

# The Effects of the Timing of Divorce on Children

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## **Purpose**

33% of all Danish children have experienced a parental divorce (or end of cohabitation) by age 15 (Ottesen and Stage, 2012). In the cross-section, these children have worse outcomes than children of parents who do not get divorced. In Denmark, children whose parents' divorced by age 15 are on average in the 45th percentile of labor earnings at age 30, while children whose parents are not divorced are in the 52nd percentile of labor earnings. However, the extent to which differences between children of divorce and not divorce is due to causal effect rather than just selection is highly debated (Amato 2010, Bjorklund et al. 2006, Bjorklund Sundstrom 2006, Corak 2001, Gruber 2004, MacLanahan et al. 2013, Sigle-Rushto et al. 2014).

Furthermore, the exact mechanisms of a causal effect have yet to be identified, though theory offers up many possibilities. In particular, divorce may lead to an increased absence of one's father, leading to fewer parental inputs. Divorce may also be surrounded by parental conflict which may cause the child mental distress leading to lower human capital. There may also be other changes resulting from the divorce, for example, moves, that lead to disruptions in children lives, which may also effect their social as well as general human capital (Coleman 1996). Some of these mechanisms might cause a fixed cost on the child independent of the timing, while others might have a cost that is dependent on the timing of the divorce.

This project attempts to non-parametrically estimate the effects of divorce on children based on the age of the child at divorce, and asks *What are the causal effects of the timing of divorce on children?* The reason for this is three-fold. First, given the possible mechanisms, we hypothesize that many of the costs are timing dependent. Second, identifying timing effects may be easier than identifying fixed effects. Third, by studying the timing of the effects we may be able to isolate the various mechanisms through which divorce affects children, which has direct policy implications. To isolate the effects we will look at various short and long run outcomes, including those related to education, mental health, labor, and family structure.

## **Policy Relevance**

Given that major family events, such as divorces, have substantial effects on the human capital formation on the children, they may affect directly the returns on schooling investments made by the government. Additionally, isolating the mechanisms through which divorce affects children will suggest specific government interventions to mitigate the adverse effects on, say, human capital formation. Given our focus on timing, this will allow for targeted interventions based on the age of child at divorce. For example, if we find large mental health impacts for teenage children, as well as large impacts children's future outcomes, this might suggest subsidies for targeted therapy of teenagers after divorce.

## Hypothesis

We hypothesize that divorce may have differential effects on children based on the timing of the divorce. This could be due to the following reasons: first, children might have “critical periods” in early childhood, such that the stress from parental conflict has a larger effect developmentally if the child is younger (Heckman and Carniero 2003, Almond and Currie, 2010). Secondly, there might be a dosage effect. That is, if there is a negative effect from the increased absence of one’s father, or stress from living in a more unstable household, then children of parents who get divorced when they are young might be more negatively influenced. Finally, there may be critical transitioning periods when children’s outcome are unduly influenced by the shock. This could be due to high stakes testing that determines later human capital investment. If this is the case, divorce may have larger effects around these critical times.

## Method and preliminary results

Using Denmark administrative data, our main method is to test whether the timing of divorce has differential effects based on the age of the child when the parents get divorced. The main identification problem is that even conditioning on divorce, there might be selection in the age at which the divorce takes place. To control for selection, we will rely on comparing the outcomes of siblings whose parents experience a divorce. This identification strategy relies on the fact that for a given divorce, siblings experience the divorce at different ages. Therefore, on average, the difference in their outcomes can be attributed to the age at which the divorce happens.

Formally, we intend to estimate (regression) equation (1) Equation (1): where  $Y_{ip}$  are the outcome of interest,  $I$  are indicators of the age of the child when parents divorce,  $X_{ip}$  is a vector of observable controls and  $\alpha_p$  are parental fixed effects. The parameter estimates of interest are  $\beta_s$  capturing the child’s age specific effect of the divorce relative to some base year.

Notes: The X-axis on the figure marks the age of the child when the parents were divorced. The Y-axis is the within cohort rank in the test-scores at the end of compulsory schooling. The Blue, Red, and Green lines plot the estimates of of equation (1) in a specification with i) no controls (Blue), ii) with the following controls: birth order and year of birth, parental age, parental education, parental labor income and child’s birth weight (Red) and iii) additional parent fixed effects (Green). The effects are all relative to divorce at age 0.

As an example of our estimation framework, Figure 1 shows a preliminary result on test scores by the end of compulsory schooling. The specification with no controls (blue line) indicates that the children who experience divorces at ages 1-3 have particularly poor outcomes at test scores by the end of compulsory schooling. However, once we control for observed and unobserved heterogeneity, these effects vanish. This result indicates that those families that experience divorces at children’s early ages may be selected. Still, the specification controlling for observed controls and parental fixed effects (green) reveal an inverted U-pattern of the compulsory schooling outcome. Particularly, those children experiencing divorces in close proximity to the tests (divorces at age 13 and 14), perform worse at the tests at age 15. This pattern reveals that the timing of divorces may have substantial effects.

## Data

While we already have data from the Denmark registers on long run outcomes, such as

educational attainment, income and labor force participation, we have a limited amount of immediate outcomes for children. ®<sub>s</sub>

We are preparing an application for *National test score* data which has test scores for 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup>, and 8<sup>th</sup> grade. As well, to look at the mental health impacts of divorce, we plan to apply for *prescription drug* data. These are both crucial to our analysis as they will help evaluate the immediate impacts of divorce. Additionally they will help isolate the mechanisms for the effect of divorce on children – through an effect on mental health and or an effect on cognitive ability (measured by test scores).

As the initial results above using test scores at age 15 showed, the test scores are lower if the child takes the test in the years immediately after their parents' divorce versus if they take the test prior to their parents getting divorced. With this grant, we will be able to look at test scores at multiple ages allowing for an *individual fixed effect design*.

### **Contribution, Publication potential and Research plan**

The project places itself in the increasing literature of the effects on early interventions on human capital formation. The leading hypothesis is that earlier investments in human capital are more important, as they generate complementarities for later investments. The current project investigates how the timing of adverse events for the children may have differential effects depending on how close they are to other important events such as school test as well as to early childhood.

Given that divorces may have substantial effects on the children's achievements and that we are able to identify differential causal timing effects, we fully expect our research to lead to publication in a top journal.

We expect results during 2016, mainly because the application process of acquiring access to short-term outcomes (National Test Scores, Available via the ministry of Education, and Prescription Drugs Data, via Statens Serum Institut) is lengthy.

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