Parental Separation, Child Time Investments and Life-Course Dynamics

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ABSTRACT

This study uses unique longitudinal cohort time-diary data from six waves of the *Longitudinal Study of Australian Children* (2004–2014) to investigate how family breakdown influences children's time use. Fixed and random effects models show that mothers compensate for parental divorce by sharply increasing time with children just after separation, yet this pattern declines over time. Father-child time remains low after marital separation. Parental separation leads to more time in unstructured activities, but it does not reduce children's educational time, with generally modest differences by social background. Empirical results reveal strong gender differences in child time use following from parental separation. Boys increase their time in screen-based activities after parental separation, while girls augment their solo and educational time. Overall, children's time use changes after parental separation in ways that are strongly gendered, which might crucially shape long-term gendered attitudes and roles among both parents and children.

Keywords: Divorce, time-use, life course, social stratification, gender, child development

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INTRODUCTION

Union dissolution has received increasing attention in the child well-being literature, along massive global increases of divorce rates in recent decades[1]. Previous studies found that children living in single-parent families, compared to children in two-parent families, are disadvantaged in key outcomes associated with life chances like socio-emotional well-being, health status, schooling performance or earnings (Amato & James, 2010; Harkonen et al., 2017; Mandemakers & Kalmijn, 2014; McLanahan et al., 2013). Even after accounting for the demographic and socioeconomic selective nature of children who experience parental divorce, parental divorce has been found to have direct harmful effects on child well-being (Harkonen, 2014; Sigle-Rushton et al., 2005). Understanding the processes that follow from parental separation in children's daily lives can provide us with precise tools to understand how parental divorce can impact children's life chances.

In this study, we argue that parental divorce plays an important role in *child time use* in ways that critically contribute to our understanding of the mechanisms by which parental separation influences children's life chances. Drawing on '*parental resource*' theories (Amato, 1993; Coleman, 1988), we contend that parental separation leads to significant variations in the quantity and quality of children's daily activities. Parental divorce leads to important changes in the family, with the absence of one parent at home (typically the father) and split/loss of resources, which can come together with difficult emotional processes and stressful relations between spouses and family members, especially in the short run (Amato, 2010; Leopold & Kalmijn, 2016). These important processes following parental separation are likely to alter how children spend time in daily lives, including their time with parents, alone, and their specific activities. For example, divorce could lead children to spend more time alone, simply because parents have less time, energy or resources to supervise them, and this could lead them to do less homework or spend more in unsupervised screen-based activities (i.e.,

[1] We use union dissolution, family breakdown, separation or divorce as synonyms.

watching TV, using mobile phones). Given that child time use is a strong predictor of their subsequent development (Cano et al., 2018; Hsin, 2009), providing rich evidence on how parental divorce impacts child time use significantly contributes to the child well-being literature.

Previous studies have provided some relevant evidence on the effect of parental divorce on parent-child relations. Scholars studied father-child frequency and trajectories across national contexts (Amato, 2010; Cheadle, Amato and King, 2010; Kalmijn, 2015), the schedule of involvement (i.e., daytime and nighttime) (Westphal, Poortman and van der Lippe, 2014) or levels of maternal and paternal involvement after divorce across socioeconomic groups (Gratz, 2017). While these studies advance on the process of parent-child time, little focus has been put into the exact activities in which children engage. Further, the study of changing dynamics in parent-child and children's daily routines has been essentially restricted to cross-sectional data or dynamic models that have tended not to control for unobserved heterogeneity (Mencarini et al., 2014). Our study seeks to fill these gaps.

Our study is, to the best of our knowledge, the first exhaustive longitudinal analysis of the impact of parental divorce on children's time use. By using unique longitudinal time-diary data from the *Longitudinal Study of Australian Children* (LSAC), we can follow children across 6 waves from early childhood to adolescence (ages 4-14). Time-diary data have been systematically found to provide the most reliable statistical measures to study how children spend time in daily activities, compared to stylized measures asking how often individuals spend time in specific activities (Bianchi et al., 2006; Hofferth & Sandberg, 2001; Kan, 2008). Apart from being able to follow children's time use from early childhood to adolescence, our data are particularly rich for allowing us to measure precisely whether children spend time in specific activities with the mother, father or alone. The longitudinal design of our study allows us to advance in the literature by adjusting for unobserved factors that may be confounding in the potential effect of parental separation and child time-use.

Our study makes four key substantive contributions. First, we test whether and how mothers' and fathers' time investments change after divorce, not only by looking at the *total time* with children, but also at its *content*. This contrasts with previous studies using cross-sectional time-diary data (Mencarini et al., 2014); Wight et al., 2009), using measures restricted to contact (Cheadle, Amato and King, 2010; Westphal, Poortman and van der Lippe, 2014; Koppen, Kreyenfeld and Trappe, 2018) or general indicators of involvement (Gratz, 2017; Kalmijn, 2015)[2]. We know that some types of parent-child time are more important than others for child development (i.e., parental cognitive stimulation matters particularly for child educational outcomes) (Hsin, 2009; Cano et al., 2018). By studying changes the changes in the quantity and quality parental time investments after divorce we can measure with high accuracy how children's routines change with parental separation.

Second, we analyze how divorce affects changes in children's own-time-investments. The nature of child time use has key developmental implications, and we know that children's self-time investments is a key determinant for cognitive and non-cognitive development (Dolton et al., 2003; Gracia and Garcia-Roman, 2018). For example, a recent study using time diary data suggests that children's self-time investments matter even more than mothers' time for child development (Del Boca et al., 2017). The child involvement in educational time fosters cognitive development across the life course (Fiorini and Keane, 2014; Hofferth and Sandberg, 2001). However, to date, how parental divorce affects children's own daily activities is unknown, one question that our study helps to answer by using rich longitudinal data of children's specific daily activities.

Third, our study investigates whether parental divorce has different effects on child time use across *educational levels*. Parental education is a central variable of social status, parenting values and resources (Kalil et al., 2012). Although we know that the risk of experiencing parental separation is higher in families with low level of education (Harkonen et al, 2017; McLanahan, 2004), whether the

[2] Kalmijn (2015) analyzes father-child contact and quality of contact, both considered here as father's involvement.

potential negative impact of divorce is greater in families with low or high educational level remains open to debate. There is a current vivid debate in the literature showing mixed results. While some studies show that the negative impact of divorce is greater on families with low level of educational resources (Gratz, 2015), others find the opposite, namely that children coming from families with high education are relatively more harmed by parental separation (Bernardi and Radl, 2014; Bernardi and Boertien, 2016). Changes in time investments is a key mechanism by which divorce might affect child development. Our study sheds light to this question by looking at how the effect of divorce in the most productive inputs for child's cognitive development (e.g., time devoted to educational activities) differ across socioeconomic groups, contributing to key social stratification debates.

Fourth, we examine the precise moderating role of *child gender* in the impact of parental divorce on children's time use over time. Time-use patterns are strongly gendered, starting to emerge early in childhood (i.e., boys are more active in media or sports and girls in domestic activities or reading) (Dotti-Sani, 2017; Wight et al., 2009). It has been argued that boys can accumulate more disadvantages after parental dissolution (e.g., socio-emotional outcomes), as boys could react more negatively to the absence of the father (Lamb, 2010) or simply because parents tend to be more active in supervising their same-sex children (Lundberg et al., 2007). Mencarini et al. (2014), using Italian cross-sectional data, found that the gap between boys and girls in educational activities is larger in single-parent than in two-parent families. Yet, we need longitudinal time-diary data form various waves to identify the actual (potential) impact of parental separation on children's time use. We contribute to these debates on gender by using rich time-diary cohort data.

Analytical Framework

Parent-Child and Children's Own Time Investments

The *first question* of the study is to what extent parental separation impacts children's time with the father, the mother and alone. After family dissolution fathers and mothers typically separate, legally

and physically, and children's time with both parents simultaneously drop dramatically. However, no study has, to our knowledge, looked at the specific quantity of time children spend with their fathers, mothers and alone after divorce, and how it changes as children grow up.

Theoretical perspectives on contact and involvement offer a range of plausible mechanisms through which divorce may affect total time investments of fathers, mothers and children on their own. First, *parental resource theory* predicts that father- and mother-child quantity of time will decrease after family breakdown while child alone time will increase. This is because after breakdown, one parent commonly leaves the household where the family was previously living together. The relocation of one parent increases economic and time costs and is associated with declines in couple's wealth. Among others, the parent who stays residing with the child (usually the mother), has to face the bulk of the economic costs of single parenting, with only one salary. The parent who leaves the house (usually the father) has to search and pay for another rent or face the time costs associated with visiting the child. Previous research found that reallocations of more than 120 kilometers create significant barriers to spend shared time with the child (e.g., distances of 600-900 kilometers are common (Ahrons and Taner, 2003). To face economic costs, fathers and mothers tend to work more, reducing their ability to spend time with their children -time is a zero-sum game. Because parents spend more time in their jobs, children will spend more time alone. We might also expect that, after initial high marked drops of fathers and mothers, time investments in children recover over time, once parents re-settle within the new financial situation.

Second, besides the economic and time costs of divorce, parents (and children) also face important changes in psychological well-being, which may affect time investments. Declines in economic resources and psychological well-being after family breakdown come together. Parents that get divorced are those usually in conflictive relationships, and conflict is a key driver of stress. But stress also comes through the need of finding a new house, partner, or informing family and friends.

Stress and conflict associated with family breakdown have been linked to decreases in fathers' time. This is because when conflict is high, maternal anger and hurt may act as a reducer of paternal involvement due to hostility (Maccoby and Mnookin, 1992). Exceptional cases are represented by those couples that end up in cooperative post-divorce arraignments, which represents around 25% (Hetherington & Kelly, 2002). Conflict and physiological stress do not have clear predictions on mothers' or children's alone time.

Third, differential effects of family dissolution for mothers and fathers' investments in childcare may be expected due to its gendered nature. Theories of doing gender predict that transitioning towards single motherhood might lead towards a compensatory trend of time from the mother. Married and cohabiting mothers and fathers have substantially increased their time in child care activities across various countries over the last decades, consistent with child-centered contemporary parenting norms (Altintas, 2016; Bianchi et al., 2006; Cano, 2018; Craig et al., 2014; Gauthier et al., 2004; Dotti-Sani & Treas, 2016; Sayer et al., 2004). While women still disproportionately do the bulk of child care, especially in more female-typed activities like routine and physical care (Craig & Mullan, 2011; Musick, Meier, & Flood, 2016; Roeters & Gracia, 2016), the emergence of *new fathering* roles is visible in fathers' active care involvement, beyond the 'traditional' economic contribution (Cano et al., 2018; Hook, 2012; Dermott, 2008; Lamb, 2010). Yet, fathers are still far from equalize responsibilities with mothers and fathers from divorced couples have been found to contribute little to childcare when compared with married or cohabiting fathers. Compensatory mother-child time is likely to occur, considering the gendered nature of domestic life and the active role of mothers as care providers in contemporary society (Bianchi et al., 2006).

Fourth, the expected decrease of father-child time and increase of mothers' time might be counterbalance by institutional design. The current legal perspective of child custody after divorce is based on the idea of attributed responsibility of (i.e., time with) the child under the assumption of what

is “best for the child”. In recent decades, this approach has considered similar responsibility between fathers and mothers as the best for the child, since the child would be equally exposed to both influences, have the possibility to develop meaningful relationships with both mothers and fathers, and parents would distribute efforts equally and thus have similar work-family demands. This logic, motivated by recent trends toward an increase in fathers’ time with children and mothers’ participation in the labor force, has driven the shift towards “joint physical custody” after divorce (i.e., each parent spends at least 35% of the time with the child). However, joint physical custody is still marginal when compared with mothers’ physical custody and, for the case of Australia during our period of observation, the percentage of couples who decided for a joint physical custody ranged from 7.5% in 2004 to 11.2% in 2012 (Smyth and Chisholm, 2017). Overall, we expect that:

H1. *Father-child time will significantly decline after family breakdown, mother-child time will increase right after breakdown and child alone will increase.*

Content of Time: Child Developmental Activities

The *second question* of this study looks into detail at *children’s specific activities*. Studies on the impact of parental separation on children’s daily lives tend to focus on parent-child closeness based on parents’ questionnaires. Yet, very little is known on the specific activities in which children participate after experiencing parental divorce. The little evidence in this direction is cross-sectional. Time-diary studies found that socially privileged children are more active in reading or studying, while more disadvantaged children typically spend more time in screen-based activities (Bianchi & Robinson, 1997; Gracia, 2015; Hofferth & Sandberg, 2001).

We anticipate that, after parental separation, children will increase their time in ‘unstructured activities’. The reason of this hypothesis is the fact that the absence of one parent (typically the father)

adds various financial, emotional and time strains on the single parent (typically the mother), which limits parents' capacities to supervise and regulate the child unstructured activities. We expect time unsupervised in television and other screen-based activities to increase particularly after parental separation, responding to parental limitations to monitor screen activities, which are sensitive to parental guidance (Strasburger et al., 2013). Time in *educational activities* might also be altered after parental separation. Children might reduce their overall independent time in educational activities (due to the lack of supervision and other emotional consequences that are often associated to marital disruption). Yet, mother-child educational might increase, as the mother could compensate for the father's absence by spending additional time with the child in educational activities. As for structured activities, we expect a certain increase of time in these activities, especially in the long run. While divorce is associated with a loss of parental income (especially in the short run), divorced parents might make the effort of putting additional efforts into arranging extracurricular activities for children, which would result into increasing time of children in *structured activities* some years after parental separation occurs. Therefore, we expect that,

> **H2a.** *Parental separation leads to children increasing time in unstructured activities, and particularly unstructured solo time.*
>
> **H2b.** *Parental separation leads to children reducing educational activities alone, increasing mother-child time, and reducing father-child educational time.*
>
> **H2c.** *Parental separation lead to an increase in the child time allocated to structured activities.*

Studies found that maternal employment, especially maternal full-time and evening work, has been found to be positively associated with TV time and negatively associated with educational activities

(Gracia & Garcia-Roman, 2018; Mullan, 2009; Wight et al., 2009). Regarding family structure, cross-sectional studies found that children living in single-mother families spend disproportionately low amounts of time on family meals and educational time, and higher amounts of time in screen-based activities (Mencarini et al., 2014; Wight et al., 2009). Yet, cross-sectional data can obscure our ability to disentangle the processes by which parental separation can impact children's developmental activities across the life course. We adopt a dynamic model, as mentioned

Parental Education

The *third question* of interest deals with heterogeneous effects by parental education on how family disruption impacts children's time use. Changes associated to the Second Demographic Transition (SDT) have brought increasing inequalities in children's life chances (Esping-Andersen, 2016; McLanahan, 2004). The 'Diverging Destinies' thesis refers to the increasing tendency of less-educated parents to break up their relationships, and higher levels of martial stability in more educated families, a trend that is now observed in many industrialized countries, even if with various levels of intensity (McLanahan, 2004; Harkonen, 2014). The studies of Gratz (2017) and Kalmijn (2015) contribute to these debates also. We are particularly interested in the (potential) unequal effect of family disruption on children's daily lives.

Educational inequalities in parents' monetary and time resources, together with socioeconomic gaps in parenting styles, are important to explain differences in child time use. Lareau (2011) found that middle and upper-class parents adhere more to the ideal of "concerted cultivation". Parents who develop a concerted cultivation strategy spend more time with their children and focus on cognitive stimulating practices to develop their talent and boost their life chances. By contrast, less-educated parents tend to develop a "natural growth" style of parenting. Natural growth parenting does not involve a high involvement and constant educational focus. It gives children more autonomy, liberating them from the constant parental scrutiny of "intensive parenting". These different parenting norms and

potential parenting awareness also need to add to different resources to monitor child activities across socioeconomic groups, with potentially more privileged income, job autonomy and availability to foster child developmental time use (i.e., cognitive stimulation, structured leisure activities (Clawson & Gerstel, 2014; Gracia & Ghysels, 2017; Sayer et al., 2004b)

How marital dissolution impacts child time use across educational groups remains unknown. We anticipate children's time use to be less affected by parental divorce in more advantaged families than in disadvantaged families. Privileged parents are advantaged in dealing with potential family and child well-being risks and can apply compensatory strategies to reduce the risks associated with marital dissolution (Harkonen et al., 2017; McLanahan, 2004). For example, compared to parents in unprivileged families, parents with higher levels of education can use their advantaged resources to organize developmental activities for children after separation (i.e., educational activities, extracurricular lessons). Also, high-educated mothers and fathers would be highly active in educational and shared time with children after marital breakdown, a relative compensation that would not be observed among less privileged children in families that have experience marital dissolution. Thus:

H3. *The impact of parental separation on child developmental time use, with parents and alone, is stronger for low-educated families than it is for high-educated families.*

Child Gender

Family structure trajectories can influence the way boys and girls engage in daily activities. Drawing on 'role model' theories, children learn and make sense of the world at the parental home, which in turn influences their aspirations and behaviours at different stages of the life course (Cunningham, 2001; Platt & Polavieja, 2016). In two-parent families, and in societies that are still driven by gender-typed roles models in which fathers are more active in activities with sons, and mothers with daughters

(Bonke & Esping-Andersen, 2009; Lundberg et al., 2007), paternal absence can have specially detrimental effects over boys' activities, rather than girls' activities (Mencarini et al., 2014). We therefore anticipate girls to change less their time use after dissolution, and boys to spend more time without parents and to engage in media-based activities, as opposed to activities like studying or related developmental activities. Hence:

H4. *The negative impact of parental separation on children's developmental time use affects boys particularly, not girls.*

METHOD

Data and Sample

To investigate the effect of parental union dissolution on time investments we need a dataset that includes information on family structure, detailed time diaries, and a track of the same children during several years. Such data are extremely rare: Only two datasets include these features, the American U.S. PSID-CDS and *The Longitudinal Study of Australian Children* (LSAC). We select the later to conduct our analysis because it offers a higher sample size, closer spaced observations and a larger window of observation. LSAC is a biannual survey started in 2004 and includes two cohorts of ~5,000 Australian children each, one born in 2000 ("Birth Cohort"), and another one born in 2004 ("Kindergarten Cohort"). These characteristics make LSAC especially suitable for the aims of our study. For further details on the study's methodology, see Australian Institute of Family Studies (2002).

Time-diary data are considered an excellent statistical tool to analyze how time is spent in daily activities (Bianchi et al., 2006). Time diaries in LSAC were designed to change over time and thus be adapted to developmental processes of children. In waves 1-3, when children are very young, parents

are those who fill out the two "light diaries" (Hofferth et al., 1997) for two different days, one in weekdays and one in weekends. This type of light diaries split the day into 96 15-minute intervals and parents (or the child's responsible person) had a list of 25 pre-coded activities to fill in the 96 time slots. From age 10 onwards (waves 4-6) time diaries are no longer filled out by parents but by children themselves, only for one day (mainly weekdays), and without a pre-coded list of activities. In waves 4-6 diaries, children write down in their own words what they were doing, in a temporal sequence of the activities conducted within the 24 hours. The day after, interviewers coded information provided by children into a pre-defined list of activities, plus collected information about who was the child with and where, in order to make children's diaries comparable across all waves. For the harmonization of time diaries across waves to conduct longitudinal analysis, we follow Mullan (2014)[3].

We restrict our analysis to children in the Kindergarten cohort ("K cohort") who experienced a family breakdown during the six available waves. Therefore, we observe children biannually for ten years, between 2004 and 2014, when they are 4, 6, 8, 10, 12 and 14 years old respectively. The reason to select only K cohort is because is the only one including time diaries across all available waves. We identify parental union dissolution by a change in child's relationship to parents from "living with two biological parents" to any other of the possible responses (i.e., living with: "one biological parent and one non-biological parent", "only one biological parent", "two non-biological parents"). We use all children's observations before and after experiencing divorce, to estimate the effect of family breakdown on dynamic time investments (immediate shocks and long-term re-adaptations).

We restrict our analysis to weekdays for both theoretical and technical reasons. We are interested in change in effects in daily routines. While weekends may represent an extraordinary part of the week, during weekdays routines are set, and changes in time-use during these days may affect

[3] An example of the LSAC time diaries: http://data.growingupinaustralia.gov.au/studyqns/wave1qns/TUD14.pdf. For waves 3-6: https://growingupinaustralia.gov.au/sites/default/files/tp13.pdf pp. 21-45).

more negatively both parents work-family balance and children's routine skills development. In addition, waves 4-6 only included one diary per child, and weekends were underrepresented. This change hampers longitudinal comparability of weekly estimates of time investments. After all restrictions, our analytical sample is formed by 1,949 observations from 449 children.

Dependent Variables

Previous studies on the relationship between divorce and children's daily routines have focused on measures of parent-child contact or involvement. Studies on *parent-child contact* and involvement using information from stylized questions have made relevant contributions, but they are limited for several reasons. First, they do not provide information about what parents and children were doing during the shared time but rather a raw measure of the number of visits. This obscures the actual length of time, the content of the contact, the quality of the shared time and the type of activities conducted during that time. Second, measures of contact do not provide information about who else was with the child during the shared time: whether the non-resident parent was alone with the child or with someone else. This makes difficult (if possible) to know men's relative share of childcare time. Third, these questions usually ask non-resident parents to identify face-to-face contact with their children on a seven or five-points scale (never, once in the past 12 months, 2–6 times in past 12 months, 7–11 times in past 12 months, 1–3 times per month, about once per week, 2–5 times per week, and almost every day -see e.g., the *National Longitudinal Study of Youth*[4]). This measure does not distinguish between a simple visit of the non-resident parent or whether he or she is taking actual caring responsibility.

Previous studies on measures of involvement have typically referred to the *quality* of parent-child contact after divorce (i.e., parent-child contact, evaluating warmth, closeness, communication styles). Now, the risk of introducing measurement error through the use of five-points-scales is even

[4] Questionnaires can be found at https://www.nlsinfo.org/content/cohorts/nlsy79/other-documentation/questionnaires For a study in Europe using similar scales to measure contact, see *Children of Immigrants Longitudinal Survey in Four European Countries* (http://www.cils4.eu/index.php?option=com_content&view=article&id=37&Itemid=13).

higher in this type of questions due to social desirability bias (between 60% and 95% of parents will typically responds they are *usually* warm with their children). In addition, none of the usual questions used to measure parent-child relationship after divorce provide information of the actual parent-child shared time and the type of activity they were doing together.

We derive our dependent variables from the LSAC time diaries. In waves 1-3, parents select among 22 to 25 of pre-coded activities (depending on the wave) to fill each of the 96 slots of 15 minutes in which the diary is divided. In waves 3-6, children write down in their own words a description of what they were doing and at what time, and this information is afterwards coded by interviewers into harmonizable activities, ranging from 55 in wave 4, 75 in wave 5 and 134 in wave 6. We select those activities that are constant and comparable across all waves and recode them into those broader categories of time commonly used in the literature (Cano et al., 2018; Hsin and Felfe, 2014; Fiorini and Keane, 2014). We analyze time spent in *developmental, unstructured* and *structured* activities. For the detailed list of activities included in each of the categories of time. In waves 1-3, we calculated time by multiplying each of the 96 diary slots marked with one of our activities of interest by 15. In waves 4-6, where diaries were not divided into pre-defined number of slots, we first used the difference between activities' end-times and activities' start-times to calculate time duration within the defined sequences of starting activity hours. We multiplied the resulting number by 1 in each of the slots marked with our activities of interests. As previous research (Cano et al., 2018), when multiple activities were carried on at the same time, we divided the number of activities by the specified time. For example, if the child reported to be reading and listening to music between 4pm and 5pm, we allocate 30 minutes to developmental time and 30 minutes to unstructured time.

Besides activities, time diaries also included information about who was with the child during the specified activity time. Following a similar recoding algorithm than for activities, we used that information to calculate total time spent with *father, mother* and *alone*. Diaries did not distinguish

between father and step-father or mother and step-mother, being both parental figures included in the same category, and making unable to distinguish time with parent and step-parent. However, very few children in our sample lived with a step-parent, and we did robustness checks to estimate measurement errors. We combine both measures (time in activities and time with whom) to derive another nine detailed categories of time (3x3), giving a total of 12 dependent variables:

1. Father-child solo time
2. Mother-child solo time
3. Alone time
4. Father-child solo time in developmental activities
5. Mother-child solo time in developmental activities
6. Alone time in developmental activities
7. Father-child solo time in unstructured activities
8. Mother-child solo time in unstructured activities
9. Alone time in unstructured activities
10. Father-child solo time in structured activities
11. Mother-child solo time in structured activities
12. Time in structured activities without parents.

In the last category of time (n. 12) we recoded time in structured activities without any parent rather than alone because time in structured activities alone is theoretically irrelevant and realistically improbable –during this time children are with other adults and/or peers. Because in waves 4-6 children did not filled two separated diaries for one weekday and one weekend, the panel survey design made not possible to estimate longitudinal measures of hours per week. Therefore, our final measures of time are in minutes per day.

Independent Variables

We use three variables capturing the effect of dissolution on children's time use. To identify temporal dynamics of family dissolution on time investments (i.e., short- and long-term effects), we follow a similar approach that Leopold and Kalmijn (2016), using three variables: (a) a dummy variable identifying biological family breakdown, changing from 0 to 1 when the child experience a transition from living with two biological parents to other family forms (one biological parent, one biological parent and one non-biological parent and two non-biological); (b) a variable identifying *duration* after family breakdown, starting from 0 in the wave in which family breakdown was observed and ranging from 0 (= both all prior observations and first observation without two biological parents) to 4. Because children are observed every two years, 1 corresponds to 2 years, and 4 to 8. The maximum of the duration range is 4 and not 5 because we are interested in the effect of dissolution, and thus those children who entered the window of observation already in other family forms beside two biological parents are excluded from the analysis. Finally, we include (c) duration squared. As in Leopold and Kalmijn (2016), the dummy variable captures initial shocks on time investments, while duration variables identify linear and curvilinear time-adaptations. For the sake of later visualization purposes, we use the same duration variable squared in form of an index, counting both years before family dissolution, in negative terms (range from -5 to -1), and years after in positive (from 0 to 4). Again, each value corresponds to two years. In this way we are able to graphically show pre- and post-divorce changes in time investments.

Moderators: Parental education and child gender

We measure parental education using a dummy variable that identifies whether during the observation period one of the two parents have University degree (=1; otherwise=0). We tried different ways of measuring parental level of education to which results are insensitive. In addition, we also ran our set of models using a dummy variable for occupation (1=professional; 0=otherwise) and, again, results

are insensitive to this other way of approximate measures of social class and status. Child gender is a dummy variable (1=female; 0=male).

Controls

In the multivariate analyses we control for age, state of residency, whether there are siblings at home, whether English is the language spoken at home, and whether a non-biological parent entered the home (i.e., re-partnering). All these variables are potential confounders in the effect of dissolution on time investments. They are all dummy variables except state of residency, which is categorical. We also include child age as categorical (4, 6, 8, 10, 12 and 14 years old; reference category=4) to avoid collinearity with measures of parental separation duration. In the models we add a full range of variables that are expected to influence children's time use, including the presence if siblings and regional variations.

Analytical Strategy

We begin with the following linear model for repeated observations nested within children:

$$f(T_{it}) = \alpha + \beta_1 FB_{it} + \beta_2 \boldsymbol{X}_{it} + \beta_3 \boldsymbol{G}_{it} + \eta_i + e_{it} \qquad (1)$$

Where T is time (alone, with father, mother, and across activities) of child i in year t and α is the intercept. $\boldsymbol{FB}$ contains dummy, continuous and squared indicators of family breakdown. β_1 indexes the coefficients of main interest to test our working hypotheses. $\boldsymbol{X}$ is a vector of time-changing control variables, while $\boldsymbol{G}$ is gender, our only time-constant variable. β_2 and β_3 are the coefficients of both kinds of control variables. η represents person-specific time-constant unobserved factors affecting attitudes to mothering and gender divisions of labor. And e is random disturbance across i and t. We use random-effects generalized least squared regressions (GLS). All children in our sample experienced family dissolution at some point of the period of observation and thus bias due to correlation between family breakdown and time-constant variables do not apply (Allison, 1994). Random-effects models are especially suitable for our research because they allow us to obtain main

effects of time-invariant variables, and one of our key moderator variables is time-invariant (i.e., child's gender). This is particularly relevant in this research because we might expect that pre-family breakdown time-use of boys and girls may differ (Mencarini et al., 2014). However, random-effects (RE) GLS models imposes the strong assumption that e_{it} and η_i are not correlated with divorce and time investments. We might also expect a selection bias since probability of divorce might be associated with time-use through time-constant unobservable factors.

To relax this assumption, we also estimate fixed-effects models (FE). FE models are more robust than RE models (Wooldridge, 2010) and they partially avoid self-selection bias of time-constant unobservable factors. The model takes the form of:

$$f(T^*_{it}) = \beta_2 \boldsymbol{FB}^*_{it} + \beta_3 \boldsymbol{X}^*_{it} + e_{it} \qquad (2)$$

The robustness of FE models comes at a price: in this equation, $\boldsymbol{G}$ drops because is a time-invariant variable and thus the main effects of gender cannot be estimated. As noted, η, because is time-invariant, also drops from the equation. Therefore, the coefficient of interest (i.e., β_3) are not affected by any observed (or unobserved) time-invariant factors correlated with $\boldsymbol{FB}$ and $\boldsymbol{T}$. This eliminates selection bias due to time-invariant unobservable factors. In equation (2), $\boldsymbol{T}^*_{it,}$ $\boldsymbol{FB}^*_{it}$ and $\boldsymbol{X}^*_{it}$ are the time-variant differences from the individual means. Thus, this model tells us how changes over time in individuals' characteristics affect changes in time investments; that is: individuals act as their own statistical adjustment. Even though this modelling is not completely free of bias (e.g., time-changing unobserved factors), it represents an important improvement over previous research on the effect of divorce on parent-child contact.

The analyses proceed as follows. We estimate three models for each outcome. Model 1 includes divorce variables to observe the short- and long-term effects on time investments. To analyze effect heterogeneity, Model 2 adds an interaction between divorce variables and parental level of education, and Model 3 an interaction between divorce variables and child gender. Then, we plot results in three

figures. Figure 1 shows results of model 1, Fig. 2 of Model 2 and Fig 3 of model 3. Models shown in figures are similar to those in the main models, with the only exception of the variable duration, that also include time before divorce, in negative values, to make visualization clearer. For the sake of simplicity, we do not show the graphical results for structured time because is the least affected variable, but they are available in Supplementary information (not shown).

We run a set of supplementary analyses. First, we replicate all models for changes before and after divorce in time investments over weekends. These models allow us to observe whether and how weekend time is affected by divorce. In these models, however, due to low number of cases we are unable to estimate dynamically, and thus observe long-term changes, but only the total effect of divorce, only using the dummy variable of divorce and not duration. Second, we replicate our models using occupation as a proxy for social class, instead of level of education. Third, we replicate our models including number of hours at paid work for both mothers and fathers as a control variable. This is a key variable explaining time investments. However, these models are shown only as a supplementary analysis (not here) and not reported in the front end because employment hours is assumed to be a pathway through which divorce affects time investments. Four, we run all analyses for a subsample of children who do not experience re-partnering. We do this because in time-diaries "father" and "mother" are in the same slot that "step-father" and "step-mother". This is likely to introduce measurement error since both parental figures are indistinguishable. Fifth, we also try different ways of modelling: we replicate Leopold and Kalmijn (2016), including multiple interactions also between control variables and divorce variables and centering all variables to the mean, and results are similar. At this stage we only present a selection of analyses.

FINDINGS

All the preliminary findings are presented at the end of this document. While analyses are preliminary, we have produced an important amount of evidence. Results or analyses are structured as follows.

Table 1 shows the descriptive and summary statistics. The multivariate statistical analyses are based on random intercept models (fixed-effects models are available upon request and tend to who quite consistent evidence). Table 2 show the general statistical effects of divorce on time with fathers, mothers, and alone. Table 3 looks at the combination of activities (educational, media and structured), while accounting for whether this time is with the father, mother or alone.

We further examine (in Table 4 and 5) the heterogeneous effects by parental education and (in Table 6 and 7) the heterogeneous effects by child gender. In both cases we use interaction effects. We finally show the main analyses, based on random effects models, as forms of graphics (Figure 1, 2, 3) related with the test of our hypotheses. All models control, among other factors, for remarriage. We have conducted a range of sensitivity analyses (not shown), including analyses using fixed-effects (in general these results resemble the one presented with random effects models). But we also have replicated the analyses by looking at weekends, as it is known that parental strategies and child time use differs remarkably between weekdays and weekends (Gracia & Garcia-Roman, 2018) (all these robustness checks are available upon request to the authors).

DISCUSSION

This article seeks to contribute to the divorce and child well-being literature by focusing on children's time use. It does it by analyzing six waves of the *Longitudinal Study of Australian Children* (2004 – 2014), an excellent dataset to investigate changes in children's daily lives from a dynamic perspective. Our study is, to our knowledge, the first systematic analysis with panel regression models that focuses on children's time use, before and after divorce, while accounting for multiple unobserved factors, by using various econometric techniques. We adopt a multidimensional approach to child time use. We do so by analyzing how divorce affects the time that children spend with mothers, parents and alone, but also whether children spend time in educational, extra-curricular or screen-based activities, while examining changes in these activities before and after experiencing parental separation.

Our longitudinal analyses, using Random Effect Models (and with Fixed-Effects Models as robustness checks, not shown), reveal interesting differences in children's time use after parental dissolution. suggest that mothers compensate for parental divorce by increasing time with children, yet this trend declines over time. Father-child time is moderately reduced over the years after divorce, while children increase their unstructured solo time, but also increase their educational time alone. The effect of divorce on time use is somehow stratified by parental education, but especially by gender. After family breakdown, boys substantially increase media and unstructured time, while girls increase educational time alone. In future analyses we will more specifically seek to disentangle why these differences occur. In any case, we believe these differences, in many respects consistent with our theoretical expectations, will contribute significantly to our knowledge on how parental separation can impact the lives of children over time and at different stages of the life course.

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Table 1. Descriptive Statistics of Variables. Means and SD

	Mean	SD	Min	Max
Daily Minutes with Father	45.37	108.34	0.00	1440.00
Daily Minutes with Mother	212.85	237.61	0.00	1440.00
Daily Minutes Alone	223.63	261.66	0.00	1065.00
Daily Minutes of Educational Time with Father	4.87	19.00	0.00	352.50
Daily Minutes of Educational Time with Mother	22.44	39.96	0.00	360.00
Daily Minutes of Educational Time Alone	22.10	52.95	0.00	597.00
Daily Minutes of Media Time with Father	9.31	31.58	0.00	427.50
Daily Minutes of Media Time with Mother	38.63	61.53	0.00	472.50
Daily Minutes of Media Time Alone	30.72	70.39	0.00	610.00
Daily Minutes of Structured Time with Father	2.58	19.18	0.00	487.50
Daily Minutes of Structured Time with Mother	8.29	25.46	0.00	225.00
Daily Minutes of Structured Time Alone	43.89	79.04	0.00	435.00
Parental Divorce Observation	0.30		0.00	1.00
Parental Divorce Duration				
Parental Divorce Duration - Squared				
Female	0.52		0.00	1.00
Speaking English at home	0.96		0.00	1.00
Respondent's Age in Months	106.44	40.61	51.00	188.00
1 or More Children in Household	0.46		0.00	1.00
State 1 == NSW	0.32		0.00	1.00
State 2 == VI	0.22		0.00	1.00
State 3 == QU	0.24		0.00	1.00
State 4 == SA	0.06		0.00	1.00
State 5 == WA	0.08		0.00	1.00
State 6== TAS	0.03		0.00	1.00
State 7 == NT	0.02		0.00	1.00
State 8 == ACT	0.03		0.00	1.00
Father's College Degree	0.30		0.00	1.00
Mother's College Degree	0.32		0.00	1.00
Child Experienced Parental Re-partnering	0.08		0.00	1.00
Observations		1477		

Table 2. Descriptive Statistics for Time Use - Before & After Parental Divorce

	Time Use Before Divorce		Time Use After Divorce	
	Mean	Sd	Mean	Sd
Time with Father	46.56	96.44	43.16	127.54
Time with Mother	227.65	238.89	185.46	232.98
Time Alone	237.45	292.37	198.04	189.89
Educational Time with Father	5.74	17.84	3.25	20.90
Educational Time with Mother	25.69	41.17	16.43	36.93
Educational Time Alone	8.85	26.07	46.61	76.28
Media Time with Father	9.86	29.19	8.29	35.59
Media Time with Mother	42.06	65.09	32.29	53.80
Media Time Alone	15.61	40.49	58.70	99.51
Structured Time with Father	2.60	14.42	2.55	25.78
Structured Time with Mother	11.31	29.06	2.70	15.41
Structured Time Alone	47.56	87.05	37.09	61.04
N	959		518	

Table 3. Descriptive Statistics for Time-Use Measures by Child Age

	Wave 1 (Age 4)		Wave 2 (Age 6)		Wave 3 (Age 8)		Wave 4 (Age 10)		Wave 5 (Age 12)		Wave 6 (Age 14)	
	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Time with Father	58.11	121.42	51.44	124.79	40.28	94.73	41.69	98.47	36.35	97.10	27.00	81.27
Time with Mother	309.30	274.78	221.40	227.62	271.60	299.03	125.51	133.21	129.80	150.13	112.90	120.62
Time Alone	241.27	305.01	257.84	314.19	250.28	303.73	139.11	127.93	179.01	163.66	268.33	172.61
Educational Time with Father	6.00	18.76	9.05	29.68	5.64	16.07	1.66	11.14	1.65	9.45	1.85	13.29
Educational Time with Mother	32.82	49.46	27.51	38.01	32.36	44.44	8.33	22.68	8.64	24.38	11.83	34.14
Educational Time Alone	3.31	10.58	4.66	14.30	6.19	15.97	29.89	46.60	67.37	86.88	58.02	89.11
Media Time with Father	13.61	37.09	8.34	23.56	6.64	25.44	11.38	37.19	5.37	34.33	6.44	23.47
Media Time with Mother	69.87	82.65	25.91	39.37	37.14	54.79	29.16	56.78	26.12	47.30	20.56	39.12
Media Time Alone	13.50	34.83	6.60	26.64	4.80	17.68	53.30	87.14	48.97	78.53	104.14	123.37
Structured Time with Father	3.48	17.76	1.74	10.10	1.95	11.15	4.03	22.72	0.00	0.00	4.07	41.15
Structured Time with Mother	21.29	37.04	4.17	14.34	6.72	26.23	5.06	21.07	1.42	12.61	0.89	7.89
Structured Time Alone	70.86	110.50	16.72	47.96	20.09	48.51	94.88	79.56	13.02	36.17	24.89	42.68
Observations	366		296		235		244		193		143	

Table 4. Random Effects Linear Models.
Dissolution and Daily Minutes with Fathers, Mothers and Alone (Weekdays)

	FATHER-CHILD TIME		MOTHER-CHILD TIME		ALONE TIME	
	Coef.	*SE*	Coef.	*SE*	Coef.	*SE*
Parental Separation	15.91^{+}	9.38	137.76***	19.26	-33.32	21.80
Duration since Divorce	-7.19	11.90	-12.85	24.12	-12.05	26.85
Duration since Divorce (Squared)	0.81	3.63	-0.61	7.35	7.09	8.18
Aged 4 (ref)						
Aged 6	-6.17	8.24	-98.67***	16.60	17.81	18.39
Aged 8	-21.41*	9.14	-64.83***	18.51	7.98	20.61
Aged 10	-24.89*	9.90	-238.24***	20.19	-87.89***	22.67
Aged 12	-32.13**	11.93	-252.67***	24.49	-47.66^{+}	27.73
Aged 14	-47.57**	15.11	-276.98***	31.30	31.04	35.78
Girl	-2.32	6.26	-8.10	13.83	12.25	17.24
Siblings at Home	-5.93	6.20	-19.23	13.38	-46.52**	16.10
Speaking English at Home	-10.70	15.24	-33.50	33.00	39.37	40.12
Father's College Degree	0.47	7.51	-9.43	16.45	13.56	20.18
Mother's College Degree	10.82	7.39	-20.82	16.18	16.07	19.85
State 1 ==NSW (ref)						
State 2 ==VIC	3.80	8.49	-14.84	18.66	-1.68	23.09
State 3 ==QLD	1.14	8.46	-10.21	18.62	-22.35	23.04
State 4 ==SA	-15.03	13.49	-55.92^{+}	29.65	46.04	36.62
State 5 ==WA	-4.54	12.32	-33.09	27.05	51.62	33.45
State 6==TAS	78.66***	18.95	-17.70	41.45	32.82	50.86
State 7 ==NT	28.89	23.02	111.80*	49.65	-93.08	59.86
State 8 ==ACT	-8.15	18.26	14.10	39.79	116.61*	48.58
Remarriage	30.84**	11.91	-83.28***	24.70	29.71	28.20
Intercept	65.78***	16.37	368.82***	35.33	205.45***	42.84
N	1477		1477		1477	

Table 4b. Fixed-Effects Linear Regressions.
Models of Dissolution and Daily Minutes with Fathers, Mothers and Alone (Weekdays)

	DAD TIME		MUM TIME		ALONE TIME	
	b	se	b	se	b	se
Parental Separation	8.73	7.33	113.17***	15.06	-21.86	19.69
Duration since Divorce	-8.99	10.12	-29.90	20.78	-4.44	27.15
Duration since Divorce (Squared)	-3.19	3.10	-0.53	6.36	7.67	8.32
Aged 4 (ref)						
Aged 6	-8.89***	2.45	-97.26***	5.04	18.84**	6.58
Aged 8	-9.79***	2.56	-100.55***	5.25	19.50**	6.87
Aged 10	-18.03***	2.55	-197.89***	5.25	-113.56***	6.85
Aged 12	-15.95***	2.64	-208.53***	5.42	-80.93***	7.08
Aged 14	-20.65***	2.77	-217.88***	5.69	-13.02+	7.44
Siblings at Home	-7.31+	3.95	-1.40	8.10	-32.21**	10.59
Speaking English at Home	-3.61	14.61	-25.21	30.00	63.20	39.21
Father's College Degree	-9.63	7.20	11.49	14.78	19.17	19.31
Mother's College Degree	3.87	6.41	-6.92	13.16	14.36	17.20
State 1 ==NSW (ref)						
State 2 ==VIC	27.75*	12.84	-46.85+	26.37	-10.86	34.47
State 3 ==QLD	7.05	10.76	-17.87	22.10	-10.00	28.88
State 4 ==SA	13.53	16.34	-42.12	33.55	-30.48	43.85
State 5 ==WA	4.14	14.70	-10.60	30.18	0.55	39.44
State 6==TAS	61.89**	21.60	-58.23	44.37	-16.45	57.98
State 7 ==NT	15.18	21.35	10.42	43.85	-53.35	57.30
State 8 ==ACT	2.99	15.62	2.73	32.07	-26.46	41.91
Intercept	28.49*	12.26	-73.51**	25.17	46.99	32.90
N	1795		1795		1795	
R^2	0.03		0.17		0.05	
AIC	164315.31		185041.74		192750.35	
BIC	164474.39		185200.82		192909.43	

Table 5a. Random Effects. Models of Dissolution and Daily Minutes in Activities with the Father, Mother and Alone (Weekdays)

	Educational Activities						Screen Activities						Structured Activities					
	With Father		With Mother		Alone		With Father		With Mother		Alone		With Father		With Mother		Alone	
	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se
Parental Separation	0.85	1.63	8.55*	3.36	2.11	4.08	0.85	2.75	20.10***	5.11	7.80	5.50	-0.29	1.67	-1.82	2.15	-5.79	6.36
Duration since Divorce	-0.99	2.11	2.74	4.21	0.48	5.27	1.10	3.50	0.64	6.30	-8.90	7.10	-0.47	2.16	3.11	2.66	10.81	7.75
Duration since Divorce Squared	-0.01	0.64	-1.70	1.28	2.20	1.60	-0.15	1.07	-0.28	1.92	3.58^{+}	2.16	-0.05	0.66	-0.74	0.81	-3.22	2.36
Aged 4 (ref)	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.
Aged 6	3.01*	1.47	-5.62^{+}	2.90	1.22	3.68	-5.03*	2.43	-45.55***	4.31	-7.69	4.96	-1.70	1.51	-17.08***	1.83	-54.06***	5.30
Aged 8	-0.86	1.62	-2.29	3.23	1.16	4.06	-7.28**	2.69	-37.03***	4.83	-10.03^{+}	5.47	-1.68	1.67	-14.43***	2.04	-49.15***	5.95
Aged 10	-5.34**	1.74	-29.08***	3.52	22.36***	4.36	-2.87	2.91	-49.29***	5.32	39.12***	5.87	0.25	1.79	-15.71***	2.24	26.74***	6.59
Aged 12	-5.54**	2.08	-29.85***	4.27	54.88***	5.19	-9.78**	3.49	-56.69***	6.50	34.80***	6.99	-3.48	2.13	-20.32***	2.73	-54.28***	8.10
Aged 14	-5.83*	2.59	-24.99***	5.46	35.43***	6.49	-10.51*	4.41	-63.77***	8.40	84.95***	8.74	0.78	2.66	-21.15***	3.51	-38.62***	10.52
Girl	2.00*	0.99	0.78	2.40	5.29*	2.47	-2.11	1.78	-2.17	4.06	-14.19***	3.33	-1.32	1.01	2.78^{+}	1.63	1.15	5.41
Siblings at Home	-1.15	1.01	-1.57	2.33	-4.07	2.52	-2.21	1.78	-2.55	3.78	-7.37*	3.39	-0.40	1.03	0.19	1.55	1.05	4.90
Speaking English at Home	-1.12	2.47	3.97	5.74	-3.24	6.18	-6.18	4.37	7.99	9.43	-2.11	8.33	2.64	2.54	-0.75	3.83	-4.16	12.36
Father's College Degree	1.93	1.20	3.98	2.86	3.35	2.99	-1.44	2.15	-1.76	4.75	-1.95	4.03	1.17	1.23	1.98	1.92	0.29	6.23
Mother's College Degree	2.29^{+}	1.18	-1.57	2.81	0.42	2.95	2.36	2.11	-5.09	4.67	0.79	3.97	2.55*	1.21	0.26	1.89	3.84	6.14
State 1 ==NSW (ref)	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.
State 2 ==VIC	0.05	1.35	-3.21	3.24	-5.96^{+}	3.37	3.11	2.42	-9.14^{+}	5.43	7.37	4.54	-0.95	1.38	0.66	2.19	11.28	7.20
State 3 ==QLD	-0.14	1.34	-1.84	3.24	-5.79^{+}	3.35	2.94	2.41	-5.58	5.42	-0.38	4.51	1.41	1.37	-1.37	2.18	8.19	7.18
State 4 ==SA	-0.14	2.14	-4.77	5.15	-5.58	5.35	-2.97	3.85	-4.28	8.62	11.05	7.20	-0.32	2.19	1.44	3.47	14.78	11.39
State 5 ==WA	-2.52	1.97	-9.35*	4.70	0.26	4.92	0.33	3.52	-5.59	7.87	0.83	6.62	-0.90	2.02	4.41	3.17	17.87^{+}	10.44
State 6==TAS	7.61*	3.02	-4.69	7.21	-1.33	7.56	15.22**	5.42	-19.34	11.97	8.16	10.18	0.08	3.10	0.56	4.84	20.84	15.74
State 7 ==NT	-3.07	3.75	18.47*	8.64	-14.02	9.37	-5.57	6.62	13.15	14.07	-10.72	12.62	-0.36	3.84	-5.57	5.74	2.16	18.30
State 8 ==ACT	-2.92	2.93	6.72	6.92	-3.23	7.32	3.11	5.23	-5.09	11.43	14.40	9.86	2.94	3.00	-0.78	4.63	-5.82	14.97
Remarriage	7.43***	2.03	-3.81	4.31	14.40**	5.09	3.24	3.47	-15.31*	6.62	-11.99^{+}	6.85	3.08	2.09	0.71	2.77	-3.31	8.27
Intercept	5.63*	2.67	30.39***	6.15	8.09	6.68	19.53***	4.71	70.54***	10.07	23.31**	9.00	0.80	2.74	19.83***	4.09	65.31***	13.18
N	1477		1477		1477		1477		1477		1477		1477		1477		1477	

Table 5b. Fixed Effects. Models of Dissolution and Daily Minutes in Activities with the Father, Mother and Alone (Weekdays)

	Educational Activities						Screen Activities						Structured Activities					
	With Father		With Mother		Alone		With Father		With Mother		Alone		With Father		With Mother		Alone	
	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se
Parental Separation	0.50	1.49	6.84*	3.00	-3.81	4.42	-1.03	2.29	21.37***	4.19	5.19	5.47	0.60	1.38	-1.87	1.99	-7.95	5.96
Duration since Divorce	-1.40	2.05	2.77	4.13	-3.90	6.10	-1.09	3.16	-1.17	5.78	-8.47	7.54	-0.50	1.91	4.28	2.74	13.03	8.22
Duration since Divorce (Squared)	-0.44	0.63	-1.84	1.27	2.16	1.87	-0.42	0.97	-0.25	1.77	4.04^{+}	2.31	0.24	0.58	-1.13	0.84	-3.64	2.52
Aged 4 (ref)	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.
Aged 6	2.75***	0.50	-1.32	1.00	2.62^{+}	1.48	-4.97***	0.77	-47.76***	1.40	-6.22***	1.83	-1.94***	0.46	-13.06***	0.66	-53.23***	1.99
Aged 8	0.04	0.52	-6.69***	1.04	3.73*	1.54	-4.95***	0.80	-46.14***	1.46	-4.93**	1.91	-0.98*	0.48	-12.03***	0.69	-44.36***	2.08
Aged 10	-3.69***	0.52	-25.26***	1.04	32.52***	1.54	-3.27***	0.80	-56.02***	1.46	37.74***	1.90	-0.31	0.48	-13.20***	0.69	29.35***	2.08
Aged 12	-3.51***	0.53	-26.10***	1.08	73.01***	1.59	-4.65***	0.82	-57.49***	1.51	31.43***	1.97	-2.69***	0.50	-18.81***	0.71	-47.57***	2.14
Aged 14	-4.28***	0.56	-28.76***	1.13	56.15***	1.67	-5.52***	0.87	-61.06***	1.58	85.23***	2.06	-2.16***	0.52	-18.11***	0.75	-34.43***	2.25
Siblings at Home	0.85	0.80	0.09	1.61	1.65	2.38	-2.51*	1.23	-3.59	2.25	-8.09**	2.94	-1.46*	0.74	0.31	1.07	4.37	3.21
Speaking English at Home	-0.67	2.96	-2.03	5.97	-3.28	8.80	1.21	4.56	4.49	8.34	14.33	10.88	-0.14	2.75	1.16	3.95	21.19^{+}	11.87
Father's College Degree	-0.53	1.46	4.59	2.94	0.95	4.34	-4.56*	2.25	8.10*	4.11	1.90	5.36	2.17	1.36	1.37	1.95	0.04	5.85
Mother's College Degree	2.43^{+}	1.30	0.16	2.62	0.23	3.86	2.61	2.00	0.09	3.66	-0.52	4.77	-0.85	1.21	1.23	1.73	-9.16^{+}	5.21
State 1 ==NSW (ref)	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.
State 2 ==VIC	1.17	2.60	-3.54	5.24	-15.33*	7.74	14.26***	4.01	-1.01	7.34	-10.26	9.57	-1.07	2.42	-3.77	3.48	-5.84	10.44
State 3 ==QLD	1.65	2.18	-1.28	4.39	-17.45**	6.48	5.92^{+}	3.36	-0.69	6.15	0.83	8.02	0.13	2.03	3.53	2.91	17.41*	8.75
State 4 ==SA	0.37	3.31	-3.67	6.67	-7.84	9.84	10.06*	5.11	6.73	9.33	-8.56	12.17	-0.93	3.08	1.71	4.42	22.82^{+}	13.28
State 5 ==WA	2.75	2.98	1.94	6.00	-20.17*	8.86	-0.22	4.59	5.13	8.40	-15.09	10.95	0.88	2.77	0.66	3.98	33.27**	11.95
State 6==TAS	9.26*	4.37	-9.66	8.82	-26.96*	13.02	12.43^{+}	6.75	8.66	12.34	-9.92	16.10	-1.24	4.07	5.99	5.85	-16.84	17.56
State 7 ==NT	-1.52	4.32	10.94	8.72	-26.83*	12.87	9.54	6.67	5.00	12.20	-1.54	15.91	1.03	4.02	4.29	5.78	7.36	17.36
State 8 ==ACT	-3.09	3.16	1.06	6.38	-11.05	9.41	-3.02	4.88	11.75	8.92	-3.87	11.64	0.94	2.94	-3.44	4.23	-7.86	12.69
Remarriage	6.40**	2.48	0.29	5.01	8.00	7.39	3.58	3.83	-13.60^{+}	7.00	-6.71	9.13	3.12	2.31	-1.65	3.32	-4.03	9.96
Intercept	3.96	3.36	28.54***	6.78	19.79*	10.00	7.96	5.19	46.64***	9.48	1.51	12.36	3.80	3.13	18.97***	4.49	51.91***	13.49
BIC	118475.80		138680.26		149885.37		130973.62		148347.99		156001.17		116406.28		126830.14			
R^2	0.03		0.12		0.23		0.01		0.19		0.22		0.01		0.08		0.19	
N	14401		14401		14401		14401		14401		14401		14401		14401		14401	

Table 6. Random Effects Models of Dissolution and Time with Parents.
Interaction Terms of Parental Divorce and Level of Education (Weekdays)

	DAD TIME		MUM TIME		ALONE TIME	
	Coef.	se	Coef.	se	Coef.	se
Divorce	26.51**	9.27	138.83***	17.63	-32.73+	19.01
College	3.46	8.42	-17.75	15.79	34.86+	17.85
Divorce # College	7.81	13.23	0.56	25.32	-29.77	26.81
Divorce Duration	-4.87	11.38	-13.43	21.76	30.33	23.12
Divorce Duration Squared	-0.47	3.54	1.06	6.77	-7.52	7.19
College # Divorce Duration	-4.82	18.52	14.46	35.42	-42.16	37.56
College # Divorce Duration Squared	-0.01	5.72	-3.16	10.93	13.02	11.61
Aged 4 (ref)						
Aged 6	-1.42	8.56	-92.57***	16.39	14.39	17.32
Aged 8	-15.63+	9.33	-52.87**	17.83	22.15	18.95
Aged 10	-34.62***	9.89	-258.02***	18.85	-88.30***	20.24
Aged 12	-43.39***	11.27	-272.35***	21.39	-29.78	23.27
Aged 14	-44.10***	13.00	-295.60***	24.56	55.75*	27.09
Girl	-4.84	6.07	-7.77	11.18	6.68	13.38
Siblings at Home	-10.31+	5.97	-11.41	11.11	-59.07***	12.79
Speaking English at Home	5.37	13.04	-39.88+	24.07	24.28	28.52
State 1 ==NSW (ref)						
State 2 ==VIC	-0.30	8.17	-12.91	15.08	10.10	17.90
State 3 ==QLD	-0.72	8.33	-5.27	15.39	-1.01	18.22
State 4 ==SA	-28.85*	12.54	-30.31	23.14	34.54	27.49
State 5 ==WA	-12.26	11.99	-14.94	22.12	35.98	26.27
State 6==TAS	60.59***	18.25	13.46	33.73	4.62	39.82
State 7 ==NT	21.74	21.07	90.51*	39.19	-66.87	45.35
State 8 ==ACT	-4.55	17.74	-15.00	32.90	106.06**	38.45
Remarriage	11.08	9.85	-75.22***	18.65	37.23+	20.41
Intercept	58.92***	14.81	364.87***	27.49	216.05***	32.07
N	1968		1968		1968	

Table 7. Random Effects. Models of Dissolution and Daily Minutes in Activities with the Father, Mother and Alone. Interaction Terms of Parental Divorce and Level of Education (Weekdays)

	Educational Activities						Media Activities						Structured Activities					
	With Father		With Mother		Alone		With Father		With Mother		Alone		With Father		With Mother		Alone	
	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se
Divorce	2.15	1.41	11.16***	3.04	0.30	4.06	3.02	2.63	20.83***	4.73	2.75	5.76	-1.36	1.42	0.29	1.82	0.76	5.70
College	3.96**	1.22	4.93+	2.72	1.81	3.55	0.42	2.36	-4.76	4.34	-0.27	5.02	0.26	1.20	2.55	1.60	5.70	5.05
Divorce # College	-1.96	2.06	-5.25	4.37	8.58	5.88	1.86	3.78	-2.60	6.73	-3.24	8.36	3.60+	2.07	-2.58	2.64	-8.75	8.21
Divorce Duration	-0.22	1.76	3.18	3.75	0.21	5.05	1.47	3.25	3.47	5.79	1.84	7.17	-0.32	1.77	1.90	2.26	1.50	7.05
Divorce Duration Squared	-0.24	0.55	-1.28	1.17	1.82	1.57	-0.52	1.01	-1.31	1.80	-1.21	2.23	0.04	0.55	-0.55	0.70	-0.08	2.19
College # Divorce Duration	-1.76	2.87	0.80	6.11	-11.40	8.22	1.39	5.29	-3.33	9.42	1.85	11.67	-0.44	2.89	0.16	3.69	4.35	11.48
College # Divorce Duration Sq.	0.43	0.89	-0.25	1.88	1.55	2.53	-0.62	1.63	1.42	2.91	1.16	3.60	-0.11	0.89	-0.02	1.14	-2.24	3.54
Aged 4 (ref)	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.
Aged 6	3.22*	1.34	-5.05+	2.83	0.58	3.81	-3.94	2.45	-46.90***	4.35	-6.39	5.42	-1.91	1.35	-16.49***	1.71	-53.07***	5.32
Aged 8	-1.08	1.45	-2.88	3.07	0.92	4.14	-7.03**	2.66	-36.76***	4.75	-8.41	5.87	-2.04	1.46	-14.08***	1.85	-48.84***	5.78
Aged 10	-4.97**	1.52	-30.03***	3.25	21.20***	4.35	-4.10	2.81	-50.87***	5.05	36.01***	6.18	-0.79	1.52	-16.09***	1.95	26.16***	6.10
Aged 12	-4.71**	1.70	-31.96***	3.69	59.87***	4.91	-11.09***	3.19	-54.43***	5.77	39.34***	6.95	-3.27+	1.70	-20.51***	2.20	-53.01***	6.90
Aged 14	-4.45*	1.93	-30.61***	4.23	34.88***	5.59	-8.55*	3.66	-60.07***	6.67	98.01***	7.92	-0.75	1.92	-20.54***	2.51	-42.49***	7.89
Girl	1.47+	0.83	0.80	1.92	4.06+	2.45	-2.75+	1.67	-2.97	3.17	-14.52***	3.44	-1.26	0.80	2.03+	1.10	-3.49	3.53
Siblings at Home	-1.37	0.84	-0.10	1.91	-4.47+	2.48	-2.40	1.66	1.47	3.09	-15.41***	3.49	-0.55	0.82	0.92	1.11	0.44	3.54
Speaking English at Home	-0.53	1.79	3.72	4.14	-4.20	5.30	-1.16	3.59	3.71	6.79	2.46	7.45	1.91	1.74	-0.76	2.39	2.95	7.62
State 1 ==NSW (ref)	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.
State 2 ==VIC	0.06	1.12	-1.01	2.59	-3.83	3.32	0.95	2.25	-8.14+	4.26	8.27+	4.66	-0.58	1.09	0.60	1.49	6.02	4.77
State 3 ==QLD	-0.16	1.15	-0.67	2.65	-5.41	3.39	2.08	2.30	-6.56	4.34	2.99	4.77	1.36	1.11	-1.43	1.53	6.20	4.87
State 4 ==SA	-1.23	1.72	-1.59	3.98	-1.11	5.08	-6.14+	3.45	-1.54	6.54	11.24	7.15	-0.67	1.66	0.80	2.29	11.78	7.32
State 5 ==WA	-1.81	1.64	-6.82+	3.81	-0.89	4.86	-0.88	3.30	-8.75	6.25	9.96	6.84	-0.87	1.59	2.68	2.19	9.25	7.00
State 6==TAS	6.43*	2.51	2.97	5.81	-3.88	7.43	9.90*	5.03	-4.00	9.50	-5.16	10.46	-0.31	2.44	-1.53	3.35	14.15	10.68
State 7 ==NT	-3.88	2.96	9.88	6.75	-13.34	8.71	-5.39	5.85	-0.40	10.93	-13.13	12.28	-0.80	2.89	-4.82	3.92	5.71	12.46
State 8 ==ACT	-1.65	2.47	1.44	5.66	-1.00	7.28	0.40	4.91	-9.02	9.22	18.50+	10.25	2.24	2.40	-1.04	3.28	-4.31	10.44
Remarriage	3.13*	1.47	-3.56	3.21	10.31*	4.26	-1.64	2.78	-18.96***	5.05	-3.43	6.03	1.37	1.46	0.35	1.91	1.76	6.00
Intercept	4.99*	2.07	27.56***	4.73	9.21	6.10	16.46***	4.10	73.50***	7.69	20.58*	8.60	2.74	2.03	19.57***	2.75	62.14***	8.73
N	1968		1968		1968		1968		1968		1968		1968		1968		1968	

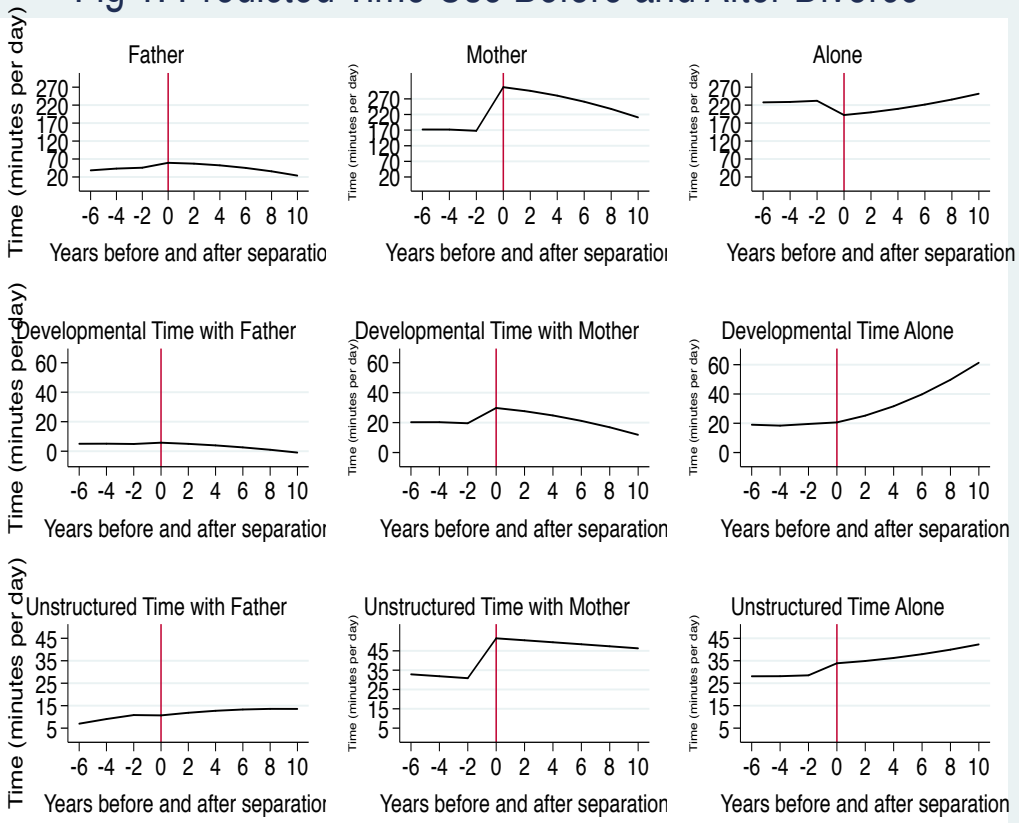
Table 8. Random Effects. Models of Dissolution and Time with Parents.
Interaction Terms of Parental Divorce and Child Gender (Weekdays)

	DAD TIME		MUM TIME		ALONE TIME	
	Coef.	se	Coef.	se	Coef.	se
Divorce	14.78	12.52	124.06***	25.59	-0.35	28.77
Girl	1.37	7.42	-15.28	16.06	19.00	19.40
Divorce # Girl	3.51	15.70	25.57	31.83	-64.50+	35.43
Divorce Duration	3.52	18.30	-16.99	37.08	-33.77	41.24
Divorce Duration Squared	-0.60	6.03	2.22	12.24	6.49	13.63
Girl # Divorce Duration	-22.30	23.86	5.29	48.24	49.76	53.54
Girl # Divorce Duration Squared	3.77	7.51	-4.10	15.21	-3.15	16.91
Aged 4 (ref)						
Aged 6	-6.22	8.25	-98.75***	16.61	17.96	18.39
Aged 8	-21.11*	9.15	-65.05***	18.53	7.81	20.62
Aged 10	-24.84*	9.91	-238.07***	20.20	-88.42***	22.67
Aged 12	-32.62**	11.93	-252.67***	24.52	-46.83+	27.73
Aged 14	-48.71**	15.15	-278.17***	31.42	35.34	35.86
Siblings at Home	-6.16	6.19	-18.76	13.41	-47.09**	16.07
Speaking English at Home	-10.86	15.19	-33.87	33.03	41.12	40.00
Father's College Degree	-0.33	7.50	-9.20	16.50	15.27	20.15
Mother's College Degree	11.16	7.37	-20.87	16.21	15.17	19.81
State 1 ==NSW (ref)						
State 2 ==VIC	4.04	8.45	-14.98	18.68	-2.05	23.01
State 3 ==QLD	1.34	8.42	-9.80	18.64	-23.71	22.96
State 4 ==SA	-14.81	13.42	-56.07+	29.66	46.29	36.48
State 5 ==WA	-4.46	12.27	-32.81	27.06	50.86	33.33
State 6==TAS	79.08***	18.87	-17.95	41.48	32.93	50.69
State 7 ==NT	29.48	22.95	111.24*	49.69	-93.45	59.70
State 8 ==ACT	-7.75	18.19	13.15	39.83	118.37*	48.44
Remarriage	28.86*	12.06	-80.64**	25.02	29.21	28.52
Intercept	64.04***	16.44	372.65***	35.61	200.78***	42.97
N	1477		1477		1477	

Table 9. Random Effects. Models of Dissolution and Daily Minutes in Activities with the Father, Mother and Alone. Interaction Terms of Parental Divorce and Child Gender (Weekdays)

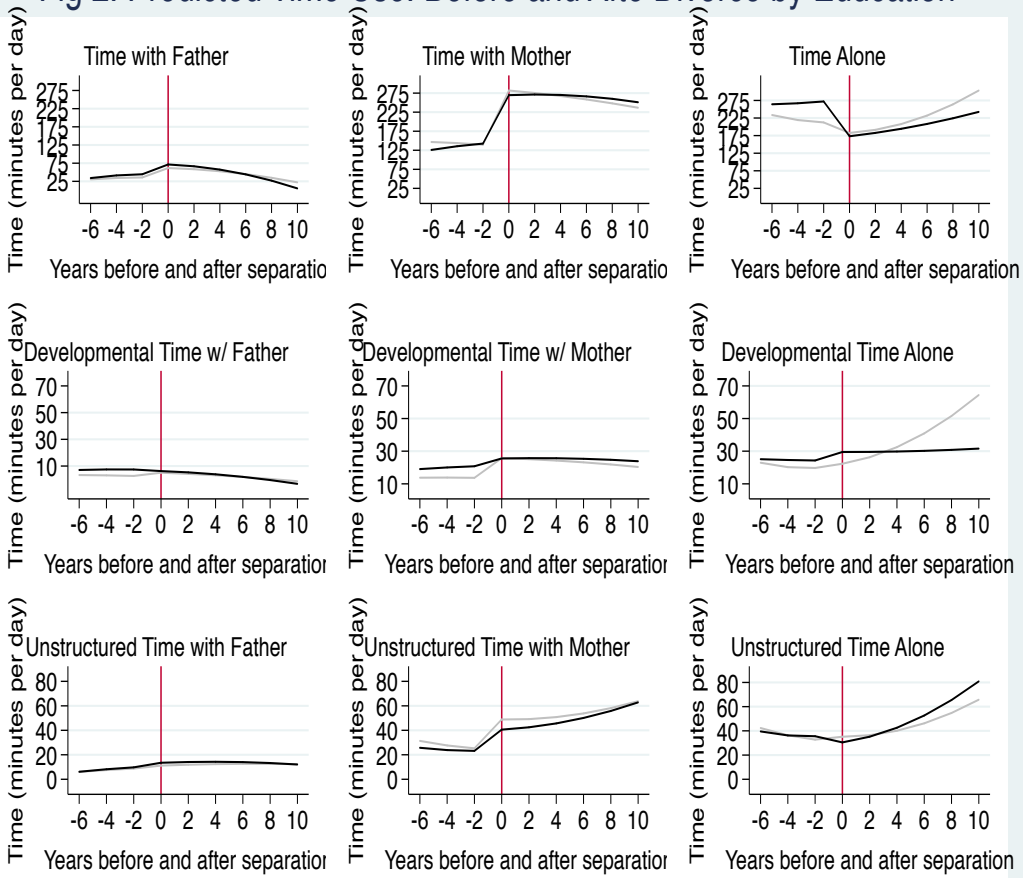
	Educational Activities						Media Activities						Structured Activities					
	With Father		With Mother		Alone		With Father		With Mother		Alone		With Father		With Mother		Alone	
	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se	Coef.	se
Divorce	0.67	2.19	6.51	4.47	-4.55	5.46	1.46	3.67	16.68*	6.76	21.19**	7.34	-1.32	2.25	0.57	2.84	-9.17	8.37
Girl	1.81	1.22	-0.83	2.80	1.53	3.04	-1.51	2.14	-3.65	4.57	-4.25	4.09	-1.20	1.25	4.01*	1.86	2.00	6.01
Divorce # Girl	0.32	2.78	3.57	5.56	11.91^{+}	6.93	-0.99	4.62	6.41	8.32	-23.94*	9.31	2.05	2.85	-4.39	3.51	6.83	10.23
Divorce Duration	-1.69	3.24	2.25	6.47	12.25	8.08	0.17	5.39	2.05	9.68	-6.79	10.85	2.71	3.32	1.75	4.09	23.79*	11.90
Divorce Duration Squared	0.25	1.06	-1.78	2.14	-2.88	2.65	0.45	1.77	-0.47	3.20	3.76	3.56	-0.92	1.09	-0.28	1.35	-6.83^{+}	3.94
Girl # Divorce Duration	1.15	4.23	1.46	8.42	-17.38^{+}	10.55	0.99	7.03	-2.70	12.56	-6.41	14.18	-5.69	4.34	2.14	5.32	-23.18	15.42
Girl # Divorce Duration Squared	-0.42	1.33	-0.10	2.65	7.26*	3.31	-0.76	2.21	0.39	3.97	0.86	4.45	1.52	1.36	-0.67	1.68	6.20	4.87
Aged 4 (ref)	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.
Aged 6	3.01*	1.47	-5.63^{+}	2.90	1.22	3.67	-5.03*	2.43	-45.57***	4.32	-7.65	4.93	-1.70	1.51	-17.07***	1.83	-54.02***	5.29
Aged 8	-0.88	1.63	-2.34	3.23	1.14	4.05	-7.27**	2.70	-37.04***	4.84	-9.64^{+}	5.44	-1.63	1.67	-14.42***	2.04	-48.92***	5.96
Aged 10	-5.33**	1.74	-29.07***	3.53	22.38***	4.35	-2.87	2.91	-49.25***	5.32	38.95***	5.84	0.26	1.79	-15.73***	2.24	26.82***	6.59
Aged 12	-5.52**	2.08	-29.86***	4.28	54.57***	5.18	-9.77**	3.50	-56.76***	6.51	34.66***	6.96	-3.59^{+}	2.13	-20.25***	2.73	-54.61***	8.11
Aged 14	-5.88*	2.61	-24.87***	5.48	36.76***	6.49	-10.75*	4.43	-63.92***	8.43	84.19***	8.73	0.78	2.67	-21.19***	3.52	-38.42***	10.55
Siblings at Home	-1.14	1.01	-1.45	2.34	-3.70	2.51	-2.25	1.78	-2.41	3.78	-8.11*	3.38	-0.41	1.03	0.09	1.55	1.07	4.91
Speaking English at Home	-1.11	2.48	3.94	5.75	-3.42	6.17	-6.16	4.37	7.84	9.43	-1.95	8.29	2.57	2.54	-0.67	3.84	-4.52	12.39
Father's College Education	1.95	1.20	4.10	2.87	3.42	2.99	-1.48	2.15	-1.78	4.75	-2.65	4.02	1.05	1.23	1.99	1.93	-0.39	6.26
Mother's College Education	2.27^{+}	1.18	-1.58	2.82	0.72	2.94	2.34	2.11	-5.06	4.67	0.81	3.95	2.63*	1.21	0.20	1.89	4.33	6.16
State 1 ==NSW (ref)	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.
State 2 ==VIC	0.04	1.35	-3.25	3.25	-5.86^{+}	3.36	3.10	2.42	-9.14^{+}	5.43	7.54^{+}	4.52	-0.90	1.38	0.65	2.19	11.53	7.22
State 3 ==QLD	-0.13	1.34	-1.83	3.24	-5.93^{+}	3.34	2.96	2.41	-5.49	5.42	-0.45	4.49	1.43	1.38	-1.41	2.19	8.30	7.20
State 4 ==SA	-0.15	2.14	-4.81	5.16	-5.71	5.33	-2.95	3.85	-4.35	8.60	11.38	7.17	-0.30	2.19	1.47	3.48	14.77	11.42
State 5 ==WA	-2.51	1.97	-9.34*	4.71	0.04	4.91	0.36	3.52	-5.57	7.86	0.82	6.59	-0.92	2.02	4.40	3.18	17.81^{+}	10.46
State 6==TAS	7.62*	3.03	-4.81	7.22	-1.76	7.54	15.31**	5.41	-19.46	11.95	8.50	10.13	0.05	3.10	0.67	4.85	20.75	15.78
State 7 ==NT	-3.10	3.75	18.35*	8.66	-14.04	9.35	-5.53	6.62	13.07	14.06	-9.80	12.56	-0.23	3.85	-5.53	5.75	2.56	18.33
State 8 ==ACT	-2.94	2.93	6.52	6.94	-3.81	7.31	3.19	5.23	-5.34	11.42	15.67	9.82	2.95	3.01	-0.59	4.64	-5.90	15.01
Remarriage	7.57***	2.06	-3.33	4.36	13.93**	5.14	3.23	3.52	-15.05*	6.70	-14.86*	6.91	2.71	2.12	0.53	2.80	-4.96	8.37
Intercept	5.72*	2.70	31.20***	6.20	10.02	6.73	19.23***	4.74	71.39***	10.13	18.39*	9.04	0.79	2.77	19.17***	4.13	65.12***	13.28
N	1477		1477		1477		1477		1477		1477		1477		1477		1477	

Fig 1. Predicted Time Use Before and After Divorce



Random Effects Models (full models)

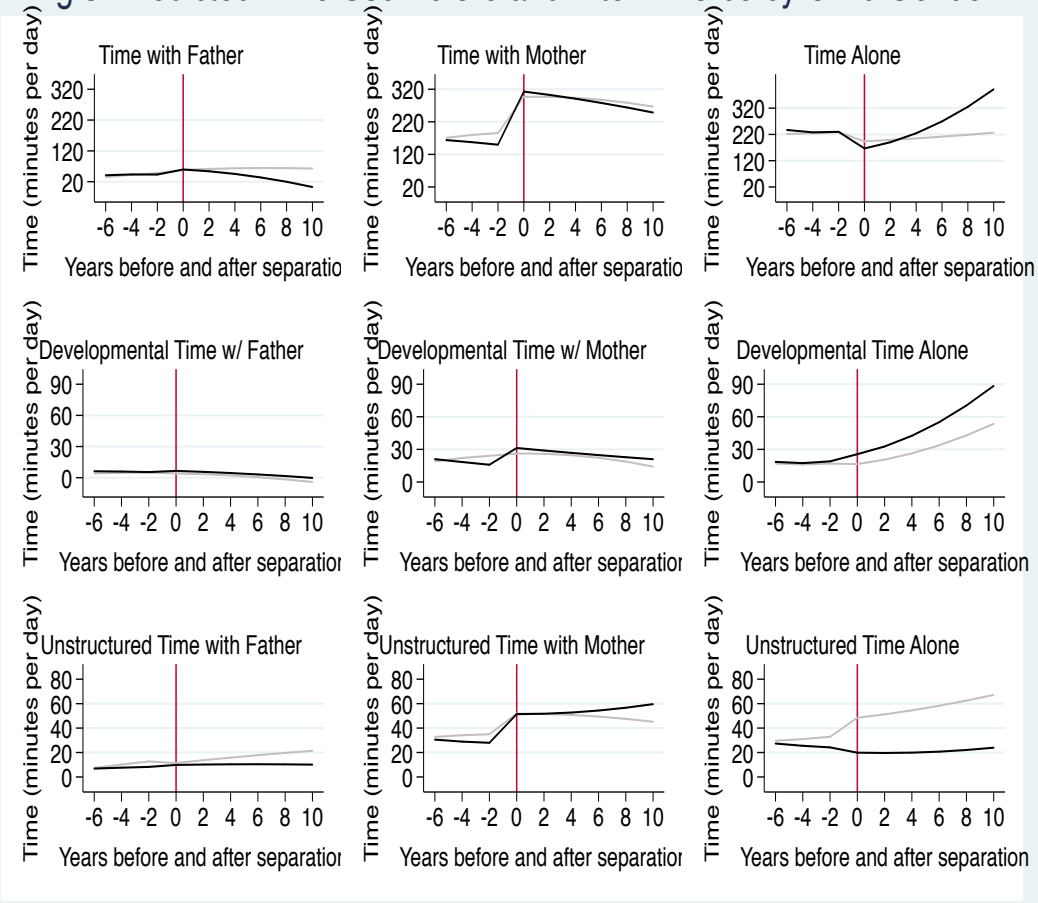
Fig 2. Predicted Time Use. Before and Afte Divorce by Education



Random Effects Models (Interaction Parental Education * Divorce)

High Education
Low Education

Fig 3. Predicted Time Use Before and After Divorce by Child Gender



Random Effects Models (Interaction Child Gender * Divorce)

Boy
Girl