Political Socialization in Flux? Linking Family Non-Intactness during Childhood to Adult Civic Engagement

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Abstract

Over the last several decades, there has been a widespread decrease in civic engagement coinciding with a breakdown in traditional family structures in many countries throughout the developed world. According to Putnam in Bowling alone (2000), however, none of the major declines in civic engagement can be accounted for by the decline in traditional family structures. In this paper, we seek to contribute a robust picture of how adult civic engagement is affected by growing up in a non-intact family. Using 26 waves of annual longitudinal data from the German Socio-Economic Panel, we construct various measures of family structure during childhood, and perform both cross-sectional and sibling difference analyses for different indicators of young adults' civic engagement. Both exercises reveal a significant negative relationship between growing up in a non-intact family and children's civic, social and political engagement as adults. We argue that this finding is consistent with causation rather than selection as the explanation for the negative relationship, and provide several robustness checks to support this claim.

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1. Introduction

Since the 1970s, economic and social changes in western societies have resulted in families that are more complex in their structure. Family breakdown through separation or divorce has become common, and non-marital birth rates have increased dramatically and appear to be continuing to rise.[1] Since most divorces involve children, there is now a substantially higher probability that children will have a lone parent than was once the case.[2] Projections of future changes in family structures indicate that the number of single-parent families is likely to further substantially increase over the next two decades in most OECD countries (OECD, 2012b).

An extensive body of research across a range of disciplines has identified childhood family structure as a key determinant of children's later-life socio-economic outcomes, emphasizing that children who grow up in a non-intact family: (i) tend to perform less well in school and to gain lower educational qualifications than children from intact families (Case *et al.*, 2001; Ermisch *et al.*, 2004; Gruber, 2004); (ii) are more likely to leave home when young and to become sexually active or pregnant at an early age (McLanahan and Sandefur, 1994); (iii) tend to report higher levels of smoking (Francesconi *et al.*, 2010b). However, one aspect of childhood family structure has remained largely neglected in the literature: its impact on children's later-life civic engagement.[3] The primary contribution of this paper is to fill that void.

In discussions on children's socialization into politics and civic affairs, it has long been recognized that the family reproduces interest in the public domain (Hyman, 1959). This idea is based not only on evidence of a transmission of basic civic responsibilities and political orientations from parents to their offspring (Alesina and Giuliano, 2011), but also on findings in the area of partisan commitment and electoral behavior indicating high intergenerational agreement (Jennings *et al.*, 2009). However, the research has also shown that the success of parental socialization of beliefs and values may differ systematically with family structure. It has been suggested in particular that growing up in a non-intact family frequently deprives children of important parental and community resources, in turn leaving them with a lack of knowledge and skills to operate effectively in society. One hypothesis, therefore, is that non-intact family structures during childhood have a negative causal effect on adult children's civic engagement, since they undermine, and in some cases prevent, the processes and activities through which parents shape their children's political orientations (*causation hypothesis*). The opposite hypothesis is that factors which increase the risk of family breakdown are also linked to children's civic and political engagement, implying that at least part of the relationship has to be seen as selective (*selection hypothesis*).

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[1]Across the OECD, the average divorce rate has doubled from 1.2 divorcees per 1000 people in 1970 to 2.4 in 2009, while the average proportion of births outside marriage has tripled from 11 percent in 1980 to 33 percent in 2007 (OECD, 2011a).

[2]On average, in developed countries, almost 1 out of 6 children today live with one parent only (Iacovou and Skew, 2010; OECD, 2010).

[3]Civic engagement can take many forms, from volunteer work to involvement in larger organizations or political parties. In the present paper, we use civic engagement as an umbrella term to refer to these various types of civic engagement.

To gain a deeper understanding of these issues, we use data from the German Socio-Economic Panel on about 6,000 adult children with matched parental marital histories and family characteristics. We derive measures of family non-intactness during childhood by exploiting extramarital births and parental divorces, and perform both cross-sectional and sibling difference analyses for different indicators of civic engagement. The latter estimation method allows us to compare adult children to their own siblings and to control for time-invariant fixed effects of family background that may influence both childhood family structure and young adults' political behavior. Both exercises reveal a significant negative relationship between growing up in a non-intact family and children's civic, social and political engagement as adults. For example, sibling difference estimates suggest that adult children who lived in a non-intact family during childhood have a 9 percentage points lower likelihood of being interested in politics. This is a sizable effect, given that 24 percent of adult children report being interested in politics. We argue that our findings are consistent with causation rather than selection as the explanation for the negative relationship, and conduct several robustness checks to support this claim. For example, we provide evidence that our estimates (i) cannot easily be explained by unobserved variables and (ii) are stronger among subsamples in which attenuation bias is less of a concern.

2. Civic Engagement: Trends, Relevance and Theories

In the last few decades, the developed world has seen not only radical changes in family structures, but also another significant social development: the increasing disengagement of citizens from public affairs. Established democracies are managing to motivate an ever smaller proportion of the electorate to exercise the right to vote. The broad pattern of reduced civic engagement is confirmed by evidence in other domains as well: union membership, partisan attachment, political interest, and church attendance (see Figure 1). Indeed, Putnam (2002) argues that waning participation in political parties, unions and churches is almost universal. While the decrease in civic engagement is prevalent throughout the population, additional evidence shows that declines in voting, political interest and association membership are much more pronounced among younger cohorts than among older cohorts (Putnam, 2000).

These trends are a matter of concern for at least two important reasons. First, it is well understood that civic engagement strengthens civic values among the population and enhances the responsiveness of government and political elites to citizens' concerns (Fukuyama, 1995; Uslaner, 2002). Second, higher levels of civic engagement tend to go hand in hand with higher levels of social capital. This not only enhances democratic representation by facilitating interest aggregation and articulation (Putnam, 1993), but also promotes collective and collaborative action (Arrow, 1974). Moreover, a growing body of research suggests that social capital also has a positive impact on a wide range of macroeconomic and microeconomic outcomes. For example, Knack and Keefer (1997) provide strong evidence that norms of civic cooperation have significant impacts on aggregate economic activity.

The importance of civic engagement has made it a major focus of analysis and commentary in the social sciences. Explanations for the contemporary phenomenon of growing civic

Figure 1: Trends in different forms of civic engagement in selected OECD countries
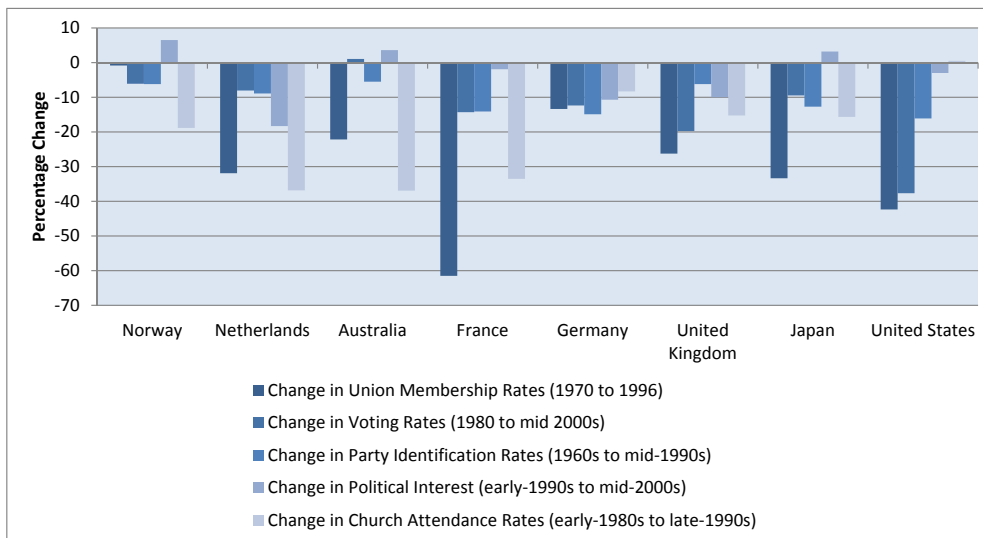
Source: Figure 1 draws upon data from a variety of sources: (a) *union membership*: change in the percentage of employees who are union members, 1970 to 1996 (Source: OECD, 2012a, own calculations); (b) *voting*: change in voting rates in parliamentary elections, 1980 to most recent election (Source: OECD, 2011b, own calculations); the latest available year is 2005 for Germany, Japan, Norway and United Kingdom; 2006 for the Netherlands and the United States; and 2007 for Australia and France; (c) *party identification*: change in the percentage of people who identify with a democratic party in the long term (Source: Dalton, 2002, 25-26, own calculations); the period over which changes are computed are as follows: Australia (1967 to 1998), France (1975 to 1996), Germany (1972 to 1998), Japan (1962 to 1995), the Netherlands (1971 to 1998), Norway (1965 to 1993), United Kingdom (1964 to 1997) and United States (1952 to 1996); (d) *political interest*: change in the percentage of respondents who are "very or somewhat interested in politics" (Source: World Value Survey, own calculations); the period over which changes are computed is as follows: France, Germany, the Netherlands, United Kingdom, and United States (1990 to 2006), Japan (1990 to 2005), Norway (1990 to 2008), Australia (1995-2005); (e) *church attendance*: change in the percentage of respondents who "attend church at least once a month" (Source: World Value Survey, own calculations); the period over which changes are computed are as follows: France, Germany, the Netherlands, United Kingdom, and United States (1981 to 1999), Japan (1981 to 2000), Norway (1982 to 1996), Australia (1981-1995).

disengagement can be broken down into three main theories.[4] The "social capital" thesis (Putnam, 2000) associates declining civic engagement with an accelerated tendency towards individualism, leading to a disintegration in the community bonds that once held society together. The "critical citizens" thesis (Norris, 2002) suggests that younger cohorts of voters are more difficult to please than their parents' or grandparents' generations, and that they tend more to express dissatisfaction through abstention from political affairs. Finally, the "voting age" thesis (Franklin, 2004) argues that the lowering of the voting age in most advanced democracies can account almost entirely for recent declines in voter turnout. Of these explanations, the social capital hypothesis is the most pertinent to the study at hand. For Putnam (2000), lack of civic engagement and declining respect for the obligations of citizens in democracies are the result of the pervasive individualism that accompanies the disintegration of communities. Our findings add a new dimension to this view by showing that the *family disintegration* may also be a root cause of civic disengagement.

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[4]A comprehensive exposition and discussion of the key theories of contemporary civic disengagement can be found in Hay (2007).

3. Why Does Family Structure Matter?

As we have seen above, the decline in civic engagement over recent decades coincided with a breakdown in traditional family structures. Despite this, Putnam (2000) dismisses the decline in the traditional family as a possible explanatory factor for the erosion of civic engagement:

> "... apart from youth- and church-related engagement, *none* of the major declines in social capital and civic engagement that we need to explain can be accounted for by the decline in the traditional family structure. In my view, there are important reasons for concern about the erosion of traditional family values, but I can find no evidence that civic disengagement is among them." Putnam (2000, p. 279)

It is important to note that Putnam's (2000) argument not only lacks a systematic empirical foundation but is also theoretically problematic in a number of ways. In this paper, we seek to contribute a more comprehensive understanding of how childhood family structure affects civic engagement in young adults.

As recently shown by Jennings *et al.* (2009), parents can have an enormous influence on their children's political learning in pre-adulthood. On the one hand, this finding coincides with childhood socialization theory, which emphasizes the role of the family in maintaining continuity in social ideologies over time (Glass *et al.*, 1986, and references therein). More generally, however, it is also compatible with the idea that social capital within the family is of key importance for a child's intellectual development. In this regard, Coleman (1988, 109–113) argues that: (i) social capital within the family depends on the physical presence of adults and the time and effort spent by the adults with a child on intellectual matters; (ii) the physical absence of adults can be described as a structural deficiency in family social capital; and (iii) the most prominent element of structural deficiency in modern families is the single-parent family. Given these arguments, one might expect that the decision of parents to live separately—e.g., as a result of a divorce—damages the social capital that might have been available to the child had it been raised jointly by both parents. We now present a simple theoretical framework that formalizes this idea.

3.1. Social Capital Investments and Family Structure

Consider a family that is comprised of two parents, f and m, with one child. Since social capital is an important resource for individuals and may positively affect their ability to operate in society and their perceived quality of life, the adult child's level of social capital is assumed to be a public good to the parents. In other words, the parents are altruistic towards their child. Following Coleman (1988), we view the child's social capital as determined by the attention given by the parents to the child during childhood. Examples of the "attention" that we have in mind is the time spent by the parents with the child on intellectual matters, which we consider to positively influence the process of political learning through which the child acquires a clear picture of civic responsibility.

We assume that the parents can make time investments in their child's social capital during two distinct periods of childhood. In one of these periods (call it a), social capital investment takes place in an intact family environment, and we assume that parental decision-making can be characterized as *cooperative* in this case. In the other period (call it b), social capital investment takes place in a non-intact family environment, and we assume that parental decision-making is better characterized as *non-cooperative* in this case. We will be specific about this below.

We normalize the duration of the entire childhood to unity, and denote by $\pi^b \in [0,1]$ the proportion of the childhood characterized by a non-intact family environment. Thus, $\pi^a = 1 - \pi^b$ is the fraction of the childhood spent in an intact family environment. In each period k ($k = a, b$), the parents can devote their time endowment, π^k, either to producing social capital, to working outside the home, or to leisure. When working outside the home, each parent can earn a wage w. In addition, each parent has non-labor income y. Social capital in period k is produced according to

$$S = f(\ell_f^k, \ell_m^k),$$

where ℓ_i^k is the time input of parent i ($i = f, m$). Each parent's preferences are represented by the additively separable utility function

$$U^i = v(x_i^a) + v(x_i^b) + g(h_i^a) + g(h_i^b) + z(S^a) + z(S^b),$$

where x_i^k and h_i^k denote personal consumption and personal leisure in period k, respectively. We assume that $v(\cdot)$ and $g(\cdot)$ are strictly increasing and concave functions. For simplicity, we let the composition of the utility function $z(\cdot)$ with the social capital function $f(\cdot)$ be given by

$$z(f(\ell_f^k, \ell_m^k) = \xi\mu(\ell_f^k) + (1 - \xi)\mu(\ell_m^k),$$

where $\mu(\cdot)$ is a strictly increasing and concave function. The parameter ξ captures parent f's productivity in social capital investment relative to parent m.

Intact Family. Suppose first that the entire childhood period is characterized by an intact family environment ($\pi^a = 1$). In this case, our approach to modeling social capital investments entails characterizing parental decision-making as cooperative. In adopting this approach, we follow the dominant premise in the economic theory of the family that intact households are able to reach efficient outcomes (Becker, 1991). One good reason for assuming this is that affective relationships among family members provide a foundation for low transaction costs, which are a prerequisite for the successful implementation of cooperative agreements (Pollak, 1985).

There are several ways to characterize an efficient allocation of family resources. Our approach is to maximize the utility of one parent subject to the other achieving a given utility and to the resource and social capital production constraints.[5] An interior solution

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[5]Formally, the efficient outcome must maximize $v(x_f^a) + g(h_f^a) + z(S^a)$ subject to (a) $v(x_m^a) + g(h_m^a) + z(S^a) \geqslant \overline{u}$, (b) $(1 - h_f^a - \ell_f^a)w + (1 - h_m^a - \ell_m^a)w + 2y = x_f + x_m$ and (c) $z(S^a) = \xi\mu(\ell_f^a) + (1 - \xi)\mu(\ell_m^a)$.

implies that the social capital investment chosen by the two parents must satisfy

$$\frac{1}{v'(x_f^a)} + \frac{1}{v'(x_m^a)} = \frac{1}{\mu'(\ell_f^a)}\frac{w}{\xi} \quad \text{and} \quad \frac{1}{v'(x_f^a)} + \frac{1}{v'(x_m^a)} = \frac{1}{\mu'(\ell_m^a)}\frac{w}{1-\xi}, \tag{1}$$

respectively. This is the Samuelson condition for the efficient provision of a public good. Stated in words, it implies that the sum of the parents' marginal rates of substitution between the child's social capital and private consumption must equal the private cost of an extra unit of social capital relative to an extra unit of private consumption. For illustration, let $U^i = \ln(x_i^a) + \ln(h_i^a) + ln(S^a)$ and $S = (\ell_f^a)^\xi (\ell_m^a)^{1-\xi}$. In this case, optimal parental decision-taking implies a social capital level of

$$\bar{S}^a = \mathbf{K}^a \left[1 + \frac{y}{w}\right] \quad \text{where} \quad \mathbf{K}^a = \left[\frac{\xi}{1-\xi}\right]^\xi \left[\frac{2(1-\xi)}{3}\right]. \tag{2}$$

Non-Intact Family. Suppose next that the entire childhood period is characterized by a non-intact family environment $(\pi^b = 1)$. In this case, we assume that the parents cannot cooperate because they cannot communicate effectively with each other. Thus, we view them as behaving non-cooperatively.[6] Thus, each parent i maximizes $v(x_i^b) + g(h_i^b) + z(S^b)$ subject to $(1 - h_i^b - \ell_i^b)w + y = x_i$ and $z(S^b) = \xi\mu(\ell_f^b) + (1-\xi)\mu(\ell_m^b)$. In an interior equilibrium, the social capital investment chosen by the two parents solve:

$$\frac{1}{v'(x_f^b)} = \frac{1}{\mu'(\ell_f^b)}\frac{w}{\xi} \quad \text{and} \quad \frac{1}{v'(x_m^b)} = \frac{1}{\mu'(\ell_m^b)}\frac{w}{1-\xi}, \tag{3}$$

respectively. This says that, for each parent, the marginal rate of substitution between the child's social capital and private consumption must be equal to the marginal cost of socializing the child relative to that of the private good. If we employ the particular form of the parents' utility functions and the social capital production function used above, the equilibrium level of social capital is given by:

$$\bar{S}^b = \mathbf{K}^b \left[1 + \frac{y}{w}\right] \quad \text{where} \quad \mathbf{K}^b = \left[\frac{\xi}{2+\xi}\right]^\xi \left[\frac{1-\xi}{3-\xi}\right]^{1-\xi}. \tag{4}$$

3.2. Implications

Underinvestment in Social Capital. The key implication of the above analysis is that family non-intactness disrupts the production process through which social capital within the family is created. Indeed, as with most privately provided public goods, the social capital available to the child will be underprovided when parents live apart and fail to coordinate their choices.

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[6]In making this assumption, we follow the seminal contributions of Weiss and Willis (1985) and Del Boca and Flinn (1995), who provide formal analyses of the non-cooperative behavior of divorced parents in terms of child support transfers and expenditures on children.
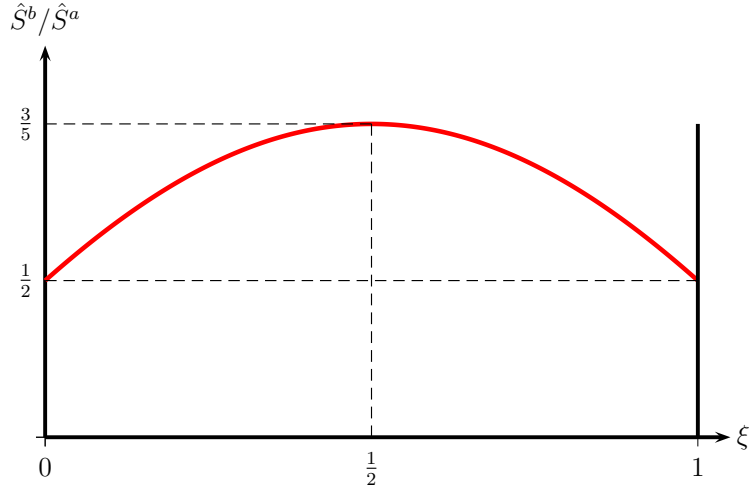
Figure 2: Family Non-Intactness and Underinvestment in Social Capital

To demonstrate this, we use equations (2) and (4) to compute:

$$\frac{\bar{S}^b}{\bar{S}^a} = \frac{\mathbf{K}^b}{\mathbf{K}^a} = \frac{3}{2} \left[\frac{1}{(2+\xi)^{\xi}(3-\xi)^{1-\xi}} \right] < 1.$$

Figure 2 shows that $\hat{S}^b/\hat{S}^a < 1$ for all $\xi \in [0,1]$. Thus, the non-cooperative equilibrium produces too little social capital. Moreover, the degree of underprovision is particularly high when the productivity in social capital investment differs between the parents (i.e., as $\xi \to 0$ or $\xi \to 1$). The intuition for underprovision is simple and follows from the public goods character of family social capital: if parents fail to cooperate, the actions that create social capital suffer from bidirectional externalities, and so it is not in each parent's interest to choose the socially efficient actions. Thus, an analogy can be drawn here to Coleman's (1988) idea that family non-intactness constitutes a structural deficiency in family social capital.

Duration of Family Non-Intactness. So far, we have assumed that the entire childhood period is characterized either by an intact ($\pi^a = 1$) or by a non-intact ($\pi^b = 1$) family environment. Now suppose that the parents make investments in their child's social capital in two periods: one period of intact and one period of non-intact family environment. Let $\pi^b \in [0,1]$ be the fraction of childhood characterized by a non-intact family environment, while $1 - \pi^b$ is the fraction of the childhood spent in an intact family environment. With the particular utility and production functions assumed above, family social capital created over both periods is

$$\tilde{S} \equiv \tilde{S}^a + \tilde{S}^b = \mathbf{K}^a \left[1 - \pi^b + \frac{y}{w} \right] + \mathbf{K}^b \left[\pi^b + \frac{y}{w} \right].$$

It now follows directly that

$$\frac{\partial \tilde{S}}{\partial \pi^b} = -\mathbf{K}^a \left[1 - \frac{\mathbf{K}^b}{\mathbf{K}^a} \right] < 0.$$

Stated in words, the social capital created during the entire childhood period decreases with the duration of family non-intactness.

Summary. In the empirical analysis, we focus on two related family structure measures that the analysis above suggests are important for young adults' social capital, including their civic engagement. The first measure of childhood family structure is whether a child spent any time living in a non-intact family. We would expect that young adults who experience family non-intactness as children are less likely to be civically engaged than those from intact families. The second measure does not indicate the mere occurrence of family non-intactness during childhood, but expresses the number of years a young adult experienced a non-intact family environment as a child. Our hypothesis is that adult civic engagement decreases with the duration of family non-intactness during childhood.

4. Data

Our data source is the German Socio-Economic Panel (SOEP)[7], a representative longitudinal survey of private households in Germany. The SOEP is the second longest running longitudinal household survey in the world and similar to the Panel Study of Income Dynamics (PSID) in the United States and the British Household Panel Survey (BHPS) in the United Kingdom. We combine information from the first 26 annual interview waves (1984-2009). In the SOEP, individuals are re-interviewed each successive year. If children move out of their parents' home to form a new household, they are followed and all adults living in the new household are invited to become SOEP respondents as well. Moreover, children living in SOEP households become adult respondents in their own right the year they turn 17. The SOEP also collects retrospective lifetime marital, fertility and employment histories.[8] We combine retrospective information provided by mothers with their annual interview data. By using mother-child identifiers, we match all maternal characteristics to adult children. We then reconstruct a respondent's childhood family structure by combining his or her birth date and the mother's marital history. The data is therefore well suited for the analysis of childhood family structure and its effects on young adults' outcomes. In particular, the long panel structure enables us to difference out unobserved time invariant family specific-effects by estimating sibling differences models. Second, since parents' family structure is self-reported, the estimates are likely to be less affected by measurement error than if it were reported by adult children retrospectively.

For the pooled cross-sectional analysis (individual sample) in which we study repeated observations of civic outcomes in relation to childhood family structure, we select individuals

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[7]We use SOEP distribution v26.

[8]Note that, for many respondents, the retrospective information spans the pre-panel period, i.e., years before 1984.

who: (i) were 18 or younger in their first year as SOEP respondents; (ii) were living with their biological mother for at least one year during the panel; and (iii) have complete information on their mother's family history. We impose condition (i) to ensure an age structure that captures young adults and minimizes the risk of oversampling adult children who leave their parents' house at a relatively late age. Condition (ii) is necessary to match mothers' characteristics to young adults, as both generations had to be interviewed as adults. Condition (iii) ensures that childhood family structure can be consistently reconstructed for all young adults.

In a second step, we estimate sibling difference models (sibling sample), which requires us to impose further conditions: (iv) an individual must have at least one sibling; (v) civic outcome measures of the siblings must be observed in the same year. Conditions (i) through (v) are used to construct the sibling sample. For similar sample selection approaches and discussions, see Ermisch *et al.* (2004), Francesconi *et al.* (2010a,b) and Siedler (2011).

4.1. Civic Engagement

As the main dependent variable in our empirical analysis, we use an index of civic engagement that averages together four component measures of civic engagement: (i) political interest; (ii) party identification; (iii) organizational involvement; and (iv) individual voluntarism. In order to come to as broad a conclusion as possible, we not only present findings for the summary index, but also report results for its components. We start by providing a description of our outcome variables.

Political Interest. In line with recent research suggesting that citizens with a greater interest in politics are more likely to be involved in public affairs (Bekkers, 2005), we view political interest as one precondition for civic engagement. In the empirical work, we make use of a survey question which reads: "Generally speaking, how much are you interested in politics?". We create an indicator variable which equals one if an individual reports being interested in politics ("very much" or "much"), and is zero for those who declare that they are not interested ("not so much" or "not at all").

Party Identification. In the past few decades, the concept of party identification has reached an important position in electoral research because public attachment to political parties is seen as a key determinant of many different aspects of political behavior (Dalton, 2002). For example, partisan ties motivate people to participate in parties, elections, and the processes of representative government. One survey question asks: "Many people in Germany lean towards one party in the long term, even if they occasionally vote for another party. Do you lean towards a particular party?". We construct an indicator variable that equals one if a respondent reports a long-term identification with a democratic party,[9] and zero otherwise.

Organizational Involvement. While official membership in formal organizations is only one aspect of civic engagement, it is regarded as a useful indicator of community involvement

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[9]The right-wing extremist parties NPD, Republikaner, and DVU are not considered democratic parties.

(Putnam, 2000). To construct a measure of organizational involvement, we use a question that reads: "Which of the following activities do you take part in during your free time? Please check off how often you do each activity: at least once a week, at least once a month, less often, never." We construct a dummy variable that equals one for individuals who report some kind of "involvement in a citizens' group, political party, or local government", and is zero for respondents who report no involvement at all.

Individual Voluntarism. For Putnam (2000, 132–133), volunteering—i.e., the readiness to help others—is an important aspect of good citizenship and political involvement. He argues, for example, that volunteers are more interested in politics and less cynical about political leaders than non-volunteers are. To quantify individual voluntarism, we create an indicator variable that equals one for respondents who report doing "voluntary work in clubs or social services" ("at least once a week", "at least once a month", "less often"), and is zero for individuals who report doing no volunteer work ("never").[10]

Index of Civic Engagement. Our main variable of interest is an index of civic engagement that aggregates the four component measures described above. We derive our index of civic engagement from all survey years in which each of the four component measures is collected.[11] The aggregation improves the statistical power by identifying effects that point in the same direction for different outcome measures with identical domains. As suggested by Kling *et al.* (2007), the summary index of civic engagement is an equally weighted average of its components' z-scores. The component measures used are such that higher scores reflect higher civic engagement. To compute the z-scores of each component, we subtract the mean in the estimation sample, in which none of the other components and none of the control variables has missing information, and divide it by the standard deviation. Thus, each standardized component has a mean of zero and a standard deviation of one. The index then aggregates the components with equal weights. Estimated coefficients on dichotomous explanatory variables can therefore be interpreted as percentage point changes in standard deviations of each component.

4.2. Childhood Family Structure

In terms of explanatory variables, the analysis that follows focuses on two measures of childhood family structure.

Our first measure, *ever lived in a non-intact family*, is derived using the self-reported marital histories of biological mothers. The sample is restricted to individuals whose mothers have complete marital histories spanning the individual's entire childhood. An individual is defined as having experienced family non-intactness during childhood if the child's mother

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[10]For this outcome variable and for the outcomes *organizational involvement*, and *individual voluntarism*, we will also use the ordinal nature of the original survey question by estimating ordered probit models.

[11]Our information about *political interest* and *party identification* is derived from questions asked in the SOEP survey in the years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey in 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009.

was ever unmarried before he or she reached the age of 16, either because the parents ended their marriage (*divorced parents*), or because the mother was unmarried when she gave birth and did not marry within the next year (*born outside marriage*).

The variable *divorced parents* captures individuals who lived with divorced parents for at least one year of their childhood (ages 0-16). In light of Coleman (1988) and our simple theory, we would expect children of divorced parents to suffer from a structural deficiency in family social capital, and therefore be civically less engaged than children from intact families. The variable *born outside marriage* captures individuals either born to lone mothers or to cohabiting parents. It is important to note that children born outside marriage have not necessarily experienced family non-intactness, since cohabiting parents may have provided an intact family environment throughout the entire childhood period. However, it is well understood that mothers who were not in a relationship at the birth of their child are more likely to continue living as a lone parent than those in a married relationship (Kiernan and Mensah, 2010). Moreover, a greater fragility of cohabiting unions compared with marital ones has been observed in most developed nations (Bumpass and Hu, 2000; Andersson, 2002). Since our data do not allow us to identify cohabitation history, we use the variable *born outside marriage* as a proxy for the family disruptions that affect children born into cohabitation or other unions than marriage.[12]

Our second measure of childhood family structure, *duration of family non-intactness*, is based on the first measure. However, instead of indicating the mere occurrence of family non-intactness during childhood, it expresses the number of years a child had lived with a divorced or unmarried mother. Given our theory, our expectation is that adult civic engagement decreases with the duration of family non-intactness during childhood.

4.3. Control Variables

Cross-sectional relationships between childhood family structure and adult civic engagement could be driven solely by selection, i.e., factors that increase the risk of family non-intactness may also be linked to children's civic engagement. We therefore choose potential observable confounders as control variables. Bedard and Deschenes (2005) show that the gender of the first child is related to parents' propensity to divorce. Gender is also likely to affect the political participation and civic engagement of adult children. Therefore, gender is among our control variables in the cross-sectional estimation.

Maternal education is also likely to affect both the probability of family non-intactness and the political behavior of children. While the classical Beckerian prediction for the effect of education on divorce is ambiguous (Becker *et al.*, 1977), we would expect parental education to go hand in hand with political and civic participation. We control for mothers' education by including three mutually exclusive indicator variables that equal one if they have

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[12]Because the variable *born outside marriage* captures not only children who experience family non-intactness at some time during their childhood, but also those who experience an intact family environment with long-term cohabiting parents, the estimates for it represent a conservative lower bound for the effect of family non-intactness and born outside marriage on civic engagement.

completed intermediate secondary school (Realschule), advanced secondary school (Abitur), or a university degree, and zero otherwise.[13]

Closely related to the educational attainment of mothers is their labor market attachment. To control for a correlation between labor market participation and non-intactness and possible adverse effects on children's development (Ruhm, 2004), we add the number of years a mother worked part-time and the number of years she worked full-time during the individual's childhood.[14]

To complete our set of control variables we add usual socio-demographic measures, which may cause selection bias if not adjusted for. Among these are the mother's age at birth, a maximum set of adult children's age dummy variables, federal state dummy variables ("Bundesländer"), year of interview dummy variables, an only child indicator, and dummy variables for children's birth order. We also control for the SOEP respondent samples to account for peculiarities in survey-specific selection.

We deliberately do not control for household income during childhood. It should be noted that, as stated in Adda *et al.* (2011), reduced income is one channel through which family dissolution affects life outcomes, and this is not what we are interested in. Household income during childhood after departure of the father is likely to consist mainly of mother's income and is probably not a good measure of financial constraints affecting children if the children also benefit from an absent father's income.[15]

4.4. Summary Statistics

We present means and standard deviations for the individual sample and the sibling sample in Table 1, measured in the last survey year adult children are observed in the sample. It is evident that a relative large proportion of young adults are interested in politics, identify with a democratic party, and do volunteer work in clubs or social organizations. Organizational involvement is less common, with only 7 percent of young adults reporting volunteer work in a citizen's group, political party, or local government.

21 percent of our respondents (18 percent of the sibling sample) lived in a non-intact family at some point during childhood; 15 (12) percent experienced the divorce of their parents and 9 (6) percent were born outside marriage. The dummy variables *parents divorced* and *born outside marriage* are not mutually exclusive. As a consequence, 3 (0) percent of respondents were born outside marriage and experienced the subsequent marriage and divorce of their mothers. The average age of adult children is 24 (25) years and both samples are balanced with respect to gender. We distinguish between four mutually exclusive dummy variables for mother's highest educational attainment. For example, 46 (45) percent of all mothers have completed a lower secondary school and 34 (35) percent have an intermediate

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[13]Paternal education is not included, because we rarely observe fathers' educational attainment after a divorce or in extramarital birth circumstances.

[14]Note that paternal labor market history is missing too often in the case of non-intact families to ensure a non-selective sample when included.

[15]Moreover, household income is almost inevitably lower for lone mothers than for couples, such that controlling for income may lead to strong multicollinearity which might pick up most variation in non-intactness.

secondary school degree. Mothers were on average 27 (26) years old when they gave birth to their child. Maternal employment during childhood averages 4.76 (4.83) years in part-time and 5.90 (5.23) years in full-time work.

5. The Effect of Family Non-Intactness during Childhood on Adult Civic Engagement

We start our empirical analysis by estimating cross-sectional models to understand the overall relationship between family non-intactness during childhood and children's civic engagement later in life. Thereafter, we present sibling difference regressions which rest on weaker identifying assumptions for estimating the effect of family non-intactness on adult civic engagement. These models are meant to eliminate family-specific characteristics (e.g., parenting style, parents' political and social values, neighborhood environment) that are assumed to be the same across siblings and to be constant over time. In a third step, we present a number of robustness tests and examine differences by gender, residential area during childhood, and mother's education.

5.1. Cross-Sectional Analysis: Selection on Observables

Empirical model. We start our empirical investigation by estimating pooled cross-sectional regressions of the form

$$Y_{ijt} = \beta_0 + \beta_1 NIT_{ij} + \beta_2 x_{ijt} + e_{ijt}, \tag{5}$$

where Y_{ijt} is one of our five dependent variables described above for adult child i from mother j at time t. For the binary outcome variables, we estimate non-linear probit models. For the continuous index variable, we estimate ordinary least-squares regressions. The key variable NIT_{ij} denotes the various childhood family structure measures for adult child i from mother j. The vector x_{ijt} includes all other control variables. Consistent and unbiased estimation of our key coefficient β_1 requires that all explanatory variables are uncorrelated with the error term e_{ijt}, obviously a very strong assumption which is unlikely to hold in the present context. Throughout the analysis, we compute standard errors that are robust to arbitrary forms of heteroscedasticity, as there are multiple observations of civic outcomes per individual over time.

Baseline results. Table 2 reports the results from the pooled cross-sectional regressions. For convenience, we only report the estimates of our key explanatory variables. Panel A reports the estimates for the dichotomous explanatory variable whether adult children ever lived in a non-intact family during childhood. Panel B reports the estimated effects for the explanatory variables *parents divorced* and *born outside marriage*. The results in Table 2, Panel A, point to a negative and statistically significant relationship between growing up in a non-intact family and the majority of civic engagement outcomes. The point estimate in Panel A, column 1 suggests that young adults who have lived in a non-intact family show a 10.4 percent of a standard deviation lower civic engagement (significant at the 1 percent level). This is a sizable effect, as it implies a 10.4 percent of a standard deviation decline

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in each of the index components, on average. Moreover, respondents who have ever lived in a non-intact family during childhood are 4 percentage points less likely to identify with a democratic party; 3 percentage points less likely to participate in a citizen's group, political parties or the local government; and 9 percentage points less likely to engage in volunteer work. These marginal effects are all precisely estimated and are statistically significant at the 1 percent level. Moreover, these are sizable effects given that 30 percent of young adults report attachment to a democratic party, 33 percent volunteer in clubs or social services, and 7 percent are active in citizen's groups or political parties. The only point estimate that is not precisely estimated in Panel A is the one for the outcome political interest.

Disentangling the two sources of non-intactness in Panel B reveals that a considerable proportion of the negative associations between family non-intactness and the majority of outcomes are driven by offsprings of divorced parents. The civic engagement index is negatively associated with both growing up with divorced parents and being born outside marriage. We see a decline of 11.7 percent of a standard deviation for adults with divorced parents (1 percent significance) and a decline of 6.2 percent of a standard deviation for respondents born outside marriage (5 percent significance). However, the estimates cannot be distinguished statistically from one another, as indicated by the p-value of a Chow test for equality of coefficients at the bottom of the table. The marginal effects in columns 2-5 all point to a negative relationship between having experienced parental divorce or being born outside marriage and the civic engagement measures. Note, however, that only half of them are statistically significant. The results of the Chow tests for equality of coefficients suggest that the estimated coefficients for the two different non-intactness measures are only statistically different from each other for organizational involvement (p-value: 0.07) and individual voluntarism (p-value: 0.01). The test statistics reveal that the relationship for these two outcome measures with growing up with divorced parents is larger in magnitude (more negative) than with being born outside marriage.[16]

Duration of family non-intactness. As laid out in the theory section, non-cooperative behavior between parents as a result of a dysfunctional relationship can decrease their children's civic engagement as young adults. The theory also reveals that the longer a period of childhood is spent in a non-intact family, the more severe the effects on social capital.

Table 3 reports the results for our explanatory variables, which measure the number of years young adults lived in a non-intact family. All estimates in Panel A of Table 3 point to a negative association between the number of years spent in a non-intact family and the civic engagement measures later in life. With the exception of the marginal effect for the outcome political interest, the point estimates are precisely estimated. For example, the result for the civic engagement index suggests that each additional year spent in a non-intact family is associated with a 0.8 percent decrease in standard deviations of civic engagement. Having spent half the childhood in a non-intact family would therefore imply a 6.4 percent decrease. The marginal effects in columns (2)-(5) indicate that each additional year spent

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[16]In addition, we applied ordered probit estimation to the ordinal measures *political interest*, *organizational involvement* and *individual voluntarism*. The results are consistent with the above findings.

in a non-intact family during childhood is associated with a 0.4 percentage point smaller probability of party identification (5 percent significance), a 0.2 percentage point lower probability of active involvement in a citizen's or political group (1 percent significance) and a 0.9 percentage point lower probability of volunteering (1 percent significance).

Table 3, Panel B, shows the results for distinct sources of family non-intactness. Although all correlation coefficients are negative for both explanatory variables, only four of the ten estimates are precisely estimated. For instance, each additional year with divorced parents is associated with a 1.2 percentage points reduction in standard deviations of civic engagement (1 percent significance). According to the Chow test, this effect is significantly different from the estimated coefficient on the number of years having lived with parents outside marriage. Overall, the sign of the estimated coefficients and marginal effects in Table 3 are in line with our hypothesis that adult civic engagement decreases with the duration spent in a non-intact family during childhood, but some of the results are not precisely estimated.

5.2. Sibling difference analysis: selection on unobservables

Empirical model. Our cross-sectional results cannot be readily interpreted as causal. The major threat to causal identification in our setting is omitted variable bias or selection bias. Reverse causality is arguably not the main concern for identification in the present context, as we measure civic engagement many years after measuring family non-intactness during childhood. Our outcomes are behavioral measures of adults, and these are not likely to cause family dissolution during childhood. Furthermore, we control for selection on observable characteristics in our pooled cross-sectional estimations to exclude the main sources of selection bias. However, unobservable factors may still confound the estimates. For example, parents who are likely to divorce may have different unobserved preferences, values and abilities than parents who are unlikely to divorce. These unobserved characteristics may in turn affect civic engagement of their offspring later in life, confounding the negative correlation in our cross-sectional estimates. We address this issue with sibling differences estimation (mother fixed-effects) of the form

$$Y_{ijt} = \beta_0 + \beta_1 NIT_{ij} + \beta_2 x_{ijt} + u_j + e_{ijt}, \tag{6}$$

where u_j, a time-invariant unobserved effect for siblings, is added to equation (1) in order to eliminate time-constant unobserved background characteristics from mother j. Sibling difference estimation eliminates all observed and unobserved time-constant mother-specific factors which are assumed to be the same for siblings and which might be associated with both family non-intactness and children's civic engagement later in life. Hence, the unobserved mother-specific error term u_j cancels out from our sibling difference regressions. The identifying assumption for unbiased sibling difference estimators is uncorrelatedness of sibling differences in family non-intactness with sibling differences in unobserved individual characteristics.[17] This is a much weaker identifying assumption than imposed by the

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[17]Recent studies using a similar estimation method are Ermisch and Francesconi (2012), Siedler (2011), Francesconi *et al.* (2010b), Currie *et al.* (2010) and Anderson *et al.* (2003). Ermisch and Francesconi (2001)

cross-sectional estimator which needs family non-intactness and unobserved mother-specific factors to be uncorrelated. We estimate sibling differences in the same observational year t, and use mother level clustering for estimating standard errors to account for correlations across siblings.

Other concerns for causal identification in sibling difference estimations are inevitable age and birth order differences between siblings. Among children born outside marriage, the affected child is always older and of lower birth order than the compared and unaffected child. When estimating the effects of growing up with divorced parents, the affected sibling is usually younger, and of higher birth order than the unaffected child. Therefore, we add age and birth order fixed effects to the sibling difference estimation that are likely to eliminate confounding variations from these sources.

It is important to keep in mind that sibling difference estimates are identified through adult siblings with differing family non-intactness during childhood years. Hence, the sibling difference estimates may deviate from cross-sectional estimates and require a different interpretation. First, sibling difference estimates are based on a sibling sample, and only children are excluded from the sample. Second, sibling differences occur only in particular situations. The individual affected by family non-intactness during childhood is compared to a sibling who did not grow up in a non-intact family. As they have the same mother, both siblings experience the event of a non-intact family, but at different times in their lives. For instance, the younger sibling might experience the divorce of his parents during childhood, at a point in time when the older sibling was already an adult and had already moved out of her parents' home. If we assume that non-intactness has a negative effect on civic engagement for both children, even if it occurs when children are adults and no longer live at home, our estimates can be regarded as lower bounds.

Sample description. Identification of sibling difference estimation hinges on within-sibling variation in family non-intactness during childhood and within-sibling variation in civic engagement. Table 4 summarizes the number of sibling pairs per year with differences in both family non-intactness and civic outcome measures. We can draw on over 1,000 sibling differences in family non-intactness when analyzing political interest and party identification. This number drops just below 500 for the outcomes organizational involvement and individual voluntarism. Within-sibling differences in outcomes generally occur more often than differences in family non-intactness. Table 4 also reports the number of observations when splitting the sample by (i) gender; (ii) mother's education and (iii) residential area, as we will study potential heterogenous effects for these groups in section 5.4. Note that, for the majority of subsamples, we still have a comfortable number of differences in family non-intactness, but in some cases the differences used for identification fall below 200. Interpretation of results based on relatively small samples will be made with caution.

Baseline results. Sibling difference estimates of the effect of family non-intactness on civic engagement are presented in Table 5. In the first column of Panel A, effects on the civic engagement index are negative and statistically significant at the 1 percent level. Growing up

provide a detailed discussion of the advantages and disadvantages of the sibling difference approach.

in a non-intact family reduces civic engagement by 15.7 percent in standard deviations. For the component outcome measures in the sibling difference analysis, family non-intactness during childhood decreases the occurrence of political interest by 9.4 percentage points, decreases identification with a democratic party and individual voluntarism by around 8 percentage points, respectively. These marginal effects are precisely estimated and statistically significant at the 5 percent level. We also find a negative effect in the magnitude of 2.8 percentage points on organizational involvement, but we cannot statistically distinguish it from zero. In sum, the results from our sibling difference estimates point to a negative effect of growing up in a non-intact family on children's civic outcomes later in life.

Table 6 reports pooled cross-sectional estimates based on our sibling sample (e.g. excluding only children and children whose siblings did not participate in the survey). Note that due to a larger set of control variables in the cross-sectional regressions, the sample sizes are slightly lower than in Table 5. One can see that the cross-sectional point estimates in Table 6 are relatively similar in magnitude to the corresponding sibling difference estimates. Therefore, the negative relationship between family non-intactness and adult children's civic engagement are unlikely to be entirely driven by unobserved heterogeneity. Regarding the magnitude of the effects, the sibling difference estimates are larger (more negative) compared to the simple cross-sectional estimates for the outcomes political interest and party identification, but slightly smaller (less negative) for organizational involvement and individual voluntarism. As these differences disappear when estimating the effect of growing up in a non-intact family on the index of civic engagement, unobserved mother characteristics seem not to be very influential. We conclude that there is not much bias in the simple cross-sectional estimates due to unobserved time-invariant family characteristics that are correlated with family non-intactness and adult children's civic outcomes. However, the cross-sectional results in the siblings sample are somehow larger than the cross-sectional results in the full sample. This points to a somewhat stronger effect of family non-intactness in families with more than one child.

Turning to the separate effects of the two sources of family non-intactness, *divorced parents* and *born outside marriage*, reveals a similar picture. The effects of growing up with divorced parents on the civic engagement index are minus 17.1 percent in standard deviations (5 percent significance) and minus 13.3 percent in standard deviations for children born outside marriage (5 percent significance).[18] The estimated effects on the component outcome measures are all negative, but only three point estimates are precisely estimated. The sibling difference estimates are again close to the cross-sectional estimates in Table 6. The effect of divorced parents on civic engagement is slightly larger in the sibling difference estimation (-0.171) than in the cross-sectional estimation (-0.150), but overall differences are moderate.

Duration of family non-intactness. Table 7 reports the results of the sibling difference models with the duration of family non-intactness (Panel A) and the number of years individuals lived with divorced parents or with a non-married mother (Panel B) as the main explanatory

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[18]Note that these two point estimates are not different from each other at conventional significance levels.

variables. In Panel A, we find a negative effect of each additional year spent in a non-intact family during childhood on civic engagement of 2.4 percent in standard deviations (5 percent significance). According to this point estimate, having had spent half of childhood (8 years) in a non-intact family decreases civic engagement by 19.2 percent. For the component measures, we find a negative significant effect of the duration of family non-intactness on party identification (1 percent significance). The estimated effects on political interest, political participation and civic engagement are all negative, but imprecisely estimated.

Turning to Panel B, the number of years that an individual lived with a divorced mother shows a slightly larger negative effect of 2.7 percent in standard deviations on the civic engagement index (5 percent significance) than the duration of having had lived with a unmarried mother. Moreover, we find a significant negative effect of the number of years having grown up with a divorced mother on adult children's party identification and organizational involvement (5 percent significance). The number of years having lived with an unmarried mother is estimated to have negative significant effects on political interest (1 percent significance) and party identification (5 percent significance). By and large, the results for the duration of family non-intactness are in line with the effects found for the occurrence of non-intactness, and are broadly consistent with our theory.

Again, we also report cross-sectional estimates for our sibling sample (see Table 8). The majority of cross-sectional estimates in Table 8 are somewhat smaller in magnitude (less negative) than the corresponding sibling difference estimates in Table 7. Thus, unobserved mother specific factors seem to play a larger role when studying the effect of the duration of family non-intactness on civic outcomes later in life compared to the occurrence of non-intactness.

Robustness—Age difference. Comparison of siblings who both experienced a very similar family background during childhood may raise some concerns. On the one hand, it is a prerequisite for our identification strategy to have siblings with very similar background characteristics. This is essential to be able to exclude family omitted variable bias in the sibling difference regressions. On the other hand, if siblings are born within a very small time span, small differences in age between the siblings will likely result in an attenuation bias, because both siblings will be affected almost identically. This might result in underestimating the negative effect of family non-intactness on adult children's civic outcomes. As additional evidence, we estimate the intergenerational effects for a smaller sample of siblings who are born more than two years apart. In fact, the estimated coefficients on the variable family non-intactness from this new sample are more negative and more precisely estimated than the corresponding sibling difference estimates in Table 5. As depicted in Table 9, growing up in a non-intact family leads to a decline in civic engagement of 20.0 percent in standard deviations (1 percent significance) compared to 15.7 percent in the baseline sibling difference estimation. Furthermore, the estimates indicate that growing up in a non-intact family decreases the likelihood to feel close to a democratic party by 13 percentage points (1 percent significance), and the likelihood to engage in volunteer work by 10.2 percentage points (5 percent significance). Also, estimates for having experienced a divorce during childhood are more precisely estimated. For all outcome variables, with the exception of

political interest, we find negative effects that are statistically significant at least at the 5 percent level. Moreover, the sibling difference estimates for the duration measures of family non-intactness, as found in in Table A.1 in the appendix, are also in line with the estimates in Table 7. The results from this exercise support our main finding that growing up in a non-intact family seems to have negative and long-lasting influences on children's civic engagement.

Robustness—Omitted variable bias. The cross-sectional and sibling difference estimations in the previous sections consistently point to negative effects of growing up in an non-intact family on adult civic engagement. We argued that the sibling difference estimations rest on less restrictive assumptions than the cross-sectional estimations, as unobservable time-invariant mother-specific characteristics are controlled for. Yet, bias from unobserved time-varying factors could still be a threat to this estimation method. The purpose of this section is to assess how robust our results are to omitted variable bias. The main idea of this method is to assess how strong the influence of omitted variables has to be in order to explain away the effect of the main explanatory variable of interest (Altonji *et al.*, 2005; Bellows and Miguel, 2009).

In the present context, we investigate how stable the coefficient of family non-intactness remains with the inclusion of additional explanatory variables in both the cross-sectional and sibling difference regressions.[19] If the inclusion of a rich set of control variables pushes the negative effect of family non-intactness towards zero, then it is likely that unobserved variables might also lead to attentuation bias. Alternatively, in case the estimated coefficient of family non-intactness does not change considerably with the inclusion of additional explanatory variables, it can be interpreted as further evidence in favor of a causal interpretation of our intergenerational estimates.

Altonji *et al.* (2005) study the impact of Catholic high school attendance in the U.S. on educational attainment and test scores. The authors report a ratio of 3.55, interpreting it as strong evidence that their estimates for high school graduation are unlikely to be entirely driven by selection on unobserved characteristics. Bellows and Miguel (2009) examine the effects of the experience of war violence in Sierra Leone on individuals' political behavior. They estimate ratios between 5 to 17, also suggesting that their estimates are unlikely to be entirely driven by unobserved variables. Following Bellows and Miguel (2009), we calculate the ratio of the "influence" of omitted variables relative to the explanatory variables that would be needed to explain away our estimates of family non-intactness on the civic engagement index. The estimated ratio for the cross-sectional estimates is 3.49, and the ratio for the siblings difference estimations is 3.53. Moreover, the corresponding ratios for the effects of growing up with divorced parents are 3.3 and 7.04, respectively. The results of our bias assessments therefore support the causal interpretation of the negative effects of growing up in a non-intact family on individuals' civic engagement as adults.

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[19]Derivation of the bias assessment estimators and underlying assumptions are explained in detail in Appendix B.

5.3. Effect heterogeneity

We have seen substantial effects of family non-intactness on civic engagement later in life. These effects may not be universally relevant for different groups of the population, and effect heterogeneity may arise for a variety of reasons. For instance, when thinking about the effect of family non-intactness during childhood on civic engagement, we have in mind certain modes of nurturing that might have adverse consequences for children's development. In the majority of families, non-intactness implies an absent father, and daughters and sons might therefore be affected differently by growing up in a non-intact family.[20] We did not find clear heterogeneous effects of non-intactness by gender. However, in the sibling difference estimations, we found negative and statistically significant effects for men only, and the magnitude of the effects of growing up in a non-intact family was larger for men than for women in most regressions.

Nurturing capacity or the effectiveness of parenting may as well produce heterogeneous effects of family non-intactness. In the case of missing fathers, mothers with higher capacity should be more able to compensate for the potential loss of paternal involvement in their children's development. On the other hand, highly educated women are likely to be married to highly educated men, and the absence of highly educated fathers might be more harmful for children. We therefore distinguish between adult children with highly educated mothers (completed upper secondary school or have an university degree), and those with lower educated mothers. Overall, the results did not point to substantial differences in the effects of family non-intactness by mother's education.

Putnam (2000) notes that social connectedness among inhabitants of densely populated urban areas is weaker than in smaller communities. Indeed, considerable differences in the levels of civic engagement and organizational involvement exist between individuals who grew up in rural or urban areas (e.g., 26 percent of respondents who lived in a city report being interested in politics, compared to 18 percent who come from a rural area), and these differences may also produce heterogeneous effects of family non-intactness. However, distinguishing between individuals who grew up in urban and rural areas did not point to heterogeneous effects.[21]

In sum, the effect of family non-intactness on civic engagement later in life is not restricted to either males or females, children of low or highly educated mothers, or rural or urban residential areas. We find some indication of more severe effects for boys and slightly weaker effects for girls. However, due to the low precision of some estimates, there remains some uncertainty about the nature of heterogeneity. The overall phenomenon of adverse effects of non-intact families during childhood on civic engagement seems to be strikingly universal. The results of the heterogeneity analyses can be found in Appendix A in Tables A.2, A.3 and A.4.

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[20]Note that we cannot actually distinguish effects of missing fathers and missing mothers as there are too few observed lone fathers in the data set.

[21]We also examined another potential source of heterogeneity: the age of the child at the time of parents' divorce. Again, our results did not point to important heterogeneous effects.

6. Final remarks

Well functioning democracies depend on active and informed citizens. Understanding the forces that shape civic engagement is therefore a significant challenge to the social sciences. This paper has focused on one very specific aspect of this challenge, proposing a mechanism which links childhood family structure to adult civic engagement. Our model illustrates the idea that family non-intactness disrupts the production process through which social capital and civic engagement is created within the family. The empirical results from our cross-sectional and sibling difference estimates do lend support to this simple idea. In particular, we find a significant negative relationship between growing up in a non-intact family and various measures of civic engagement, from individual voluntarism to organizational involvement to partisan commitment. These results are robust across a variety of specifications and subsamples of our data. Clarifying the mechanisms that produce the civic engagement effects is a research question that merits further attention.

As we have emphasized throughout, our results complement others in the literature, in particular those which have singled out family structure as of special importance for the intellectual development of children, and have conjectured that family non-intactness is a phenomenon which has broad implications for social capital and civic engagement (see, for example, Coleman's (1988) extensive discussion of social capital in the family). Despite this, there have been few previous attempts and little evidence to show that family non-intactness during childhood actually causes adult civic disengagement. From a practical standpoint, our findings suggest that schools or community organizations, which reach children across socioeconomic strata, might need to offer more opportunities for civic and political learning to counteract some of the negative effects on civic engagement stemming from the break-up of families.

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Table 1: Summary statistics, by sample

	Basic sample		Sibling sample	
	Means	Standard deviation	Means	Standard deviation
Dependent variables				
Political interest	0.24	0.43	0.24	0.43
Party identification	0.30	0.46	0.30	0.46
Organizational involvement	0.07	0.26	0.07	0.26
Individual voluntarism	0.33	0.47	0.35	0.48
Explanatory variables				
Ever lived in a non-intact family	0.21	0.41	0.18	0.38
Parents divorced	0.15	0.35	0.12	0.32
Born outside marriage	0.09	0.28	0.06	0.22
Duration of family non-intactness	1.57	3.75	1.09	3.02
Duration: parents divorced	1.02	2.91	0.77	2.46
Duration: born outside marriage	0.55	2.48	0.32	1.79
Control variables				
Age	24.19	6.33	24.61	5.76
Female	0.50	0.50	0.51	0.50
Mother's age at birth	26.65	5.09	26.36	4.78
Only child	0.13	0.33		
Firstborn child[a]	0.40	0.49	0.38	0.48
Second born child[a]	0.40	0.49	0.42	0.49
Third born child or higher birth order[a]	0.20	0.40	0.20	0.40
Mother's highest educational attainment				
Secondary school certificate or less	0.46	0.50	0.45	0.50
Intermediate school qualification	0.34	0.47	0.35	0.48
High school degree	0.04	0.19	0.04	0.20
Technical college or university degree	0.16	0.37	0.16	0.37
Mother's employment during childhood				
Number of years part-time employed	4.76	5.31	4.83	5.23
Number of years full-time employed	5.90	6.35	5.23	6.10
Number of individuals	*5828*		*3325*	

Notes: Figures shown are sample means computed in the last survey year for which individuals are observed. The sibling sample is constrained to the observations used in the sibling-fixed effects approach, i.e. two siblings must be observed in the same year. [a]Computed for children with siblings only.

Table 2: Childhood family structure and civic engagement
(Cross-sectional estimates)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A					
Ever lived in a non-intact family	-0.104**	-0.013	-0.041**	-0.027**	-0.088**
	(0.019)	(0.013)	(0.014)	(0.005)	(0.013)
Panel B					
Parents divorced	-0.117**	-0.019	-0.031+	-0.030**	-0.102**
	(0.020)	(0.015)	(0.016)	(0.005)	(0.013)
Born outside marriage	-0.062*	-0.005	-0.049*	-0.012	-0.041*
	(0.030)	(0.019)	(0.021)	(0.009)	(0.016)
Equality of coefficients (p-value)[1]	*0.14*	*0.56*	*0.51*	*0.07*	*0.01*
Person-year observations	*18503*	*42913*	*40947*	*19738*	*19754*

Notes: Each column in each panel reports the results of a regression for the outcome listed in that column. Figures are estimated coefficients from OLS regressions [(1)] or marginal effects from probit models [(2),(3),(4),(5)]. Probit effects are evaluated at the mean of all covariates. Panel robust standard errors are in parentheses. Standard errors are clustered on individuals' identification numbers, as there are multiple observations per person over time. Other explanatory variables are age dummy variables, sex, mother's highest educational attainment, mother's age at the child's birth, whether the respondent is an only child, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, regional dummy variables, survey years dummy variables, a dummy variable for East Germany, indicators of SOEP-samples, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.
[1]Test for equality of coefficients tests whether the coefficients for *parents divorced* and *born outside marriage* from the same regression can be distinguished statistically in a Chow test. We report p-values for the null hypothesis of equal coefficients.

Table 3: Duration of family non-intactness and civic engagement
(Cross-sectional estimates)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A					
Duration of family non-intactness	-0.008**	-0.001	-0.004*	-0.002**	-0.009**
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
Panel B					
Duration: parents divorced	-0.012**	-0.001	-0.004+	-0.004**	-0.014**
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Duration: born outside marriage	-0.003	-0.001	-0.003	-0.001	-0.002
	(0.004)	(0.002)	(0.003)	(0.001)	(0.002)
Equality of coefficients (p-value)[1]	0.03	0.99	0.88	0.07	0.00
Person-year observations	*18503*	*42913*	*40947*	*19738*	*19754*

Notes: Each column in each panel reports the results of a regression for the outcome listed in that column. Figures are estimated coefficients from OLS regressions [(1)] or marginal effects from probit models [(2),(3),(4),(5)]. Probit effects are evaluated at the mean of all covariates. Panel robust standard errors are in parentheses. Standard errors are clustered on individuals' identification numbers, as there are multiple observations per person over time. Other explanatory variables are age dummy variables, sex, mother's highest educational attainment, mother's age at the child's birth, whether the respondent is an only child, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, regional dummy variables, survey years dummy variables, a dummy variable for East Germany, indicators of SOEP-samples, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.
[1]Test for equality of coefficients tests whether the coefficients for *parents divorced* and *born outside marriage* from the same regression can be distinguished statistically in a Chow test. We report p-values for the null hypothesis of equal coefficients.

Table 4: Means of civic engagement measures and within-siblings variation

| | Political interest | | | Party identification | | | Organizational involvement | | | Individual voluntarism | | |
| | Mean | Number of sibling pairs with differences in: | | Mean | Number of sibling pairs with differences in: | | Mean | Number of sibling pairs with differences in: | | Mean | Number of sibling pairs with differences in: | |
		Family structure[a]	Outcome[b]		Family structure[a]	Outcome[b]		Family structure[a]	Outcome[b]		Family structure[a]	Outcome[b]
All	0.25	1027	3574	0.35	948	3330	0.08	481	654	0.33	480	1762
By gender[c]												
Women	0.17	239	708	0.32	220	759	0.07	114	136	0.31	114	434
Men	0.32	310	1080	0.38	300	975	0.09	152	198	0.36	151	518
By mothers education												
Less than high school degree	0.23	832	2822	0.34	777	2732	0.07	393	532	0.33	392	1466
High school or university degree	0.31	165	740	0.40	158	590	0.08	83	122	0.36	83	292
By residential area:												
Rural	0.20	249	768	0.30	241	792	0.09	117	164	0.38	118	463
Urban	0.26	529	1586	0.20	506	1420	0.07	253	265	0.30	252	711

Notes: [a] The number of sibling pairs with differences in the experience of family structure during childhood, e.g. one sibling grew up in a non-intact family and the other sibling in an intact family. [b] The number of sibling pairs with differences in the political outcome measure. [c] Both siblings of the same sex.

Table 5: Family non-intactness and civic engagement
(Sibling difference estimates)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A					
Ever lived in a non-intact family	-0.157**	-0.094**	-0.077*	-0.028	-0.081*
	(0.052)	(0.036)	(0.036)	(0.018)	(0.040)
Panel B					
Parents divorced	-0.171*	-0.048	-0.069	-0.040+	-0.101+
	(0.082)	(0.051)	(0.052)	(0.022)	(0.058)
Born outside marriage	-0.133*	-0.126**	-0.066	-0.018	-0.037
	(0.056)	(0.043)	(0.042)	(0.021)	(0.047)
Equality of coefficients (p-value)[1]	0.70	0.25	0.96	0.48	0.40
Person-year observations	8892	20613	19679	9445	9448
Number of sibling-year pairs	4423	9751	9663	4478	4479
Birth order FE	Yes	Yes	Yes	Yes	Yes

Notes: Each column in each panel reports the results of a regression for the outcome listed in that column. Results are sibling-difference estimates at same survey time. Estimates from linear fixed-effects models. Robust standard errors in parentheses. Standard errors are clustered on mother's identification number, as there are multiple observations for sibling pairs. Other explanatory variables are age dummy variables, sex, mother's age at the child's birth, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.

[1]Test for equality of coefficients tests whether the coefficients for *parents divorced* and *born outside marriage* from the same regression can be distinguished statistically in a Chow test. We report p-values for the null hypothesis of equal coefficients.

Table 6: Family non-intactness and civic engagement
(Cross-sectional estimates in sibling sample)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A					
Ever lived in a non-intact family	-0.157**	-0.052**	-0.067**	-0.038**	-0.121**
	(0.026)	(0.018)	(0.021)	(0.007)	(0.019)
Panel B					
Parents divorced	-0.150**	-0.036+	-0.037	-0.044**	-0.134**
	(0.029)	(0.021)	(0.025)	(0.007)	(0.020)
Born outside marriage	-0.134**	-0.074**	-0.102**	-0.014	-0.060+
	(0.040)	(0.023)	(0.032)	(0.013)	(0.032)
Equality of coefficients (p-value)[1]	0.74	0.22	0.12	0.02	0.05
Person-year observations	*8,873*	*20,560*	*19,612*	*9,409*	*9,425*

Notes: Results from the same sample used for the sibling difference approach. Observations with missing information in cross-sectional control variables are dropped. Each column in each panel reports the results of a regression for the outcome listed in that column. Figures are coefficients from OLS [(1)] or marginal effects from probit [(2),(3),(4),(5)] regressions. Probit effects are evaluated at the mean of all covariates. Panel robust standard errors in parentheses. Standard errors are clustered on individuals' identification numbers, as there are multiple observations per person over time. Other explanatory variables are age dummy variables, sex, mother's highest educational attainment, mother's age at the child's birth, whether the respondent is an only child, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, regional dummy variables, survey years dummy variables, a dummy for East Germany, indicators of SOEP-samples, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.

[1]Test for equality of coefficients tests whether the coefficients for *parents divorced* and *born outside marriage* from the same regression can be distinguished statistically in a Chow test. We report p-values for the null hypothesis of equal coefficients.

Table 7: Duration of family non-intactness and civic engagement
(Sibling difference estimates)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A					
Duration of family non-intactness	-0.024*	-0.011	-0.026**	-0.002	-0.002
	(0.011)	(0.008)	(0.009)	(0.004)	(0.001)
Panel B					
Duration: parents divorced	-0.027*	0.004	-0.024*	-0.007*	-0.010
	(0.012)	(0.010)	(0.011)	(0.003)	(0.011)
Duration: born outside marriage	-0.019	-0.039**	-0.024*	0.004	0.008
	(0.019)	(0.011)	(0.012)	(0.007)	(0.015)
Equality of coefficients (p-value)[1]	0.71	0.00	0.98	0.14	0.34
Person-year observations	8892	20613	19679	9445	9448
Number of sibling-year pairs	4423	9751	9663	4478	4479
Birth order FE	Yes	Yes	Yes	Yes	Yes

Notes: Each column in each panel reports the results of a regression for the outcome listed in that column. Results are sibling-difference estimates at same survey time. Estimates from linear fixed-effects models. Robust standard errors in parentheses. Standard errors are clustered on mother's identification number, as there are multiple observations for sibling pairs. Other explanatory variables are age dummy variables, sex, mother's age at the child's birth, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.

[1]Test for equality of coefficients tests whether the coefficients for *parents divorced* and *born outside marriage* from the same regression can be distinguished statistically in a Chow test. We report p-values for the null hypothesis of equal coefficients.

Table 8: Duration of family non-intactness and civic engagement (Cross-sectional estimates in sibling sample)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A					
Duration of family non-intactness	-0.013**	-0.006*	-0.007*	-0.002+	-0.013**
	(0.003)	(0.003)	(0.003)	(0.001)	(0.003)
Panel B					
Duration: parents divorced	-0.015**	-0.003	-0.003	-0.006**	-0.020**
	(0.004)	(0.003)	(0.004)	(0.002)	(0.003)
Duration: born outside marriage	-0.011*	-0.013**	-0.015**	0.002	-0.002
	(0.004)	(0.004)	(0.004)	(0.002)	(0.004)
Equality of coefficients (p-value)[1]	0.41	0.03	0.04	0.04	0.00
Person-year observations	*8,873*	*20,560*	*19,612*	*9,409*	*9,425*

Notes: Results from the same sample used for the sibling difference approach. Observations with missing information in cross-sectional control variables are dropped. Each column in each panel reports the results of a regression for the outcome listed in that column. Figures are estimated coefficients from OLS [(1)] or marginal effects from probit [(2),(3),(4),(5)] regressions. Probit effects are evaluated at the mean of all covariates. Panel robust standard errors in parentheses. Standard errors are clustered on individuals' identification numbers, as there are multiple observations per person over time. Other explanatory variables are years of age dummy variables, sex, mother's highest educational attainment, mother's age at the child's birth, whether the respondent is an only child, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, regional dummy variables, survey years dummy variables, a dummy for East Germany, indicators of SOEP-samples, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.
[1]Test for equality of coefficients tests whether the coefficients for *parents divorced* and *born outside marriage* from the same regression can be distinguished statistically in a Chow test. We report p-values for the null hypothesis of equal coefficients.

Table 9: Robustness—Siblings more than two years apart
(Sibling difference estimates)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A					
Ever lived in a non-intact family	-0.200**	-0.092*	-0.131**	-0.033+	-0.102*
	(0.060)	(0.042)	(0.034)	(0.020)	(0.044)
Panel B					
Parents divorced	-0.236**	-0.054	-0.123*	-0.058*	-0.140*
	(0.086)	(0.060)	(0.053)	(0.026)	(0.057)
Born outside marriage	-0.153*	-0.138**	-0.113**	-0.010	-0.028
	(0.070)	(0.049)	(0.037)	(0.023)	(0.057)
Equality of coefficients (p-value)[1]	0.45	0.29	0.88	0.18	0.17
Person-year observations	5708	13233	12676	6039	6042
Number of sibling-year pairs	2702	5984	5941	2729	2729
Birth order FE	Yes	Yes	Yes	Yes	Yes

Notes: Each column in each panel reports the results of a regression for the outcome listed in that column. Results are sibling difference estimates at same survey time. Estimates from linear fixed-effects models. Robust standard errors in parentheses. Standard errors are clustered on mother's identification number, as there are multiple observations for sibling pairs. Other explanatory variables are age dummy variables, sex, mother's age at the child's birth, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.
[1] Test for equality of coefficients tests whether the coefficients for *parents divorced* and *born outside marriage* from the same regression can be distinguished statistically in a Chow test. We report p-values for the null hypothesis of equal coefficients.

Appendix A. Supplementary Tables

Table A.1: Robustness—Siblings more than two years apart
(Sibling difference estimates)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A					
Duration of family non-intactness	-0.027*	-0.011	-0.028**	-0.003	-0.004
	(0.012)	(0.009)	(0.009)	(0.004)	(0.010)
Panel B					
Duration: parents divorced	-0.031*	0.007	-0.026*	-0.008*	-0.012
	(0.013)	(0.011)	(0.012)	(0.003)	(0.012)
Duration: born outside marriage	-0.022	-0.039**	-0.032**	0.006	0.008
	(0.021)	(0.012)	(0.012)	(0.007)	(0.016)
Equality of coefficients (p-value)[1]	0.71	0.00	0.74	0.08	0.30
Person-year observations	5708	13233	12676	6039	6042
Number of sibling-year pairs	2702	5984	5941	2729	2729
Birth order FE	Yes	Yes	Yes	Yes	Yes

Notes: Each column in each panel reports the results of a regression for the outcome listed in that column. Results are sibling-difference estimates at same survey time. Estimates from linear fixed-effects models. Robust standard errors in parentheses. Standard errors are clustered on mother's identification number, as there are multiple observations for sibling pairs. Other explanatory variables are age dummy variables, sex, mother's age at the child's birth, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.

[1]Test for equality of coefficients tests whether the coefficients for *parents divorced* and *born outside marriage* from the same regression can be distinguished statistically in a Chow test. We report p-values for the null hypothesis of equal coefficients.

Table A.2: Heterogeneity analysis
(Cross-sectional estimates)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A: By gender					
Women	-0.129**	-0.012	-0.058**	-0.033**	-0.079**
	(0.025)	(0.014)	(0.019)	(0.005)	(0.016)
N	9117	21352	20211	9704	9811
Men	-0.083**	-0.013	-0.022	-0.016+	-0.096**
	-0.028	(0.021)	(0.021)	(0.009)	(0.019)
N	9386	21563	20736	9893	9935
Equality of coefficients					
(p-value)[1]	0.44	0.87	0.15	0.01	0.71
Panel B: By mother's education					
Less than high	-0.117**	-0.013	-0.039*	-0.027**	-0.101**
school degree	(0.021)	(0.014)	(0.016)	(0.006)	(0.014)
N	15274	35523	33863	16326	16341
High school or	-0.055	-0.018	-0.045	-0.025*	-0.037
university degree	(0.041)	(0.033)	(0.032)	(0.012)	(0.029)
N	3229	7381	7070	3365	3412
Equality of coefficients					
(p-value)[1]	0.30	0.81	0.81	0.77	0.03
Panel C: By residential area					
Rural	-0.133**	-0.002	-0.044+	-0.035**	-0.133**
	(0.035)	(0.022)	(0.026)	(0.010)	(0.028)
N	4595	10648	10260	4746	4899
Urban	-0.072**	-0.017	-0.032+	-0.016*	-0.048**
	(0.026)	(0.018)	(0.019)	(0.007)	(0.016)
N	9328	21126	20457	9812	9841
Equality of coefficients					
(p-value)[1]	0.15	0.67	0.66	0.17	0.02

Notes: Each estimate represents a regression result for the outcome listed in that column on *ever lived in a non-intact family*. Rows denote different samples. Figures are estimated coefficients from OLS [(1)] or marginal effects from probit [(2),(3),(4),(5)] regressions. Probit effects are evaluated at the mean of all covariates. Panel robust standard errors in parentheses. Standard errors are clustered on individuals' identification numbers, as there are multiple observations per person over time. Other explanatory variables are age dummy variables, sex, mother's highest educational attainment, mother's age at the child's birth, whether the respondent is an only child, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, regional dummy variables, survey years dummy variables, a dummy for East Germany, indicators of SOEP-samples, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.
[1] Test for equality of coefficients tests whether the coefficients between the two samples can be distinguished statistically in a Chow test. Equality of coefficients, not marginal effects, means that the effect would be of equal size had the two sample populations equal characteristics.

Table A.3: Heterogeneity analysis
(Sibling difference estimates)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A: By gender					
Women	-0.034	-0.074	0.022	-0.021	0.001
	(0.082)	(0.060)	(0.084)	(0.033)	(0.077)
N	*4378*	*10230*	*9704*	*4685*	*4685*
Men	-0.293**	-0.070	-0.153**	-0.054+	-0.202*
	(0.091)	(0.052)	(0.052)	(0.028)	(0.080)
N	*4514*	*10383*	*9975*	*4760*	*4763*
Equality of coefficients (p-value)[1]	*0.03*	*0.96*	*0.08*	*0.44*	*0.07*
Panel B: By mother's education					
Less than high school degree	-0.134*	-0.068+	-0.060	-0.026	-0.065
	(0.056)	(0.039)	(0.042)	(0.021)	(0.045)
N	*7348*	*17120*	*16298*	*7822*	*7825*
High school or university degree	-0.319+	-0.270*	-0.174+	-0.058	-0.166
	(0.194)	(0.128)	(0.102)	(0.050)	(0.134)
N	*1525*	*3442*	*3334*	*1601*	*1601*
Equality of coefficients (p-value)[1]	*0.30*	*0.08*	*0.27*	*0.54*	*0.47*
Panel C: By residential area					
Rural	-0.173	-0.080	-0.112	-0.037	-0.114
	(0.108)	(0.074)	(0.074)	(0.037)	(0.085)
N	*2245*	*5234*	*5027*	*2380*	*2387*
Urban	-0.088	-0.040	-0.062	-0.024	-0.068
	(0.077)	(0.052)	(0.065)	(0.025)	(0.061)
N	*4143*	*9375*	*9121*	*4338*	*4333*
Equality of coefficients (p-value)[1]	*0.55*	*0.75*	*0.63*	*0.76*	*0.66*

Notes: Each estimate represents a regression result for the outcome listed in that column on *ever lived in a non-intact family*. Rows denote different samples. Results are sibling difference estimates at same survey time. Estimates from linear fixed-effects models. Robust standard errors in parentheses. Standard errors are clustered on mother's identification number, as there are multiple observations for sibling pairs. Other explanatory variables are age dummy variables, sex, mother's age at the child's birth, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.
[1] Test for equality of coefficients tests whether the estimates for family non-intactness differ between the groups in a regression of a fully interacted model. We report p-values of the interactions with the variable of interest.

Table A.4: Heterogeneity—Age at parents' divorce
(Cross-sectional and sibling difference estimates)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Panel A: Cross-sectional estimates					
Parents divorced at ages:					
0-5 years	-0.133**	-0.027	-0.035	-0.025**	-0.111**
	(0.030)	(0.023)	(0.025)	(0.009)	(0.021)
6-10 years	-0.102**	-0.006	-0.022	-0.029**	-0.102**
	(0.031)	(0.022)	(0.026)	(0.008)	(0.021)
11-16 years	-0.065*	-0.005	-0.010	-0.022**	-0.073**
	(0.029)	(0.023)	(0.025)	(0.007)	(0.020)
Person-year observations	*18503*	*42913*	*40947*	*19738*	*19754*
Panel B: Sibling difference estimates					
Parents divorced at ages:					
0-5 years	-0.178*	-0.001	-0.102+	-0.033+	-0.035
	(0.090)	(0.053)	(0.056)	(0.019)	(0.064)
6-10 years	-0.154+	-0.026	-0.076	-0.042+	-0.076
	(0.086)	(0.070)	(0.066)	(0.024)	(0.075)
11-16 years	-0.138	-0.042	-0.010	-0.040	-0.135*
	(0.087)	(0.057)	(0.063)	(0.025)	(0.062)
Person-year observations	*8873*	*20562*	*19632*	*9423*	*9426*
Number of sibling-year pairs	*4417*	*9739*	*9649*	*4473*	*4474*

Notes: Each column in each panel reports the results of a regression for the outcome listed in that column. In Panel A, figures are estimated coefficients from OLS [(1)] or marginal effects from probit [(2),(3),(4),(5)] regressions. Probit effects are evaluated at the mean of all covariates. Panel robust standard errors in parentheses. Standard errors are clustered on individuals' identification numbers, as there are multiple observations per person over time. In Panel B, results are sibling difference estimates at same survey time. Estimates from linear fixed-effects models. Robust standard errors in parentheses. Standard errors are clustered on mother's identification number, as there are multiple observations for sibling pairs. Other explanatory variables according to the other cross-sectional and sibling difference estimations. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.

Table A.5: Baseline full estimation table
(Cross-sectional estimates)

Dependent variable:	(1) Index of civic engagement	(2) Political interest	(3) Party identification	(4) Organizational involvement	(5) Individual voluntarism
Female	-0.196**	-0.164**	-0.071**	-0.026**	-0.060**
	(0.016)	(0.010)	(0.010)	(0.005)	(0.011)
Mother's highest educational attainment					
Intermediate school	0.150**	0.117**	0.077**	0.009**	0.050**
	(0.020)	(0.033)	(0.015)	(0.006)	(0.013)
High School	0.222**	0.127**	0.122**	0.032*	0.015**
	(0.048)	(0.033)	(0.033)	(0.019)	(0.035)
Technical college or university degree	0.314**	0.214**	0.205**	0.042**	0.106**
	(0.026)	(0.020)	(0.019)	(0.010)	(0.019)
Mother's age at birth	0.008**	0.005**	0.005**	0.001	0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Only child	-0.044	-0.004	-0.028	-0.007	-0.050**
	(0.028)	(0.018)	(0.019)	(0.009)	(0.018)
Birth order					
Second child	-0.087**	-0.050**	-0.044**	-0.000	-0.022
	(0.020)	(0.012)	(0.014)	(0.006)	(0.013)
Third child	-0.122**	-0.062**	-0.072**	0.004	-0.041*
	(0.030)	(0.017)	(0.020)	(0.009)	(0.019)
East Germany	0.006	0.035	0.048	-0.050*	-0.006
	(0.073)	(0.046)	(0.054)	(0.020)	(0.054)
Mother's employment during childhood years					
Number of years part-time employed	0.003	0.001	0.002	0.001	0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Number of years full-time employed	-0.003*	-0.002	-0.000	-0.000	-0.004**
	(0.002)	(0.001)	(0.001)	(0.000)	(0.001)
Ever lived in a non-intact family	0.104**	-0.013	-0.041**	-0.027**	-0.088**
	(0.019)	(0.013)	(0.014)	(0.005)	(0.013)
Person-year obs.	*18503*	*42913*	*40947*	*19738*	*19754*

Notes: Each column in each panel reports the results of a regression for the outcome listed in that column. Figures are marginal effects from OLS [(1)] or probit [(2),(3),(4),(5)] regressions. Probit effects are evaluated at the mean of all covariates. Panel robust standard errors in parentheses. Standard errors are clustered on individuals' identification numbers, as there are multiple observations per person over time. Other explanatory variables are years of age dummy variables, sex, mother's highest educational attainment, mother's age at the child's birth, whether the respondent is an only child, birth order dummy variables, the number of years of maternal part-time and full-time employment during the respondent's childhood, regional dummy variables, survey years dummy variables, east Germany, indicators of SOEP-samples, and a constant. The information about *political interest* and *party identification* is derived from questions asked in the survey years 1985-2009 and 1984-2009, respectively. For *organizational involvement* and *individual voluntarism*, we use information derived from questions asked in the survey years 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2001, 2005, 2007 and 2009. + significant at 10%; * significant at 5%; ** significant at 1% level.

Appendix B. Supplementary Material on how to Approximate the Importance of Omitted Variable Bias

We ought to assess how strong the relation of the key explanatory variable to omitted variables would have to be to explain away our estimates of interest (e.g. measures of family non-intactness during childhood years) in the cross-section and the sibling difference regressions. We closely follow the approach in Bellows and Miguel (2009) and extend it to the inclusion of family fixed effects.

Abstaining from person and time indices, our model can be characterized by

$$Y = \alpha NIT + \gamma q + \epsilon, \tag{B.1}$$

where Y denotes the outcome measure, NIT is family non-intactness, α is the estimate of interest and q is an unobserved index of characteristics. The unobserved index is a determinant of selection into family non-intactness and, if left out of the estimation, as in

$$Y = \alpha NIT + \epsilon, \tag{B.2}$$

leads to standard omitted variable bias in OLS estimates with no control variables (as indicated by the subscript no), such that

$$plim \, \hat{\alpha}_{OLS,no} = \alpha_0 + \gamma \frac{Cov(NIT, q)}{Var(NIT)}. \tag{B.3}$$

Next, we assume that the observed control variables x are related to the selection index q in the following way

$$q = x'\beta + \tilde{q}, \tag{B.4}$$

with $\tilde{q}$ being the unobserved component of q. Further, we assume that the explanatory variables in x are only related to non-intactness NIT through q, which implies that the control variables are exogenous and therefore uncorrelated with the unobserved components. We also assume that the impact of the selection on observable factors is equal to the impact of selection on unobservable factors. In a second step, we estimate the following equation, including the control variables (denoted by the subscript con),

$$Y = \alpha NIT + x'\beta + \epsilon. \tag{B.5}$$

The new probability limit of the estimate of interest is

$$plim \, \hat{\alpha}_{OLS,con} = \alpha_0 + \gamma \frac{Cov(NIT, \tilde{q})}{Var(NIT)}. \tag{B.6}$$

By taking the difference of the two estimates, we get

$$\hat{\alpha}_{OLS,no} - \hat{\alpha}_{OLS,con} = \gamma \frac{Cov(NIT, x'\beta)}{Var(NIT)}. \tag{B.7}$$

The explanatory variables in x are unlikely to perfectly resemble the selection index q. Unobserved heterogeneity in $\tilde{q}$ can still induce bias in the estimates of interest. Without being able to compute the bias due to unobservables, we would like to assess how strong the covariance between NIT and $\tilde{q}$ must be to explain away the entire intergenerational effect of growing up in a non-intact family after controlling for x. We can express this covariance as a fraction of the covariance between NIT and the control variables. The effect is explained away if $\alpha_0 = 0$, which yields

$$\frac{\hat{\alpha}_{OLS,con}}{\hat{\alpha}_{OLS,no} - \hat{\alpha}_{OLS,con}} = \frac{Cov(NIT, \tilde{q})}{Cov(NIT, x'\beta)}. \tag{B.8}$$

This fraction of point estimates from different regressions denotes how strong the covariance between family non-intactness and unobserved factors $\tilde{q}$ relative to the covariance of family non-intactness NIT and the control variables has to be to explain away the entire effect. The larger this fraction is, the more unlikely it is that unobserved factors are fully confounding our estimate. This is the Bellows and Miguel (2009) result and we now extend it to the fixed-effects regression framework.

Assume now that unobserved factors $\tilde{q}$ are the sum of mother (or sibling pair) fixed-effects and other unobserved factors that are individual-specific, such that

$$q = x'\beta + \tilde{q} = x'\beta + \eta + \nu, \tag{B.9}$$

with η being the mother fixed-effect and ν other unobserved factors. The fixed-effects model is denoted by

$$Y = \alpha NIT + x'\beta + \eta + \nu. \tag{B.10}$$

We cannot get consistent estimates of η due to the incidental parameter problem (Neyman and Scott, 1948). As a thought experiment, assume for now that we can get consistent estimates. Then, we would get an estimate of interest according to

$$plim\,\hat{\alpha}_{OLS,\eta,con} = \alpha_0 + \gamma \frac{Cov(NIT, \nu)}{Var(NIT)}. \tag{B.11}$$

The difference to a simple estimate without control variables is given by

$$\begin{aligned}\hat{\alpha}_{OLS,no} - \hat{\alpha}_{OLS,\eta,con} &= \gamma \frac{Cov(NIT, x'\beta) + Cov(NIT, \eta) + Cov(NIT, \nu)}{Var(NIT)} - \gamma \frac{Cov(NIT, \nu)}{Var(NIT)} \\ &= \gamma \frac{Cov(NIT, x'\beta) + Cov(NIT, \eta)}{Var(NIT)}.\end{aligned} \tag{B.12}$$

If we again assume $\alpha_0 = 0$, we get the following expression

$$\frac{\hat{\alpha}_{OLS,\eta,con}}{\hat{\alpha}_{OLS,no} - \hat{\alpha}_{OLS,\eta,con}} = \frac{Cov(NIT, \nu)}{Cov(NIT, x'\beta) + Cov(NIT, \eta)}. \tag{B.13}$$

This fraction tells us how large the covariance between family non-intactness and individual specific unobserved factors has to be relative to the covariance between family non-intactness and observable controls including mother fixed-effects.

In fact, we cannot estimate an equation with mother fixed-effects. Instead we use a sibling difference transformation. Fixed-effects and within-transformations identify the same estimates if $E(\nu|NIT, x, \eta) = 0$. As Borghans *et al.* (2008) show in an appendix, bias in these models can be different. Sibling difference equations between siblings i and j can be characterized by

$$Y_i - Y_j = \alpha(NIT_i - NIT_j) + (x_i' - x_j')\beta + (\eta - \eta) + (\nu_i - \nu_j). \qquad \text{(B.14)}$$

We can assume that $Var(NIT_i) = Var(NIT_j)$, $Cov(NIT_i, \nu_j) = Cov(NIT_j, \nu_i)$ and $Cov(NIT_i, \nu_i) = Cov(NIT_j, \nu_j)$. The estimate of interest then has the following property

$$plim\,\hat{\alpha}_{SD,\eta,con} = \alpha_0 + \gamma\frac{Cov(NIT_i - NIT_j, (\nu_i - \nu_j))}{Var(NIT_i - NIT_j)} = \alpha_0 + \gamma\frac{Cov(NIT_i, \nu_i) - Cov(NIT_i, \nu_j)}{Var(NIT_i) - Cov(NIT_i, NIT_j)}.$$
$$\text{(B.15)}$$

By assuming that

$$\frac{Cov(NIT_i, \nu_j)}{Cov(NIT_i, NIT_j)} = \frac{Cov(NIT_i, \nu_i)}{Var(NIT_i)}. \qquad \text{(B.16)}$$

we get as an approximation the known expression for

$$\frac{\hat{\alpha}_{SD,\eta,con}}{\hat{\alpha}_{OLS,no} - \hat{\alpha}_{SD,\eta,con}} = \frac{Cov(NIT, \nu)}{Cov(NIT, x'\beta) + Cov(NIT, \eta)} = \frac{\hat{\alpha}_{OLS,\eta,con}}{\hat{\alpha}_{OLS,no} - \hat{\alpha}_{OLS,\eta,con}}. \qquad \text{(B.17)}$$