Child Protection and Adult Outcomes: Evaluating the Reproductive Behavior Following Evacuation to Foster Care during World War II

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Abstract

Parental separation during childhood may influence reproductive behavior during adulthood. The author evaluates the associations between unaccompanied evacuation to foster care and reproductive

behavior using nationally representative data on participants of the Finnish policy of evacuation during WWII including sibling pairs discordant in evacuation status.

This study combines Finnish individual level data collected from war time government records with Finnish census data from 1950 and 1971, and population register from 1971-2011 for Finnish cohorts born in 1933-1944 to examine associations between evacuation to temporary foster care in Sweden during World War II and reproductive behavior. Marriage patterns between ages 38 and 52 are also looked at.

The author estimate the association between evacuation and reproductive and marriage behavior accounting for the selection of evacuee families by comparing evacuees with their same-sex siblings. No statistically significant associations between evacuation and reproductive and marriage traits are found in the within sibling comparison although some associations are found in naïve least squares comparisons (OLS). The difference between the within sibling estimates and the OLS estimates indicate a negative selection of evacuees biasing the OLS results towards more adverse results.

1 Introduction

Finland fought two wars against Soviet Union during World War II (WWII). During this period, roughly 49,000 Finnish children from the whole range of socioeconomic backgrounds aged between 1 and 10 years were evacuated

to Sweden and spent on average 2 years in foster families. The evacuations were conducted between 1941 and 1944 by a large-scale evacuation scheme with organized logistics on both sides of the border. The Finnish government stated in 1941 the following eligibility criteria to be able to screen the most exposed families: 1. Children of families relocated from the border region between Finland and the Soviet Union in 1940 (roughly 400,000 individuals, 11 percent of the population, were evacuated from Karelia, i.e., the county that was ceded to the Soviet Union in 1940); 2. Children whose fathers were wounded in battle; 3. Children who had lost their homes in bombings; 4. Children whose fathers had died in war or who had lost their parents in bombings (12). In January 1942, the criteria were expanded to comprise children from large families, and those whose mothers were working full time; also children who resided in towns that were potential targets for air raids were considered eligible.

This policy of evacuation to foster care offers a fruitful setting to study the long-term consequences of removing children from their rearing parents due to war or other external causes and placing them in foster care. From a *life history theory* (LHT) perspective, the examination of associations between reproductive behavior and the largest possible intervention into a child's rearing environment, i.e., the removal from ones biological family and placement in foster care in a foreign country during early childhood is intriguing. According to LHT, an early life insult to the child's well-being might lead to reproducing early in life so as to maximize the probability of leaving descents

(Belsky, 2008). Further, Belsky et al. (1991) proposed that childhood adversities are associated with adult personality characteristics less well adapted to stable pair-bonding.

This paper asks the following question: Did the unaccompanied evacuation and placement in foster care during WWII have and impact on the individuals reproductive behavior and marriage patterns later in life. Specifically, we look at whether the individual ever married, whether the individual divorced (conditional on having married), number of children, age at first childbirth, and the individual's average interbirth interval. The causal analysis of these questions is nontrivial because of the problem to sort out the causal effect of evacuation from selection into the evacuation program. Because evacuees were not selected randomly from the sending population, naïve means comparisons of evacuees and nonevacuees are likely to be confounded by selection of evacuees. For example, teenage childbearing may have been more common among evacuees than among the nonevacuees because of socioeconomic selection. Girls from working class families - those who are more likely to give birth as teenagers regardless of evacuation - are overrepresented among the female evacuees. Therefore, in the presence of negative selection, a naïve means comparison in teenage childbearing between evacuees and nonevacuees will be biased upward.

We compare reproductive behavior of evacuees to the reproductive behavior of their same-sex siblings who remained with their biological families throughout the war. The resulting estimate of the association between evac-

uation and each outcome variable eliminates the across family component of evacuee selection, which results from the aforementioned eligibility criteria of the evacuation program and potentially also other confounding factors related to family background. Furthermore, the within-family estimate also eliminates the component of genetic selection shared between siblings.

The data used in the analysis come from a unique register based data set consisting of a 10 percent sample of households drawn from the full 1950 Finnish Census of Population with follow-up of household members in subsequent censuses beginning at the end of 1970 through 1985 (including information on marital status), and data from the Population Register as of 2011 on number of children and their exact birth dates.

The contribution of this article rests on using within-sibling estimators with nationally representative high quality register data matched to register based individual-level war time data to study reproductive outcomes over the complete fertile age range of the subjects and marriage patterns until middle-age. Our naïve OLS estimates show a significant negative association between evacuation and age at birth of first child for men and likewise between evacuation and the probability of divorce for women. However, we estimate a zero association between evacuation and each of the outcomes in the same-sex sibling analysis. This finding suggests that negative between-family selection into the evacuee program biases the naïve OLS results towards a negative association.

1.1 Importance

Little is known about the long term consequences of family disruption during early childhood that children exposed to, e.g., war or natural disasters may face. A large proportion of the 43 million refugees in the world are children and there are currently thousands of unaccompanied children living in refugee camps, detention centers and foster families. In 2010, 15,500 unaccompanied and separated children sought protection by filing for asylum (Global Trends 2010). The European Commission has proposed an action plan (Action Plan on Unaccompanied Minors, 2010-2014), in order to improve the protection of unaccompanied child refugees. Another form of disruption is fostering following family neglect or child abuse. Only in the United States, roughly 420,000 children were placed in foster care as of 2009 for an average time of two years (US Department of Health and Human Services 2009). A common feature to the aforementioned forms of family disruptions is that the policies aimed at remediating the children deal with two competing goods: family preservation versus child protection. Although adversities related to wars and natural disasters as well as an abusive family environment are harmful to child development, separation from ones biological parents may be traumatic as well.

Further, several empirical findings motivate our study. Among the existing studies looking at the association between childhood adversities and reproductive behavior, Teilmann et al. (2006) find that adopted children (foreign origin) have a 10-20-times risk for earlier onset of menarche as com-

pared to native children living with their rearing parents. Wilson and Daly (1997) document using data from Chicago that parents from deprived neighborhoods with shorter life expectancy tend to have their first child at an earlier age than parents from neighborhoods where people live longer.

Pesonen et al. (2008) find, using a local sample of evacuees from Helsinki ($n = 396$) of the same evacuation program as examined in this study, that evacuees had on average earlier menarche, earlier first childbirth (only men), more children (only women), and shorter interbirth intervals (only men), than other local same-aged children. The existing evidence on the association between childhood adversities and age at menopause is inconclusive. Allsworth et al. (2004) document that abused children had later menopause than controls whereas Hardy and Kuh (2005) show that children who face family disruptions due to divorce have twice as high risk of earlier menopause than the control group. The limitation common to all of these aforementioned studies is the problem of confounding in the means comparison, that is, the problem of finding a credible comparison group. For example, girls from worse socioeconomic backgrounds are more likely to give birth as teenagers regardless of experiencing divorce, and adoption (Lundberg and Plotnick, 1995; Duncan et al., 1998; Kearney and Levine, forthcoming). In fact, among the studies exploring the link between childhood adversity and reproductive behavior, Doyle's (2007) study on the effects of foster care on children at the margin of being placed is the only study to our knowledge documenting a causal relationship. He found that removal from ones' biological family increased

the probability of teenage motherhood, however, only for the subgroup of girls being removed during their adolescence.

1.2 Mechanisms

Life history theory is defined as the analysis of life history traits, i.e., "the suite of maturational and reproductive characteristics that define the life course (e.g., age at weaning, age at menarche, adult body size, time to reproduction, interbirth interval, litter size, and pairbond stability)" (Ellis, 2004). It seeks to explain variations in life history traits through trade-offs in the allocation of metabolic resources to different competing life functions. A textbook example of such a trade-off is the paradox that resources spent on growth and development during adolescence cannot be spent on current reproduction and thus rather postpones the production of offspring. Thus, according to life history theory, the benefits of prolonging the developmental stage and sexual maturation are traded off against the costs of delayed reproduction (Chisholm, 1999). Further, the theory posits that these trade-offs are solved through phenotypic mechanisms so as to recurrently optimize the fitness of a species through its evolutionary history.

Common to the various middle-level theories that life history theory encompasses is the central question of when the individual should reach sexual maturity, i.e., when to switch from directing the resources to growth and development to directing them into reproduction? Ellis (2004) discusses five different middle-level theories: energetics theory, stress-suppression theory,

psychosocial acceleration theory, paternal investment theory, and child development theory. All these variations of life history theory seem to agree on the existence of a link between variation in pubertal timing and variations in exposure to psychosocial stress among individuals, in particular stress induced by adverse experiences during childhood. However, no consensus has been reached about the sign of the association between stress and pubertal timing. Several empirical findings support the *psychosocial acceleration theory* proposed by Belsky et al. (1991), which hypothesizes that children are programmed to mature earlier as a consequence of exposure to stress (e.g., poverty, father's absence, or familial conflict) so as to ensure reproduction before death (Moffitt et al., 1992; Ellis and Garber, 2000; Hulanicka, Gronkiewiwicz, and Koniarek, 2001). The contradicting model referred to as *stress-suppression model* predicts that early life insults cause delay in pubertal maturation until more favorable conditions allow for reproduction. The mechanism through which this negative association between psychosocial stress and pubertal development operates is the linkage between stress and suppression of the HPG axis (Ferin, 1999). Also this theory has gained some empirical support by studies exploiting war time data (Kantero and Widholm, 1971; Prebeg and Bralic, 2000; van Noord and Kaaks, 1991), and thus the empirical evidence is inconclusive on whether the association between early life stress and reproductive debut is positive or negative.

As our study is based on register data we do not have data on age at menarche, which seems like the most relevant outcome variable to use when

taking LHT to the data. However, early childbearing is explicitly hypothesized to be linked with early life stress, and furthermore, the strong positive association between early menarche and early childbearing is rather uncontroversial (Ellis, 2004). Further, even though other outcomes, such as interbirth interval and pairbond stability have received much attention in the theoretical literature, more work is needed to test the link between childhood experiences and these aspects of reproductive behavior (Ellis, 2004).

2 Data and measures

2.1 Data

The analysis is based on a ten percent sample of households drawn from the full 1950 Finnish Census of Population (indeed the first full census implemented in Finland). Statistics Finland drew this sample[1] (1950 census sample) in 1997 and matched it to the Population Register based on all three first names, last name, and date and place of birth, in order to link the social security number (issued during the last years of the 1960s) of each individual to the data. Thus, the individual had to be alive as of 1970 and reside in Finland in order to make it to the matched 1950 census sample that was linkable to more recent censuses and other register data based on the social security number. We linked it to census records beginning with

[1] The original draw resulted in 411,629 individuals from 114,000 households in 392 municipalities.

the 1970 census through the 1985 census to extract information on marriage patterns[2] and to Population Register as of 2011 to extract information on the exact birth date of the subject's each child. By use of the Finnish National Archive's complete register of all children who were evacuated to foster care in Sweden during World War II we identified 2,245 as having been evacuated to foster care during World War II among the 71,788 individuals belonging to the 1933-1944 cohorts in the 1950 census sample.[3] The family identifier contained in the 1950 census sample enabled us to identify all siblings who belonged to 1933-1944 cohorts who were alive as of 1950. Full siblings in this study were defined as individuals registered as children to the same parents. Of the 71,788 individuals in the base population we dropped the individuals whose family identifier was missing (n =1,136), those who had either died or emigrated before the 1970 census ($n = 4,037$). Our analytical sample consists of 66,615 individuals of which 2,009 are child evacuees.

2.2 Measures

Exposure is defined as a dichotomous variable obtaining value one if having been evacuated to foster care in Sweden during WW II according the

[2] We used the variable marital status contained in censuses 1970, 1975, 1980, and 1985, to construct the variables Ever married and divorced (conditional on having been married).

[3] The matching procedure of the 1950 census sample to the child evacuee registry of the National Archives of Finland was conducted based on all three first names, last name and exact birth date. It turned out to be surprisingly successful with only 87 ambiguous cases of which 71 were more likely to be due to errors of spelling (a character missing in the name, one of the first names spelled differently or the birth date varying by 1-2 days while names were matching).

complete child evacuee register of the Finnish National Archives and zero otherwise. Our outcome variables of interest are: number of children, age at first child birth, average interbirth interval between two births, ever married, and divorced conditional on having married. Number of children born to the participants by 2012, age at first childbirth, and interbirth interval were obtained from the population register whereas marital status was derived from the census records from 1971 through 1985 with 5-year intervals. We thus observe marital patterns over a 15 year period and able to construct an indicator variable for whether the individual ever married by 1985 and an indicator variable for whether the whether the individual divorced by 1985 conditional on having married before that. All family background characteristics come from the 1950 census, which (rather fortunately for the author), contains important questions with the specific purpose to retrospectively survey the family conditions before the outbreak of the war, i.e., as of September 1,1939. Father's socioeconomic status as of 1939 (SES), replaced by mother's SES if missing, is adjusted for by including class dummies for each class (entrepreneurs as reference category), i.e., white collar workers, blue collar workers, assisting family members, and unemployed or out of labor force. Parental education is adjusted for by including a dummy for whether either the father or the mother had continued her education past primary school. Number of children in the family as of 1939 is calculated based on the birth dates of each child in the family (including those siblings born before 1933, i.e., before the relevant child evacuee cohorts). Native language mea-

sures whether the family spoke Swedish or Finnish. Birth order is adjusted for by including an indicator variable for each rank (first born as reference category) and preintervention region of residence is adjusted for by including an indicator variable for county of residence as of September 1, 1939 (the ceded parts of Karelia, i.e., the region ceded by the Soviet Union in 1940, are treated as a separate county even though such a county was originally part of what today forms the county of Karelia). Descriptive variables extracted from the Finnish National Archives were duration of evacuation and age at evacuation measured by use of the birth date, date of evacuation and date of return.

2.3 Descriptive analysis

Table 1 presents the sample characteristics. Panel A shows that the mean differences in outcomes between evacuees and nonevacuees are rather small with the exception being markedly higher divorce rates for female evacuees than for their nonevacuee counterparts ($P =$). Also evacuee men showed significantly higher divorce rates than their nonevacuee counterparts ($P =$). The duration of the average stay in foster care (Panel B) was roughly 22 months for both sexes and the average age at evacuation was roughly 6.5 years for women and 6.3 years for men.

It is clear from Panel C that the evacuees and nonevacuees do not balance with respect to family background. The two groups differ in particular with respect to socioeconomic status, number of children in the family ($P =$), and

native language ($P =$).

Additional evidence for evacuee selection is provided by regressing an indicator variable for evacuee status of the household against background characteristics. Table 2 shows quite clear evidence of selection of evacuee households. In evacuee households with more than one sibling the parent with the highest educations was 1.9 percentage points (24 percent) less likely to continue schooling past primary school. Further, evacuee household heads were 6.9 percentage points (111 percent) more likely to native Swedish speaking and the household head was 5.2 percentage points (18 percent) more likely to hold a blue collar occupation as compared to their counterparts of nonevacuee households.

Table 3 shows that in women no clear relationship between age at evacuation and reproductive behavior exists although the few children evacuated before age 2 ($n = 18$) had a clearly deviant reproductive behavior as compared to the other age groups with more teenage childbearing and lower number of kids in total during the reproductive career.

3 Estimating the long-term consequences of evacuation on reproductive traits and marriage outcomes

3.1 Conditional means comparison: evacuees versus nonevacuees

Our first approach to exploring the long term consequences of evacuation is to compare the outcomes of interest of all evacuees to all nonevacuees while conditioning on important potential confounders:

$$Y_i = \beta_0 + \alpha\left(Evacuee_i\right) + \left(Family\ background_i\right)\beta_1 + \delta_{county} + \theta_{birth\ cohort} + \varepsilon_i, \tag{1}$$

where outcome Y for child i is explained by a dummy variable, $Evacuee_i$, equal to one if individual i was evacuated to Sweden during World War II and placed in foster care and with a vector of observable family background covariates (see Panel C in Table 1). County fixed effects are used to compare individuals living in the same county as of 1940, i.e., before the intervention and birth cohort indicators are used to capture changes in reproductive behavior over time. We use the same model specification for all our five different outcomes (see Panel A in Table 1) and estimate the difference in means between evacuees and nonevacuees using ordinary least squares (OLS). For our two binary outcomes, ever married and divorced, the OLS translates into

a linear probability model. Results are similar when a probit model is used, as shown below. The standard errors are clustered at the family level in all estimations to reflect variation in the propensity to evacuate across families.

We estimate equation (1) separately for the male and female subsample allowing all of the covariates to have different coefficients depending on sex, rather than constraining all differences between sexes to work through the variable of interest ($Evacuee_i$), which would be the case if only an interaction term between sex and evacuation was included. The first row of Table 4 shows that for women a significant association is found between evacuation and the probability of divorcing, women who were evacuated to foster care during WWII had a 8.5 percentage points higher divorce rate than their nonevacuee counterparts. The coefficients of parental education and the indicator for whether parents were blue collar workers is significant in three regressions out of five whereas native language and number of children in the family in 1940 only played a role for the age at first childbirth. Table 5 presents the same results for men. Evacuated men had their first child on average roughly 5 months earlier than their nonevacuated counterparts. The coefficient of number of children is marginally significant but not very meaningful economically, the evacuated men have on average 0.08 percentage points larger families than their nonevacuated counterparts.

Maybe expand the analysis by splitting the data by age at exposure...

3.2 Comparing same-sex siblings discordant in evacuee status

If the Finnish policy of evacuating children to foster care was indeed a natural experiment, i.e., the evacuees were randomly selected from the Finnish population of prewar cohorts of children, then α in equation (1) would be the true causal effect of participation in the evacuation program. However, both anecdotal evidence on the eligibility criteria to the program and empirical evidence (Santavirta and Santavirta, 2013) suggest that evacuees came from more adverse family backgrounds. Thus, the largest concern when evaluating the long term consequences of this early life intervention is that the adverse associations found are contaminated by confounding bias: children from worse backgrounds have poorer adult outcomes regardless of evacuation. Fixed effects can be a powerful way to eliminate selection from shared family background characteristics, even when they are not fully observed. In most families who participated in the program, only part of the children were sent away. Comparing outcomes of siblings eliminates confounding bias induced by shared aspects of the family background that are correlated with both evacuation and reproductive behavior/marriage patterns. Potential confounders that are differenced out by within sibling pair analysis are, e.g., parental death and all the other aforementioned eligibility criteria, parental child-rearing skills, and parental depression. In addition to the shared family environment siblings also share approximately 50 of their genome, in other

words, half of the genome is held constant using a stable sibling design.

We consider the following equation in which the individual error term is decomposed into two components:

$$Y_{ij} = \beta_0^{ws} + \alpha^{ws}\left(Evacuee_{ij}\right) + \left(Family\ background_{ij}\right)\beta_1^{ws} + \delta_{county}^{ws} + \theta_{birth\ cohort}^{ws} + \eta_j + \nu_{ij},$$

where η_j is the component of the error term shared between full siblings living in the same household j and ν_{ij} is the idiosyncratic component specific to each indiviual.

Table 6 reports the same-sex within sibling estimates for subsamples with sibling groups of at least two same-sexed siblings. For comparison the naïve OLS estimates using equation (1) are also reported. The both statistically and economically significant association between evacuation and divorce for women obtained by OLS turns into a zero association in the within sibling comparison. Likewise for men, the association between evacuation and age at first childbirth becomes zero in the within sibling analysis.

By comparing our naïve OLS estimates of the associations between evacuation and our outcomes (α) and the within sibling estimate (α^{ws}) we can sign the direction of the unobserved household-specific confounding. As for the divorce estimates for women, $\alpha^{ws} < \alpha$, suggests that α is biased by negative selection of evacuee families, i.e., evacuees have on average worse outcomes than their nonevacuee counterparts from the same county and cohort due

to more adverse family environment as opposed to any effect of evacuation itself. On a similar note, we also find evidence of negative selection bias in the age at first child birth estimates for men ($\alpha^{ws} > \alpha$). Men who were evacuated as children do not exhibit any difference in reproductive behavior when compared with their same-sex nonevacuee siblings. To conclude, our within sibling estimates provide evidence of a zero association between evacuation and reproductive behavior and that the negative estimates obtained by naïve OLS are contaminated by negative confounding bias.

4 Discussion and conclusions

These large nationally representative longitudinal census data possess many features that make them particularly well suited for evaluating long term outcomes of the Finnish child evacuee policy. First, linking social security numbers to a random sample of the 1950 census allows for unusually long follow-ups of the subjects and thus avoids the problem of potential recall bias that arises when childhood characteristics are retrospectively retrieved. Second, the availability of a family identifier and a variable defining the family ties between each family member in the 1950 census makes the data suited for within sibling analysis while also providing family background variables dating back to the period before WWII for the cohort analysis. Third, additional leverage is gained by linking this existing census sample with individual level war time data from a child evacuee registry. Further, this is to

our knowledge the only register based data set containing a nationally representative random sample of child evacuees during WWII from the whole Finnish population.

While some adverse associations are found for each sex in the conditional means comparisons no statistically significant association between temporary unaccompanied evacuation to foster care during childhood and reproductive behavior is found in the within sibling analysis for neither sex. Even though the within sibling estimates are imprecise, the finding indicates that negative confounding by unobserved shared family factors may be present in the conditional means comparison.

Our results do not confirm the mainstream studies associating childhood adversities with reproductive behavior (Ellis, 2004). We do neither find support for the psychosocial acceleration theory nor for the stress-suppression theory. While the Finnish evacuation policy has been evaluated before, this is the first study using nationally representative register based data on this policy intervention. It is furthermore the first sibling design in this context as all previous studies have relied on simple means comparison (Pesonen et al., 2008; Pesonen and Räikkönen, 2011), with the exception of a matching study by the author of this study matching the evacuees to controls based on the eligibility criteria and demographic characteristics (Santavirta and Santavirta, 2013). Our results are in stark contrast to the findings of Pesonen et al. (2008) who sample child evacuees from the Helsinki Birth Cohort Study (HBCS), 1934-1944 and find that evacuees had earlier first childbirth

(men), more children by late adulthood (women), and shorter interbirth intervals (men), than their nonevacuee counterparts. Our results are more in line with Santavirta and Santavirta (2013) who do not find any statistically significant association between evacuation and number of children by late adulthood. However, they did find a significant adverse association between evacuation and ever getting married.

Even though the data used in the analysis is of exceptional quality and geared towards the examination of our research question, also these data have limitations. At least three potential concerns warrant discussion: potential confounding, attrition, and measurement error in the explanatory variables.

Our within sibling analysis is only adjusting for sibling-invariant aspects of the family background. Thus, the identifying assumption for a causal interpretation of our within sibling estimate is that exposure, in this case the parental decision to evacuate a specific sibling, was uncorrelated with unobserved sibling-specific endowments (Rosenzweig and Wolpin, 1995). This is a strong assumption as the literature documents a range of differences between siblings in family context that could potentially bias our evacuation estimate. We attempt to remediate this by adjusting for sibling-specific factors to reduce the amount of unadjusted child-specific potential confounders. The obvious ones in our case would be childhood cognitive and non-cognitive skills as well as physical characteristics that may well have affected parental behavior. These were however not available in the data at hand. The sibling-specific variable adjusted for except for age is birth order. Birth order is a

potential confounder in almost any within-sibling research designs dealing with interventions during early life and later life health as it has been found to be inversely correlated with education and cognitive ability, and these factors are shown to predict later life health (Black et al., 2005; McCall, 1977; Elliot, 1992).

Another limitation is the attrition of subjects between 1950 and 1970, i.e., the period before the social security number was issued and before the death cause records were available. A small proportion of these subjects had died but a more important source of attrition was the mass migration to Sweden in the late 1960s. Table 7 compares those lost before 1971 to the analytic sample. The subjects lost were less likely to be women, more likely to be evacuated and to speak Swedish as their native language. However, there were small differences in socioeconomic background and parental education.

Ultimately, within sibling analysis estimates tend to be more attenuated than cohort analysis estimates as they are more susceptible to measurement error in the exposure variable (Bound and Solon, 1999). As for the evacuation parameter this should be less of a concern as the complete child evacuee registry was matched to the census sample based on all three first names, last name along with date of birth. Only 87 ambiguous matches were found while linking the entire war time registry including 48,628 child evacuees to the 71,788 individuals of the 1950 census sample. Among these, 71 cases were such that the mismatch seemed to indicate a spelling error (e.g., in the (manual) spelling of one of the three first names or the month being January

(1) in one of the registries and July (7) in the other while complete name, day, and year matched). These cases were kept in the analysis but dropping all 87 ambiguous observations did not change the results qualitatively.

With the empirical studies testing the hypothesis of life history theory showing rather inconclusive results more studies designed to test the hypotheses of these theories are needed. Further, while a large number of todays refugees are children and many of them unaccompanied by their parents, it would be useful to gain more knowledge about whether parental separation actually affects these children's reproductive outcomes. This study explores the associations between parental separation during childhood and reproductive behavior during adulthood. When selection of evacuees is accounted for no statistically significant associations between evacuation and the reproductive outcomes are found. Neither does the author find an association between evacuation and marriage patterns.

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Tables

Table 1. Sample Characteristics of a 10 Percent Sample of 1933-1944 Cohorts From the 1950 Finnish Census of Population (Those who Survived Until 1970 Included)

Characteristic	Women		Men	
	Evacuees	Nonevacuees	Evacuees	Nonevacuees
	$(n = 910)$	$(n = 31,355)$	$(n = 1,099)$	$(n = 33,251)$
Panel A: Outcomes				
Married	0.92	0.91	0.92	0.90
	(0.27)	(0.28)	(0.28)	(0.30)
Divorced	0.24	0.14	0.16	0.13
	(0.43)	(0.35)	(0.37)	(0.34)
Number of children	1.9	1.93	1.86	1.78
	(1.40)	1.39	(1.42)	(1.37)
Age at first birth, years	24.08	24.32	26.19	26.70
	(4.34)	(4.37)	(4.72)	(4.85)
Mean of child spacing, months	48.88	48.20	51.16	50.99
	(33.25)	(31.97)	(43.05)	(36.29)
Panel B: Evacuation program				
Duration of evacuation, years	1.81		1.85	
	(1.12)		(1.15)	
Age at evacuation, years	6.49		6.27	
	(2.59)		(2.54)	

Table 1. continued

Characteristic	Women		Men	
	Evacuees	Nonevacuees	Evacuees	Nonevacuees
	$(n = 910)$	$(n = 31,355)$	$(n = 1,099)$	$(n = 33,251)$
Panel C: Family background				
Socioeconomic status in 1939				
Entrepreneur	0.11	0.27	0.11	0.27
	(0.32)	(0.44)	(0.31)	(0.44)
White collar worker	0.11	0.09	0.11	0.10
	(0.31)	(0.29)	(0.32)	(0.29)
Blue collar worker	0.44	0.30	0.42	0.30
	(0.50)	(0.46)	(0.49)	(0.46)
Assisting family member	0.03	0.08	0.03	0.08
	(0.16)	(0.27)	(0.18)	(0.27)
Unemployed or out of LF	0.31	0.26	0.33	0.25
	(0.46)	(0.44)	(0.47)	(0.44)
Parental education	0.07	0.07	0.09	0.07
	(0.26)	(0.25)	(0.29)	(0.26)
No of children in 1940	2.23	1.58	2.29	1.62
	(1.44)	(1.67)	(1.52)	(1.69)
Swedish speaking	0.14	0.06	0.14	0.06
	(0.35)	(0.23)	(0.34)	(0.24)

Note: The standard errors of the sample means are reported in parentheses. The socioeconomic status of the family in 1939 is based on father's occupation, replaced if missing by mother's occupation.Parental

education measures the highest level of schooling of either the mother or the father with an indicator variable obtaining one if either parent attained education past primary school.

Table 2. Evidence on evacuee selection: Regressing an indicator variable for whether evacuees in household (HH) (=1 if yes) on family background characteristics

	All households		Households with >1 siblings	
	Control mean	Dependent variable: Evacuee status of HH	Control mean	Dependent variable: Evacuee status of HH
Parental education,				
(past primary school=1)	0.078	-0.015	0.078	-0.019
		(0.004)		(0.007)
Number of children				
in the family in 1940	1.31	0.017	1.73	0.014
		(< 0.001)		(0.001)
Swedish speaking	0.069	0.046	0.062	0.069
		(0.005)		(0.009)
Occupation, (blue	0.308	0.038	0.294	0.052
collar worker=1)		(0.003)		(0.004)
Observations	37,193	38,765	17,993	19,027

Note: Sample means of background characteristics for the control group of households (HH) without any evecuees and OLS estimates for all HH are reported with standard errors of the OLS estimates in parentheses.

Table 3. The average number of children and age at first childbirth among mothers from evacuee families

	Non-separated siblings ($n = 418$)	< 2 yrs ($n = 18$)	2 to < 4 yrs ($n = 141$)	4 to < 7 yrs ($n = 243$)	7 to 11 yrs ($n = 358$)
Number of kids	2.30 (1.22)	1.78 (0.73)	2.10 (1.15)	2.22 (1.09)	2.39 (1.34)
Age at first childbirth	23.90 (4.11)	22.94 (3.54)	23.85 (4.62)	24.07 (4.31)	24.82 (4.31)

Note: For comparison, both outcomes are reported for mothers, i.e., number of children refers to the average number of children among women who had at least one child. The average number of children for all mothers in the sample $(n = 26,984)$, was 2.30 and the average age at first childbirth was 24.30.

Table 4. Associations between the evacuation to foster care during World War II and marriage patterns and reproductive traits - women

	Ever married	Divorced	Number of children	Age at first childbirth	Interbirth interval
Evacuated	0.010	0.085***	-0.004	-76.769	47.650
	(0.009)	(0.016)	(0.049)	(60.405)	(43.972)
Parental education,					
(Past primary school=1)	-0.008	0.035***	-0.087***	481.155***	-33.115
	(0.008)	(0.011)	(0.032)	(48.510)	(36.397)
SES in 1939					
White collar	<0.001	0.051	-0.057	205.875	-109.653
	(0.030)	(0.047)	(0.112)	(162.600)	(96.435)
Blue collar	0.019***	0.046***	-0.009	-269.586***	23.181
	(0.005)	(0.006)	(0.022)	(28.013)	(18.861)
Assisting family member	<-0.001	0.004	-0.023	-26.942	11.825
	(0.007)	(0.008)	(0.034)	(42.422)	(27.744)
Unemployed or out of labor force	0.010**	0.042	0.029	-263.315***	-23.313
	(0.005)	(0.006)	(0.023)	(28.651)	(18.736)
Native language, (Swedish=1)	0.025	-0.032	-0.142	105.685**	-2.894
	0.008	(0.012)	(0.036)	(50.511)	(36.609)
Number of children in					
the family in 1940	-0.003	-0.001	0.024	26.897**	-5.048
	(0.002)	(0.002)	(0.010)	(11.299)	(8.042)
Observations	32,265	29,407	32,265	26,984	20,273

Note: OLS estimates for evacuee status. Standard errors (in parentheses) are clustered at family level. All specifications also include 12 categorical variables for birth order, 20 categorical variables for residence municipality in 1939 and 11 categorical variables for birth cohort.

Table 5. Associations between the evacuation to foster care during World War II and marriage patterns and reproductive traits - men

	Ever married	Divorced	Number of children	Age at first childbirth	Interbirth interval
Evacuated	0.003	0.006	0.080*	-146.72***	49.02
	(0.009)	(0.013)	(0.045)	(44.31)	(51.87)
Parental education,					
(Past primary school=1)	0.023***	0.005	0.075**	302.42***	0.83
	(0.006)	(0.009)	(0.030)	(46.06)	(34.52)
SES in 1939					
White collar	0.046**	0.044	0.113	-191.92	-85.98
	(0.023)	(0.040)	(0.128)	(193.93)	(102.17)
Blue collar	0.028***	0.051***	-0.062***	-375.40***	76.48***
	(0.005)	(0.006)	(0.022)	(30.62)	(21.01)
Assisting family member	-0.012	-0.003	-0.028	-2.51	-23.67
	(0.008)	(0.007)	(0.034)	(47.70)	(28.81)
Unemployed or out of labor force	0.022***	0.043***	-0.072***	-269.14***	31.85
	(0.005)	(0.006)	(0.023)	(31.42)	(20.90)
Native language, (Swedish=1)	0.003	-0.038***	-0.155***	244.68***	-12.97
	(0.008)	(0.011)	(0.028)	(58.79)	(43.07)
Number of children in					
the family in 1940	-0.007***	0.002	-0.006	46.71***	4.64
	(0.002)	(0.002)	(0.009)	(12.59)	(8.86)
Observations	34,350	30,840	34,350	27,074	20,568

Note: OLS estimates for evacuee status. Standard errors (in parentheses) are clustered at family level. All specifications also include 12 categorical variables for birth order, 20 categorical variables for residence municipality in 1939 and 11 categorical variables for birth cohort.

Table 6. Reproductive traits and marriage patterns according to child-evacuee status during World War II - Same-sex sibling samples, within sibling analyses

		Women			Men		
Dependent variable	**Explanatory variable**	OLS	Within sibling	N	OLS	Within sibling	N
Ever married	Evacuated	0.007	0.040	15,098	-0.001	0.015	17,231
		(0.014)	(0.039)	[262]	(0.013)	(0.029)	[395]
Divorced	Evacuated	0.103***	0.059	13,745	-0.002	-0.067	15,344
		(0.024)	(0.061)	[213]	(0.017)	(0.046)	[328]
Number of children	Evacuated	0.121	0.105	15,098	0.093	0.062	17,231
		(0.078)	(0.178)	[262]	(0.064)	(0.152)	[395]
Age at first childbirth	Evacuated	-21.91	25.79	12,723	-215.30**	11.39	13,482
		(89.22)	(240.78)	[200]	(86.15)	(235.66)	[260]
Interbirth interval	Evacuated	3.268	204.82	9,676	25.310	29.596	10,243
		(57.28)	(205.68)	[114]	(72.296)	(231.59)	[163]

Note: OLS estimates and within sibling estimates for evacuee status. Standard errors (in parentheses) are clustered at family level. The OLS analysis adjusts for the same family background covariates as in Tables 4 and 5 while all family-specific covariates cancel out in the within sibling analysis. All models adjust for birth order and year of birth.

Table 7. Background characteristics of the analytic sample and of those who died or emigrated before 1971

	Analytic sample		Died or emigrated before 1971	
Characteristic	($n = 66,615$)		($n = 4,037$)	
	N	Mean (%)	N	Mean (%)
Women	32,265	48.44	1,661	41.14
Men	34,350	51.56	2,376	58.86
Evacuee status				
Evacuated	2,009	3.89	206	5.10
Not evacuated	64,606	96.98	3,831	94.90
Socioeconomic status in 1939				
Entrepreneur	17,509	26.28	952	23.58
White collar worker	6,390	9.60	389	9,63
Blue collar worker	20,087	30.15	1,317	32.62
Assisting family member	5,337	8.02	302	7.48
Unemployed or out of LF	17,292	25.96	1,077	26.68
Parental education				
Primary school or less	61,790	92.76	3,732	92.44
Past primary school	4,825	7.24	305	7.56
Number of children in the family in 1940		1.62		1.41
One	12,606	18.92	648	16.05
Two	12,155	18.25	559	13.85
Three or more	18,210	27.34	1003	24.84
Native language				
Finnish	62,516	93.85	3,581	88.70
Swedish	4,099	6.15	456	11.30