Economic Consequences of War Widowhood:

A Life-Cycle Perspective [*]

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Abstract

One of the most devastating consequences of violent conflict is the loss of a spouse, but we know surprisingly little about the economic effects of war widowhood. In this paper, we study the effect of war widowhood on socio-demographic outcomes, labor market trajectories and intergenerational spillovers, using life course and census data from West-Germany after World War II. While widowhood significantly increased employment in the immediate post war period, by 1971 war widows were *less* likely to work and more likely to be out of the labor force than non-widows. War widows therefore shouldered a "double burden" of employment and child-care during their 20s and 30s, but became less likely to participate in the labor market once their children left the maternal household. We discuss the mechanisms and institutional context that contributed to this counterintuitive life-cycle pattern.

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1   Introduction

One of the most devastating consequences of violent conflict is the loss of a spouse, a fate that particularly affects women. While their global count remains unknown, the high prevalence of widowhood is well-documented for some conflicts. For instance, the First World War resulted in an estimated 3-4 million war widows (Bette, 2015), the Rwandan genocide created 500,000 widows (United Nations, 2001), and mid-2000s estimates for Afghanistan suggested one to two million war widows (IRB, 2007; Chandran, 2020). Despite these staggering numbers, we lack evidence on the economic impact of war widowhood (Brück and Schindler, 2009). While earlier work has examined the economic consequences of losing one's spouse (e.g. Burkhauser et al., 2005; Fadlon and Nielsen, 2021), war widows face unique challenges due to the sudden and violent nature of their spouse's death, their often young age, and the added difficulties of balancing work and childcare in post-conflict societies.

To our knowledge, this paper provides the first empirical evidence on the economic effects of war widowhood. We focus on post-war West Germany, where an estimated 1.0-1.2 million war widows lived in 1950 (Niehuss, 2002). Our analysis centers on labor market effects over the life cycle, also examining possible spillover effects to the next generation. Specifically, we test the hypothesis that war widows increased their labor supply due to the adverse income shock of losing their husbands (Boehnke and Gay, 2022). Using survey data on social attitudes, we also study if war widows transmitted more progressive norms about women's employment to their children, thereby increasing female labor force participation in the next generation (Fernandez et al., 2004; Gay, 2023).

Using both census and life course data, we first show that war widowhood significantly increased employment in the immediate postwar period. In 1950, war widows born between 1906 and 1914 were 13.8 percentage points (or 67%) more likely to be in market work than otherwise comparable women who did not lose their husbands in the war. However, this positive employment effect gradually diminishes, and by 1971 war widows were *less* likely to work than their peers. This finding is surprising because the vast majority of war widows remained unmarried, and unmarried women had much higher labor force participation rates at the time. In our sample, war widows were 48.6 percentage points (or 73%) less likely to be married in 1971 than women who did not lose their husbands in the war. At the same time, they were 2.5 times more likely to rely on welfare as their primary source of income.

Considering intergenerational spillovers, the children of war widows left school and entered the labor force earlier than their peers, presumably due to financial hardship in the postwar period. This educational penalty is particularly pronounced for boys, who lose about 0.8 years of education if their mother was widowed during World War II (WWII). However, we find no long-run effects of widowhood on children's employment rates, either for daughters or for sons. Overall, war widowhood leaves an indelible mark on the employment trajectories and socioeconomic outcomes of the war widos themselves, but did not have lasting effects on female labor force participation in Germany.

We derive these results by comparing war widows with other women who were comparable in socioeconomic characteristics before the war but did not lose their husbands. Importantly, our primary data source includes a dedicated question on war widow status, allowing us to directly identify widows. Our empirical analysis controls for a large number of prewar characteristics, including education, wealth, employment, and occupational status. A causal interpretation of our findings requires that widowhood status is uncorrelated with unobserved prewar characteristics that still affect economic outcomes in postwar West Germany.

We provide several pieces of evidence to support our empirical strategy. First, the normalized differences in prewar characteristics between widows and non-widows are small. Second, adding control variables leaves our estimates unchanged while improving model fit, making it unlikely that omitted variables drive our results. Third, our extensive set of prewar characteristics explains only about 1% of the variation in widowhood status. Fourth, we show in auxiliary data that war widowhood is not correlated with spousal or parental characteristics. These findings are consistent with the fact that women in our sample were mostly married to men whose cohorts were largely or entirely conscripted for the war, minimizing selection into war service and ultimately death (Braun and Stuhler, 2023).

How can the counterintuitive life-cycle pattern in the labor supply of war widows be explained? We argue that this pattern is primarily a result of the interplay between societal attitudes that stigmatized women's work, insufficient child care facilities, and evolving institutional incentives. Initially, financial support available to war widows was limited, forcing many widows to take up employment in the immediate postwar period. At the same time, public discourse framed the employment of war widows solely as a response to the loss of the male breadwinner, not as formative in shaping one's identity (Schnädelbach, 2007). The employment of war widows often carried a social stigma, as widows were accused of neglecting their child-

care responsibilities. Consequently, many war widows grappled with the challenges of balancing work, household duties, and a lack of available childcare, which led to physical and emotional exhaustion (Niehuss, 2002). Likely as a consequence, war widows in our data did not hold more progressive views regarding the compatibility of family and employment, and did not place a higher value on work than non-widows.

The challenging experience of reconciling work and child care met with negative incentives to work from the welfare system. Part of the pension paid to war widows was means-tested and reduced in proportion to earned income, creating disincentives to work. These disincentives became more important in later life for two reasons: first, Germany's economic boom in the 1950s and 1960s allowed higher pension payments, and second, women aged 45 and over were eligible for the means-tested pension even if they were able to work. Consistent with this interpretation, employment was particularly low among less educated widows, for whom the compensation payments replaced a higher share of their labor earnings.

Although our institutional framework is specific to post-war Germany, some of its aspects are transferable to other post-conflict economies. In particular, compensation for war widows and childcare facilities will often be inadequate in war-ridden societies, while more generous policies become viable after reconstruction and economic recovery. Our results suggest that such back-loaded compensation schemes generate "perverse" life-cycle profiles that force widows to shoulder the double burden of employment and child-care while young, but then incentivize their withdrawal from the labor market later on.

Literature. Our paper is the first to provide representative individual-level evidence on the effects of war widowhood on labor market and other socioeconomic outcomes.[1] However, our findings relate to several strands of the literature. First, we contribute to a growing literature that examines the effects of war mobilization and military fatalities on female labor force participation (FLFP).[2] Much of this literature has focused on the case of WWII in the United

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[1] Salisbury (2017) studies the remarriage rates of Union Army widows whose husbands died in the US Civil War. As in the German context, Civil War widows were entitled to a pension if their husbands died in the line of duty, but they lost their pension if they remarried. Only about half of eligible widows took up the Union Army pension (Salisbury, 2023). Salisbury (2017) shows that receiving a pension caused the remarriage rate to fall by 25 percent. Nevertheless, most US Union Army widows eventually married again. Although not the main focus of our analysis, we find much lower remarriage rates in the German context, with the large majority of widows remaining unmarried.

[2] A related literature explores the effect of war-related scarcity of men on the marriage market and fertility (Bethmann and Kvasnicka, 2013; Brainerd, 2017; Kesternich et al., 2020; Battistin et al., 2022). While these papers use cohort and/or regional variation in sex ratio imbalances, we examine the effect of losing a spouse at the individual level, showing that widows have low remarriage probabilities and remain with fewer children.

States, suggesting that the mobilization of men drew women into the labor force during the war (Acemoglu et al., 2004; Goldin and Olivetti, 2013). However, there is still debate about the mechanisms by which the war affected participation and how permanent this effect was. Recent evidence suggests that wartime employment lowered educational attainment (Jaworski, 2014) and increased fertility among some cohorts (Doepke et al., 2015). Rose (2018) argues that the wartime surge in FLFP was primarily due to the exigencies of war production rather than mobilization, and had limited effects on participation after the war.

While this literature emphasizes shifts in aggregate labor demand, war may also affect women's labor supply. Boehnke and Gay (2022) note that that the negative income shock of losing one's spouse may have led war widows to enter the labor force. Using variation across French regions, they show that higher military deaths in WWI increased FLFP, and estimate that widowed women accounted for nearly half of this effect. However, they cannot provide definitive evidence for this mechanism, as their main sources lack information on women's labor force participation by marital status at the individual or regional level.[3] We contribute to this literature by tracking the labor market careers of war widows at the individual level, rather than exploiting regional variations in mobilization or military deaths. We show that, at least in the German context, the employment effect of losing a husband differs markedly over the life cycle and, while large in the immediate post-war period, did not increase FLFP in later decades.

Second, our paper also relates to studies that analyze the *intergenerational* persistence of war shocks on female labor supply.[4] Noting that the wives of men whose mothers worked are more likely to work themselves, Fernandez et al. (2004) use variation in WWII mobilization rates and FLFP across US states to document intergenerational spillovers in women's labor supply. Gay (2023) finds that women born in French counties that experienced higher military death rates in World War I were more likely to work decades after the war ended. While these studies capture intergenerational spillovers from both supply- and demand-induced shifts in FLFP, we isolate the former. We find no evidence that the high employment rates of war widows after the war changed FLFP or attitudes about women's roles in the labor force in the next generation. We

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[3]Similarly, Fenske et al. (2022) argue that the 1918 influenza pandemic in India temporarily increased female labor force participation because widows were drawn into the labor force. Again, the paper cannot track the labor force participation of individual widows. Instead, they show that across regions, higher influenza mortality is associated with a higher share of widows, and the share of widows mediates part of the effect of influenza mortality on female labor force participation.

[4]Relatedly, Dupraz and Ferrara (2023) studies the effect of losing a father in the US Civil War on the labor market careers of their sons. They show that sons whose fathers died in the war had lower occupational earnings than sons whose fathers returned from the war. The authors do not examine the effect on the spouses of fallen soldiers, as we do.

hypothesize that the challenges of working without access to institutionalized child care and the stigma associated with working single mothers prevented war widowhood from having a lasting effect on women's participation.

Third, we contribute to a small literature that examines the impact of spousal death on spouses' labor supply. In the only recent study, Fadlon and Nielsen (2021) show for Denmark that after their husband's death the surviving widows strongly increase their labor force participation.[5] However, while the surviving spouses in Fadlon and Nielsen (2021) are, on average, 63 years old and thus at the end of their working careers, the war widows in our analysis lose their spouses in their late 20s or 30s and have to balance child-care and employment in a post-conflict economy where widowhood is particularly prevalent (Buvinic et al., 2013; The Loomba Foundation, 2016).

2   Background

In the 1950s, an estimated 1.0 to 1.2 million war widows lived in West Germany (Niehuss, 2002).[6] They thus accounted for up to 7% of women born in 1927 or earlier (who were 18 or older in 1945). In our data from 1971, the proportion of war widows is highest among women born in 1910-19. As many as 15.8% of women born in 1912 report being war widows in our sample.

The fate of the war-disabled and the survivors of soldiers killed in the war was a pressing social problem in the postwar period. After the surrender of Nazi Germany, the Allied occupying powers initially dismantled the old war disability system to reduce the influence of the German military class and the cost of social services (Diehl, 1985). Despite some expansion of benefits, care for German war victims remained limited until the founding of the Federal Republic in 1949 and varied widely by region. Yet, the welfare of war-disabled soldiers and the families of fallen soldiers ranked high on the social agenda of the new West German government. Already in October 1950, the *Bundesversorgungsgesetz* (BVG) reorganized and improved welfare for the German *Kriegsopfer* (victims of World War II).

The BVG was modelled on the old war disability system of the Weimar Republic (Diehl,

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[5]The authors see the unavailability of comprehensive household-level data on health and labor market outcomes as the main reason why we do not have credible estimates of how households respond to severe health events, despite the importance of the survivor's pension as a social insurance program to protect households from fatal health shocks.

[6]These estimates are based mainly on the number of women who received war widows' pensions. Because some war widows were not eligible for pension payments, for example, because they had remarried, these estimates likely represent a lower bound.

1985). It aimed at the physical and vocational rehabilitation of victims and their families, and paid social assistance to those for whom rehabilitation was not, or only partially, possible. However, the difficult financial situation at the time limited the generosity of the compensation payments. War widows initially received an unconditional basic pension (*Grundrente*) of DM 40 as well as a means-tested compensatory pension (*Ausgleichsrente*) of up to DM 50. The latter was generally not paid to women under age 50 unless they had children to care for or were unable to work. The maximum pension of 90 DM represented roughly 30% of the average gross labor income at the time.[7] Children under age 18 received additional orphan's pensions.

The level of pension payments were successively increased in the 1950s and 1960s, as Germany spectacular growth rates led to higher government revenues. By 1960, the maximum amount of basic and compensatory pensions totaled DM 250, which corresponded to about 49% of average labor income. In addition, the conditions for receiving a compensatory pension were lowered and the age limit decreased from 50 to 45 years.[8] The second revision of the BVG in 1964 introduced additional "damage compensation" (*Schadensausgleich*) for widows whose income (including pension payments) was less than half of what the husband would have earned, further increasing the maximum pension to almost 60% of average labor income in 1970. Appendix A shows how maximum pension payments increased since the mid-1950s, both in real terms and as a share of gross labor income.

Three features of the BVG are worth highlighting in our context. First, the compensatory pension was reduced in proportion to the earned income above a basic allowance. This reduced the incentive to take up formal employment (Niehuss, 2002). Importantly, the means-tested part of the widow's pension gained importance from the mid-1950s onwards, and especially with the introduction of the likewise means-tested damage compensation (see Appendix A). Second, women were not entitled to a compensatory pension until later in life, unless they were unable to work or had to care for children. Third, war widows lost all pension rights related to the deceased husband if they remarried, receiving only a one-time severance payment upon re-marriage.[9] War widows were therefore often accused of living in marriage-like cohabitation, so-called *Onkelehen*, in order not to lose their pension entitlements (Schnädelbach, 2007).

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[7]The women in our sample, however, could receive only up to 70 DM because they were under age 50 in 1950 (unless they were unable to work).

[8]In addition, younger widows who did not have children to support were now eligible for a compensatory pension if they had lost "only" half (not all) of their earnings capacity.

[9]The severance pay was initially set at 1200 DM and later increased to first 36 times and later 50 times the basic monthly pension.

War widows frequently faced a dilemma in their labor market participation (Niehuss, 2002; Schnädelbach, 2007). Women's employment was still controversial in the early 1950s, and the employment of war widows was considered particularly undesirable due to concerns they would neglect the care of their children. On the other hand, gainful employment was often essential for financial reasons due to the initially low compensation payments under the BVG. High unemployment rates, the influx of displaced Germans from Eastern Europe, and the re-integration of returning soldiers made it initially difficult for war widows to find work. As unemployment fell in the 1950s, to just 1.3% in 1960, women were increasingly sought after on the labor market and their share in the labor force increased from 28.6% in 1950 to 32.5% in 1961 (Müller et al., 1983).

Policy makers promoted the employment of war widows in the *Schwerbeschädigtengesetz* (Severely Disabled Persons Act) of 1953. The law provided that war widows were to be given preference over other applicants in the civil service. In addition, the private and public sectors were able to meet their mandated hiring quotas for the severely disabled by hiring two war widows for every job reserved for the severely disabled.[10] At the same time, additional funds were made available for the retraining of war widows. However, these only benefited those widows who had not already found work as semi-skilled or unskilled workers–and thus often came too late (Niehuss, 2002).

3 Data and Empirical Strategy

3.1 Data

The Microcensus. The main data source for our analysis is the German Microcensus 1971 (MZU71) (Mikrozensus-Zusatzerhebung, 1971). This representative and mandatory survey provides detailed information on changes in the social and occupational structure of the German population between 1939 and 1971, covering one percent of the West German population aged 15 and over with German citizenship (see Tegtmeyer, 1979, for an overview). In total, the survey contains information on 456,000 individuals.

The survey asked respondents in 1971 about their employment status, occupation, and sectoral affiliation in 1939, 1950, 1960, and 1971. It also recorded whether respondents owned a

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[10]However, this was only possible if the hiring of war widows did not hamper the integration of disabled people into the labor market.

house in 1939 and 1971, their education level, their main source of income, and their net monthly income in March 1971. The latter is recorded in seven categories and is missing for farmers (but not for dependent farm workers). The survey also contains the place of residence in 1939, which allows us to identify persons displaced from Eastern Europe in the wake of WWII and refugees from the GDR. Information on other household members is available through an household identifier.

Importantly for our purpose, the survey asked all women who were married, divorced, or widowed at the time of the survey whether they are or were war widows. War widows are all women who were married at the time of WWII and whose husbands were killed in the war, died in captivity, or were missing in action. They constitute our treatment group. We focus on women born in 1906-14 who were between 25 and 65 years old during our observation period of labor market outcomes (1939-1971). Women of the same birth cohort who were married by 1945 but did not lose their spouses in the war form our control group. We drop women who were never married as they were not 'at risk' of losing their spouse in the war. For the same reason, we drop married women from the control group if they married after 1945.

Unfortunately, the MZU71 does not contain the respondents' entire marriage history, but only the year of the last marriage for those married in 1971. This poses two problems for the definition of our control group. First, we cannot exclude the possibility that divorced or widowed women in our control group married after rather than before 1945. We consider this to be a minor problem because we focus on women who were well above the average age at first marriage of 25.4 years in 1945. Second, married women who married after 1945, whom we exclude from the analysis, could in principle have been in an earlier marriage during the war. Again, we consider this a minor problem, as only xxx% of the married women in our control group married after 1945 (and most of them shortly after the war). Nevertheless, in robustness checks, we drop widowed and divorced women from the control group and keep all married women in the control group. More importantly, we confirm that our results hold in a second survey, the German Life History Study, where we observe women's complete marriage histories (see below).

Table 1 contains means and standard deviations of the available pre-war covariates for war widows (Columns (1) and (2)) and non-war widows (Columns (3) and (4)) in our baseline sample. Column (5) reports t-statistics for testing the null of no differences in covariate means between the two groups. However, given the relatively large sample size of 32,704, even small differences between sample means will be statistically significant. We thus also report normalized

differences in Column (6), which scale differences in means by the square root of the sum of the variances. Normalized differences indicate whether average covariate values differ substantially between treatment and control and help assessing overlap in the covariate distribution (Imbens and Wooldridge, 2009).

Table 1 shows that women in the treatment and control group were very similar in their pre-war characteristics. All normalized differences in pre-war covariates between the two groups are smaller than 0.10, except for two: age and displacement status. War widows tend to be slightly older than non-war widows; as earlier cohorts were more likely to be married before the war started, they were more likely to lose their husband. War widows were also somewhat more likely to be displaced than non-war widows, presumably because of the elevated death rates of soldiers from Germany's former eastern territories (Overmans, 1999). However, even these pre-war differences in observables are sufficiently small so that they can be (robustly) controlled for in standard linear regressions.[11]

German Life History Study. For complementary analysis, we use the GHS (see Mayer 2007), a retrospective survey of eight West German birth cohorts born 1919-1971. We draw on the second wave (GHS-2, conducted in 1985-88), which surveyed 1,412 respondents born in 1919-21, of whom 853 are women.

While the sample size is much smaller, the GHS provides two key advantages compared to the 1971 Microcensus. First, the GHS contains detailed retrospective information on respondents over their life-cycle, including their education, employment, family and demographic information, residential history, and their entire occupational history.[12] We can thus study war widows' labor market outcomes over the entire life cycle until retirement and not 'only' for specific years as in the MZU71. Second, the GHS-2 provides information on the respondents' current spouse and all previous spouses, such that we can infer each woman's marriage status during the war and use that information to define a suitable control group. Specifically, we define a woman to be a war widow if her husband died in or before 1945 ($N = 95$) and the control group as women from the same 1919-21 birth cohorts who also married in or before 1945, but did not loose their husband during the war ($N = 428$).

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[11]Results of linear regressions tend to be sensitive to the specification if normalized differences exceed 0.25 in absolute value (Imbens and Wooldridge, 2009).

[12]We use the Standard International Occupational Scale (Treiman, 1977) to study occupational success, with occupational prestige scores ranging from 18 (unskilled laborers) to 78 (medical professionals, professors). The GHS recorded time spent in school, vocational training, and further education, and we measure educational attainment by total years of education.

Table 1: Pre-war differences of later war widows and nonwar widows

	War widows (N=5,329)		Non-war widows (N=27,375)		Differences	
	mean (1)	st.d. (2)	mean (3)	st.d. (4)	t-stat (5)	norm. (6)
Socio-demographic characteristics:						
Birth year	1910.331	2.479	1909.889	2.556	11.349	0.176
House ownership (0/1)	0.488	0.500	0.466	0.499	2.877	0.044
Years of education	8.944	1.580	9.046	1.655	4.039	0.063
Years of schooling	8.356	1.065	8.408	1.148	3.044	0.048
Siblings	4.807	2.731	4.674	2.724	3.182	0.049
Place of residence:						
Eastern Europe (incl. eastern territories)	0.208	0.406	0.155	0.362	9.293	0.137
Soviet occupation zone	0.047	0.212	0.052	0.221	1.319	0.020
Employment and occupational status (%):						
Employed	0.419	0.494	0.388	0.487	4.233	0.065
Market employment	0.331	0.471	0.289	0.453	6.064	0.092
Self employed[1]	0.025	0.157	0.022	0.146	1.421	0.021
Farmer[2]	0.023	0.151	0.012	0.111	5.894	0.081
Civil servant	0.003	0.056	0.003	0.058	0.240	0.004
White collar	0.082	0.274	0.091	0.288	2.119	0.033
Blue collar	0.197	0.398	0.159	0.366	6.651	0.099
Apprentices	0.001	0.031	0.001	0.030	0.135	0.002
Helping family	0.088	0.284	0.099	0.298	2.364	0.037
In education	0.002	0.044	0.003	0.052	1.007	0.016
Unemployed	0.001	0.024	0.001	0.026	0.227	0.004
Out of the labor force	0.578	0.494	0.609	0.488	4.110	0.063
Sector of employment (%):						
Agriculture	0.121	0.326	0.099	0.298	2.364	0.037
Industry	0.143	0.350	0.123	0.329	3.918	0.059
Construction	0.002	0.039	0.003	0.054	1.689	0.028
Trade	0.073	0.261	0.079	0.270	1.427	0.022
Finance	0.013	0.114	0.016	0.127	1.714	0.027
Services	0.066	0.249	0.065	0.247	0.302	0.005
Not employed or unknown	0.581	0.493	0.614	0.487	4.353	0.066

Notes: Sample means and standard deviations of pre-war covariates for war widows and non-war widows. All data refer to 1939 except for education, schooling, and the number of siblings, which are measured in 1971. [1] Self-employed outside agriculture. [2] Farmer with own land. The t-statistic in Column (5) refers to a two-sided mean difference t-test. Normalized differences in Column (6) are calculated as $|\bar{X}_1 - \bar{X}_0|/\sqrt{(S_1)^2 + (S_0)^2}$ where $\bar{X}_1$ and $\bar{X}_0$ are the sample means and $(S_1)^2$ and $(S_0)^2$ the sample variances of war widows and non-war widows, respectively.

3.2 Empirical Strategy

To examine whether widows and non-widows, who were comparable before the war, fared differently after the war, we run OLS regression models of the following type:

$$y_{it} = \alpha + \boldsymbol{x}_{i,39}\boldsymbol{\beta} + \delta D_i + \epsilon_{it}, \qquad (1)$$

where y_{it} is a particular post-war outcome of person i at time t (such as income or number of children), D_i is a dummy variable indicating whether a woman is a war widow, $\boldsymbol{x}_{i,39}$ is a (row) vector of prewar control variables, and ϵ_{it} is an error term. Our main parameter, δ, measures the "widowhood effect," that is, the average difference in a given outcome between wartime widows and otherwise (as of 1939) comparable women as defined above.[13] We report robust standard errors throughout, clustered at selection districts (*Auswahlbezirke*). We also compare the least squares estimate to estimates based on inverse probability weighting (IPW).[14]

Identification requires that conditional on $\boldsymbol{x}_{i,39}$, widowhood status D_i is uncorrelated with unobserved pre-war differences that still affect economic outcomes in post-war West Germany. This assumption would be violated if women with better unobserved labor market skills married high-skilled men who, in turn, were less likely to die in World War II. Non-widows then had better labor market prospects on average, which would explain why we do not find any lasting impact of widowhood on employment. Several pieces of evidence speak against this concern.

First, women in our sample were predominantly married to men whose cohorts were largely or entirely conscripted for the war. This is important because differences in conscription rates, rather than unequal survival rates, are the main explanation for why mortality rates differed between birth cohorts (Overmans, 1999).[15] Importantly, our results also apply to younger women born 1919-21, almost all of whom were married to men born between 1910 and 1925. Their cohorts were fully conscripted during the war, so that selection into military service played a negligible role.[16] At the same time, these cohorts were far too young for middle and higher office ranks, which required higher education and might have promised better survival prospects.[17] Consistent with these arguments, Braun and Stuhler (2023) show for a sample of war survivors born 1919-21 that socio-economic background does not predict war service or injuries.

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[13]The large number of widows in West Germany may have affected the economy as a whole and thus also the control group. Our parameter of interest does not capture such general equilibrium effects. However, from a policy perspective, the relative economic fortunes of war widows are of primary interest, not the situation that would have prevailed in the absence of war and fallen husbands.

[14]IPW does not specify a model of the outcome of interest but instead focuses on modelling widowhood, the treatment (see, e.g., Imbens and Wooldridge, 2009, for details). IPW estimates the average treatment effect on the treated by comparing *weighted* outcome means of widows and non-widows. Intuitively, IPW places more weight on observations in the control group that–given their prewar covariates–had a high probability of losing their husbands.

[15]While skilled individuals in the armaments industry were initially spared military service (Müller, 2016), more than 80 percent of German military deaths occurred after 1942 (Overmans, 1999), when the increasing deterioration of the German war situation led to a mobilization of all reserves for the Wehrmacht.

[16]About 88% of the spouses were born between 1910 and 1925. We therefore exploit whether a husband dies conditional on serving, not whether a husband was serving in the first place.

[17]In contrast to previous wars, however, there was a high casualty rate among officers in WWII (Müller, 2016), especially on the Eastern Front. By April 1942, almost a quarter of the officer corps had fallen.

Second, Table 1 document only small difference between widows and non-widows in their prewar status for our main sample based on the Microcensus, as discussed in the previous subsection. Moreover, Appendix Table B1 documents that our extensive set of prewar characteristics explains little more than 1% of the variation in widowhood status. Third, Appendix Table B2 shows for the GHS auxiliary sample that war widowhood is not only uncorrelated with women's own pre-war characteristics (birth year, number of siblings and years of schooling),[18] but also with their spouse's characteristics (birth year and schooling), and their parent's characteristics (years of schooling of the father and mother, occupational score of the father).

Fourth, we show below that adding the extensive set of prewar covariates listed in Table 1 has virtually no effect on our estimates of the widowhood effect. At the time, the covariates generally help in explaining variation in the outcome variables. It is thus unlikely that omitted variables drive our results.

4 Socio-economic effects of WWII widowhood

4.1 Socio-demographic outcomes

We begin with studying the effect of war widowhood on socio-demographic outcomes in the 1971 Microcensus, a quarter century after the war's end. The women in our sample were 56-65 years old at this time. Table 2 reports our results. Column (2) presents OLS estimates of the widowhood effect from a parsimonious OLS model, controlling only for age. Column (3) adds control variables for house ownership in 1939, indicators for expellees from Eastern Europe and refugees from the GDR, the number of siblings, and a full set of education dummies. The full-fledged specification in Column (4) additionally accounts for the sectoral and occupation affiliation in 1939. Finally, Column (5) presents estimates based on IPW using the full set of controls to predict treatment status. In what follows, we generally discuss the point estimates from the IPW model but note that the estimates hardly change across specifications (2) to (5).[19] This lends credibility to the unconfoundness assumption we invoke for identification.

Panel A. of Table 2 shows that widowhood during the war had long-term demographic

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[18]Widowhood does correlate with the marriage year, as women who marry earlier are exposed for a longer time to the risk of loosing their spouse than women who married only towards the end of the war (i.e., the marriage year determines the length of exposure to the risk of spousal death). We therefore control for marriage year in all regressions in the GHS. While we cannot control for the marriage year in the MZU71, we restricted that sample to earlier cohorts of women born in 1906-14, who were above the age of first marriage before the war started.

[19]Appendix Figure xxx shows the estimated propensity of war widowhood for war widows and non-widows, confirming considerable overlap between the two groups.

Table 2: The impact of WWII widowhood on demography, labor market status, income, and wealth in 1971

	Control mean (1)	OLS (2)	OLS (3)	OLS (4)	IPW (5)
A. Demographic outcomes:					
Married (0/1)	0.664	-0.488	-0.489	-0.485	-0.486
		(0.007)	(0.007)	(0.007)	(0.007)
Living alone (0/1)	0.246	0.335	0.338	0.335	0.335
		(0.008)	(0.008)	(0.008)	(0.008)
Number of children	2.130	-0.253	-0.287	-0.278	-0.282
		(0.025)	(0.025)	(0.024)	(0.024)
B. Labor market status:					
Market employment	0.162	-0.018	-0.014	-0.018	-0.019
		(0.006)	(0.006)	(0.006)	(0.006)
Helping family member	0.061	-0.033	-0.033	-0.031	-0.031
		(0.003)	(0.003)	(0.003)	(0.003)
Out of the labor force	0.776	0.052	0.048	0.050	0.051
		(0.006)	(0.006)	(0.006)	(0.006)
C. Income:					
Personal income	241.018	243.295	250.198	248.311	246.919
(unconditional)		(5.768)	(5.459)	(5.435)	(5.423)
Personal income	676.935	118.043	98.186	104.075	105.252
(conditional on market work)		(18.325)	(16.083)	(15.690)	(15.882)
Welfare support as main income	0.297	0.454	0.451	0.448	0.449
		(0.007)	(0.007)	(0.007)	(0.007)
Household income, square-root scale[a]	765.377	-64.782	-50.846	-45.984	-46.630
		(6.881)	(6.587)	(6.515)	(6.485)
D. Wealth:					
House ownership	0.406	-0.096	-0.095	-0.095	-0.095
		(0.008)	(0.007)	(0.007)	(0.007)
Sociodemographic controls		no	yes	yes	yes
Labor market controls		no	no	yes	yes

Notes: Means of the control group and estimates for war widowhood. Each estimate stems from a separate regression. Estimates in Columns (2)-(4) are by OLS, estimates in Column (5) by IPW. Regressions include the following pre-war covariates: (2) full set of age dummies, (2) = (1) plus an indicator for house ownership in 1939, indicators for expellees from Eastern Europe and refugees from GDR, number of siblings, full set of education dummies, (3)/(4) = (2) plus seven categories for the sector of employment in 1939 (agriculture, industry, construction, trade/transport, finance, public and private services, unknown) and seven categories for the occupational or employment status in 1939 (self-employed, farmer, civil servant, white-collar worker, blue-collar worker, helping family member, out of the labor force including apprentices, in education, and unemployed). Robust standard errors clustered at selection districts (*Auswahlbezirke*) are reported in parentheses. [a] The square-root scale divides total household income by the square root of household size.

consequences. By 1971, war widows have a 48.6 percentage points (pp) lower probability of being married (from a baseline probability of 66.4%, see Column (1)). As the war led to an acute shortage of men, finding a new partner often proved elusive. War widows were also more

than twice as likely to live alone.[20] Not surprisingly, war widows also had fewer kids. Yet, the difference is not large, since many of women in our baseline sample had children before 1945.

The top panels of Figure 1 illustrate the demographic consequences of war widowhood over the lifecycle, based on the GHS. The estimates are based on a pooled OLS regression in which we interact a full set of age indicators with an indicator for war widows (and the year of their marriage, to account for the observation that women who married early were at greater risk of loosing their husband during the war). Figure 1a shows that war widows and the control group married at similar rates until the onset of the war, but the former were 80 pp less likely to be married by the end of the war. This gap then shrinks as some widows remarry in their late 20s or 30s, but stabilizes at around 40 pp when they reach their late 30s. The gap starts shrinking again in their late 50s, when widowhood becomes more common also in the control group. Figure 1b illustrates that war widows had a similar number of children until the later years of the war, but fewer children after the war ended.

A comparison of Table 2 and Figure 1 is informative about how those effects vary with women's age: the cohorts covered by the GHS (born 1919-21) were widowed at a younger age than those covered by the 1971 Microcensus (born around 1910, see Table 1). Consequently, they were more likely to remarry by age 60, but experienced a more significant decrease in their total number of children.
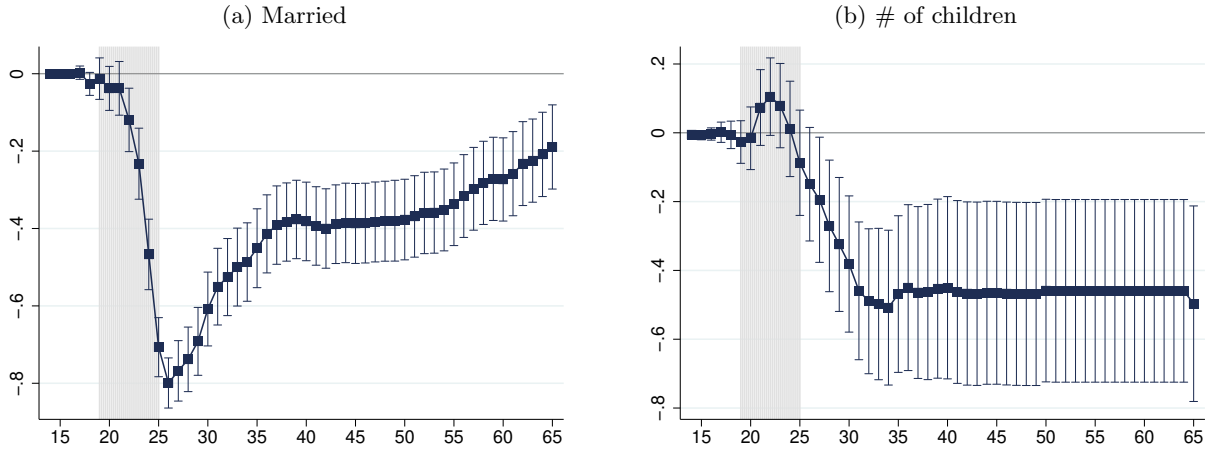
4.2 Labor market outcomes

Panel B. of Table 2 shows that in the MZU71, war widows were *less* likely to be employed in 1971, having a 1.9 pp lower probability to be in market employment, a 3.1 pp lower probability to be a helping family member, and thus a 5.1 pp higher probability to be out of the labor force than non-widows.[21] This finding is surprising, as war widows remained in their great majority unmarried, and unmarried women had considerably higher participation rates at the time. Moreover, previous work shows that across regions, the absence of men during or after wars tends to increase female labor supply although the persistence of the increase is debated (e.g. Acemoglu et al., 2004; Rose, 2018; Boehnke and Gay, 2022).

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[20]We find little evidence for the widely-hold belief that war widows often lived in marriage-like cohabitations without marrying their partner. Although war widows were twice as likely as nonwidows to live with a nonfamily member in the same household (e.g., a partner), the overall probability was still low, at about 2% (not shown).
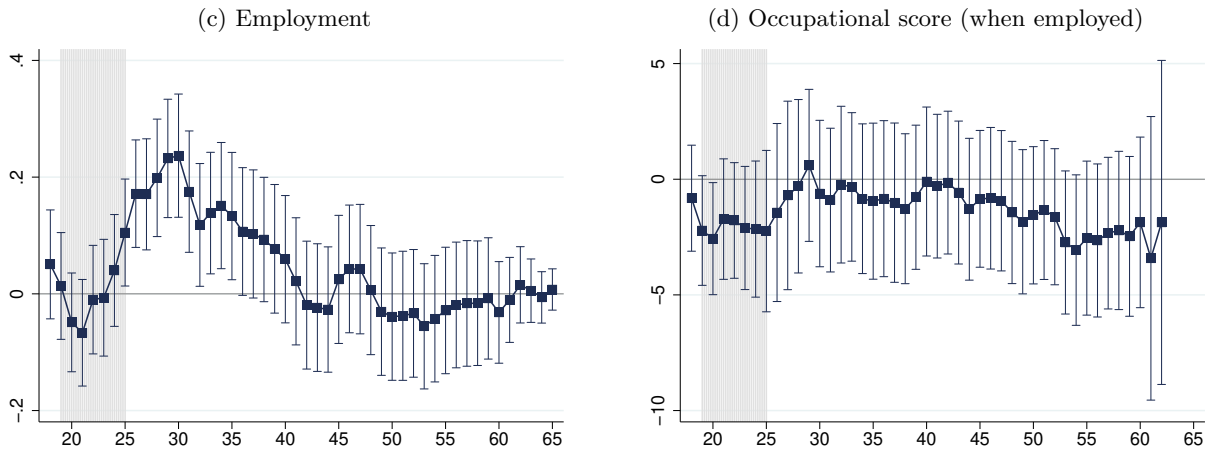
[21]Helping family members assist in a business managed by a family member as a self-employed person without receiving a contractually agreed wage or salary for this work. Market employment includes all other employed persons other than working family members.

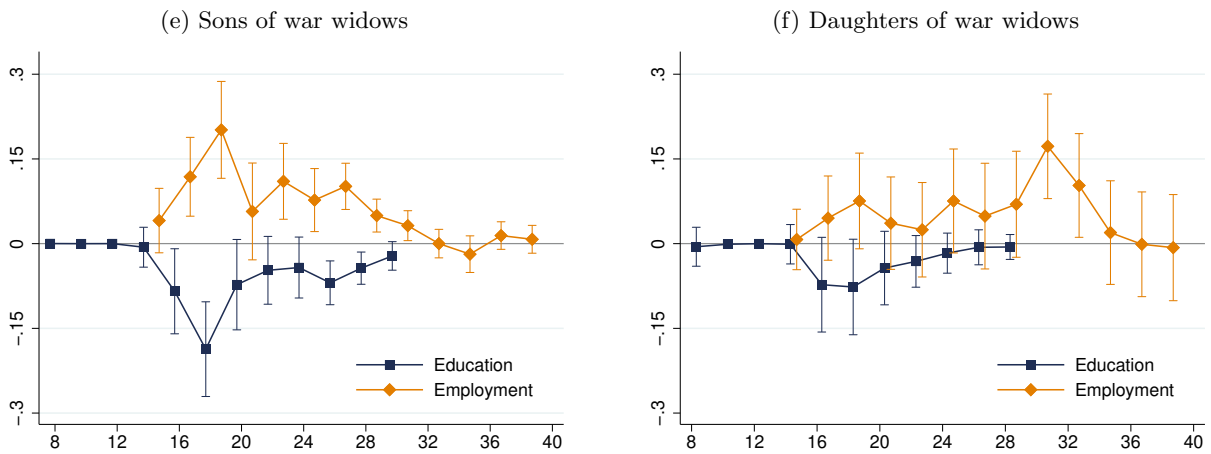Figure 1: Life-cycle effects of war widowhood (GHS)

Socio-demographic characteristics

(a) Married

(b) # of children

Employment and career outcomes

(c) Employment

(d) Occupational score (when employed)

Intergenerational spillovers

(e) Sons of war widows

(f) Daughters of war widows

Notes: GHS, estimated effect of war widowhood over the life cycle. Estimates are from a pooled OLS regression, interacting indicators for war widows (panels a-d) or their children (panels e-f) and birth year with a full set of age indicators. Panels a-d also control for the year of marriage. Point estimates are marked by a dot. The vertical bands indicate the 95% confidence interval of each estimate. The shaded area indicates the duration of WWII.

To better understand these patterns, Table 3 reports the effect of war widowhood on employment, occupation, and sectoral affiliation in 1950, 1960, and 1971. We focus on IPW estimates from our full-fledged model with the full set of controls. In addition, Figure 1 provides auxiliary evidence from the GHS, which has a smaller sample size but detailed information on labor market outcomes over the entire lifecycle.

Panel A of Table 3 shows that war widowhood significantly increased market work in 1950, shortly after the war. This initial effect is substantial: war widows were 13.8 pp more likely to perform market work in 1950 than non-widows with similar pre-war characteristics (from a baseline probability of 20.5%). However, this difference halved to 5.8 pp by 1960, and by 1971 war widows were less likely to work in the market. Thus, while war widows did take up market work as a result of their husband's death, this initial gain had no lasting positive effect on their labor force participation, quite to the contrary.

This negative long-term effect on labor force participation is reinforced by the fact that, in all years, war widows were only half as likely as non-widows to work as helping family members. Most of the helping family members supported their husband on the family farm. After their husband's death, many war widows had to give up the family business, although some continued as farmers (see below). Combined with the negative effects on market employment, war widows were 5.1 percentage points less likely to be active in 1971.

Table B3 in the Appendix shows similar life-cycle patterns for alternative samples of MZU1971 that either consider younger cohorts or vary the definition of the control group. Moreover, Appendix C shows that highly educated women were much more likely to enter market employment after the death of their spouse in WWII than low-educated women. For them, a modest positive employment effect persists into old age. This differential effect is consistent with earlier findings for the US, according to which mobilization during World War II increased female labor supply only among women with high levels of education (Goldin 2013).

Figure 1b also confirms the lifecycle patterns for the GHS, showing a large increase in employment among war widows in the years after the war (relative to non-widows), but similar or lower employment rates by the time the widows reached their mid-40s and up to retirement. Their entries in retirement were very similar, with most women retiring around age 60 and less than 10% of all women remaining employed at age 62. The GHS also contains detailed information on the occupational trajectories of each women, allowing us to compute occupational prestige scores. Figure 1d shows that despite their higher employment rates at early age, war widows

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reported a similar average occupational status than non-widows, although these estimates are not very precise.

Table 3: The impact of war widowhood on labour market outcomes in 1950-1971

	1950		1960		1971	
	Control mean (1)	IPW (2)	Control Mean (3)	IPW (4)	Control mean (5)	IPW (6)
A. Labor market status:						
Market employment	0.205	0.138	0.238	0.058	0.162	-0.019
		(0.007)		(0.007)		(0.006)
Helping family	0.089	-0.045	0.084	-0.044	0.061	-0.031
		(0.003)		(0.003)		(0.003)
Unemployed	0.004	0.000	0.000	0.000	0.001	-0.001
		(0.001)		(0.001)		(0.000)
Out of the labor force	0.703	-0.093	0.677	-0.003	0.776	0.051
		(0.007)		(0.007)		(0.006)
B. Occupational status (conditional on market work):						
Self employed	0.135	-0.023	0.128	-0.013	0.132	-0.012
		(0.007)		(0.008)		(0.012)
Farmer	0.055	0.017	0.045	0.017	0.039	0.014
		(0.006)		(0.006)		(0.008)
Civil servant	0.009	0.003	0.010	0.010	0.010	0.017
		(0.003)		(0.003)		(0.005)
White collar	0.249	0.012	0.265	0.022	0.302	0.031
		(0.010)		(0.011)		(0.016)
Blue collar	0.552	-0.013	0.551	-0.036	0.517	-0.050
		(0.011)		(0.011)		(0.016)
C. Sector of employment (conditional on market work):						
Primary	0.127	0.026	0.077	0.020	0.052	0.010
		(0.008)		(0.007)		(0.008)
Secondary	0.394	-0.013	0.391	-0.023	0.340	-0.028
		(0.012)		(0.013)		(0.018)
Tertiary	0.474	-0.011	0.531	0.004	0.605	0.016
		(0.012)		(0.013)		(0.019)

Notes: Means of the control group and IPW estimates for war widowhood. Each estimate stems from a separate regression. Regression include as controls a full set of age dummies, an indicator for house ownership in 1939, indicators for expellees from Eastern Europe and refugees from GDR, the number of siblings, a full set of education dummies, indicators for the sector of employment in 1939 (agriculture, industry, construction, trade/transport, finance, public and private services, unknown) and the occupational or employment status in 1939 (self-employed, farmer, civil servant, white-collar worker, blue-collar worker, helping family member, out of the labor force including apprentices, in education, and unemployed). Robust standard errors clustered at selection districts (*Auswahlbezirke*) are reported in parentheses.

Panel B. of Table 3 shows evidence on the occupational status from our larger main sample. Conditional on market work, war widows were less likely to work as blue-collar workers. The differences between widows and non-widows were small in 1950 but increased over time. By

1971, war widows were 5.0 pp less likely to be blue-collar workers (relative to a control mean of 51.7%). Instead, war widows were overrepresented in white-collar occupations, probably in part because firms were allowed to hire them for jobs reserved by law for the severely disabled. They were also more than two and a half times as likely to be employed as civil servants as comparable non-widows (albeit from a low baseline of only 1.0%). This is likely the result of policies that favored war widows over other applicants for civil service employment. War widows were also overrepresented among farmers, as some of them continued the family farm. These differences in occupational affiliation are reflected in the sector of work (Panel C. of Table 3), as war widows were slightly over-represented in the primary and tertiary sector.

Panel C. of Table 2 summarizes the income situation of war widows. Overall, the personal net income of war widows was about twice that of nonwidows. This higher income is largely due to higher support by the state: war widows were 2.5 times more likely than nonwidows to report welfare support (*Unterstützung*) as their main income source (relative to a baseline probability of 29.7%).[22] If we focus only on women in market work, war widows have only about DM 105 more than nonwidows (relative to a baseline of 677 DM). This is considerably less than the unconditional basic pension of DM 198 paid to war widows at the time. Panel C. also shows that household income, measured at the square root equivalence scale, is about 6% lower for war widows than for non-widows.[23]

Finally, Panel D. reports the effect of war widowhood on the probability of house ownership in 1971 as a proxy for wealth. We find that war widowhood reduced house ownership rates by 9.5 pp, a decline of 23.4% relative to baseline.

4.3 Mechanisms

We have shown that despite an initial rise in employment, war widows ended up with lower household income, lower wealth, and lower employment rates than non-widows. The life-cycle pattern of employment appears particularly concerning: war widows shouldered a double burden of employment and child-care during their 20s and 30s, when most had small children but not a partner to rely on. However, war widows became *less* likely to work than non-widows in their 40s and 50s, after their children left the household. We here discuss the institutional context

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[22]The MZU71 distinguishes between employment, pension, wealth; welfare support; unemployment benefits; parental or spousal support; and soldiers as main income sources.

[23]The square root equivalence scale divides total household income by the square root of household size (see Dudel et al., 2020, for a recent comparison of different equivalence scales). Recall that we do not observe younger household membeers born 1956 or later in our data.

that may have contributed to this peculiar life-cycle pattern.

To formalize ideas, we consider a simple static model of labor supply in which women choose consumption c, hours of work h, leisure time l and (in households with young children) child-care time t to maximize the utility function

$$\max_{l,t} U(c(l,t), l, q(t); \theta)$$

subject to a "disutility of work" θ (which we may assume to increase in age), a time constraint $l_0 = h + l + t$,[24] a constraint for child "quality" $q = q(t)$ with $q' > 0$ and $q'' < 0$, and the budget constraint

$$c = w(\underbrace{l_0 - l - t}_{=h}) + R_0$$

where w is the hourly wage rate and R_0 are other sources of household income (including labor income of the woman's spouse). The optimal choices of leisure, child-care and work time are defined by the slopes of the indifference curves and budget constraints.[25] Women with young children face a trade-off between time spent working and child-care, and are therefore less likely to work; in addition, working mothers might experience stigma θ that discourages work further.

While simple, the model can rationalize the peculiar life-cycle pattern of the effect of war widowhood on labor supply, as estimated in our data. Similarly as Boehnke and Gay (2022), we interpret the loss of a spouse as a negative income shock (i.e., a decrease in R_0). If leisure is assumed to be a normal good, such decrease in income decreases leisure, increases participation, and increases working hours conditional on participation (*income effect*).[26] Figure B2 a in the Appendix provides an illustration.

However, war widows also received a compensation, consisting of a basic pension as well as means-tested "compensatory" and "damage" pensions (see Section A). As these pensions offset only part of the decline in R_0 (household income decreases, as shown in Table 2), this would not

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[24]We do not model formal child-care here, as the sector was not well developed. Data from the 1962 Microcensus suggests that among children below 2 years, only 5% attended a nursery, although this share is higher for children of single parents (Niehuss, 2002). Among children aged 2-6, about one quarter attended a nursery. As the opening hours of nurseries did generally not match job hours, working mothers often had to rely on relatives to take care of their children.

[25]For example, the interior solution for hours worked is defined by $U_l/U_c = w$, implying that ceteris paribus, highly educated women earning a higher wage are more likely to work.

[26]This implication holds both for women with or without children as given the traditional gender norms at the time, the loss of a husband will generally represent a greater shock to a household's income than time spent on child-care.

yet explain why at older age, war widows were *less* likely to work than non-widows. However, as pensions were partially means-tested, they also decrease the effective take-home wage, which diminishes women's work incentives further (*substitution effect*).

Crucially, these compensatory pension payments increased substantially over time, outpacing the growth in labor income; by 1970, means-tested forms of compensation accounted for 72% of the total pension (see Appendix Figure A1). The budget curve of war widows therefore became increasingly flatter, greatly disincentivizing their participation in the labor force. The implied (negative) substitution effect can dominate the (positive) income effect from a reduction in total income, as illustrated in Appendix Figure B2 b.

The life-cycle pattern of compensation schemes therefore generated "perverse" incentives on war widows – their insufficient size in earlier years forced war widows to enter employment, even though widows with young children faced insufficient child care options and social stigma. Once their children grew older, war widows had more time for market employment, but the increasingly means-tested compensation scheme discouraged them from employment.

5 Intergenerational spillovers

We can also study the intergenerational spillovers of war widowhood, as the GHS also interviewed children born shortly before (cohorts 1929-31) or in (cohorts 1939-41) the war. We define the treatment group as those who report that their father (but not their mother) died during war deployment in WWII. As we do not observe direct information on war deployment, we define the control group as children in the same cohorts whose fathers were absent for at least one year during the war. When studying educational outcomes we can also include the respondent's siblings, as the GHS provides basic educational information for close family members.

We use this information to estimate a variant of equation (1),

$$y_{it} = \alpha + \boldsymbol{x}_{i,39}\boldsymbol{\beta} + \delta_m D_i + \delta_{gap} D_i 1(i = \text{female}) + \epsilon_{it}, \tag{2}$$

where D_i is a dummy variable indicating whether the father of individual i died in the war, δ_m measures the intergenerational spillover on the male children of war widows, and δ_{gap} the differential impact on daughters relative to sons, i.e., whether the effects differ by the gender of the child. The controls $\boldsymbol{x}_{i,39}$ include the mother's birth year and interactions between indicators of the child's birth year and gender.

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Table 4 reports our estimates. Column (1) shows that the sons of war widows had half a year less schooling, relative to a mean for the control group of 8.8 years. The decline is even more pronounced in tertiary schooling (university or vocational training), which is 30% lower in the treatment group, as shown in Column (2). Overall, educational attainment declines by one year (column (3)). In contrast, there is little decline in the educational attainment among the daughters of war widows; the estimated effect on the gender gap δ_{gap} is of opposite sign and nearly as large as the main effect δ_m in both Columns (1)-(3).

Table 4: Intergenerational spillovers on the children of war widows

	Schooling (1)	Tertiary schooling (2)	Schooling w/ tertiary (3)	Employment age 16-29 (4)	Employment age 30-39 (5)	Occupat. prestige (6)
Father's death	-0.478	-0.524	-1.005	1.337	0.080	-0.704
	(0.127)	(0.156)	(0.217)	(0.399)	(0.118)	(1.643)
Father's death x daughter	0.347	0.476	0.828	-0.451	0.260	-0.972
	(0.187)	(0.193)	(0.296)	(0.665)	(0.594)	(2.246)
Control mean	8.744	1.722	10.468	8.597	6.839	41.973
R2	0.046	0.118	0.086	0.172	0.529	0.080
N	1,722	1,718	1,718	615	615	615

Notes: Estimates of the effect of war widowhood on educational attainment or employment (in years) of their children. Each estimate stems from a separate OLS regression including the mother's birth year and interactions between indicators of the child's birth year and gender as control variables. GHS birth cohorts 1929-31 and 1939-41 (incl. siblings in Columns (1)-(3)). Robust standard errors clustered at the household level are reported in parentheses.

With less time spent in education, the children of war widows instead start employment at an earlier age. As shown in Column (4), the sons of war widows spent nearly 1.3 years less in employment during age 16-29 than comparable sons who did not loose their father during the war. To provide more details on this result, Figures 1e and 1f show separately by gender the impact of parental death on educational attainment and employment, illustrating that the decline in educational attainment is mirrored by increasing employment at early age.

Despite the lower schooling and tertiary training among male children, we find no intergenerational spillovers of parental death on their employment in later life (see Table 4, Column (5) and Figure 1e). A likely explanation are the favorable macroeconomic conditions and low unemployment that Germany experienced during the 1960s and early 1970s. More surprisingly, Column (6) shows that the sons of war widows achieved nearly as high occupational status as the children of non-widows.

Importantly, we also find no sustained spillover effects on the employment or occupational

success among the daughters of war widows. While they are more likely to be employed in their 20s, this gap disappears in the mid30s. As shown in Appendix section D, the children of war widows do not hold more progressive norms about women's work either, consistent with the actual labor supply decisions in our data. These findings contrast with previous work, as reviewed in our introduction, which highlighting persistent effects of WWII on female employment in the US and other countries.

6 Conclusion

Millions of women around the world have lost their husbands to violent conflict, but we still know little about the economic consequences of such losses for widows and their children. This paper examines impact of war widowhood on socio-demographic outcomes, labor market trajectories, attitudes and gender norms, and intergenerational spillovers in post-war West Germany, shedding the first light on the complex effects of losing one's spouse to violent conflict.

Our results show that war widowhood initially led to a significant increase in employment among affected women, driven by the adverse income shock of their husband's death and the limited financial support available at the time. Over the life cycle, however, this positive employment effect gradually diminished, and by 1971 war widows were less likely to work than their peers. We argue that this counterintuitive pattern can be attributed to social attitudes that stigmatized women's work, inadequate childcare facilities, and increasingly generous pensions that created disincentives to work.

While earlier work documents intergenerational spillovers of war shocks on female labor supply, we find no such spillovers in our setting. This contrast is likely due to differences in focus: While earlier work considered shifts in the *demand* for female labor, as caused by industrial or manpower mobilization, we studied how the war affected labor *supply* among those women who lost their husband. Evidently, gains in female labor force participation are less likely to persevere when caused by individual hardship rather than shifts in overall demand.

Our research underscores the importance of considering the interplay of economic, social, and institutional factors in understanding the long-term consequences of conflict-related widowhood. While the institutional framework is specific to post-war Germany, our findings highlight the challenges of balancing work and family responsibilities, and the importance of designing policies that do not discourage labor force participation later in life.

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Online Appendix

A   Compensation for war widows, 1951-1975

Figure A1 documents the evolution of the maximum attainable war widow's pension from 1951 to 1975. Panel A1 a shows the increase in maximum compensation since the mid-1950s, both when measured relative to gross labor income (black solid line) and when considering the real increase since 1951 (gray dashed line). Relative to labor income, compensation nearly doubled from about 30% in the early 1950s to between 50% and 60% after the second revision of the BVG in 1964.[27] At the same time, the maximum attainable war widow's pension increased fivefold in real terms between 1951 and 1970. The increase began in the second half of the 1950s. It continued relatively evenly after that, with a notable spike in 1964 when significant compensation of damage was introduced for widows whose income was less than half their deceased husband's expected income.

Figure A1 b shows how the three different types of compensation—non-means-tested basic pension, means-tested compensatory pension, and means-tested damage compensation—have contributed to the increase in the ratio of war widows' pensions to average gross labor income. As can be seen, the basic pension was relatively stable over time, fluctuating between 13% and 17% of average labor income. The increase in the war widow's pension was initially largely due to the fact that the compensatory pension payments outpaced the growth in labor income. Later, the introduction of damage compensation spurred the increase in the maximum war widow's pension. By 1970, means-tested forms of compensation accounted for 72% of the total pension.

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[27]The occasional declines are due to the fact that compensation payments were not increased in some years, while labor income generally rose rapidly during Germany's economic boom.

Figure A1 : Maximal compensation for war widows, 1951-1975

(a) Relative to gross labor income and real compensation index

(b) Composition of compensation (relative to gross labor income)
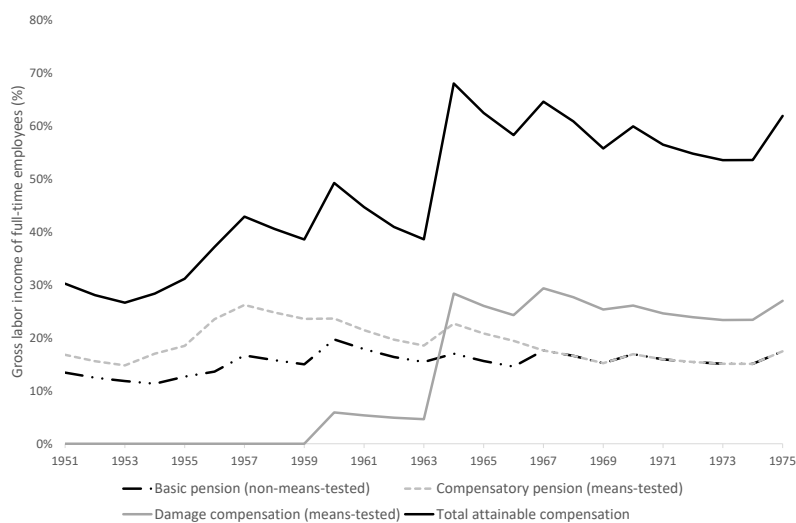
Notes: The figure shows the maximum compensation for war widows between 1951 and 1975. Panel (a) shows total compensation relative to the gross labor income of full-time workers (black solid line) and the real increase in maximum compensation since 1951 (gray dashed line; the 1951 value is normalized to 100). Panel (b) decomposes total compensation relative to gross labor income (black solid line) into the part due to basic pension (non-means-tested; black dashed-dotted line), compensatory pension (means-tested; gray dashed line), and damage compensation (means-tested; gray solid line). See the description in Section 2 and Appendix A for further details.
Source: Author's calculations based on the *Bundesversorgungsgesetz* (in its various versions). Data on average gross labor income are taken from Bundesamt für Justiz and BMJV (2020); the price index (standard of living of a 4-person household with medium income) is taken from Statistisches Bundesamt (2023).

B Additional tables and figures

Table B1: Predicting war widowhood status in the Microcensus 1971

	(1)	(2)	(3)	(4)
	Dependent variable: War widow (0/1)			
R2	0.005	0.009	0.011	0.012
Birth year	yes	yes	yes	yes
Socio-demographic characteristics	no	yes	yes	yes
Employment & occupational status in 1939	no	no	no	yes
Sector of employment in 1939	yes	yes	yes	yes

Notes: The table reports the R2 from regressions relating war widowhood status in the German Microcensus 1971 to an increasing number of covariates. Regressions include the following pre-war covariates: (1) full set of age dummies, (2) = (1) plus an indicator for house ownership in 1939, indicators for expellees from Eastern Europe and refugees from GDR, number of siblings, full set of education dummies, (3) = (2) plus eight categories for the occupational or employment status in 1939 (self-employed, farmer, civil servant, white-collar worker, blue-collar worker, apprentice, helping family member, out of the labor force, in education, and unemployed). (4) = (3) plus six categories for the sector of employment in 1939 (agriculture, industry, construction, trade/transport, finance, public and private services).

Table B2: Exogeneity of war widowhood in GHS

|	mean (std. dev.)	Dependent variable: War widow (0/1)			
		(1)	(2)	(3)	(4)
Birth year	1920.06	0.008	-0.006	0.012	0.018
	(0.81)	(0.021)	(0.021)	(0.021)	(0.024)
# siblings	2.80	-0.006	-0.010*	-0.007	-0.002
	(2.49)	(0.007)	(0.006)	(0.006)	(0.007)
Years of schooling	8.64	-0.011	-0.018	-0.018	-0.019
	(1.26)	(0.013)	(0.014)	(0.014)	(0.016)
Spouse's schooling (years)	9.27		-0.004	-0.001	0.000
	(1.93)		(0.003)	(0.004)	(0.004)
Spouse's birth year	1914.58		0.004	0.007	0.008
	(4.07)		(0.011)	(0.010)	(0.012)
Marriage year	1941.55			-0.032***	-0.038***
	(1.94)			(0.008)	(0.010)
Father's schooling (years)	8.62				-0.013
	(1.95)				(0.009)
Mother's schooling	8.24				-0.014
	(0.94)				(0.013)
Father's occupational score	40.82				0.002
	(11.05)				(0.002)
R2		0.002	0.013	0.043	0.056
N	523	521	411	411	340

Notes: The table reports coefficient estimates from a regression of war widowhood status on a set of pre-war individual, spousal and parental characteristics for women born 1919-21. Robust standard errors in parentheses.

Table B3: Robustness: The impact of war widowhood on market work in 1950-1971 across samples

	1950		1960		1971	
	Control mean (1)	IPW (2)	Control Mean (3)	IPW (4)	Control mean (5)	IPW (6)
A. Market employment:						
Baseline sample	0.205	0.138	0.238	0.058	0.162	-0.019
		(0.007)		(0.007)		(0.006)
Cohorts born 1915-21	0.227	0.149	0.293	0.048	0.334	-0.024
		(0.011)		(0.011)		(0.010)
Cohorts born 1919-21	0.241	0.127	0.311	0.013	0.366	-0.044
		(0.016)		(0.016)		(0.016)
Control group: Married women[1]	0.156	0.176	0.174	0.102	0.114	0.028
(married 1945 or earlier)		(0.007)		(0.007)		(0.006)
Control group: Ever married women[2]	0.225	0.125	0.248	0.044	0.166	-0.017
		(0.007)		(0.007)		(0.005)
B. Out of the labor force:						
Baseline sample	0.703	-0.093	0.677	-0.003	0.776	0.051
		(0.007)		(0.007)		(0.006)
Cohort: Born 1915-21	0.696	-0.127	0.631	-0.018	0.604	0.048
		(0.011)		(0.011)		(0.011)
Cohort: Born 1919-21	0.683	-0.109	0.616	0.015	0.571	0.064
		(0.016)		(0.016)		(0.016)
Control group: Married women[1]	0.734	-0.127	0.720	-0.044	0.802	0.020
(married 1945 or earlier)		(0.008)		(0.008)		(0.006)
Control group: Ever married women[2]	0.680	-0.079	0.665	0.001	0.769	0.051
		(0.007)		(0.007)		(0.006)

Notes: Means of the control group and IPW estimates for war widowhood across different samples of the 1971 Microcensus. The samples differ by the birth years of cohorts considered and the definition of the control group. Each estimate stems from a separate regression. Regression include as controls a full set of age dummies, an indicator for house ownership in 1939, indicators for expellees from Eastern Europe and refugees from GDR, the number of siblings, a full set of education dummies, indicators for the sector of employment in 1939 (agriculture, industry, construction, trade/transport, finance, public and private services, unknown) and the occupational or employment status in 1939 (self-employed, farmer, civil servant, white-collar worker, blue-collar worker, helping family member, out of the labor force including apprentices, in education, and unemployed). Robust standard errors clustered at selection districts (*Auswahlbezirke*) are reported in parentheses. [1] The control group consists only of women who were married in 1971 and whose marriage year was 1945 or earlier. Compared to the baseline sample, widowed and divorced women in the control group (as of 1971) are dropped. [2] The control group includes all women who were ever married. Compared to the baseline sample, the control group also includes women who were married in 1971 but whose last marriage was after 1945.

Figure B2 : Labor supply of war widows

(a) Income shock from losing one's spouse

(b) Means-tested compensation
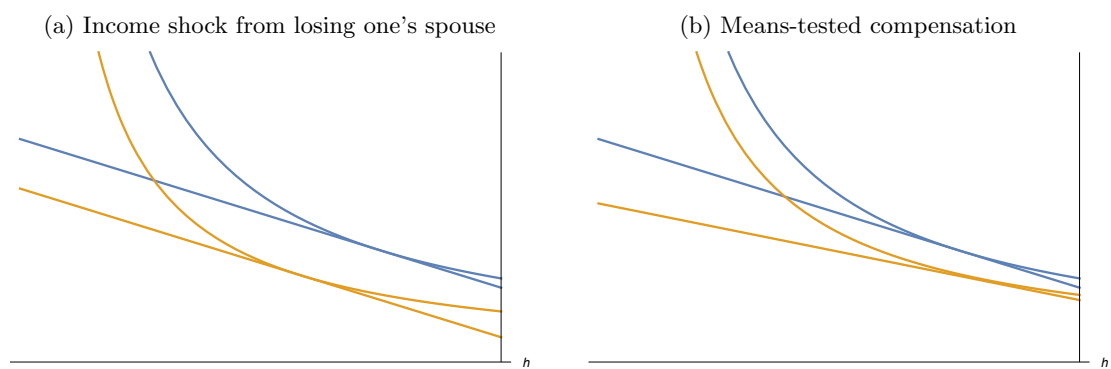
Notes: Budget constraints and indifference curves in a static model of labor supply. Sub-figure (a) illustrates the income effect from losing one's spouse, modeled as a reduction in the non-labor income R_0. Sub-figure (b) illustrates the effect from a means-tested compensation scheme that partially offsets the reduction in R_0 but also reduces the effective take-home wage from work.

6

C   Effect heterogeneity

The main result of Section 4 is that war widowhood increased the probability of market employment only immediately after the war. In the longer run, war widowhood actually decreased market employment. Here, we document that the negative long-term effect on participation is strongest for less educated women with children.

Table C4 presents estimates of the effect of widowhood on market employment in 1950, 1960, and 1971 separately for the subgroups indicated on the left. In the first row, we replicate our baseline results for ease of comparison. We first distinguish between women who have children and those who do not. Not surprisingly, women without children have much higher employment rates in middle age. For example, the control mean in 1950 is twice as high for those without children as for those with children (35.9% versus 18.3%). However, the pattern of the widowhood effect over time–large and positive in 1950 and then declining–is similar for both groups. As we can see, the negative long-term effect is only visible for women with children. For them, war widowhood reduced market employment by 2.4 pp in 1971.

Second, we show that high-educated women were much more likely than low-educated women to take up market employment after the death of their spouse in WWII. Moreover, for them, the positive effect persists, albeit muted, until late in life. We find that for highly educated women, war widowhood increased the probability of market employment by 21.9, 13.7, and 4.8 pp in 1950, 1960, and 1971, respectively. In contrast, the effect sizes are 12.2, 2.9, and -3.3 percentage points for women with low education. This differential effect is consistent with previous findings for the US that WWII mobilization increased female labor supply only among highly educated women (Goldin and Olivetti, 2013).

Finally, Table C4 also examines the effect of widowhood by occupational status in 1939, distinguishing between women who were in market employment, who worked as helping family members, or who were out of the labor force before the war. There are notable differences among these groups in 1950 and 1960, but not in 1971. In 1950, the widowhood effect is largest for those who worked as family helpers in 1939, increasing their probability of market work in 1950 by 26.1 percentage points (or 300% compared to the control group's probability of 8.8%). The increase is also substantial for women who did not work before the war, and more modest for those who were already in the labor force in 1939. The widowhood effect declines between 1950 and 1960 for all three groups, and it disappears by 1960 for those in market employment in 1939. This group also experienced the largest negative effect in 1971, at 3.6 percentage points.

D   Evidence on attitudes towards work and gender norms

This section summarizes evidence of the impact of war widowhood on attitudes towards work and gender norms. We first describe the data source and then discuss findings separately for war widows and their children.

D.1   Data description

The ALLBUS is a survey that has been collecting data on the attitudes, behavior, and social structure of the German population every two years since 1980. We use data from five waves: 1980, 1982, 1984, 1986, 1988 (GESIS - Leibniz-Institut für Sozialwissenschaften, 2002b,a). Each wave interviewed a random sample of about 3000 West German citizens over the age of 18 (foreigners were excluded). The exact questions vary, so our outcome variables of interest are typically available only for a subset of waves.

All five waves contain information on the complete marital history of the respondents. This allows us to identify women who lost their spouse between 1939 and 1945 (our treatment group). We compare them with women who married before 1945. We restrict the sample to women born

Table C4: Heterogeneity in the impact of war widowhood on market employment in 1950, 1960, 1971

	1950		1960		1971	
	Control mean (1)	IPW (2)	Control Mean (3)	IPW (4)	Control mean (5)	IPW (6)
Baseline	0.205	0.138 (0.007)	0.238	0.058 (0.007)	0.162	-0.019 (0.006)
Children:						
With kids	0.183	0.133 (0.008)	0.222	0.041 (0.007)	0.157	-0.024 (0.006)
Without kids	0.359	0.159 (0.020)	0.350	0.080 (0.021)	0.198	0.009 (0.018)
Education:						
High (>10 years)	0.283	0.219 (0.019)	0.336	0.137 (0.019)	0.244	0.048 (0.018)
Low (≤10 years)	0.188	0.122 (0.008)	0.217	0.029 (0.008)	0.144	-0.033 (0.006)
Occupational status 1939:						
Market employment	0.461	0.104 (0.014)	0.446	-0.000 (0.014)	0.253	-0.036 (0.012)
Helping family	0.088	0.261 (0.025)	0.142	0.125 (0.025)	0.136	-0.008 (0.019)
Out of the labor force	0.104	0.137 (0.009)	0.156	0.061 (0.009)	0.123	-0.012 (0.007)

Notes: Means of the control group and IPW estimates for war widowhood. Each estimate stems from a separate regression for the subgroup indicated on the left. Regression include as controls a full set of age dummies, an indicator for house ownership in 1939, indicators for expellees from Eastern Europe and refugees from GDR, the number of siblings, a full set of education dummies, indicators for the sector of employment in 1939 (agriculture, industry, construction, trade/transport, finance, public and private services, unknown) and the occupational or employment status in 1939 (self-employed, farmer, civil servant, white-collar worker, blue-collar worker, helping family member, out of the labor force including apprentices, in education, and unemployed). Robust standard errors clustered at selection districts (*Auswahlbezirke*) are reported in parentheses.

in 1906-21 in order to look at similar cohorts as in the main analysis. Our regressions control for a full set of dummies for the year of birth and year of first marriage, year of interview, and the years of schooling of the respondent and her father.

In addition, the 1988 wave includes the year of death of the respondent's father and mother. Thus, for this wave, we can also examine the children of war widows by comparing respondents whose fathers died in World War II and those whose fathers did not. We focus on cohorts born in 1929-45 and drop respondents whose mothers died before 1945. The regressions control for respondents' year of birth and their fathers' years of schooling.

D.2 Attitudes towards work and gender norms of war widows

The ALLBUS waves of 1980, 1982, and 1986 asked respondents about the importance of different domains in life, including family, job, leisure, friends, relatives, religion, and politics, as measured on a scale from 1 (unimportant) to 7 (very important). Table D5 shows that war widows placed a, on overage, 0.36 lower value on the importance of family and children in life (relative to a

Table D5: Impact of war widowhood on the importance of different life areas

	Importance of different life areas (1-7):						
	Family & children	Job & work	Leisure & recreation	Friends	Relatives	Religion & church	Politics
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
War widow	-0.364	-0.076	-0.026	0.026	-0.142	-0.157	0.034
	(0.144)	(0.202)	(0.149)	(0.146)	(0.160)	(0.185)	(0.174)
Control mean	6.404	4.493	5.110	5.364	5.323	4.978	3.749
N	831	832	832	831	833	833	833

Notes: Control means and estimates of the effect of war widowhood on the importance of different domains of life. The sample consists of women born in 1906-21 in the 1980, 1982, and 1986 ALLBUS waves. The outcome variables are measured on a scale from 1 (unimportant) to 7 (very important). Each estimate comes from a separate OLS regression, controlling for a full set of dummies for year of birth and year of first marriage, year of interview, and years of schooling of the respondent and her father. Robust standard errors are shown in parentheses.

control mean of 6.40).[28] For all other domains of life, the differences between war widows and the control group are small. In particular, we find no evidence that war widows attach greater importance to job and work in life. If anything, the impact is negative (but small and statistically insignificant).

The ALLBUS waves of 1982 and 1988 asked several questions about women's roles in family and work. Unfortunately, most questions changed between waves and are thus not directly comparable. We summarize respondents' attitudes towards gender roles by measuring the proportion of progressive statements with which respondents agreed.[29] Column (1) of table D6 shows that this "progressive gender role index" is 7.3 pp higher among war widows, albeit from a comparatively low baseline of 24.6%. In other words, war widows tend to have more progressive gender roles but still disagree with most progressive statements (or agree with traditional statements).

Of particular importance for women's labor supply decisions is the compatibility of work and child care responsibilities. In West Germany, the birth of a child often led previously employed women to give up work altogether in favor of the family, or to interrupt their careers for many years (e.g. Matysiak and Steinmetz, 2008). Previous research based on the 1988 ALLBUS wave has shown that West Germans strongly disapproved of women working outside the home when there are preschool children at home, even more so than respondents in the UK and US (Alwin et al., 1992).

The results in columns (2) to (5) indicate that war widows were not an exception, as they were not more supportive of women with young children working. Column (2) shows that war widows were only slightly less likely to agree with the statement that young children suffer when the mother works, a statement with which nearly 90% of control group respondents agreed. And while war widows were more likely to approve of women working in situations where childcare is not an issue (Column (3)), they were even slightly more likely to disapprove of women working when they have children (Columns (4) and (5)).

D.3 Attitudes and gender norms of the war widow's children

Table D7 shows that also the children of war widows did not hold more progressive gender norms than their peers. Neither the progressive gender role index (Column (1)) nor agreement with the statement that young children suffer when mothers work (Column (2)) differs statistically

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[28] We find similar results for an alternative question that asked respondents in 1980, 1984, and 1984 whether they believed that one needs a family to be truly happy. War widows are 9.1 pp less likely to agree (relative to a baseline of 80.8%).

[29] We count the negation of traditional gender roles as a progressive statement.

Table D6: Impact of war widowhood on work-related gender norms

	Progressive gender roles index (0-1)	Do small kids suffer if mother works? (0/1)	Should women not work if they have		
			no kids? (0/1)	small kids? (0/1)	school kids? (0/1)
	(1)	(2)	(3)	(4)	(5)
War widow	0.073	-0.042	-0.109	0.027	0.037
	(0.030)	(0.042)	(0.067)	(0.054)	(0.101)
Control mean	0.246	0.897	0.183	0.878	0.730
N	512	503	174	176	176
Waves	82, 88	82, 88	88	88	88

Notes: Control means and estimates of the effect of war widowhood on work-related gender norms. The sample consists of women born in 1906-21 in the 1982 and 1988 ALLBUS waves. The outcome variable in Column (1) summarizes the responses to six and nine statements about work-related gender norms asked in the 1982 and 1988 waves, respectively. The indicator measures the proportion of progressive statements with which respondents agreed (including the negation of traditional statements). The outcome variables in Columns (2) through (5) are indicator variables indicating whether respondents agreed with the question in the table header. Each estimate comes from a separate OLS regression, controlling for a full set of dummies for year of birth and year of first marriage, year of interview, and years of schooling of the respondent and her father. Robust standard errors are shown in parentheses.

significantly between the two groups. The same applies to the approval of women's work in Columns (3) to (5), with one exception: Daughters of war widows have a 13.8 pp higher probability of agreeing with the statement that women with young children should *not* work (from a baseline probability of 78.5 pp). Thus, if anything, we find evidence that the experience of growing up without a father has made daughters of war widows less supportive of the compatibility of women's work and caring for young children, potentially because they experienced the challenges faced by the mothers in the post-war period. In any case, even among respondents born in 1929-45, most disapproved of women working outside the home when preschool children are at home.

Table D7: Intergenerational spillovers on work-related gender norms

| | Progressive gender roles index (0-1) | Do small kids suffer if mother works? (0/1) | Should women not work if they have | | |
			no kids? (0/1)	small kids? (0/1)	school kids? (0/1)
	(1)	(2)	(3)	(4)	(5)
A. Daughters:					
Father's death	0.028	-0.045	0.007	0.138	0.001
	(0.039)	(0.079)	(0.049)	(0.072)	(0.092)
Control mean	0.474	0.730	0.072	0.785	0.506
N	375	361	340	345	338
B. Sons:					
Father's death	0.017	0.019	0.090	-0.048	0.008
	(0.046)	(0.068)	(0.068)	(0.078)	(0.088)
Control mean	0.434	0.812	0.072	0.843	0.570
N	312	304	287	291	288

Notes: Control means and estimates of the effect of war widowhood on work-related gender norms of their children. The sample consists of respondents born in 1929-45 in the 1988 ALLBUS who did not lose their mother before 1945. Panel A. restricts the sample to women (daughters), Panel B. restricts the sample to men (sons). The outcome variable in Column (1) summarizes the responses to nine statements about work-related gender norms asked in the 1988 wave. The indicator measures the proportion of progressive statements with which respondents agreed (including the negation of traditional statements). The outcome variables in Columns (2) through (5) are indicator variables indicating whether respondents agreed with the question in the table header. Each estimate comes from a separate OLS regression, controlling for a respondents' year of birth and their fathers' years of schooling. Robust standard errors are shown in parentheses.