

Comparing the Family Formation Trajectories of World War II Survivors

Lara Vomfell

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1 Introduction

Drawing on the paper “Family Formation Trajectories of World War II Survivors”, this paper extends the investigation into the specific effect of the war and looks at the life and family formation trajectories of European citizens who have been directly affected by World War II (WWII). Using data from the SHARE survey, its objective is the identification of how, compared to peers who did not experience war, the war lasting from 1939 to 1945 with 60–70 million fatalities and 11–20 million displaced affected family formation patterns.

2 Method

As in the first paper, the scope of the analysis is limited to men and women born in Austria, Germany, The Netherlands, Italy, France, Switzerland, Belgium, the Czech Republic, and Poland before 1945. The original sample of WWII survivors consists of 1114 individuals born between 1910 and 1944 from those countries who experienced war either through evacuation, as a prisoner of war, or as a concentration camp survivor.

This paper uses a control-treatment approach where the WWII survivor group identified in the first paper is the “treatment” group and the “control” group consists of individuals closely matching the characteristics of the treatment group without having explicitly experienced war. A 1-to-1 matching is used such that each treatment case is assigned only one control.

To prevent the introduction of biases, the individuals were matched only on birth year, gender and country. Using the `optmatch` package for R, different matching techniques were tested: pairwise matching, propensity score matching and matching based on the Mahalanobis distance. The quality of matching on a range of

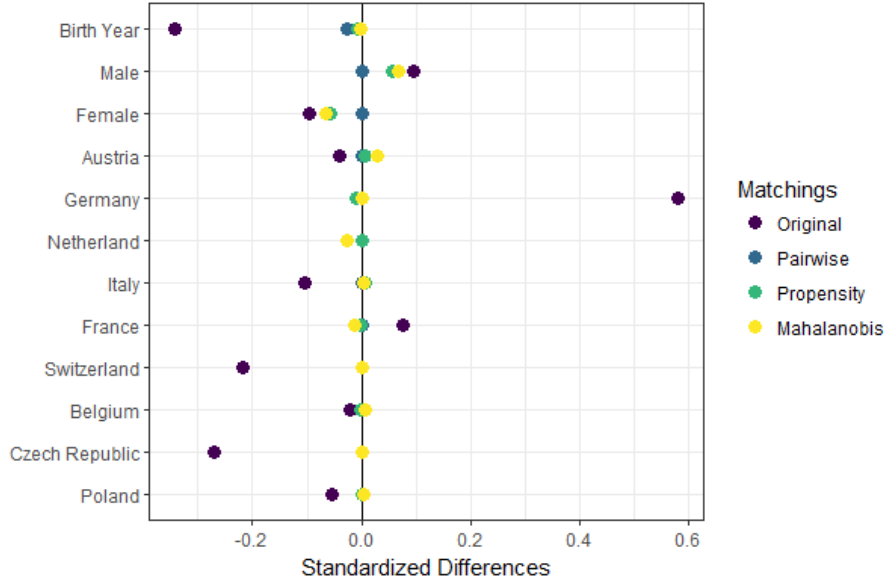


Figure 1: Variable Similarity between treatment group and various control group matchings.

variables is shown in Figure 1 where “Original” refers to the full set of potential matches. Pairwise matching attempts to find “identical” controls, while propensity score matching balances the distribution of the covariates between treated and control subjects. Matching based on the Mahalanobis distance metric standardizes the variances within and between variables and then the subject with the smallest distance is chosen as the final control case.

While pairwise matching yields the best overall matching, there is a significant mismatch in the birth year dimension such that the control subjects are considerably younger. Due to this mismatch, the null hypothesis of “the data is balanced” is rejected for pairwise matching with a p -value of nearly 0. A more appropriate matching is returned by propensity score matching and used here.

3 Comparing WWII survivors and their peers

As mentioned above, the differences between the two groups are negligible. As Figure 2a illustrates, the age differences under propensity matching are very minor. The gender differences are shown in Figure 2b. While the treatment group has an even proportion between men and women, the control group consists of 47% men and 53% women.

The analysis of the family sequences was limited to ages 15 to 60 and considers six different mutually exclusive family states: 1. single, 2. single with children, i.e., parenthood without cohabitation with a partner, 3. cohabitation with a partner, 4. cohabitation with a partner and children, 5. marriage, and 6. marriage with

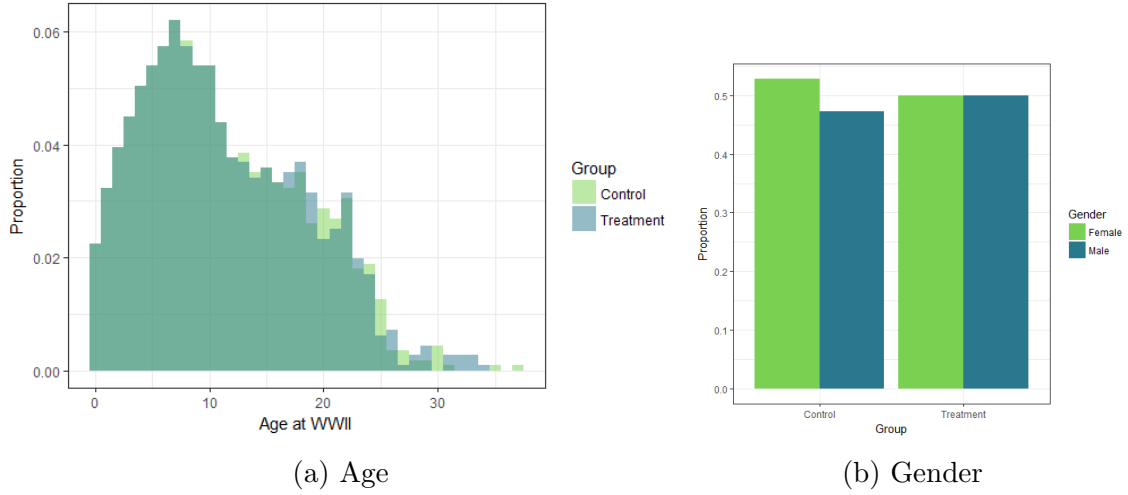


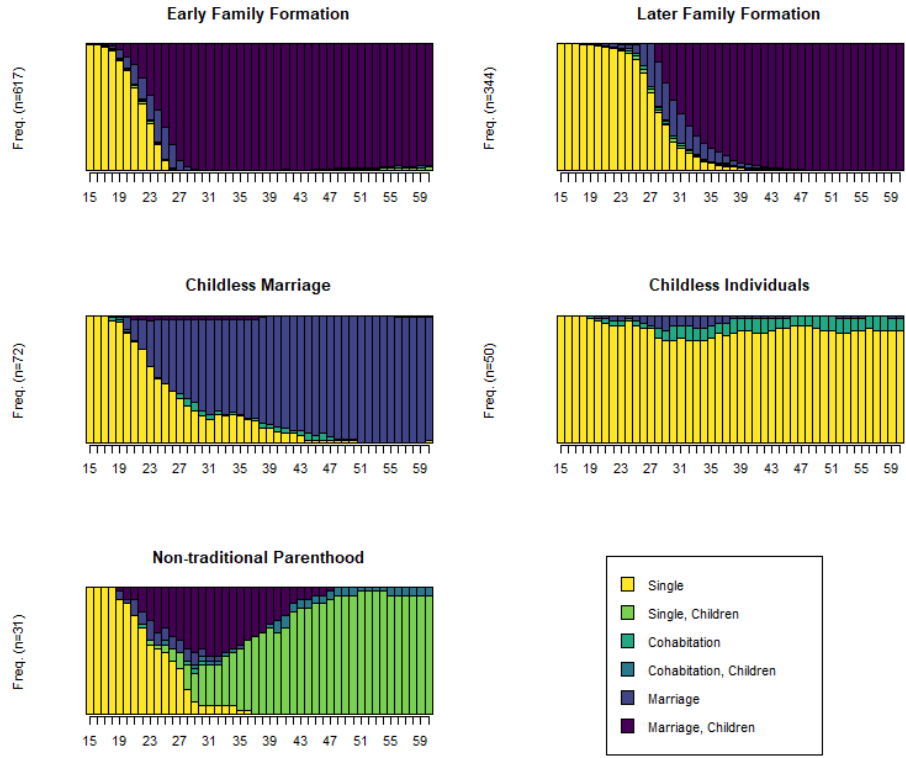
Figure 2: Differences between treatment and control group.

children.

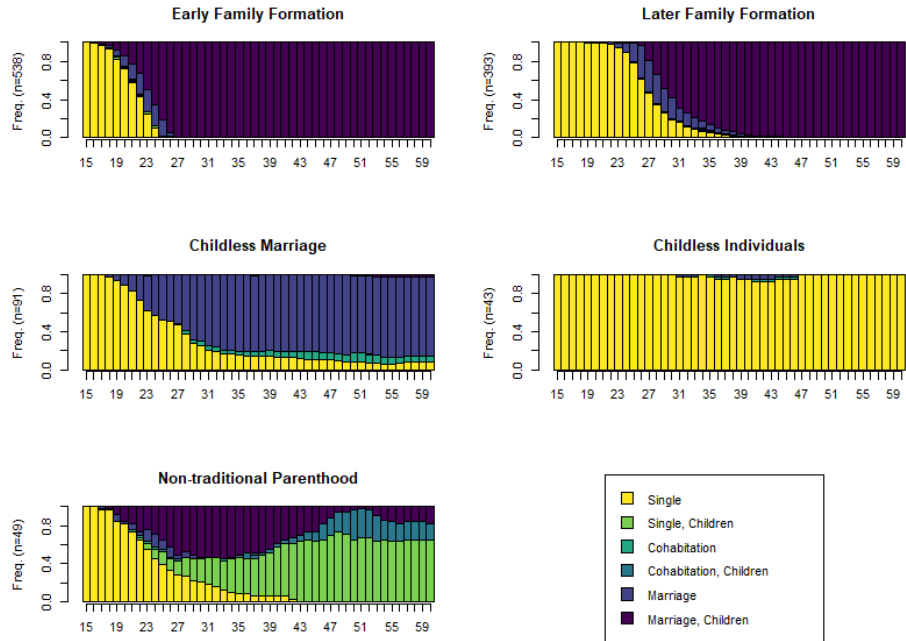
The defined sequences were clustered into qualitative groups based on optimal matching using the equal weight distance metric. Its use is motivated by the fact that it does not give preference to order nor timing as well as the fact that the clusters do not change substantially under different distance metrics. Using the Ward’s minimum variance method with squared dissimilarities and a range of evaluation criteria, an optimal solution with five clusters with an average silhouette width (ASW) of 0.4666 is suggested.

When analyzing the data, it is immediately striking that on a first glance, the family formation patterns between groups are very similar. For the WWII survivors, five clusters were identified: “Early Family Formation”, “Later Family Formation”, “Childless Marriage”, “Childless Individuals” and “Non-traditional Parenthood”. Surprisingly, the control group follows a very similar pattern as illustrated by the comparisons in Figures 3 and 4.

However, the two groups do not overlap perfectly as is illustrated in Table 1. The control group is slightly less likely to follow traditional family formation patterns. Control subjects are both more represented in the childless marriage cluster and in the non-traditional parenthood cluster which covers events like divorce, widowhood or non-marriage. Still, about 85% of both groups marry and have children in their early or late twenties, i.e. are in the early or late family formation cluster. However, these differences are not significant. The null hypothesis that the cluster membership between the two groups is the same could not be rejected with an ANOVA test.



(a) Treatment Group

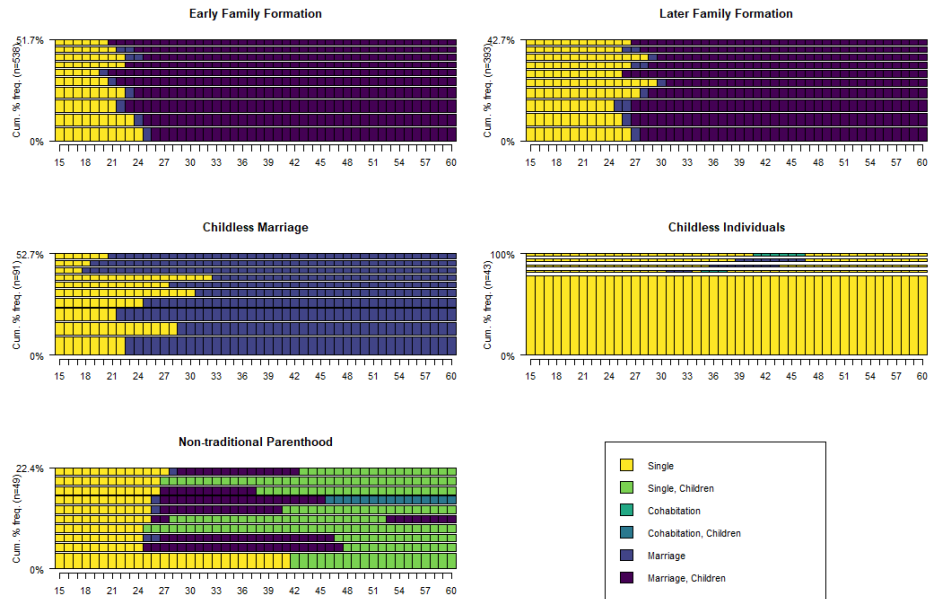


(b) Control Group

Figure 3: Sequence State Distribution Between Groups



(a) Treatment Group



(b) Control Group

Figure 4: Sequence Frequency Between Groups

Group	Clusters				
	Early Family	Late Family	Childless Marriage	Childless Individuals	Non-traditional Parenthood
Survivors	617	344	72	50	31
Non-survivors	538	393	91	43	49

Table 1: Cluster membership distribution between groups

4 Regression Analysis

The clustering was performed on the sequences only. However, which individuals are more likely to follow which trajectories? This section analyzes that relationship. To this end, a multinomial regression on the clusters was performed. The selection of the variables for this regression was motivated by which factors matter for family formation, encompassing gender, age and country. The marriage age variable was excluded to prevent simultaneity as it is already embedded in the family sequences.

Two separate regressions were run, one considering a “treatment effect”, i.e. a dummy for having experienced the war, and a second one looking at the specifics of the war experience: survival of evacuation, of war imprisonment, and of concentration camp. The results are reported in Table 2. Men from France who did not experience WWII in the early family formation cluster were used as a baseline. The coefficients, here illustrated for the first coefficient, can be interpreted as follows: the log odds of being in the later family formation cluster compared to the early family cluster will decrease by 1.221 if the subject is a women instead of a man.

Compared to men, women are more likely to be in the early family formation cluster, which is not too surprising given that in most heterosexual marriages, women tend to be a bit younger than their partners. The country effects are extremely interesting. Subjects from Austria are significantly more likely to start their families late. In particular, both married and unmarried individuals are highly more likely to remain childless. Similarly, men from the Czech Republic are highly more likely to remain unmarried and childless throughout their lives. While both effects were already tentative results of the first paper, it is surprising that this holds in a full sample where control individuals were picked only based on gender, age and country. It is not entirely clear how this effect can be explained.

Individuals from Germany, Italy, the Netherlands and Switzerland are all significantly more likely to start their families later. In comparison, Polish subjects are most likely to be in the early family formation cluster, though only the effect for not being in the non-traditional parenthood cluster is significant.

Here, age at WWII is a proxy for age. It appears that individuals who were adults during the war were – contrary to popular belief about war marriages – not

more likely to marry quickly. The effect of age on non-traditional family formation patterns is insignificant. This implies that for this sample, there is no clear evidence for a generational shift towards less traditional family formation patterns. Even individuals born in the 1940s, who would be of adult age during the 1960s, married young and had their children young. This might be a consequence of the cut-off birth year at 1944 such that the sample would be slightly too old to have personally been part of the generational shift.

There is, however, a significant effect regarding the war. Individuals who experienced WWII first-hand are significantly more likely to be in the later family formation cluster. As the separate regression on the specific experience suggests, this is primarily driven by evacuation. One could easily imagine several scenarios explaining this result. Under evacuation, individuals might have been separated from their partners and could not marry them until later. Or they might have lost contact with them entirely or simply deferred family formation until later. However, there is no clear relationship between age at WWII and evacuation such that these hypotheses cannot be further explored.

Interestingly, individuals who survived concentration camps are significantly more likely to either remain unmarried and childless or follow non-traditional parenthood trajectories.

	Cluster				Cluster			
	Later Family	Childless Marriage	Childless Individuals	Non-traditional Parenthood	Later Family	Childless Marriage	Childless Individuals	Non-traditional Parenthood
Female	-1.221*** (0.104)	-0.762*** (0.171)	-0.194 (0.218)	0.093 (0.221)	-1.241*** (0.106)	-0.769*** (0.175)	-0.250 (0.222)	0.054 (0.224)
Austria	0.620** (0.257)	0.989*** (0.348)	0.866** (0.429)	-0.064 (0.520)	0.672*** (0.259)	0.998*** (0.354)	0.958** (0.433)	0.001 (0.524)
Belgium	-0.124 (0.192)	0.176 (0.283)	-0.086 (0.363)	-0.574 (0.374)	-0.122 (0.192)	0.174 (0.283)	-0.099 (0.363)	-0.582 (0.374)
Czech Republic	0.289 (0.344)	-0.674 (0.760)	0.966** (0.489)	-1.211 (1.041)	0.283 (0.345)	-0.681 (0.761)	0.880* (0.493)	-1.288 (1.043)
Germany	0.295* (0.165)	-0.348 (0.285)	-0.453 (0.351)	-0.282 (0.298)	0.320* (0.167)	-0.341 (0.286)	-0.407 (0.352)	-0.245 (0.299)
Italy	0.812*** (0.193)	0.166 (0.330)	-0.203 (0.445)	-1.471** (0.627)	0.815*** (0.193)	0.166 (0.331)	-0.227 (0.446)	-1.483** (0.627)
Netherlands	0.463** (0.201)	0.438 (0.309)	-0.028 (0.416)	0.294 (0.336)	0.461** (0.202)	0.435 (0.309)	-0.081 (0.419)	0.245 (0.338)
Poland	-0.026 (0.227)	-0.725 (0.444)	-0.814 (0.569)	-1.307** (0.628)	-0.028 (0.227)	-0.727 (0.444)	-0.855 (0.571)	-1.342** (0.629)
Switzerland	1.053*** (0.360)	0.613 (0.591)	1.160** (0.563)	0.556 (0.595)	1.063*** (0.361)	0.609 (0.592)	1.106* (0.571)	0.480 (0.605)
Age at WWII	0.021*** (0.007)	0.024* (0.012)	0.011 (0.016)	-0.017 (0.016)	0.024*** (0.008)	0.024* (0.013)	0.017 (0.016)	-0.012 (0.017)
Treatment	0.202** (0.101)	0.012 (0.169)	-0.075 (0.215)	0.241 (0.212)				
Evacuation					0.246** (0.103)	0.026 (0.174)	-0.044 (0.220)	0.220 (0.213)
POW					-0.097 (0.234)	-0.118 (0.387)	-1.174 (0.764)	-0.736 (0.764)
Camp					0.459 (0.470)	0.212 (0.805)	1.360* (0.708)	1.520** (0.714)
Constant	-0.668*** (0.175)	-1.939*** (0.283)	-2.470*** (0.354)	-2.225*** (0.342)	-0.708*** (0.178)	-1.946*** (0.287)	-2.505*** (0.356)	-2.236*** (0.342)

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 2: Log Odds using French men in “Early Family” as baseline

5 Matching Analysis

Beyond the overall comparison between the two groups, the matched pairs can be examined, too. As each “treated” individuals is matched with a control of similar age, one can directly compare the family formation trajectories by considering whether they are in the same cluster. About half of the 1114 matched pairs are in the same cluster whereas the cluster memberships differ for the remaining half. The exact differences are detailed in Tables 3 and 4.

Early Family	Later Family	Childless Marriage	Childless Individuals	Non-traditional Parenthood
448	66	5	2	5

Table 3: Cluster membership of the 526 pairs where both are in the same cluster.

Treatment	Control				
	Early Family	Later Family	Childless Marriage	Childless Individuals	Non-traditional Parenthood
Early Family		114	59	36	29
Late Family	148		14	13	8
Childless Marriage	56	15		0	3
Childless Individuals	26	11	3		2
Non-traditional Parenthood	44	5	2	0	

Table 4: Cluster membership of the 588 pairs where the membership differs.

526 of the 1114 matched pairs are in the same cluster (c.f. Table 3). Interestingly, this primarily concerns the early family formation cluster. This may be a result of the fact that this is simply the largest cluster. It may also be a consequence of the cluster classification where the sorting into the early family cluster is most straightforward.

This is partially confirmed when looking at cluster differences in Table 4. Table 4 compares the differences between the treated and the control individuals. As an example, the first entry in the second row, 148, means that 148 treated individuals are in the late family formation cluster whereas their matched controls are in the early family formation cluster. Clearly, the pairs most often differ between early

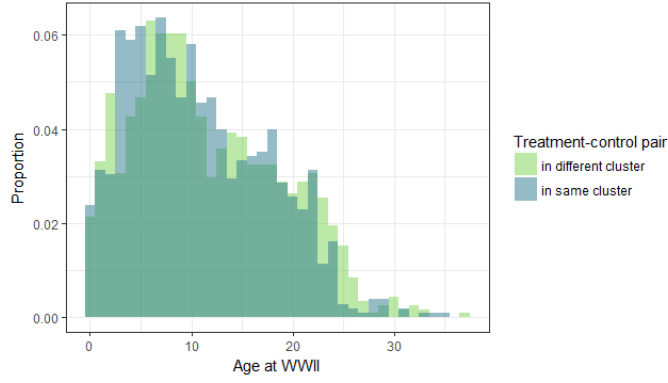


Figure 5: Age differences between treatment-control pairs in same and different clusters.

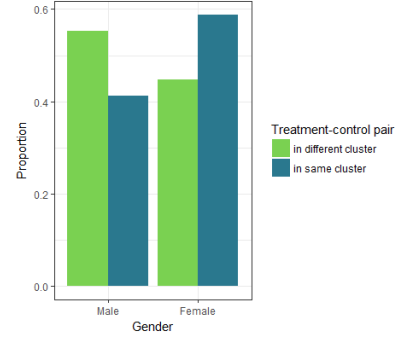


Figure 6: Gender differences between treatment-control pairs in same and different clusters.

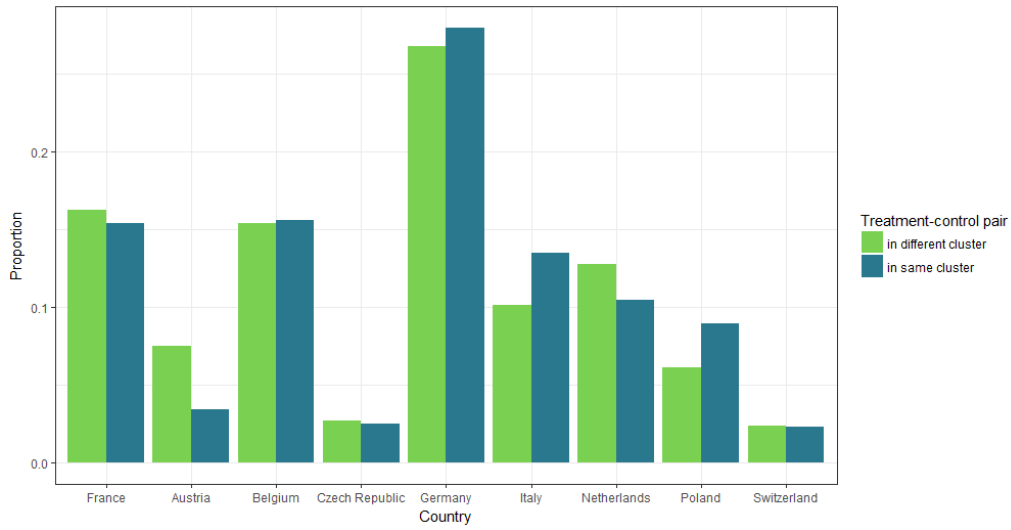


Figure 7: Country differences between treatment-control pairs in same and different clusters.

and late family formation which concerns about 45% of the differing pairs. Next, many pairs differ whether they had children which would put them either in the childless marriage or childless individual cluster. Overall, there does not appear to be a straightforward effect of treatment and control regarding these differences.

This is further illustrated by Figures 5 to 7. As shown in Figure 6, women are highly more to be in the same cluster, as a consequence of their early family foundation. Germans, Italians, and Polish are more likely to follow the same family formation trajectories and have families early (c.f. Figure 7). On the other hand, French and Dutch individuals are far less likely to follow the same patterns. In addition, the pairs where both follow the same trajectory are on average younger than differing pairs (c.f. Figure 5). This robustifies a result from the first study where individuals who were adults during the war were more likely to follow non-traditional trajectories.

	Same Cluster
Female	0.429*** (0.103)
Italy	0.575*** (0.189)
Poland	0.395* (0.213)
Late Family Cluster	−1.313*** (0.162)
Childless Marriage Cluster	−3.120*** (0.338)
Childless Individuals Cluster	−3.188*** (1.037)
Non-traditional Parenthood Cluster	−2.495*** (0.345)

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 5: Excerpt of a regression on the probability of a treatment-control pair being in the same cluster. Only significant variables included.

To investigate this further, a logistic regression on the likelihood of a treatment-control pair being in the same cluster was run. The full regression included all relevant variables (gender, country, and marriage age). For the sake of brevity, an excerpt of the regression results is given in Table 5. Women are more likely to be in the early family formation cluster and are therefore more likely to have their pair match be in the same cluster (cf. Table 3). A similar reasoning can be applied to subjects from Italy and Poland. Further, subjects in clusters other than the early family formation cluster are less likely to have their match be in the same cluster.

6 Conclusion

This analysis of family formation trajectories compares people directly affected by World War II to unaffected peers. The results suggest – contrary to the tentative results of the first investigation – a significant impact of the war experiences. This is somewhat surprising because the control group is very likely to have been touched by the war as well. Almost any resident of, e.g., Germany or France between 1939 and 1945 would have some connection to WWII. Still, the significance of the “treatment effect” despite a possibly flawed control group suggests that the war did have a considerable impact on the family formation of Europeans.

Pairs who are in the same cluster suggest that the family formation patterns in their home countries are comparatively general. The significant country coefficients in the regression on matching probability show that, in particular, many Italians

and Polish start their families early.

People who were adults during the war are significantly more likely to have families later. Further, there seems to be a small effect that they are also more likely to remain childless throughout life. Later generations who were children in wartime are the ones marrying early with vary stable family states throughout their lives. Whether this is a result of their war experience as young children is not straightforward as there is no clear effect between war experience and age.

The specifics of the war experience appears to matter. While war imprisonment does not appear to entail a significant general impact on family formation, evacuation and survival of concentration camps do. They lead to later and less traditional family formation patterns and generally suggest less stable lives.

References

Börsch-Supan, A. (2017). *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 3 SHARELIFE*. Data set. Release version: 6.0.0. DOI: 10.6103/SHARE.w3.600.