated coefficient remains stable across all specifications. (Note that the number of clusters remains sufficiently large to meet typical standards, throughout all sample restrictions.)

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 10-12 percentage points. This effect is quantitatively substantial and, we would argue, also eminently reasonable – it sounds rather plausible that the son of a veteran could be about twice as likely to serve, as implied by a comparison of our estimated effect against the sample mean.

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 can be seen in Table A1, 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 0.12, we would obtain an effect around 0.112.[32] 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.

Table 3 also shows the IV/2SLS estimates for the effect of fathers' wartime service on the sons' likelihood of peacetime service. Columns 7-11 show a large and significant negative effect: the sons of war veterans become less likely to serve outside of war. This suggests, rather emphatically, that our key results are not a manifestation of a broader mechanism of intergenerational transmission of occupational choice, applied to military service. Instead, it seems to be the expression of something specific to war.

These results are very similar if we split the sample according to region, or race of the Census respondents. Table 4 shows that the general pattern of fathers' war service having a positive effect on sons' serving in wartime, and a negative effect on peacetime service, holds for all four Census regions, as well as for whites and non-whites. In addition, coefficient sizes do not vary much quantitatively. This suggests that there is not much in the way of heterogeneous effects, along a couple of dimensions that might have seemed potentially important prima facie.

[TABLE 4 HERE]

In sum, these contrasting results 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

[32] Specifically, $\frac{-1*(0.019*0.4)+.12}{1+(0.019*0.4)} \approx 0.1115$. 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.

military service outside of war. We will return to that shortly, as we investigate the mechanisms behind the intergenerational transmission of war service.

4.3 External Validity: Sample Selection

Our results provide evidence that there is intergenerational transmission of war service, in the context of the subsample of individuals who live with their fathers. Still, one might wonder what we could infer about the average effect in the population as a whole, given that our sample is not randomly drawn. In particular, a key concern here is that our estimates would overestimate the intergenerational transmission that would take place in the population – say, if individuals who live with their fathers are more likely to emulate their behavior in general. For instance, suppose that the subpopulation outside of our sample – that is, those individuals who do not live with their fathers – there is zero intergenerational transmission. Since our sample comprises 9% of the (male) population, simple arithmetic indicates that the average effect in the population would be of the order of 0.011 (CI: 0.008-0.014). This would still be non-trivial, as it would make the sons of veterans about 10% more likely to serve in war, but on a different order of magnitude.

In order to learn more about the average effect, 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:

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

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 3, 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 estimation results underlying these results are presented in Table A6 in the Appendix.)

[FIGURE 3 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 somewhat 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 demographic variables on the right-hand side. 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.

The results are in columns 6 and 12 of Table 3. We estimate the inverse probability weights with the full set of demographic characteristics from Figure 3. We also remove observations with less than 1% probability. The results are rather close to the baseline estimates, and actually slightly bigger when it comes to wartime service.[33]

To further test the robustness of this message, we make full use of our set of observables. The intuition behind this sensitivity analysis is in the spirit of Altonji et al (2005) and the extension by Oster (2014), but applied to IPW regressions when there are unobservables in the sample selection equation. Specifically, we run 326 IPW regressions, with probability weights in each of them computed by regressing (within each Census) the dummy for living with father on every possible combination of four or more out of a set of eight demographic characteristics, with and without the interactions between the variables.[34] Figure A8 in the Appendix shows that this set of demographics performs well in predicting cohabitation: the pseudo-R-squared from these probit regressions is typically above 0.3, and increases as more covariates are added, reaching just under 0.5.

The resulting IV/2SLS coefficients for wartime service are plotted in Figure 4, according to

[33]Table A5 shows that the results are similar if we use different thresholds – the patter is that as we increase the threshold, the estimates get closer to baseline.

[34]To reduce the computational burden, we replace the set of race dummies with a dummy for white race, and revert back to age and age squared, instead of the set of the fully saturated set of age dummies.

the number of predictors included.[35] The first thing to note is that the vast majority of the estimated coefficients lie above our baseline estimates from Table 3, Columns 1-5. This confirms the robustness of the intuition conveyed in Figure 3.

[FIGURE 4 HERE]

At this point one might still be concerned, however, with the possibility of unobservable factors correlated with selection. To fix ideas, consider a selection equation such that an individual i enters the sample if $X_{1i} + X_{2i} + z > 0$, where X_1 and X_2 are observable factors (say, "youth" and "single," for concreteness) and z is an unobservable (say, "father affinity"). The true (population) coefficient of interest is a function of these selection variables, $\beta(X_1, X_2, z)$, and since we are mostly concerned with our estimate β_{IV} being an overestimate of the population parameter, the problematic case would be one in which the latter is increasing in the three selection variables.

Note that the IPW estimates will place a bigger weight on sample observations with a small realization of $X_1 + X_2$; the selection equation then suggests that such observations are likely to also have a large realization of z. If the true β is strongly increasing in z, relative to the effect of the observable variables, the IPW estimates might be biased upwards. In this case the fact that the estimated coefficients in Figure 4 lie above the baseline may not be so reassuring.

To address this issue, we first note that concerns with unobservable variables would have to contend with the negative impact of fathers' war service on the sons' propensity for peacetime service. It would seem unusual, after all, that "father affinity" would lead to higher-than-usual propensity for wartime service, yet lower-than-usual propensity in peacetime.

Even leaving aside the peacetime result, however, the concern does not seem to be borne out by the data. In fact, in Figure A10 in the Appendix, we plot the likelihood of father and son sharing the same veteran status against the predicted probability of living with one's father, based on our full set of observables. We see a rather flat pattern in which, in any case, individuals who are in our sample in spite of having a low predicted probability of cohabitation would not have an especially large likelihood of following on the footsteps of their fathers' service.[36] This would work against having an upward-biased IPW estimate.

More broadly, a second feature of Figure 4 is of special importance in refuting that concern: the fact that the coefficients do not vary systematically as more observable predictors are included. To see why, suppose we first produce an IPW estimate taking only X_1 into account. In that case,

[35] Figure 4 excludes observations with less than 1% predicted probability. The corresponding plot not excluding any observations is shown in Figure A9 in the Appendix.

[36] In fact, the selection equation does not necessarily imply that IPW estimates will place a greater weight on observations with large realizations of z: that depends on the covariance between observable and unobservable variables. If z is positively correlated with X_1 and/or X_2, it is easy to show that the realization of z could be on average smaller for observations that do not end up in the sample, matching Figure A10.

the observations that will receive a large weight will be those with a small realization of X_1, which again could correspond (depending on the covariance structure) to a large realization of $X_2 + z$. The IPW estimate would then be biased upwards if the combined effect of X_2 and z on the true β were large relative to that of X_1. But if that were true, we would expect that introducing X_2 into the IPW estimation would have a large impact on the estimate. Even if the effect of X_2 is relatively small, we would still expect a large impact of this introduction whenever the correlation between X_2 and z is large. In other words, an unobservable selection component would only overturn our central message when it not only has a large positive effect on the true parameter, but also is uncorrelated with the observable variable we add. It seems implausible that all the observable variables we have happen to be uncorrelated with "father affinity."

In sum, after taking into account the observable differences between sample and the rest of the population, and doing so in a few different ways, we still end up with an estimated effect that is relatively close to our baseline, and essentially never below it. The baseline estimates are thus unlikely to overestimate substantially the treatment effect in the broader population.

4.4 War-by-War Results

4.4.1 From World War I to Vietnam

Our baseline results represent an average effect over all four major wars. As shown in Figure A9 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.[37] This means that the baseline results implicitly give more weight to those 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.

The results of the exercise are in Table 5. The first two columns show that World War I had

[37] 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.

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.[38] Columns 3-4 show the effect is similar between World War I and Korea, though sample sizes are even smaller and the estimates less precise. (All estimates in the table are significant at the 1% level.)

[TABLE 5 HERE]

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. In short, exposing fathers to World War II or Korea service increases the likelihood of a son being a Vietnam veteran by about 5 or 6 percentage points.

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 two lines of the table display the benchmarked results. They state the percentage of the total number of veterans involved in a war, within our sample, that we could ascribe to the previous generation's war, based on our point estimate and on the lower bound of the 95% confidence interval. Specifically, taking the example of Columns 1-2, we do a back-of-the-envelope calculation multiplying the estimated coefficient (or lower bound) 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 15% of the latter can be estimated to have served because their fathers had previously been induced to serve in World War I, and we can rule out an effect smaller than 10% at the 95% confidence level.

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 the fact that the effects of World War II and Korea, taken together, correspond to no less than about 30% of Vietnam veteran sons. 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,

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

in the absence of the boost coming from the "Greatest Generation" wars.[39]

This latter point underscores a note of caution in interpreting the aggregate numbers. First of all, we compute them assuming that all of the intergenerational transmission takes place within the family, leaving aside the social effects or oblique transmission that our empirical strategy also encompasses.[40] In addition, the very existence of an important intergenerational transmission mechanism can give rise to general equilibrium and political economy effects, as hinted in the previous paragraph, 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. 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.

These numbers also hint at the links between wars across generations, which we explore in greater depth in the Online Appendix, by jointly considering the intergenerational transmission of war service and its interaction with demographic trends in the US male population over the 20th century. The analysis confirms the key message that a war can have a substantial impact on the availability of volunteers for future wars. It also underscores that this impact depends crucially on the size of the war – for instance, the massive scale of World War II gave rise to a large number of potential volunteers – but also on the distance between wars in time: a war that occurs about thirty years after another war (that is, the space of a generation) would be ideally positioned to enjoy a boost in the number of individuals volunteering.

4.4.2 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.

[39] 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." Note that such boost does not manifest itself necessarily in the number of individuals going to war, which is largely driven by an assessment of military needs. Rather, it could get reflected in, say, the quality of recruits that the military is willing to accept, or the scope of draft exemptions allowed. Either way, it seems likely that these would affect the sustainability of a given war effort.

[40] Additionally, 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. We leave these for future research.

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 A1. 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.

The results, in the last two columns in Table 5, display a statistically significant estimated intergenerational transmission (at the 1% level).[41] Its size, however, became even smaller relative to previous wars, of the order of 0.014.[42] Interestingly, we can nevertheless see 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 not far from what we find for the four major 20th century wars. This suggests that the intergenerational transmission mechanism remained important as ever in understanding wartime service in the all-volunteer era.

5 What Drives the Intergenerational Transmission of War?

We have presented evidence of a causal effect of war service experience over the next generation's propensity to serve in future wars. In contrast, we have found a negative impact of one generation's war service on the next generation's inclination to serve in peacetime. These results naturally beg the question of what drives the patterns of intergenerational transmission of those wartime experiences.

To fix ideas, consider how a father's experience might impact his sons' behavior. It could do so in at least three distinct ways. First, war service could affect 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 change preferences or beliefs in a process of *cultural transmission*. Second, it could affect the *material incentives* facing the sons in their decision to serve, by changing the set of economic opportunities available to them. Third, it could affect some characteristics of the sons 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

[41] The first-stage relationship remains as strong in this context as what we estimate in Table 1 for the main sample (available upon request).

[42] We could also consider the effect of Vietnam veteran fathers in the wars in Afghanistan and Iraq. However, the time elapsed between the conflicts means that there is a relatively small number of these cases. Moreover, among those that do exist, the distribution of father years of birth is quite asymmetric around the peak year of 1947 – quite naturally, a lot more fathers of Afghanistan/Iraq veterans were born after 1947 than before. This undermines the variation we rely on for our empirical strategy. In any case, the estimate (available upon request) turns out to be insignificant, but due to these sample issues we consider this result to be relatively unreliable.

explaining our results.

5.1 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 individual beliefs, values, and attitudes across generations. Specifically, standard sources of survey data on the latter typically do not contain information on father's year of birth, which is required to implement our empirical strategy.[43]

To make progress, we must connect the transmission of cultural traits across generations to 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 link between authoritative parenting and intergenerational transmission.[44] 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 map onto parental strategies, and specifically the prevalence of certain styles of parenting.

5.1.1 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 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. It will also allow us to consider explicitly the social dimension of intergenerational transmission, by studying how 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

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

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

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 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 oblique transmission.

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):

$$-C(\tau^i) + \left(P^i(\tau^i;q^i)u^i(x^i) + (1 - P^i(\tau^i;q^i))u^i(x^{-i})\right), \tag{5}$$

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 (5) 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.[45]

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 within the family, but also from interacting with others outside of it. 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:

$$P^i(\tau^i, q^i) = \tau^i + (1 - \tau^i)q^i, \tag{6}$$

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 transmission of war service from father to son 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 within the family to be particularly strong in an environment where service could well be a community-level tradition. 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 within-family component to be less important in those

[45] 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.

environments, thereby weakening our estimate of intergenerational transmission.[46]

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.

5.1.2 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).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

[46] As discussed in Bisin and Verdier (2001), there could be transmission technologies that would give rise to complementarities instead – for instance, if direct socialization happens only if there is homogeneity between the family and "role models" drawn from the population.

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.[47]

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 Census 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:

$$\begin{aligned} WarService_{icst} = \beta_{1C} * FatherWarService_{icst} + \\ + \beta_{2C} * FatherWarService_{icst} \times WarVeterans_s + \beta_{3C} * WarVeterans_s + \\ + f(FatherYOB_{icst})\theta + X'_{icst}\gamma + \tilde{\varepsilon}_{icst}, \end{aligned} \tag{7}$$

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 (7) 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.[48] We see that the first-stage relationship is stronger in counties in which war service is more prevalent (Column 1), a pattern that holds unaltered upon controlling for service outside of wartime or for a set

[47] 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.

[48] 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

of county-level demographic variables and their interactions with father's year-of-birth distance (Columns 2-3). 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.[49]

5.2 Material Incentives

Let us now turn to a second possible mechanism: that the experience of war service might induce decisions that change the economic environment facing the subsequent generation, affecting the set of economic opportunities available to the latter. This could impact the appeal of war service relative to the alternatives. In short, it could affect material incentives.

[49]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."').

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 8 considers whether there is a causal impact of father's war service on sons' education.[50] We find a clear positive effect, always significant at the 1% level. Columns 1-2 show the results measuring educational achievement by total years of education, while Columns 3-4 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 3). 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 4) – a strong effect compared to a baseline mean of 36%.

[TABLE 8 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 – as well as with the evidence linking human capital accumulation across generations (Currie and Moretti 2003; Holmlund, Lindahl, and Plug 2011).[51] 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 5-6 show evidence of a causal effect of fathers' wartime service on their own educational achievement.[52]

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 the next generation, which 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.

[50] 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.

[51] 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.

[52] 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.

This helps us make sense of the negative impact of war service on the next generation's peacetime military service: the comparative economic appeal of a military career is actually weaker, in light of the better opportunities in the broader labor market. 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. In normal times, this is more than compensated by better outside options in the labor market. It takes war to trump that counteracting force, and tip the balance in favor of service.

5.3 Demography

We now 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 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 delays 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 rule out that any story predicated on the age or relative age of fathers or sons is a meaningful explanation for our results: Table 1 shows 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, leaves the estimates 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.

It is also unclear how such demographic mechanisms would, in and of themselves, account for the specific evidence on cultural transmission. Still, it is interesting to speculate how they might interact with the latter: for instance, if war veterans are more likely to marry women who are sympathetic to service, this could further strengthen the transmission of those traits through parenting styles.

In sum, demographic mechanisms could be part of the explanation – though they would not naturally explain the full gamut of our results – and especially so in interaction with some of the channels we have discussed.

6 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 a generation to serve, because of distance to peak service age at the time of the war in question, increases the likelihood that the next generation 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. In fact, that the boost to wartime service exists alongside a negative impact on peacetime service by the next generation already indicates that other forces, such as opportunity cost, affect the intergenerational transmission. The possibility of complementary mechanisms, in contrast, remains an open question for future research.

Our findings also open other promising avenues for future research. First, there is the natural question of whether they extend to other contexts – different countries, civil wars, etc. On a separate vein, there is the question of what specific cultural 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. It would also be interesting to further unpack the purely intra-family (vertical) and the social (oblique) components of this intergenerational transmission, as well as the relationship between them. Finally, more remains to be learned about how individual decisions might 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.

References

Altonji, Joseph G., Todd E. Elder, and Christopher R. Taber (2005). "Selection on Observed and Unobserved Variables: Assessing the Effectiveness of Catholic Schools." *Journal of*

Political Economy 113(1): 151-184.

Angrist, Joshua D. (1990). "Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records." *American Economic Review* 80(3): 313-336.

Angrist, Joshua D. (1993). "The Effect of Veterans Benefits on Education and Earnings." *Industrial and Labor Relations Review* 46(4): 637-652.

Angrist, Joshua D., Guido W. Imbens, and Donald B. Rubin (1996). "Identification of Causal Effects Using Instrumental Variables." *Journal of the American Statistical Association* 91(434): 444-455.

Angrist, Joshua, and Alan B. Krueger (1992). "The Effect of Age at School Entry on Educational Attainment: An Application of Instrumental Variables with Moments from Two Samples." *Journal of the American Statistical Association* 87(418): 328-336.

Angrist, Joshua, and Alan B. Krueger (1994). "Why do World War II Veterans Earn More Than Nonveterans?" *Journal of Labor Economics* 12(1): 74-97.

Baumrind, Diana (1968). "Authoritarian vs Authoritative Parental Control." *Adolescence* 3: 255-272.

Besley, Timothy and Marta Reynal-Querol (2014). "The Legacy of Historical Conflict: Evidence from Africa." *American Political Science Review* 108(2): 319-336.

Bingley, Paul, Petter Lundborg, and Stéphanie Vincent Lyk-Jensen (2015). "Estimating Family Spillovers: Evidence from a Draft Lottery." Danish National Centre for Social Research (unpublished).

Bisin, Alberto and Thierry Verdier (2001). "The Economics of Cultural Transmission and the Dynamics of Preferences." *Journal of Economic Theory* 97(2): 298-319.

Blattman, Christopher and Jeannie Annan (2010). "The Consequences of Child Soldiering." *Review of Economics and Statistics* 92(4): 882-898.

Blattman, Christopher and Edward Miguel (2010). "Civil Wars." *Journal of Economic Literature* 48(1): 3-57.

Bound, John and Sarah Turner (2002). "Going to War and Going to College: Did World War II and the G.I. Bill Increase Educational Attainment for Returning Veterans?" *Journal of Labor Economics* 20(4): 784-815.

Brown, F. Peter (2014). "Last Vietnam War Draftee Retires After 42 Years In Army." *Western Journalism*, Nov. 10.

Card, David and Thomas Lemieux (2001). "Going to College to Avoid the Draft: The Unintended Legacy of the Vietnam War." *American Economic Review* 91(2): 97-102.

Carlson, Elwood and Joel Andress (2009). "Military Service by Twentieth-Century Generations of American Men." *Armed Forces and Society* 35(2): 385-400.

Collier, Paul (2003). *Breaking the Conflict Trap: Civil War and Development Policy.* World Bank Publications.

Currie, Janet and Enrico Moretti (2003). "Mother's Education and the Intergenerational Transmission of Human Capital: Evidence from College Openings." *Quarterly Journal of Economics* 118(4): 1495-1532.

Dahl, Gordon B., Andreas Ravndal Kostol, and Magne Mogstad (2014). "Family Welfare Cultures." *Quarterly Journal of Economics* 129(4): 1711-1752.

Dal Bó, Ernesto, Pedro Dal Bó, and Jason Snyder (2009). "Political Dynasties." *Review of Economic Studies* 76(1): 115-142.

Dobkin, Carlos and Reza Shabani (2009). "The Health Effects of Military Service: Evidence from the Vietnam Draft." *Economic Inquiry* 47(1): 69-80.

Doepke, Matthias and Fabrizio Zilibotti (2014). "Parenting with Style: Altruism and Paternalism in Intergenerational Preference Transmission." Northwestern University (unpublished).

Elder, Glen H. (1986). "Military Times and Turning Points in Men's Lives." *Developmental Psychology* 22(2): 233-245.

Erikson, Robert and John H. Goldthorpe (2002). "Intergenerational Inequality: A Sociological Perspective." *Journal of Economic Perspectives* 16(3): 31-44.

Erikson, Robert S. and Laura Stoker (2011). "Caught in the Draft: The Effects of Vietnam Draft Lottery Status on Political Attitudes." *American Political Science Review* 105(2):221-237.

Faris, John H. (1981). "The All-Volunteer Force: Recruitment from Military Families." *Armed Forces and Society* 7(4): 545-559.

Giuliano, Paola and Antonio Spilimbergo (2014). "Growing up in a Recession." *Review of Economic Studies* 81(2): 787-817.

Goodman, Sarena and Adam Isen (2015). "Un-Fortunate Sons: Effects of the Vietnam Draft Lottery on the Next Generation's Labor Market." US Dept of Treasury.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales (2006). "Does Culture Affect Economic Outcomes?" *Journal of Economic Perspectives*, 20 (2006), 23-48.

Holm, Jeanne (1993). *Women in the Military: An Unfinished Revolution.* Presidio Press.

Holmlund, Helena, Mikael Lindahl, and Erik Plug (2011). "The Causal Effect of Parents' Schooling on Children's Schooling: A Comparison of Estimation Methods." *Journal of Economic Literature* 49(3): 615-651.

Humphreys, Macartan and Jeremy M. Weinstein (2008). "Who Fights? The Determinants of Participation in Civil War." *American Journal of Political Science* 52(2): 436-455.

Jackson, Matthew O. and Massimo Morelli (2011). "The Reasons for Wars: An Updated Survey." In: Chris Coyne (Ed.), *Handbook on the Political Economy of War.* Elgar Publishing.

Jennings, M. Kent and Gregory P. Markus (1977). "The Effect of Military Service on Political Attitudes: A Panel Study." *American Political Science Review* 71(1): 131-147.

Kang, Joseph D.Y. and Joseph L. Schafer (2007). "Demystifying Double Robustness: A Comparison of Alternative Strategies for Estimating a Population Mean from Incomplete Data." *Statistical Science* 22(4): 523-539.

Kasinsky, Renée G. (1976). *Refugees from Militarism: Draft-Age Americans in Canada.* Transaction Publishers.

Kleykamp, Meredith A. (2006). "College, Jobs, or the Military? Enlistment During a Time of War." *Social Science Quarterly* 87(2): 272-290.

Larsen, Matthew F., TJ McCarthy, Jeremy Moulton, Marianne Page, and Ankur Patel (2014). "War and Marriage: Assortative Mating and the World War II G.I. Bill." Tulane University (unpublished).

Lillard, Dean R. and Jacob Fahringer (2014). "Does Military Service Shorten Lives? The Effect of Compulsory Military Service on Smoking Prevalence." Ohio State University (unpublished).

Maccoby, Eleanor E. and John A. Martin (1983). "Socialization in the Context of the Family: Parent-Child Interaction." In E. Hetherington (ed.) *Handbook of Child Psychology, Vol. 4*, Wiley, p. 1-103.

Malmendier, Ulrike and Stefan Nagel (2011). "Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?" *Quarterly Journal of Economics* 126(1): 373-416.

Maoz, Zeev (2004). "Statesmen, Popular Wisdom, and Empirical Realities in the Study of Conflict and War: Extending the 'Predictors of War in History and in the State of the World Message'." In: Paul F. Diehl (Ed.), *The Scourge of War: New Extensions on an Old Problem.* University of Michigan Press.

Mayseless, Ofra, Miri Scharf, and Michal Sholt (2003). "From Authoritative Parenting Practices to an Authoritarian Context: Exploring the Person-Environment Fit." *Journal of Research on Adolescence* 13(4): 427-456.

Oster, Emily F. (2013). "Unobservable Selection and Coefficient Stability: Theory and Validation." NBER WP 19054.

Pew Research Center (2011). "War and Sacrifice in the Post-9/11 Era: The Military-Civilian Gap." October 5, 2011, available at: http://www.pewsocialtrends.org/files/2011/10/veterans-report.pdf

Rotsker, Bernard (2006). *I Want You! The Evolution of the All-Volunteer Force*. RAND Corporation.

Simon, Rita J. and Mohamed Alaa Abdel-Moneim (2011). *A Handbook of Military Conscription and Composition the World Over.* Lexington Books.

Singer, J. David and Melvin Small (1974). "Foreign Policy Indicators: Predictors of War in History and in the State of the World Message." *Policy Sciences* 5: 271-296.

Solon, Gary (1999). "Intergenerational Mobility in the Labor Market." In: Orley C. Ashenfelter and David Card (eds.) *Handbook of Labor Economics, Vol. 3A*, North Holland.

Solon, Gary, Steven J. Haider, and Jeffrey M. Wooldridge (2015). "What Are We Weighting For?" *Journal of Human Resources* 50(2): 301-316.

Speck, Kimberly and David S. Riggs (2013). "Differences in the Parenting Styles of Military and Civilian Mothers." Third MFRI International Research Symposium on Military and Veteran Families.

Stander, Valerie A. and Lex L. Merrill (2000). "The Relationship of Parental Military Background to the Demographic Characteristics of 11,195 Navy Recruits." Naval Health Research Center, Report 00-14.

Steinberg, Laurence Steinberg, Susie D. Lamborn, Sanford M. Dornbusch, and Nancy Darling (1992). "Impact of Parenting Practices on Adolescent Achievement: Authoritative Parenting, School Involvement, and Encouragement to Succeed." *Child Development* 63(5): 1266-1281.

Takiff, Michael (2003). *Brave Men, Gentle Heroes: American Fathers and Sons in World War II and Vietnam.* William Morrow.

Tanielian, Terri and Lisa H. Jaycox (Eds.) (2008). *Invisible Wounds of War: Psychological and Cognitive Injuries, Their Consequences, and Services to Assist Recovery, Volumes 1-2.* RAND Corporation.

Vandenbroucke, Guillaume (2014). "Fertility and Wars: The Case of World War I in France." *American Economic Journal: Macroeconomics* 6(2): 108-136.

Van Evera, Stephen (2013). *Causes of War: Power and the Roots of Conflict.* Cornell University Press.

Vazquez, John A. (Ed.) (2000). *What Do We Know about War?* Rowman & Littlefield Publishers.

A Online Appendix A: Aggregate Effects

The quantitative benchmarks we present in the main text 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. Here we exploit those links in greater depth, by jointly considering intergenerational transmission and its interaction with demographic trends, in order to paint a more complete picture of the aggregate dynamics of war service 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.[53] (This is shown in Figure A11 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 A12) – 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.[54]

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 A13. 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 by far the largest "wave" of sons of veterans. The figure also highlights that the length of an individual war matters for the shape of the wave that follows: the sons of Vietnam veterans are spread out over a wider range of years.

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:

$$N_t^w = \beta^w * \sum_{\tau=20}^{22} S_{t-\tau} + 0.75\beta^w * \sum_{\tau=23}^{25} S_{t-\tau}, \tag{8}$$

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 3 and 4.[55] We focus attention on the individuals between ages 20 and

[53] 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.

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

[55] Specifically, the numbers for World War I, World War II, Korea, and Vietnam come from Table 3 (Column 2), Table 3 (Column 6), Table 3 (Column 8), and Table 4 (Column 6), respectively.

25, because estimating the intergenerational transmission separately by age groups shows that the effect is significant only for individuals within that range (Appendix Table A8). 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 A14 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.

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.