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MARITAL BREAKUP AND CHILDREN'S BEHAVIOURAL RESPONSES

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Marital breakup and children's behavioural responses

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Abstract

In contrast to most other studies focusing on children's cognitive outcomes and using cross sectional data, this paper exploits information from three waves of the Millennium Cohort Study to assess the impact of marital breakup on children's behaviour. Using fixed effect estimation throughout, the analysis shows that separation has an impact on some behavioural aspects, but not all, and that the impact may persist over time. On the contrary, we find negative anticipation effects, meaning that children of parents who are getting separated have fewer conduct problems. In terms of magnitude, the estimated effects, when significant, are all modest.

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1. Introduction

In recent years, the relationship between divorce and children's outcomes has received massive attention. The acute interest stems from the fact that in almost all developed countries, marital disruption is on the increase, and with it, a steady liberalisation of divorce laws has taken place, which tends to make divorce easier (Gruber 2004; Wolfers 2006) . The key concern drives from the suggestion that divorce has adverse impact on a range of child-outcomes, in particular it is well documented that children of single parents score worse in terms of poverty, substance abuse, and school performance – just to mention a few. As the more recent literature points out however, these adverse effects might be driven by selection and that divorce is endogenous with respect to children's outcomes. The argument is straight-forward – children of divorcing parents may in any case have experienced an adverse family environment prior to divorce, which might equally affect their outcomes. Recent studies based on longitudinal information and using fixed effect regression techniques find that there is little effect of the divorce event per se on children's cognitive development (Sanz-de-Galdeano and Vuri 2007).

In contrast to children's cognitive outcomes, the evidence concerning behavioural problems following parental divorce is more mixed. This is in part driven by lack of longitudinal data that include outcomes measured over children's conduct and more generally their non-cognitive outcomes. Our paper adds to a relatively scant literature by taking information from the Millennium Cohort Study (MCS) for the UK, estimating a series of statistical models exploiting the longitudinal nature of the survey, as well its richness in measuring children's outcomes. Whereas the survey includes information about cognitive outcomes, it is particularly rich in non-cognitive outcomes. It includes information about children for the ages of nine months, and then at age three, five and seven, where the latter three rounds include information about children's behaviour. The key aims of our analysis are to identify the effect of experiencing parental separation in terms of lacking the presence of the father – on the behaviour of the child. Second, we identify persistency in the effects, and in particular, we are interested in understanding if a good relationship with the father after the divorce helps children adapting to the divorce event. Finally, we also identify anticipation effects of divorce. We do this by considering changes in children's behaviour as a function of marital dissolution happening later in time.

Our results show that marital disruption indeed affects children's behaviour negatively. We find some negative effects of parental separation but children do tend to adapt to divorce if the post-divorce relationship with the father is a good one here measured in terms of frequency of contact. There is also an anticipation effect. Though small, it turns out to be positive, meaning that as parents are heading for a break-up, children – if anything – tend to behave better. Despite these significant effects, the overall picture is that the magnitude of the estimated effects are modest.

Section 2 provides a brief review of the relevant literature. The Millennium Cohort Study is presented in Section 3. We select a sample of cohort children with parents living together when they were 9 months old (wave 1), who may separate along the window of time we can observe them, which is until age 7 in wave 4. As part of the robustness check we also make us of the sample of older siblings. The statistical methods are explained in Section 4, while Section 5 presents the empirical findings. Conclusions follow in Section 6.

2. Background

There is now extensive research on children's outcomes as a function of parental actions (e.g. parenting) and their background. A substantial part of this literature has focussed on marital breakup and its implication for children. The interest in marital disruption as part of parenting and its potential consequence for children is not surprising given that divorce is spreading in most developed countries, and high and persistent divorce rates characterizes now many countries (Amato 2010). The literature suggests that marital breakup has adverse impact on a whole range of child-outcomes. Children of single parents are more likely to be poor, more likely to engage in substance abuse, have worse school performance and more likely to suffer mental problems (Sigle-Rushton et al 2005; Cherlin et al 1998; Chase-Lansdale et al 1995). The consensus appears to be that divorce or separation is indeed bad for children – though there is less agreement on the magnitude of the effects. Amato (2001) provides an excellent review of the literature. He points out that those studies that compare children from divorced parents and those living in intact families, the former scores consistently worse on a range of child outcomes. His own analysis from 2001, based on a sample of 655 adult-children, where outcomes are defined over psychological wellbeing, he concludes that both divorce and marital discord have negative effects. However, he also shows that these effects are diluted once controlling for the quality of the child-parent relationship. These results allude to the issue that marital disruption by itself – may not cause poorer outcomes for children. Rather, divorce may simply be a symptom of bad family relations or conflict – which instead are the driver behind bad outcomes for children. That is, if there is good parent-child relationship also after divorce, then divorce is not necessarily bad for the children. This line of argument suggests that previous studies reporting a negative relationship between divorce and children's outcome may instead be driven by selection. In other words, cross-sectional analysis of divorce on children's outcomes are likely to overstate the potential effect of divorce.

This issue is particularly relevant in the literature concerning children's cognitive outcomes following parental separation. Whereas previous studies have consistently found significant negative

associations between family stability and children's academic performance (Steele et al. 2009, Astone and McLanahan 1994), recent studies based on longitudinal data and fixed effect estimation cast doubt about these findings. For instance, Sanz-de-Galdeano and Vuri (2007) considering the effect of divorce on teenagers' cognitive outcomes using the National Education Longitudinal Study, and specifically considering cognitive outcomes before and after divorce, find no effects from the divorce event. Other studies also suggest the effects of divorce are weaker (though not necessarily non-existent) once selection is taken care of. Examples of this line of analysis includes the study by Aughinbaugh et al (2005) and Bjorklund and Sundstrom (2006). The latter using a sibling fixed effect model, found no relationship between divorce and educational attainment.

When considering children's behavioural outcomes, the evidence is more mixed. As reviewed by Amato (2010), using a child fixed-effects model Cherlin et al (1998) find divorce to have a detrimental effect in terms of psychological distress whereas Ermisch and Francesconi (2001) find negative effects on several non-cognitive outcomes using sibling fixed effects. Moreover, the studies by Sun (2001), Sun and Li (2001) and Sun and Li (2002) suggest that children of divorcing parents have more problems at school and they suffer poorer self esteem, even when pre-divorce characteristics were controlled for (though they do explain a large proportion of the post-divorce difference in child outcomes). In other words, there are signs that divorce further deteriorates poor outcomes measured prior to the divorce. Along the same line, Strochschein (2005) found that divorce lead to further deterioration in anxiety and depression. Again, differences in psychological distress for children prior to divorce were high, and explain a large part the differences after divorce. In sum, studies using fixed effect techniques, indicate that parental separation often has a further negative impact on children's wellbeing and non-cognitive outcomes. This fact relates to two important extensions in this literature. The first is that non-cognitive outcomes are defined over various dimensions, and it appears that marital separation may have a negative impact on some but not all of these. For instance, Strochschein (2005) shows that whereas divorce has an impact on emotional wellbeing, it does not affect antisocial behaviour. Second, studies have looked into the potential heterogeneity of these negative effects. In particular, there is keen interest in understanding the various coping strategies children adopt and also what characteristics of the parents and their relationship after divorce, may either help or worsen the effects of the divorce. As Amato 2010 points out, judging the existing literature, a range of variables appears to have a negative association with divorce and children's wellbeing. They include economic resources, as divorce often inflicts economic strain on the parents, and especially the mother who ends up as a single carer (Aassve et al 2007), poor relationship between parents or poor parenting from the resident parent, loss of contact with the father, and also continued conflict between the divorced parents (Carlson and Corcoran 2001, Fabricius and Luecken 2007, King and Sobolewski 2006). Family circumstances and active parenting are critical dimensions in the child

development literature. Here the focus lies on the coping strategies of the children following stressful events. Whereas adapting coping is associated with lower mental health problems, disengagement away from the stressful event associates with higher mental problems (Compas et al 2001). A positive relationship with the parents is helpful because it may increase the sense of security, heighten the child's confidence in relying on the parents in resolving conflicts and problems, and it increases predictability (Velez et al 2011). Consequently, parenting and the relationship with the child, matters in the way children are able to cope with stressful events, for which divorce is one example. In other words, whereas parental break-up might have on average a negative effect on children's behaviour and mental wellbeing, there is likely to be substantial heterogeneity in which the relationship with parents may have important explanatory power (Fabricius and Luecken, 2007).

3. Data

The Millennium Cohort Study (MCS) is a longitudinal survey conducted by the Centre for Longitudinal Studies (CLS), following the lives of a sample of about 19,000 babies born in the UK in the year 2000/2001. The survey is conducted in different waves with the first one concentrating on the circumstances of the pregnancy and birth as well as the first few months of life. This first part of the survey is also important as it records the socio-economic background of the family into which the child is born. The second wave took place when the children were about 3 years of age and the main focus was on continuity and change in the family as well as the parenting environment to extract information about the child's development. In the third wave in 2006, the children were at the age of starting primary school. The fourth wave took place in 2008, and the fifth will be held in 2012.

In wave 1, the survey consists of 18,552 children. This was reduced to 14,898 children in wave 2, 13,234 children in wave 3 and 11,721 children in wave 4. We select couples of parents living together in wave 1, meaning that all children will have had some contact with the father (86.5% of the cases[1]) and where, in case of separation after wave 1, the child keeps on living with the mother (98.6% of the cases). We also include only children who are observed four times, meaning that our resulting panel is a balanced one. Attrition may be an issue, which is explored in Table A1 (in the Appendix)[2]. With these selection criteria, the sample consists of 10,008 children. By excluding twins and households with step-siblings in wave 1 (880 cases), reduces the sample to 9,002 children. Finally, we exclude another 148 cases because of missing

[1] The sample was selected from a random sample of electoral wards, disproportionally stratified to ensure adequate representation of all 4 UK countries, deprived areas and areas with high concentration of immigrants. This feature may explain the high percentage of households where the father is not present when the child is 9 months old.

[2] Attrition can be a problem if the probability of leaving the survey is related to the object of our study. From Table A1 (in the Appendix), we observe that the probability of leaving the sample between wave 2 and 3 (and between wave 3 and 4) is not associate with the child's behaviour in wave 2 (and 3). On the other hand, as expected, we observe that separated parents are less likely to participate in the survey, but this does not bias our results.

values in our main variables of interest, so that we are left with a final sample of 8,854 children observed for four waves.

Tables 1 and 2 describe the sample. In Table 1, the dependent and independent variables are summarized by year of the survey. Given our sample selection all parents are together when the child is 9 months old. The percentage of separated parents is 5.9% when children are 3 years old, 10.2% when 5 years old and 14.6% when 7 years old. MCS is rich in information on children's outcomes[3] but a unique feature is its detailed information about the non-cognitive outcomes of children which are contained in the "Strengths and Difficulties" questionnaire, a self completed questionnaire done by the mother. The "Strengths and Difficulties questionnaire is a brief questionnaire for children and adolescents, developed by the UK child psychiatrist Robert Goodman (Goodman, 1997). Mothers are asked 25 questions about their child's behaviour. As an example, "Shares readily with other children" is one of the questions, and refers to what extent they believe their child tends to share things with other children. Possible answers are given on a three point scale with the following labels: "not true", "somewhat true", and "certainly true". With each response converted to numerical values of 0, 1 or 2, groups of five answers are then summed up in a total score which goes from 0 to 10. These five groups are defined by Goodman (1997) as: 1) emotion symptoms scale, 2) conduct problems, 3) hyperactivity scale, 4) peer problems and 5) pro-social behaviour. All five measures are implemented for ages three, five and seven and are listed in the Appendix (Table A2). By looking at their descriptive statistics, we note some changes over time. Conduct problems and hyperactivity decrease over time, which may relate to the fact that at age three children tend to express more strongly their independence, and by age five (in UK) they have initiated school. The pro-social scale and peer problems improve with the children's age.

The MCS is otherwise very rich in its measurement of family background. The characteristics of the mother is important in our analysis since they are the ones also reporting the behaviour of their children. Clearly, the mental state of the mother might influence her judgement of her children. In our models, we control for mother's work status and yearly net household income, which are characteristics which may vary with parental separation and directly affect the child's behaviour. Indeed, we observe more mothers working and with higher income as the child grows older (Table 1). We also include variables concerning the mental wellbeing of the mother. In particular, we exploit the question: "how often felt depressed in the last 30 days" where answers can be 1) all the time, 2) most of the time, 3) some of the time, 4) a little of the time, 5) none of the time. The variable are made dichotomous in which answers 1) to 4) become 1, and answer 5 becomes 0. The proportion of mothers expressing some depression symptoms are relatively stable over time (Table 1).

[3] We will use the cognitive measures included in the survey (Section 5) to see whether results with our empirical strategy are similar to the ones found in the literature. Cognitive measures (repeated over time) consist of two tests taken by the interviewer: naming vocabulary and construction pattern.

Table 2 describes the sub-samples of children whose parents will or will not separate, at different points of time. Whereas we adopt fixed effects model which cancels fixed unobserved family characteristics, it is important to see whether and how these sub-samples differ. Table 2 summarizes the characteristics when the child is 9 months old when all parents are still together, and other four groups defined over never-separated parents, parents who separate between age 1 to 3 of the child, 3 to 5, and those separating when the child is between 5 to 7 of age. The table gives insights into the separation process. Younger parents, less educated, less likely to be married, less work-attached and less financially well off, all have higher rate of separation and, to a certain extent, separate earlier in time. The most relevant differences between separating and non-separating parents are observed in terms of education, income and perhaps curiously - breastfeeding. That is, non-separating parents have on average one year more of education, have on average 100 pounds more of disposable income per week, and have a higher prevalence of breastfeeding. Moreover, those parents who separated by age 3 of the child only 40% were married, whereas those who did not separate - the marriage rate is 79%. There is also a higher rate of unemployment among those separating.

An interesting feature of the MCS is that for a sub-sample of the children, their older *siblings* were interviewed through a self-completion questionnaire in wave 2 and in wave 3 if aged between 10 and 15. Even if the sample size is small, and not all of them are observed at the same ages as for the cohort children, their responses are interesting since they are not filtered by the mother's perspective, who otherwise answers all questions about the child (i.e. the unit for the analysis). We use this sample to assess to what extent behavioural reaction by the child (following separation) can be attributed to the subjective assessment of the mother (as opposed to real behavioural changes to the child). Table 3 compares the family background characteristics of the 8,854 cohort children (i.e. the main target of our analysis) with those 397 children where information about the siblings who are aged 7-10 years older. Their responses are available in two waves, so allows also here a fixed effect estimation. Clearly, this subsample differs from the main sample: as expected, parents have had more children and are older , but also less educated, less work attached and with lower income, and more likely to be married.

4. Methods

Given the longitudinal nature of the MCS, we use fixed effect estimation throughout. The effects of parental separation on children's behaviour can be expressed as follows:

$$scale_{iv} = \alpha + \sum_{k=1}^{2} \beta S_{k,iv} + \sum_{k=1}^{3} \gamma P_{k,iv} + \alpha A_{iv} + X_{iv}'\lambda + u_i + \varepsilon_{iv} \qquad []$$

The measure of behaviour (i.e. *scale*) of child *i* is measured at time *v*, where *v=1,2,3* which in terms children's age refers to 3, 5 and 7. In the MCS these will refer to the 2nd, 3rd and 4th wave of the survey. With these observational points across time we are able to identify both short-term effects and persistency, as well as anticipation effects. To do so we define a set of dummy variables. The first, $S_{1,iv}$, indicates if parents are separated at time *v* but were not separated in *v-1* where v = 2. Similarly $S_{2,iv}$ indicates if parents are separated in time *v* but were not separated in *v-1* but where *v = 3*. More intuitively, $S_{1,iv}$ indicates if there was a separation from age 3 to 5, whereas $S_{2,iv}$ refers to a separation from age 5 to 7 both being held up against a change in behaviour of the child for those time periods. β is consequently reflecting the short term effect of separation.

$P_{1,iv}$ indicates if parents are separated in *v* and were also separated in *v-1* where *v = 2* therefore referring to the age 5 of the child. $P_{2,iv}$ is defined similarly but where *v = 3* which refer to the last wave of the survey when the child was aged 7. $P_{3,iv}$ indicates separation but where parents were also separated in *v , v-1* and *v-2*, in which case v = 3. In other words, its parameter estimate can only be established when the children have reached the age of 7. The parameter vector γ indicates whether there is any additional separation effect since separation took place, and therefore, reflecting persistency in the effect of parental separation. A value of γ smaller than 0 indicates that the child is adapting while if γ is larger than 0 the child's behaviour is worsening.

A_{iv} is an indicator for whether parents will be separated in *v+1*. In other words, the variable takes the value 1 if parents are currently not separated, but did end up so in the next recorded round of the MCS. α reflects consequently an anticipation effect, and can be only estimated for children aged 5 who will experience parental separation between 5 and 7 years old.

Finally, Xi,v refers to other household characteristics, its effects reflected by the parameter vector λ, *u* are unobservable characteristics of the child *i* that are constant over time, and *ε* is a random error term assumed uncorrelated with any of the explanatory variables.

By considering three points in time and differentiating, we clean the estimated effects of interest by the child's unobservable characteristics *u*. For this to give unbiased estimates two assumptions have to be imposed. First, the control group (children of non separated parents) are similar to those children of the treatment group (children of separated parents). This is not to say that they cannot be different, but with the fixed effect estimation, we do assume that the two groups would develop at the same path in absence of parental separation. Second, panel data and fixed effect models solve endogeneity problems only in case reverse causality and omitted variables are the only two sources of endogeneity. In other words, the fixed

effect estimation provides unbiased estimates in so far effects of any observed factors are cancelled out by the fixed effect transformation. But one can imagine cases where this is not the case. For instance, a heavy drinking father may not only be the cause of separation, but also simultaneously worsen the outcomes of the children over time. In so far this is not measured, the effects gets included in the error term.

5. Results

Table 4 reports the complete set of estimated parameters of the model while Table 5 displays a re-elaboration of the key parameters of interest. We comment directly on Table 5. The top row indicates the time of the parental separation and the age of the child. Assuming that separation happens in the middle of the time window, the short term effect refers to behavioural change measured one year after separation. The persistency effects refer to measures recorded three and five years later, whereas the anticipation effect refers to any behavioural change one year before the separation takes place.

We start by looking at the consequences of parental separation in the short and medium term (columns 2-5 of Table 5). First of all, we do not observe any effect of parental separation on the pro-social scale (how much the child shares with other children, is considerate of others' feelings, etc.) and on conduct problems (not obedient, argumentative with adult, etc.). In the short run, we find that parental separation increases hyperactivity (10-15% of one standard deviation). Children of just-separated parents are more restless, overacting, and distracted. The detrimental effect is not worsening over time, nor is it improving That is, children who experienced parental separation between age 3 and 5 increase their hyperactivity in the short run (0.295**) while there are no additional significant changes 3 years later (-0.028). We then find an increase in problems with peers (playing alone, bullied by other children, etc.) for children aged 5 who experience parental separation one year earlier, which could be related to the fact that these children are at the stage of starting school. In fact, the effects are not present for children aged 7, who have already spent some time in school when separation took place.

There appears to be different impact on emotional problems (seems worried, unhappy, etc.) for the different age groups. For children aged 7 who have just experienced separation the effect is large (around one fourth of one standard deviation) and for children aged 7 who experienced separation 3 years earlier the effect is sizeable (around one fifth of one standard deviation). In contrast, these effects are not present for children who experienced separation at an earlier age (i.e. age 5) even if the direction is still positive. The age pattern could reflect a greater awareness of the older children and they react consequently stronger than younger children. This is in part supported by the fact that when we look at children who experienced parental separation between age 3 and 5, we observe there is no effect when they are 5 years

old (0.016), but emerges when they are 7 (0.278***). In contrast, for children aged 7 who experiences separation very early in life there is no effect.

The anticipation effects refer to the case where we measure the change in the behavioural indices at age 5, but who will be experiencing the separation between age 5 and 7. Perhaps unexpected, we find here a negative effect on conduct problems, suggesting that children of future-separated parents appear to behave better than children of parents who instead remain together. These effects derive from two potential sources. First, mothers who are in the process towards separation, and consequently experiencing potentially a stressful life situation, may be less severe in judging their children. The other possibility is that children indeed do behave better as they observe parental problems. They consequently try to compensate for what otherwise will be a situation of heightened tension among the parents. In order to explore the underlying mechanism for this effect we turn to the sample of older siblings who in the MCS also did a self-completion questionnaire. The key benefit of this strategy is that we can say more about parents' control and general attention, which matters since for the main questionnaire, it is the mother answering about the children. We are particularly interested in questions regarding life at home (to assess the control role of parents) and things siblings may have done (as an indicator of their true conduct behaviour). We run a set of regressions again with fixed effects (Tables 6 and 7). We compare self-reported responses in two consecutive waves (wave 2 and 3) and we consider whether parental separation is affecting some of these. The key findings here is that for some activities mothers who will eventually separate within the time of the survey, are more lenient towards their children. Table 6 is suggesting that parents that are set to separate, set fewer limits on TV watching (both before and after separation) and let them choose more freely what to eat (once parents have separated). When siblings are asked about their own conduct, they are less likely to avoid paying when travelling on public transportation and to take something from a shop without paying, but more likely to engage in bullying[4].

In sum, we find that the detrimental consequences of parental separation on children behaviours are small, but there is no evidence that children (on average) tend to adapt over time (that is, reverting back to become similar to those children of non separating parents), at least during the window of time we can observe. Clearly many circumstances change after a parental separation and there is large variation in children's post separation experiences. We consider a range of potential factors that may either help or worsen the behaviour of the children and we do so by selecting the subsample of those children experiencing a separation from our main sample. We test how their behavior changes when their circumstances after parental separation change. Table 8 displays the results. We observe that children who meet the father more often show less emotional problems. For instance, the detrimental effect is cancelled

[4] For what concerns the effect of other variables not reported in the tables, we find that mother's mental wellbeing, when significant, goes in the expected direction in the sense that mentally unhealthy mothers report children's behaviour to be worse. Mother's work, when significant, improves child behaviour while income is never significant.

if the child meets the father almost daily. Less intuitive perhaps, the estimates suggest that in the case the mother and father maintain a friendly relationship emotional problems increase. One potential interpretation here would be that children may feel confused observing parents living apart, but at the same time maintaining a close relationship. In their mind children may question why the parents have divorce, but yet have decided to live apart. The effect is consistent with the idea that children's wellbeing can increase if the relationship between the parents prior to divorce was very poor and filled with conflict. If parents maintain a good relationship after the separation, it may also have not been very bad before the divorce, and the event of parents moving away from each other may consequently been experienced as a greater shock - all else equal. In addition to this, we also find that conduct problems decrease when the mother re-partner, and this partner lives in the household. Our results are consistent with the existing literature. The effects are significant, but small in magnitude. Moreover, like Strochschein (2005), we find that divorce has an impact on emotional wellbeing, but does not affect antisocial behaviour. To our best knowledge, there is no work estimating the effect of parental separation on non-cognitive outcomes, using fixed effects estimation based on the MCS. As an end note, it is worth mentioning that when outcomes are defined over cognitive performance, we find no effect of the divorce. Table 9 reports the effects of divorce on cognitive outcomes. As is clear, we find no significant effect on child's vocabulary and construction ability. Although not shown in table 9, this is in stark contrast to pooled regressions or random effect estimation, in which effects of separation on cognitive outcomes are significant. This confirms results by Sanz-de-Galdeano and Vuri (2007) adopting the same empirical strategy and the same nature of the outcomes.

6 Conclusions

The paper considers the impact of parental separation on children's wellbeing measured in terms of non-cognitive outcomes. It adds to the literature in several respects. First, the majority of studies of this kind stems from the US, whereas we provide evidence from the UK. Second, most studies (also those of the US) are based on cross-sectional data. Here we use longitudinal data from children born in 2000, and we are able to follow them through four waves up until age 7. Moreover, since the behavioral outcomes are standardized and repeated across waves, we are able to use fixed effect estimation to control for time fixed unobserved heterogeneity, which may otherwise bias the parameter estimates. Whereas we cannot control for time-varying unobserved characteristics, the approach provides an important contribution. We know for instance from the literature that focuses on children's cognitive outcomes that divorce has a strong negative association, but these effect wane and often disappears altogether once fixed effect estimation is

implemented. An additional benefit of the MCS is that we are able to distinguish short and long term effects and consequently establish if effects are persistent or not. Moreover, we can also establish the presence of anticipation effects. Our analysis shows that parental divorce have adverse effects on some outcomes - one of them being emotional status. In terms of the timing of the divorce, we find that the effect is sizeable for older children (i.e. the divorce happened when children were between 5 and 7) and much lower for younger children. We do find evidence that the effect is persistent. That is, on average, we do not find that children revert back to their original level in the second follow up after the divorce. Given this result, our analysis focused on the heterogeneity of this effect, and we do so by selecting children who did experience the divorce for then to assess the factors that explains the heterogeneity. One clear predictor is that frequent contact with the father after the divorce has a favorable impact on emotional wellbeing, and might even neutralize the negative impact of the break-up. Our analysis also demonstrate a significant anticipation effect and we show that for certain indicators, the imminence of a divorce make children behave better. This result is robust in that we use additional information from the subsample of siblings, which, importantly, were not gathered through interviews by the mother. In other words, children do not appear to behave better because of a change in the mother's behavior in terms of her assessment of the children, which could potentially matter as she is experiencing heightened tension in the household.

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TABLES

Table 1: Descriptive statistics by year of the survey

	Wave 2 **3 years old** *mean/sd*	**Wave 3** **5 years old** *mean/sd*	**Wave 4** **7 years old** *mean/sd*
Outcomes			
Emotion symptoms scale	1.09	1.15	1.31
	(1.24)	(1.39)	(1.58)
Conduct problems	2.34	1.24	1.14
	(1.80)	(1.32)	(1.36)
Hyperactivity scale	3.43	2.88	2.99
	(2.17)	(2.19)	(2.36)
Peer problems	1.21	0.90	0.94
	(1.39)	(1.26)	(1.30)
Pro-social scale	7.54	8.54	8.76
	(1.76)	(1.56)	(1.51)
Main variable of interest			
Separated parents	0.059	0.102	0.146
Control variables			
Age of the child	3.12	5.22	7.22
	(0.18)	(0.24)	(0.25)
Mother works	0.650	0.678	0.731
HH net yearly income	32,144	33,791	36,563
	(20,745)	(20,982)	(22,917)
Mother feels depressed	0.285	0.252	0.286
Mother feels hopeless	0.227	0.209	0.224
Mother feels restless	0.399	0.366	0.352
Mother: everything is an effort	0.558	0.507	0.491
Mother feels worthless	0.183	0.180	0.195
Mother feels nervous	0.338	0.358	0.358
Observations	8,854	8,854	8,854

Notes: average values with standard deviations in brackets for continuous variables.

Table 2: Descriptive statistics in wave 1 (when the child is 9 months old) by separation status and timing

	Never separated	**Separated between waves 1 and 2 age 1 and 3 of the child**	**Separated between waves 2 and 3 age 3 and 5 of the child**	**Separated between waves 3 and 4 age 5 and 7 of the child**
	mean/sd	*mean/sd*	*mean/sd*	*mean/sd*
Age of the mother	30.9	26.8	27.9	29.0
	(5.0)	(5.9)	(5.4)	(5.6)
Age of the father	33.4	29.9	31.0	32.1
	(5.7)	(6.8)	(6.2)	(6.9)
Mother: age left	18.1	17.1	17.2	17.5
full-time education	(2.4)	(1.8)	(2.0)	(2.1)
Father: age left	17.8	16.6	16.8	17.0
full-time education	(2.4)	(2.0)	(2.1)	(2.1)
Mother works	0.598	0.444	0.530	0.547
Father works	0.934	0.795	0.866	0.877
Married (vs cohabiting)	0.794	0.409	0.601	0.670
Number of siblings	0.80	0.66	0.73	0.89
	(0.91)	(0.89)	(0.86)	(1.13)
Child is a girl	0.492	0.476	0.493	0.503
Child breastfeed at least 3 months	0.448	0.306	0.305	0.333
Birth weight (kg)	3.43	3.33	3.37	3.40
	(0.56)	(0.56)	(0.63)	(0.65)
Equivalent weekly household income	404	271	316	326
	(253)	(185)	(219)	(216)
Observations	7,492	579	423	360

Notes: average values with standard deviations in brackets for continuous variables.

Table 3: Descriptive statistics in wave 1 (whole sample and sub-sample with older siblings)

	Whole sample *mean/sd*	**Sub-sample with older siblings** *mean/sd*
Age of the mother	30.4	33.7
	(5.3)	(4.5)
Age of the father	33.1	36.8
	(6.0)	(5.9)
Mother: age left	17.9	17.0
full-time education	(2.3)	(2.0)
Father: age left	17.6	17.0
full-time education	(2.4)	(2.1)
Mother works	0.562	0.452
Father works	0.918	0.893
Married (vs cohabiting)	0.756	0.836
Number of siblings	0.83	2.23
	(0.96)	(1.06)
Equivalent weekly	381	298
household income	(250)	(191)
Observations	8,854	397

Notes: average values with standard deviations in brackets for continuous variables.

Table 4: Short term, time-additional and anticipation effects of parental separation on children's behaviour (parameter estimates)

	Emotion symptoms scale	**Conduct problems**	**Hyperactivity scale**	**Peer Problems**	**Pro-social scale**
	b/se	b/se	b/se	b/se	b/se
β_1	0.016	0.098	0.295**	0.172**	0.020
	(0.084)	(0.085)	(0.116)	(0.083)	(0.095)
β_2	0.349***	-0.110	-0.069	-0.149	-0.186
	(0.121)	(0.123)	(0.165)	(0.119)	(0.137)
γ_1	0.182	-0.135	0.496***	0.414***	-0.108
	(0.114)	(0.116)	(0.157)	(0.114)	(0.129)
γ_2	0.111	0.320***	-0.229	-0.117	0.072
	(0.111)	(0.113)	(0.150)	(0.109)	(0.124)
γ_3	0.267**	-0.066	0.529***	0.407***	-0.223*
	(0.112)	(0.115)	(0.155)	(0.112)	(0.128)
α_1	0.117	-0.181**	-0.025	-0.014	-0.032
	(0.089)	(0.092)	(0.122)	(0.088)	(0.102)
Wave 3	-0.013	-0.677***	0.015	-0.021	0.259**
	(0.102)	(0.104)	(0.139)	(0.101)	(0.114)
Wave 4	0.076	-0.334*	0.684**	0.353*	-0.283
	(0.196)	(0.200)	(0.268)	(0.195)	(0.221)
Observations	24,605	24,724	23,890	22,347	24,394

Notes: estimations of equation [1], coefficients with standard errors in brackets. Statistical significance: *** at 1% level, ** at 5% level, * at 10% level. All other control variables (child's age, mother's mental wellbeing and work, income) are included but coefficients not reported.

Table 5: Short term, time-additional and anticipation effects of parental separation on children's behaviour (re-elaboration of parameter estimates from Table 4)

	Anticipation effects 1 year earlier (separation 5-7) [age 5]	**Short term effects 1 year later (separation 3-5) [age 5]**	**Short term effects 1 year later (separation 5-7) [age 7]**	**Time-addit effects 3 years later (separation 3-5) [age 7]**	**Time-addit Effects 5 years later (separation 1-3) [age 7]**
Parameters from Table 4	α_1	β_1	$\beta_1 + \beta_2$	$\gamma_1 + \gamma_2 - \beta_1$	$\gamma_3 - \gamma_1$
Emotional symptoms scale	0.117	0.016	0.364***	0.278***	0.086
	(0.089)	(0.084)	(0.090)	(0.081)	(0.071)
Conduct problems	-0.181**	0.098	-0.012	0.087	0.069
	(0.092)	(0.085)	(0.092)	(0.083)	(0.073)
Hyperactivity	-0.025	0.295**	0.225*	-0.028	0.033
	(0.122)	(0.116)	(0.123)	(0.109)	(0.096)
Peer problems	-0.014	0.172**	0.023	0.125	-0.006
	(0.088)	(0.083)	(0.089)	(0.079)	(0.071)
Pro-social scale	-0.032	0.020	-0.166	-0.056	-0.115
	(0.102)	(0.095)	(0.103)	(0.090)	(0.078)

Statistical significance: *** at 1% level, ** at 5% level, * at 10% level.

Table 6: The effect of parental separation on older siblings' life at home

	Limits on TV	**Tells parents where**	**Out after 9 pm**	**Chooses what to eat**	**Household chores**	**Parental control**	**Ever been to a dentist**
	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Anticipation	-0.333**	0.036	0.019	-0.066	0.063	-0.014	-0.009
effects	(0.131)	(0.119)	(0.049)	(0.099)	(0.131)	(0.102)	(0.008)
Observations	816	830	830	792	802	764	848
Short-term	-0.309**	-0.188	0.14	0.522***	0.056	-0.088	-0.013
effects	(0.151)	(0.175)	(0.124)	(0.133)	(0.095)	(0.188)	(0.011)
Observations	796	810	810	774	786	748	828
Time-additional	0.012	0.085	-0.028	-0.061	-0.033	-0.217	-0.059
effects	(0.111)	(0.129)	(0.102)	(0.144)	(0.121)	(0.172)	(0.048)
Observations	816	830	828	792	806	766	848

Notes: sample of older children (waves 2 and 3), coefficients with standard errors in brackets. Statistical significance: *** at 1% level, ** at 5% level, * at 10% level. Other control variables (child's age, mother's work, income) are included but coefficients not reported.

Table 7: The effect of parental separation on things older siblings may have done

	Avoid paying when traveling b/se	Rude in a public place, people complain b/se	Taking something without paying b/se	Bought a stolen mobile b/se	Ever written things on a building b/se	Damaged something in a public space b/se	Ever bullied someone b/se	Been rude because of the race b/se	Knife or weapon carried b/se
Anticipation effects	-0.068***	-0.022	-0.036***	-0.006	0.05	-0.009	0.135**	0.093	-0.012
	(0.019)	(0.022)	(0.014)	(0.004)	(0.066)	(0.008)	(0.067)	(0.065)	(0.007)
Observations	826	838	838	836	840	838	836	838	836
Short-term effects	0.119	0.163	0.151	-0.002	0.233*	0.000	-0.127	-0.003	0.083
	(0.173)	(0.171)	(0.118)	(0.003)	(0.136)	(0.125)	(0.115)	(0.007)	(0.086)
Observations	806	818	818	816	820	818	816	818	816
Time-addit effects	0.078	0.070	0.050	-0.007	-0.046	0.032	0.002	-0.005	-0.059
	(0.110)	(0.066)	(0.095)	(0.005)	(0.069)	(0.049)	(0.049)	(0.069)	(0.047)
Observations	824	838	838	836	840	838	836	838	836

Notes: sample of older children (waves 2 and 3), coefficients with standard errors in brackets. Statistical significance: *** at 1% level, ** at 5% level, * at 10% level. Other control variables (child's age, mother's work, income) are included but coefficients not reported.

Table 8: After separation circumstances and children's behaviour

	Emotion sympt. scale	**Conduct problems**	**Hyperactivity scale**	**Peer problems**	**Pro-social scale**
	b/se	*b/se*	*b/se*	*b/se*	*b/se*
Mother's new	0.136	-0.267*	0.135	-0.191	0.008
partner	(0.147)	(0.160)	(0.187)	(0.135)	(0.151)
Observations	2,568	2,595	2,518	2,363	2,582
Father-child	-0.058*	-0.048	0.017	-0.024	(0.031)
frequency	(0.031)	(0.035)	(0.041)	(0.028)	0.032
Observations	2,518	2,545	2,471	2,314	2,532
Father-mother	0.196*	-0.108	-0.001	0.019	-0.154
friendly	(0.104)	(0.115)	(0.132)	(0.093)	(0.106)
Observations	2,163	2,179	2,121	1,990	2,170
Father - child	0.128	0.087	-0.181	-0.130	0.154
overnight	(0.118)	(0.102)	(0.138)	(0.107)	(0.117)
Observations	1,741	1,757	1,728	1,621	1,780

Notes: regressions on the sample of children with separated parents, , coefficients with standard errors in brackets. Each panel is a separate regression All other control variables (child's age, mother's mental wellbeing and work, income) are included but coefficients not reported. Statistical significance: *** at 1% level, ** at 5% level, * at 10% level.

Table 9: The effects of parental separation on children's cognitive abilities

	Naming age 3-5 *b/se*	**Construction age 5-7** *b/se*
Short-term effects	0.091	-0.191
	(0.543)	(0.550)
Observations	14,984	15,392
Anticipation effects	0.038	
	(0.581)	
Observations	14,862	

Notes: coefficients with standard errors in brackets. Statistical significance: *** at 1% level, ** at 5% level, * at 10% level. All other control variables (child's age, mother's mental wellbeing and work, income) are included but coefficients not reported.

APPENDIX

Table A1: Probability of leaving the sample

	Between wave 2 and 3	**Between wave 3 and 4**
	b/se	*b/se*
Emotion symptoms scale	-0.004	-0.014
	(0.024)	(0.025)
Conduct problems	0.000	-0.018
	(0.018)	(0.029)
Hyperactivity scale	0.019	-0.006
	(0.014)	(0.016)
Peer problems	0.020	0.042
	(0.025)	(0.028)
Pro-social scale	0.030	-0.035
	(0.019)	(0.023)
Missing outcome	0.118	0.111
	(0.073)	(0.084)
Separation	0.162	0.228**
	(0.113)	(0.101)
Observations	10,961	9,851
Average probability of leaving the sample	0.101	0.101

Notes: probability of leaving the survey between t and t+1, controlling for variables at time t: child's behaviour, parental separation, and other variables included in Table 1 (whose coefficients are not reported). The variable "missing outcome" is equal to 1 when at least one measure of child's behaviour is missing, 0 otherwise. Statistical significance: *** at 1% level, ** at 5% level, * at 10% level.

Table A2: Questions of the Strengths and Difficulties Questionnaire

Emotion Symptoms Scale	Complains of headaches/stomach aches/sickness Often seems worried Often unhappy Nervous or clingy in new situations Many fears easily scared
Conduct problems	Often has temper tantrums Generally obedient* Fights with or bullies other children Can be spiteful to others Often argumentative with adults
Hyperactivity Scale	Restless, overactive, cannot stay still for long Constantly fidgeting Easily distracted Can stop and think before acting* Sees tasks through to the end*
Peer Problems	Tends to play alone Has at least one good friend* Generally liked by other children* Picked on or bullied by other children Gets on better with adults
Pro-social Scale	Considerate of others' feelings Shares readily with others Helpful if someone is hurt, upset or ill Kind to younger children Often volunteers to help others

Notes: the possible answers to these questions are: "not true", "somewhat true", "certainly true" which count respectively 0, 1, 2 scores. For the questions marked with * scores are reversed.