

# Children of war: The long-run effects of early exposure to World War II on trust\*

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\*\*\* PRELIMINARY AND INCOMPLETE \*\*\*

## Abstract

We rely on retrospective data of Europeans aged above 50 to estimate the effect of early exposure to World War II on present levels of trust. Our identification strategy combines the regional and time variation of conflict episodes with the variation in respondent’s month-year of birth and region of residence during the war. We find that individuals exposed to conflict episodes early in life display lower levels of trust in the adulthood. The gap persists after controlling for region and date-of-birth fixed-effects, current and past socio-economic status, parental investment in human capital and other socio-demographic and economic controls including current mental and physical health.

**Keywords:** Trust, World War II, Childhood experiences, Europe.

**JEL Classification:** A13 (Relation of Economics to Social Values); J14 (Economics of the elderly); N34 (Europe 1913-)

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## 1. Introduction

Trust in others is recognized as a key ingredient of societal success. As a pillar of the broader concept of social capital (e.g. Coleman 1990; Putnam 1995; Uslaner 2002), it has been defined as “lubricant” of the entire socioeconomic system (Arrow, 1974), with positive effects on growth (Zak and Knack, 2001; Algan and Cahuc, 2010), financial development (Guiso et al. 2004), quality of institutions (La Porta et al., 1997), innovation (Gulati and Wang 2003) and subjective well-being (Bjørnskov, 2003). Trust has been also documented to be persistent in time as a result of the transmission of values from parents to children (Dohmen et al., 2012). However, while outcomes of trust have been largely examined in the economic literature, less emphasis has been placed on understanding the determinants of trust. Among the latter, exposure to war early in life emerges a promising candidate.

Recent empirical studies have showed that war exposure affects trust, though often with conflicting results. For instance, Becchetti et al. (2011) and Cassar et al. (2013) document negative effects of exposure to violence on social preferences, respectively in Kenya and Tajikistan. Positive effects, instead, are showed by Bellows and Miguel (2009) and Voors et al. (2012) with respect to the violence experienced during the civil war in Sierra Leone and Burundi. These studies, however, focus on *adult* individuals exposed to recent or past (at most ten years earlier) conflicts. Yet, what are the consequences of *early-life* exposure to war episodes on trust at the adult stage is still an open issue.

Psychological research suggests that preferences or attitudes, like trust in others, are developed very early in life (Erikson, 1963). Because trust embraces subjective expectations on others’ trustworthiness (Gambetta, 1998), beliefs that a person refrains from causing emotional harm (Rotenberg et al., 2010) and a general faith in the self and in the world (Erikson, 1963), the role of parents in the development of children’s trust is crucial. Stressed parents may be less likely to stimulate secure attachment (Bowlby, 1979) and to instil the belief that unknown others, in general, can be trusted. Anxiety caused by frequent war episodes might also increase emotional instability of parents and inconstant care-giving, because – for instance – food scarcity or lack of job opportunities

require time investment in coping strategies, which are implemented often outside the household. Psychological observations made at Hampstead - a residential war nursery - during the Second World War (WW2) by Burlingham and Freud (1942) suggest that quality of care-giving and parental reactions to bombing events are important factors in explaining the degree of traumatization of pre-school children. If quality of care-giving and parents' attitudes transmitted to children early in life are crucial for the development of trust attitudes, early-exposure to war episodes might have persistent effects on infants' preferences.

This paper sheds lights on the link between early-life exposure to WW2 and levels of trust at adult age. To this purpose we rely the Survey on Health, Ageing, and Retirement in Europe (SHARE), which contains retrospective data of Europeans aged above 50. In particular Wave 3 of SHARE provides a rich set of information on respondents' childhood characteristics and life episodes (e.g. migration to other region), which can be combined with levels of trust that are measured in other waves. We merge the region were each respondent lived during the war (1939-1945) with conflict episodes happened in that region, and restrict the sample to individuals aged at most six during WW2. By exploiting the joint variation in period-location of conflicts and in the respondents' month-year and region of birth, we estimate the effect of early-life exposure to WW2 on the older adults' level of trust.

Our study extends to trust the previous results on the persistent effects of war exposure on health and socio-economic status (Ichino and Winter-Ebmer, 2004; Akbulut-Yuksel, M., 2009; Kesternich et al., 2014; Akbulut-Yuksel, M. 2014; Havari and Peracchi, 2016). We contribute to this literature by focussing on what is considered by psychologists as a critical age for value development (pre-school years) and considering a broader set of EU regions. Moreover, our methodological improvement hinges on a larger individual-level variability in victimization both between and within regions, which allows us to control for region fixed effects. This is not just a technical issue, because accounting for region-specific characteristics mitigates the confounding effect of the stable societal characteristics (e.g. social norms, reconstruction paths, institutional quality) on the respondents' level of trust.

Our results show a robust and negative effect of early WW2-exposure on later trust. The effect is significant both at the intensive (months of exposure) and extensive margin (at least one month of exposure), and robust when controlling for percapita GDP and number of deaths during WW2. Placebo tests on respondents born after WW2 confirm the validity of our results. Interestingly, the trust gap between exposed *vis-à-vis* non-exposed individuals does not narrow when controlling for heterogeneous childhood quality, e.g. parental investment in human capital, socio-economic status (SES) at age 10 and the absence of a parent. The effect persists also when accounting for present differences in socio-economic characteristics, health status and mental well-being. Because neither the childhood nor the adulthood SES contribute to narrow the systematic differences in trust due to war exposure, a candidate interpretation of our finding relies on the early-life insecure attachment or parental stress perceived by children during the years of the war.

## **2. Background literature**

Caregivers appear for young children as key interfaces between the self and the others. Not only parents are the primary source of information, judgement and filter regarding the external world, but also they provide children with role models and emotional stability. Erikson's seminal contribution emphasizes that trust or mistrust depends on the type of caregiving received during the childhood (Erikson, 1959). In particular, trust emerges when infants experience responsive caregiving, while harsh treatments or tardive responsiveness could instead stimulate mistrust (Crain, 2005; Erikson, 1993). The trust formed in early childhood through the interaction with the caregivers has been also showed to predict social functioning in the adulthood (Waters et al., 1995). Moreover, children in pre-school age are showed to be particular vulnerable to the effects of wartime violence and destruction (Arroyo and Eth, 1996; Pynoos and Nader, 1993), which creates in them a sense confusion and self-blame. Such reactions are sometimes amplified by surrounding adults, who become stressed and overextended in response to traumatic events. More specifically to WW2, Burlingham and Freud (1942) provide clinical evidence that children under five years are little affected by bombing, provided they were not injured and were in

their mother's care, and if latter showed no signs of panic. Hence this literature motivates our study because it suggests that traumatic events witnessed directly (through personal victimization) or indirectly (through parents' reactions to war events) during the initial years of life may have long-lasting impact on trust.

Our paper is closely related to the previous studies by Kesternich et al. (2014) and Havari and Peracchi (2016), both providing empirical evidence on the negative effects of exposure to WW2 on health outcomes. However, different from our analysis, their identification strategy does not combine the variation in the month-year of conflict with the variation in month-year of birth of the respondents. Moreover, those studies include also Europeans born after the war and implicitly assume that, for these individuals, living in a region that witnessed conflicts during the WW2 has the same effects as living in a non-conflict region. This might not be a plausible assumption in our study as the average levels of trust and trustworthiness in a conflict region affect the beliefs of individuals growing up in that region after the end of the war. Finally, in Kesternich et al. (2014) war exposure varies at regional level and, therefore, unobserved region fixed effects could produce spurious correlation. The authors only control for country fixed effects, but this is not sufficient to avoid the bias induced by unobserved heterogeneity for at least three reasons. First, country borders changed frequently during the years of the war and it is therefore difficult to identify a common country fixed effects during the years of the war.<sup>1</sup> Second, individuals in conflict regions might have moved to non-conflict areas during and after the war. It is therefore difficult to assign to each individual a unique country dummy during and after the years of the war. Third, trust varies substantially within-countries (and likely do so also other socio-economic characteristics) and country fixed-effects do not account for this source of heterogeneity. Our approach instead allows to net out region fixed effects for two reasons. First, by exploiting differences in place-period of birth and place-period of conflict, our measure of war exposure has sizeable variation at the individual level. Second, we restrict the sample only to individuals who never have migrated to other regions. This is a substantial improvement with respect

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<sup>1</sup> Moreover, it is not clear from the analysis whether they control for the country of residence during WW2 or at the time of the interview

to the aforementioned studies as trust levels are very heterogeneous across EU regions (e.g. Tabellini, 2010), though stable in time (Volken, 2002). Omitting region fixed effects would lead to biased inference as regional specific characteristics might induce a spurious correlation between living in conflict regions during WW2 and later trust.

Closely related to our study is also the paper by Ichino and Winter-Ebmer (2004) on the WW2 effects on education, which shows that individuals living in Germany and Austria who were ten years old during WW2 are less educated than the similar cohort living in Switzerland and Sweden (non-war countries). Our analysis expands these results by including individuals who lived in a large set of EU regions involved and non-involved in the war, and who witnessed conflicts during the childhood at different time periods. Therefore, instead of comparing cohorts in war vs. non-war countries (that might be highly heterogeneous) we are able to compare individuals who grew up in the same region but were differentially exposed to war only because they were born in different months. A similar approach is chosen by Bundervoet et al. (2009) to assess how children's' exposure to violence during the civil war in Burundi affected childhood health. In the same spirit but limited to Germany, Akbulut-Yuksel (2014) exploit the exogenous region-by-cohort variation in the intensity of WW2 to assess the long-term consequences of war exposure on human capital and labor market outcomes of children.

### **3. Data**

We use three sources of data. The first is SHARE, a rich and multidisciplinary database that collects socio-demographic and health information of Europeans aged 50+. More specifically, we use wave 2 and wave 5, which include a specific question on generalized trust jointly with several socio-demographic characteristics. We also use wave 3 (called "SHARELIFE"), which includes retrospective information on life events. In particular, our measure of trust is the 0-10 scale answer to the question "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" (0 = you can't be too careful; 10 = most people can be trusted.). Regarding the retrospective information, SHARELIFE focuses on past life events of

respondents, including regions and years of moving and characteristics of childhood. On the basis of this information we create an index capturing socio-economic status (SES) during the childhood by applying a principal component analysis as in Havari and Peracchi (2016). As we can track the regions where individuals have lived since they were born and the year of each moving, we can precisely identify the exposure of individuals to the war events.<sup>2</sup> The reliability of retrospective data with respect to this specific wave of SHARE has been extensively proved by Havari and Mazzonna (2015). The authors document the internal and external consistency of childhood health and SES measures.

The second source of data is an original and detailed description of combat events during WW2, including battles, attacks, bombings, invasions, and occupations as described by, among others, Ellis (1994), Davies (2006) and Collier et al. (2004). Our final dataset complements the war data used by Kesternich et al. (2014) by considering major bombing and minor attacks at regional level in each month between September 1939 and September 1945.<sup>3</sup>

We combine information on the month-year of birth, the region where respondents lived in each year and the combat events occurred in each region to create a variable *War* capturing the number of months of war events that each individual has experienced in the period Sept. 1939 - Sept. 1945. Figure 1 shows an example for three hypothetical individuals (i.e., A, B, and C) who lived in the same region during the period Sept. 1939 - Sept. 1945, but have different *War* measure as they did not experienced the same events. Individual A has experienced three war events and therefore her *War* will be equal to three; individual B has experienced two war events as she was born after the first war event; therefore *War* will be equal to two. Analogously, individual C's *War* will be equal to one. This allows us to create a highly varying measure of war exposure at the individual level. In facts, respondents who lived in the same

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<sup>2</sup> We restrict the analysis to individuals born during the WW2 who never moved to other regions to avoid potential bias due to selective migration.

<sup>3</sup> We consider the beginning of the war on September 1939, when Germany occupied Poland, and the ending of the war on September 1945, when the formal Japanese surrender was signed.

region for some years may have completely different values of *War*, which would capture their real exposure to combats.<sup>4</sup>

Our dataset includes Austria, Germany, Sweden, The Netherlands, Italy, Spain, France, Denmark, Greece, Switzerland, Belgium, Czech Republic and Poland. The analysis of the WW2 by specific months in which conflicts happened allows us not to confound the effect of the WW2 with other wars that ended before April 1945, such as the Spanish Civil War and the German occupation of Czech Republic.

#### **4. Descriptive evidence**

Table 1 shows descriptive statistics of the main variables used in the analysis. Respondents' trust takes on average the value of 5.8, while 39 percent of the sample was exposed to at least one conflict episode during WW2 (variable *War*). The sample is almost perfectly balanced in terms of gender (54 percent are women) and the majority of individuals are married (74 percent) and retired (73 percent). Most of our respondents have a primary education level (29 percent).

In order to compare respondents' socio-economic status during the childhood, we extract the first component from a principal component analysis aimed at capturing latent family characteristics at age 10. As in Havari and Peracchi (2016), the principal component analysis includes the number of rooms per capita, the number of books at home and the main occupation of the breadwinner. Figure 2a compare the distribution of the principal component of SES in childhood by war exposure. The two distributions almost perfectly overlap, highlighting that on average there are no significant differences in SES at age 10 between respondents exposed and non-exposed to war episodes. By comparing average SES in childhood by war exposure and quarter of birth, we notice that the main differences in SES emerges among those who were older during the war, i.e. those born in 1939 (Figure 2b). The average difference in childhood SES between exposed and non-exposed starts decreasing from 1940

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<sup>4</sup> Note that if a war event occurred in region *x* on a specific day, for instance, May 1st 1940, we consider one more month of our war exposure (*War*) for respondents born on May 1940 and before, and lived in region *x* in 1940.



onwards and, apart from the last quarter of 1940, the SES path for the two groups looks similar across birth semesters.

Generalized trust is on average significantly higher for respondents that were exposed to any conflict event as documented in Figure 3a. By comparing average levels of trust over semesters of birth, non-exposed respondents systematically report higher trust than exposed respondents, while – as expected – there is evidence of convergence for those born towards the end of the war (Figure 3b). This result is consistent with the placebo tests implemented on the sample of respondents born after the WW2 (see section 5). This preliminary evidence suggest that individuals who did not experience war events early in life enjoy higher trust levels in the adulthood than those who witnessed at least one war episode. This gap does not seem to be explained by different SES levels during childhood between the two groups.

The maps in Figure 4a and 4b report respectively the geographical distribution of war episodes<sup>5</sup> and the fraction of respondents who experienced at least one month of conflict during the childhood<sup>6</sup>. Both maps highlight a substantial within-country variability in conflict magnitude and in the respondents' degree of exposure.

#### **4. Econometric analysis**

By exploiting variation in i) month-year of war episodes, ii) region where the latter occurred and iii) month-year of birth of respondents during WW2, we identify the effect of being exposed to war episodes on later levels of trust. Our identification strategy exploits region-by-period variation in conflicts and respondents' month of birth. Instead of considering cohorts as in Bundervoet et al. (2009) and Akbulut-Yuksel (2014), we compare individuals born in a different month-year during WW2 *and* in different regions where conflicts occurred. As a result, in our sample individuals' length of exposure (in months) depends both on the timing and location of each war episode as well as on the (plausibly exogenous) month-year of birth.

Our estimating equation writes:

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<sup>5</sup> Regions in light blue witnessed no war episodes; for regions in white no data are available.

<sup>6</sup> Regions in light blue show respondents who were not exposed to war in the childhood; for regions in white no data are available.

$$\text{Trust}_{ijt} = \alpha_j + \gamma_t + \beta_1 \text{War}_{ijt} + \beta_2 \text{Female}_{ijt} + \beta_3 \text{Wave}_{ijt} + \sum_k \beta_k X_{k,ijt} + \varepsilon_{ijt} \quad (\text{eq. 1})$$

where  $\text{Trust}_{ijt}$  is the value of generalized trust of individual  $i$ , born in period  $t$  and living in region  $j$ ;  $\alpha_j$  and  $\gamma_t$  capture respectively region<sup>7</sup> and period fixed effects.  $\text{War}_{ijt}$  is a (0/1) dummy for individuals who experienced at least one episode of conflict. More specifically, this variable is equal to one if the respondent was born in a region where a conflict occurred ( $\text{War\_Region}_j$ ) and at least one month before the conflict ( $\text{War\_Period}_{it}$ ), i.e.  $\text{War}_{ijt} = \text{War\_Region}_j * \text{War\_Period}_{it}$ . Because some regions witnessed frequent conflicts during the WW2 (and therefore within-region variation is limited), we measure war exposure also at the intensive margin by considering the number of months a respondent have been exposed to war episodes during the childhood<sup>8</sup>. This variable captures the plausibly exogenous variation in length of WW2-exposure induced by different birth periods also in case of individuals living in a region exposed to frequent conflicts.  $\text{Female}_{ijt}$  is a (0/1) dummy for women;  $\text{Wave}_{ijt}$  controls for the wave (wave 2 or wave 5) of the respondents' answers. In alternative specifications we also control for a set of  $k$  socio-demographic variables ( $X_{k,ijt}$ ) including education level (years of schooling), income percentiles, marital status, job status, health

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<sup>7</sup> We consider the region where the respondent  $i$  has spent more time during the period 1939-1945. Geographical information are collected at Nuts2-level for Austria, Switzerland, Czech Republic, Denmark, Spain, Greece, Italy, Poland and Sweden, and Nuts1-level for Belgium, Germany, France, and The Netherlands.

<sup>8</sup> We created a categorical variable taking value zero for no months of exposure to war, one for one to three months of exposure and two for more than three months of exposure.

status<sup>9</sup>, and mental well-being (in particular memory performance, variable *Memory*)<sup>10</sup>.

Baseline results are reported in Table 2 show OLS estimates of eq. 1 and suggest that exposure to war during the childhood has negative effects on trust in the adulthood. In particular, the negative effect of war exposure is significant both at the extensive margin (column 1) and the intensive margin, though in the latter case for longer exposure (column 3). As the effect of war exposure on trust might be mediated by other variables (e.g. education, income and health), we control for other socio-demographic and economic characteristics measured at the time of the interview (columns 2 and 4). Results are very stable especially at the extensive margin (column 2), suggesting that the negative effect of exposure to war during the pre-school years on trust is not mainly due to observable (and potentially unobservable) characteristics leading to poor health, low education and inadequate income. Controlling for memory performance (*Memory*) allows us also to mitigate a possible measurement-error bias, which is a relevant issue when retrieving past information from aged individuals.

Finally we check whether the gap in trust between exposed and non-exposed to war reduce in significance and/or magnitude when controlling for specific events or characteristics of the respondents' childhood. To this purpose, we first check for the mediating role of SES in childhood, which captures also the parental investment in human capital (variable *SES in childhood*). Results are reported in Tables 3a-b and show that the significance and the magnitude of the war effect do not change remarkably (columns 1-2 in Tables 3a-b). We also add among controls the respondent's current number of chronic diseases, the

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<sup>9</sup> As SHARE contains several measures of individuals' health, we include in our analysis i) the number of chronic diseases (*n\_chronic\_diseases*) reported by the respondent and ii) the first extracted component (*health\_functionalities*) from a factor analysis of the indices capturing mobility functionalities, i.e. *adla* (sum of the scores for five tasks, i.e. dressing, bathing or showering, eating, cutting up food, walking across a room and getting in or out of bed), *iadla* (sum of scores for telephone calls, taking medications and managing money), *mobility\_index* (sum of scores for walking 100 meters, walking across a room, climbing several flights of stairs and climbing one flight of stairs), *large\_muscle* (sum of scores for sitting two hours, getting up from chair, stooping, kneeling, crouching, and pulling or pushing large objects), *gross\_motor\_skills* (the sum of scores for walking 100 meters, walking across a room, climbing one flight of stairs, and bathing or showering); the higher *health\_functionalities*, the poorer the mobility performance.

<sup>10</sup> *Memory* is the sum of scores from two recalling tasks and contains the number of words recalled in the first trial of (and in a delayed) word recall task.

presence of a parent at age 10 (*mother at age 10; father at age 10*), any hunger episode happened during the war (*hunger episode*), self-assessed health status when the respondent was a child (*health status in childhood*), residence in a rural area during the childhood (*rural area when child*) and any vaccination received at early age (*vaccinated when child*). Results are robust also to the inclusion of all these controls (columns 3 and 4 in Tables 3a-b), suggesting that early exposure to the war may have a persistent effect on trust later in life that does not entirely depend mainly on parental investment in human capital or later individuals' choices and personal characteristics.

## 5. Placebo tests and robustness checks

To exclude that our results are lead by noise in war exposure and reported trust, we re-estimate the previous models on individuals born seven years later, i.e. in the period 1946-1952. During this period there were no actual war episodes, with the exception of the Greece civil war, and therefore we rely on the perfect independence between WW2 events and the level of trust of our new sample. Tables 4a-b show the results of this placebo test. We observe no significant effect of early exposure to WW2 events on the level of trust. The null effect remains also when controlling for socio-demographic characteristics, childhood status, and when clustering standard errors cluster by country/month-year of birth.

To check whether previous results depend on the chosen econometric specification, we perform several robustness checks. First, we consider two different ways for clustering standard errors (Tables A1-A2 in the Appendix), i.e. at individual level since we have panel respondents in wave 4 and 5 of Share, and by country/month year of birth in order to account for possible error correlation among individuals born in the same period. Second, we estimate eq. 1 through ordered probit, which accounts for the ordered nature of our dependent variable (Tables A3-A4 in the Appendix). Finally, we include as controls the country-specific characteristics during WW2 (Tables A5-A6 in the Appendix), such as per capita GDP (Maddison, 2011), the share of victims during the war period or the number of civilian and military deaths.<sup>11</sup> All these

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<sup>11</sup> Data are collected from Van Mourik (1978), Putzger (1963), Overman (1999) and Statistical Yearbook for the German Reich (1939).

estimates confirm the negative and significant effect of early exposure to WW2 on generalised trust.

## **6. Conclusion**

If trust in others is generally developed during pre-school years through children's interaction with parents, the type of attachment and quality of child-care are crucial for nurturing positive expectations about the surrounding world. Parents' reactions to traumatic events are likely to affect the transmission of generalized trust values and beliefs on others' trustworthiness to children. Beyond the direct exposure of children to war events at a vulnerable age, a long-lasting war may influence the infant's formation of trust in others through the stress and anxiety intentionally or unintentionally exhibited by parents at home during or in the aftermath of war episodes.

With this paper we test the impact of early exposure to the WW2 on levels of trust at adult age in Europe. Our war measure captures the months of exposure to any combat episode related to the WW2 during the period 1939-1945. By exploiting variation in the period and place of combats as well as month-year and region of birth of respondents, we identify the effect of early exposure to war at the intensive and extensive margin.

Controlling for month-year of birth and region fixed effects, we provide empirical evidence of a significant and negative effect of war exposure at age 0-6 on generalized trust at adult age. Surprisingly, the gap in trust due to early war exposure does not narrow when accounting for several mediating factors, including current socio-demographic, economic and health characteristics, socio-economic status and health conditions in the childhood, episodes of hunger witnessed during the war, the absence of a parent at age 10, the country levels of GDP per capita and the number of deaths during WW2. Results are also robust to different estimation methods and are corroborated by placebo tests.

Our findings highlight that exposure to war at early age may have a persistent impact on trust later in life and that the war effect seems not to be driven by parental investment in human capital or direct/indirect victimization. This result suggests that the WW2 may have affected trust formation of infants through perceived stress and anxiety of parents at home, e.g. via inconstant

child-care and insecure attachment. On the basis of the psychological observation by Burlingham and Freud (1942), further research is needed to identify on a larger scale and in a clearer way the psychological channels through which war exposure early in life affects trust levels at adult age.

## References

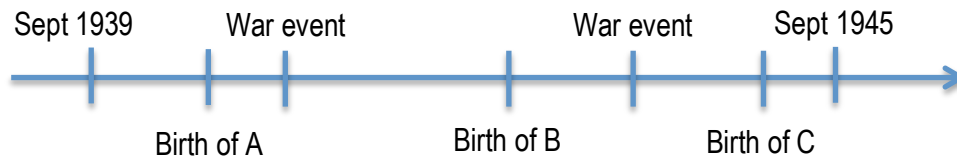
- Akbulut-Yuksel, M. (2014). Children of War The Long-Run Effects of Large-Scale Physical Destruction and Warfare on Children. *Journal of Human resources*, 49(3), 634-662.
- Algan, Y., and Cahuc, P. (2010). Inherited trust and growth. *American Economic Review*, 100(5), 2060-2092.
- Arrow, K.J. (1974). *The Limits of Organization* (1st edn). Norton: New York.
- Arroyo, W., & Eth, S. (1996). *Traumatic stress reactions and post- traumatic stress disorder (PTSD)*. In R. Apfel & B. Simon (Eds.), *Minefields in the heart: The mental health of children in war and communal violence*. New Haven, CT: Yale University Press.
- Becchetti, L., Conzo, P., & Romeo, A. (2014). Violence, trust, and trustworthiness: evidence from a Nairobi slum. *Oxford Economic Papers*, 66(1).
- Bellows, J., & Miguel, E. (2009). War and local collective action in Sierra Leone. *Journal of public Economics*, 93(11), 1144-1157.
- Bjørnskov, C. (2003). The happy few: Cross-country evidence on social capital and life satisfaction. *Kyklos*, 56, 3-16.
- Bowlby, J. (1979), *The Making & Breaking of Affectional Bonds*, Psychology Press.
- Burlingham, D., & Freud, A. (1942). Young children in war-time.
- Bundervoet T., Verwimp P., and Akresh R. (2009), Health and civil war in rural Burundi. *Journal of Human Resources*, 44: 536-563.
- Cassar, A., Grosjean, P., & Whitt, S. (2013). Legacies of violence: trust and market development. *Journal of Economic Growth*, 18(3), 285-318.
- Coleman, J. (1990). *Foundations of Social Theory*. Cambridge, MA: Harvard University Press.
- Collier, P. et al. (2004). *The Second World War*. Oxford: Osprey Publishing.
- Davies N. (2006). *No Simple Victory: World War II in Europe, 1939-1945*, Viking Press.
- Dohmen, Thomas, Armin Falk, David Huffman, and Uwe Sunde (2012). The Intergenerational Transmission of Risk and Trust Attitudes. *The Review of Economic Studies*, 79(2), 645-677.
- Ellis J. (1994), *World War II. A Statistical Survey*, Aurum Press.
- Erikson, E. (1959). Identity and the life cycle. *Psychological Issues*, 1(1), 18-164.

- Erikson, E. H. (1993). *Childhood and society*. New York: Norton.
- Erikson, E. H. (Ed.). (1963). *Youth: Change and challenge*. Basic books.
- Gambetta, D. (1998). *Can we trust trust?* In: D. Gambetta (Ed.), *Trust: Making and breaking cooperative relations* (pp. 213–238). Oxford: Basil Blackwell.
- Guiso, L., Sapienza, P., and Zingales, L. (2004). The role of social capital in financial development. *The American Economic Review*, 94(3), 526-556.
- Gulati R, Wang, L.O. (2003). Size of the pie and share of the pie: implications of structural embeddedness for value creation and value appropriation in joint ventures. *Research in the Sociology of Organizations*, 20: 209–242.
- Havari, E., and Mazzonna F. (2015), Can we trust older people's statements on their childhood circumstances? Evidence from SHARELIFE. *European Journal of Population*, 33: 233–257.
- Havari, E. and Peracchi F. (2016). Growing up in wartime: Evidence from the era of two world wars. *Economics & Human Biology*.
- Ichino A., and Winter-Ebmer R. (2004), "The long-run educational cost of World War Two". *Journal of Labor Economics*, 22, 57–86.
- Kesternich I., Siflinger B., Smith J.P., and Winter J. (2014), The effects of World War II on economic and health outcomes across Europe. *Review of Economics and Statistics*, 96, 103–118.
- La Porta R., Lopez-de-Silanes F., Shleifer A. and Vishny R.W. (1997). Trust in Large Organizations. *American Economic Review*, 87(2): 333-338.
- Maddison, A. (2011), Historical statistics: Statistics on World population, GDP and per capita GDP, 1-2008, [http://www.ggdc.net /MADDISON/oriindex.htm](http://www.ggdc.net/MADDISON/oriindex.htm).
- Overman, R. (1999), *Deutsche Militaerische Verluste im 2 Weltkrieg*, Munich: Oldenburg Verlag.
- Pynoos, R., Nader, K. (1993). *Issues in the treatment of posttraumatic stress disorder in children and adolescents*. In: Wilson, J., Raphael, B. (eds). *International Handbook of Traumatic Stress Syndromes*. NYC: Plenum Press, 535-549.
- Putnam, R. (1995). Bowling alone: America's declining social capital. *Journal of Democracy*, 6(1), 65-78.
- Putzger, F.W. (1963), *Historischer Weltatlas*, Bielefeld: Velhagen & Klasing.
- Rotenberg, K. J., Addis, N., Betts, L. R., Corrigan, A., Fox, C., Hobson, Z., ... & Boulton, M. J. (2010). The relation between trust beliefs and loneliness during early childhood, middle childhood, and adulthood. *Personality and Social Psychology Bulletin*.
- Statistisches Jahrbuch für das Deutsche Reich* (Statistical Yearbook), Kaiserliches Statistisches Amt, Berlin: Puttkammer & Mühlbrecht, 1909–1939.
- Tabellini, G. (2010). Culture and institutions: Economic development in the regions of Europe. *Journal of the European Economic Association*, 8, 677-716.

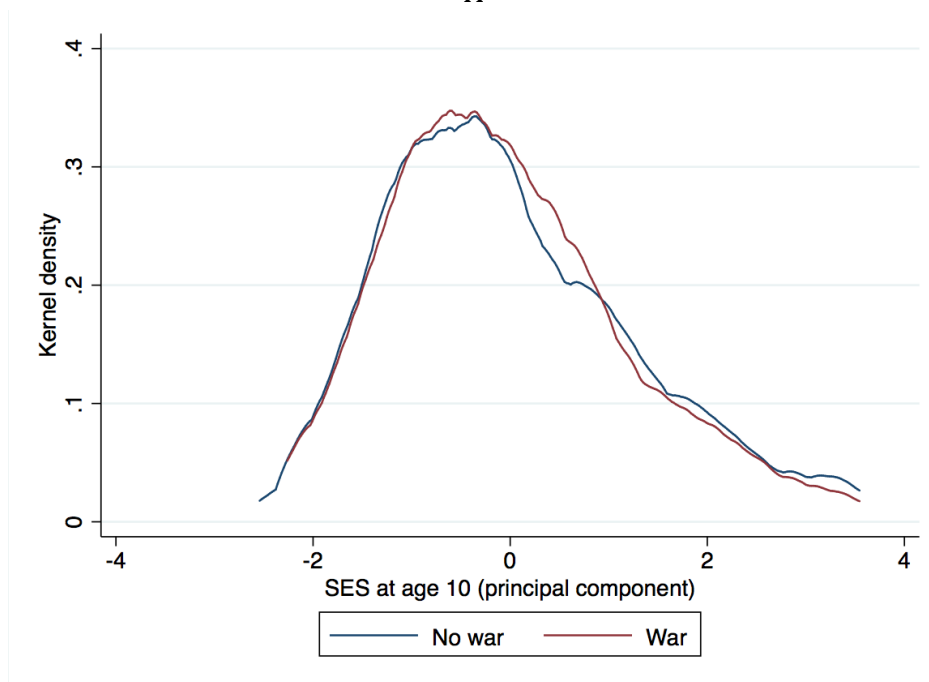
- Uslaner, E. M. 2002. *The Moral Foundations of Trust*. New York, Cambridge University Press.
- Van Mourik, W. (1978), *Bilanz des Krieges*. Rotterdam: Lekturama.
- Volken, T. (2002). Elements of trust: The cultural dimension of Internet diffusion revisited. *Electronic Journal of Sociology*, 6(4), 1-20.
- Waters, E., Heinicke, C. M., & Bretherton, I. (1995). *Caregiving, cultural, and cognitive perspectives on secure-base behavior and working models: New growing points of attachment theory and research*. University of Chicago Press.
- Zak, P.J., and Knack, S. (2001). Trust and growth. *The Economic Journal*, 111, 295-321.



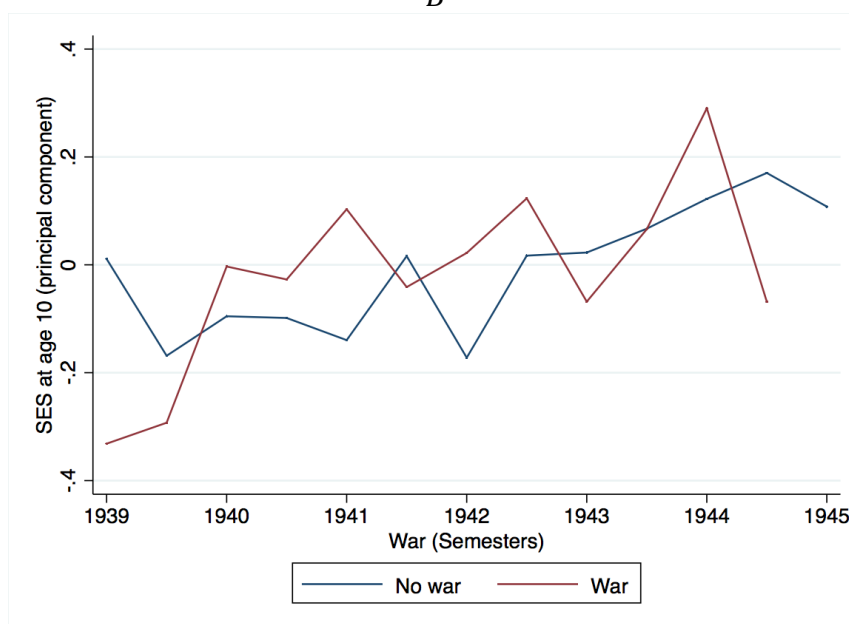
**Figure 1** – Examples of WW2-exposure



**Figure 2** – Socio-economic status during childhood and exposure to WW2  
*A*

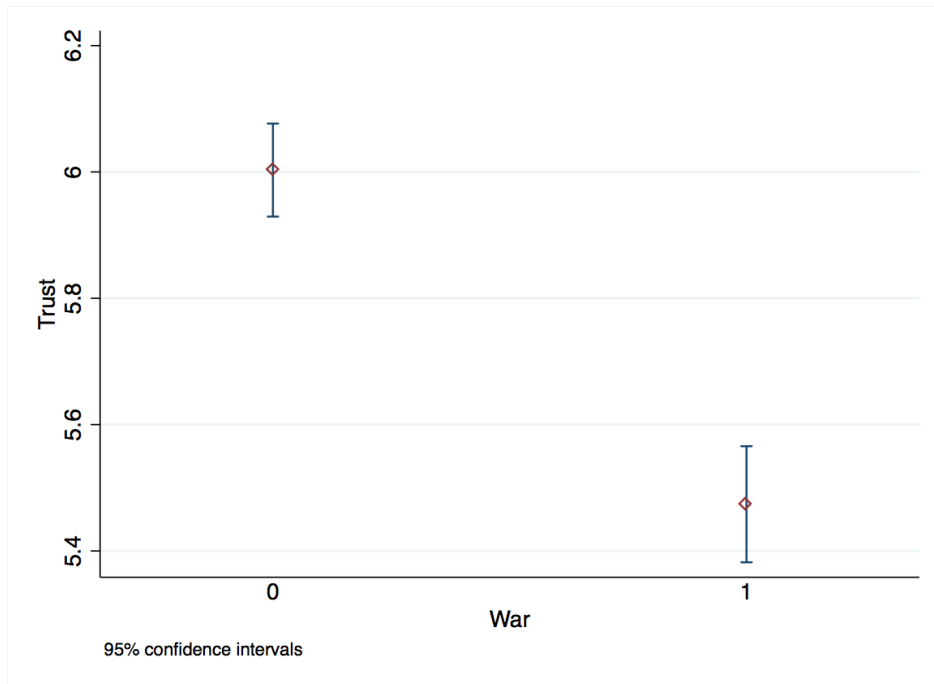


*B*

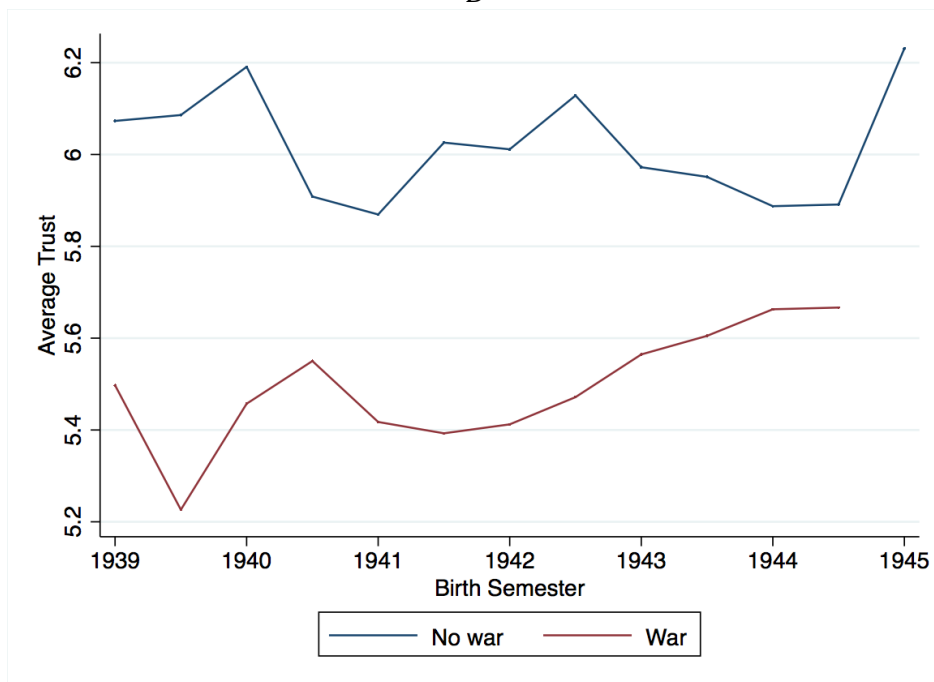


**Figure 3 – Average trust by WW2-exposure**

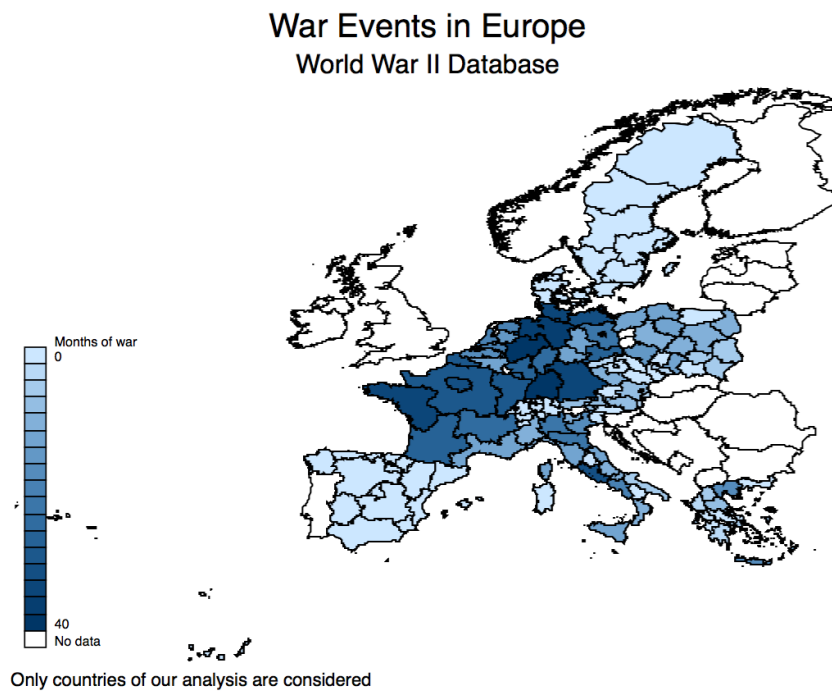
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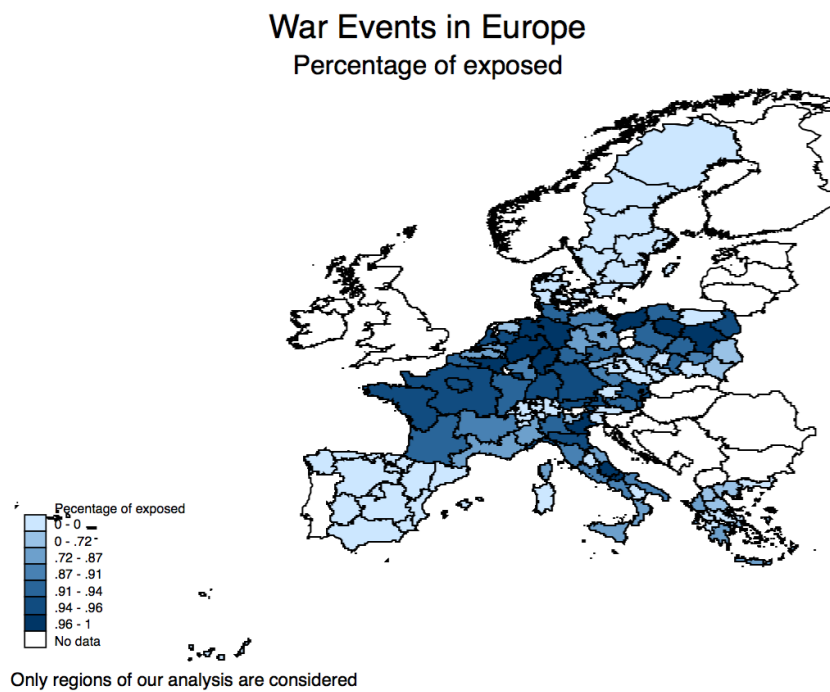
B



**Figure 4a** – Regional distribution of war episodes during WW2



**Figure 4b** – Respondents exposed to at least one war episode during WW2



**Table 1 – Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
Trust	6759	5.80	2.423	0	10
War (0-1)	6759	0.39	0.488	0	1
War (0-2)					
	<i>0 = No war events</i>	4,111	60.82		
	<i>1 = 1-3 war events</i>	1,319	19.51		
	<i>2 = 3+ war events</i>	1,329	19.66		
Year of birth					
	1939	306	4.53		
	1940	1,051	15.55		
	1941	948	14.03		
	1942	1,082	16.01		
	1943	1,163	17.21		
	1944	1,306	19.32		
	1945	903	13.36		
Wave					
	2	4,100	60.66		
	5	2,659	39.34		
Female	6759	0.54	0.498	0	1
Marital status					
	<i>Married and living together with spouse</i>	5,049	74.73		
	<i>Registered partnership</i>	101	1.49		
	<i>Married, living separated from spouse</i>	102	1.51		
	<i>Never married</i>	312	4.62		
	<i>Divorced</i>	460	6.81		
	<i>Widowed</i>	732	10.83		
Income percentile					
	1	506	7.49		
	2	582	8.61		
	3	741	10.96		
	4	760	11.24		
	5	770	11.39		
	6	761	11.26		
	7	795	11.76		
	8	670	9.91		
	9	633	9.37		
	10	541	8.00		
Job Status					
	<i>Retired</i>	4,927	73.22		
	<i>Job (Employed, self-employed, Homemaker)</i>	1,566	23.27		
	<i>No job (Unemployed, Sick or disabled)</i>	236	3.51		
Education					
	<i>None or Primary</i>	1,967	29.12		
	<i>Lower Secondary</i>	1,306	19.33		
	<i>Upper Secondary</i>	1,909	28.26		
	<i>Tertiary</i>	1,573	23.29		
Health functionalities	6,759	-0.18	1.449	-0.916	12.475
Memory	6,730	9.09	3.269	0	20
SES in childhood (first extracted component)	6,439	1.59e-09	1.251	-2.539	3.580
N. chronic diseases	6,752	1.15	1.151	0	7
Hunger episode (during WW2)	6,759	0.03	0.164	0	1
Mother at age 10 (0= absent)	6,753	0.95	0.225	0	1
Father at age 10 (0= absent)	6,753	0.872	0.334	0	1
Vaccinated when child	6,702	0.04	0.193	0	1
Rural area when child	6,737	0.45	0.498	0	1
Health status when child					
	<i>Excellent</i>	2,328	34.63		

<i>Very Good</i>	2,155	32.05
<i>Good</i>	1,656	24.63
<i>Fair</i>	437	6.50
<i>Poor</i>	147	2.19

**Table 2 – War exposure and trust (OLS estimates)**

Dep var: <i>Trust</i>		(1)	(2)	(3)	(4)
War		-0.243**		-0.243**	
		(0.123)		(0.122)	
War (Ref=No war)					
	<i>1-3 events</i>		-0.175		-0.220
			(0.136)		(0.136)
	<i>4+ events</i>		-0.336**		-0.318**
			(0.146)		(0.145)
Wave 5		0.210***	0.211***	0.327***	0.327***
		(0.0596)	(0.0596)	(0.0621)	(0.0621)
Female		0.0802	0.0812	0.0911	0.0918
		(0.0574)	(0.0574)	(0.0612)	(0.0612)
Marital status (Ref=Married)					
	<i>Registered partnership</i>			-0.00606	-0.00222
				(0.236)	(0.236)
	<i>Married, living separated from spouse</i>			-0.343	-0.333
				(0.238)	(0.239)
	<i>Never married</i>			0.0457	0.0448
				(0.142)	(0.142)
	<i>Divorced</i>			-0.217*	-0.214*
				(0.122)	(0.122)
	<i>Widowed</i>			0.160	0.162
				(0.100)	(0.100)
Income percentile (Ref=10)					
	<i>1</i>			-0.274*	-0.276*
				(0.153)	(0.153)
	<i>2</i>			-0.531***	-0.534***
				(0.148)	(0.148)
	<i>3</i>			-0.462***	-0.462***
				(0.137)	(0.137)
	<i>4</i>			-0.268**	-0.268**
				(0.134)	(0.134)
	<i>5</i>			-0.383***	-0.383***
				(0.132)	(0.132)
	<i>6</i>			-0.259**	-0.256*
				(0.132)	(0.132)
	<i>7</i>			-0.194	-0.195
				(0.130)	(0.130)
	<i>8</i>			-0.174	-0.176
				(0.134)	(0.134)
	<i>9</i>			-0.116	-0.115
				(0.136)	(0.136)
Job status (Ref=Retired)					
	<i>Job</i>			0.239***	0.240***
				(0.0765)	(0.0765)
	<i>No job</i>			0.249	0.240
				(0.162)	(0.162)
Education (Ref=Primary)					
	<i>Lower Secondary</i>			0.243***	0.245***

			(0.0907)	(0.0907)
			0.273***	0.274***
			(0.0862)	(0.0862)
			0.541***	0.542***
			(0.0942)	(0.0942)
Health functionalities			-0.131***	-0.130***
			(0.0212)	(0.0212)
Memory			0.0653***	0.0652***
			(0.00981)	(0.00982)
Month/Year of birth FE	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Constant	5.616***	5.519***	4.873***	4.789***
	(0.490)	(0.496)	(0.499)	(0.504)
Observations	6,555	6,555	6,494	6,494
R-squared	0.157	0.157	0.189	0.189

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 3a – War exposure and trust: the role of childhood SES**

	Dep var: <i>Trust</i>	(1)	(2)	(3)	(4)
War		-0.269**	-0.269*	-0.282**	-0.282**
		(0.123)	(0.138)	(0.124)	(0.138)
SES in childhood		0.144***	0.144***	0.145***	0.145***
		(0.0282)	(0.0319)	(0.0285)	(0.0321)
N. of chronic diseases				-0.128***	-0.128***
				(0.0261)	(0.0294)
Hunger episode				-0.192	-0.192
				(0.190)	(0.257)
Mother at age 10				0.360**	0.360
				(0.173)	(0.233)
Father at age 10				-0.152	-0.152
				(0.106)	(0.126)
Health status when child (Ref = Excellent)					
<i>Very good</i>				0.0214	0.0214
				(0.0734)	(0.0780)
<i>Good</i>				-0.0157	-0.0157
				(0.0823)	(0.0874)
<i>Fair</i>				-0.229*	-0.229
				(0.130)	(0.150)
<i>Poor</i>				-0.472**	-0.472*
				(0.211)	(0.285)
Vaccinated when child				-0.177	-0.177
				(0.154)	(0.156)
Rural area when child				-0.0216	-0.0216
				(0.0649)	(0.0726)
Month/Year of birth FE	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes	Yes
Socio-demographics	Yes	Yes	Yes	Yes	Yes
Observations	6,213	6,213	6,134	6,134	6,134
R-squared	0.194	0.194	0.200	0.200	0.200

Robust standard errors in parentheses, clustered by country/month-year of birth (columns 2 and 4); \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 3b** – War exposure and trust: *the role of childhood SES*

	Dep var: <i>Trust</i>	(1)	(2)	(3)	(4)
War (Ref=No war)					
	<i>1-3 war events</i>	-0.178 (0.141)	-0.178 (0.153)	-0.188 (0.142)	-0.188 (0.153)
	<i>4+ war events</i>	-0.387** (0.152)	-0.387** (0.169)	-0.404*** (0.153)	-0.404** (0.169)
SES in childhood		0.143*** (0.0282)	0.143*** (0.0319)	0.144*** (0.0285)	0.144*** (0.0321)
N. of chronic diseases				-0.127*** (0.0261)	-0.127*** (0.0294)
Hunger episode				-0.191 (0.190)	-0.191 (0.258)
Mother at age 10				0.363** (0.173)	0.363 (0.233)
Father at age 10				-0.151 (0.106)	-0.151 (0.126)
Health status when child (Ref = Excellent)					
	<i>Very good</i>			0.0226 (0.0734)	0.0226 (0.0780)
	<i>Good</i>			-0.0133 (0.0823)	-0.0133 (0.0872)
	<i>Fair</i>			-0.226* (0.130)	-0.226 (0.150)
	<i>Poor</i>			-0.474** (0.211)	-0.474* (0.284)
Vaccinated when child				-0.180 (0.154)	-0.180 (0.156)
Rural area when child				-0.0219 (0.0649)	-0.0219 (0.0725)
Month/Year of birth FE	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes	Yes
Socio-dem.	Yes	Yes	Yes	Yes	Yes
Observations		6,213	6,213	6,134	6,134
R-squared		0.194	0.194	0.200	0.200

Robust standard errors in parentheses, clustered by country/month-year of birth (columns 2, 4); \*\*\*  
p<0.01, \*\* p<0.05, \* p<0.1.

**Table 4a** – War exposure and trust: *the null effect on individuals born in the period Sept. 1946—Sept.1952*

	Dep var: Trust	(1)	(2)	(3)	(4)
War		0.0253 (0.112)		0.0684 (0.111)	
War (Ref=No war)					
	1-3 war events		0.0454 (0.125)		0.0944 (0.124)
	4+ war events		-0.00305 (0.137)		0.0317 (0.135)
Month/Year of birth FE	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes	Yes
Socio-dem.	No	No	Yes	Yes	Yes
SES in childhood	No	No	No	No	No
Observations		7,674	7,674	7,627	7,627
R-squared		0.164	0.164	0.191	0.191

Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 4b** – War exposure and trust: *the null effect on individuals born in the period Sept. 1946—Sept.1952*

	Dep var: Trust	(1)	(2)	(3)	(4)
War		0.0445 (0.113)		0.0445 (0.124)	
War (Ref=No war)					
	1-3 events		0.0774 (0.127)		0.0774 (0.139)
	4+ events		-0.000646 (0.138)		-0.000646 (0.150)
Month/Year of birth FE	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes	Yes
Socio-dem.	Yes	Yes	Yes	Yes	Yes
SES in childhood	Yes	Yes	Yes	Yes	Yes
Observations		7,289	7,289	7,289	7,289
R-squared		0.200	0.200	0.200	0.200

Standard errors in parentheses, clustered by country/month year of birth (column 3 and 4). All columns include the number of chronic diseases measured in the adulthood as well as childhood controls (i.e. SES in childhood, the presence of a parent at age 10, any hunger episode happened during the war, self-assessed health status when the respondent was a child, residence in a rural area during the childhood, and any vaccination received at early age); \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



## APPENDIX

**Table A1 – War exposure and trust (OLS estimates)**

Dep var: <i>Trust</i>	(1)	(2)	(3)	(4)
War	-0.243* (0.142)	-0.243* (0.139)	-0.243* (0.141)	-0.243* (0.138)
Month/Year of birth FE	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes
Socio-demographics	No	Yes	No	Yes
Observations	6,555	6,494	6,555	6,494
R-squared	0.157	0.189	0.157	0.189

Robust standard errors in parentheses, clustered by country/month-year of birth (columns 1 and 2) and at individual level (columns 3 and 4); \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table A2 – War exposure and trust (OLS estimates)**

Dep var: <i>Trust</i>	(1)	(2)	(3)	(4)
War (Ref=No war)				
1-3 war events	-0.153 (0.156)	-0.164 (0.152)	-0.153 (0.159)	-0.164 (0.155)
4+ war events	-0.356** (0.175)	-0.344** (0.171)	-0.356** (0.175)	-0.344** (0.172)
Month/Year of birth FE	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes
Socio-demographics	No	Yes	No	Yes
Observations	6,555	6,494	6,555	6,494
R-squared	0.157	0.189	0.157	0.189

Robust standard errors in parentheses, clustered by country/month-year of birth (columns 1 and 2) and at individual level (columns 3 and 4); \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table A3 – War exposure and trust (OPROBIT estimates)**

Dep var: <i>Trust</i>	(1)	(2)	(3)	(4)
War	-0.104* (0.0555)	-0.105* (0.0559)	-0.104* (0.0627)	-0.105* (0.0623)
Month/Year of birth	Yes	Yes	Yes	Yes
Region during war	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes

Socio-demographics	No	Yes	No	Yes
Observations	6,555	6,494	6,555	6,494

Robust standard errors in parentheses, clustered at individual level (columns 3 and 4) \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table A4 – War exposure and trust (OPROBIT estimates)**

Dep var: <i>Trust</i>	(1)	(2)	(3)	(4)
War (Ref=No war)				
1-3 war events	-0.0576 (0.0637)	-0.0624 (0.0641)	-0.0576 (0.0705)	-0.0624 (0.0698)
4+ war events	-0.161** (0.0681)	-0.159** (0.0687)	-0.161** (0.0777)	-0.159** (0.0778)
Month/Year of birth FE	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes
Socio-demographics	No	Yes	No	Yes
Observations	6,555	6,494	6,555	6,494

Robust standard errors in parentheses, clustered at individual level (columns 3 and 4); \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table A5 – War exposure and trust: *the effect of GDP and the share of deaths***

Dep var: <i>Trust</i>	(1)	(2)	(3)	(4)
War	-0.326** (0.139)		-0.374** (0.156)	
War (Ref=No war)				
1-3 events		-0.253 (0.157)		-0.287* (0.169)
4+ events		-0.417** (0.168)		-0.487** (0.193)
Gdp	-0.00254 (0.0113)	-0.000783 (0.0115)	-0.00950 (0.0122)	-0.00723 (0.0125)
Share of deaths	-18.15* (9.380)	-19.25** (9.449)	-16.42 (12.34)	-17.74 (12.34)
Month/Year of birth FE	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes
Socio-dem.	Yes	Yes	Yes	Yes
Childhood SES	No	No	Yes	Yes
Observations	5,118	5,118	4,830	4,830
R-squared	0.188	0.188	0.200	0.200

Standard errors in parentheses, clustered by country/month year of birth (columns 3-4). Columns 3 and 4 include the number of chronic diseases measured in the adulthood as well as childhood controls (i.e. SES in childhood, the presence of a parent at age 10, any hunger episode happened during the war, self-assessed health status when the respondent was a child, residence in a rural area during the childhood, and any vaccination received at early age); \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A6** – War exposure and trust: *the effect of GDP and the number of deaths*

Dep var: <i>Trust</i>	(1)	(2)	(5)	(6)
War	-0.326** (0.139)		-0.374** (0.156)	
War (Ref=No war)				
1-3 events		-0.253 (0.157)		-0.287* (0.169)
4+ events		-0.417** (0.168)		-0.487** (0.193)
Gdp	-0.00254 (0.0113)	-0.000783 (0.0115)	-0.00950 (0.0122)	-0.00723 (0.0125)
Civilian deaths (x100,000)	0.00996 (0.0907)	0.0103 (0.0907)	0.0358 (0.0251)	0.0362 (0.0249)
Military deaths (x100,000)	-0.404* (0.211)	-0.428** (0.212)	-0.371 (0.276)	-0.401 (0.275)
Month/Year of birth FE	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Wave FE	Yes	Yes	Yes	Yes
Socio-dem.	Yes	Yes	Yes	Yes
Childhood status	No	No	Yes	Yes
Observations	5,118	5,118	4,830	4,830
R-squared	0.188	0.188	0.200	0.200

Standard errors in parentheses, clustered by country/month year of birth (columns 3-4). Column 3 and 4 include the number of chronic diseases measured in the adulthood as well as childhood controls (i.e. SES in childhood, the presence of a parent at age 10, any hunger episode happened during the war, self-assessed health status when the respondent was a child, residence in a rural area during the childhood, and any vaccination received at early age); \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.