Topics in Economic History
Class 7: World Wars

Jade Ponsard

University of Lyon, ENS de Lyon

An Overview

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  - World War I caused around 16 million deaths, while World War II led to approximately 70-85 million military and civilian deaths (Keegan 2014; Snyder 2011)

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  - Infrastructures were severely damaged across Europe, the Soviet Union, and parts of Asia, necessitating post-war reconstruction (Mazower 2009)
- Created **major societal shifts**
  - Rapid technological advances, large-scale population displacements, and changes in workforce demographics (Marwick 1974; Higonnet et al. 1987; Fussell 2009)

An overview

- The literature examining the effects of war encompasses a wide array of topics, such as:
  - Long-term impacts of infrastructure destruction, displacement, and changes in labor markets to test theories (Broadberry and Harrison 2005; Akbulut-Yuksel 2014; Halbmeier and Schröder 2024 or Redding and Sturm 2024)

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  - Female labor force participation and marriage market structures, through a shock to the sex-ratio (Goldin and Olivetti 2013; Boehnke and Gay 2022; Goldin 1991 or Brainerd 2017)
  - Emancipation of women through transmission of progressive norms (Gay 2023) and reward (Arnsbarger, WP)

This class

- Two presentations:
  1. *The Intergenerational Transmission of World War I on Female Labor*, Gay (2023) (The Economic Journal)
  2. *The Political Economy of Women's Suffrage and World War I*, Arnsbarger (WP)

The Intergenerational Transmission of World War I on Female Labor

Gay (2023)

The Economic Journal

Motivation I

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- 1.3 million men died during the war, i.e., military death rate of 16%

Motivation II

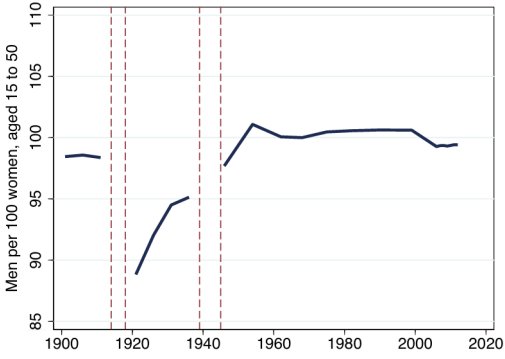


Fig. 1. *Adult Sex Ratio (1900–2012).*

- The balance of the adult sex ratio was not restored until the 1950s

Motivation III

- Limited pensions to widows + deteriorated marriage market conditions
  - ↪ it pushed millions of women to enter the labor market
- Has this generation of newly-employed women paved the way for subsequent generations?

This paper

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- Exploits the World War I as a shock to sex-ratio
- Compares labor outcomes of women born in counties exposed to different death rates during the war but who currently live and work in the same counties
- Findings suggest:
  - i women born in counties that experienced higher military death rates were more likely to be working in the long run
  - ii transmission to next generations through parents, marriage and local social interactions

Contributions

- **Female labor inter-generational transmission** (Fernandez, 2011; Fernandez, Fogli and Olivetti, 2004; Fogli and Veldkamp, 2011)
  - ↪ Transmission from mothers to daughters, from mothers-in-law to daughters-in-law and through local information diffusion were simultaneously at work

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  - ↪ Lineage approach rather than a location-based aspect of history

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- **Emergence and variation of cultural norms** due to change in sex ratio (Giuliano and Nunn, 2021; Teso, 2019; Grosjean and Khattar, 2019)
  - ↪ (i) disentangle the role of culture from that of institutions thanks to the empirical strategy

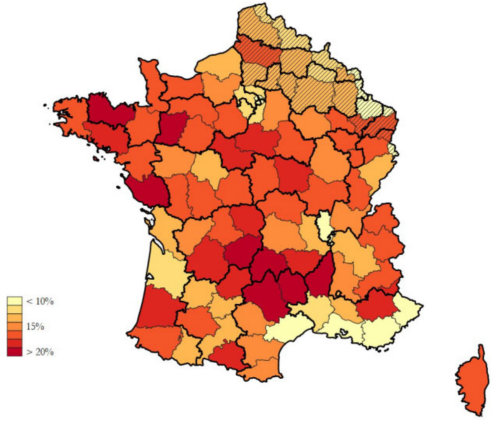
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  - ↪ (i) disentangle the role of culture from that of institutions thanks to the empirical strategy and (ii) since outcomes are examined continuously over time, allows to document that effects are stable and persistent across generations

Historical context

Military Fatalities

- Large variations across counties in terms of military death rates – "ratio of deceased soldiers born in the county to the size of its drafted population"



Historical context

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  - i the territorial **organization of military recruitment**
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    - ... after five months, they were reassigned to decimated units, mixing soldiers from various regions
  - ii the **industrial war effort**
    - As the war persisted, to provide materiel soldiers with manufacturing skills were reassigned to war factories and administration ...
    - ... lowering combat death rates for those from industrial areas
- Therefore, rural counties experienced greater military death $\rightarrow$ explains 75% of the variation

Historical context

Military Fatalities

Table 1. *Military Death Rates and Pre-War County Characteristics.*

Dependent variable	Military death rate		
	(1)	(2)	(3)
Share rural population	0.12***	0.12***	0.14***
	[0.01]	[0.03]	[0.03]
Share born in county	0.12***	0.13***	0.15***
	[0.03]	[0.03]	[0.04]
Female labour force participation		−0.03	−0.02
		[0.03]	[0.04]
Share girls aged 5–19 in school		0.09	0.04
		[0.07]	[0.07]
Total fertility rate		0.01*	0.02
		[0.01]	[0.01]
Personal wealth (10,000 francs)		0.04**	0.06*
		[0.02]	[0.04]
Other characteristics	No	Yes	Yes
Military region FEs	No	No	Yes
Counties	87	87	87
R^2	0.745	0.827	0.875

Notes: This table reports OLS coefficients from regressing military death rates on various pre-war county characteristics measured in 1911. *Other characteristics* include average height, population, the shares of men working in industry and in agriculture, the share of the literate population and the average direct taxes per inhabitant. Robust standard errors are in brackets. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level.

- Determinants of subsequent female labour force participation available in historical statistics do not appear correlated with military death rates

Historical context

Female Labor Force Participation

- Boehnke and Gay (2022) examine WWI's short-run impact on women's labor behavior in the interwar period
  - ↪ Counties with 20% military death rates rather than 10% saw female labor force participation rise by 12% (compared to pre-war levels)

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  - ↪ Counties with 20% military death rates rather than 10% saw female labor force participation rise by 12% (compared to pre-war levels)
- This rise occurred after the war, driven by war widows (due to limited pensions until the 1930s) + young single women, who became secondary earners in their family while delaying marriage

Data

Military Fatalities

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- Treatment variable $\rightarrow$ the proportion of deceased soldiers to the drafted population, captured by the male population aged 15 to 44 in the 1911 census

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  - ↪ city of residence, county and year of birth, position in the labor force, occupation, monthly wage, educational attainment, marital status and fertility
  - \+ information on parents' birth places and their LFP during childhood
- Restricts the sample to:
  1. married women – their entrance in the labour force represented the core of the revolution of female labour
  2. women between 30 and 49 years old – human capital investments are completed and to abstract from retirement decisions
- % of working women in this sample increased from 30% in the early 1960s to 80% in the late 2000s

Empirical strategy

Naive approach

- Overall long-run effect of WWI on female labour force participation

$$\text{employed}_{irt} = \beta \text{death_rate}_{r} + \alpha X'_{1911,r} + \theta_{i;1914;r} + \epsilon_{irt} \quad (1)$$

- i stands for women, r county of residence and t for year
- employed_{irt} equals 1 if the woman i is employed
- $X'_{1911,r}$ set of pre-war controls that control for the determinants of military death rates and subsequent female labor force participation
- $\theta_{i;1914;r}$ set of cohort by military region fixed effects "as soldiers from the same military region were initially sent to the same battlefields, making the distribution of military death rates more likely to be idiosyncratic within these regions"

Empirical strategy

Threat to identification I

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- The goal is to isolate the role of intergenerational cultural transmission
- But, differences in FLFP rates across counties identified with equation (1) could also be explained by changes in local labour markets
- FLFP increased during the interwar period $\rightarrow$ lowered female wages in counties intensively affected by the war $\rightarrow$ pushed firms to specialize in female-intensive activities and created persistent differences

Empirical strategy

Threat to identification II

- Studies labour market outcomes of women who reside in the same county but county of birth differ in terms of exposure to death rate → "epidemiological approach"

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- Compare internal migrant residing in the same county ...

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- Compare internal migrant residing in the same county ...
- ... but born in counties that experienced different military death rates

Empirical strategy

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Empirical strategy

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$$\text{employed}_{ibrt} = \beta \text{death_rate}_b + \alpha X'_{1911,b} + \theta_{i;r;1914;b} + \epsilon_{ibrt} \quad (2)$$

- b stands for county of birth
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- β captures differences in labor market outcomes of married women of the same cohort and residing in the same county ...
- ... but born in different neighboring counties $\rightarrow$ solely captures inter-generational cultural transmission channels

Results

Epidemiological Approach

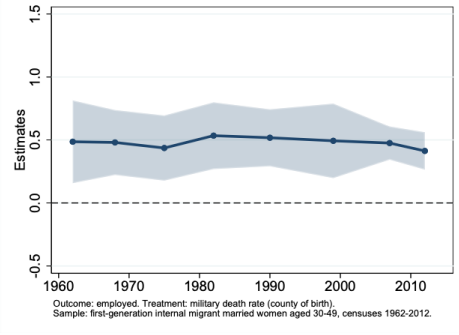


Figure 4. The Effect of WWI Military Death Rates on Female Labor Force Participation Across Counties of Birth, Holding Counties of Residence Constant

- "Women residing in the same county but born in counties that experienced 20 rather than 10 percent military death rates were 5 percentage points more likely to be working between 1962 and 2012"

Results

Epidemiological Approach

- **Selective migration** could bias results

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  - i if out-migration patterns are correlated with both military death rates and labor market outcomes
    - Migration is common → half of married women were internal migrants as of 2012
    - Migration trends for married women align with those of all women
    - Internal migrant and non-migrant women share similar observable characteristics

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    - Internal migrant and non-migrant women share similar observable characteristics
  - ii if individuals from counties with higher military death rates may settle in more dynamic labor markets
    - Remove the ten most urban destination counties
    - Accounts for the relative attractiveness of origin and destination counties, along with distance between counties

Results
Additional findings

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  - ↪ the war did not lead to persistent gender segregation in occupations

Results

Additional findings

- Women born in counties with higher military death rates show no differences in fertility or educational outcomes
  - ↪ these factors do not explain the estimated effect
- They are not more likely to work in male-dominated occupations
  - ↪ the war did not lead to persistent gender segregation in occupations
- Marriage rates are similar, and spouses do not differ in observable characteristics
  - ↪ war-related imbalances in the marriage market were limited to the interwar years

Mechanisms

Intergenerational Transmission

- **Three mechanisms** are explored:

Mechanisms

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Intergenerational Transmission

- **Three mechanisms** are explored:
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  2. Transmission through **marriage**
  3. Transmission through **local social interactions**

Mechanisms

Transmission through parents

- Same empirical strategy, but one generation earlier
- Compares women born and residing in the same counties, but whose parents were born in counties with different exposure to war
  - Focus on the sample of second-generation internal migrant married women aged 30 to 59 ...
  - ... and who reside in their county of birth, but whose mothers and/or fathers were born in another county
- Since the location of second-generation internal migrants was decided before their birth $\rightarrow$ the results are even less likely to be driven by selective migration

Mechanisms

Transmission through parents – Empirical strategy

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$$\text{employed}_{imfr} = \beta\, \text{death_rate}_{m} + \alpha X'_{1911,m} + \gamma_i + \delta_r + \mu_{1914,m} + \omega_f + \epsilon_{imfr} \quad (3)$$

  - m stands for the mothers' counties of birth
  - γ_i is a set of year of birth and survey year indicators
  - δ_r are county of residence fixed effects
  - ω_f fathers' county of birth fixed effects $\rightarrow$ Neutralize the influence of fathers' origins

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- Explore the role of fathers, estimating equation (3) but at the level of fathers' origins + the relative role of each parents

Mechanisms

Transmission through parents – Results

Table 3. *The Effect of Mothers' Birth County Military Death Rates on Their Daughters' Labour Force Participation.*

Dependent variable	Employed				
	(1)	(2)	(3)	(4)	(5)
Military death rate (mother)	1.05***	0.93**	1.11***	1.25***	0.83**
	[0.36]	[0.38]	[0.40]	[0.34]	[0.37]
Father birth county FEs	No	Yes	Yes	Yes	Yes
Mother birth region FEs	No	No	Yes	Yes	Yes
Other controls	No	No	No	Yes	No
Clusters					
Own birth-residence county	95	95	95	95	95
Mother birth county	95	95	95	95	95
Observations	15,091	15,091	15,091	15,091	32,081
Outcome mean	0.81	0.81	0.81	0.81	0.79
Outcome SD	0.39	0.39	0.39	0.39	0.40

- "women whose mothers were born in counties that experienced 20 rather than 10 percent military death rates were 11 percentage points more likely to be working, which represents 13 percent of the outcome mean"
- Results are a bit lower for father, i.e. 8pp

Mechanisms

Transmission through marriage

- Focuses on husbands to wives transmission, and by extension, from mothers-in-law to daughters-in-law
  - ↪ Son of working mothers should hold more progressive attitudes toward female labor (Fogli and Olivetti, 2014)

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- Two potential confounders:
  - i Assortative matching, i.e., couple could match based on exposure to war (women more likely to work + men progressive attitudes towards female labor)
    - ↪ compare wives that reside and were born in the same county, i.e., who carry a similar legacy of the war in their initial propensity to work

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    - ↪ compare wives that reside and were born in the same county, i.e., who carry a similar legacy of the war in their initial propensity to work
  - ii Men can take on a greater share of household responsibilities
    - ↪ use data from the 2005 Generation and Gender Survey to show that husbands of women from counties more exposed to the war do not assume more domestic duties

Mechanisms

Transmission through marriage – Strategy

- Compares women born and residing in the same counties, but whose husbands were born in counties with different exposure to war

$$\text{employed}_{ihbrt} = \beta\, \text{death_rate}_{h} + \alpha X'_{1911,h} + \theta_{i;r;b} + \epsilon_{ihbrt} \tag{4}$$

  - h stands for the husbands' counties of birth
  - $\theta_{i;r;b}$ are cohort by wives' county of birth by county of residence fixed effects to isolate the role of husbands' origins from that of their wives'

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- Explore the relative role of the wife's and her husband's origins + the direct role of the mother-in-law's origins, reproducing the analysis of parental transmission while keeping the origins of the wife's parents and husband fixed

Mechanisms

Transmission through marriage – Results

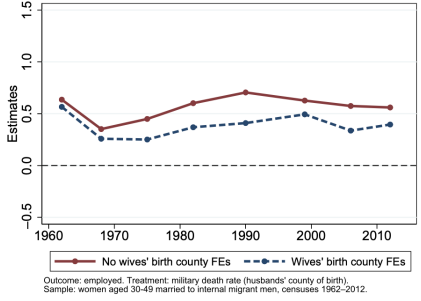


Fig. 5. *The Effect of Husbands' Birth County Military Death Rates on Their Wives' Labour Force Participation.*

- "Women whose husbands were born in counties that experienced 20 rather than 10 percent military death rates were 4 to 7 percentage points more likely to be working between 1962 and 2012"
- "Women's own origins are quantitatively twice as important as those of their husbands"

Mechanisms

Transmission through mother-in-law

Table 4. *The Effect of Mothers-In-Law's Birth County Military Death Rates on Their Daughters-In-Law's Labour Force Participation.*

Dependent variable	Employed			
	(1)	(2)	(3)	(4)
Military death rate (mother-in-law)	1.32*	1.24*	1.50**	1.64**
	[0.77]	[0.64]	[0.68]	[0.68]
Own parents birth county FEs	No	Yes	Yes	Yes
Mother-in-law birth region FEs	No	No	Yes	Yes
Other controls	No	No	No	Yes
Clusters				
Own birth-residence county	94	94	94	94
Mother-in-law birth county	94	94	94	94
Observations	13,387	13,387	13,387	13,387
Outcome mean	0.81	0.81	0.81	0.81
Outcome SD	0.39	0.39	0.39	0.39

- "Women whose mothers-in-law were born in counties that experienced 20 rather than 10 percent military death rates were 13 percentage points more likely to be working"
- "Mothers and mothers-in-law were equally important agents of inter-generational transmission of the war"

Mechanisms

Transmission through local interactions

- The cultural composition of a neighborhood is important in shaping individuals' beliefs

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Transmission through local interactions

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  - i if someone lives among many people with similar cultural backgrounds, they may be more inclined to preserve their original culture $\rightarrow$ *preservation*

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Transmission through local interactions

- The cultural composition of a neighborhood is important in shaping individuals' beliefs
  - i if someone lives among many people with similar cultural backgrounds, they may be more inclined to preserve their original culture → *preservation*
  - ii if not, might assimilate into the dominant culture of the area → *assimilation*

Mechanisms

Transmission through local interactions

- The cultural composition of a neighborhood is important in shaping individuals' beliefs
  - i if someone lives among many people with similar cultural backgrounds, they may be more inclined to preserve their original culture → *preservation*
  - ii if not, might assimilate into the dominant culture of the area → *assimilation*

1 To identify cultural *preservation*, due to the geographic clustering of individuals from similar backgrounds:

↪ Examines whether the presence of a higher share of residents from the same county affects women's employment rates

Mechanisms

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1 To identify cultural *preservation*, due to the geographic clustering of individuals from similar backgrounds:

↪ Examines whether the presence of a higher share of residents from the same county affects women's employment rates

2 To identify cultural *assimilation*:

↪ Construct a measure of cultural composition of municipalities based on the military death rates in the counties where residents of a given municipalities were born and analyzes its impact on the employment behavior

Mechanisms

Transmission through local interactions – Results

- Results concerning **cultural preservation**:
  - ↪ Women living in municipalities with a 1 percentage point higher share of residents from their county of birth are 1 to 2 percentage points more likely to be employed

Mechanisms

Transmission through local interactions – Results

i Results concerning **cultural preservation**:

↪ Women living in municipalities with a 1 percentage point higher share of residents from their county of birth are 1 to 2 percentage points more likely to be employed

ii Results concerning **cultural assimilation**:

↪ Women in municipalities with a 1 percentage point higher average military death rate composition are 1 to 3 percentage points more likely to be employed between 1968 and 2012

⇒ Highlight the role of local social interactions for long-run historical processes

Take away

- After the First World War, women's participation in the workforce increased, mainly driven by women born in counties highly exposed to war
- This trend, persisted over time (at least until 2012)
- This paper shows that such a pattern can be (partly) attributed to women altering attitudes toward female employment of their daughters, sons, and social relationship at the local level
- A comparison of these different transmission channels shows that mothers and mothers-in-law were of primary importance

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