
PARENTS' TIME WITH CHILDREN: MICRO AND MACRO PERSPECTIVES

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ABSTRACT

This thesis studies the dynamics of parents' time with children. It uses self-reported time diary data to empirically document discrepancies between high- and low-educated parents' time spent in various childcare activities. By doing so, the study considers one important but under-researched form of childhood inequality, namely inequality in parental time investment. The thesis is among the first to provide an extensive and detailed empirical documentation of variations in parents' time use with children and to examine the effect of macro-structure and policy context on parenting behaviour.

Using the American Time Use Survey (2003-2008), the thesis first investigates variations in parents' time spent in different types of childcare among white parents in the US. Then, the American Heritage Time Use Survey (1965-2010) is employed to examine whether differences between high- and low-educated parents' time spent with children have been growing or diminishing over time. Finally, the Multinational Time Use Survey (1965-2008) is used to explore the relationship between specific policies, macro-economic structure and childcare across time and across countries.

The results can be summarized as follows. High-educated parents provide more primary childcare for their children compared to low-educated parents. The difference is particularly acute during the early years of childhood, and the gap is particularly wide for childcare activities which are fundamentally important for the social and cognitive development of children. This parental investment gap, most notably between high- and low-educated mothers, has been widening in the US. The main source of this widening phenomenon is the steady increase in high-educated mothers' time spent in interactive and developmental childcare activities, rather than in routine and physical childcare activities. The analysis of cross-national data shows that the strong positive effect of education on childcare is a cross-national occurrence. However, the strength of this association varies considerably across time and across countries: universal paid leave for mothers and a gender egalitarian labour market structure help alleviate the education and gender gap in childcare. Mothers provide more primary childcare as the number of available paid leave weeks increases, while fathers increase their contribution to primary childcare as the percentage of women in the labour market increases. The provision of paid leave for mothers decreases the effect of education on primary childcare, and specific family policies as well as gender egalitarian socio-economic contexts can help alleviate inequalities in parental time investment in children.

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CHAPTER 1:

SETTING THE SCENE: CHILDHOOD INEQUALITIES

1.1 INTRODUCTION

Children are not born equal nor do they grow up in equal circumstances. Across the world, babies born in less advantaged households are more likely to be delivered pre-term (Rowley 1994), have low birth weight (Starfield et al. 1991) and face significantly higher mortality risk (Sorlie, Backlund and Keller 1995). Those who survive are more likely to be deprived of basic necessities such as a nutritious diet or health insurance (Lindsey 2009), and have poorer health (Korenman and Miller 1997), psychological distress (McLeod and Shanahan 1993) and lower self-esteem (Axinn, Duncan and Thornton 1997). They are less likely to receive paternal acceptance (Grimm-Thomas and Perry-Jenkins 1994), and more likely to grow up in single-parent households (McLanahan and Schwartz 2002) in poor neighbourhoods where they are exposed to higher health and safety risks (Brooks-Gunn, Duncan and Aber 1997). Children born to more affluent families receive more financial investment and high quality non-parental care (Smeeding, Erikson and Jantti 2011). They spend more time in organized extra-curricular activities that are designed to improve their social and cognitive skills, and go to better schools that pave the way for a college degree (Kaushal, Magnuson and Waldfogel 2011; Willingham 2012).

Such inequalities in early childhood persist into adulthood and undermine equality of opportunity, putting a high weight on birth (dis)advantages. In this study, we focus on one important but under-researched form of early childhood inequality, namely *inequality in parental time investment*. We investigate whether advantages accruing to children from more educated families are growing or diminishing over time, and whether they differ across countries. Furthermore, we examine the extent to which parental time investment in children is shaped by the socio-economic context in which parents live and the policy provisions available to parents.

Time is both a resource and a constraint. How much parents are constrained by time and how much of it they can allocate to their children heavily influences children's life chances. This thesis provides strong evidence that there are significant inequalities in parental time investment by education. Parents with high educational attainment provide more primary childcare for their children compared to parents with low educational attainment in the US (Chapter 2).¹ The difference is particularly acute during the early years of childhood and the gap is particularly wide in developmental childcare activities which are fundamentally important for the social and cognitive development of children (Chapter 3). The gap between high-and low-educated parents' time spent in developmental childcare increased significantly in the 1990s and 2000s, compared to the 1970s (Chapter 4). Yet, the provision of paid leave policies and gender egalitarian labour market conditions could help alleviate this parenting gap (Chapter 5).

¹ With the exception of the final chapter, the findings presented in this thesis are for non-Hispanic white parents residing in the US with at least one child under the age of thirteen. Consequently, the results cannot be generalized for the entire parental population of the US.

In this introductory chapter we first provide a discussion of the literature establishing the link between parental investments and child outcomes, particularly educational attainment. This section is then followed by a brief review of previous work studying trends in childcare. Next, we highlight the contribution of the study and provide an outline of the thesis.

1.2 ESTABLISHING THE LINK BETWEEN PARENTAL INVOLVEMENT AND CHILD OUTCOMES

The determinants of children's educational attainments are numerous, interlinked and operate on many levels. According to Haveman and Wolfe (1995, 1994), a comprehensive characterization of the process of children's attainment should incorporate the relation between three decision-makers, namely society (or government), parents and children: society determines the opportunities available both to children and their parents (social investments),² parents make choices regarding the quantity and quality of family resources to be devoted to children (parental investments), and children make (some) decisions given these investments and constraints as well as the opportunities available to them. This is the broad socio-economic framework in which the present research is situated. However, as the analytical focus of the next three chapters is at the individual level, more specifically variations in parental time use patterns, in this review we concentrate on parental investments rather than social investments or children's decisions in terms of children's outcomes; though they are arguably as important.

There is a rich body of research on *parental involvement/ parental inputs* and *child outcomes*, mostly conveying a positive relationship between the two. However, the

² See Folbre (2008) on why society should invest in children.

findings are not entirely consistent and rather scattered for several reasons. Most importantly, the definitions and operationalization of parental involvement and child outcomes vary widely.³ By parental involvement, studies variously refer to: time spent with children (Leibowitz 1977), frequency of specific activities with children (Amato and Rivera 1999; Thomson, Hanson and McLanahan 1994; Zick, Bryant and Oosterbacka 2001), children's perception of parental behavioural and emotional involvement (Wenk et al. 1994), involvement with school activities (Epstein 1990), parental aspiration for educational attainments (Sewell and Shah 1968), frequency of contact (Amato and Gilbreth 1999; Furstenberg, Morgan and Allison 1987), parental rules and control (Thomson, Hanson and McLanahan 1994), or a combination of some of the above (Astone and McLanahan 1991; King and Sobolewski 2006; McNeal 1999). Similarly, child outcomes as a response variable are very broadly defined and operationalized as cognitive or linguistic skills (Leibowitz 1977; Rosenzweig and Wolpin 1993), educational attainments (Coleman 1987), behavioural outcomes (Azier 2004; Baumrind 1991; Richardson et al. 1989) or psychological well-being (Baumrind 1978). Moreover, many studies fail to account for the significant intervening variables between parental inputs and child outcomes such as race, gender, socio-economic situation (McNeal 1999), ethnic context or sub-cultural variations of norms and acceptable behaviours (Bluestone and Tamis-Lemonda 1999). Adding to the difficulty of studying parental investments and child outcomes, Burton, Phipps and Curtis (2002) suggest that, unlike what is commonly assumed in the literature, parental behaviour is not exogenous to child behaviour and

³ The age range of children in the reviewed literature is 0 to 18.

so should not be analysed in a simple unidirectional sense as has been done in much empirical research.⁴

Despite the diversity of definitions, methods and data, a great deal of research consistently provides support for the positive effect of parental involvement-very broadly defined- on a variety of cognitive, behavioural and social-emotional child outcomes: sensitive parenting predicts children's cognitive and linguistic achievements (Lamb and Tamis-LeMonda 2007), higher levels of paternal involvement are associated with fewer behavioural problems (Amato and Rivera 1999), self-care at early ages is a significant risk factor for substance use (Aizer 2004; Richardson et al. 1989), and school-related parenting practices are positively related to many school achievement indicators (Astone and McLanahan 1991; Sui-Chu and Willims 1996).⁵ The conclusions regarding the importance of parental involvement are also not limited to sociological research. Psychological studies underline the significance of parenting style in children's psychological well-being (Baumrind 1978; Deater-Deckard et al. 1998). In turn, economic studies approach the issue from a *human capital* perspective and highlight the increased salience of parents' responsibility in augmenting their children's human capital (Becker and Nigel 1986; Leibowitz 1974, 2003; Rosenzweig and Wolpin 1993).

⁴ Similarly, despite the fact that empirical evidence in the literature lends strong support for the positive correlation between parents' and children' education, the causal explanation behind this is still disputed (Black, Devereux and Salvanes 2005; Behrman and Rosenzweig 2002; Plug 2004; Sacerdote 2002). For more on the intergenerational transmission of occupation/socio-economic status, see Biblarz, Bengston and Bucur (1996) and Hauser and Logan (1992).

⁵ Not only time spent in direct childcare but also parents' other time use activities can play a role in child development. Buchel and Duncan (1998) report significant positive effects of fathers' engagement in sports activities on children's school outcomes, while fathers' socializing with friends have negative effects. Yeung, Duncan and Hill (2000) also find a strong association between fathers' church attendance and children's schooling. However, the explanatory mechanism behind these associations is not clear.

Having mentioned the accumulated empirical evidence for the association between parental involvement and child outcomes, we move to a brief review of three paths linking parenting and child outcomes, outcomes such as school success: *parenting style*, a combination of distinctive parental manners and strategies, *parental aspirations* regarding children's educational and occupational attainments, and *parenting practices*, in other words the type, amount and frequency of activities parents engage in with their children (which is expected to be highly correlated and influenced by the first two) have all been discussed and offered as potential mechanisms linking parental involvement and child outcomes.

Parenting style and children's outcomes have been a topic of interest in psychology, particularly following the parenting style typology of Baumrind (1978) with a further contribution from Maccoby and Martin (1983). Depending on the level of responsiveness and demandingness, four types of parenting styles have been identified: *authoritative*, *authoritarian*, *permissive* and *rejecting- neglecting* (Baumrind 1991). These parenting styles were found to be correlated with a series of child outcomes such as substance use, school achievement, personality traits, psychological distress and behavioural problems (Baumrind 1991; Chan and Koo 2011; Lamborn et al. 1991; Steinberg et al. 1994; Weiss and Schwarz 1996). Authoritative parenting appears positively associated with child outcomes, while rejecting- neglecting parenting is reported to be detrimental to child outcomes: Chan and Koo (2011) found that youth with authoritative parents are more likely to get good exam results. In the study of Steinberg et al. (1994), highest academic

competence was reported by children from authoritative parents.⁶ Weiss and Schwarz (1996) found that sons of authoritative parents have the highest Grade Point Averages (GPA). Various parenting styles are found to be correlated with class (Kohn 1977), maternal depression (Belsky 1984), parental childhood history (Gara, Rosenberg and Herzog 1996), family structure (Chan and Koo 2011), ethnic background, education and socio-economic status (Bluestone and Tamis-LeMonda 1999).

Another path between parental characteristics and children's educational attainments is through variations in *parental aspirations*. Known also as the Wisconsin Model and built on the work of Blau and Duncan (1978) on status attainment, this model emphasises parental encouragement when it comes to their children's decision to pursue higher education (Sewell and Shah 1968). Parental inputs in the form of encouragement and motivation affect the educational attainment of children by shaping their educational aspirations. Children born to parents with high educational/occupational aspirations for their children are actively encouraged and supported, sometimes even pushed, towards higher educational attainment. High parental aspiration is a significant intervening variable between social class and children's educational aspirations. For status attainment to be effective, however, it is not enough for parents to simply hold high aspirations: they must also transmit these aspirations (Astone and McLanahan 1991). Intense parental supervision, attendance to parent-teacher meetings, close monitoring of school performance as well as extracurricular activities can help parents do this. In this regard, variations in parental aspirations would then be reflected in different behavioural patterns.

⁶ Academic competence is a combination of student's own perception of her intelligence compared to her classmates, her ability to finish homework on time and her competence in the classroom (Steinberg et al. 1994).

The third explanatory path between parental inputs and child outcomes is through differentials in daily *parenting practices*. Hoover-Dempsey and Sandler (1995) provide an informative explanation of why *parenting practices* positively influence children's educational outcomes. The authors identify three mechanisms of parental influence on children's school success: *monitoring*, *reinforcement* and *direct instruction*. *Monitoring* means that, through activities such as discussing the school day with children, helping with and checking homework and talking with teachers, parents convey the importance of educational activities to children. To put it simply, parental time investments in specific activities signal the importance of those activities to a child. *Reinforcement* happens when parents provide rewards for school related achievements via praise, interest, appreciation, etc. When applied "properly", *reinforcement* increases the likelihood of children behaving in ways that lead to school success. Thirdly, time spent with children positively influences children's school success via *direct instruction*, particularly *direct, open-ended instruction*, such as asking questions, explanations or engaging in discussions. Such intellectual activities tend to "promote higher levels of cognitive complexity and ability" and "contribute to higher-level thinking skills" in children (Hoover-Dempsey and Sandler 1995: 321). Although parental time investments in children likely contribute to children's school outcomes via these three mechanisms, the success of these parenting practices very much depends on the fit between parental involvement and schools' expectations.⁷ Lastly, researchers also underline the importance of *social capital* (via time spent in parent-teacher meetings) and the acquisition of information regarding children's performance (via time spent in discussing with children) (Coleman 1987). Therefore, time spent with children is expected to lead to positive

⁷ As will be explained in detail in the theoretical section, from Bourdieu's perspective, this fit refers to the "legitimized cultural capital" that provides advantages to children versus the "wrong sort of cultural capital" which is unlikely to yield any gains (Blackledge 2001; Tyson 2003).

child outcomes, although the effect is likely to be mediated with many other factors such as school context, race, gender, parental skills as well as *parenting style* and *aspirations*. As the focus of this research is on parental time spent with children, the next section provides a detailed review of the relevant literature on parental characteristics and time spent in childcare activities.

1.3 TRENDS AND ISSUES IN PARENTAL TIME INVESTMENT IN CHILDREN

Although not new, social concern over “neglected” children has increased in the last few decades in the US. The expressions “latchkey kid syndrome,” “parental time famine” or “parenting deficit” have frequently been used in academic studies as well as in popular literature.⁸ Researchers claim that children have been “suffering from the erosion of social capital in the family” (Coleman 1987), “starving for attention” (Mattox 1990), “living in distress” (Hewlett 1991), “left fatherless” (Blankenhorn 1995), and overall are “spending much less time with their parents” (Presser 1989). Additionally, increased studies linking children’s well-being to parental involvement, and recent demographic trends challenging the traditional “breadwinner husband/ homemaker mother” family structure have exacerbated these concerns.

Whilst research emphasizes the importance of parent-child interaction and fostered the ideal of involved parents, mothers have been leaving the home for work and

⁸ A school-aged child returning to an empty house after school and getting no adult supervision is referred to as “latchkey-child,” especially in the popular press, and has invoked many debates in both academic and non-academic circles. For non-academic writings, see for example Schulte (2009) in the *Washington Post*, Branigan (2007) in *The Guardian*, and Bernstein (2003) in the *NY Times*. For academic studies on the risk faced with latchkey-children, see Aizer (2004), Dwyer et al. (1990) as well as Fox and Newman (1997). Parental availability, the child’s level of responsibility and the neighbourhood context are found to be among the factors that affect the choice of self-care over supervised care alternatives (Casper and Smith 2004).

fathers are increasingly absent as a result of divorce or failure to marry. Given the well-established negative association between maternal employment and time spent with children (Bianchi et al. 2000; Bryant and Zick 1996; Gauthier, Smeeding and Furstenberg 2004; Nock and Kingston 1988; Robinson and Godbey 1997; Zick and Bryant 1996), concerns regarding the negative effect of mothers' employment on children's outcomes have increased.⁹ Additionally, as a result of possible adverse effects of marital instability and a fathers' tendency to disengage from their children after divorce, worry surrounding the amount of parenting children receive has increased.¹⁰ Policy makers, researchers as well as the media have begun to sound an alarm proclaiming that children are suffering from parental famine, mostly due to mothers' employment and increased fatherlessness, which in turn results in major social ills for society, ills such as teenage pregnancy, drug abuse, and juvenile delinquency/ youth violence.

This being said, recent time use studies do not lend strong support for widespread societal concern regarding parental neglect. There is no compelling evidence that parental time has declined drastically over the last few years. Indeed, time spent in primary childcare has remained constant or even increased in some cases in virtually all Western countries. The last few decades have witnessed a clear increase in parental time in the US (Sandberg and Hofferth 2001, 2005), and also in other

⁹ Maternal employment in the early years of infancy is found to have some adverse effects on children's behavioural and cognitive development, but the evidence is not conclusive. Datcher-Loury (1988) and Leibowitz (1977) found no negative effect of maternal employment on children's educational attainment and verbal development respectively, while Stafford (1987) and Ruhm (2000) reported negative effects. In another study, the negative effect of maternal employment in the first year of life is found to be offset during the second and subsequent years (Blau and Grossberg 1992).

¹⁰ Despite considerable research, firm conclusions regarding the effect of divorce on children have indeed remained elusive. There is substantial evidence of statistical associations between divorce and negative outcomes; however, the evidence on the causal link is not conclusive (See Amato 2000 and Seltzer 1994 for review). Additionally, many studies failed to find strong associations between non-resident father contact and child well-being (Amato and Gilberth 1999). What matters seems to be the types of involvement rather than mere contact (King and Sobolewski 2006).

industrialized countries (Gauthier, Smeeding and Furstenburg 2004; Gershuny 2000), mostly as a result of increased time spent in developmental activities rather than routine childcare (Sayer, Bianchi and Robinson 2004).

Why then does widespread social concern not match the empirical evidence? First, the supposition that *some* children might be suffering from “parental famine” is not unfounded. Whilst parental time increased *on average* in the last few decades, there are significant inequalities in parental involvement among different family types and among mothers. Some mothers spend significantly more time with their children than in the past, while others spend less: between 1965 and 1998, the proportion of mothers who reported any childcare decreased from 80% to 70% in the US (Sayer, Bianchi and Robinson 2004). An increase in the maternal time of *participating* mothers (those who report at least one minute in the activity) compensates for the missing time of *non-participating* mothers, resulting in an *average* increase over time. However, the possibility of growing inequalities is a matter of concern.

Moreover, children raised in single-parent households spend less time with their custodial parents (Robinson 1989). For example, Asmussen and Larson (1991) find that young adolescents in single-parent households spend 20 per cent fewer hours with their parents daily compared to those living with two parents. Similarly, Robinson and Godbey (1997) found single mothers spending about three hours a week less with their children compared to married mothers in the US in 1985. In 2000, this difference decreased to one hour (Bianchi, Robinson and Milkie 2006). Although single mothers’ time in childcare has increased in the last few decades, the maternal time of a single parent still does not compensate for the absence of a father,

and children from single-parent households receive less parental encouragement and attention compared to those from intact families (Astone and McLanahan 1991). Positive trends in single motherhood are likely to exacerbate the problem of *paternal inequality* due to custodial fathers' diminished willingness to spend time with their children (McLanahan and Sandefur 1996). Inequalities in fathers' time spent in childcare have been observed among fathers of intact families as well. Pacholok and Gauthier (2010) identify a distinct group of non-involved fathers who tend to work longer hours and have lower levels of education. In summary, although there is a positive trend of parental time investment in recent decades, there is also significant heterogeneity among parents (Monna and Gauithier 2008; Sayer, Bianchi and Robinson 2004).

These findings warrant attention as they point to a double disadvantage of children coming from single parents and less well-off families. These children receive less economic resources as well as less parental time investment. Given the importance of parenting as well as economic resources in future life chances (Carniero and Heckman 2003), inequality in parenting contributes to the “diverging destinies of children” coming from different backgrounds (McLanahan 2004). As will be explained in detail in the theoretical section, not only do some parents provide higher amounts of time investments to their children, but also the type of investments they make is more likely to be rewarded in the educational system as well as in the labour market.

Reported positive trends in childcare time should be interpreted with caution for another reason: most of the studies on childcare patterns report findings on time

spent in childcare as a *primary* activity only. There is a limited amount of studies on less direct forms of childcare (e.g. secondary childcare) and on the specific types of childcare activities (e.g. physical childcare or interactive childcare). Ignoring other forms of childcare is problematic given that a substantial amount of childcare is done in the form of secondary childcare, comprising almost one third of all parental childcare time (Zick and Bryant 1996). Moreover, some types of parenting activities are found to be more critical for children's social and cognitive development than others (Tamis-LeMonda, Bornstein and Baumwell 2001). In other words, there is a need for research involving both broader and more specific definitions of childcare that capture various forms of childcare activities.

This thesis is among the first to provide such an extensive and detailed analysis of parents' time spent with children. It adds to previous research on parents' childcare patterns in several ways: first, by considering and measuring a broader set of childcare activities a parent may engage in; second, by examining the effects of education on parents' time spent in childcare using cross-sectional, historical and cross-national time diary data and; third, by incorporating macro-level factors such as policy and social context into the analysis. There is a voluminous literature on the effect of education and other parental characteristics on time spent in *primary* childcare. However, studies that investigate specific childcare activities are scarce. Furthermore, to the best of our knowledge, there is no cross-national research that analyses the relationship between macro context and *changes* in the effect of education on time spent in childcare. Therefore, at present, there is little known regarding the relationship between variations in parents' allocation of time in childcare and variations in policy and socio-economic structure. This thesis will be

the first to show whether the effect of education on parenting behaviour is mediated by the macro context.

1.4 OUTLINE OF THE THESIS

This thesis is composed of three independent but closely related empirical studies. The first is a cross-sectional study (Chapters 2 and 3) that examines the childcare patterns of parents by educational attainment; the second uses repeated cross-sectional data to investigate the change in the effect of educational attainment on childcare patterns over time in the US (Chapter 4) and the final study is cross-national and incorporates individual level time use data with macro-level policy data (Chapter 5). Each chapter is organized as an independent and self-contained research providing a comprehensive analysis, evidence regarding the robustness of the findings and justification for the statistical methods used. In doing so, we try to avoid distracting from the overall continuity of the work by steering away from an overabundance of material. Hence, we provide Appendices for the first three chapters at the end of the thesis. An extensive discussion and justification of the methodology is presented in Appendix A. Results from additional models as robustness checks for Chapter 1, 2 and 3 are in Appendix A, B and C respectively. Detailed information of the data used in Chapter 4 is also provided in Appendix C.

The research questions addressed in each chapter and the outline of the thesis are as follows:

Q1: Do children receive significantly disparate parental time investments according to parental educational attainment? (Chapter 2 and Chapter 3)

Chapter 2 and Chapter 3 are based on the theoretical framework of Annette Lareau (2003), who claims that middle-class and working-class parents have distinctive child-rearing practices which contribute to the transmission of differential advantages to children. Using American Time Use Survey data (2003-2008), we test this proposition. We use parental educational attainment as a proxy for *social class* and investigate whether high-(middle class) and low-educated (working class) parents differ in their daily time spent in childcare, *ceteris paribus*. In doing so, we also examine whether the effect of class operates similarly for mothers and fathers. We apply OLS regression to estimate the effect of education on minutes spent in primary and secondary childcare by non-Hispanic white parents who have at least one child under the age of 13. All else being equal, the results show that high-educated mothers and fathers provide significantly and substantially more *primary childcare* for their children than low-educated mothers and fathers. Hence, there is a significant class-gap in parental time investments. However, the effect of education does not operate similarly on fathers' and mothers' time spent in secondary childcare. Being highly educated is negatively associated with mothers' time spent in secondary childcare, while there is no discernible effect of educational attainment on fathers' time spent in secondary childcare.

In Chapter 3, we continue to exploit 2003-2008 ATUS data in order to further test hypotheses based on Lareau's theory on class differences in child-rearing strategies. OLS and logistic regression results provide further empirical evidence of differences between high-and low-educated parents' involvement in specific childcare activities.

High-educated parents spend more time in developmental and out-of-home childcare activities compared to low-educated parents, while they allocate less time to watching TV during secondary childcare both in absolute and relative terms. Chapter 3 also highlights the importance of gender in understanding the effect of education on time spent with children. Minutes spent in basic childcare are significantly higher for high-educated fathers compared to low-educated fathers, but there is no such association in the case of mothers. In brief, Chapters 2 and 3 empirically document significant disparities in parental time investment in children by educational attainment. The findings also reveal that the effect of education on childcare patterns does not always operate similarly for mothers and fathers.

Q₂: Are the differences in parental time investment between high-and low-educated parents decreasing, persisting, or increasing over time?

After documenting the contemporary differences between high- and low-educated parents in detail, Chapter 4 uses American Heritage Time Use Study data (1965-2010) to show how the effect of education has changed (or not) over time. The works of Lareau (2003) and Hays (1996) provide the theoretical framework for this part of the study. The sample of interest is non-Hispanic white mothers with at least one child under the age of 18. OLS and logistic regression results confirm the previous research: On average, mothers have substantially increased their time spent in primary childcare in the last four decades, and the main area of this increase has been in developmental care activities rather than basic childcare. Chapter 4 also shows that, although all mothers have increased their involvement in developmental childcare activities, high-educated mothers have increased this involvement at a

faster rate. This in turn has resulted in a widening of the class-gap in mothers' time spent in developmental childcare activities.

Q3: Does context matter? How do policy and labour market structures affect parental time investment in children?

Chapter 5 integrates cross-national and cross-temporal individual level time diary data with data on leave policies and labour market structure, and applies multilevel modelling techniques to investigate the effect of macro structure on parental childcare patterns. Chapter 5 begins by showing the cross-national similarities and differences in childcare patterns of mothers and fathers with a child under the age of 5. The positive effect of being high-educated on primary childcare is confirmed in a cross-national setting. There are, however, significant cross-national and cross-temporal variations in the change of the effect of education. We show that the availability of universal paid leave increases mothers' time spent in primary childcare, while it decreases the effect of education on the activity. Moreover, fathers contribute to childcare more as the labour force structure of the country becomes more gender equal. We therefore conclude that context does matter, and well-designed family policies could help alleviate inequalities in parental time investment in children.

Chapter 6 provides a brief review of the findings, lists the limitations of the study, addresses potential criticisms and suggests avenues for future research.

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CHAPTER 2: INEQUALITIES IN PARENTAL TIME INVESTMENT (I): TIME SPENT IN PRIMARY AND SECONDARY CHILDCARE

ABSTRACT

Despite there being established research regarding the effects of parental background on a variety of child outcomes, the mechanisms through which parental advantages are transmitted to children are still debated. One possible mechanism is parental time investment during the early years of childhood. In her work on variations in child-rearing behaviours of American families, Annette Lareau (2003) articulates this mechanism by claiming that, unlike working-class parents, middle-class ones transfer their class advantages to their children by pursuing a specific childcare strategy: what Lareau calls *concerted cultivation*. Middle-class parents spend a significant amount of time with their children in an attempt to foster their interests and improve their social, linguistic and cognitive skills. Chapter 2 tests this proposition empirically. Using ATUS 2003-2008 data, the study investigates the relationship between parental education and time spent in primary and secondary childcare for non-Hispanic white parents. Results show that high-educated parents provide more primary childcare for their children compared to parents with low educational attainment. However, mothers' educational attainment is negatively associated with time spent in secondary childcare, while in the case of fathers there is no discernible association between educational attainment and secondary childcare.

2.1 INTRODUCTION

Inequalities in early childhood prolong into adulthood through various channels, of which the most prominent is differential educational attainments. In fact, one of the most enduring findings in the field of sociology of stratification has been the persistence of intergenerational class differences in educational attainment. Despite the diminished gender gap and substantial increase in the average level of education across the Western world (Blossfeld and Shavit 1993; Buchmann, DiPrete and McDaniel 2008), “any compelling evidence of a generalised, sustained, and substantial decrease in class differentials in educational attainment is not found” (Goldthorpe 2007: 29). The US, even with its relatively high mobility rates compared to other industrialized countries, is not an exception.

The effect of parental background on a variety of children outcomes, including school success, is well established in the literature (Duncan and Brooks-Gunn 1997; McLoyd 1998; Wagmiller, Lennon and Kuang 2008), but the mechanisms through which parental advantages contribute to children’s enhanced life chances are still unresolved. One possible mechanism refers to *inequalities in parental time investment* which take place in the early years of childhood. In her comprehensive work, Lareau (2003), argues for such a mechanism and claims that (upper) middle-class parents and low income/ working-class parents embrace different patterns of time investments. Accordingly, middle-class parents are more actively involved in fostering their children’s interests as well as their social, linguistic and cognitive skills. Having heavily involved parents who can afford to spend significant amounts of time (as well as money) in pursuit of children’s academic success gives middle-class children substantial advantages in the education system as well as in the labour

market. In brief, inequalities in parental time investment perpetuate into adulthood, and continue over generations.

To the extent that parental time investments lead to positive child outcomes, in particular success in school, variations in parental time inputs could be informative in understanding the transmission of differential advantages to children. Indeed, previous studies show that time spent in primary childcare increases with the educational attainment of parents (Monna and Gauthier 2008 for a review). However, research on time spent in secondary childcare or specific primary childcare activities is limited. Previous studies do not isolate the effect of educational attainment from that of race/ethnicity. Further, there is no study that shows whether the effect of education on various childcare activities operates differently for mothers and fathers. The first two empirical chapters of this thesis fill this gap by providing a comprehensive and detailed investigation of the effect of educational attainment on mothers' and fathers' parenting behaviour in a comparative setting. We borrow the theoretical framework of Annette Lareau who formulates two distinct parenting practices for middle-class and working-class/low-income families in the US, and test this theory empirically by using minutes spent in primary and secondary childcare as response variables. In line with the theoretical setting, the main research question addressed in this chapter is: Are there significant disparities in parenting practices between high-and low-educated parents?

The following section provides a detailed presentation of the theoretical framework. The work of French sociologist Pierre Bourdieu on the reproduction of social inequalities through the education system is reviewed. This section is then followed

by a review of the ethnographic research of Lareau, who, building on Bourdieu's broader theoretical work, provides a detailed account of class differences in parenting practices in the US. In line with Lareau's observations, we then formulize a set of hypotheses and describe the data and sample of the study. This will be followed by a short section on methods and model selection. Since the methods of analyzing time use data remains an un-resolved issue in the literature, a detailed explanation and justification of the chosen methodology is provided in Appendix A2 at the end of this thesis.

The first part of the results section tests the formulated hypotheses in a multivariate setting. In the second part, predicted minutes spent in childcare by different "types" of parents are presented, in order to demonstrate the extent of inequality in parental time investments for children born into different types of households. The chapter concludes with a presentation of the results and a brief summary of the findings. A more comprehensive discussion of the findings of Chapter 2 and 3 is provided at the end of Chapter 3.

2.2 THEORETICAL FRAMEWORK

2.2.1 BOURDIEU'S "THINKING TOOLS"

The most comprehensive theoretical explanation of class differences in child-rearing practices in the US has been provided by Lareau (2003).¹¹ Following the theoretical underpinnings of Bourdieu, Lareau argues that, unlike working-class parents, middle-class parents embrace a set of child-rearing practices that is compatible with

¹¹ Lareau completed a series of studies on the relationship between parental class situation and child-rearing practices (2003, 2002, 1989 and 1987). Although we will refer to her previous works from time to time, the theoretical framework we borrow is proposed comprehensively in her most recent book (2003).

the dominant child-rearing culture of the major American social institutions. This therefore leads to the transmission of differential advantages to working-class and middle-class children. Since Bourdieu's conceptual repertoire, or *thinking tools* as he prefers to put it (Jenkins 1992), provides the framework for Lareau's theory on child-rearing practices and social class, we begin with a brief review of his relevant work. Due to Lareau building her theory mostly on his early work (with Passeron), we mostly focus on early-Bourdieu: that is, his early conceptualization of different capitals, and how they are formed and transmitted. We then follow with a detailed account of Lareau's work that translates Bourdieu for the US context. Finally, we move to the hypothesized linkages between parental time use patterns and parental education.

Bourdieu offers one of the few coherent accounts of the reproduction of social inequalities via the education system (DiMaggio 1979; Harker 1990). At the centre of his argument lies the interaction between *habitus* and *field*. According to Bourdieu, what lies at the core of the reproduction of social inequalities is the embodiment of the dominant class's *habitus* in the educational practices of schools. Education (just like life-style, labour market or politics) is a *field*, a social arena where individuals struggle and negotiate over specific resources or stakes (Jenkins 1992). How "successful" individuals are in their struggles within the *fields* very much depends on their *habitus*.

The concept of *habitus* has been rightly criticised for being vaguely defined and not suitable for precise empirical estimation (e.g., Harker, Mahar and Wilkes 1990).¹² Simply put, *habitus* can be understood as “the set of dispositions, or learned behaviours, which provides individuals with a sense of how to act and respond in the course of their daily lives” (Blackledge 2001: 349). Although modified continuously by individuals’ encounters with the world, *habitus* is indeed “a product of early childhood experience, particularly of unconscious family socialization” (DiMaggio 1979: 1464). What gives certain children an early advantage is the fact that the dominant group *habitus* permeates into all *fields* in life, including education. With Lareau’s translation for the US context, middle-class children acquire in their early years schemes of perception, thought and action that are dominant in the school system. Education then becomes a “familiar *field*” within which they act, perform and compete more comfortably. On the other hand, working-class children’s *habitus* lacks this inherited/natural familiarity to the education system. Therefore, class-specific *habitus* does not endow children with a similar amount of *cultural capital* they can activate in a given *field*. It is not surprising then that middle-class children perform better in the *field* of education, since:

“[] what is measured by means of the level of education is nothing other than the accumulation of the effects of training acquired within the family and the academic apprenticeships which themselves presupposed this previous training” (Bourdieu 1983[1977]: 492).

Consequently, inequalities in the transmission of *cultural capital* to children play a key role in the reproduction of social inequalities.¹³ Bourdieu distinguishes three

¹² In Bourdieu’s words, it is defined as a “system of lasting, transposable dispositions which, integrating past experiences, functions at every moment a *matrix of perceptions, appreciations and actions* and makes possible the achievement of infinitely diversified tasks, thanks to analogical transfers of schemes permitting the solution of similarly shaped problems” (1983[1977]: 82-83).

¹³ As noted by DiMaggio, in Bourdieu’s work “capitals proliferate” (1979: 1468). In addition to *economic capital, cultural capital* and *symbolic capital*, Bourdieu refers to *linguistic capital, social capital, academic capital, scholastic capital, artistic capital* and many more. Moreover, the repertoire

forms of *cultural capital* (Bourdieu 1986): *objectified*, *institutionalized* and *embodied* cultural capital. *Objectified cultural capital* simply refers to materials and physical objects of cultural capital (such as writings, paintings etc.); *institutionalized cultural capital* refers to the objectification of cultural capital as a certified academic qualification. *Institutionalized cultural capital* is a valuable resource in the labour market which can be compared, exchanged and converted into economic capital. Most relevant to our research, however, is *embodied cultural capital* “in the form of long-lasting dispositions of the mind and body”, and so “linked to the body and presupposes embodiment” (Bourdieu 1986:47-50). This form of *cultural capital* denotes three fundamental features. First, it cannot be separated from its holder; second, it can be transmitted within the family; and third, its acquisition and accumulation takes time. Unlike financial resources,¹⁴ *embodied cultural capital* cannot be transmitted instantaneously. Rather, it is a very long and costly process that not everyone can afford:

“[I]f the best measure of cultural capital is undoubtedly the amount of time devoted to acquiring it, ..., it is because the cultural capital that is effectively transmitted within the family itself depends not only on the quantity of cultural capital, itself accumulated by spending time, that the domestic group possess, but also on the usable time (particularly in the form of mother’s free time) available to it (by virtue of its economic capital, which enables it to purchase the time of others) to ensure the transmission of this capital and to delay entry into the labour market

of capitals is not immune from definitional inconsistency or ambiguity. For example, Bourdieu uses the term “*cultural capital*” in ways that imply subtly different meanings, such as “an informal academic standard, a class attribute, a basis for selection, and a resource for power which is salient as an indicator/basis of class position” (Lareau and Lamont 1988: 153). This variety of definitions, particularly in his early work, is reflected in the literature where the interpretations of *cultural capital* have proliferated (See Lareau and Weininger 2003 for a review). One common practice is to use the rather narrow definition of a possession of knowledge or proficiency to consume “high-brow” aesthetic cultural goods. In this research, however, we follow the broader interpretation of Lamont and Lareau (which is in line with the early definition of Bourdieu and Passeron (1990[1970]): that is, “institutionalized, i.e. widely shared, high status cultural signals (attitudes, preferences, formal knowledge, behaviours, goods and credentials) used for social and cultural exclusion” (1988:587).

¹⁴ We use the term financial capital (or financial resources) simply to refer to any physical or material goods that have an economic value in the market or that can be converted instantaneously with a signature (e.g. cash, car, real estate etc.).

through prolonged schooling, a credit which pays off, if at all, only in the very long term” (Bourdieu 1986:54).

Therefore, only the children of those parents (particularly mothers according to Bourdieu) who not only possess *embodied cultural capital* (to be transmitted) but also financial resources (to buy time to transmit it) can enjoy the acquisition of *cultural capital* during their early years. In the US, parents with accumulated *embodied cultural capital* and “usable time” to transmit this *cultural capital* to their children are more likely to be from the middle-class since they have a higher educational attainment and financial resources.

2.2.2 BOURDIEU IN THE US CONTEXT: *CONCERTED CULTIVATION* VERSUS *NATURAL GROWTH*

In the context of Bourdieu’s *thinking tools*, Lareau claims that, because middle class child rearing practices are compatible with the dominant child rearing culture of the main social institutions in the US (especially the educational system), middle class children are more advantaged in academic settings, and thus also in the labour market. This section describes in detail how Lareau applies Bourdieu’s work to the US context, and her identification of distinct child rearing practices between upper-middle/middle class and working class/ poor families.¹⁵

According to Lareau, middle class parents embrace a culture of *concerted cultivation* while working class parents facilitate the accomplishment of *natural growth*.¹⁶

¹⁵ Lareau specifically refers to variation between middle class and working class or poor families. Although some of the middle class families were wealthier than others and could be labeled as upper-middle class families, she observes no intra-class variations within that group (See Appendix A in Lareau 2003). In this study, we use the term *middle class* to refer to middle or upper-middle class families, and *working class* to refer to working class or poor families. We will proxy these class positions with educational attainment. See section 2.3.4 of this chapter for more on this point.

¹⁶ In her recent book, Lareau’s research is based on in-depth interviews with 88 parents and an intensive observation of 12 of those families with children aged 9 or 10 years. The sample is composed of both black and white families who are classified as middle class, working class or poor. In addition to fathers and mothers, she also interviews classroom teachers and some other school

Concerted cultivation refers to the set of child rearing practices through which middle class parents deliberately try to augment their children's cultural capital. In other words, middle class parents actively engage in activities that improve their children's cognitive and social skills, which in turn can lead to further success in various social settings, most notably in school and in the labour market. The practice of *natural growth*, on the other hand, does not entail an active promotion of children's cultural capital nor very close monitoring of everyday school experiences; rather, it grants more autonomy to children in everyday life and keeps them free from constant parental scrutiny, if not guidance.

The components of the logic of *concerted cultivation* among middle class parents can be stated as follows: firstly, middle class parents invest considerable amounts of time and money in organized leisure activities for their children. Every organized activity involves planning, preparing, coordinating transportation, waiting for children and paying for necessary equipment as well as participation fees. Despite the substantial time and money costs associated with these activities, middle class parents are "committed to involving their children in a steady schedule of organized activities attuned to children's particular interests" (2003: 170). Secondly, middle class parents use verbal negotiations extensively in their daily interactions with children and "reasoning" is a part of regular parental guidance. Instead of simply telling children what to do, parents engage in discussions with children and explain the rationale behind their act. As a result, in the course of daily family life middleclass parents and children often engage in long conversations.¹⁷ Thirdly,

personnel (See Appendix A in Lareau 2003 for more on methodology). See footnote 3 for the definition of *cultural capital* as used in Lareau's work.

¹⁷ Lareau's observation of distinct language-use patterns between middle class and working class parents is reminiscent of British sociologist Basil Bernstein's classic work on social class differences

“intensive parental involvement is a key component of *concerted cultivation*” (2003: 82). Middle class parents not only constantly monitor their children’s educational activities but also pursue assertive advocating on their behalf in any setting, particularly in school. Parents often use their informal networks to gain more information about school-related activities (that is, they talk to friends, experts, and teachers), do not hesitate to intervene in the classroom, question or criticise the teacher and even demand individualized treatment for their children if need be. Despite the fact that “assertive parental involvement” does not always yield benefits, it helps to create school-home interconnectedness as well as a critical teacher-parent linkage, which parents exploit to the advantage of their children in many settings such as parent-teacher meetings (Lareau 1989). Moreover, middle class parents teach their children to be “involved” by instructing them how to interact with other adults such as teachers or doctors. Lastly, *concerted cultivation* complies with current professional standards which emphasize the “importance of parents being ‘active’, ‘involved’, ‘assertive’, ‘informed’, and ‘advocates’ of their children” (Lareau and Weininger 2003: 589). This is especially crucial since it puts middle class children in a more advantageous position in social settings.

Middle class practices are quite different from those of the working class which Lareau refers to as a whole as *natural growth*. To begin with, mainly due to financial constraints working class children’s participation in organized activities is far more limited. Fees, cost of equipment as well as difficulties related to transportation make

in language use: Class, Codes and Control. Bernstein observes two distinct language codes in British society: the *restricted code* of the working class and the *elaborated code* of the middle-class (Bernstein 1971). He reports that working class children are disadvantaged in school because success in such an institution necessitates the use of the elaborated code of the middle class which is, unlike the restricted code, context independent and universalistic (Sadavonik 2001). He highlights that what puts the working class at a disadvantage is not a linguistic deficit per say, but the incongruity of the working class’ language code with that of school.

it very hard for working class and poor parents to afford such activities. As a result, children have more unstructured free time and autonomy. They spend their leisure time mostly playing outside as well as socializing with friends and extended family members. Second, unlike middle class parents, working class parents tend to use short directives in their interactions with children, and expect respectful compliance rather than their parental authority being questioned/ challenged. Long discussions, reasoning and bargaining are not part of the daily family life. In other words, language, rather than being “an intrinsically interesting dimension of life” as in middle class family life, is just “a tool, a practical necessity” to communicate with children (2003:208). This lack of negotiation and an expectation of obedience from children draw boundaries between adults and children: parent and child do not happen to be equal partners in a discussion. Third, although working class parents care about their children’s education to a great extent, they are more reserved and sceptical in their dealings with school authorities. This partially stems from a lack of informal networks to access information, and a lack of familiarity with the practices in school. Unlike middle class parents, those of the working class do not see themselves as equal to (let alone “better” than) teachers. From their class position, working class and poor families “look up to” teachers. They grant teachers a “full-professional status” and turn over the responsibility of education entirely to them (Lareau 1989). This results in an absence of strong school-home interconnectedness, and deprives the working class parents of social capital that could be activated if necessary for the benefit of their children.

Indeed, both child rearing strategies have their advantages and disadvantages. Children raised by parents who embrace *natural growth* have more control over their

leisure time. They are not overscheduled as in the case for some middle class children, and they can enjoy more free unstructured time.¹⁸ As a result, they have better skills to create activities for their own enjoyment, and are generally less bored. Lareau observes “self-proclaimed boredom” among very busy middle class children, while comparatively under-scheduled working class and poor children do not find it hard to entertain themselves (2003: 186). Working class children also have more chances to socialize with children from various age groups, rather than only with their peer group. They have stronger ties with extended family, and more responsibility towards their family members. They have a better sense of constraints and limitations. Unlike middle class children, they do not have unfounded feelings of entitlement in many settings, and are more respectful towards adults. Therefore, in many respects *natural growth* endows children with useful skills and positive personal traits. However, what is “useful” and what is “positive” in the *field* of education as well as in the labour market is not neutrally determined.¹⁹

What gives middle class children more advantages is the fact that *concerted cultivation* is in line with the dominant cultural repertoire of child rearing in the American context. Hence, the skills transmitted to children via *concerted cultivation* are more appreciated and valuable in major US institutions, particularly in school and the labour market. To reiterate with Bourdieu’s terms, middle class parents

¹⁸ Although being over-scheduled and having a hurried lifestyle is a potential source of stress and anxiety (Elkind 2001), one should also not overestimate the variety of options available to working class children to enjoy their free time as they prefer. See Chapter 6, Section 6.2.1 for a review of a recent line of research that is sceptical of middle class child rearing practices.

¹⁹ What is perceived as positive in the US setting today (e.g. individualism, independence, standing up for one’s self) can be interpreted as negative in other social settings or at other times. The emphasis is on *the US context at present*. See Hays (1996) for a short review of the historical conceptualization of “good parenting” and how the opinions on “the right way of child rearing” have historically evolved. See Wrigley (1989) on how expert opinions on raising children have also changed over time. Wrigley’s historical study shows that the widely held opinion of children being in need for intellectual stimulation is in fact a fairly recent phenomenon with no historical precedence.

transmit a *legitimized embodied cultural capital* which gives their children advantages in many *fields*.²⁰ More specifically, organized activities provide children with many opportunities to involve themselves in team work, make public performances and interact with adults in official settings. The extensive use of verbal negotiation and reasoning enables children to develop better linguistic and communication skills with adults and authority figures. Middle class mothers' assertive involvement with school activities helps children to realize their potential, and provides certain tangible advantages (e.g. setting the amount and duration of the material they will be exposed to), sometimes at the expense of working class children (Lareau 2003).

In summary, middle class parents and working class parents' child rearing practices widely differ. Working class parents have neither the informational nor financial resources to afford time-consuming parenting practices. Their care patterns are limited to sustaining the basic needs of children, using language only as a tool to communicate rather than an end in itself, providing less out-of-home care and supporting their children's educational activities only passively. Middle class parents, on the other hand, transfer their class advantages through a set of behavioural patterns such as taking their children to scheduled activities, engaging in long conversations with them, reading to children and providing intensive support for school-related activities: in other words, by actively spending time with and for their children. These theoretical claims set the direction of our research, a research which empirically documents the differences in the time use patterns of parents with

²⁰ See for instance Blackledge (2001) on how the *linguistic capital* of Bangladeshi parents does not pay off in the academic setting in England, as it is the "wrong sort of capital."

varying resources, and tests whether the implications of the theory are actually borne out in parents' time use.

2.2.3 RESEARCH FOCUS AND HYPOTHESES

The objective of this chapter is to test the behavioural implications of Lareau's theory regarding different child rearing patterns, and to show the extent of the inequalities in time spent with children. The basic premise is as follows: if parents with different resources do hold different logics regarding child rearing practices, there must be behavioural implications of such differences in their daily activity patterns. In fact, similar to Bourdieu who is interested in daily practices, Lareau's theory is also concerned with behaviour, not attitudes or preferences. In other words, some of the less well-off parents may prefer to enrol their children in organized leisure activities or may want to help their children with their homework more often. However, financial constraints as well as limited cultural capital may prevent them from behaving in the way they would prefer. Similarly, those who follow the logic of *concerted cultivation* may feel exhausted and prefer less intensive parenting, but still continue to follow concerted cultivation out of a sense of responsibility, social pressure or habit. In brief, irrespective of their underlying motivation, this research studies how parents *behave*. Accordingly, the focus is on the observable implications of parents' child rearing cultures, specifically their daily time use patterns.²¹

In Lareau's work, the theorization of class differences in parenting behaviour is gender-neutral. In other words, the effect of class on parenting behaviour is assumed to be similar for both fathers and mothers. As formulated by Lareau, there are no

²¹ Lareau also explicitly states that her work is focused on *behaviours*, not *attitudes*. In fact, she observes fewer differences in attitudes surrounding child rearing (2003:5, 236). This is also in line with our argument that the way parents enact their visions of good parenting is both constrained and enabled by the resources at their disposal.

mediating or attenuating effects of class on gender differences in childcare, or vice versa.²² However, an analysis of class separate from gender is particularly problematic given that parenting is one of the most *gendered* social roles. Therefore, while investigating the effect of educational attainment on time spent with children, we do not push gender aside. We formulate two separate hypotheses for mothers and fathers, each positing the same effect of education on childcare in line with Lareau's theoretical framework. We compare mothers and fathers by statistically testing whether the effect of educational attainment operates in the same way for both parents. By doing so, we test Lareau's assumption that class operates similarly for both mothers and fathers.

In line with the theoretical framework, the first section of this chapter tests the following hypotheses:

HYPOTHESIS 1 A (B): *High-educated mothers (fathers) provide more primary childcare compared to low-educated mothers (fathers).*

Middle class parents who follow *concerted cultivation* are expected to pursue involved parenting during which they deliberately engage in activities to transmit their cultural capital to their children. Such an involved parenting style would require actively spending time with their children. Therefore, the time spent in total primary care activities of high-educated parents would be more than those with a lower education.²³

²² See Choo and Ferre (2010) for a criticism of Lareau on this point.

²³ Not only the total amount of time spent in primary or secondary childcare, but also the *type of activities* parents are involved in are significant indicators of specific parenting practices. Variations in specific childcare activities are investigated in Chapter 3.

HYPOTHESIS 2 A (B): *High-educated mothers (fathers) provide less secondary childcare compared to low-educated mothers (fathers).*

Natural growth as a parenting strategy would be best captured by secondary care time, which provides a measure of times when children are in parental care but not the primary centre of attention. We expect parents with high educational attainment to provide less secondary childcare compared to parents with low educational attainment.

2.3 DATA AND SAMPLE

2.3.1 DATA SPECIFICATION

Time diary methodology provides the most reliable and accurate information on time use patterns, especially if the duration of the activities are not institutionally controlled such as with childcare as well as leisure or personal time (Chenu and Lesnard 2006). Unlike stylized survey questions where the respondents are required to remember the total amount of time spent on or frequency of an activity, diarists contemporaneously self-describe their 24 hours without being prompted about specific activities. The diary method therefore is less prone to recall error or social desirability response bias (Bianchi, Robinson and Milkie 2006; Gershuny 2000; Harvey 1993; Juster and Stafford 1985; Robinson and Godbey 1997). This is particularly important for the present research given that childcare activities, particularly *developmental care* activities, tend to be over-reported in stylized questions due to social desirability bias (Hofferth 2006).²⁴

²⁴ See Chapter 3 for the definition and scope of *developmental childcare*.

The data used in this chapter comes from the 2003-2008 American Time Use Survey (ATUS) which provides nationally representative estimates of time use patterns of individuals aged 15 years or older. ATUS contains information on the amount of time Americans spend in various activities, where and with whom each activity occurred and whether a child was in the care of the respondent during the activity. The survey is collected from a subsample of households which have completed the eighth and final wave of the Current Population Survey (CPS). We mostly follow the American Heritage Time Use Surveys (AHTUS) coding procedures in order to create background variables, activity categories, weights as well as to define good and bad quality diaries. In line with AHTUS, any diary which has 91 or more minutes of missing time, is missing two or more basic activities (sleep/rest, eating/drinking, personal care and exercise/travel) or has fewer than seven episodes is defined as a low quality diary.²⁵ 447 diaries in the sample are considered to be low quality and excluded from the analysis. Because the focus of this research is on time spent with children aged under 13 years, some modifications are made to the original coding as will be explained in detail below. Table 2.1 provides detailed data specification.

In section 2.3.2 the sample is described, and in section 2.3.3 and 2.3.4 the response and explanatory variables are discussed, respectively.

²⁵ If age or sex of the diarist or the diary completion day was missing, the diary would also be identified as of bad quality, but we had no such case in our sample. See AHTUS User's Guide for more on AHTUS coding procedures.

Table 2.1 Data specification

Survey years	2003-2008		
Sample frame	CPS respondents who completed their 8 th and final wave of CPS.		
Response rate	2003	57.80%	
	2004	57.30%	
	2005	56.60%	
	2006	55.10%	
	2007	52.50%	
	2008	54.60%	
Total sample size (high-quality diaries only)		Mothers	Fathers
	2003	2505	1844
	2004	1589	1236
	2005	1679	1240
	2006	1599	1183
	2007	1488	1107
2008	1467	1169	
Target population	The civilian population not living in institutions		
Sampling restrictions	1 person aged 15 years or older in the household		
Fieldwork period	Samples drawn monthly, data released in yearly batches		
Sampling of days of the Week	Half of diaries were collected on weekdays, half on weekend days.		
When activities recorded	Diaries covered the previous 24 hour day		

Source: Centre for Time Use Research

2.3.2 SAMPLE

The sample used in this chapter is restricted to non-Hispanic white mothers and fathers aged 18 years or older with at least one child under the age of 13, but have no non-own household children under the age of 18.²⁶ In 738 cases, a non-own household child in addition to an own household child is reported: these cases were thus excluded. By non-own household children we mean children who are aged under 18 years and are living with the diarist, but are not biological, adopted or step

²⁶ It is not possible to identify the biological and non-biological children in pre-2007 surveys. Therefore 'own children' refer to biological, adopted and step children, but it excludes foster children. Own child can be a household or non-household child.

children of the diarist. Non-own children can be related to the diarist, such as a sibling or cousin, or they can be unrelated.

Households where there are non-own household children were excluded for two reasons. First, in those households it is not possible to disentangle the secondary childcare provided for a parent's own children from non-own children in the 2003 data (see the next section for details). Because the focus of this study is on parental time only, childcare provided for an own child is the subject of interest. Not being able to disentangle the care provided for own and non-own children would be problematic for this purpose. Second, families that have non-own children aged under 18 years can be considered as a different (sub) demographic group with their own mechanisms of time allocation among household members. Presence of non-own children may put more constraints on parents' time or some families may be getting assistance from the older non-own children for the care of the younger ones. Families that have non-own children at home are thus excluded from the analysis.

There are two reasons for limiting the sample to parents with at least one child under the age of 13 years: one is data driven and the other is theoretical. First, ATUS does not collect information on secondary childcare for children aged 13 years and over. To be able to compare time spent in primary and secondary childcare activities, we need parents whose children are in the same age group. Second, the substantial research interest in this study lies in investigating inequalities in the transmission of advantages during childhood, a transmission which mainly takes place during the earlier years of childhood and schooling.

The sample is limited to non-Hispanic white parents in order to isolate the effect of educational attainment from race or cultural variations. Lareau accords rather insufficient attention to the role of race and how it mediates class differences (Choo and Ferree 2010; Pearce 2004; Wells 2005). Her sample is racially balanced; she directs questions regarding parents' concerns about racial discrimination and addresses middle class parents' sensitivities surrounding race. She concludes, however, that race does not play a decisive role in forming parental care practices. This claim is rather unexpected, not only because in the US race has been a key explanatory variable in many other sociological studies on the transmission of family advantages or disadvantages to children (Cheng and Powell 2007; Entwistle and Alexander 1992; Kao and Thompson 2003; Roscigno and Ainsworth-Darnell 1999), but also because Lareau's previous work underlined the importance of race as a significant factor beyond and above *class*:

“Although social class seems to influence how black and white parents negotiate their relationships with schools, for blacks race plays an important role independent of social class, in framing the terms of their relationship (p. 38)... [This is because] whiteness represents a largely hidden cultural resource that facilitates white parents' compliance with the standard of deferential and positive parental involvement in school” (Lareau and Horvat 1999:49)

This conclusion is in line with other research on race and school achievement (Downey and Pribesh 2004; Roscigno and Ainsworth-Darnell 1999; Tyson 2003). To the extent that school embodies the cultural practices of the dominant group in the US, race (as well as religion or ethnic background) acts as another significant stratifier. Furthermore, previous studies have identified certain distinctions between black and white parents in terms of *parenting style*, partially due to variations in access to resources and demographic conditions. Black parents, being more likely to live apart from their biological children, have irregular working hours, suffer from

job insecurity and financial strain, tend to spend less time with their children and show negative parenting behaviours (Bulcroft, Carmody and Bulcroft 1996; Golden 2008; Monna and Gauthier 2008; Hofferth 2003). Black families also suffer from residential disadvantages (Massey and Denton 1993) and have less accumulated wealth compared to whites (Shapiro 2004). Furthermore, two recent studies provide empirical evidence that contradicts Lareau's claim that there are no significant race differences in the endorsement of *concerted cultivation* and its consequences for child outcomes (Bodovski 2010; Cheadle 2009).

In brief, we see race/ethnicity as another important *stratifier* in the US context. Hence, from a statistical perspective it is very likely that race/ethnicity significantly interacts with most controls for parental characteristics (e.g. educational attainment and employment status). Not interacting race with these variables would lead to model misspecification and possible obfuscation of the effect of class (as proxied by education). Including race interactions would make the investigation of the effect of educational attainment more opaque. To isolate the effect of education clearly, we choose to only examine non-Hispanic white parents.

Consequently, in all the empirical chapters except for Chapter 5 the results shown are for non-Hispanic white parents only and cannot be generalized to the whole population of parents in the US. However, to ease the flow of reading, we use only the term *parent* while explaining our empirical findings, not always using the full specification of "non-Hispanic white parent with at least one young child of the specified age group".

2.3.3 RESPONSE VARIABLES

Childcare as primary activity refers to the total minutes spent in all forms of childcare activities provided for the parent's own child aged under 13 years and reported as the main activity at a specified time on a given diary day.

ATUS collects primary childcare activity data for any child under the age of 18 years. However, because secondary childcare information is collected only for children under the age of 13 years, primary childcare recipients are also limited to children under the age of 13. The distinction is made according to "who else was present" information. When a respondent reported the co-presence of at least one own child under the age of 13 during a childcare activity, that childcare is assumed to be provided for the child reported to be present.²⁷

Secondary childcare refers the total amount of time when a child was under parental care while the diarist was simultaneously involved in another primary activity. The time for parents providing secondary childcare is restricted to the time between when the first household child under the age of 13 woke up and the last household child under the age of 13 went to bed. It is also restricted to times when parents are awake. When both primary and secondary care are reported simultaneously, time is attributed to primary care only (Fisher, Altintas and Gershuny 2010).

²⁷ In 4.3% (3341) of all the episodes of childcare activities (78047), no children were reported to be present during the activity. While in some forms of childcare activities the child may not necessarily be there (e.g. meetings and school conferences), in others (e.g. reading to a child) it is reasonable to assume that a child was present, but the "who else was present code" was left missing. In such cases, unless the respondent has another child aged between 13 and 18 years, we assumed those activities were provided for children under the age of 13. Because the sample already excludes cases where there is another non-own household child under the age of 18, it is reasonable to assume that childcare with missing information is provided for the parent's own children under the age of 13, given that there is no other own child available. For those parents who also have a child aged between 13 and 18 years, however, no such assumption is made since, albeit unlikely, childcare could be provided for the child aged over 12 years. We make the assumption here that the remaining cases where a parent provides childcare for someone else's children while her/his child is not present are negligibly small.

The standard way of recording secondary activities is by appending a parallel column for these activities in the respondent's diary, or asking whether the respondent was involved in a secondary activity immediately after she reported her primary one.²⁸ However, ATUS does not follow this standard. Instead, after completing the diary, respondents are asked: "was at least one of your own household children under 13 in your care during this activity?" (TUCC5).²⁹ This question addresses "child-is-in-care" time, which is indeed a broader category than childcare provided as a secondary activity such as is found in the literature. As a result, in the US data reports of time where a child-is-in-care are overall much greater than those of secondary childcare measured in the standard way.³⁰

In brief, although *secondary childcare* and *child-is-in-care* time are used interchangeably in this thesis, it must be noted that secondary childcare time as measured by ATUS actually refers to more passive parenting than the provision of secondary childcare measured in the standard way. Therefore, it covers much longer time periods. For the purposes of this research, however, this quantity is a more accurate measure of the behaviour of interest, namely passive parenting as a form of *natural growth*.

²⁸ See for instance Harmonised European Time Use Survey Guidelines 2008

²⁹ This variable was introduced in 2004. In 2003, the respondents were asked "Was a household or own non-household child <13 in your care during this activity?" (TR_03CC57). Therefore, in the 2003 survey it is not possible to identify whether the child under care was the own child of the diarist or not. After 2003, we replaced TR_03CC57 by TUCC5 to derive secondary childcare information.

³⁰ The comparison of secondary childcare reports in ATUS with those in the Harmonized European Time Use Survey (HETUS) clearly indicates this difference. For example, average secondary childcare time reported by mothers aged 20-74 years with one child aged younger than seven years is 24 minutes in Belgium (2005), 56 minutes in Germany (2002) and in the UK (2001), and approximately 30 minutes in Italy (2003) and Norway (2001). The figure in the US is 435 minutes (author's calculation).

Unless otherwise stated, the term *parental time investments* refers to parents' time spent in *primary childcare* given that these are the type of activities that are “likely to have direct implications for child outcomes such as emotional well-being and cognitive attainment” (Budig and Folbre 2004: 58). Some types of primary care activities are thought to be more relevant for children's social and cognitive development than others.³¹ However, since children are, in a sense, *the main recipients* of the time spent by the parent during primary childcare, total time spent in primary care is referred to as parental time investment.

Co-presence refers to time periods when parents did not report any form of primary or secondary childcare but an own child was still physically present.³² This makes investigation of co-presence time tangential to our main research interest. Additionally, parents are more likely to refer to time together with children as “in-care” time (i.e. *secondary childcare*) rather than mere co-presence with the child. Consequently, the reports of this type of activity are very low, and the investigation of this variable has been limited to a descriptive analysis.

2.3.4 EXPLANATORY VARIABLE

Educational attainment

Data on educational attainment refers to the highest *completed* degree, and the relevant question is formulated as “What is the highest level of school you have completed or the highest degree you have received?” Unless the respondent received her diploma, she is not considered as having obtained a degree even if she dropped out in her last year.

³¹ See Chapter 3 for more on this.

³² For most of the activities the diarist was asked “Who accompanied you?” or “Who was in the room with you?” (*TUWH OCD*) ATUS did not collect who information for the times during which diarists reported sleeping, grooming, involving in personal/private activities, or working.

The original education variable is a 16-category ordinal variable, but is collapsed into five categories because most of the original ones have a very small number of cases, and each of the 16 categories does not necessarily refer to a significant transition in education attainment. The first two categories, *less than high school* and *high school degree*, are followed by *some college education*, which refers to college education *without* a degree regardless of the attended period. Completed occupational/ vocational degrees as well as academic programs following graduation from high school are all collapsed in the *college degree* level, along with a bachelor's degree. All degrees above graduate level, most notably master's degrees (MA, MS, MEng etc.), professional school degrees (MD, DDS, DVM, etc.) and doctoral degrees are coded as *post-college degree*.

The theoretical framework refers to *class* differences in parenting behaviour, while the main variable of interest is *educational attainment*. We believe that this variable is appropriate, since most of Lareau's theoretical linkages connect parental resources to child rearing practices.³³ The sources of variation in child rearing practices in Lareau's work mainly relate to differences in the informational and financial resources of parents, which can best be approximated by educational attainment and income.³⁴ Financially poor and culturally impoverished parents cannot afford an intensive and costly parenting style, a style that better-off parents can provide for their children. To us, what Lareau sees as the working class culture of child rearing is

³³ Annette Lareau published the second edition of her book, *Unequal Childhoods*, in 2011 where she added a chapter that includes a quantitative analysis of her own ethnographic work. There, she and her co-authors also use mothers' education and family income as class proxies (Lareau et al. 2011).

³⁴ We also investigated the role of household income in parenting practices, which was less powerful than expected.

to a great extent a reflection of constraints rather than preferences.³⁵ This is not to say that there would be no variation in the way parents with similar resources would raise their children. However, as for the minutes spent in childcare activities we expect to see similar patterns among parents with similar access to resources.

The hypothesized relationship refers to differences between high (college degree or more) and low (high school or less) educated parents' childcare time, while the explanatory variable has five categories. We coded education into five levels in order to have a more nuanced view of the relationship between educational attainment and parental behaviour. Unless otherwise stated, we use the terms *high-educated (college degree or more)* and *middle-class* interchangeably.

2.3.5 CONTROL VARIABLES

The control variables in the model are theory driven and in line with previous research on time spent with children (e.g. Sayer, Bianchi and Robinson 2004; Sayer, Gauthier and Furstenberg 2004; Zick and Bryant 1996). The main control variables included in the analysis are: age of diarist, age squared of diarist, age of youngest own children, number of own children aged 0-12 years, employment status of the diarist, civic status of diarist and, for those who have a spouse, employment status of spouse.

Employment status is a three-category variable. Those who work less than 35 hours a week are defined as employed *part time*. Because one fourth of mothers and 9 per cent of fathers are single, we combine *civic status* with *employment status of spouse*

³⁵ See for instance Hays (1996) on how all mothers, regardless of their class or education status, embrace the culture of *intensive mothering*.

in a four-category single variable as follows: (i) the respondent does not have a spouse, (ii) the respondent has an not-employed spouse, (iii) the respondent has a part-time employed spouse; and lastly (iv) the respondent has a full time employed spouse.³⁶ We also control for the *number of own children under the age of 13, age of youngest child* and *diary completion day*.³⁷

In all the models we apply weights, first to represent the population distribution accurately and to correct for distribution of the days of the week.

Table 2.2 summarizes the explanatory and control variables.

³⁶ Spouse also includes cohabiting partners.

³⁷The saturated model with all the possible influential control variables was also performed in which the explanatory variable is tested with other control variables such as the diary completion month, region of the country, whether the child is a household child or not, whether the diarist lives in an urban or rural area, year the survey was conducted, whether the diarist is a US citizen or not, household income quartile, and the presence of an adult in the household other than parent(s). The additional control variables turned out to be significant in some cases. For example, parents who live in urban areas provide more primary childcare for their children. Even after controlling for living in an urban area, there are some regional differences. Overall, parents who live in the West of the country report less primary or secondary childcare. The month of diary completion was also significant. For example, parents (particularly mothers) report less childcare during the summer months (and December) than during other months of the year, probably because of school vacation. These extra control variables are dropped because of theoretical irrelevance as well as a preference for a more parsimonious model. The effect of those additional controls on the significance, magnitude and direction of the explanatory variables was negligible.

Table 2.2 Summary statistics for explanatory and control variables

	Mothers	Fathers
Educational Attainment		
0-11th Grade	4	5
High school graduate	24	25
Some college	20	17
College degree	40	38
Post-college degree	12	16
Household income		
Lowest quartile	17	9
Second lowest quartile	29	26
Second highest quartile	24	28
Highest quartile	30	37
Employment status		
Full-time employed	46	90
Part-time employed	24	3
Not employed	30	6
Civic status/ employment status of spouse		
Spouse not present	21	8
Full-time employed	68	38
Part-time employed	6	23
Not employed	2	30
Age of respondent	36 (8)	38 (7)
Child characteristics		
Age of youngest child	5 (5)	5 (4)
Number of children	1.72 (.84)	1.75 (.84)
Percentage of weekday diaries	72	72
Sample size	10451	7953

Note: Percentages are shown for categorical variables. Weighted means and standard deviations (in parentheses) are shown for quantitative variables.

2.4 METHODS

In this chapter, Ordinary Least Squares (OLS) regression is used to analyse primary and secondary childcare. To confirm that the results are robust to violations of OLS assumptions, gamma regressions were also performed for each model (not shown).³⁸ Predicted minutes based on gamma regression results are presented in the final section. A detailed discussion and justification of statistical techniques used in this thesis is provided in Appendix A2.

Model selection is a complex issue even with simple techniques. Both substantive and statistical considerations are important. For us, the problem of model selection becomes more acute because our main variable of interest is educational attainment. On the one hand, to estimate the effect of education one must avoid controlling for things that cause parents' time in childcare and are caused by education (this is the classic post-treatment / included-variable bias). On the other hand, we need to control for enough variables to make the relevant counterfactuals meaningful. Hence, we proceed with step-wise regression to gain a better picture of the relationship between variables of interest and time spent in childcare.

2.5 RESULTS

2.5.1 DESCRIPTIVE ANALYSIS

Figure 2.1 shows the average time non-Hispanic white mothers and fathers spend in primary and secondary childcare, and co-presence. The top and bottom of the boxes and circles roughly refer to 99 per cent confidence intervals for mothers and fathers,

³⁸ The results on which the predicted minutes are calculated are shown in Appendix A1.

respectively. Figure 2.2 shows the percentage of respondents who reported *any* childcare activity on a given day.

Evidently, mothers are the main caregivers. On average, mothers spend 65 minutes more in primary childcare and 118 minutes more in secondary childcare than fathers. The percentage of mothers who provide some primary childcare on a given day is 26 per cent higher compared to fathers (Figure 2.2). More than one third of fathers (34 per cent) do not provide any primary care for their children on a given day. These figures indicate significant gender differences in time spent in childcare.

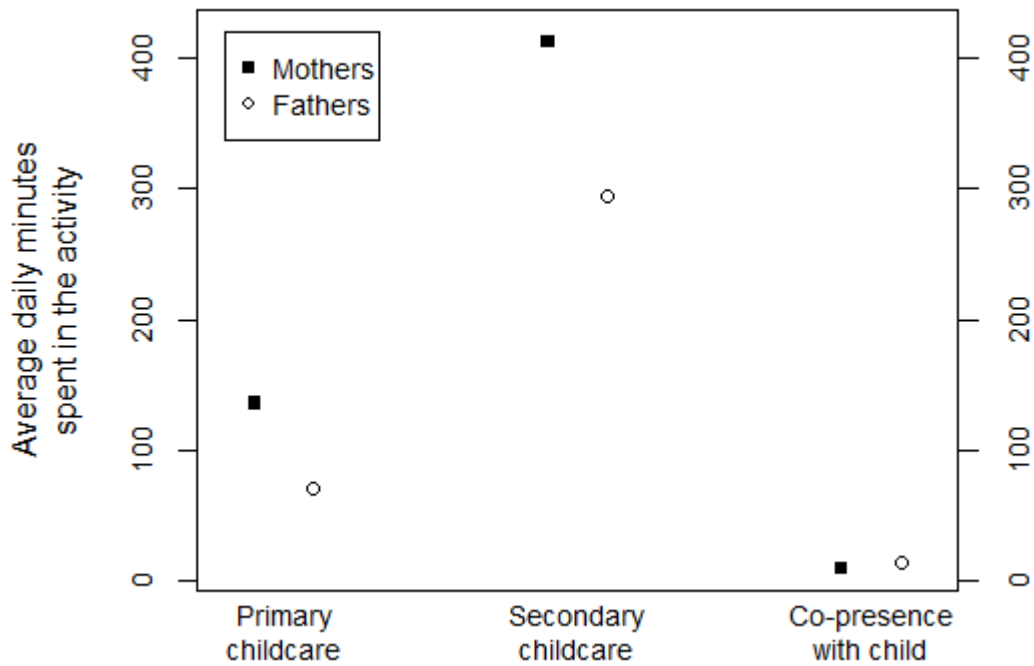


Figure 2.1 Average minutes spent in childcare by mothers and fathers
Note: Survey weights are applied to account for sampling design and non-response. The upper and lower boundaries of circles and boxes roughly correspond to 99 per cent confidence intervals.

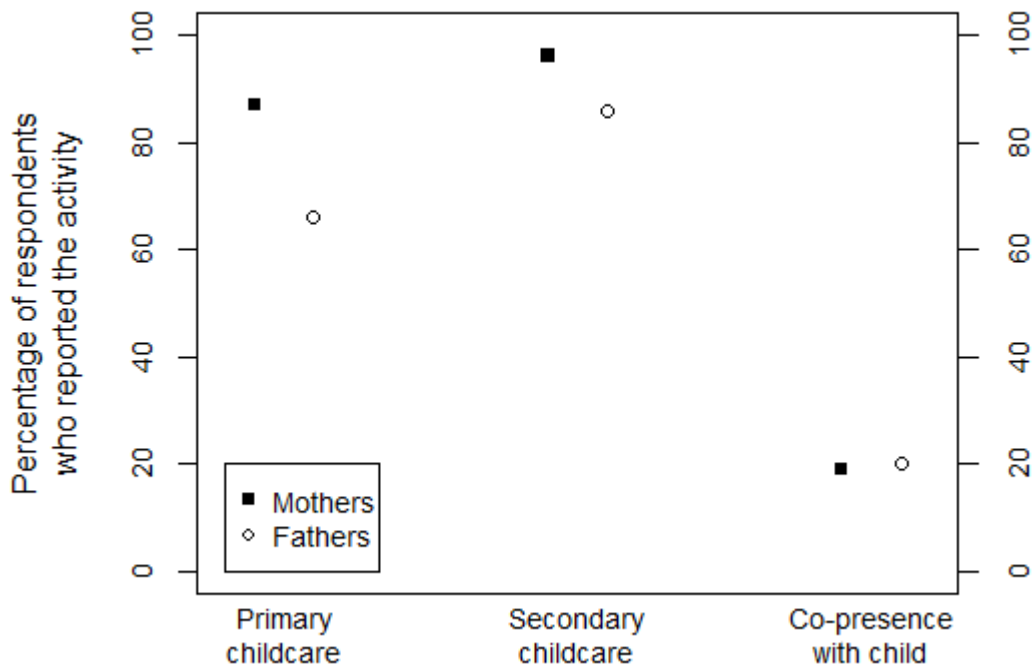


Figure 2.2 Participation rate in childcare by mothers and fathers
Note: Survey weights are applied to account for sampling design and non-response. The upper and lower boundaries of circles and boxes roughly correspond to 99 per cent confidence intervals.

As expected, the most substantial amount of childcare is given in the form of secondary childcare (*child is in care*). Mothers keep their children in their care for approximately 7 hours a day, while the figure for fathers is approximately five hours, and almost all mothers provide some secondary childcare on a given diary day (96 per cent). Lastly, on average parents report 10 to 15 minutes of co-presence a day with their under 13 year old children. Comparing these last two categories, it is evident that when a child is in the presence of a parent, by and large that parent regards the child as under her/his care.

In brief, the gender gap in parental time investments is pronounced. Despite the increase in fathers' participation in childcare in recent decades (Sullivan 2010), a substantial amount of childcare is still being provided by mothers. The descriptive results clearly indicate the necessity of investigating both primary and secondary childcare in order to draw conclusions about daily parenting behaviours.

Table 2.3 and Table 2.4 present the descriptive analysis of time use patterns of mothers and fathers, respectively, by their educational attainment, household income, employment status and marital status*employment status of spouse. In both tables, the first column of the panel shows the average time spent in the activity by *all* respondents in the relevant demographic category. The second column shows the percentage of respondents who reported at least one minute in the activity on the diary day (*participants*). The average time spent in childcare by *participants only* is presented in the third column.

Table 2.3 Mothers' average minutes in childcare activities and percentages of diarists reporting the activity

	Primary childcare		Secondary childcare			Co-presence			Mean (>0)
	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	
Educational Attainment									
0-11th Grade	133	87%	154	477	96%	498	12	19%	63
High school graduate	119	83%	143	432	96%	451	10	16%	63
Some college	129	86%	150	424	96%	444	11	20%	56
College degree	145	89%	163	400	96%	416	10	21%	47
Post-college degree	155	91%	172	369	96%	382	11	20%	54
Household income									
Lowest quartile	132	87%	152	425	95%	447	10	17%	62
Second lowest quartile	132	85%	155	427	96%	446	12	19%	60
Second highest quartile	140	88%	159	414	97%	428	11	20%	53
Highest quartile	140	88%	159	387	96%	402	10	21%	46
Employment status									
Full-time employed	101	83%	121	345	94%	367	9	18%	49
Part-time employed	143	88%	161	420	97%	435	12	22%	53
Not employed	185	92%	201	504	98%	467	12	20%	60
Civic status/ Employment status of spouse									
Spouse not present	113	84%	134	348	91%	382	9	18%	52
Married/cohabiting	143	88%	162	428	97%	441	11	20%	54
Full-time employed	145	87%	164	429	98%	440	10	20%	52
Part-time employed	137	88%	157	452	96%	471	10	16%	59
Not employed	117	82%	143	400	95%	423	16	22%	72
All mothers	136	87%	157	412	96%	429	10	19%	54

Note: Survey weights are applied to account for sampling design and non-response.

Table 2.4 Fathers' average minutes in childcare activities and percentages of diarists reporting the activity

	Primary childcare		Secondary childcare			Co-presence			Mean (>0)
	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	
Educational Attainment									
0-11th Grade	58	47%	123	295	81%	363	20	21%	63
High school graduate	62	58%	106	284	84%	339	19	20%	63
Some college	65	64%	101	306	86%	354	16	19%	56
College degree	76	70%	109	297	87%	341	14	21%	47
Post-college degree	82	74%	110	288	89%	323	14	20%	54
Household income									
Lowest quartile	63	57%	110	286	81%	353	20	22%	92
Second lowest quartile	65	61%	106	293	84%	348	18	21%	87
Second highest quartile	71	66%	107	302	88%	342	14	19%	73
Highest quartile	76	70%	108	289	87%	331	14	20%	68
Employment status									
Full-time employed	68	65%	104	284	86%	330	15	20%	75
Part-time employed	86	69%	124	329	88%	375	20	24%	53
Not employed	105	72%	145	410	88%	467	20	20%	97
Civic status/ Employment status of spouse									
Spouse not present	57	54%	106	235	68%	346	6	12%	53
Married/cohabiting	72	67%	108	299	88%	340	16	21%	78
Full-time employed	75	67%	112	308	89%	347	14	19%	74
Part-time employed	71	69%	104	295	89%	330	10	20%	73
Not employed	68	64%	106	291	86%	338	20	24%	85
All fathers	71	66%	108	294	86%	341	15	20%	77

Note: Survey weights are applied to account for sampling design and non-response.

As shown in Table 2.3, as mothers' educational attainment increases, average time spent in primary childcare also increases, the only exception being mothers with less than a high school education.³⁹ This relationship reverses when it comes to time spent in secondary childcare. Although in each educational category 96 per cent of mothers report at least one minute of secondary childcare, as educational attainment increases the amount of secondary childcare mothers provide decreases.

It is also noticeable that mothers in the highest income quartile spend only slightly more primary childcare time with their children compared to less affluent mothers. However, when it comes to secondary childcare or co-presence with children, they are the ones who spend the least amount of time with their children. While mothers' average time spent in childcare does not vary much by relative household income, employment and marital status are significant factors. Full-time employed mothers provide 84 minutes less primary childcare and 160 minutes less secondary childcare compared to mothers who are not employed. This finding is consistent with previous research showing that employed mothers spend less time with children compared to non-employed mothers (Connelly and Kimmel 2010; Bianchi, Robinson and Milkie 2006; Robinson and Godbey 1997; Zick and Bryant 1996). Although the difference between employed and non-employed mothers is quite high, it is noticeable that the difference is far less than the amount of time a full-time employed mother would spend in paid work. Therefore, these findings are in line with Hofferth's (2001) claim that employed mothers do not decrease their provision of childcare by the full amount of time they spend in gainful employment. In her work on maternal employment and time spent in childcare, Bianchi et al. (2000) also conclude that

³⁹ This is likely due to their higher likelihood of being not employed.

employed mothers try to maximize their time with children by decreasing time spent in other activities.

The average time spent in primary childcare by non-Hispanic white fathers also shows a steady increase as the level of educational attainment increases, yet the difference among fathers with less than a high school degree is negligible. The main source of variation in the average time spent in childcare by fathers is the percentage of fathers who report any time in the activity on a given day rather than the amount of time participants spend with their children. Only less than half of fathers with no degree provide some amount of primary childcare for their children on a given day. This proportion increases to 70 and 74 per cent for fathers with a college and post-college degree, respectively. There is no noticeable trend in fathers' time spent in secondary childcare by their educational attainment or household income. However, single fathers provide considerably less secondary childcare for their children: they participate in secondary childcare 20 per cent less than the average (66 per cent). Forty-five per cent of single fathers report no primary childcare on a given day.

2.5.2 MULTIVARIATE ANALYSIS

In this section we look at the effect of educational attainment on primary and secondary childcare by non-Hispanic white parents after controlling for diary completion day as well as parental and child characteristics. Table 2.5 shows OLS regression results using minutes spent in primary childcare by mothers as the dependent variable. Being highly educated (having a college degree or more) is positively associated with primary care time (Model 1). This association is robust to controls of child characteristics (Model 2). Controlling for the age of respondents

lowers this effect, though it is still statistically significant (Model 3). We therefore conclude that the estimated effect of college in Model 1 and Model 2 are inflated, capturing the effect of age as highly educated mothers are older.⁴⁰ McLanahan (2004) interprets parental age as an indicator of parenting quality, since older parents tend to be more mature, highly educated and live in a stable union. Mothers' age is indeed positively associated with primary childcare at a decreasing rate (based on Model 5 the effect becomes negative at the age of 48).

⁴⁰ The decreased estimated coefficient of *college* and *post-college degree* in Models 1 and 2 to Model 3 supports this conclusion.

Table 2.5 Mothers' minutes spent in primary childcare (OLS regression)

	Model 1	Model 2	Model 3	Model 4	Model 5
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
Intercept	102.24*** (3.48)	140.00*** (4.58)	47.56** (18.79)	179.99*** (4.81)	73.21*** (18.38)
0- 11th grade	4.15 (7.03)	-9.98 (6.29)	-2.93 (6.33)	-21.85*** (6.16)	-13.86** (6.20)
High school graduate	-9.66** (3.85)	-3.99 (3.44)	-3.20 (3.43)	-4.95 (3.35)	-3.76 (3.34)
Ref: Some college					
College degree	15.81*** (3.49)	15.55*** (3.12)	9.48*** (3.19)	18.71*** (3.04)	12.91*** (3.12)
Post-college degree	26.44*** (4.62)	26.60*** (4.13)	16.36*** (4.27)	33.80*** (4.03)	24.93*** (4.18)
Age of youngest child		-13.51*** (0.32)	-15.82*** (0.41)	-12.63*** (0.31)	-14.74*** (0.41)
# of children<13		17.91*** (1.44)	15.35*** (1.48)	13.03*** (1.42)	10.59*** (1.46)
Age			4.61*** (1.06)		5.76*** (1.04)
Age squared			-0.04*** (0.01)		-0.06*** (0.01)
Ref: Not-employed					
Part-time employed				-33.74*** (3.05)	-34.22*** (3.04)
Full-time employed				-63.33*** (2.69)	-62.94*** (2.70)
Ref: No spouse					
Spouse is not emp.					-20.89*** (5.43)
Spouse part-time emp.					-9.23* (5.31)
Spouse full-time emp.					-2.83 (2.90)
Adj R	0.03	0.22	0.23	0.26	0.27

Note: Standard errors are in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

In line with previous research, employment status is one of the most significant explanatory factors in parents' time spent with children (see Monna and Gauthier 2008 for a review). In Model 4, which controls for the employment status of the respondent, coefficients of educational attainment change substantially compared to Model 2 (which has no controls for employment status). For example, unlike in Model 2, not having a high school degree is substantially and negatively associated with primary childcare in Model 4. Compared to mothers with some college education, mothers with the lowest educational attainment provide 22 minutes less primary childcare in a day, while mothers with the highest educational attainment provide 34 minutes more (Model 4).

As shown in Table 2.5, Model 4 does not control for age of diarist and Model 3 does not control for employment status, hence a direct comparison of the coefficients of education in Models 3 and 4 is not possible. We therefore also perform an OLS regression controlling for both age and employment status ("Model 3 + employment status") in order to see how the coefficient of education in Model 3 changes once employment status is controlled for. The results (not shown), demonstrate that, compared to mothers with some college education, mothers with no high school degree provide approximately 15 ($p < 0.05$) minutes less primary childcare while mothers with a college and post-college degree provide 13 ($p < 0.01$) and 25 minutes ($p < 0.00$) more primary childcare, respectively. Adding a control for employment status results in a significant and substantial increase in the coefficient of no high school degree. Mothers with no high school degree are far less likely to be employed compared to mothers with higher educational attainment (authors' calculation); yet *ceteris paribus* they provide less primary child care. Therefore, once the employment

status of the respondent is added to the model, the coefficient of having a low education becomes negative and significant.

In the final model (Model 5), we include all child-related and mother-related controls. The sizes of the coefficients diminish in magnitude compared to Model 4. However, even in the full model, the effect of education is substantial. Holding all other aspects constant, mothers with a post-college degree provide approximately 25 minutes more primary childcare compared to mothers with some college education (Model 5). The gap between mothers with the lowest educational attainment and those who are highly educated is even more substantial. Holding all other aspects constant, college educated mothers provide roughly 27 minutes more of daily childcare for their children compared to mothers with the lowest educational attainment (13.86+12.91), while the gap between mothers with the highest and lowest educational attainments is as high as 39 minutes (13.86+24.93). These results provide strong support for the first hypothesis. *Ceteris paribus* high-educated mothers provide significantly more primary childcare for their children compared to low-educated mothers.⁴¹

One may ask, however: How much of the association between primary childcare and educational attainment is related to financial resources at the disposal of mothers? In order to address this question, we also controlled for household income quartile in

⁴¹ In order to see whether this comes from mothers' higher propensity to report primary childcare or their actual reporting of more minutes in the activity, we performed a series of logistic regressions where the dependent variable refers to a parent spending any time in childcare, and OLS regressions on *participants* only (not shown). After controlling for parental and child characteristics, mothers with at least a college degree are significantly more likely to report the activity compared to mothers with less than a college degree. Conditional on reporting some primary childcare, mothers with some college education report 14 minutes more primary childcare on a given day compared to mothers with the lowest educational attainment. The figures for mothers with a college and post-college degree are 40 and 55 minutes, respectively.

Model 5 (not shown here).⁴² Controlling for relative household income does not change the effect of educational attainment. Even after controlling for relative income, high- educated mothers provide substantially more primary childcare for their children than low-educated mothers. The results also indicate that mothers who are financially better-off also provide more primary childcare compared to financially worse-off mothers. Mothers in households in the top two income quartiles provide 10 minutes more primary childcare compared to mothers in the lowest income quartile *ceteris paribus*.

⁴² In the original sample, 14 per cent of cases were missing for the household income, and a preliminary analysis showed that the missing data is *not missing completely at random* (MCAR), which would require the missingness mechanism (the pattern of missingness) to be independent of all data. Moreover, dropping off 14 per cent of the total sample would mean throwing away a large amount of information, and would reduce power. We therefore estimate missing values to form multiple imputed datasets. Single imputation would ignore the additional variability caused by the missing values, which would lead to the underestimation of standard errors. According to Rubin (1987), when there is a modest fraction of *missing information*, using 2 to 10 imputed values is enough to avoid over precision and obtain valid inferences. In terms of the number of imputations, we followed Rubin's approach and created 10 imputed datasets. For each imputed dataset, an analysis (regression) was performed, and estimates (along with estimates of uncertainty) were collected. This yielded 10 sets of parameter estimates. To obtain a single, final set of parameter estimates, "Rubin's Rules" were employed, thus combining uncertainty arising from estimation and from imputation. Whenever we report findings from a model that includes household income as a control variable, we refer to the estimates from the multiple imputed dataset.

Table 2.6 Fathers' minutes spent in primary childcare (OLS regression)

	Model 1	Model 2	Model 3	Model 4	Model 5
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)
Intercept	72.21 ^{***} (3.20)	88.56 ^{***} (4.36)	-15.97 (18.65)	129.85 ^{***} (5.97)	14.63 (18.75)
0- 11th grade	-6.44 (5.80)	-6.49 (5.60)	-1.33 (5.64)	-13.24 ^{**} (5.59)	-6.00 (5.62)
High school graduate	-2.82 (3.49)	-1.99 (3.37)	-0.90 (3.36)	-2.34 (3.35)	-1.23 (3.33)
Ref: Some college					
College degree	11.58 ^{***} (3.24)	9.36 ^{***} (3.13)	6.70 ^{**} (3.14)	10.83 ^{***} (3.11)	9.13 ^{***} (3.12)
Post-college degree	17.49 ^{***} (3.86)	15.95 ^{***} (3.73)	11.15 ^{***} (3.79)	18.20 ^{***} (3.71)	15.83 ^{***} (3.77)
Age of youngest child		-5.95 ^{***} (0.30)	-7.40 ^{***} (0.37)	-6.00 ^{***} (0.29)	-7.57 ^{***} (0.37)
# of children<13		8.29 ^{***} (1.34)	5.93 ^{***} (1.39)	8.78 ^{***} (1.34)	7.86 ^{***} (1.40)
Age			5.16 ^{***} (0.97)		5.95 ^{***} (0.97)
Age squared			-0.05 ^{***} (0.01)		-0.06 ^{***} (0.01)
Ref: Not-employed					
Part-time employed				-23.88 ^{***} (7.21)	-24.44 ^{***} (7.18)
Full-time employed				-45.93 ^{***} (4.44)	-46.32 ^{***} (4.47)
Ref: No spouse					
Spouse is not emp.					-15.54 ^{***} (4.28)
Spouse part-time emp.					-3.90 (4.37)
Spouse full-time emp.					2.64 (4.09)
Adj R	0.01	0.08	0.08	0.09	0.1

Note: Standard errors are in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

Table 2.6 shows analogous OLS regressions for fathers. The most noticeable finding here is the significance of having a college degree in estimating fathers' primary care time. There is no significant difference in paternal care time for fathers without a college degree (with the single exception of Model 4). Having a college degree or more, however, is consistently positively associated with primary care time. Holding all other aspects constant, college educated fathers provide 9 minutes more primary childcare a day compared to fathers with less than a college degree, while the figure for fathers with a post-college degree is 16 minutes more (Model 5). The gap between respondents with the highest and lowest education attainments is roughly 22 minutes ($6 + 15.83$). Overall, our findings support hypothesis 1B for fathers, yet the effect of education does not increase steadily across educational attainment. The effect of education does not significantly differ between fathers with some college education and those with a high school degree or less (Model 5). Increased education is positively and significantly associated with more childcare time for fathers with a college degree or more.

In order to investigate whether the effect of education significantly differs for mothers and fathers, all the respondents were pooled in a single regression with sex being interacted with all other variables (not shown). There is no significant difference in the effect of education between mothers and fathers, with the exception of having a post-college degree, which has a stronger positive effect for mothers in some models. However, child characteristics affect mothers' primary care more than fathers. Mothers' primary care time increase at a faster rate than fathers' as the age of the youngest child decreases or the number of children increases. Additionally, unlike fathers, mothers provide significantly more primary childcare on weekdays.

Table 2.7 Mothers' minutes spent in secondary childcare (OLS regression)

	Model 1	Model 2	Model 3	Model 4	Model 5
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
Intercept	552.92*** (6.44)	500.37*** (9.32)	500.40*** (38.38)	590.01*** (9.73)	555.3*** (37.14)
0- 11th grade	55.72*** (13.00)	50.74*** (12.81)	54.25*** (12.93)	24.18*** (12.46)	32.52** (12.53)
High school graduate	9.58 (7.12)	13.28** (7.01)	13.83* (7.01)	11.18 (6.79)	11.65* (6.76)
Ref: Some college					
College degree	-22.38*** (6.45)	-23.39*** (6.35)	-26.99*** (6.51)	-16.32** (6.16)	-24.00*** (6.30)
Post-college degree	-54.17*** (8.54)	-52.68*** (8.41)	-60.23*** (8.72)	-36.46*** (8.17)	-47.53*** (8.45)
Age of youngest child		-3.93*** (0.65)	-5.77*** (0.84)	-1.93*** (0.63)	-1.93** (0.82)
# of children<13		42.22*** (2.93)	41.36*** (3.02)	31.17*** (2.87)	28.54*** (2.95)
Age			-0.81 (2.16)		-0.88 (2.11)
Age squared			0.03 (0.03)		0.02 (0.03)
Ref: Not-employed					
Part-time employed				-73.86*** (6.17)	-74.33*** (6.15)
Full-time employed				-142.60*** (5.43)	-135.9*** (5.46)
Ref: No spouse					
Spouse is not emp.					38.19*** (10.97)
Spouse part-time emp.					75.67*** (10.73)
Spouse full-time emp.					60.77*** (5.85)
Adj R	0.11	0.14	0.14	0.19	0.20

Note: Standard errors are in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

Tables 2.7 and 2.8 show the results of the OLS regressions estimating mothers' and fathers' time spent in secondary childcare, respectively. The results in Table 2.7 provide strong empirical support for the second hypothesis regarding mothers (Hypothesis 2A). There is a strong negative association between mothers' educational attainment and secondary childcare. The baseline control model with no controls for child or parental characteristics (Model 1) shows that mothers who have a high school degree provide, on average, 46 minutes less secondary childcare a day for their children compared to mothers with the lowest educational attainment (55.72-9.58). The difference increases by ten minutes for mothers with some college education (compared to mothers without a high school degree), and to 78 and 110 minutes for mothers with a college and post-college degree, respectively. Controlling for child characteristics (Model 2) or the age of the respondent (Model 3) does not change the results substantially. Although controlling for employment status decreases the effect of educational attainment noticeably (Model 4), even after controlling for all the parental and child characteristics (Model 5) educational attainment is still negatively associated with time spent in secondary childcare. This association is significant and substantively strong. Holding all other aspects constant, mothers with a college degree spend 24 minutes less a day in childcare compared to mothers with some college education, while the figure is 48 minutes for mothers with a post-college degree (Model 5). Mothers with no degree, on the other hand, spend approximately 33 minutes more secondary childcare on an average day compared to mothers with some college education.⁴³

⁴³ Similar to high-educated mothers, financially better-off mothers also provide less secondary childcare. Mothers coming from households in the highest household income quartile provide half an hour less secondary childcare for their children compared to those in the bottom quartile ($p < 0.00$).

Although single mothers do not significantly differ from mothers married to employed spouses in their time spent in primary childcare (Table 2.5), they do provide significantly less secondary childcare for their children compared to married/cohabiting mothers. Holding all other aspects constant, a mother who is married to an employed spouse provides 61 minutes more secondary childcare on an average day for her child compared to single mothers. These latter types of mothers, in the absence of spousal support, are likely working longer hours in paid work and hence less available for their children.⁴⁴

⁴⁴ Single mothers indeed report 61 minutes more time in paid work a day compared to mothers who are married to employed spouses (authors' calculation).

Table 2.8 Fathers' minutes spent in secondary childcare (OLS regression)

	Model 1	Model 2	Model 3	Model 4	Model 5
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)
Intercept	489.9*** (7.65)	447.9*** (10.78)	484.13*** (46.21)	566.6*** (14.71)	512.7*** (46.38)
0- 11th grade	-3.08 (13.86)	-3.09 (13.83)	-3.43 (13.96)	-22.35 (13.79)	-15.09 (13.90)
High school graduate	-18.50** (8.34)	-19.19** (8.33)	-18.90** (8.33)	-20.35** (8.25)	-18.36** (8.23)
Ref: Some college					
College degree	-7.60 (7.74)	-8.00 (7.73)	-9.24 (7.78)	-4.09 (7.67)	-6.80 (7.71)
Post-college degree	-13.05 (9.22)	-15.45 (9.22)	-19.13** (9.38)	-9.33 (9.15)	-13.56 (9.32)
Age of youngest child		2.84*** (0.73)	1.76* (0.91)	2.69*** (0.73)	2.60*** (0.91)
# of children<13		16.46*** (3.32)	16.52*** (3.44)	17.81*** (3.29)	16.72*** (3.45)
Age			-2.62 (2.40)		-0.72 (2.40)
Age squared			0.05 (0.03)		0.02 (0.03)
Ref: Not-employed					
Part-time employed				-80.32*** (17.77)	-82.93*** (17.75)
Full-time employed				-131.26*** (10.95)	-133.4*** (11.06)
Ref: No spouse					
Spouse is not emp.					61.87*** (10.58)
Spouse part-time emp.					65.89*** (10.81)
Spouse full-time emp.					76.26*** (10.11)
Adj R	489.98	447.96	484.13	566.62	512.68

Note: Standard errors are in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

However, the results for fathers, presented in Table 2.8, show a different picture. Fathers with a high school degree spend significantly less time in secondary childcare than fathers with some college education. There is no significant difference in high- (college or more) and low- (high school or less) educated fathers' minutes in secondary childcare. In other words, having a college or post-college degree is not associated with a significantly different amount of time spent in secondary childcare compared to having a high school degree or less. In order to further investigate the relationship between educational attainment and involvement in secondary childcare for fathers, corresponding logistic regressions estimating fathers' probability of providing secondary childcare on a given day are performed (not shown). The baseline reference model with no controls (except for diary completion day) shows that the odds of reporting secondary childcare on a diary day are 30 per cent higher for fathers with a college degree and 53 per cent higher for fathers with a post-college degree compared to those with the lowest educational attainment (no high school degree). However, after controlling for child and parental characteristics, the probability of providing secondary childcare on a given day is no longer significantly different for fathers with less than a post-college degree.

Additionally, an OLS regression was performed on only those fathers who participate in secondary childcare, in order to test whether having a higher education is associated with time spent in secondary childcare, conditional on reporting some secondary childcare on a given day. The results do not indicate a consistently significant association (not shown). We therefore conclude that there is not enough empirical evidence to support the hypothesis that educational attainment and secondary childcare are negatively associated for fathers. Moreover, the effect of

educational attainment on time spent in secondary childcare is significantly different between mothers and fathers.⁴⁵

In summary, in line with theoretical expectations, there is strong empirical evidence that mothers with a college degree or more provide more primary care for their children. College educated mothers' higher average time spent in primary childcare results from both their higher likelihood of reporting some primary childcare on a given day and an increase in the number of minutes in the activity conditional on reporting some primary childcare. The educational attainment of mothers is negatively associated with secondary childcare: high-educated mothers provide less secondary childcare for their children compared to mothers with low education, even after controlling for employment and marital status. While the analysis for mothers therefore supports the theoretical expectation, we have mixed results regarding fathers parenting behaviour. Although high-educated fathers provide more primary childcare for their children compared to low-educated fathers, there is no discernible association between education and secondary childcare for this group.

2.5.3 PREDICTED MINUTES IN CHILDCARE ACTIVITIES BASED ON GAMMA REGRESSIONS

In this section, we consider another regression model, gamma regression, and use it to examine the childcare activities of fathers and mothers. The purpose of doing so is two-fold: first, to show that results obtained from the OLS regressions are robust to other parametric assumptions, and hence robust to violations of OLS assumptions; second, to show the extent of inequality in parental time investments for children

⁴⁵ There are also other noticeable gender differences: the coefficient for age of youngest child is also significantly different for mothers and fathers. As the age of the youngest child increases, mothers' time spent in secondary childcare decreases, while fathers' time in the activity increases.

born into different types of households. In all the models, the sample is limited to non-Hispanic white parents with at least one child under the age of 13 years.

Figures 2.3 and 2.4 show the predicted minutes spent in primary and secondary childcare by parents, respectively, based on gamma regression.⁴⁶ The horizontal lines show the 95 per cent confidence intervals. Mothers with less than some college education do not significantly differ from others, but mothers with a college degree or more were predicted to provide significantly more primary childcare compared to mothers with a lower educational attainment (Figure 2.3). In other words, there is no significant effect of education for those with less than a college degree; after which there is a significant and positive effect of education on primary childcare. The gap between mothers with the highest and lowest educational attainments is as high as half an hour per day. Similarly, the gap in predicted minutes spent in primary childcare by fathers with the highest and lowest educational attainments is almost half an hour (27 minutes). There is, however, a negative relationship between educational attainment and predicted minutes in secondary childcare by mothers, while there is no discernible relationship for fathers (Figure 2.4).

⁴⁶ The model has the same controls as Model 5 presented in Table 2.5: number of own children, age of youngest child, age of the respondent (and its squared term), diary completion day, marital status and employment status of the respondent. The model coefficients are shown in Appendix A1 at the end of this chapter. The values of the quantitative variables are held constant at their medians; categories of categorical variables are assigned their sample proportions. This implies that Figure 2.3 and Figure 2.4 show the effect of minutes spent in childcare for a “typical” mother as her educational attainment increases.

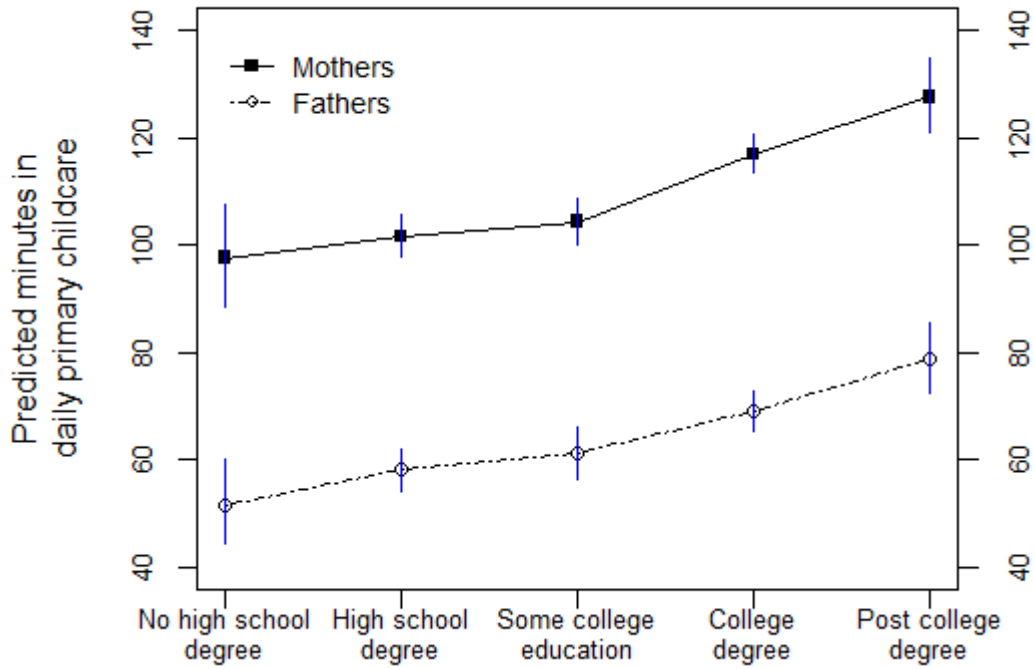


Figure 2.3 Mothers' and fathers' predicted minutes in primary childcare by education

Note: The values of the quantitative variables are held constant at their medians; categories of categorical variables are assigned their sample proportions.

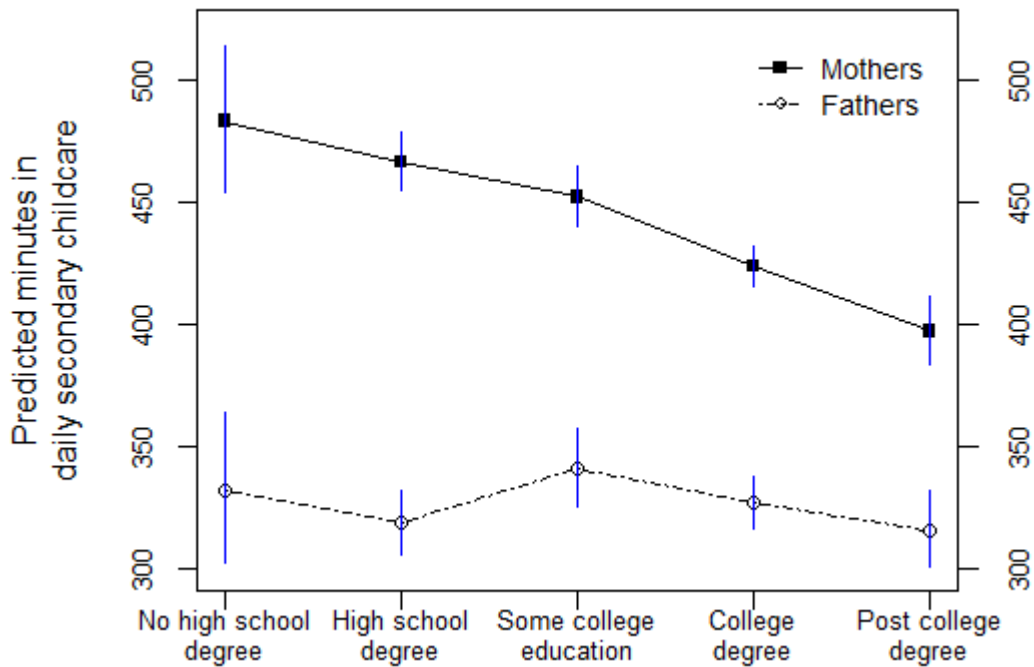


Figure 2.4 Mothers' and fathers' predicted minutes in secondary childcare by education

Note: The values of the quantitative variables are held constant at their medians; categories of categorical variables are assigned their sample proportions.

The next set of figures shows how predicted minutes in childcare between high-educated (college degree) and low-educated (high school degree) parents of different employment and marital status vary as the child ages (Figure 2.5, Figure 2.6 and Figure 2.7). Parental time investments are particularly consequential during early childhood years, since the role of family in the development of a child is stronger during pre-school years. Of interest, then, is the difference in childcare time provided by high- and low-educated mothers to children of different ages.

The value shown on the Y-axis of Figure 2.5 is calculated by subtracting the predicted daily primary childcare time of a low-educated (*only* high school degree) mother from the predicted primary childcare time of a high-educated (*only* college degree) mother, using results from the gamma regression. We calculate such differences for three “types” of mothers: single and employed mothers (shown as triangles in Figure 2.5), married and employed mothers (boxes), and married but not employed mothers (circles). For example, the solid curve in Figure 2.5 shows how many more predicted minutes in primary childcare a high-educated (*only* college degree), married and employed mother spends compared to a low-educated (*only* high school degree), married and employed mother.

Predicted minutes in all cases are calculated for a 36 year old (mean and median age) mother of one child.

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Figure 2.5 The gap in mothers' predicted minutes in primary childcare by employment and marital status

For all mothers, the gap in primary childcare time decreases as a child gets older. Less dramatic disparities at later ages probably result from two related factors: first, older children need less parental childcare, and hence all mothers provide less primary care as the child gets older; and second, more care for school-aged children is transferred to schools, hence parental care is replaced by non-parental care.

The gap between low- and high-educated mothers is particularly striking for married mothers who are not employed (circles). College-educated married mothers provide more than half an hour more primary care for their new-borns than their high-school graduate counterparts. Although the gap shrinks as the child gets older, it remains 20 minutes or more until the child is six years old. The gap is smaller for married mothers. Still, college-educated married and employed mothers are predicted to provide more than 20 minutes more primary childcare per day for their children

under the age of three, compared to mothers with a high school degree. The results therefore indicate substantial inequalities in the amount of primary childcare children receive, particularly at earlier ages. As noted, the figures show the gap between mothers with at least a college degree and those with high school degree only. We chose these two categories because more than half of mothers fall into one of these two groups. The gap in predicted minutes spent in primary childcare is wider for those who are at opposite ends of the education scale.



Figure 2.6 The gap in mothers’ predicted minutes in secondary childcare by employment and marital status

Figure 2.6 shows differences in predicted minutes of secondary childcare for similar types of mothers. As education and time spent in secondary childcare is negatively associated, the difference between high-educated (college degree) and low-educated (high school only) mothers’ predicted minutes in secondary childcare is negative. The amount of time mothers spend in secondary childcare does not vary as the age of the child increases, and hence the difference in secondary childcare by high- and low-educated mothers remains relatively stable across children of different ages. It remains approximately 33 minutes for married and employed mothers (boxes), while it is approximately 28 minutes for single mothers (triangles). The biggest gap between high- and low-educated mothers can be found among mothers who are married but not in paid work (48 to 45 minutes).

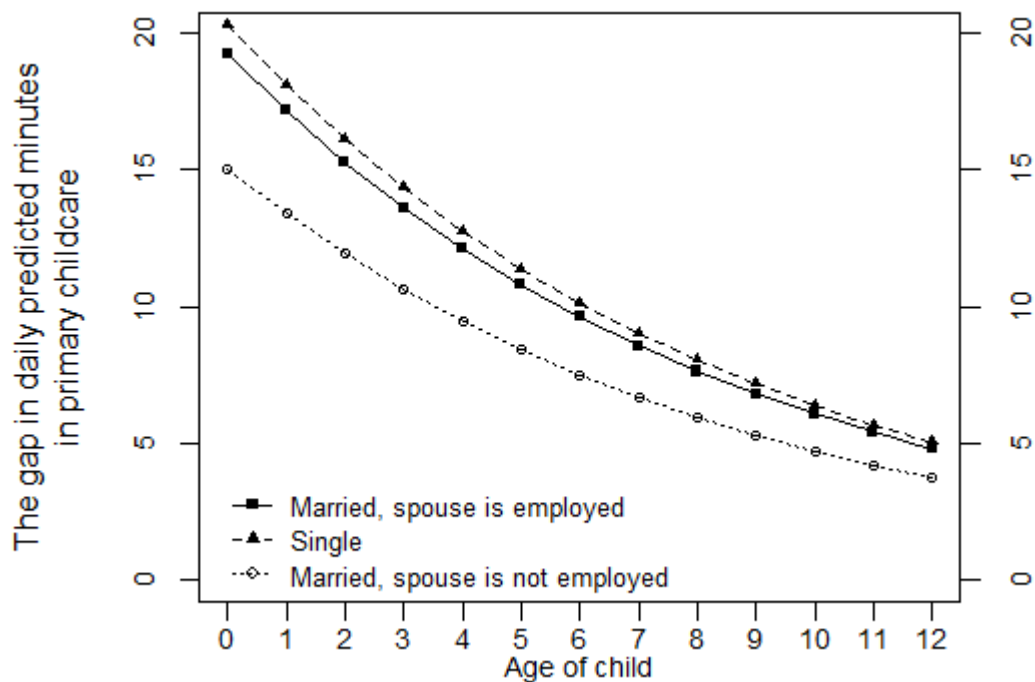


Figure 2.7 The gap in fathers’ predicted minutes in primary childcare by marital status and employment status of spouse

Figure 2.7 shows the education gap in fathers’ time investments⁴⁷ for three types of fathers: i) fathers who are married to full time employed spouses (boxes); ii) single fathers (triangles), and iii) fathers who are married to not-employed spouses (circles). In all three cases, predicted minutes are based on fathers who are employed full-time at the age of 39 (mean and median age) and have only one child. The gap in primary care time of high- (college degree) and low- (high school degree) educated fathers is largest when the child is young. For example, in a dual-earner family, a college educated father of a new born is predicted to provide 20 minutes more primary care for his child a day compared to a father with a high school degree. Fathers who are married to not-employed spouses are predicted to provide the smallest amount of primary childcare among the three groups (not shown).

⁴⁷ We found no difference between high- and low-educated fathers’ predicted minutes in secondary childcare.

In summary, as educational attainment increases, predicted minutes in primary childcare also increase for “typical” mothers and fathers. High-educated mothers are predicted to provide less secondary childcare than low-educated mothers, while there is no association between fathers’ predicted minutes in secondary childcare and educational attainment. The gap between high- and low-educated parents’ predicted minutes in primary childcare is especially pronounced during the early years of childhood.

2.6 CONCLUSION

To the extent that time spent in primary childcare is a proxy for a *concerted cultivation* that embraces active and involved parenting, the findings presented here are in line with the theoretical expectation that non-Hispanic white parents with a high education embrace this logic of *concerted cultivation*. High-educated mothers and fathers provide significantly more primary childcare for their children compared to parents with low educational attainment. This significant difference is robust to controls for parental and child characteristics. The gap in parental time investments is largest during the early years of childhood, and gradually diminishes as children age.

There is also support for the hypothesis that high-educated mothers provide less secondary childcare compared to low-educated mothers. The results from the gamma regressions indicate that the gap between college educated and high school educated parents’ secondary childcare time remains more or less stable as the age of the youngest child increases. However, the hypothesized relationship between fathers’ education and secondary childcare does not hold. Unlike in the case of mothers, there

is no discernible effect of educational attainment on the secondary childcare time of fathers. Evidently, educational attainment does not operate in a similar manner for mothers and fathers. The results highlight the importance of taking gender into account when studying class differences in childcare.

The findings of this chapter, albeit informative, are not conclusive. Total time spent in primary childcare is a rather crude proxy for *concerted cultivation*. It is informative in the sense that it is a reliable measure of involved parenting, since during primary childcare a child is at the centre of attention and the main recipient of parental time. However, not all primary childcare activities are equally developmentally important. The main distinctive feature of *concerted cultivation* is parents' deliberate attempts to improve their children's social, cognitive and linguistic skills. Therefore, we need more nuanced measures to identify distinct parenting behaviours. In the following chapter, we exploit time use data even further for that purpose. Detailed and comprehensive discussion of the findings from Chapter 2 and Chapter 3 is provided at the end of Chapter 3.

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CHAPTER 3:

INEQUALITIES IN PARENTAL TIME INVESTMENT (II): TIME SPENT IN SPECIFIC CHILDCARE ACTIVITIES

ABSTRACT

Research on child development shows that not only the total amount of time but also the types of activities parents engage in are important determinants of a child's well-being. To the extent that some childcare activities are more vital in enhancing children's social and cognitive skills, variations in specific parenting behaviour could be informative in understanding the differential transmission of parental advantages to children. In this chapter, we use a sample of non-Hispanic white parents from the American Time Use Survey (2003-2008) to test more hypotheses based on the theoretical framework presented in Chapter 2, and to empirically document variations in specific childcare activities by parental educational attainment. The results show that high-educated parents are more involved in developmental childcare activities than parents with low educational attainment. The main source of variation is high-educated parents' time spent in reading/talking to their children or playing with children instead of an involvement in school-related activities. High-educated parents also spend significantly less time watching television while their child is in their care, both in absolute and relative terms. The analysis presented here reveals substantial variation in parents' involvement in specific childcare activities by educational attainment.

3.1 INTRODUCTION

High-educated parents spend more time in daily primary childcare compared to parents with low educational attainment (Chapter 2). The gap is particularly wide during the early years of childhood. Inequality in parental time investment in early childhood is likely to lead to the transmission of differential advantages to children, and put middle-class children at an advantageous starting point in school (Lareau 2003). However, as child development literature shows, not only the total amount of time but also the type of activities parents engage in are important determinants of a child's well-being (Pleck and Masciadrelli 2004; Shaw and Bell 1993). For example, parental involvement in developmental activities is positively correlated with children's school achievements (Kalenkoski and Foster 2008; McNeal 1999). Sensitive parenting (a type of parenting that is interactive and responsive to children's needs) is positively associated with children's linguistic and cognitive achievements (Tamis-LeMonda, Bornstein and Baumwell 2001; Shannon et al. 2002). Consequently, researchers have begun to differentiate between "high quality" and "low quality" childcare; the former refers to activities that augment children's linguistic, social or cognitive skills, such as reading a book to a child, while the latter refers to routine childcare activities, such as travel associated with childcare (Bianchi, Robinson and Milkie 2006; Kalenkoski and Foster 2008; Sayer, Gauthier Furstenberg 2004; Zick, Bryant and Osterbacka 2001). To the extent that some childcare activities are more vital in enhancing children's social and cognitive skills, variations in specific parenting behaviour could be informative in understanding the differential transmission of parental advantages to children.

In this chapter, we investigate time spent in specific childcare activities by parental educational attainment for non-Hispanic white parents. The research objectives are twofold: first, to test the hypothesized relationship between parental class (measured by educational attainment) and involvement in specific childcare activities; second, to examine the absolute and relative differences in parents' time use patterns. While doing so, we also examine whether the effect of education operates differently between mothers and fathers.

In the next section, we formulate a set of hypotheses based on the theoretical framework of Lareau (2003). This is then followed by a description of the data, sample and methodology employed. The results section is divided into three parts. We first present results from a descriptive and multivariate analysis of time spent in specific primary childcare activities: namely *basic childcare*, *developmental childcare* and *out-of-home childcare*. This is followed by results from the analysis of parental time spent in *secondary childcare* activities while *watching television* and *out-of-home leisure* activities. In the third part of the results section, we take a brief look at relative differences in time spent in specific childcare activities. After summarizing the findings of this chapter, we finally discuss the findings from Chapter 2 and Chapter 3 together and address possible limitations of the study.

3.2 THEORETICAL EXPECTATION AND HYPOTHESES

This chapter has two main research objectives: the first is to provide a comprehensive and detailed empirical documentation of variation in the parenting practices of mothers

and fathers by their education. While doing so, further hypotheses based on the theory of Annette Lareau are tested. Lareau claims upper-middle/ middle class parents have a distinctive child rearing culture (*concerted cultivation*) compared to that of working class/low-income parents (*natural growth*).⁴⁸ More specifically, time use patterns of parents are analysed in detail to investigate variations in daily parenting behaviour. Chapter 3, therefore, takes a step further from an analysis of *total* time spent in primary or secondary childcare and examines the variations in parents' involvement in *specific* primary childcare activities as well as other (non-childcare) activities during secondary childcare.

Parents who follow *natural growth* see their main parental responsibility as providing the basic needs of their children such as shelter, food and clothing. As a result of financial constraints, they likely cannot provide as many material advantages as middle class parents, but there is no reason to expect working class parents to spend significantly less time in basic childcare activities compared to middle class mothers. In fact, middle class parents probably have more time to provide developmental childcare for their children because they can transfer some of the routine childcare and housework activities to others such as spouses, baby-sitters, private childcare, etc. (Chalasani 2007). Hence, there is no reason to expect high-educated parents to be spending more time in basic childcare activities compared to low-educated parents.

HYPOTHESIS 1A (B): *High-educated mothers (fathers) do not significantly differ from low-educated mothers (fathers) in their involvement in basic childcare activities.*

⁴⁸ See Section 2.2.2 in Chapter 2 for a detailed review of Lareau's work.

At the core of the logic of *concerted cultivation* lies parents' deliberate and active attempt to improve the social and cognitive skills (what Lareau calls *cultural capital*) of their children, in order to help them to succeed in school as well as, in the long run, in the labour market. A likely behavioural pattern that follows such a logic of child rearing is to spend time in *developmental* activities. Although low-income and working class families both likely prefer their children to be successful at school, in the absence of necessary resources (financial resources, social network, information, etc.) they tend to delegate education-related childcare to schools (Lareau 2003). High-educated parents, on the other hand, not only are more aware of the importance of developmental activities but are also better equipped to perform such childcare. Additionally, due to high-quality, better paid and more secure jobs, higher-educated parents can afford more stress-free time that is directed towards the augmentation of the cultural capital of their children (Willingham 2012).⁴⁹

HYPOTHESIS 2A (B): *High-educated mothers (fathers) are more involved in developmental childcare than low-educated mothers (fathers).*

One of the very important dimensions of *concerted cultivation* is middle-class children's substantial amount of time spent in extracurricular activities.⁵⁰ Parents spend significant amounts of time planning and organizing extracurricular activities for their children as well as chauffeuring them to and from these events. A significant portion of time spent in out-of-home care activities in the ATUS data is picking up/ dropping of children and

⁴⁹ Jacobs and Gerson (2004) argue that high-educated parents are more likely to fall into the group of "overworked Americans" as opposed to "underworked Americans". Hence, although they are less likely to feel stress due to employment insecurity or income volatility, they do face time pressure and stress due to long working hours.

⁵⁰ Unfortunately, ATUS data does not allow for a direct measure of this.

waiting for or attending children's events. Therefore, this activity category is used as a proxy for *out-of-home developmental activities*⁵¹ for children. For the reasons stated above, high-educated parents are expected to spend more time in out-of-home childcare activities, and so hypothesis 3A (B) is formulated as follows:

HYPOTHESIS 3A (B): *High-educated mothers (fathers) are more involved in out-of-home childcare than low-educated mothers (fathers).*

The theoretical reasoning behind the next hypothesis is very similar to the previous one. Time spent in out-of-home leisure activities during secondary childcare includes activities such as going to a museum, church, restaurant, parties/receptions and doing sports/exercises, etc.⁵² These are the types of activities that would foster children's *cultural capital* and would help children to integrate into their parent's social network. Familiarity in interaction with adults or institutions, knowing how to behave in social settings, being aware of the social/institutional norms of the formal and adult world are among the many advantages that are transferred from middle class parents through concerted cultivation (Lareau 2003). Furthermore, involvement in out-of-home leisure activities has social, informational and financial costs. More precisely, it requires knowledge (about events, social norms/rules regarding the activities), and it costs money and time. Hence, high-educated parents with better financial and informational resources

⁵¹ To avoid confusion, we refer to these activities as *out-of-home childcare* activities only.

⁵² In other words, the primary activity is a leisure activity outside the home and the child is in parental care during the activity.

are expected to involve themselves in secondary childcare during out-of-home leisure more than low-educated parents.⁵³

HYPOTHESIS 4A (B): *High-educated mothers (fathers) are involved in out-of-home leisure activities during secondary childcare more than low-educated mothers (fathers).*

Middle-class parents in Lareau's qualitative work either ban or strictly limit watching television for their children, while television is reported to be "always available" for children from working class families. The culture of *concerted cultivation* "vehemently opposes" watching television, whilst children raised by parents who embrace *natural growth* watch "unrestrictive amounts of television" (Lareau 2003: 242).⁵⁴ There are several important reasons behind this variation, each relating to the availability of a specific parental resource, which we proxy with educational attainment.

First, parents with higher *financial resources* are able to schedule/ provide alternative leisure activities for their children, which decrease the amount of time available for children to watch television. For example, one of the affluent parents in Lareau's sample schedules a piano lesson and a choir practice on Saturday mornings for her son to specifically prevent him from watching television (2003:112). Second, parents with higher *informational resources* are more aware of the negative effects of television on children. Scientific research has demonstrated the potential harms of excessive television-watching, particularly if the content is non-educational and the child is young

⁵³ Some of children's extracurricular activities during which parents were present (such as watching a child performing, going to a child's soccer game, etc.) are likely to be reported as leisure outside the home while child is in care. This is another reason to expect high-educated parents to report this activity more than low-educated mothers.

⁵⁴ For more on variations in parental attitudes on television, see Chapter 6 and Chapter 7 in Lareau (2003).

(see Christakis 2009 for a review). The dominant expert opinion on child rearing practices is also very negative towards television exposure.⁵⁵ Since high-educated parents have a better access to such information and comply with the dominant professional standards in child rearing practices, they are expected to limit their children's television-watching more compared to low-educated parents. Accordingly, parents who oppose their children's excessive exposure to television should be less likely to watch television themselves while their child is in their care. Moreover, previous research shows that parents interact with their children less if they are watching television while the child is in their care (Mendelsohn et al. 2008; Tanimura, Okuma and Kyoshima 2007). As parents who embrace the logic of *concerted cultivation* are more likely to be involved in intensive interactions with their children, one would expect that they avoid watching television while their child is in their care.

HYPOTHESIS 5A (B): *High-educated mothers (fathers) watch television less while their child is in their care compared to low-educated mothers (fathers).*

3.3 DATA AND SAMPLE

The time use data analysed comes from the 2003-2008 American Time Use Survey. The sample is limited to non-Hispanic white parents who have at least one child under the age of 13 years.⁵⁶ Hence, the results cannot be generalized to the whole population of parents in the US. The sample size is 7980 for fathers and 10573 for mothers. 447 cases

⁵⁵ Dr Spock's parental guidance book on child rearing (the country's bestseller) has a chapter on television in which it is identified as "a high risk medium", and parents are advised to not to have it at all (Spock and Needlman 2004: 558-463).

⁵⁶ See section 2.3 (Data and Sample) in Chapter 2 for a more detailed explanation of data specification and the sample.

with low quality diaries are zero-weighted and hence functionally removed from the analysis (246 mother diaries and 201 father diaries).

Primary childcare is decomposed into three sub-activity categories: *basic childcare*, *developmental childcare* and *out-of-home care*. Table 3.1 shows the decomposition of primary childcare activities into these three categories and their respective original activity codes. We test hypotheses 1-3 using these three specific childcare activities as response variables.

In order to test hypotheses 4 and 5, reports of secondary childcare⁵⁷ during out-of-home leisure activities and watching television are examined. Out-of-home leisure activities are composed of activities such as going to the cinema, theatre, museum, café, bar, restaurant, as well as voluntary acts, religious activities, and exercising/sports; while secondary childcare while watching television simply refers to watching television or a video while a child is under parental care.

The main explanatory variable is the educational attainment of the parent, a five-category ordinal variable. Unless otherwise stated, high-educated refers to parents with a college degree or more, and low-educated refers to parents with a high school degree or less.⁵⁸

⁵⁷ As stated previously, *secondary childcare* and *child-is-in-care* time are used interchangeably in this thesis.

⁵⁸ The association of household income with specific childcare activities is also investigated. Although regression coefficients are not shown, the relation between household income and parental involvement in specific activities is explained in the main text where relevant.

TABLE 3.1 The decomposition of primary childcare activities

Primary childcare activities	ATUS Code
1. Basic childcare	
1.1 Physical childcare	30101, 40101
1.2 Organization and planning for children	30108, 40108
1.3 Looking after children	30109, 40109
1.4 Caring for and helping children	30199, 40199
1.5 Providing medical care to children	30301, 40301
1.6 Obtaining medical care for children	30302, 40302
1.7 Waiting associated with children's health	30303, 40303
1.8 Activities related to children's health	30399, 40399
2. Developmental childcare	
2.1 Play with child	
2.1.1 Play with child-not sports	30103, 40103
2.1.2 Play sport with child	30105, 40105
2.2 School related/ educational activities	
2.2.1 Arts and crafts with children	30104, 40104
2.2.2 Helping with homework	30201, 40201
2.2.3 Meetings and school conferences	30202, 40202
2.2.4 Home schooling of children	30203, 40203
2.2.5 Waiting associated with children's education	30204, 40204
2.2.6 Activities related to child's education	30299, 40299
2.3 Read /talk to child	
2.3.1 Reading to/with children	30102, 40102
2.3.2 Talking with/listening to children	30186, 40186
3. Out-of-home childcare	
3.1 Attending children's events	30110, 40110
3.2 Waiting for/with children	30111, 40111
3.3 Picking up/dropping off children	30112, 40112
3.4 Using paid childcare services*	80101, 80199
3.5 Waiting associated with purchasing childcare*	80102
3.6 Travel related to caring for/helping children*	180381, 180481
3.7 Travel related to using childcare services*	180801

Note: * Only if child is present, else coded as purchasing services.

3.4 METHODS

The hypothesized relationships between parents' involvement in specific childcare activities and educational attainment are tested using two statistical techniques. First, a series of OLS regressions are performed to test whether educational attainment is positively associated with more time (in minutes) spent in specific childcare activities.⁵⁹ Second, a series of logistic regressions are performed to test whether high-educated parents have a higher propensity to participate in specific care activities. We refer to the findings of logistic regression models in the main text, but the results are explicitly shown only in Appendix 3.1.

We apply logistic regressions in addition to OLS linear regressions because the propensity of providing an activity is another dimension of parental *involvement* in the activity. As the type of childcare activity gets more specific, we expect smaller variation in the number of minutes spent in the activity. For example, there is a natural and reasonable limit on the amount of time a parent can read to or talk with a child on a given day. As shown later in the chapter, among parents who report some time in reading or talking to children, the vast majority spent about half an hour a day in the activity. This is likely because a few minutes of reading is too short to serve the intended purpose, while children would hardly be able to follow a parents' reading for hours. In such cases, it is not the average minutes in the activity but rather whether the respondent reported the activity or not that is of interest. Furthermore, because different

⁵⁹ All the OLS models are repeated in gamma regression in order to confirm that the results are robust to the violations of OLS assumptions. At the end of the first part of the results section, we plot the predicted minutes in the activities based on gamma models. See Appendix B for the gamma models, and see Appendix A for a more detailed description and justification of the methods applied in this thesis.

distributions can produce the same mean, average time spent in the activity is not necessarily the most interesting feature of the dependent variable. For example, imagine there are 10 low-educated parents each spending 30 minutes in reading to their children, and 10 high-educated parents where one spends 300 minutes and 9 parents spend no time in the activity. Both of these groups have an average of 30 minutes. In the latter case, however, the results are driven by a single outlier. As the activity types get more specific and the number of people who report the activity decreases, the mean becomes more sensitive to such outliers. In these situations, the participation rate is a more informative measurement of overall parental involvement patterns, rather than the mean.

In all the models, an intermediate level of educational attainment (*some college education*) is used as a reference point, but the differences between high-(college or more) and low-educated (high school or less) parents are consistently reported in line with our hypothesis formulation. We also report whether the effect of educational attainment on parental involvement in specific activities varies significantly for mothers and fathers.

3.5 RESULTS OF SPECIFIC PRIMARY CHILDCARE ACTIVITIES

This section presents the results of the analyses of the specific primary childcare activities of parents. After presenting the descriptive results, hypotheses 1-3 are tested in a multivariate setting. To provide a detailed and comprehensive empirical documentation of variation in parents' involvement in specific *developmental childcare*

activities, parents' propensity to report some time (i) *reading/talking to a child*; (ii) *in school-related activities* and (iii) *playing with child* are also examined.

3.5.1 DESCRIPTIVE RESULTS

Tables 3.2 and 3.3 present the descriptive analysis by educational attainment and household income quartile for non-Hispanic white mothers and fathers respectively. The first column of each panel in the tables shows the average time spent in the activity by all parents in the relevant education and household income category. The second column shows the percentage of parents who reported at least one minute in the activity on a given diary day (*participants*). Finally, average time spent in childcare by *participating parents* (parents who reported at least 1 minute in the activity) is presented in the third column in each panel.

Descriptive results do not show any clear trend between maternal resources (educational attainment or household income) and mothers' minutes spent in basic childcare. By contrast, the results for fathers (Table 3.3) show a clear positive trend in their participation rate: as the educational attainment or the household income of a father increases, the percentage of fathers who provide some basic care on a given day shows a steady increase (second column, top panel). Approximately one third of all fathers (32 per cent) with no degree provide some basic childcare on a given day, while the corresponding figure for fathers with a post-college degree is 58 per cent. However, because the participating fathers with no degree (and those in the lowest household income quartile) report more minutes in the activity, average time spent in basic care by

fathers with a college degree or more (and those in the highest income quartile) is only slightly higher than that of fathers with the lowest educational attainment.

Table 3.2 Mothers' average minutes spent in specific childcare activities and percentages of diarists reporting the activity

	Basic care		Developmental care			Out-of-home care			
	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	Mean (>0)
Educational Attainment									
0-11th Grade	70	72%	92	42	44%	96	16	44%	36
High school graduate	56	72%	78	42	46%	91	18	43%	42
Some college	59	76%	78	44	49%	90	21	47%	45
College degree	64	79%	82	50	57%	88	27	52%	52
Post-college degree	69	79%	86	55	61%	92	28	54%	51
Household income									
Lowest quartile	64	78%	82	46	47%	98	19	45%	42
Second lowest quartile	62	74%	84	46	50%	90	21	45%	46
Second highest quartile	62	78%	79	50	54%	93	25	49%	50
Highest quartile	61	77%	79	48	57%	84	28	54%	51
All mothers	62	77%	81	47	53%	90	23	49%	48

Note: Weights are applied to represent the population distribution accurately, and to correct for the distribution of days of the week.

Table 3.3 Fathers' average minutes spent in specific childcare activities and percentages of diarists reporting the activity

	Basic care		Developmental care			Out-of-home care			
	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	Mean (>0)
Educational Attainment									
0-11th Grade	27	32%	83	26	24%	108	5	18%	29
High school graduate	24	40%	62	27	30%	91	9	24%	36
Some college	24	47%	51	29	33%	86	11	26%	43
College degree	31	53%	58	33	39%	84	11	26%	44
Post-college degree	32	58%	54	36	45%	80	13	31%	42
Household income									
Lowest quartile	28	38%	72	28	31%	91	7	23%	31
Second lowest quartile	25	45%	57	31	33%	93	9	23%	37
Second highest quartile	28	50%	56	31	36%	85	11	26%	43
Highest quartile	30	53%	57	32	40%	81	13	29%	45
All fathers	28	48%	58	31	46%	86	11	26%	41

Note: Weights are applied to represent the population distribution accurately, and to correct for the distribution of days of the week.

Average time spent in developmental childcare and the percentage of parents who reported any developmental care increases as educational attainment increases. The difference in participation rates between mothers with the highest educational attainment and those with the lowest educational attainment is 15 per cent; the figure for fathers is 10 per cent. Finally, descriptive trends in out-of-home care are also in the expected direction. High-educated mothers and those in households in the top income quartile provide approximately 28 minutes of out-of-home care for their children on a given day; that is approximately 10 minutes more than mothers with the lowest educational attainment or household income. Similarly, fathers with higher educational attainment (and those coming from financially better-off households) provide more out-of-home childcare for their children, but the absolute differences in minutes spent in the activity among fathers with various educational or income levels are smaller. For example, minutes spent in out-of-home childcare on a given day vary from 5 minutes for fathers with the lowest educational attainment to 13 minutes for those with the highest educational attainment.

There are noticeable gender differences in parenting behaviour. For example, while the amount of time spent in developmental or out-of-home childcare by *participating* mothers and fathers is very similar, participation rates of mothers in developmental and out-of-home childcare are respectively 7 and 23 per cent higher than for fathers. The gender difference is also pronounced in involvement in basic childcare activities. On average, mothers provide 34 minutes more basic childcare than fathers. Mothers are not only more likely to participate in the activity on a given day but they also report a

greater number of minutes than fathers, conditional on reporting some basic care on a given day.

In summary, the descriptive trends show increased parental involvement in developmental or out-of-home care activities as parental resources increase. Also, there is no noticeable trend between mothers' educational attainment or household income and their basic childcare activities; while for fathers, educational attainment increases average time spent in basic childcare. The next section presents results from the multivariate analysis.

3.5.2 MULTIVARIATE RESULTS

Table 3.4 shows the OLS regression results for non-Hispanic white mothers and fathers estimating minutes spent in basic childcare. The first model, a baseline reference model (Model 1), only controls for educational attainment and diary completion day while the full model (Model 2) has controls for parental and child characteristics.

Table 3.4 Mothers' and fathers' minutes spent in basic childcare (OLS regression)

	Mothers		Fathers	
	Baseline reference model	Full model	Baseline reference model	Full model
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)
(Intercept)	52.68*** (2.26)	58.84*** (12.15)	27.47*** (1.90)	15.01 (11.23)
0- 11th grade	12.03** (4.57)	1.17 (4.10)	2.26 (3.44)	2.34 (3.37)
High school graduate	-4.41* (2.50)	-0.60 (2.21)	1.04 (2.07)	1.91 (1.99)
College degree	4.63** (2.27)	3.08 (2.06)	7.15*** (1.92)	5.74*** (1.87)
Post-college degree	9.17*** (3.00)	7.73** (2.77)	8.13*** (2.29)	7.18*** (2.26)
Age of youngest child		-9.78*** (0.27)		-4.29*** (0.22)
Number of children <13		6.38*** (0.96)		3.41*** (0.84)
Full-time employed		-26.19*** (1.79)		-21.92*** (2.68)
Part-time employed		-15.08*** (2.01)		-15.75*** (4.30)
Spouse is not employed		-8.35** (3.59)		-6.99** (2.56)
Spouse is part-time employed		0.66 (3.51)		1.18 (2.62)
Spouse is full-time employed		0.39 (1.91)		1.89 (2.45)
Age		2.03*** (0.69)		2.17*** (0.58)
Age squared		-0.02* (0.01)		-0.02*** (0.01)
Adj R	0.01	0.23	0.00	0.08

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

*p<0.10, ** p<0.05, ***p<0.01

The results for mothers lend some support for the hypothesis that high-educated mothers do not provide more basic childcare compared to mothers with low-education. Mothers with a college degree or more spend more time in basic childcare compared to mothers with some college education, but so do mothers with no degree (Model 1). Moreover, once the parental and child characteristics are controlled for (Model 2), the difference between mothers' educational attainment and time spent in basic childcare disappears with one exception: mothers with a post-college degree provide 8 minutes more basic childcare compared to mothers with some college education. Yet, there is no significant difference between mothers with a post-college degree (highest educational attainment) and those with no degree (lower educational attainment, not shown on table). The results, therefore, indicate no negative linear relationship between educational attainment and basic childcare.

These OLS results do not provide strong support for a systematic relationship between maternal resources (educational or financial) and minutes spent in basic childcare.⁶⁰ This finding is contradictory to the finding of Guryan, Hurst and Kearney (2008) who conclude that the positive effect of educational attainment holds for all types of childcare, including basic childcare. One possible reason behind the contradictory findings is likely due to our limitation of the sample to white parents only.⁶¹ Guryan,

⁶⁰ All the models in this chapter are also generated while controlling for household income quartile instead of (or in addition to) educational attainment. With the exception of a few cases, which are explained further in the text, we find no significant association between relative household income and time spent in specific childcare activities.

⁶¹ There are other differences between the two studies. First, their sample is not limited to parents but men and women (aged between 21 and 55) who live with at least one child under the age of 18 years. Second, although the definition of basic childcare is very similar in both studies, small variations in the activity coding are likely. Finally, the two studies do not have identical model specification.

Hurst and Kearney include all race/ethnicities in their sample, but do not control for race/ethnicity in their analysis. However, in the absence of proper controls for race/ethnicity, educational attainment is likely to be capturing the effect of race, since black and Hispanic parents are more likely to have low levels of education and less likely to report some basic childcare for their children on a given day (author's calculation).

A logistic regression model estimating mothers' probability of providing some basic childcare on a given day is also performed (Appendix B, Table 3.18). The results show that, after controlling for child and parental characteristics, mothers' probability of providing any basic childcare on a given day is significantly higher for mothers with a college degree or more compared to mothers with a high school degree or less. Although the marginal effect of having a higher educational attainment is not substantially large, logistic regression results provide some evidence that mothers with high-education have a higher propensity to provide basic childcare compared to mothers with low-education. A higher propensity to report the activity, however, does not result in a significant time gap between high- and low-educated mothers.⁶²

OLS regression results for fathers shown in Table 3.4 offer partial support for the hypothesis (of no relationship). Fathers who have a college degree or more spend

⁶² There is no effect of relative household income on parents' involvement in *basic childcare*. After controlling for parental and child characteristics, coming from households in the top two income quartiles is associated with 4-5 minutes more *out-of-home childcare* than being at the bottom. There is a significant positive association between relative household income and mothers' probability of providing *developmental childcare*, even after controlling for educational attainment, but the substantive effect is not large. Adding relative household income as a control variable does not result in any noteworthy change in the effect size or significance of educational attainment.

significantly more time in basic childcare compared to fathers with some college education (baseline reference model for fathers), and this relationship is robust to controls for parental and child characteristics (full model for fathers). Fathers with a college or post-college degree also report significantly more time in basic care compared to fathers with a high school degree, although there is no significant difference between fathers with no degree and those with a college degree or more (not shown on table). We therefore cannot conclude that high-educated fathers do not differ significantly from those with a low education.

Further evidence to reject the hypothesized relationship between fathers' educational attainment and their involvement in basic care comes from a logistic regression predicting fathers' probability of providing basic childcare on a given diary day (Appendix B, Table 3.18). Fathers with a college degree or more are significantly more likely to provide basic childcare on a given day compared to fathers with a high-school degree or less. The marginal effect of educational attainment on the probability of providing basic childcare based on the full model shown in Table 3.18 is presented in Figure 3.1. Typical values are medians for quantitative variables and sample proportions of categories for categorical variables. As shown in Figure 3.1, the probability of providing some basic care on a given diary day almost doubles as fathers' education level increases from having no degree (.30) to having a post-college degree (.58). The differences are significant between each educational attainment category; in other words, as educational attainment increases, fathers' probability of providing some basic

childcare increases progressively. In brief, we cannot conclude that there is no relationship between fathers' involvement in basic care and their educational attainment.

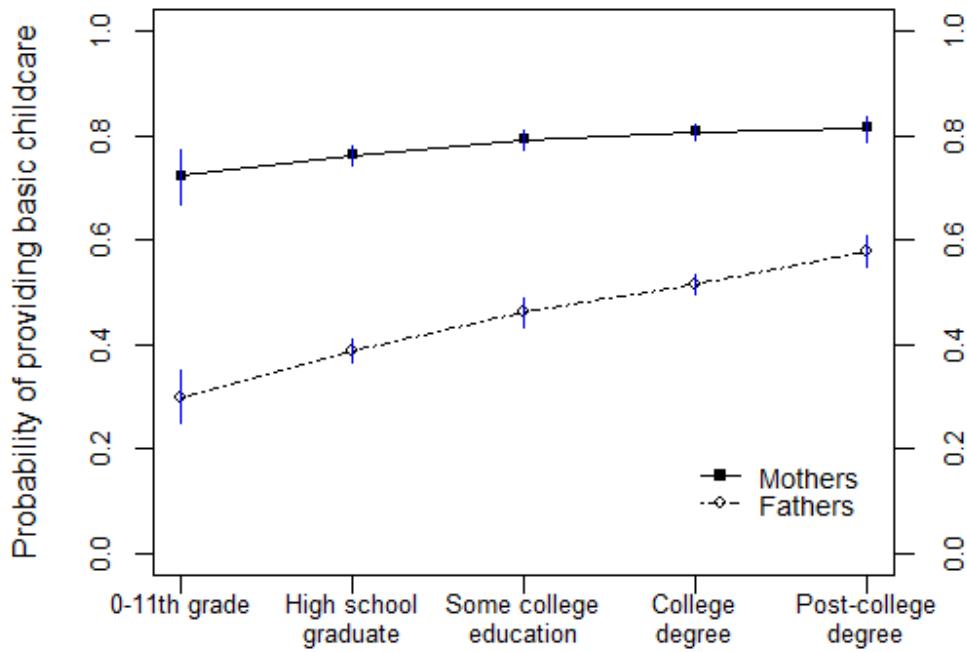


Figure 3.1 Predicted probability of providing basic childcare by mothers and fathers

Note: The values of the quantitative variables are held constant at their medians; categories of categorical variables are assigned their sample proportions.

A positive association was hypothesized between parental education and involvement in developmental childcare. The results for mothers largely support this hypothesis. Controlling for parental and child characteristics, mothers with no college degree provide 11 minutes less developmental childcare than mothers with a high school degree (not shown in table, $p=.005$) or those with some college education (Table 3.5). The differences between mothers with no degree and those with a college and post-college degree are roughly 17 ($11.19+5.31$, $p<0.00$) and 23 ($11.19+ 11.87$, $p<0.00$) minutes, respectively. Additionally, as the educational attainment of a mother increases, her probability of providing some developmental childcare on a given day also increases significantly (Appendix B, Table 3.19). For example, compared to mothers with some

college education, the probability of providing developmental childcare is 30 per cent less for mothers with no degree, 30 per cent more for mothers with a college degree and 50 per cent more for those with a post-college degree. Overall, therefore, there is a strong positive association between mothers' educational attainment and involvement in developmental childcare.⁶³

The results for fathers show no significant positive relationship between fathers' educational attainment and minutes spent in developmental childcare, though the sign of the coefficients are in the expected direction. Only fathers with a post-college degree report significantly higher minutes in developmental childcare compared to fathers with a lower educational attainment.⁶⁴ However, logistic regression results show that high-educated fathers are significantly more likely to report some developmental childcare compared to low-educated fathers (Appendix B, Table 3.19). Hence, the results indicate that the probability of high-educated fathers providing some amount of developmental care is higher than those with lower levels of education; yet, this higher likelihood of reporting the activity does not translate into more minutes spent in the activity. One possible explanation behind this is that a small number of *participating* low-educated fathers spend substantially more time with their children than high-educated *participating* fathers.

⁶³ Controlling for the household income quartile of mothers rather than educational attainment reveals that mothers coming from households in the top two quartiles provide 10 minutes more developmental childcare for their children compared to those coming from households in the bottom quartile. This association, however, disappears to a large extent once educational attainment is controlled for, indicating that informational resources at the disposal of mothers matter more than financial resources. Alternatively, the educational attainment variable is capturing the financial resources of parents better than a relative measure of household income.

⁶⁴ Gamma regression shows a significant difference between time spent in developmental childcare by fathers with a college degree or more and those with a high school degree or some college education.

Table 3.5 Mothers' and fathers' minutes spent in developmental childcare (OLS regression)

	Mothers		Fathers	
	Baseline reference model	Full model	Baseline reference model	Full model
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)
(Intercept)	36.44 ^{***} (1.99)	41.55 ^{***} (11.48)	32.67 ^{***} (2.06)	-1.45 (12.40)
0- 11th grade	-2.26 (4.03)	-11.19 ^{***} (3.87)	-2.96 (3.74)	-2.74 (3.72)
High school graduate	-2.11 (2.20)	-0.52 (2.09)	-1.41 (2.25)	-0.57 (2.20)
College degree	5.52 ^{**} (2.00)	5.31 ^{**} (1.95)	4.13 [*] (2.09)	3.02 (2.06)
Post-college degree	11.03 ^{***} (2.65)	11.87 ^{***} (2.61)	7.42 ^{***} (2.49)	7.11 ^{***} (2.49)
Age of youngest child		-5.09 ^{***} (0.25)		-3.57 (0.24)
Number of children <13		-2.24 ^{**} (0.91)		1.15 (0.92)
Full-time employed		-35.11 ^{***} (1.69)		-18.92 ^{***} (2.96)
Part-time employed		-19.61 ^{***} (1.90)		-6.66 (4.75)
Spouse is not employed		-5.33 (3.39)		-1.70 (2.83)
Spouse is part-time employed		-5.03 (3.32)		0.11 (2.89)
Spouse is full-time employed		-0.78 (1.81)		1.41 (2.70)
Age		2.17 ^{***} (0.65)		3.40 ^{***} (0.64)
Age squared		-0.02 ^{**} (0.01)		-0.04 ^{***} (0.01)
Adj R	0.01	0.11	0.00	0.05

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

*p<0.10, ** p<0.05, ***p<0.01

Figure 3.2 shows the marginal effect of educational attainment on the probability of providing developmental childcare based on the full models shown of Table 3.19, Appendix B. The predicted probability of fathers' providing developmental care almost doubles as the educational attainment of fathers increases from its lowest to highest level (from 0.23 to 0.42). In the case of mothers, the predicted probability increases from 0.38 (no degree) to 0.56 (post-college degree).

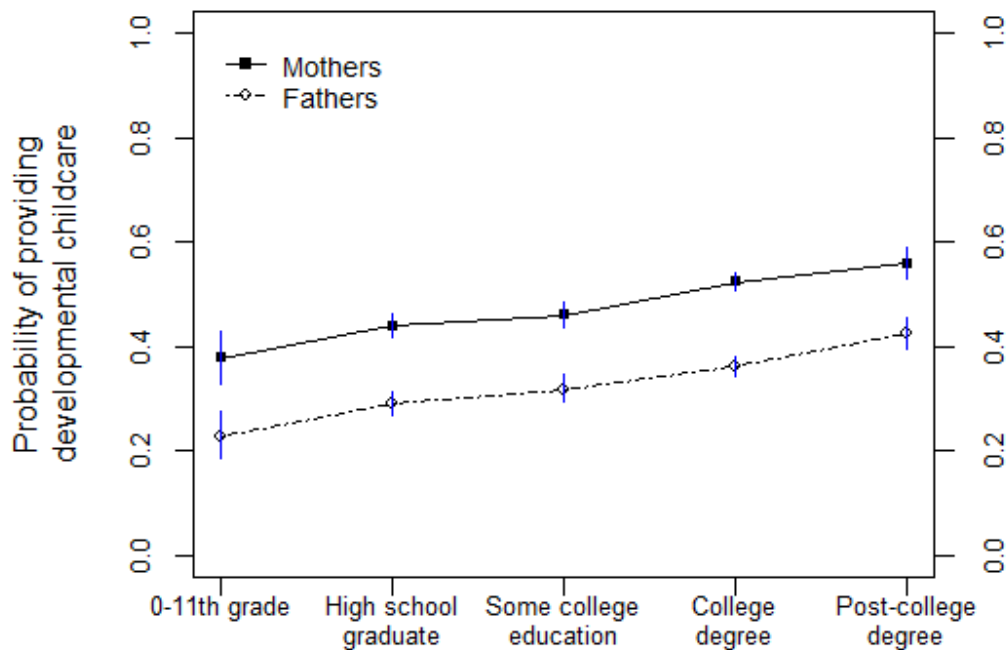


Figure 3.2 Predicted probability of providing developmental childcare by mothers and fathers

Note: The values of the quantitative variables are held constant at their medians; categories of categorical variables are assigned their sample proportions.

Next, the relationship between educational attainment and time spent in out-of-home care activities (such as attending children's events, picking up/dropping off children and waiting for/with children) is investigated. Children born to middle/upper-middle class families are expected to participate more in extracurricular activities compared to children born to working class parents. Hence, a positive relationship was hypothesized

between out-of-home care activities and the educational attainment of a parent. OLS results do show a positive and significant association between the educational attainment of mothers and time spent in out-of-home childcare (Table 3.6, Model 1), and this effect is largely robust to controls for parental and child characteristics. For example, all else equal, mothers with a college or post-college degree provide roughly 9 minutes more out-of-home care on a given day compared to mothers with no degree. Although this is not a very high number in absolute terms, given that the average time spent in basic childcare by all mothers is 23 minutes per day it corresponds to a relatively large difference.

Table 3.6 Mothers' and fathers' minutes spent in out-of-home childcare (OLS regression)

	Mothers		Fathers	
	Baseline reference model	Full model	Baseline reference model	Full model
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)
(Intercept)	13.13 ^{***} (1.13)	-27.18 ^{***} (6.81)	12.07 ^{***} (1.08)	1.07 (6.58)
0- 11th grade	-5.62 ^{**} (2.28)	-3.84 [*] (2.30)	-5.74 ^{***} (1.95)	-5.60 ^{***} (1.97)
High school graduate	-3.14 ^{**} (1.25)	-2.63 ^{***} (1.24)	-2.45 ^{**} (1.18)	-2.57 ^{**} (1.17)
College degree	5.66 ^{***} (1.13)	4.52 ^{**} (1.15)	0.29 (1.09)	0.36 (1.09)
Post-college degree	6.23 ^{***} (1.50)	5.33 ^{***} (1.55)	1.94 (1.30)	1.54 (1.32)
Age of youngest child		0.13 (0.15)		0.29 ^{**} (0.13)
Number of children <13		6.45 ^{***} (0.54)		3.29 ^{***} (0.49)
Full-time employed		-1.63 (1.00)		-5.48 ^{***} (1.57)
Part-time employed		0.47 (1.13)		-2.03 (2.52)
Spouse is not employed		-7.21 ^{***} (2.01)		-6.84 ^{***} (1.50)
Spouse is part-time employed		-4.85 ^{**} (1.97)		-5.19 ^{***} (1.53)
Spouse is full-time employed		-2.44 ^{**} (1.07)		-0.67 (1.43)
Age		1.55 ^{***} (0.39)		0.38 (0.34)
Age squared		-0.02 ^{***} (0.01)		0.00 (0.00)
Adj R	0.02	0.04	0.003	0.02

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

*p<0.10, ** p<0.05, ***p<0.01

In the case of fathers, the OLS results also support the hypothesis (Table 3.6). Although there is no significant difference in minutes of out-of-home care activities between fathers with some college education and those with a higher degree, fathers with a college or post-college degree spend significantly more time in out-of-home care activities than fathers with a high school degree or less (not shown in table). Similarly, according to the logistic regression results, there is no significant difference between the effect of having some college education and having a high school or college degree. However, fathers with a college degree or more are significantly more likely to report out-of-home care activities compared to fathers with a high school degree or less (Table 3.20). The magnitudes of coefficients are not large however. Moreover, there is no considerable increase in the predicted probability of parents providing out-of-home care (Figure 3.3).

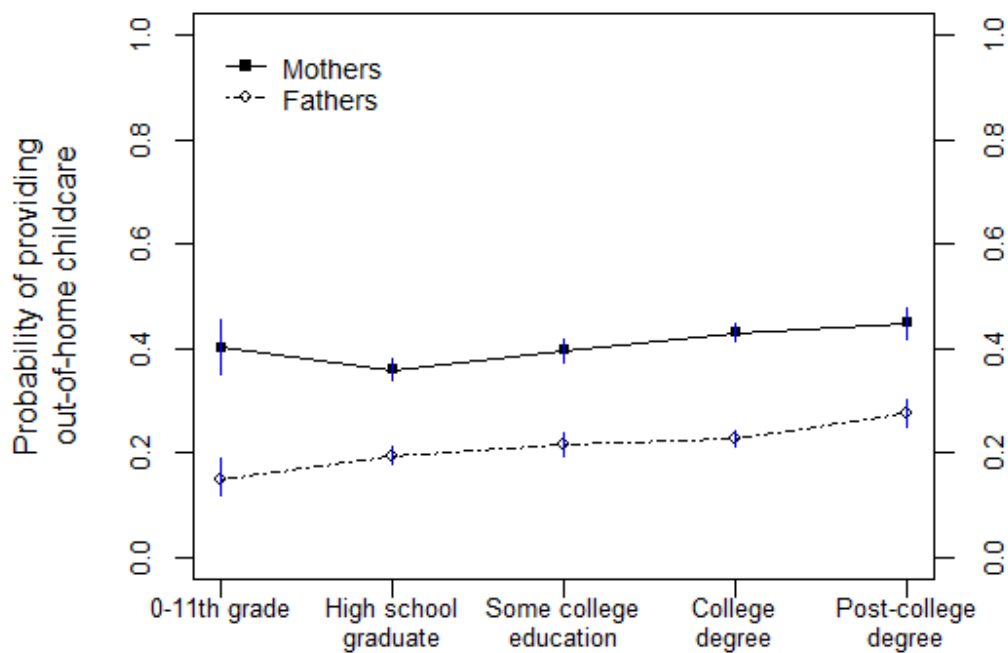


Figure 3.3 Predicted probability of providing out-of-home childcare by mothers and fathers

Note: The values of the quantitative variables are held constant at their medians; categories of categorical variables are assigned their sample proportions.

Next, predicted minutes spent in specific childcare activities by mothers and fathers based on gamma regression models are presented in Figure 3.4 and Figure 3.5.⁶⁵ Predicted minutes spent in basic and out-of-home childcare are relatively stable for mothers with different educational backgrounds. Predicted minutes in developmental childcare are, on the other hand, significantly higher for mothers with at least a college degree than for those with a lower educational attainment. A “typical” mother with no degree is predicted to provide 30 minutes of developmental childcare for her children, while the figure is approximately 41 and 47 minutes for mothers with a college and post-

⁶⁵ The models control for parental and child characteristics as specified in the *full models* presented so far (see Appendix B Table 3.21 and Table 3.22). Typical values are set to medians for quantitative variables and proportions of categories for categorical variables.

college degree, respectively. Note that the education-gap in developmental childcare is largest during the early years of childhood (not shown in table).

Predicted minutes spent in both basic and developmental childcare are noticeably higher for fathers with at least a college degree compared to those with a lower educational attainment, while predicted minutes in basic or developmental childcare do not vary for fathers with less than a college degree. It is also noticeable that, unlike mothers, fathers are predicted to provide more developmental childcare than basic childcare regardless of their educational attainment. As expected, the number of predicted minutes spent in the activities by mothers and fathers is also different. For example, a college-educated (“typical”) mother is predicted to provide 50 minutes of basic childcare on a given day; while the figure for a college-educated (“typical”) father is only 25 minutes. The corresponding difference in developmental care activities is approximately 10 minutes.

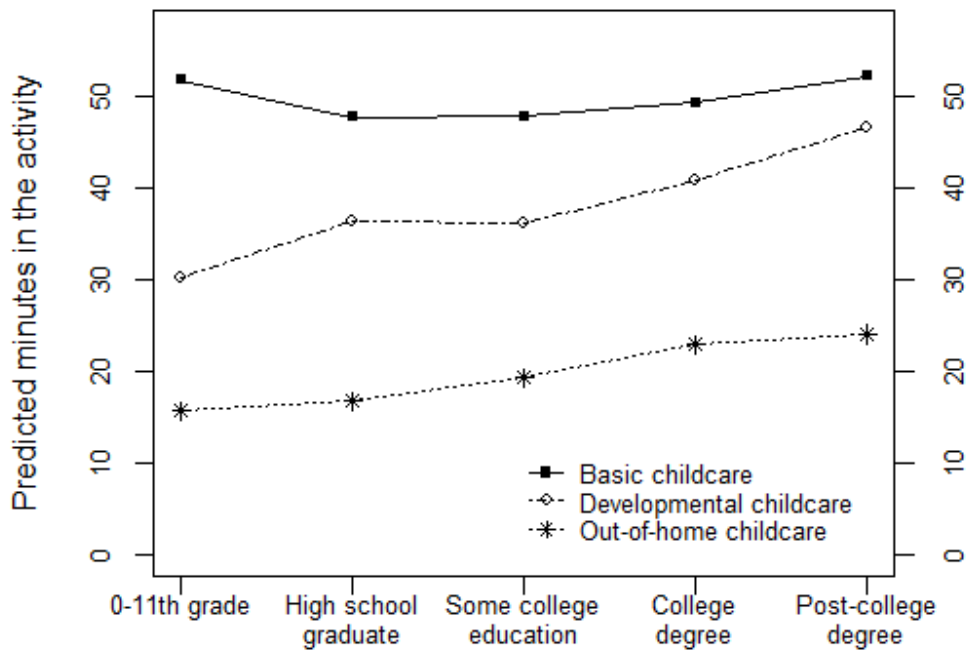


Figure 3.4 Predicted minutes in specific childcare activities by mothers
Note: The values of the quantitative variables are held constant at their medians; categories of categorical variables are assigned their sample proportions.

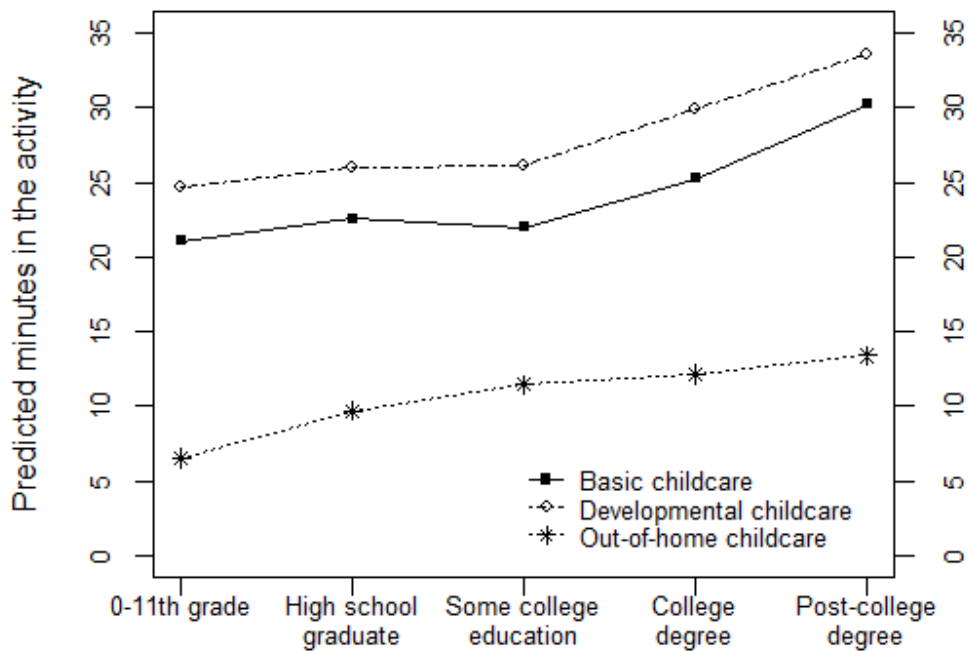


Figure 3.5 Predicted minutes in specific childcare activities by fathers
Note: The values of the quantitative variables are held constant at their medians; categories of categorical variables are assigned their sample proportions.

3.5.3 DECOMPOSING DEVELOPMENTAL CHILDCARE ACTIVITIES

As stated previously, in an analysis of diary data, decomposing time use activities into specific sub-categories has advantages and disadvantages (see Chapter 3 in this thesis for more on this point). On the one hand, it provides a more in-depth and comprehensive understanding of daily behaviour. On the other hand, since the window of observation is only a single day, as the activity gets more specific the percentage of respondents who have not engaged in this activity on a specific day increases, and we are left with less variation to explain. Excessive zeros make the investigation of variation in minutes spent in the activity less interesting.⁶⁶

However, since disentangling childcare into its sub-categories allows us to capture nuances in parenting behaviour, before concluding the investigation of specific primary childcare activities we further decompose developmental childcare into its sub-categories and test whether the expected positive relationship between education and specific developmental childcare activities hold for each component. We decompose developmental childcare into: *playing with children*, *school-related activities* and *reading to/talking with children*. For the stated reasons, we show results only from the descriptive analysis and logistic regression.

Table 3.7 shows the descriptive analysis of specific developmental childcare activities by parental education. Average time spent in playing with children increases as the educational attainment of a parent increases (with the exception of mothers with the lowest educational attainment). We see a similar trend in the average time spent in

⁶⁶ See Methods section in this chapter and Appendix A2 for more on this point.

reading to/talking with a child. Percentage of mothers who spend some time in reading to/talking with a child increases from 19 per cent to 35 per cent as educational attainment increases. Similarly, only 6 per cent of fathers with no degree report reading to/talking with their children on a given diary day, while the figure reaches 6 and 20 per cent respectively for those with a college and post-college degree.⁶⁷ There is, however, no trend between involvement in school-related activities and parental education. Preliminary analysis, therefore, suggests that the differences in time spent in developmental activities between high-and low-educated parents are mostly driven by high-educated parents' time spent in playing with children and reading to/talking with them.

⁶⁷ Note that these figures refer to reading to or talking with children as *primary childcare only*. Most daily talks, that likely take the form of a secondary activity, are not included here.

TABLE 3.7 Mothers' and fathers' average minutes in developmental childcare activities and percentages of diarist reported the activity

	Play with children			School related activities			Read/ talk to children		
	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	Mean (>0)
Mothers									
0-11th Grade	28	27%	104	7	13%	55	7	19%	37
High school graduate	24	21%	114	10	17%	56	8	21%	38
Some college	25	23%	107	11	18%	60	8	24%	34
College degree	28	28%	98	11	18%	58	11	31%	35
Post college degree	31	31%	102	11	19%	57	12	35%	34
All mothers	27	26%	104	10	18%	58	10	27%	35
Fathers									
0-11th Grade	17	15%	116	3	6%	54	4	6%	66
High school graduate	19	17%	110	4	7%	61	3	9%	32
Some college	20	20%	100	5	8%	62	4	12%	30
College degree	23	23%	99	4	7%	52	5	16%	31
Post college degree	24	25%	95	5	9%	52	6	20%	31
All fathers	21	21%	101	4	8%	56	4	14%	32

Note: Weights are applied to represent the population distribution accurately and to correct for distribution of the days of the week.

Tables 3.8 and 3.9 show the results of logistic regression models estimating mothers' and fathers' probability of providing a specific childcare activity. We control for parental and child characteristics in each model (as specified in previous *full models*), but coefficients of the control variables are not shown.

There is a positive association between maternal educational attainment and playing with children as well as reading to/talking with children. The association between education and reading to/talking with children is especially striking. Mothers' probability of reading to/talking with children on a given day increases substantially as their educational attainment increases. However, rather unexpectedly high-educated

mothers are not necessarily more involved in school-related activities compared to low-educated mothers. There is no significant difference among mothers with less than a college degree regarding their probability of playing with their children on a given day.

Table 3.8 Mothers' probability of providing specific developmental care activities (logistic regression)

	Play with children	School-related activities	Read to/talk with children
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
0- 11th grade	-0.17 (0.14)	-0.26 (0.17)	-0.28** (0.14)
High school graduate	-0.07 (0.08)	-0.08 (0.08)	-0.18** (0.07)
College degree	0.28*** (0.07)	-0.11 (0.08)	0.26*** (0.06)
Post-college degree	0.41*** (0.10)	0.01 (0.10)	0.43*** (0.08)

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown) as well as parental and child characteristics as specified in previous models (coefficients not shown). Reference category for educational attainment is *some college education*. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

As in the case of mothers, there is a significant positive relationship between fathers' probability of reading to/talking with their children and their educational attainment (Table 3.9). Compared to fathers with some college education, the odds of reporting some time in reading to/talking with children is 50 per cent lower for fathers with no degree. The figure is 30 per cent and 70 per cent higher for fathers with a college and post-college degree, respectively. Again similar to mothers, fathers do not significantly differ in their probability of being involved in school-related activities on a given day.

Table 3.9 Fathers' probability of providing specific developmental care activities (logistic regression)

	Play with children	School-related activities	Read to/talk with children
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
0- 11th grade	-0.31* (0.17)	-0.45* (0.26)	-0.71*** (0.24)
High school graduate	-0.11 (0.09)	-0.16 (0.14)	-0.30** (0.12)
College degree	0.11 (0.08)	-0.05 (0.13)	0.26** (0.10)
Post-college degree	0.27** (0.10)	0.20 (0.15)	0.54*** (0.11)

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown) as well as parental and child characteristics as specified in previous models (coefficients not shown). Reference category for educational attainment is *some college education*.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In summary, the results indicate that the main difference between high- and low-educated parents is high-educated parents' higher propensity to read to/talk with their children. This finding is in line with the ethnographic findings in Lareau's work where she claims that middle-class parents engage in long conversations with their children and are involved in activities that augment their child's linguistic skills. However, contrary to expectations, high-educated parents are not more likely to be involved in school-related activities compared to low-educated parents.⁶⁸

⁶⁸ As a robustness test, we replicated the analysis but limited the sample to parents of school-aged children (aged between 6 and 12 years). The results were very similar. Fathers with a post-college degree are more likely to report school-related activities than fathers with some college education or those with a high school degree. However, they are not significantly different from fathers with no degree. Similarly, fathers with a college degree do not significantly differ from fathers with a lower educational attainment in their probability of reporting school-related activities. Mothers with a high school degree are significantly less likely to be involved in school-related activities compared to high-educated mothers. However, there is no significant difference between mothers with the lowest educational attainment and those with a college degree or more.

3.6 RESULTS ON SPECIFIC PARENTAL ACTIVITIES DURING SECONDARY CHILDCARE

Two hypotheses were formulated regarding parental activities during secondary childcare. A positive association is expected between parental educational attainment and time spent in secondary childcare during out-of-home leisure activities, and a negative association is expected between parental educational attainment and time spent in watching television during secondary childcare. The first part of this section presents results from a descriptive analysis. It is followed by results from a multivariate analysis which allows us to test the hypothesized relationships while controlling for child and parent-related factors.

3.6.1 DESCRIPTIVE ANALYSIS

Average time spent in leisure activities while a child is in parental care increases as the educational attainment or household income of mothers (Table 3.10) and fathers (Table 3.11) increases. In the case of mothers, average time spent in leisure activities during secondary childcare is higher for richer and high-educated parents due to their higher propensity to report the activity, rather than the high number of minutes spent in the activity by participants. As shown in the third column of the first panel (Table 3.10), average time spent in the activity by participant mothers actually decreases as the household income or educational attainment increases. However, the percentage who report the activity increases by 15 per cent as we move from the lowest income and education levels to the highest. Similarly, the main source of the average increase in time spent in leisure activities during childcare is due to highly educated and financially better off fathers' higher participation rate.

The decreasing trends in time spent watching television while a child is in parental care is even more striking. As we move from respondents with the highest educational attainment to those with the lowest educational attainment, minutes spent watching television during secondary childcare almost triples for mothers (from 41 minutes to 117 minutes), and more than doubles for fathers (from 46 minutes to 101 minutes). High-educated parents not only participate less in the activity compared to those with a low educational attainment, but when they do report some time spent in the activity it is also considerably less. We observe similar trends between relative household income and time spent in watching television during secondary childcare. On average, financially better-off parents spend considerably less time watching television while a child is in their care compared to parents coming from poorer households. In brief, the descriptive analysis provides preliminary evidence for the hypothesized relationship. The next section investigates whether these trends hold in a multivariate setting.

Table 3.10 Mothers' average minutes spent in specific secondary childcare activities and percentages of diarist reporting the activity

	Leisure outside home			Watching television		
	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	Mean (>0)
Educational Attainment						
0-11th Grade	34	30%	113	117	66%	177
High school graduate	38	34%	113	92	63%	145
Some college	42	39%	107	73	58%	125
College degree	47	44%	106	56	52%	107
Post-college degree	49	46%	107	41	42%	99
Household income						
Lowest quartile	36	31%	114	91	60%	151
Second lowest quartile	43	40%	110	75	59%	127
Second highest quartile	45	42%	105	64	55%	117
Highest quartile	48	44%	107	53	50%	107
All mothers	44	40%	108	69	55%	124

Note: Survey weights are applied to account for sampling design and non-response.

TABLE 3.11 Fathers' average minutes spent in specific secondary childcare activities and percentages of diarist reporting the activity

	Leisure outside home			Watching television		
	Mean (all)	Per cent	Mean (>0)	Mean (all)	Per cent	Mean (>0)
Educational Attainment						
0-11th Grade	35	23%	148	101	57%	176
High school graduate	36	29%	125	88	55%	159
Some college	42	32%	130	81	53%	152
College degree	43	35%	125	63	48%	132
Post-college degree	50	38%	129	46	41%	114
Household income						
Lowest quartile	27	24%	112	91	52%	173
Second lowest quartile	40	33%	124	76	51%	151
Second highest quartile	42	32%	131	73	52%	141
Highest quartile	46	36%	129	61	47%	130
All fathers	42	33%	127		50%	143

Note: Survey weights are applied to account for sampling design and non-response.

3.6.2 MULTIVARIATE ANALYSIS

Table 3.12 contains the results of the OLS regressions estimating non-Hispanic white mothers' and fathers' minutes spent in out-of-home leisure activities while a child is in parental care. After controlling for parental and child characteristics, mothers with a college degree spend 10 minutes more time in the activity compared to mothers with no degree (7.21+3.21, $p<0.05$). The difference between mothers with the highest and lowest educational attainments is roughly 14 minutes (7.21+6.49, $p<0.005$). Compared to mothers with a high-school degree, those with a college and post-college degree spend 6 (3.21+2.86, $p<0.005$) and 9 (6.49+2.86, $p<0.005$) minutes more in the activity, respectively. Hence, the results show a significant difference between high- and low-educated mothers in their minutes spent in out-of-home leisure activities while a child is in parental care. In other words, mothers with a college or post-college degree spend significantly more minutes in the activity, compared to mothers with a high school degree or less.

In the case of fathers, both the baseline reference model and the model with full controls demonstrate a positive association between fathers' educational attainment and time spent in out-of-home leisure activities while a child is in their care, but the association is not significant for all levels of educational attainment. Fathers with a high school degree spend significantly less time in the activity compared to fathers with a college degree or more. However we do not observe such significant differences between fathers with no high school degree and those with a college or post-college degree. Similarly, fathers with some college education report fewer minutes spent in the activity compared to

those with a post-college degree, but not compared to fathers with a college degree. Hence, we conclude that the results provide weak support for the hypothesized association between leisure activities and fathers' education.

A series of logistic regressions were performed to estimate parents' probability of spending time in a leisurely activity during secondary childcare on a given diary day (Table 3.23, Appendix B). Both mothers' and fathers' probabilities of being involved in leisure activities during secondary childcare increase substantially as their educational attainment increases. For example, compared to mothers/fathers with a high-school degree, the odds of reporting the activity are approximately 32 and 52 per cent higher for mothers/fathers with a college and post-college degree, respectively (not shown in table). Hence, high-educated parents are more likely to engage in out-of-home leisure activities while a child is in parental care.

Table 3.12 Mothers' and fathers' minutes spent in leisure activities while child is in parental care (OLS regression)

	Mothers		Fathers	
	Baseline reference model	Full model	Baseline reference model	Full model
	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)
(Intercept)	75.31*** (2.19)	47.65*** (13.19)	85.15*** (2.81)	62.05*** (17.18)
0- 11th grade	-7.29 (4.42)	-7.21 (4.45)	-5.25 (5.08)	-4.77 (5.15)
High school graduate	-3.15 (2.42)	-2.86 (2.40)	-5.01 (3.06)	-5.30* (3.05)
College degree	4.99** (2.19)	3.21 (2.24)	2.18 (2.84)	2.19 (2.85)
Post-college degree	7.41** (2.90)	6.49** (3.00)	9.16** (3.38)	8.22** (3.45)
Age of youngest child		0.72** (0.29)		2.19*** (0.34)
Number of children <13		4.76*** (1.05)		7.74*** (1.28)
Full-time employed		-17.45*** (1.94)		-3.14 (4.10)
Part-time employed		-5.86** (2.18)		-3.60 (6.58)
Spouse is not employed		8.54** (3.90)		5.80 (3.92)
Spouse is part-time employed		13.20*** (3.81)		8.49** (4.01)
Spouse is full-time employed		15.21*** (2.08)		9.60** (3.74)
Age		0.64 (0.75)		-0.28 (0.89)
Age squared		-0.01 (0.01)		0.00 (0.01)
Adj R	0.06	0.09	0.10	0.11

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

*p<0.10, ** p<0.05, ***p<0.01.

Parents' time in watching television during secondary childcare is also investigated. The results are clear and consistent: there is a substantively large negative association between parental educational attainment and time spent in watching television while a child is in parental care. The relationship is robust to controls for parental and child characteristics. Compared to mothers with some college education, mothers with a post-college degree spend almost half an hour less time watching television during secondary childcare, while mothers with no degree spend almost half an hour more (Model 2). Similarly, fathers with a post-college degree spend approximately half an hour less time watching television during secondary childcare compared to the fathers in the reference category (Model 1 and Model 2). Parents' probability of spending some time watching television during secondary childcare also significantly decreases as their educational attainment increases (Table 3.24, Appendix B). In brief, the findings strongly support the hypothesized relationship between parents' time spent in watching television during secondary childcare.

There are also noteworthy gender differences. For example, having no degree is positively associated with watching television during secondary childcare for both mothers and fathers, but this association is significantly larger for mothers compared to fathers (not shown here). Similarly, compared to parents with a college degree those with high school degrees spend less time watching television during secondary childcare, and yet again the association is stronger for mothers. Some of these differences may relate to *relative* differences between mothers' and fathers' daily time use patterns, which are briefly examined in the following section.

Table 3.13 Mothers' and fathers' minutes spent in watching television while child is in parental care (OLS regression)

	Mothers		Fathers	
	Baseline reference model	Full model	Baseline reference model	Full model
	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)
(Intercept)	90.27*** (2.52)	136.76*** (15.22)	116.27*** (3.38)	150.80*** (20.61)
0- 11th grade	44.81*** (5.08)	37.15*** (5.13)	21.07*** (6.13)	15.06** (6.18)
High school graduate	19.49*** (2.78)	18.17*** (2.77)	7.18** (3.69)	6.84* (3.66)
College degree	-16.38*** (2.52)	-12.37*** (2.58)	-17.47*** (3.42)	-16.06*** (3.43)
Post-college degree	-31.18*** (3.34)	-23.97*** (3.46)	-33.70*** (4.08)	-31.22*** (4.14)
Age of youngest child		2.06*** (0.34)		1.60*** (0.40)
Number of children <13		-0.26 (1.21)		-2.22 (1.53)
Full-time employed		-22.79*** (2.24)		-51.94*** (4.92)
Part-time employed		-18.85*** (2.52)		-43.63*** (7.89)
Spouse is not employed		6.43 (4.50)		26.28*** (4.70)
Spouse is part-time employed		6.90 (4.40)		23.47*** (4.81)
Spouse is full-time employed		0.04 (2.40)		28.73*** (4.49)
Age		-1.68 (0.86)		-0.53 (1.07)
Age squared		0.01 (0.01)		0.00 (0.01)
Adj R	0.05	0.07	0.07	0.08

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

*p<0.10, ** p<0.05, ***p<0.01.

3.7 RELATIVE DIFFERENCES IN SPECIFIC CHILDCARE ACTIVITIES

Previous sections of the chapter discussed *absolute* differences in time spent with children. In other words, the focus so far has been on the variations in *minutes* spent in specific childcare activities by parental education. There is, however, another aspect of variation that has been under-researched in the literature: variations in *relative* time spent in specific childcare activities. For example, high-educated parents may be spending large amounts of time in developmental childcare either because they spend more time in primary childcare in total (in all childcare activities) or they allocate a higher proportion of their childcare time to developmental activities. Similarly, low-educated parents provide more secondary childcare while watching television, but we also know that low-educated parents watch more television in general (authors' calculation) and that they spend more time in secondary childcare (Chapter 2). In the light of such differences in absolute minutes spent in specific activities, an obvious question emerges: how do parents vary in their *relative* time allocated to specific childcare activities? To provide a detailed examination of relative differences in a multivariate setting is beyond the scope of this paper. However, we present some preliminary results that show that parents' relative time allocations to specific activities also vary by their educational attainment.

Table 3.14 shows the proportion of specific care activities that *participating* parents involve themselves in on a given diary day. To calculate these figures, we limited the sample to parents who reported at least one minute of total childcare time in a given

diary day. We then divide the minutes spent in a specific activity by total time spent in primary childcare.

Table 3.14 Mothers' and fathers' relative time spent in specific primary childcare activities

	Basic childcare	Developmental childcare			Out-of-home care
		Play with child	School-related activities	Read/talk to child	
Mothers					
0-11th Grade	57%	15%	4%	6%	17%
High school graduate	52%	13%	8%	7%	19%
Some college	52%	13%	7%	8%	20%
College degree	49%	13%	7%	9%	22%
Post-college degree	47%	15%	7%	10%	21%
All mothers	50%	14%	7%	8%	21%
Fathers					
0-11th Grade	46%	22%	8%	7%	17%
High school graduate	44%	22%	7%	6%	20%
Some college	44%	21%	7%	7%	20%
College degree	46%	23%	5%	8%	18%
Post-college degree	45%	21%	6%	10%	18%
All fathers	45%	22%	6%	8%	19%

Note: Survey weights are applied to account for sampling design and non-response.

High-educated mothers allocate a relatively smaller proportion of their total childcare time to basic care activities compared to mothers with a lower educational attainment. Instead, they spend relatively more time in out-of-home childcare and reading to/talking with their children. There is not much variation in the relative amount of time mothers spend in playing with their children or school-related activities. In the case of fathers, however, as their educational attainment increases the proportion of childcare time allocated to school-related activities mainly decreases, while the proportion of time spent in reading to/talking with children increases. Finally, although on average mothers spend more time in developmental care activities compared to fathers, fathers allocate a

greater proportion of their childcare time to such activities. More specifically, playing with children makes up more than one fifth of all paternal childcare time, while mothers only allocate 14 per cent of their total childcare time to playing with their children. This is in line with previous research on the US (Bianchi, Robinson and Milkie 2006) and on Australia (Craig 2006). Craig shows that mothers spend more time in interactive (developmental) childcare activities than fathers, but it makes up a lower proportion of their time. She concludes that fathers' contribution to "fun" childcare activities is higher, but it is the mothers who do the bulk of the work when it comes to routine or physical childcare. Similarly, in their examination of 2000 data from the National Survey of Parents, Bianchi, Robinson and Milkie (2006) conclude that fathers devote proportionately more of their childcare time to interactive activities. Our investigation of 2003-2008 ATUS confirms these findings.

Table 3.15 Mothers' and fathers' relative time spent in specific secondary childcare activities

	In proportion to total time in secondary childcare		In proportion to total time in the main activity	
	Watching television	Out-of-home leisure	Watching television	Out-of-home leisure
Mothers				
0-11th Grade	25%	6%	72%	71%
High school graduate	21%	7%	68%	61%
Some college	18%	8%	65%	62%
College degree	14%	10%	59%	57%
Post-college degree	11%	11%	55%	56%
All mothers	17%	9%	63%	59%
Fathers				
0-11th Grade	34%	9%	63%	45%
High school graduate	30%	10%	61%	48%
Some college	27%	11%	59%	50%
College degree	21%	12%	53%	47%
Post-college degree	16%	14%	49%	45%
All fathers	24%	12%	56%	47%

Note: Survey weights are applied to account for sampling design and non-response.

Table 3.15 presents relative time spent in secondary childcare activities by the educational attainment of parents. To calculate the figures in the first panel, we divided the minutes spent in specific activities (watching television or out-of-home leisure) during secondary childcare by total time spent in secondary childcare. The figures in that panel, therefore, show time spent in secondary childcare while watching television or engaging in out-of-home leisure *in proportion to total time in secondary childcare*. The panel on the right shows time spent in secondary childcare while watching television or engaging in leisure activities, *in proportion to total time spent in that particular activity*. For example, during 63 per cent of their television-watching time, mothers also provide secondary childcare for their children. Of all the time they spend

on secondary childcare, 17 per cent of it is spent watching television. The activity during which mothers provide secondary childcare the most is housework (not shown).

As the educational attainment of a parent increases, relative time spent in secondary childcare while watching television decreases both in proportion to total time spent in secondary childcare and in proportion to total time spent in watching television. Hence, the findings suggest that high-educated parents not only spend less time watching television during secondary childcare in absolute terms, but they also spend relatively less time in the activity. The explanation behind this may be related to middle class parents being more “TV-conscious” and avoiding watching television particularly when a child is in care. The relationship between educational attainment and absolute and relative differences in watching television during secondary childcare therefore goes in the same direction. However, that is not the case with out-of-home leisure activities during secondary childcare. As the educational attainment of mothers’ increases, relative time spent in secondary childcare during out-of-home leisure activities in proportion to total time spent in out-of-home leisure decreases.

3.8 SUMMARY AND DISCUSSION OF THE FINDINGS

This chapter presents a comprehensive empirical documentation of variations in parenting behaviour by educational attainment for non-Hispanic white parents in the US. Five hypotheses based on the theoretical framework provided by Lareau are tested. A summary of the hypotheses and findings for mothers and fathers are listed in Tables 3.16 and 3.17.

There is no significant difference between high- and low-educated mothers' minutes spent in basic childcare, although high-educated mothers are slightly more likely to report the activity compared to mothers with low educational attainment even after controlling for the age of their youngest child and their employment status. In the case of fathers the relationship between education and involvement in basic childcare activities is more pronounced. The effect of having a college or post-college degree on the probability of being involved in basic childcare is positive for both parents, but the effect is significantly larger for fathers than for mothers. For example, holding parental and child characteristics constant, when the reference category is having no degree the odds ratio of reporting the activity for college- (post-college) educated fathers is 0.57 (0.91) times higher than the corresponding ratio for mothers.

The differential effect of education on involvement in basic childcare highlights the importance of gender differences in parenting behaviour. Mothers, as the main care givers, provide substantial amounts of basic childcare for their children regardless of their educational attainment. On average, 75 per cent of mothers report at least one minute of basic childcare on a given diary day. However, more than half of fathers do not provide any basic childcare on a given day for their children (52 per cent). As argued in previous research, high-educated fathers are more likely to endorse/accept gender egalitarian norms compared to low-educated fathers, and hence they contribute more to domestic labour (Coltrane 2000). Accordingly, fathers' involvement in basic childcare, which is the most routine and least rewarding form of care, is likely influenced by their gender ideology. The stronger effect of high-education on fathers' contribution to basic

childcare partially reflects well-educated fathers' relatively more gender egalitarian perspective.

Another indication of gendered parenting behaviours is the variations in the relative time spent in specific childcare activities. On average, mothers spend more time in both basic and developmental childcare activities, but fathers also allocate a relatively higher proportion of their total childcare time to developmental care activities, in particular playing with children.

Following the theoretical background of Lareau, a positive association was hypothesized between parental educational attainment and involvement in developmental and out-of-home childcare. We tested this hypothesis by investigating the relationship between parental educational attainment and minutes spent in the activity, as well as parent's probability of providing the activity on a given diary day. Based on the results we conclude that, although the difference is not very large for out-of-home childcare, mothers with a college degree or more provide more developmental and out-of-home care for their children compared to mothers with less than some college education. In the case of fathers, while there is no significant positive association between minutes in developmental care and education, the probability of providing some developmental care on a given day significantly increases as the educational attainment of fathers' increases. In fact, logistic regression results showed a significant and positive association between fathers' educational attainment and all three forms of specific primary care. High-educated fathers have a higher propensity to provide some basic,

developmental or out-of-home childcare for their children. Yet, this higher likelihood of providing the activity does not necessarily lead to significant differences in minutes spent in the activities.

A detailed analysis of developmental care activities reveals that high-educated parents are particularly more likely to read to/talk with their children on a given day, but they are not more involved in school-related activities. The absence of any relationship between parental education and involvement in school-related activities is surprising. There are several possible explanations for it. First, Lareau observes that low-educated parents value education and do their best for the academic success of their children despite limited resources. Accordingly, they may be spending time for their children's school-related activities, possibly more than they were given credit for in the ethnographic work of Lareau. Second, school involvement might be more demand-driven in comparison to other childcare activities. To put it more explicitly, parents who have children with school-related problems (e.g. learning difficulties) may feel the need to be involved in school-related activities more than others. For example, teachers may be calling them to school more often to discuss their children's behavioural problems or learning difficulties. Such children may ask for help with their homework more often. This then brings us to the question of why children coming from less-advantaged households have more difficulty in school despite their parents' involvement. Children coming from poor (and minority) families are more likely to experience residential instability, attend segregated schools with poor physical conditions, be exposed to negative teacher bias, have a lack of helpful social networks and to grow up in

disadvantaged neighbourhoods (Ainsworth 2002; Condron 2007, 2009; Downey and Pribesh 2004; ICP 2009). All of these factors may simultaneously lead to academic difficulty and call for more intense parental involvement. Additionally, affluent parents are likely outsourcing some of their school-related activities in a direct or indirect manner via for example private tutoring, extra classes in school, lower teacher-student ratios in the classroom (which allows children to have more one-to-one time with teachers) and other extracurricular activities which are not necessarily directly school-related but still help children to further develop the skills needed to be successful in school. Finally, other parental activities can be a substitute for school-related help. For example, a large body of literature highlights the importance of strong parent-parent and parent-teacher relationships regarding children's school outcomes (see Ream and Palardy 2008 for a review). As suggested by Lareau (2003), affluent and well-educated parents may be more successful in utilizing their parent-parent and parent-teacher social capital to the advantage of their children, providing another form of support that children born to less-advantaged households do not receive. Also, as shown in this study, high-educated parents are significantly more likely to read to/talk with their children on a given diary day. It should be highlighted that talking with children here refers to a primary activity, where the main centre of attention is the child, and the parent is primarily involved in communicating/discussing with him/her. One direct effect of such an activity is language development. A classic study by Hart and Risley (1995) shows the significance of quality parent-child interaction in the first three years of childhood for predicting vocabulary growth and IQ of children in later ages. Their research concludes that the vocabulary gap created in the first three years cannot be

closed by external help in later ages. The better linguistic skills of middle-class children may give them an advantageous start in school and decrease the need for parental help in homework, class exercises, etc. To investigate the reason behind the class differentials in educational attainment and achievement of children is beyond the scope of this study; however, we do provide strong empirical evidence that the lower educational achievement of children coming from less-advantaged households cannot be attributed to their parents lesser involvement in school activities.

Finally, the results give very strong and consistent support for the hypothesized negative relationship between educational attainment and time spent watching television while a child is in parental care. Holding other factors constant, high-educated parents spend substantially less time watching television during secondary childcare. Moreover, the descriptive analysis also shows they spend relatively less time watching television (during secondary childcare). However, high-educated parents do spend more time in out-of-home leisure activities with their children than parents with a low educational attainment: better educated parents are more likely to report leisure activity outside home while a child is in their care. This despite the fact that they spend relatively less leisure time during secondary childcare. In brief, the chapter presented significant variations in parental time spent in specific childcare activities in both absolute and relative terms for non-Hispanic white parents in the US.

Table 3.16 Summary of hypotheses and findings for mothers' time spent in specific childcare activities

	OLS regression results	Logistic regression results
H. 1A: High -educated mothers do <u>not</u> significantly differ from low-educated mothers in their involvement in basic childcare activities.	Mostly supported. Mothers with a post-college degree provide more basic care than mothers with some college education, but not those with no degree.	Not supported. High-educated mothers are more likely to report the activity than low-educated mothers.
H. 2A: High-educated mothers are more involved in developmental childcare than low-educated mothers.	Supported.	Supported.
H. 3A: High-educated mothers are more involved in out-of-home childcare than low-educated mothers.	Supported.	Partially supported. Mothers with no degree do not spend significantly less time in the activity compared to high-educated mothers.
H. 4A: High-educated mothers do more leisure activities while their child is in parental care compared to low-educated mothers.	Supported	Supported
H. 5A: High-educated mothers watch less television while their child is in their care compared to those with low-educated mothers.	Supported.	Supported.

Table 3.17 Summary of hypotheses and findings for fathers' time spent in specific childcare activities

	OLS regression results	Logistic regression results
H. 1B: High-educated fathers do not significantly differ from low-educated fathers in their involvement in basic childcare activities.	Partially supported. High-educated fathers spend more time in basic childcare than fathers with some college education or a high school degree, but they don't significantly differ from those with no degree.	Not supported. High-educated fathers are more likely to report the activity than low-educated fathers.
H. 2B: High-educated fathers are more involved in developmental childcare than low-educated fathers.	Not supported. Fathers with a college degree do not significantly differ from those with a lower educational attainment.	Supported.
H. 3B: High-educated fathers are more involved in out-of-home childcare than low-educated fathers.	Supported.	Supported.
H. 4B: High-educated fathers do more leisure activities while their child is in parental care compared to low-educated fathers.	Partially supported. Fathers with a high school degree spend significantly less time than those with a higher education, but there is no significant difference between fathers with no degree and high-educated fathers.	Supported.
H. 5B: High-educated fathers watch less television while their child is in their care compared to low-educated fathers.	Supported.	Supported.

3.9 CONCLUDING REMARKS FOR CHAPTER 2 AND CHAPTER 3

The research objective of the first part of this thesis (Chapter 2 and 3) was to investigate variations in parenting behaviour by educational attainment and to document inequalities in parental time investment. Chapter 2 shows that parents with a higher educational attainment are more likely to provide primary care for their children. In other words, they tend to spend more “active and involved” time with their children, time during which a child is the main centre of attention. This first set of findings, therefore, provide some support for Lareau’s theory and highlight the problem of inequality in parental time investments and transmission of *parental (dis)advantages* to children.

The decomposition of primary childcare into sub-categories (Chapter 3) reveals further discrepancies between high- and low-educated parents’ childcare patterns. High-educated mothers are more likely to provide developmental and out-of home childcare, while they spend significantly less time watching television (in both relative and absolute terms) during secondary childcare. Similarly, fathers’ involvement in childcare activities is strongly linked to their educational attainment, although there are some variations in the way education operates for fathers’ parenting practices. The findings, therefore, provide some support for Lareau’s theory that middle-class parents are more likely to be involved in parenting practices that augment children’s cultural capital and put them in an advantageous position both in school and later in the labour market, practices such as reading to children, engaging in long conversations with them, organizing extracurricular activities, etc..

There is, however, a limit to what extent one can empirically document the transmission of cultural capital from parents to children with the available time use data. For a start, infrequent activities are not captured well enough by single day diaries. Activities such as visiting a museum or going to the theatre with children would also be particularly good indicators of the transmission of cultural capital, but because the observation window is very short they are rarely observed in the data. Therefore, they, along with other activities, were agglomerated into the out-of-home leisure category. Second, the data does not allow us to measure the specific contents of activities, which would be very informative. For instance, the data records whether a parent reads to or talks with or watches television with a child and if so for how long, but it does not tell us what she talks about nor reads nor what kinds of programmes she watches on television. Third, the data does not provide detailed information on secondary childcare activities. This is problematic particularly because most of communicative interactions such as discussion take place in the form of secondary activities.

Furthermore, some strong propositions of Lareau's theory have to be left untested due to other data limitations. For example, she states that some parents use their informal social networks to acquire valuable information about their children's school life or extracurricular activities. Time use data does not provide information on respondents' social network or for what purposes it is used. Moreover, the data does not contain information on children's behaviour, though one of the main features of *concerted cultivation* is children's time in extracurricular activities. We tried to capture this aspect

indirectly by using parents' time spent in out-of-home childcare activities or leisure activities while a child is in parental care. The findings were largely in line with the theoretical expectation. Recent research also show that high-income parents are more likely to spend a higher proportion of their income on extracurricular activities (Kaushal, Magnuson and Waldfogel 2011), and participation in organized activities among children aged between 6 and 12 years is strongly and positively related to social class (Lareau et al. 2011). ATUS does not allow us to confirm these findings directly since it does not collect "child" diaries. Despite such limitations, the first part of this thesis provides detailed evidence that there are significant discrepancies between the daily parental behaviour of working class (low-educated) and middle class (high-educated) children which likely contribute to childhood inequalities. It should, however, be highlighted that the empirical evidence provided in this study is for non-Hispanic white parents only and further research is needed to investigate the association between parental education and time spent with children for non-white parents.

Although the importance of *class* in shaping daily parenting behaviour is largely confirmed by this research, other significant intervening factors are also identified, which then cast doubt on the theoretical link between parental resources and parenting practices that are isolated from gender, family structure and time availability. For example, parental *time availability* stood out as an important factor in predicting parental time investments above and beyond educational attainment (and household income).⁶⁹ There are several findings that support this claim. First, irrespective of their

⁶⁹ *Time availability* perspective states that the division of labour is based on the availability of partners to participate in housework and childcare. A partner who has more competing demands on his/her time

educational attainment or financial resources, employed parents spend far less time with their children. Second, this gap gets substantially smaller on a weekend day compared to a weekday (not shown). Third, having a full-time employed spouse increases parents' childcare time on weekdays, which again ceases to have any substantial effect on weekends (not shown). In brief, time must be taken into account as a significant parental resource on its own, at least as important as educational attainment or financial resources. Of course, how *time* is distributed, shared or used by mothers and fathers is strongly linked to prevailing gender norms in society. Our research clearly shows that the importance of *gender* cannot be underestimated in any analysis of parental behaviour. Not only are there significant variations in parenting behaviour by gender, but also the effect of class does not always operate similarly for mothers and fathers (unlike the implicit assumption in the theoretical framework of Lareau). The findings from both Chapters 2 and 3 show that the effect of education on time spent in childcare activities is often, if not always, different for mothers and fathers. Hence, we conclude that the theoretical framework provided by Lareau is limited in its propositions about/understanding of the interaction of gender and class.

spends less time in household tasks. Previous research operationalized *time availability* as the employment status of partners (Coverman 1985), paid work hours (Bianchi 2004), the spouses work schedule (Presser 1994), number of children (Kamo 1991) or a combination of those (Bianchi et al. 2000). The empirical results are mixed. On the one hand, there is a negative association between women's time spent in paid work and in childcare; yet on the other, women continue to spend more time in childcare than men regardless of their paid work time. Furthermore, given that both employed and non-employed mothers increased their childcare time in the last four decades, this points to a set of factors other than *time availability* affecting parents' tendency to invest time in their children (Gauthier, Smeeding and Furstenberg 2004).

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CHAPTER 4: CHANGES IN THE EFFECT OF EDUCATION ON PARENTS' TIME INVESTMENT (1965-2010):

ABSTRACT

Past research has consistently shown that average time spent in primary childcare by mothers has increased substantially in recent decades. However, little is known about how this increase is distributed among parents with different educational attainments. Do children born into different socio-economic classes receive more equal time investments from their parents; or is the distribution of parental time getting more and more unequal? In this chapter, the 1965-2010 American Heritage Time Use Study is used to answer this question. The change in the effect of education on time spent in primary childcare by non-Hispanic white mothers is investigated. The results show that there has been a widening gap in parental time investments between high-educated and low-educated mothers during this period. The main source of the widening gap in maternal care is the steady increase in high-educated mothers' time spent in developmental care, rather than in basic childcare. Children born into disadvantaged households not only receive fewer economic resources but also less parental time investment compared to those who are born in better-off households.

4.1 INTRODUCTION

There is a significant variation in parental time investments among non-Hispanic white parents in the US. High-educated parents provide more primary childcare for their children than low-educated parents (Chapter 2). The discrepancy is particularly acute between highly-educated, married parents (typically more affluent, older and having few children) and low-educated, single mothers (typically poorer, with a greater number of children and often having to combine long working hours with childcare) (Monna and Gauthier 2008; Sayer, Bianchi and Robinson 2004). Despite these cross-sectional differences, a clear temporal trend has been observed: the last few decades have witnessed an increase in average childcare time spent by parents in the US. In light of this, a natural question emerges: are the *differences* documented above decreasing, persisting, or increasing over time? Previous research on childcare trends has suggested the possibility that “the average increase might be masking greater heterogeneity among parents than in the past” (Sayer, Bianchi, Robinson 2004: 32), but this possibility has gone unstudied. A recent review of the literature highlights the absence of research on the issue and calls for a more in-depth investigation of the “concealed polarisation of families in terms of time spent with children” (Monna and Gauthier 2008: 647). This chapter fills this gap in the literature by disaggregating average childcare time provided by mothers. Specifically, we investigate whether the gap in childcare between high-educated (college or more) and low-educated (no college degree) non-Hispanic white mothers has increased from the 1960s-70s to the 2000s.

The theoretical framework of this chapter is based on the works of Lareau (2003) and Hays (1996). Starting from the early 1990s, the dominant child-rearing advice in

the US has been very child-centred and required parents to provide considerable time investments to their children (Hays 1996). Although this ideal has been accepted in all segments of society, affluent and well-educated mothers are most likely to put this expensive and time-consuming ideal into practice (Lareau 2003). Accordingly, a substantial increase in mothers' care time starting from the 1990s can be particularly pronounced for highly educated mothers.

This chapter concentrates on the changing effect of *mothers'* educational attainment on *maternal care*. Although we report a summary of the findings for fathers at the end of the chapter (section 4.8), our major focus here is on mothers. This shift in focus is due to data-related and theoretical reasons. The work of Hays (1996) and her conceptual contribution (*intensive mothering*) forms the theoretical background of this empirical investigation, and is a background limited to mothers only. Furthermore, a thorough investigation of the changing effect of education on fathers' time spent with children would require incorporating non-residential fathers, which is not possible with the available data. Hence, a summary of the findings on the changes in the effect of educational attainment on paternal care for (largely) residential fathers is presented in the final section, but the major focus of this chapter is on mothers.

In line with theoretical expectations, the results show that, although all mothers spend more time with their children in the 2000s compared to earlier periods, high-educated mothers have increased their primary childcare investment at a faster rate. The main source of the widening gap in total childcare time is high-educated mothers' increased involvement in developmental childcare activities rather than

basic childcare. Beginning in the 1990s, the marginal effect of being highly educated on developmental care activities has increased substantially. The overall increase in primary childcare therefore conceals a significant and increasing polarization by mothers' education level.

4.2 CONCERTED CULTIVATION IN A HISTORICAL CONTEXT

In her ethnographic work, Lareau (2003) shows that middle-class and working-class mothers in the USA have different child-rearing strategies (See Chapter 2 in this thesis for a detailed review). Middle class parents engage in a specific child-rearing practice, namely *concerted cultivation*. Parents who pursue *concerted cultivation* try to improve their children's social and cognitive skills deliberately and use all the resources at their disposal to that end, particularly financial resources, social networks, cultural capital and time. *Concerted cultivation* as a child rearing strategy resonates strongly with the cultural ideal of *intensive mothering*, which is an “expert-guided, expensive, labour-intensive and time-consuming child-rearing practice” (Hays 1996:8).⁷⁰ Note that while Lareau is interested in the *behavioural* patterns of *parents*, Hays' focus is on *ideals* about *mothering*.

According to Hays (1996), there is a prevalent child-rearing *ideology* in contemporary America which necessitates substantial time and money investment, and requires constant emotional, physical and mental energy.⁷¹ That has not always been the case. At the beginning of the 20th century, dominant child-rearing advice was not as child-centred as today. In fact, the “explicit goals of child-rearing were

⁷⁰ The sampling frames of the two studies differ. In Hays' research, the sample is *mothers* of children aged 2 to 4 years, while Lareau's sample is composed of *parents* with school-aged children.

⁷¹ See also Caputo (2007) for Canada and Vincent and Ball (2007) for the UK.

centred on the good of the family and the nation” (Hays 1996: 45, rather than on the child’s needs and desires. The idea that a “good mother” must devote a substantial amount of time, money and energy to foster children’s cognitive and social development is therefore a fairly new phenomenon without historical precedence. With roots tracing back to the 1940s, this paradigm only gained cultural traction beginning in the 1990s with best-selling child-rearing manuals, family magazines and experts on TV distributing the idea of the “right way of parenting” to all segments of society in the US. By the end of the 1990s, the ideal of *intensive parenting* was widely accepted. Spending some amount of “quality time” with children was no longer enough. Parents were required to provide ample, one-to-one childcare time for their children not only for children’s psychological health but also to stimulate cognitive development (Wall 2010). The ideal of *intensive mothering* was reinforced by the findings from child development research that emphasized the importance of parental involvement in a child’s well-being.

Although *intensive mothering* is now widely accepted as *the* appropriate way of child rearing, not all mothers can afford it. Low-educated parents have a much harder time adopting this norm, either because of a lack of free time, or a lack of human capital and resources. As the gap between the resources of high- and low-educated parents has increased over time, their ability to act in line with parenting ideals has also differed. This expensive and time consuming child-rearing ideal, as widespread as it is, remains a middle-class practice in reality (Lareau 2003).

4.3 PREVIOUS RESEARCH ON CHILDCARE TRENDS

Past research consistently shows that high-educated parents spend more time in primary childcare compared to low-educated parents (Leibowitz 1974; Guryan, Hurst and Kearney 2008; Hill and Stafford 1985; Monna and Gauthier 2008; Sayer, Gauthier and Furstenberg 2004; Chapter 2 in this thesis). Despite voluminous cross-sectional studies on the effect of parental education on primary childcare, research on how the effect of education has changed over time is limited and provides mixed findings. There are only three studies that investigate class-based trends in *mothers'* childcare in a multivariate setting with time diary data. Further, with the single exception of Ramey and Ramey (2010) there is no research on class-based changes in specific childcare activities over time.⁷²

Examining the time use patterns of married/cohabiting fathers and mothers between 1985 and 2003, Chalasani (2007) argues that, although all parents have increased their time spent in primary childcare, better educated parents have increased it more than less-educated parents. In his decomposition analysis, Chalasani shows that only a very small portion of this average increase can be attributed to demographic changes during the period. The author puts forward two possible explanations for the observed increase: first, because high-educated parents saw a greater increase in their disposable income compared to low-educated parents during the period, they can “buy” differentially more free time relative to less-educated parents. For example, by out-sourcing housework high-educated parents are able to spend more time with their

⁷² Sullivan (2010) investigates the trends in the housework and childcare time of fathers between the 1970s and the 2000s in the UK and the US. The analytical sample of the study is limited to married men in dual-earner couples with a dependent child under the age of 18 years. She finds that high-educated fathers increased their time spent in childcare at a faster rate compared to low-educated fathers, which leads to a widening education gap in fathers' time spent in childcare.

children. Second, as also argued in this thesis, high-educated parents are following a parenting ideal which prescribes significant time investments in children.

Ramey and Ramey (2010) investigate trends in primary childcare for parents between 1965 and 2008, and report an increasing effect of having a college degree in the 2000s compared to 1975. Among the different childcare activities, the greatest increase is observed in the general care of older children. In the same paper, the authors also provide a detailed investigation of the 2003-2008 American Time Use Survey, where they observe a significant difference in time spent in educational activities and chauffeuring children between high- and low-educated parents whose youngest child is aged 5 years or older. According to the authors, the driving motive behind high-educated parents' increased time investment in older children and their extracurricular activities is to increase their children's chances of admission to an elite college.

In another study, Sullivan (2011) investigates the changing effect of education on men's and women's domestic work between the 1970s and the 2000s for dual-earner couples. The author reports an almost 200 per cent increase in primary childcare between 1975 and 2003 in the US for employed women with at least a high school degree. In the corresponding period, those with no high school degree increased their childcare by about 11 per cent. The study shows a growing gap in predicted minutes in primary care between high-educated women and those with a lower educational attainment. Among the possible explanations for the disproportionate increase in childcare by high-educated employed women is the growing "perception and

salience of childcare” felt strongly among this group of women (2011: 25). This explanation is in line with the theoretical framework provided earlier in the chapter.

In an earlier study, however, Bianchi et al. (2004) found no evidence that having a college degree in 2000 explained greater time spent in childcare than it did in the 1970s. This being said, there are certain reasons to be sceptical about the findings in their paper. The authors neither use weights nor controls for diary completion day to correct for the disproportionate number of diary days in the surveys. This is likely to be problematic because, for example, more than one fifth of mothers in their 1975 sample completed diaries on a Sunday. Also, their analysis suffers from two potential problems: one is the inclusion of employment status and weekly working hours, which induces post-treatment bias in the estimated effect of education; and the other is the potential endogeneity due to calculating weekly working hours from time use activities on a sampled day. Still, unlike the previous three studies, the results in this paper show no empirical support for the claim that college/non-college differentials have significantly changed over time.

In brief, previous research provides mixed findings on the changing effects of educational attainment over time. The studies vary in their period of interest, statistical techniques and surveys/sources of data. However, in all these studies, the samples include both white and non-white respondents with no proper controls for race or ethnicity. As also stated by Ramey and Ramey (2010), non-white mothers spend less time in primary childcare and are more likely to be low-educated (author’s calculation). The effects of having a college degree are therefore likely to be overestimated. Moreover, since the proportion of non-white respondents in surveys

has increased substantially from 1965 to the 2000s, omitting race likely biases the estimates.

In their comprehensive study on childcare trends, Sayer, Bianchi and Robinson (2004) provide thorough evidence that average time spent in primary childcare has increased substantially between 1965 and 2000 (see also Bianchi, Robinson, Milkie 2006; Sandberg and Hofferth 2001, 2005).⁷³ Common to these studies is the conclusion that the main reason behind the increased time spent in childcare is *not* the changes in the demographic composition of mothers but shifts in maternal behaviour. In fact, the negative effects of compositional changes are offset by substantial changes in the behavioural patterns of mothers. However, that does not necessarily mean that all mothers changed their behaviour similarly. Since high-educated parents possess the necessary resources to shift their behaviour patterns in line with contemporary parenting ideals (Coltrane 1996; Hays 1996), the observed increase in average time spent in childcare may be masking a significant polarization between high- and low-educated parents' time investment (Sayer, Bianchi and Robinson 2004).

4.4 RESEARCH FOCUS

The ethnographic study of Hays (1996) and Lareau (2003) sets the historical and theoretical framework of this chapter, while the empirical work of Sayer, Bianchi

⁷³ Similar trends are observed in other industrialized countries. Between the 1980s and the 1990s, both fathers' and mothers' time spent in childcare increased in the Netherlands (Sayer, Bianchi and Robinson 2004), Canada (Gauthier, Smeeding and Furstenberg 2004; Zuzanek 2001), the UK (Sayer, Bianchi and Robinson 2004) and Australia (Bittman 1995, 2004). The only exception is Sweden where parental time has declined between 1984 and 1993 (Klevmarken and Stafford 1997). The results from Gershuny's (2000) analysis of 20 countries and Gauthier, Smeeding and Furstenberg's (2004) analysis of 16 countries also confirm the trends in increased childcare time, especially since the 1980s.

and Robinson (2004) motivates our investigation of heterogeneity over time. We expect to see a positive trend in average time spent in primary children for all mothers in the last four decades. However, in line with the theoretical framework, a shift in parenting towards heavy investments in children is expected to be concentrated among more educated parents. Additionally, the education gap in parental time investments is expected to increase beginning in the 1990s since this is when social norms regarding “good parenting” that require immense time and financial investments spread widely. In line with these expectations, the first part of this chapter tests the following hypotheses:

HYPOTHESIS 1A: Mothers’ time spent in primary childcare is significantly greater in the 1990s and the 2000s than before.

HYPOTHESIS 1B: High-educated mothers have increased their primary childcare time at a faster rate compared to low-educated mothers.

Any increase in primary childcare is expected to be driven mostly by an increase in developmental childcare activities, i.e. those activities that would be more likely to be practiced as an effort to increase children’s social and cognitive skills. This leads to the second hypothesis:

HYPOTHESIS 2: High-educated mothers have increased their developmental childcare activities at a faster rate than low-educated mothers.

After testing these hypotheses in a multivariate setting, predicted probabilities of providing childcare by mothers of various demographic characteristics in the 1960s, 1970s, 1990s and 2000s are presented in order to portray the extent of inequalities in

parental investments that children born to various households have received during different time periods.

4.5 DATA AND SAMPLE

4.5.1 DATA SPECIFICATION

The data used in this study come from the American Heritage Time Use Study (AHTUS), which is a harmonized data set for American time use surveys conducted in 1965-66, 1975-76, 1985⁷⁴, 1992-94, 1994-1995 and 2003-2010.⁷⁵ All the surveys in AHTUS employ time diary methodology: that is, the respondents are asked to report their activities sequentially on a given diary day in their own words. Total minutes spent in specific activities by diarists are then summed up and coded in their relevant activity categories. AHTUS is the only harmonized time use data set permitting the examination of trends in people's time use in the US since the 1960s.

Differences in the mode of data collection and sampling frame of the surveys raise some issues regarding the comparability of the surveys in the dataset.⁷⁶ The 1965-66 survey, the oldest national time use survey in the US, was conducted as a part of the Multinational Time Budget Research project, and is not nationally representative. The 1965-66 sampling frame excludes farm households and is limited to respondents ages 19-65 years and living in households where at least one adult member worked in an industry other than agriculture (Fisher, Altintas and Gershuny 2010). The sample was collected from 44 largely urban census districts (Szalai 1972). The 1965-

⁷⁴ The population of interest in this research is non-Hispanic white mothers. The 1985 data does not have information on the race of respondents, and therefore was excluded from the analysis.

⁷⁵ The American Heritage Time Use Study, release 4 (January 2011), was created at the Centre for Time Use Research, United Kingdom, by Kimberly Fisher, Evrim Altintas, Muriel Egerton and Jonathan Gershuny, with Nuno Torres and Andreas Pollmann, and contributions from Anne H. Gauthier and John Robinson. More information on the data and data downloads are available at: <http://www.timeuse.org>

⁷⁶ See Appendix C at the end of this chapter for a detailed data description.

66 survey also differs from the other surveys in its activity recording period. All the analysed surveys other than 1965-66 cover the previous 24 hours, but the 1965-66 survey collected *tomorrow diaries*. In a two-stage tomorrow approach, diaries are left with respondents one day prior to the sampled day. After respondents complete the diary on the sampled day, diaries are collected on the subsequent day. In other surveys, respondents record time spent in activities for the previous 24 hours. Given the problems with sampling frame and the major difference in diary administration method, caution is advisable when interpreting 1965-66 results.⁷⁷

1975-76 contains nationally representative panel data where the same respondents were surveyed over four waves within a year. Although previous studies that used this survey tend to limit their analysis to the first wave only (e.g. Bianchi et al. 2004; Sayer, Bianchi, Robinson 2004), in this chapter data from all four waves is used because: (i) the first wave of the survey collects only autumn activities, but the four waves span a whole year and so account for potential seasonal variation; (ii) excluding the follow-up waves makes it harder to correct for the oversampling of weekdays or weekends because the proportion of days collected during different waves varies and; (iii) using four waves yields a considerably higher number of diary days. Hence, we utilize the full sample in the 1975-76 survey and account for the repeated observations with clustered standard errors.⁷⁸ The 1975-76 survey also collected diaries from spouses, but we only use the main respondent diaries to

⁷⁷ Previous studies compared time use from 1965-66 both to a sub-sample of 1975-76 matching characteristics of the 1965-66 sample and to the full 1975-76 sample. The comparison did not yield significant differences (See Bianchi, Robinson and Milkie 2006 Appendix B for a review).

⁷⁸ Three time use experts also recommend using all waves with weights as the most appropriate approach (Jonathan Gershuny, the director of Centre for Time use Research; Kimberly Fisher, the manager of MTUS/AHTUS, and Thomas Stafford one of the principal investigators of the 1975 survey, all personal communication August 2011). We replicated the analysis by using only the first wave of the study (with AHTUS weights) and the results were consistent.

maintain comparability with the other surveys, and also because there is no race/ethnicity information for spouses.

The 1992-95 data is a combination of the 1992-94 National Human Activity Pattern Survey (NHAPS) and the 1994-95 NHAPS follow-up. The 1992-94 survey is combined with the 1994-95 follow-up to increase sample size. Both surveys are administered by the University of Maryland, and followed the same methodology and diary codes. The 2003-2010 American Time Use Survey (ATUS) is a subsample of households which completed the eighth and final wave of the Current Population Survey. Although primary childcare measures in ATUS 2003-10 data can be meaningfully compared to those in previous studies, the 1992-94 data may underestimate childcare time due to an error in the sampling design (Allard et al. 2007).⁷⁹

In all AHTUS datasets, original activity classifications are consistent, background and time use variables are harmonized, and weights correct for imbalances in sample and population distributions. Hence, despite variations in the mode of data collections and the sampling frame, AHTUS provides comparable and reliable data to investigate US time trends. The time diary surveys in AHTUS are widely used in previous scholarly work on historical changes in US time use patterns.⁸⁰

⁷⁹ Allard et al. (2007) compare primary childcare figures from the 1985, 1992-94, 1995, 2000 and 2003 data sets. Primary care time decreased by one hour from 1985 to 1992-94, then increased by approximately 2 hours per week between 1992-94 and 1995, and then increased by another 3 hours per week between 1995 and 2000, and another 1.5 hours between 2000 and 2003. The authors conclude that the “true” increase in average time in primary childcare between 1985 and the 2000s is more likely to be smoother and gradual, rather than a decrease between 1985 and 1992-94 followed by a sharp increase in 1995 (2007:35) as the raw data suggest.

⁸⁰ See for example Sullivan (2010) for changes in men’s time in housework (1960s-2000s); Dew (2009) on trends in spousal time between (1970s -2000s); Bianchi, Robinson and Milkie (2006) on trends in housework, personal care and leisure (1960s-2000s); Sayer, Bianchi and Robinson (2004) on childcare (1960s-1990s); Robinson and Godbey (1999) on time spent in media usage, work,

4.5.2 SAMPLE AND MEASUREMENT

The population of interest in this study is non-Hispanic white mothers residing in the USA. AHTUS does not provide information on the relationship of household children to the sampled individual, so we are not able to identify mothers precisely. Instead, we limit the sample to non-Hispanic white respondents aged between 19 and 55 years living in a household where there are between one and six children under the age of 18 years.⁸¹ The restrictions on the respondent's age and number of children allow us to have comparable samples across different surveys as well as to exclude respondents who are less likely to be actual mothers (as opposed to grandmothers, siblings, etc.). We use men and women living with a child (under 18 years) in the household as a proxy for *fathers* and *mothers*.

We measure mothers' time investments in children by minutes spent in *primary childcare activities* on an average day. Specifically, *primary childcare* refers to total minutes spent in all forms of childcare activities provided for household children aged under 18 years, and reported as the main activity at a specified time on a given diary day. This measure does not include other forms of childcare, mainly because secondary childcare measures in AHTUS surveys are not comparable.⁸²

housework and socialization (1960s-1980s); and for cross-national cross-time comparison of time use trends, see Bianchi, Robinson and Milkie (2006), Gauthier, Smeeding and Furstenberg (2004) and Gershuny (2000).

⁸¹ We can only identify whether parents have a child under the age of 5 or 18 years. We limit the sample to parents with a child under the age of 18 years instead of 5 years because we would otherwise have a very small sample size in the earlier surveys.

⁸² Limiting the analysis to primary childcare only is not ideal, given that this operationalization ignores the broader definition of parental care such as parental availability, parental responsibility, etc. (Budig and Folbre 2004; Folbre and Yoon 2007). Moreover, parents are likely to spend a significant amount of time in non-childcare activities *for* their children, such as working longer hours to afford higher life standards, doing childcare related housework, reading childcare manuals, etc. Yet, the data on time spent in other forms of childcare (e.g. *secondary childcare*) is not comparable across AHTUS surveys, and we do not have information on "for whom" the activity is conducted for. Hence, the analysis is limited to the most direct form of childcare, namely *primary childcare activities*. We use *parental time investments*, *childcare time* and *primary childcare* interchangeably in this study. See Chapter 2 in this study for a more extensive discussion on secondary childcare.

Small samples in the earlier surveys make reliable inferences on the detailed activity patterns of the respondents particularly problematic. These early samples yield a very small number of *participating* mothers as the childcare activity category becomes more specific. Additionally, the comparability of activity categories across surveys becomes more problematic as the activity categories are defined more specifically. As a result, in this study we decompose primary childcare time into two sub-categories (instead of three as in the previous chapter): namely time spent in *basic childcare* (e.g. physical childcare, medical care and care of infants or older children) and time spent in *developmental childcare* (e.g., time spent reading/talking to children, supervising/accompanying children/out-of-home care, playing with children and attending school-related activities).⁸³ The activities in which parents would be more actively involved in developing their children's social, cognitive or linguistic skills are defined as developmental childcare. The developmental activities of parents may be directly (e.g. reading to children and helping with homework) or indirectly (e.g. attending children's events or attending meetings at school) developmental. Basic childcare refers to those activities in which parents are involved in the physical well-being of children and sustaining children's basic needs. This distinction is important because not only the total amount of time but also the types of activities parents engage in are important determinants of a child's well-being. Moreover, parents who engage in *concerted cultivation* as a child rearing strategy would be more likely to focus on developmental childcare activities.

⁸³See Appendix C at the end of this chapter for the corresponding original codes.

In this chapter, minutes spent in primary childcare activities refer to the primary childcare time that is provided for *household* children only, excluding primary care provided for non-household children. In the case of mothers, this exclusion is not very problematic given that children are far more likely to live with their mothers even after divorce. However, this is not the case for fathers, and there is no data on how many minutes of care children receive from non-residential fathers in earlier periods. As a result, a thorough investigation of the inequality in *paternal* care time is not possible. Moreover, small sample sizes in earlier periods lead to unreliable estimations. Due to these problems, we limit the focus of this study to mothers only. However, a brief overview of the corresponding findings for residential fathers is presented at the end of the chapter.

High-educated mothers refer to mothers who have a four-year college degree or more, while low-educated mothers are those with no four-year college degree.⁸⁴ Pooling mothers into two broad educational categories conceals significant within-group heterogeneity and could result in attenuation bias, hence providing conservative estimates of the class gap.⁸⁵ However, small sample sizes in earlier surveys make it impossible to use a more detailed educational classification.

Survey period (1960s, 1970s, 1990s and 2000s) is used as a dummy variable in the models specified in the following section.

⁸⁴In this chapter, we use the terms “college-gap,” “education-gap” and “class-gap” interchangeably to refer to the difference between high-educated (college or more) and low-educated (less than a college degree) mothers’ time spent in relevant childcare activities.

⁸⁵2003-2008 ATUS data provides significant evidence of such attenuation bias (Chapter 2 and Chapter 3 in this thesis). Mothers with less than a high school degree provide significantly less primary childcare compared to mothers with some college education.

Table 4.1 contains the summary statistics of the data. The sample is limited to non-Hispanic white parents with at least one child under the age of 18 years. Respondents in the 1990s-2000s are slightly older compared to those in the 1970s. The weight variable adjusts well for the distribution of diary completion day, except for the 1965-66 surveys (we control for diary completion day in all the models). Evidently, summary statistics also reflect a declining fertility rate in recent periods.

Table 4.1 Summary statistics

	1965-1966		1975-1976		1992-1995		2003-2010	
	College degree	No college degree	College degree	No college degree	College degree	No college degree	College degree	No college degree
Age	38 (6.2)	35 (5.9)	36(6.0)	34(5.8)	38(6.2)	35(5.9)	39(6.2)	35(5.9)
Weekday diaries (%)	82	73	71	71	75	71	72	72
Child under age 5 is present (%)	28	46	29	32	44	41	42	38
Number of children aged under 18	2.2	2.3	2.3	2.1	1.8	1.9	1.9	1.8
Percentage of mothers by education	10	90	12	88	28	72	52	48
Sample size (diary day)	32	302	133	902	250	652	9123	8585

Note: Weighted means and standard deviations in parenthesis.

4.6 METHODS

In this chapter, the choice of statistical method depends on the response variable. The analysis starts by estimating total time spent in primary childcare, performing an OLS regression with all mothers in the sample. Next, primary childcare is decomposed into two components and two-step estimation is applied for each activity. First, a logistic regression is used to estimate the probability of providing the activity. Then, an OLS regression is performed using a sub-sample limited to participating mothers (those who reported any time spent in the activity).⁸⁶

AHTUS weights are applied to account for attrition in the 1975 sample and to correct for sample and day distributions. Clustered standard errors are used to account for the repeated observation of the same individuals in the 1975 data. Twenty three cases with missing education information are list-wise deleted. 124 cases with missing presence of infant information in 1992-95 survey are list wise deleted in final models.

The variables of interest are the interaction terms between the 1990s and college degree as well as between the 2000s and college degree. Significant and positive coefficients for these interaction terms would imply a widening education-gap. The baseline model includes only the explanatory variables of survey period, having at least a college degree and the interaction term, and does not have any controls other than diary completion day.

⁸⁶ Gamma and OLS regression models are also performed for the whole sample. The findings from these models are referred to in the main text in order to show the extent to which the findings are robust to model choices, parametric assumptions and sample restrictions. OLS regression model results that estimate minutes spent in basic and developmental childcare for *all* respondents can be found in Appendix C at the end of this chapter. See Appendix A at the end of Chapter 2 for a more detailed description and justification of the methods applied in this thesis.

The baseline control model (BC) is written:

$$E[Y|X, \beta] = g^{-1} (\beta_0 + \beta_{\text{collegedegree}} X_1 + \beta_{\text{year}} X_2 + \beta_{\text{period*college degree}} X_1 * X_2 + \beta_{\text{weekday}} X_3)$$

Then, variables to control for demographic characteristics are added (see Table 4.): age (and its squared term), number of children (and its squared term), and presence of child under the age of 5 years.⁸⁷

Models with controls for employment and marital status are not presented for data-related and theoretical reasons. The 1992-94 data does not have information on marital status. Moreover, including employment and marital status in a regression may induce a potential bias in the quantity of interest (effect of education), due to included variable bias (post-treatment bias). In other words, by including education and employment status together we may control for some of the consequences of education.⁸⁸ This is particularly problematic given that we are interested in the change in the effect of educational attainment over time. If the relationship between education and employment itself changes over time, the potential bias in the estimated effect of education can be exacerbated. Finally, there are very few observations in some cells (e.g. high-educated and employed mothers in the 1960s) which yield relatively small statistical power. Given the very small sample size in earlier years, it is particularly preferable to use a parsimonious model.

⁸⁷ Due to data limitations, the age of the youngest child in the household cannot be controlled for.

⁸⁸ Also see section 2.4 regarding this issue.

However, as shown in previous chapters, employment (and marital) status is one of the most important factors predicting minutes spent in childcare, and it would be informative to show whether the results are robust to a control for the employment status of the respondent. Therefore, even if the models with employment status are not shown in the main text, we consistently report results from the models that control for employment status and explain whether the findings are robust to the inclusion of employment status or not.

4.7 RESULTS

4.7.1 DESCRIPTIVE ANALYSIS

Table 4.2 presents the descriptive analysis of non-Hispanic white mothers' time spent in total primary childcare. The first column in the top two panels contains the average time spent by all mothers in the relevant education category. The second contains the percentage of mothers who reported at least one minute of childcare on a given diary day (*participants*). The average time spent in childcare by *participating* mothers is presented in the third column. The last three columns contain the 25th percentile, median, and 75th percentile of minutes spent in primary childcare. The bottom panel (bottom third of the rows) contains the difference between mothers with a college degree and no college degree for these various metrics.

Table 4.2 Mothers' average minutes spent in primary childcare and percentages of diarists reporting the activity by education level over time (1960s-2000s)

	Mean (all)	% who reported	Mean (>0)	25%	Median	75%
Mothers with a college degree						
1965-66	70	86	102	0	46	86
1975-76	56	73	88	0	40	87
1992-95	65	62	105	0	30	100
2003-2010	117	84	140	15	76	170
Mothers with no college degree						
1965-66	73	83	91	15	60	116
1975-76	52	74	78	0	25	75
1992-95	63	61	104	0	20	90
2003-2010	94	73	129	0	45	130
The gap						
1965-66	-3	3	11	-15	-14	-30
1975-76	4	-1	10	0	15	12
1992-95	2	1	1	0	10	10
2003-2010	23	11	11	15	31	40

Note: Survey weights are applied to account for sampling design and non-response. Only the first wave of the 1975 survey is used to calculate the participation rate.

In line with previous research, the descriptive analysis indicates that the average time spent in primary childcare has increased substantially for both high-educated (college degree or more) and low-educated (less than college degree) mothers between the 1960s and the 2000s. However, the increase is more pronounced for high-educated mothers. After a 21 minute drop between the 1960s and the 1970s, low-educated mothers increased their primary childcare time by about 42 minutes between the 1970s and the 2000s. The corresponding increase for mothers with at least a college degree is an hour. As a result, the *education gap* in primary childcare grows from 4 minutes a day in the 1970s to 23 minutes a day in the 2000s.⁸⁹

⁸⁹ The dip in the 1990s is generally attributed to a data quality problem (see Allard et. al 2007; Ramey and Ramey 2010), more specifically the underestimation of childcare time.

The average increase in the primary childcare time of high-educated mothers between the 1970s and the 2000s is partly due to an increase in the percentage of mothers who reported some childcare activity on a given diary day (column 2), but more substantially to an increase in the minutes spent in the activity by *participants* (column 3). The percentage of low-educated mothers who reported some childcare on a given diary day dropped by 10 per cent in the 1990s, and returned to its 1975-level (73 per cent) in the 2000s. The average minutes spent in primary childcare by *participating* low-educated mothers follows a steady increase between the 1970s and the 2000s from 78 minutes to 129 minutes. In other words, while 27 per cent of low-educated mothers do not report any primary childcare on the given diary day in the 2000s, the *participating* low-educated mothers spend on average more than two hours a day in childcare. This is a noteworthy indication of further polarisation *among* low-educated mothers.

The last three columns of the top two panels of Table 4.1 contain the 25th, 50th and 75th percentile of primary childcare time. The zero-inflated and skewed distribution of childcare time is evident. With two exceptions, all the 25th quartiles are equal to zero. In the 1960s, the median number of minutes spent in primary childcare time for college-educated mothers is actually *less* than those with no college degree. The median childcare time rose by more than half an hour for highly-educated mothers between the 1970s and the 2000s, while the corresponding increase for low-educated mothers was only 20 minutes. As a result, the gap in the median primary childcare time has doubled. In fact, the entire distribution of primary childcare time for high-educated mothers has increased relative to low-educated mothers. For example, the

difference between low- and high-educated mothers' primary care time at the 75th percentile increased from 12 minutes in the 1970s to 40 minutes in the 2000s.

In summary, the descriptive analysis shows that the gap between high- and low-educated mothers' primary childcare time has widened between the 1970s and the 2000s. The widening gap is both due to high-educated mothers' increased participation rate and their provision of more childcare time. The next section investigates whether the average increase in primary childcare is concentrated within specific childcare activities. Figures 4.1 and 4.2 show the average time spent in basic and developmental childcare activities and the percentages of mothers who reported any time spent in those activities separately.

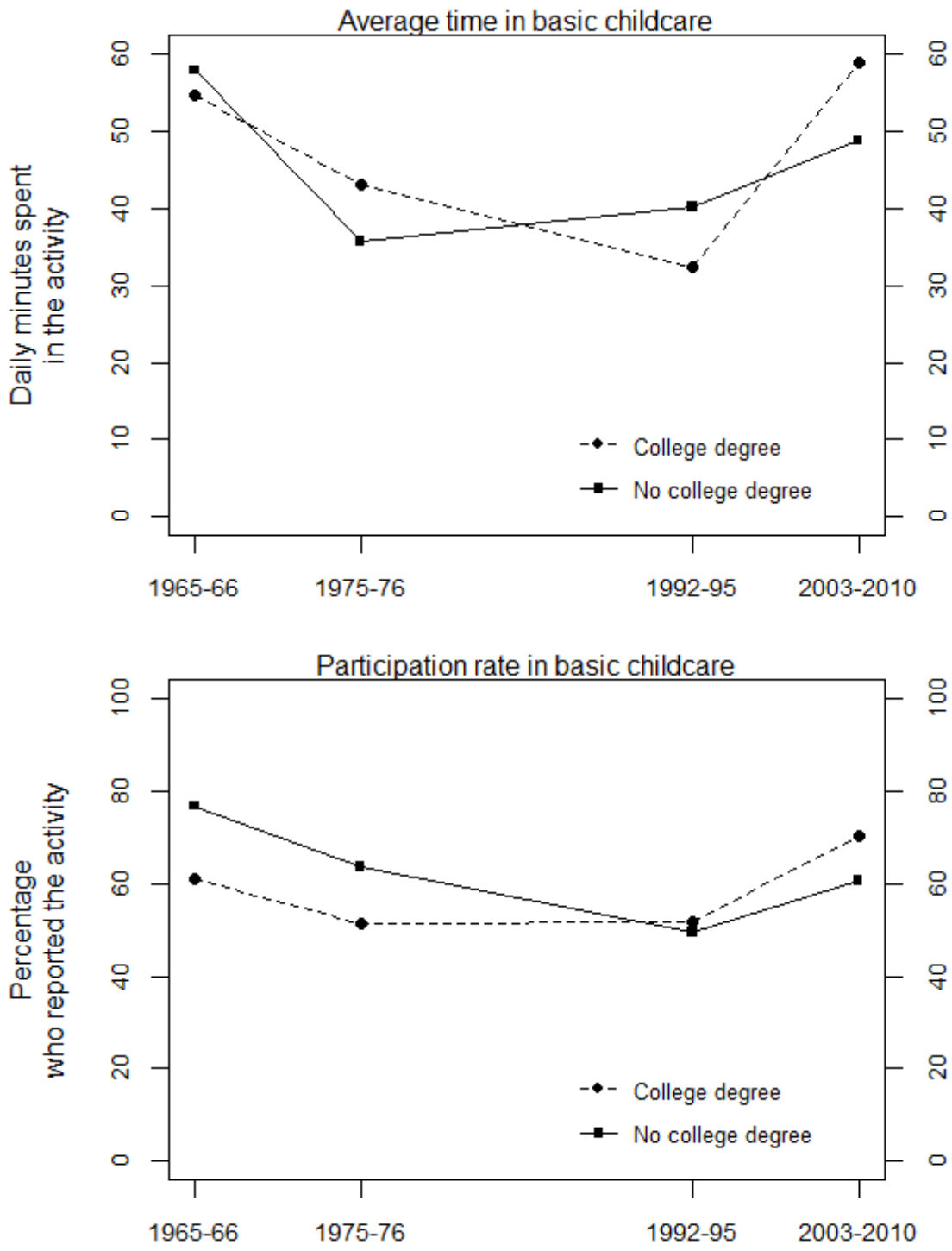


Figure 4.1 Trends in basic childcare by mothers' education

Note: Survey weights are applied to account for sampling design and non-response. Only the first wave of the 1975-76 survey is used to calculate participation rate.

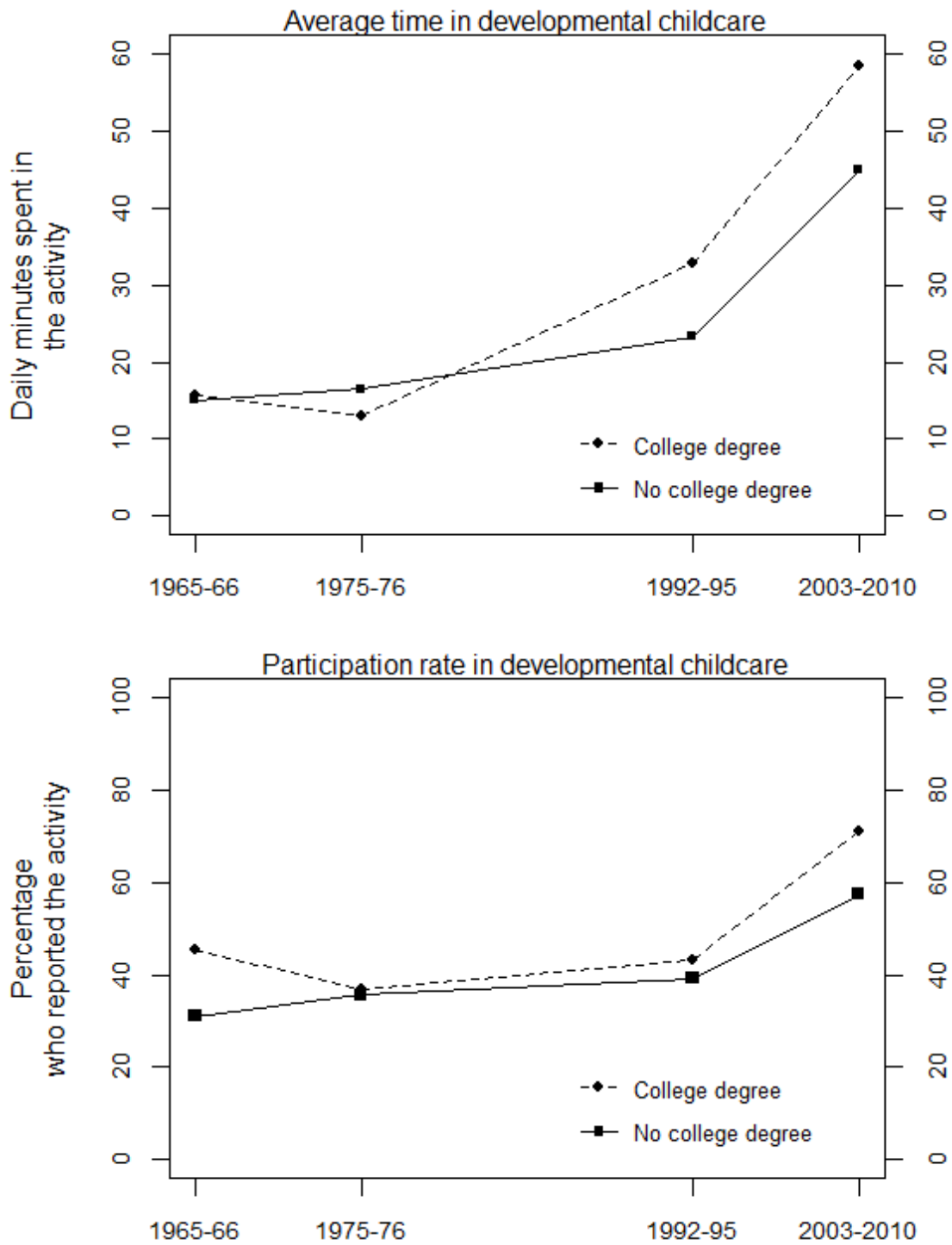


Figure 4.2 Trends in developmental childcare by mothers' education

Note: Survey weights are applied to account for sampling design and non-response. Only the first wave of the 1975-76 survey is used to calculate participation rate.

The plots indicate that the main source of the widening gap in average time spent in primary childcare is developmental childcare rather than basic childcare. After a 22 minute decrease from the 1960s, time spent in basic childcare remained relatively stable at around 40 minutes between the 1970s and the 1990s, and then rose by about 10 minutes for low-educated mothers. High-educated mothers' basic care time shows more fluctuation during the same period. Yet, the gap between high- and low-educated mothers basic care time remains at around 7-10 minutes in the 1970s and the 2000s. The difference between the percentages of high- and low-educated mothers who reported some basic care on the diary day is about 10 per cent in the 2000s. Note that in the pre-1980s period, the percentage of low-educated mothers providing basic childcare is approximately 15 per cent *higher*. Still, there is generally no evidence of a widening gap in average time spent in basic care.

Average time spent in developmental childcare remains stable at around 15 minutes per day between the 1960s and 1970s, and then shows a steady increase for all mothers. College-educated mothers, however, increase at a faster rate, with the result that the education-gap widens to 15 minutes per day. Similarly, the percentage of mothers who reported developmental care is 14 per cent higher in the 2000s, while there is virtually no difference in the 1970s and the 1990s. Therefore, the descriptive analysis provides preliminary evidence that the increase in time spent in primary childcare over the period is mostly due to an increase in developmental childcare rather than basic care.

4.7.2 MULTIVARIATE ANALYSIS

Table 4.3 contains the results of OLS models estimating minutes spent in primary childcare for non-Hispanic white mothers. In line with the previous chapters, having at least a college degree is associated with more primary childcare time. This being said, as the interaction terms show, the positive relationship between being highly educated and primary childcare time gets even stronger in the 2000s compared to the 1970s. Without any demographic controls, being high-educated is associated with 22 minutes more childcare compared to being low-educated in the 2000s (Model 2). Controlling for the age of respondents (Model 3) and the number of children results in an even more substantial association (Model 4). For example, a college-educated mother of a single child in the 2000s is predicted to spend around half an hour more in childcare per day compared to a low-educated mother for the same years, *ceteris paribus*. The corresponding gap in the 1970s is only five minutes (Model 4). Although the first four models show a widening gap, with the inclusion of the presence of a child under the age of 5 years standard errors increase and the interaction terms become significant only at the $p \leq 0.07$ value (Model 5). Adding a control for employment status decreases the coefficient of the interaction term between college and 2000 survey year to 9.39 (SE=8.02), and the term is no longer significant even at the 0.10 level (not shown in table). Therefore, including employment status reduces the effect of education in the 2000s. This finding is consistent with our previous findings (see the discussion on Table 2.5 in Chapter 2). Low-educated mothers are less likely to be employed, and not-employed mothers spend more time with their children. Hence, once employment status is controlled for, the effect of education gets smaller.

Table 4.3 Mothers' minutes spent in primary childcare (all mothers-OLS)

	Model 1	Model 2	Model 3	Model 4	Model 5
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
Intercept	33.47*** (3.49)	35.77** (3.70)	-94.5*** (17.36)	-68.3*** (17.50)	-159.3*** (15.04)
College degree or more	22.01*** (1.95)	3.63 (9.34)	7.03 (8.18)	4.80 (9.03)	3.25 (7.36)
1960s	20.14*** (5.31)	20.44** (5.45)	21.72*** (5.37)	17.74*** (5.43)	4.92 (4.90)
1990s	7.76* (4.66)	11.31* (5.26)	8.55 (5.35)	15.61*** (5.46)	6.32 (5.26)
2000s	44.55*** (3.54)	41.34*** (3.83)	44.25*** (3.99)	52.12*** (4.13)	42.65*** (3.70)
Age of diarist			10.75*** (0.91)	5.87*** (0.94)	7.38*** (0.82)
Age squared			-0.19*** (0.01)	-0.12*** (0.01)	-0.11*** (0.01)
Number of children				29.49*** (4.18)	27.77*** (4.04)
Number of children sq.				-1.40 (0.88)	-2.33*** (0.86)
Child under age 5					92.86*** (2.02)
College:1960s		-8.30 (20.26)	-5.66 (18.54)	0.25 (18.75)	8.72 (15.31)
College:1990s		-2.64 (11.66)	2.28 (10.61)	7.20 (11.24)	-1.80 (10.26)
College:2000s		20.12** (9.57)	23.82*** (8.41)	25.91*** (9.24)	13.69* (7.57)
AIC	0.031	0.0322	0.09	0.12	0.23
N	19534	19534	19534	19534	19410

Note: Clustered standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. 124 cases with missing values for presence of a child under the age of 5 are excluded from the analysis shown in Model 5. Having a college degree or more X 1975 is the omitted category. All models correct for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

The significance and magnitude of the coefficients of the control variables are also in line with previous research. Age has a curvilinear relationship with primary childcare time. Older mothers provide more primary care for their children, but at a decreasing rate. Holding all other aspects constant, having a child under the age of 5 years is associated with one and a half hours of primary care on a given day. The number of children is also strongly associated with mothers' time spent in primary childcare.

Time spent in primary childcare has increased in the 1990s and particularly in the 2000s compared to the 1970s. The effect of having a college degree in the 2000s is larger than it was in the 1970s, but this difference is sensitive to controlling for the presence of a young child.⁹⁰ Moreover, none of the interaction terms between education and year (1990s-2000s) are significant, indicating that the gap between high- and low-educated mothers has not widened in the 1990s compared to 1970s. In conclusion, there is mixed evidence for the claim that the effect of having a college degree has significantly increased over the period at study. In order to investigate parenting behaviour in more detail, primary childcare is decomposed into two components: basic childcare and developmental childcare. Separate OLS and logistic regressions are performed for both types of childcare activities.

Table 4.4 presents the logistic regression models estimating the probability of providing any basic care on a given day, while Table 4.5 contains the OLS regression results for participating mothers only. Again, the variable of interest is the

⁹⁰ The results depend on the parametric assumptions we make while choosing the model. We replicated this analysis in a gamma framework. Gamma results provide even less support for the hypothesis. The significance of the interaction term disappears when we control for the number of children under the age of 18 years or under the age of five years. The baseline model with no demographic controls (Model 2) also does not yield a significant interaction term. We also ran a logistic regression to see whether the probability of providing childcare has significantly increased for high-educated parents over the course of the period. None of the interaction terms were significant.

interaction term between having at least a college degree and survey period (for the 1990s and 2000s).

Table 4.4 contains two interesting results: first, the probability of providing basic care has declined substantially in the 1990s compared to 1970s (Model 1). The decline is even more noticeable compared to the 1960s. Mothers are less likely to report basic childcare in the 1990s even after controlling for their educational attainment, age of youngest child or presence of a child under the age of 18 years (Model 4). Second, the effect of having a college degree in the 2000s is significant and positive. This association is robust to other controls. In other words, the education-gap in the *probability* of providing basic childcare has increased in the 2000s compared to 1970s. In the 1970s, being high-educated was negatively associated with the probability of providing basic childcare, while this association is reversed in the 2000s. More specifically, holding all other variables constant, the odds of providing basic childcare for high-educated mothers in the 2000s is 45 per cent higher ($e^{0.64} - e^{0.27} = 1.45$) compared to low-educated mothers in the 2000s (Model 5). However, having a college degree *reduces* the odds of reporting basic care by 24 per cent ($e^{-0.27} = 0.76$) in the 1970s (Model 5). Due to the inverse relationship between being high-educated and probability of providing childcare, the results show a growing education-gap in the probability of providing basic childcare between the 1970s and the 2000s. The finding is robust to a control for the employment status of mothers (not shown in table).

Table 4.4 Mothers' probability of providing basic childcare (all mothers-logistic regression)

	Model 1	Model 2	Model 3	Model 4	Model 5
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
Intercept	-0.10 (0.10)	-0.02 (0.11)	-4.73*** (0.36)	-4.59*** (0.37)	-7.25*** (0.34)
College degree or more	0.39*** (0.03)	-0.23 (0.29)	-0.21 (0.27)	-0.25 (0.27)	-0.27 (0.27)
1960s	0.76*** (0.17)	0.81*** (0.18)	0.91*** (0.18)	0.90*** (0.19)	0.73*** (0.18)
1990s	-0.43*** (0.12)	-0.42*** (0.13)	-0.53*** (0.14)	-0.43*** (0.14)	-0.68*** (0.15)
2000s	0.14 (0.10)	0.04 (0.11)	0.12 (0.11)	0.25** (0.12)	0.10 (0.11)
Age of diarist			0.34*** (0.02)	0.25*** (0.02)	0.32*** (0.02)
Age squared			-0.01*** (0.00)	0.00*** (0.00)	0.00*** (0.00)
Number of children				0.84*** (0.07)	0.90*** (0.08)
Number of children sq.				-0.09*** (0.01)	-0.13*** (0.02)
Child under age 5					2.06*** (0.05)
College:1960s		-0.57 (0.49)	-0.59 (0.49)	-0.56 (0.50)	-0.44 (0.51)
College:1990s		0.31 (0.33)	0.43 (0.32)	0.50 (0.32)	0.36 (0.33)
College:2000s		0.67** (0.29)	0.80*** (0.28)	0.82*** (0.28)	0.64** (0.27)
AIC	22392	22372	20574	20181	17952
N	19534	19534	19534	19534	19410

Note: Clustered standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. 124 cases with missing values for presence of a child under the age of 5 years are excluded from the analysis shown in Model 5. Having a college degree or more X 1975 is the omitted category. All models correct for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

Because the coefficients of the logistic regression are not directly interpretable, the predicted probability of providing basic childcare by a 35 year-old mother of one child under the age of 5 years is plotted in Figure 4.3. The figure shows that the difference in the predicted probability of providing childcare between high- and low-educated mothers is not significant in any time period. However, in the 1960s and 1970s high-educated mothers' probability of providing basic childcare is lower than that of low-educated mothers, while the relationship is reversed in the more recent periods. Not surprisingly, the predicted probability of providing primary childcare for a mother of a young child is quite high in each time period. There is no increasing trend. In fact, mothers are least likely to provide basic childcare in the 1990s (the probability is .78 for college-educated mothers and .76 for mothers with no college degree).

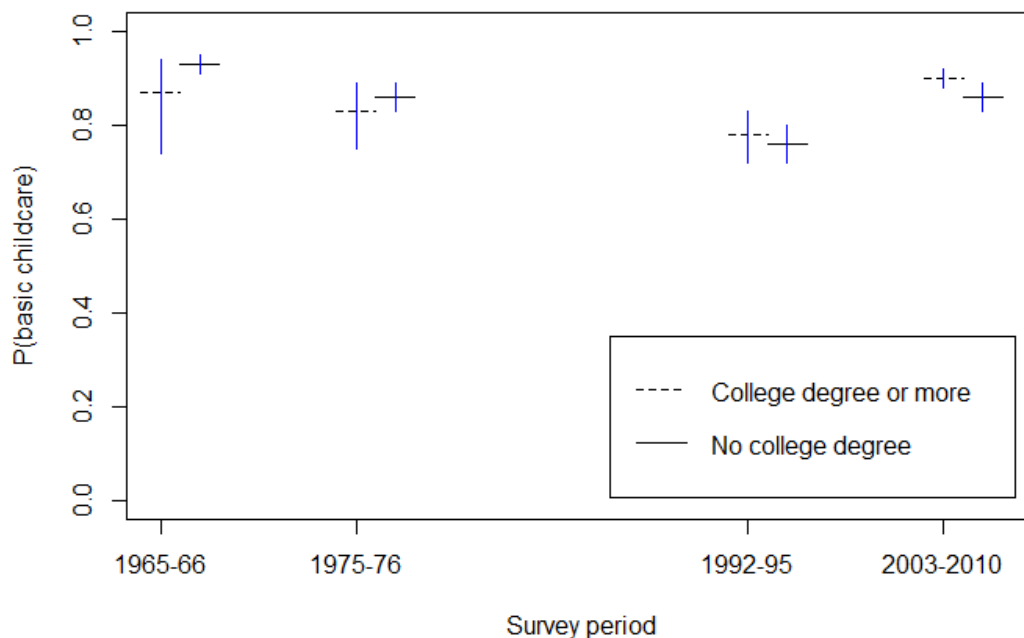


Figure 4.3 Predicted probability of providing basic childcare by mothers

Note: The probabilities are calculated for a 35 year-old mother with a single child under the age of 5 years. Vertical lines show the 95 per cent confidence intervals, horizontal lines show the point estimates.

The next set of models show the changing effect of education on minutes spent in basic childcare, conditional on reporting minutes in the activity on a given diary day. The sample is limited to mothers who report at least one minute spent in basic childcare, and a series of OLS regressions were performed on that sample in which the dependent variable was minutes spent in basic childcare.

Table 4.5 Mothers' minutes spent in basic childcare (*participants only*-OLS)

	Model 1	Model 2	Model 3	Model 4	Model 5
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
Intercept	60.01*** (3.48)	57.98*** (3.66)	102.66*** (19.13)	125.41*** (19.22)	39.51** (20.09)
College degree or more	2.94 (1.85)	19.68** (10.23)	22.14** (9.24)	19.33** (10.49)	16.15** (9.63)
1960s	14.48*** (5.42)	15.58** (5.38)	17.78*** (5.21)	14.34*** (5.07)	7.43 (4.79)
1990s	13.15** (5.09)	21.40*** (6.09)	23.00*** (6.02)	26.71*** (6.01)	18.07*** (6.26)
2000s	18.76*** (3.50)	20.49*** (3.73)	23.13*** (3.66)	27.17*** (3.66)	20.40*** (3.53)
Age of diarist			-0.69 (1.04)	-3.76*** (1.05)	-1.39 (1.07)
Age squared			-0.02 (0.01)	0.02 (0.01)	0.01 (0.01)
Number of children				13.94*** (3.96)	15.74*** (4.01)
Number of children sq.				-0.19 (0.82)	-0.98 (0.84)
Child under age 5					45.03*** (1.82)
College:1960s		-6.10 (27.86)	-3.48 (26.55)	4.05 (26.54)	7.14 (24.57)
College:1990s		-38.42*** (12.40)	-36.52*** (11.53)	-30.80** (12.58)	-36.69*** (12.15)
College:2000s		-16.29 (10.42)	-10.67 (9.43)	-6.35 (10.66)	-10.35 (9.81)
Adj R.	0.00	0.00	0.04	0.06	0.10
N	12202	12202	12202	12202	12149

Note: Clustered standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. 124 cases with missing values for presence of a child under the age of 5 years are excluded from the analysis shown in Model 5. Having a college degree or more X 1975 is the omitted category. All models correct for diary completion day (coefficient not shown).

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The OLS regression results in Table 4.5 show that having a college degree in the 1990s has a negative effect on mothers' minutes spent in basic childcare (conditional on reporting some basic care on a given day) (Model 2-5). Having a college degree is positively associated with minutes spent in basic care. Yet being highly educated *in the 1990s* is associated with at least half an hour less time spent in the activity compared to the 1970s. Overall, participant mothers provide more basic childcare in the 2000s compared to the 1960s or the 1970s, but the results do not indicate any widening of the education gap in the 2000s. Controlling for employment status increases the main effect of college (19.62, SE=0.07), but the coefficient and the significance of the interaction term between college and 1990 (or 2000) hardly change.⁹¹

In summary, there is no widening of the gap in basic childcare time by educational attainment for non-Hispanic white mothers. The marginal effect of having a college degree in the 2000s is positively associated with the *probability* of reporting basic care but not with the minutes spent in basic childcare, conditional on reporting the activity. Moreover, high-educated mothers in the 1990s indeed spend *less* time in providing basic childcare compared to high-educated mothers in earlier periods. The predicted probability of providing basic childcare for a 35 year-old mother with a child under the age of 5 years has not increased over time, and the difference between high- and low-educated mothers has not significantly widened. The results do not provide strong evidence for the claim that the education gap in basic care provision has increased between the 1970s and the 1990s/2000s.

⁹¹ A set of OLS regressions is also performed on the full sample (*all* mothers) (Table 4.10 in Appendix C). Overall, the findings are in line with the results presented in Table 4.5: having a college degree in the mid-1990s is negatively associated with providing basic childcare. The results of the OLS model for the full sample are also robust to controls for employment status.

Table 4.6 shows the results of the logistic regression models estimating the probability of providing any developmental childcare on a given day. College-educated mothers are more likely to provide developmental childcare compared to mothers with no college degree (Model 1). Also, the probability of providing developmental childcare is significantly higher in the 1990s, and especially in the 2000s compared to the 1970s (Models 1-5). The effect of having a college degree on the probability of providing developmental childcare is greater in the 2000s compared to the 1970s (Model 4), and is robust to a control for employment status (not shown). However, the interaction term is significant only at the $p < 0.10$ level and, once the presence of a child under the age of 5 years is controlled for (Table 5), the results cease to be significant. Hence, the results do not show a widening college gap in the probability of providing some developmental childcare in the 2000s compared to the 1970s.

Table 4.6 Mothers' probability of providing developmental childcare (all mothers-logistic regression)

	Model 1	Model 2	Model 3	Model 4	Model 5
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
Intercept	-1.64*** (0.10)	-1.57*** (0.10)	-6.63*** (0.33)	-6.57*** (0.33)	-7.70*** (0.34)
College degree or more	0.60*** (0.03)	0.13 (0.26)	0.07 (0.25)	0.06 (0.25)	0.03 (0.25)
1960s	0.06 (0.15)	0.00 (0.16)	-0.01 (0.16)	-0.05 (0.16)	-0.18 (0.17)
1990s	0.33*** (0.12)	0.40*** (0.13)	0.32** (0.13)	0.39*** (0.13)	0.29* (0.14)
2000s	1.24*** (0.10)	1.16*** (0.10)	1.23*** (0.11)	1.32*** (0.11)	1.25*** (0.10)
Age of diarist			0.30*** (0.02)	0.25*** (0.02)	0.27*** (0.02)
Age squared			0.00***	0.00*** (0.00)	0.00*** (0.00)
Number of children				0.59*** (0.07)	0.58*** (0.07)
Number of children sq.				-0.07*** (0.01)	-0.09*** (0.01)
Child under age 5					0.90*** (0.04)
College:1960s		0.42 (0.48)	0.44 (0.46)	0.48 (0.47)	0.58 (0.49)
College:1990s		0.01 (0.30)	0.05 (0.29)	0.08 (0.29)	0.03 (0.31)
College:2000s		0.51* (0.26)	0.48* (0.25)	0.48* (0.25)	0.39 (0.25)
AIC	21758	21747	21262	21085	20414
N	19534	19534	19534	19534	19410

Note: Clustered standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. 124 cases with missing values for presence of a child under the age of 5 years are excluded from the analysis shown in Model 5. Having a college degree or more X 1975 is the omitted category. All models correct for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

Figure 4.4 shows the predicted probability of reporting developmental childcare for a 35 year-old mother of a child under the age of 5 years, based on Model 5 from Table 4.6. The figure illustrates two points: first, the probability of providing developmental childcare for a mother of a five year old has increased substantially (30 to 40 per cent) in the 2000s compared to earlier periods. Second, high-educated mothers in the 2000s are more likely to report the activity compared to low-educated mothers. There is no such significant difference by educational attainment in earlier periods. Although the predicted probability of providing developmental childcare for mothers with a college degree is more than 10 per cent higher than those with no degree in the 1960s, the estimates are imprecise, likely due to small sample size. In the 1970s and the 1990s, the point estimates of high- and low-educated mothers are almost identical.

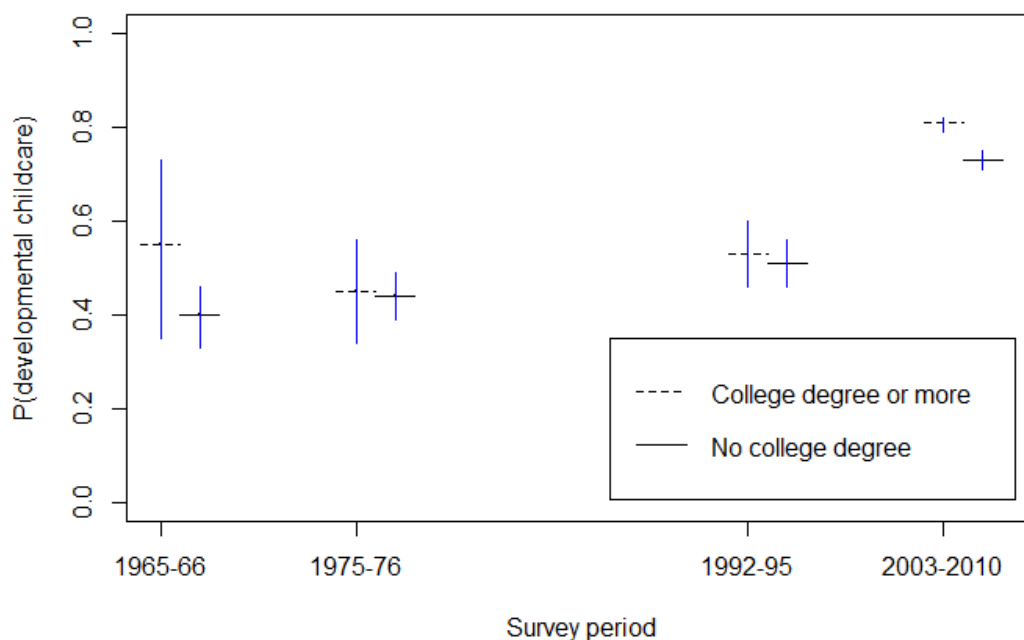


Figure 4.4 Predicted probability of providing developmental childcare by mothers
Note: The probabilities are calculated for a 35 year-old mother with single child under the age of 5 years. Vertical lines show the 95 per cent confidence intervals, horizontal lines show the point estimates.

Table 4.7 presents the OLS regressions for mothers who reported some developmental childcare on the diary day. *Ceteris paribus*, in the 1970s having a college degree is associated with approximately 15 minutes less of developmental childcare time (Model 2 to 5). This association is clearly reversed in the 1990s and 2000s. For example, holding all other aspects constant, mothers with a college degree provide 17 minutes more childcare time compared to mothers with no college degree in the 1990s (32.14-15.04 in Model 5). The corresponding figure in the 2000s is approximately 4 minutes (18.53-15.04 in Model 5). Hence, conditional on reporting the activity all mothers have increased their minutes spent in developmental childcare substantially in the 2000s, yet the education gap for this same period is smaller than it was in the 1990s. This may be an indication of the spread of an *intensive mothering ideal* beginning in the 1990s. In other words, it was high-educated mothers who increased their developmental care time substantially in the 1990s. As the norm of intensive mothering and expert advice on spending interactive time with children spread to all segments of society throughout the 1990s, high-educated parents are followed by mothers from lower socio-economic backgrounds in the 2000s. In brief, there is no increase in the marginal effect of having a college degree in the 1990s on the probability of providing developmental childcare on a given day (Table 4.6). This being said, having a college degree in the 1990s is associated with a substantially greater number of minutes spent in developmental childcare activities compared to the 1970s, conditional on reporting the activity. However, it should be noted that adding employment status to a model decreases the coefficient of the interaction term between college and 2000 (11.81,

SE=8.6), and the term is no longer significant at the 0.05 level. The interaction term between 1990 and having a college degree remains significant at the 0.05 level.⁹²

⁹² The models that are run with the full sample also yield similar results. The college gap in minutes spent in developmental childcare has widened significantly in the 1990s and in the 2000s (Model 2-5, Table 4.11 in Appendix C), yet the findings are not robust to controls for employment status (not shown).

Table 4.7 Mothers' minutes spent in developmental childcare (*participants only-OLS*)

	Model 1	Model 2	Model 3	Model 4	Model 5
	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)
Intercept	62.82 ^{***} (4.01)	65.50 ^{***} (4.46)	83.20 ^{***} (19.30)	95.98 ^{***} (19.49)	32.80 ^{**} (19.54)
College degree or more	3.73 ^{**} (1.65)	-15.52 ^{**} (6.18)	-14.36 ^{**} (6.43)	-15.08 ^{**} (6.25)	-15.04 ^{**} (7.11)
1960s	-4.96 (5.39)	-5.03 (6.03)	-5.22 (6.25)	-5.82 (6.40)	-7.90 (6.50)
1990s	11.96 ^{**} (5.40)	5.36 (6.05)	5.56 (6.17)	7.99 (6.29)	4.69 (6.43)
2000s	27.04 ^{***} (3.96)	24.45 ^{***} (4.50)	25.17 ^{***} (4.72)	28.46 ^{***} (4.83)	26.00 ^{***} (4.82)
Age of diarist			0.32 (0.99)	-1.38 (1.03)	0.45 (1.02)
Age squared			-0.02 [*] (0.01)	0.00 (0.01)	-0.01 (0.01)
Number of children				5.38 (3.91)	5.77 (3.82)
Number of children sq.				0.63 (0.83)	0.17 (0.81)
Child under age 5					32.02 ^{***} (1.84)
College:1960s		0.61 (9.58)	0.76 (9.97)	3.55 (10.48)	4.65 (10.20)
College:1990s		32.37 ^{***} (10.93)	33.19 ^{***} (11.10)	35.02 ^{***} (10.97)	32.14 ^{***} (12.23)
College:2000s		19.14 ^{***} (6.42)	22.56 ^{***} (6.67)	23.71 ^{***} (6.50)	18.53 ^{**} (7.32)
Adj R.	0.01	0.01	0.03	0.04	0.07
N	11156	11156	11156	11156	11048

Note: Clustered standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. 124 cases with missing values for presence of a child under the age of 5 years are excluded from the analysis shown in Model 5. Having a college degree or more X 1975 is the omitted category. All models correct for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

The OLS findings therefore provide support for the second hypothesis⁹³: high-educated mothers have increased their minutes spent in developmental childcare activities at a faster rate compared to mothers with a low educational attainment. We do not however observe a similar trend in basic childcare. Pooling these two different types of childcare activities consequently yields mixed results regarding the effect of education on parenting behaviours.

In their analysis of childcare trends, Sayer, Bianchi and Robinson (2004) conclude that the average increase in primary childcare time between the 1960s and the 2000s is mostly driven by an increase in developmental care. The authors also show that the main reason behind increasing time investments in children is behavioural change rather than a change in demographics. This chapter advances previous research by showing that better-educated mothers shifted their behavioural patterns to a greater extent than less-educated mothers, particularly to provide more developmental care. These findings are in line with the theoretical expectation that middle class parents are more likely to adopt child rearing practices that improve their children's social and cognitive skills, namely *concerted cultivation*. As expected, significant increases in parental time spent in developmental care are observed in the 1990s, a period where the ideal of *intensive parenting* became widespread (Hays 1996).

4.8 TRENDS IN PATERNAL CARE

As stated previously, AHTUS does not provide information on non-residential fathers' childcare time. This is problematic for the purposes of our research since

⁹³ We ran gamma regressions using the whole sample. The results were in line. There is no strong evidence to support the claim that the effect of being highly educated on the provision of basic childcare has significantly increased over the period at study. However, after controlling for basic demographic and child characteristics, highly educated mothers time spent in developmental childcare has increased at a faster rate, leading to a widening gap in the 1990s and 2000s.

divorce rates have increased substantially during the period at study and they are particularly high among low-educated couples (Raley and Bumpas 2003; Teachman 2002). Since low-educated families are less likely to have a present and involved father in childcare, inequalities in total parental time investments are exacerbated once fathers' time spent with children is taken into account. To fully portray the inequalities in total parental time investments, therefore, we need to incorporate non-resident fathers into the analysis. Due to data limitations however, we cannot fully incorporate the extent to which paternal time investments vary by educational attainment. However, we analysed the paternal care time of residential fathers during the period at study. Small sample sizes in earlier periods prevent us from having reliable estimates, but the findings can be summarized as follows.⁹⁴

The descriptive analysis shows that, similar to mothers, all fathers have increased the total time they spent in *primary childcare* between the 1960s and 2000s. However, highly-educated fathers have increased their primary care time at a faster rate.⁹⁵ On average, time spent in primary childcare by low-educated fathers has increased from approximately 15 minutes in the 1960s-1970s to 20 minutes in the 1990s, and to 44 minutes in the 2000s. During this period, college-educated fathers have increased their primary childcare time from approximately 25 minutes in the 1960s-70s to half an hour in the 1990s. In the 2000s, highly educated fathers spent 67 minutes in primary childcare on average. As a result, the gap between high- and low-educated fathers' primary childcare time increased from 10 minutes in the 1960s-1970s to 23 minutes in the 2000s. As for *developmental childcare*, high-educated fathers saw an

⁹⁴ The findings summarized below are for non-Hispanic White men who are aged between 19 and 55 years and are living with at least one child under the age of 18 years in the household.

⁹⁵ See Figure 5.2 in Chapter 5 for trends in time spent in primary childcare for all fathers (White and non-white), based on MTUS data. See Figure 5.4 for the differences in the average minutes spent in primary childcare.

increase from 10-15 minutes in the 1960s-1970s to 40 minutes in the 2000s. During the same period, low-educated fathers' developmental care time has increased from less than 10 minutes to 25 minutes. As a result, the class gap in fathers' developmental care has increased from approximately 5 minutes to 15 minutes per day. The class gap in fathers' *basic childcare* has also increased by approximately 10 minutes.

The OLS regression analysis indicates that having a college degree in the 2000s, compared to the 1970s, is associated with 15 minutes more primary childcare time for fathers ($p < 0.005$).⁹⁶ Further investigation of the data shows that the main source of the increase in high-educated fathers' primary childcare time is their higher participation rate in the activity, rather than longer minutes spent in it. In other words, high-educated fathers have increased their probability of providing primary childcare at a faster rate compared to low-educated fathers. Yet, among those who reported the activity, high-educated fathers do not necessarily increase their primary care time at a faster rate. Unlike in the case of mothers, a multivariate analysis does not show a widening education gap in fathers' involvement in developmental childcare activities, while the education gap in the probability of providing basic childcare has grown significantly between the 1970s and 1990s. The gap also continued to widen in the 2000s. However, limiting the analysis to *participating* fathers shows that, among fathers who reported some basic care, being high-educated in the 2000s compared to being high-educated in the 1970s is associated with *fewer* minutes spent in basic care time.

⁹⁶ The model controls for number of children under 18 years (its squared term), age of diarists (and its squared term), presence of a child under the age 5 years and diary completion day. It should also be noted that the significant findings heavily depend on parametric assumptions: that is, gamma models yield no significant results.

In brief, the analysis of non-Hispanic white fathers' care time provides some evidence that the education gap in paternal time investments has widened during the period at study. The main reason behind this is college-educated fathers' higher likelihood of reporting primary childcare, particularly basic childcare, on a given diary day. However, the results do not show an increased gap in developmental care activities. Moreover, although highly educated fathers' probability of providing basic childcare has increased overtime, minutes spent in the activity by *participating* high-educated fathers have not increased. The absence of well-educated and involved fathers, therefore, is likely to result in an even more unequal distribution of total parental care time among children.

4.9 SUMMARY AND DISCUSSION

This chapter presents empirical evidence showing an increase in the effect of education on mothers' time spent in developmental childcare among non-Hispanic white mothers. The resulting inequality in parental time investments is particularly acute during the early years of childhood (not shown). In the 1970s, the education-gap in mothers' time investments was negligibly small. Yet from the 1990s onwards, the gap in developmental care time widens. The findings are partially in line with theoretical expectations: all mothers have increased their time in primary childcare substantially, particularly starting from the 1990s. This is the period during which the ideal of *intensive parenting* has spread to all segments of society through best-selling childcare manuals, magazines and television.

The education gap in the probability of reporting basic childcare has widened in the 2000s compared to 1970s. Conditional on reporting some time spent in the activity,

being highly educated in the 1990s is associated with approximately 38 minutes less basic childcare time, but 32 minutes *more* developmental childcare time (according to baseline control models with no controls). Being highly educated in the 2000s does not yield significantly more time spent in basic childcare compared to the 1970s (the interaction term is not significant), while the education gap in developmental childcare time is approximately 20 minutes more.

The growth of inequality in non-Hispanic white mothers' time investments in developmental care activities is particularly problematic in the context of the US, because there is no affordable high-quality childcare which could substitute for missing time with parents (National Association of Childcare Resource and Referral Agencies 2010). In other words, inequality in parental time investments is likely accompanied by inequality in *non-parental* time investments. The absence of adequate state support for mothers affects poor and single mothers the most (Craig and Mullan 2011). Single mothers have substantially increased their predicted time spent in primary childcare, particularly in developmental childcare for the same period. Despite this substantial increase, children born to low-educated and single mothers receive much less parental time investment compared to children born to two-parent families.

A series of demographic and socio-economic problems are likely to exacerbate the problem. Marital dissolution has disproportionately increased among parents with a low educational attainment (Raley and Bumpass 2003; Teachman 2002). The same period also witnessed an increase in income inequality among parents with children (Western, Bloome and Percheski 2008) as well as in the cost of non-parental

childcare, forcing families to shift to low-quality childcare (NACCRRRA 2010). Due to increased educational homogamy, high-educated men and women are more likely to be married, and thus more likely to concentrate both maternal and paternal class advantages on the same children. Furthermore, the study's sample is limited to non-Hispanic white mothers, and hence the role of race/ethnicity as another significant *stratifier* in the US context is ignored. The extent of the growth in inequality in parental time investments reported in this research is, therefore, likely underestimated.

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CHAPTER 5:

DOES CONTEXT MATTER? CROSS-NATIONAL ANALYSIS OF CHILDCARE PATTERNS OF MOTHERS AND FATHERS*

ABSTRACT

Recent literature has documented the importance of relevant policies and institutional structures for women's decisions regarding employment (Van Dijk 2001), time spent in paid work (Van der Lippe 2001), domestic division of labour (Fuwa 2004) and men's unpaid work (Hook 2006). However, cross-national research that analyses the effect of family policies and national context on childcare time is scarce and lacks a historical perspective. This study addresses this gap in the literature and explores the relationship between specific policies, macro-economic structure and childcare across time. Using the Multinational Time Use Survey, the study first shows that high-educated (college degree or more) parents provide more primary childcare for their children compared to low-educated (no college degree) parents. In some countries, such as Canada and the US, the gap between high- and low-educated parents has been widening. The chapter then demonstrates the positive effect of the provision of paid leave and a gender egalitarian labour market structure on mothers' and fathers' time investments in children. The chapter concludes by showing that the availability of universal paid leave and gender egalitarian labour market conditions could help alleviate inequalities in parental time investments in children.

**Shortly after the defense of this thesis CTUR has identified a possible error in the Swedish 2001 survey. The estimates of childcare based on MTUS version of the survey were found to be significantly lower than those based on HETUS. We will rerun the analyses with the correct data before publishing anything from this chapter and the results in the published version (and in all other future replications) may differ from those in the chapter.*

5.1 BACKGROUND OF THE STUDY: SOCIO-ECONOMIC AND DEMOGRAPHIC CHANGES IN THE WESTERN WORLD

In the second half of the twentieth century, industrialized countries have witnessed substantial changes in their demographic and socio-economic structures. These changes have presented significant policy challenges. For example, in all OECD countries women have been entering into salaried employment in growing numbers.⁹⁷ In 1965, 12 of the 14 industrialized countries had female participation rates lower than 50 per cent, whereas three decades later only four out of 21 had less than 50 per cent female participation rates (Brewster and Rindfuss 2000). What is more striking is an increase in the employment rate of married mothers, especially those with young children. More than 50 per cent of all married and cohabiting mothers across industrialized countries are now in the labour force, although the figure ranges from a low of less than 50 per cent in southern European countries to a high of over 75 per cent in Scandinavian countries (LIS 2009). Despite significant cross-national variations, the overall increase in women's employment has been considered one of the most influential changes in the labour markets of industrialized countries during the post-war era (Van der Lippe and Van Dijk 2001).

One consequence of this significant shift has been the decline of the traditional *breadwinner- homemaker* arrangement, the norm which dominated Western families during the first half of the twentieth century. In most industrialized countries, the

⁹⁷ As demonstrated by early and recent studies, the increase in women's participation in the labour force had little or no effect on occupational gender segregation or the gender gap in earnings (Van der Lippe and Van Dijk 2001). Women are still underrepresented in managerial positions and overrepresented in clerical, sales and service work (Charles 1992). Moreover, gender occupational inequality is more pronounced in developed welfare states characterized by a large public service sector and "mother-friendly" policies (Hansen 1997; Mandel and Semyonov 2006, 2005).

idealized male breadwinner family is now outnumbered by the dual-earner family. In the US, more than half of married-couple families are dual-earners, while male breadwinner/female homemaker couples amount to only 19.8 per cent (Bureau of Labour Statistics 2007). Neither is this trend limited to the US. The proportion of dual-earner couples has also expanded throughout Europe. In Austria, Belgium, France, Germany, the Netherlands, Portugal and the UK, two-thirds or more of all couples with at least one partner working were dual-career couples, compared with less than half in southern European countries (Hantrais 2004).⁹⁸

These massive changes in demographic structure, however, are not followed by equally substantial changes in time use patterns in the domestic division of labour. In all countries, women continue to do a disproportionate share of unpaid work at home regardless of their employment status, and continue to be the main care givers. The analysis of time use patterns of men and women show some convergence in total time spent in paid and unpaid work, however these changes mostly result from a considerable decline in the time women devote to housework, rather than a substantial increase in men's contribution (Gershuny 2000). Men have also increased their time spent in childcare, but the burden of childcare is still disproportionately on women. Besides, detailed investigation of domestic time use patterns reveal that men are more likely to engage in "fun" childcare activities (such as playing with children), leaving the routine

⁹⁸ Another challenge to the traditional family has come from increased marital instability and changing social norms. Cohabitation has become increasingly popular, turning into a more permanent form of family, while marriage is no longer seen as the only accepted way to have a child. The proportion of marriages dissolved by divorce in the EU-15 countries is estimated at 15 per cent for marriages entered into in 1960. The figure has doubled to 29 per cent for those who married in 1980 (Eurostat 2007). Divorce has replaced death as a leading reason of single parenthood in many countries, leading to a significant increase in solo parenting.

and less rewarding childcare activities to mothers (Chapter 3). Similarly, women still do the bulk of housework, especially when it comes to routine and core housework activities (Kan, Sullivan and Gershuny 2011). In short, revolutionary change in women's work life has not been followed by an equivalent change at home.

This persistence of a gendered division of domestic labour and childcare against the background of significant social transitions has sparked voluminous sociological research in many related areas such as "work life balance" (Hattery 2001), "well-being of children" (McLanahan and Sandefur 1996), "the dual burden" of working mothers (Hochschild and Machung 1989) and "the role of the welfare state on family organization" (Gornick and Meyers 2003). The common focus of these various strands of research has been the reconciliation of work and family life, as well as gender inequality, in the face of a fundamentally altered family profile and the substantial demographic changes in the industrialized world. Three sociological debates have particularly dominated the literature.

One line of research focuses on the well-being of children in the face of increased maternal employment and single parenting (Blau and Grossberg 1992; McLanahan and Sandefur 1996; Stafford 1987; Ruhm 2000). A report by the Council of Economic Advisors (1999) concluded that an increase in mothers' employment and a shift toward single parent families resulted in a reduction of 22 hours in the time available for parents to spend with children. Given the strong positive connection between parental involvement and children's social and cognitive development, a reduction in available

childcare time is considered to be potentially detrimental to children's well-being. Following this premise, both popular and scholarly literature (especially in the US) has highlighted issues surrounding the increased employment of mothers and its potential adverse consequences on children. Additionally, increased solo parenting and less paternal contact has also raised concerns regarding the deprivation of the father-child relationship. Consequently, the problem of *parenting deficit* has been frequently expressed in academic literature as well as in the media. However, in line with the findings presented in the previous chapter, a large body of research shows no evidence of a decline in parental time in the US. The supposition that the increased working hours of mothers would translate into a substantial reduction in childcare time has been shown incorrect, yet concerns about increased inequalities are not unfounded.

In another related sociological debate, the focus of interest has been on the well-being of adults, especially working mothers, and work-life balance (Moen 2003; Plantenga and Remery 2005; Schenider and Waite 2005). Social norms surrounding good parenting now require extreme time and financial investments in children (Hays 1996). However, recent work has identified possible detrimental effects of over-burdening mothers with the demands of "good mothering" (Chapter 6). As a result of the persistence of gender divisions in childcare and housework, working mothers were claimed to be having a *second shift* and to be suffering from a *dual burden* (Hochschild and Machung 1989), which in turn leads to conflict among couples, marital instability and increased risk of divorce (Cooke 2006). Competing theoretical perspectives have been put forward and tested in order to explain the persistence of the gendered division of domestic labour.

Economic theories have predicted housework by the rules of economic exchange (e.g. Becker 1991 [1981]), while gender perspectives put forward the prevailing gender norms and the gender identity of individuals as major explanatory factors (e.g. Berk 1985, West and Zimmerman 1987). Accordingly, different propositions have been made addressing the issue of how to balance the gender division of domestic labour, and how to integrate fathers further into family life in terms of increased paternity time as well as responsibility.

Yet another sociological debate has approached the issue from a policy perspective, in which the role of the welfare state and national context has been a matter of interest (Gauthier 1996; Gornick and Meyers 2003; Sainsbury 1994; Van der Lippe & Van Dijk 2001). Decisions regarding the allocation of time in households have significant repercussions for the whole society at the aggregate level. The importance of women's labour force participation and declining fertility rates combined with an aging society has alerted policy makers to work-life balance problems in the family and in children's care. This in turn led to a considerable expansion of family policies during the late 1990s most notably in Scandinavian countries, followed later by a majority of the industrialized countries. A large body of research has been devoted to investigating the effects of welfare regimes on gender relations in the household as well as in the public sphere (e.g. Geist 2005; Gornick and Jacobs 1998; Gornick, Meyers and Ross 1997; Gershuny and Sullivan 2003).

This chapter is situated at the cross-roads of these three sociological debates. In the context of the substantial changes that the Western family has been experiencing, the

study examines the extent to which family policies and socio-economic context have been effective in terms of influencing parents' allocation of time to childcare. Linking individual-level time use data with policy information at the national level, this chapter investigates the association between policy context and time spent in childcare by mothers and fathers. The results show that the gap in parental time investments between high- and low-educated parents is a cross-national phenomenon. Whereas well-articulated family policies can help to alleviate this parenting gap, unintended consequences of parental leave policy innovations can also contribute to this polarization (O'Brien 2009). Unequal access to leave rights can create a duality of *parental-leave-rich-households* versus *parental-leave-poor-households* in which some privileged infants enjoy maternal, paternal and financial capital, while others receive less emotional and financial investment (O'Brien 2009). This possibility is addressed by examining the direct effect of paid leave policies on mothers' time spent in childcare, and by investigating whether the effect of education is being mediated by the provision of paid leave. The chapter also shows the extent to which gender egalitarian labour market conditions and wage-ratio have an effect on mothers' and fathers' contribution to childcare.

5.2 PREVIOUS RESEARCH

This study combines individual-level time diary data with information on the socio-economic and policy context of the countries at study, and investigates the effect of macro-level factors on the childcare patterns of individuals. Taking such an integrative approach with a specific policy focus is a rather recent practice in the sociological

literature. Recently, studies have made some progress in identifying the relation between specific policies and various individual outcomes. Ferrarini (2006) shows the relation between family policy benefits and cross-national poverty in households with young children, where child poverty decreases with family policy transfers. Fuwa and Cohen (2007) report that, in countries with substantive parental leave policies and no discriminatory policies, the division of housework is more egalitarian. The authors also find a mediating effect of parental leave policies on the effect of women's full-time employment on the domestic division of labour (excluding childcare). Smith and Williams (2007) create a father-friendly policy index to assess the relation between paternal time and father-friendly legislation, and conclude that both absolute and relative levels of paternal time are correlated with the policy index. Pettit and Hook (2006) shows the different implications of the provision of publicly funded childcare and parental leave policies on the employment decisions of women. Extended leave provisions are found to be negatively associated with the effects of having young children on the probability of employment, while public childcare is positively associated with these effects. Hook (2006) finds parental leave available to men as a key determinant of father's time spent in unpaid work. In a more recent study (2010), she also shows that national conditions (e.g. availability of parental leave, women's employment rate, etc.) also affect the *types* of housework that women and men engage in. In a comparative analysis of two Nordic countries (Sweden and Norway) with the UK, Sullivan et al. (2009) show that variations in fathers' childcare patterns reflect the policy variations across these 3 countries. The study shows, for example, full-time employed Norwegian fathers with an infant under the age of 1 year spend approximately

40 minutes more in primary childcare time on average compared to their British counterparts. “Father-friendly” policy provisions and state incentives in Norway are therefore reflected in the “fathering strategies” within families. The study identifies a gap in the existing literature and calls for a future research that examines not only the direct effect of policies but also “the ways in which policies moderate the impact of individual characteristics” (2009: 250).

The literature provides significant evidence for the importance of macro-structure, particularly institutional setting, when it comes to individual decisions regarding the allocation of time and family organization. However, the studies that focus on the effect of family policies on the domestic division of labour remain scarce, and there is no large-scale study that concentrates on the effect of policy structure and labour market conditions on childcare patterns across time. It is against this background that the present chapter attempts to fill the gap in the literature by analysing the effect of the national provision of childcare services across time and countries.

5.3 THEORETICAL PERSPECTIVE AND RESEARCH FOCUS

Research investigating the effect of individual-level factors on childcare time is abundant. While gender remains the most important determinant of childcare time, the number and age of children are found to be more significant than other parental characteristics (Sandberg and Hofferth 2001, 2005; Sayer, Bianchi and Robinson 2004; Zick and Bryant 1996). Employment decreases childcare time for both parents, while the effects are much stronger for mothers than fathers (Coltrane 2000; Shelton and John

1996); education is positively and strongly associated with total time spent in childcare, and particularly developmental activities (Chapter 2 and Chapter 3); and the presence of teenage girls and older adults in the household reduce parental time (Sayer, Gauthier and Furstenberg 2004). This chapter takes a further step from an individual-level analysis. The main premise of the study is that context affects individuals: that the effect of individual factors on childcare time varies across different socio-economic and policy contexts.

Based on this premise, individual-level theories can only provide a partial explanation since individuals' behaviours are affected by the context within which they live.⁹⁹ Because the socio-economic conditions and policy context surrounding individuals vary, the effect of the individual factors may as well. For example, as stated by Blumberg and Coleman, macro-level factors such as the general extent of male domination or the prevailing ideology of women's place in society can act as a "discount rate" on women's exercise of power at the micro-level (Blumberg 1984; Blumberg and Coleman 1989). Similarly, policy structure could mediate the effect of individual factors at the micro-level. The state, through its regulations and policy structure, provides incentives as well as constraints within which individuals form their preferences and make their choices.¹⁰⁰ Depending on the policy structure of the country and its socio-economic conditions, both the preferences of individuals and the cost of acts associated with those preferences

⁹⁹ As Giddens (1984) recognizes in his structuration theory, individuals (agencies) also shape the contexts (structures) they live in.

¹⁰⁰ An underlying difference between state responses to childcare is whether the children are seen as a public good or a private good. For a brief summary on this diverse position, see Craig (2007); for a pro-"children as public good" view, see Folbre (2008).

can vary. Therefore, any account of individual decisions regarding the allocation of time would be inadequate without paying sufficient attention to the broader socio-economic and policy context within which individuals are embedded.

There are several possible explanatory mechanisms behind the relationship between family policies and parents time spent with children. First, states can provide direct incentives for parents to use their leave rights and spend time with their children through generous and extended leave provisions. For instance, the provision of long parental leave with high compensation levels decreases the financial cost of temporary withdrawal from employment, and thus encourages parents to take leave and spend time with their children, especially in early infancy. Second, it is also plausible to expect a correlation between taking parental leave during early infancy periods and increased childcare time during the later childhood period. In other words, in countries where the provision of parental leave enables parents to spend more time with their children in early infancy periods, parents may also be more likely to spend time in childcare activities during the late childhood period. A study by Aldous, Mulligan and Bjarnason (1998) shows that, if fathers begin taking care of young children, a continuing pattern is established. Early participation in childcare leads to fathers' continued involvement with these children when they are older. Hence, a prolonged effect of long leave policies on childcare patterns may exist long after the initial leave period spent with the child. Third, the provision of leave policies may create a more suitable ideological environment for parents, especially for fathers, to spend time with their children. For example, when leave period is given as a non-transferrable reserved right to fathers, the social pressure

on mothers to use the whole parental leave can be mitigated. Similarly, in the case of fathers, removal of institutional barriers could increase the pace of change (Lamb and Tamis-Lemonda 2007), and could lead them to shift their behavioural patterns and/or fatherhood ideals more quickly. They could also help working mothers to negotiate while transferring some of the housework and less pleasant aspects of childcare to fathers. From a perspective of *relative resources*¹⁰¹, for example, working mothers would be negotiating in a more advantageous environment regarding transferring certain domestic duties when the state provides fathers with a compensated leave period. In summary, a relationship between family policies and childcare patterns is expected because the policy structure of the country provides incentives as well as constraints within which individuals make decisions regarding the allocation of time in all aspects of their lives.

5.3.1 RESEARCH OBJECTIVES AND HYPOTHESES

This study has three main research objectives. First, it tests whether being high-educated is associated with more time spent in primary childcare cross-nationally. Previous

¹⁰¹ *Relative resources perspective* assumes that individuals within a household have potentially conflicting interests, which they indeed pursue over and above the household utility. This perspective regards both childcare and housework as disutility. As a result, the individual who has the greater resources is expected to spend less time in childcare and housework. What constitutes a “resource”, however, is a matter of dispute. Women’s relative financial power has been the most common way of operationalizing relative resources (Brayfield 1992; Fuwa 2004; Presser 1994; Ross 1987), followed by educational attainment, occupational status, age, or a combination of these (Coverman 1985; Deutsch, Lussier and Servis 1993). The assessment of relative resources theory for the division of household labour provides quite consistent results, yet the theory proved to be less powerful in explaining only childcare. Coverman (1985), using both childcare and housework as dependent variables, finds no strong support for the relative resources hypothesis. Deutsch, Lussier and Servis (1993) find one of the three measures, the discrepancy of income, statistically significant in explaining fathers’ involvement in childcare, while discrepancy in occupational prestige and discrepancy in education were not found to be significant. Fernandez and Sevilla-Sanz’s (2006) analysis of Spanish Time Use Survey data reveals that a woman’s relative share of housework decreases as her relative earnings increase, but only up to a certain point, while the relative time spent in childcare does not vary by spouse’s relative earnings.

chapters show that high-educated white mothers and fathers provide more primary childcare for their children than their low-educated counterparts in the US. In this chapter, cross-national and cross-time data is used to see whether the positive association between childcare and high-education holds in different socio-economic and policy contexts. In line with previous research (for example Gershuny 2000 and Sayer; Gauthier and Furstenberg 2004), we expect a positive association between parental education and time spent in primary childcare for both mothers and fathers.

HYPOTHESIS 1A\B: High-educated mothers\ fathers provide more primary childcare compared to mothers\ fathers with a low educational attainment.

The second research objective is to examine the possible effect of macro-conditions on parenting behaviour. We specifically investigate the relationship between parents' time spent in childcare and (i) paid leave available for mothers, (ii) female participation rates in the labour market and (iii) women's wage ratio to men's. An increased female participation rate in the labour market and a high ratio of female-male income are indicators of a relatively more gender egalitarian context. A direct positive association is expected between gender egalitarian macro-economic contexts and fathers' contribution to childcare, and between the provision of paid parental leave (available for mothers) and mothers' childcare time. As stated previously, the strength and the direction of the factors associated with childcare are expected to vary across different macro- contexts.

HYPOTHESIS 2: Number of paid leave weeks for mothers is positively associated with mothers' time spent in primary childcare.

HYPOTHESIS 3: A gender egalitarian labour market structure is positively associated with fathers' time spent in primary childcare.

The third research objective is to investigate the extent to which the effect of education on childcare patterns is mediated by the national context. More specifically, the chapter examines whether a gender egalitarian labour structure and the provision of paid leave alleviate or exacerbate the inequalities in parental time investments between high- and low-educated parents.

5.4 DATA

5.4.1 DATA SPECIFICATION

The time use data used in this study comes from the Multinational Time Use Study (MTUS) which is a collection of harmonized time use diary surveys based on samples from over 20 countries from the early 1960s to the 2000s.¹⁰² Data from 14 countries between the period of 1965 and 2009 is used. There is considerable variation among the diary methodologies applied in the surveys. Surveys in MTUS vary in their period, number of diary days, time intervals and number of household members included in the survey. We attempt to minimize some of these inconsistencies by statistical techniques (see next section). However, not all the comparability-related problems can be addressed through such techniques. For example, variation in the units of time intervals in which respondents record their activities (e.g. recording activities in 1 minute intervals or 15 minute intervals) may lead to under-estimation (or over-estimation) of activities.

¹⁰² More information on the data and data downloads are available at: <http://www.timeuse.org>

The country-level data used in the study is largely from Anne Gauthier's recent cross-national family policy data set (2011), which is explained in more detail in the following section.

5.4.2 SAMPLE AND MEASUREMENT

The sample of the study is limited to men and women aged between 19 and 64 years who live with one child under the age of 5 years in the household. Because the data does not provide information on the relationship between the child and the respondent, we use women and men living with a child in the same household as proxies for mothers and fathers.

The sample is limited to parents of young children for theoretical and data-related reasons. First, as shown previously, time spent in primary childcare is especially high during the pre-school period when children are more dependent on adult care. Accordingly, family policies are largely designed for families with pre-school aged children. Hence, we would not expect the effects of family policy to be so evident among parents with relatively older children. For example, in all countries there is a child age limit after which parental leave cannot be taken. Although the maximum age of the child after which leave cannot be taken varies across countries, it typically ends with the beginning of compulsory schooling age.¹⁰³ All the countries in the sample provide some sort of institutional/out-of-home education for children aged 5 years or older. The countries, however, vary significantly in their provision of paid leave for

¹⁰³ One major exception to this is Sweden, where flexibility of parental leave allows parents to take leave until a child is 8 years old. Still, it is unlikely for parents to take considerable amounts of parental leave while a child is at school-age.

families with *young* children (e.g. pre-school age). Ideally we would sample only those parents with younger children (age 3 years or younger), yet the data does not allow us to specify the age of the youngest child in each survey. Information on the age of the youngest child is particularly inconsistent among the surveys. Having a child under the age of 5 years is the most common cut-off point, which minimizes the problem of lack of comparability across surveys.

From a methodological perspective, one potential disadvantage of limiting the sample to families with young children is that it decreases the sample size considerably, and hence inferential power is reduced (which we avoided in the previous chapter). However, this potential disadvantage is mediated since multilevel modelling, the statistical technique applied in this chapter, “borrows” information from other surveys when it comes to the inference regarding survey-level effects (e.g. policy) (Gelman and Hill 2008).

The sample is not limited to mothers coded as employed in the surveys, although by definition only employed mothers are eligible for paid leave.¹⁰⁴ The reason is that limiting the sample to employed mothers would actually exclude some employed mothers who are sampled during their leave. Including those who are not eligible gives us a conservative estimate of the effect of paid leave. In other words, we are including mothers for whom the effect of paid leave is 0 by definition, but we cannot identify

¹⁰⁴ Eligibility conditions are generally related to prior employment history, while in some countries they may also be attached to family circumstances (Moss and Deven 1999). Strict eligibility requirements can exclude a substantial proportion of the parents’ entitlement, which would directly affect the take-up levels, and thus the time spent with children. There is no comparable cross-national data on the proportion of eligible parents.

these mothers. Hence, we include a larger set of mothers than those who are the direct beneficiaries of parental leave policy.

The response variable in this chapter is *time spent in primary childcare*.¹⁰⁵ As explained in detail previously (Chapter 2 in this thesis), an analysis of primary childcare that ignores other forms of childcare is not ideal and gives us only a partial picture of variations in parenting behaviour. Yet, there are not enough surveys with comparable data in other forms of childcare to proceed otherwise.

The main explanatory variable at the individual level is having *a college degree*. Mothers with a college degree or more are coded as 1, and those with no college degree are coded as 0. At the individual level we also control for the age of the respondent and number of children in the household. We opt for a parsimonious model to avoid controlling for factors that would be highly correlated with education; and also due to data limitations. However, models controlling for the employment and marital status of respondents are also performed to show the extent to which the findings are robust to controlling for two other very significant predictors of parental time. The findings from these models are presented at the end of the Results section.

Three variables are used at the country level: (i) *Number of total paid leave weeks available for mothers*; (ii) *percentage of women in the labour market*, and (iii) *female/male wage ratio in manufacturing in the country*. Table 5.1 shows the country-

¹⁰⁵ In this chapter, we use the terms “primary childcare”, “time investments in children” and “time spent with children” interchangeably.

level variables and sample sizes. All three variables come from the family policy data set of Anne Gauthier (2011).¹⁰⁶ However, we modified the leave policy variable that was provided in the data set. In her extensive family policy data set, Gauthier distinguishes maternity, childcare and parental leave as three separate variables. In Sweden and Norway, there is no *maternity* leave *per se*, but rather parental leave as a family entitlement with some periods reserved for mothers or fathers (i.e. *quotas*). Parental leave with quotas reserved for mothers are in effect the same as maternity leave. Therefore, it would be misleading to use only maternity leave measures and record Norway and Sweden as countries with no leave provision. Maternity leave is sometimes taken immediately after or even prior to birth, while childcare and parental leave are usually taken later. However, for the purposes of this research, such distinctions are less important. What matters is the duration of paid leave available for mothers to spend with their children.¹⁰⁷

The focus is on the provision of *paid* leave because high wage replacement rates are the most straightforward instruments to increase parental use of leave benefits (Gornick and Meyers 2003). When a leave is unpaid or has lower coverage, the impact on usage is likely to be quite low (Baum 2006). For example, in the US, seven years after the

¹⁰⁶ Gauthier, A.H. (2011). Comparative Family Policy Database, Version 3 [computer file]. Netherlands Interdisciplinary Demographic Institute and Max Planck Institute for Demographic Research (distributors). Retrieved from: www.demogr.mpg.de.

¹⁰⁷ One may claim that maternity leave taken prior to birth should have been excluded. We avoid doing so for two reasons. The first relates to data quality. The measures of such specific policies are less reliable than the measures used here, and more importantly leave prior to birth and post birth are substitutes (though obviously not perfect ones). For example, time spent setting up a nursery, buying nappies, etc., allows for more time spent in childcare post-birth.

enactment of 12 months *unpaid* maternity leave in 1993,¹⁰⁸ median leave remained 10 days, which was the same as in 1995 (Waldfogel 2001a). Government mandated leave was *not* found to have significant positive effects on leave-taking (Baum 2003).¹⁰⁹ In the absence of wage replacement, the provision is not effective. Hence, the focus is on *paid* leave only.

The 2004, 2005, 2006 and 2007 US surveys are dropped from the multivariate analysis, and we only use the 2003 and 2008 surveys for three reasons.¹¹⁰ First, trends in time use patterns in a society do not change annually. Using a 5-year period allows us to trace aggregate changes. Moreover, given that ATUS collects diaries throughout the year, cut-off points in January are rather arbitrary. There is no reason to think that January 2005 would be more different than December 2004 to February 2005.

As noted previously, one of the strengths of multilevel modelling is that the model “borrows” information from other groups while making inferences about survey level effects. Yet borrowing information could be problematic when there are potentially influential specific groups. The 2003-2008 data from the US is likely to be one of them. 6 surveys from the US in the 2000s may overwhelm the inference regarding other

¹⁰⁸ The first provision of job-protected unpaid leave by the federal government, Family and Medical Leave Act (FMLA), was signed into law in 1993 by President Clinton, being previously vetoed twice by President Bush. The act covers all public employees regardless of the number of employers. However, private firms with less than 50 employees are exempt from the leave. As a result, about 40% of workers in private firms are ineligible (Waldfogel 2001b).

¹⁰⁹ In our case, including the FMLA provision of 1993 would be particularly problematic because, as shown previously, there has been a substantial increase in the average time spent in primary childcare in the US between the mid-90s and early 2000s. However, research shows that the take-up rates in the US is extremely low, indicating that the increase in maternal care time during the period could not be attributed to the provision of *unpaid* leave (Waldfogel 2001a). Therefore, unlike previous research (e.g. Hook 2010) we do not include the provision of unpaid leave in the model.

¹¹⁰ By the time the analysis was completed, ATUS 2009 and 2010 MTUS conversions were not completed. The first (2003) and the last (2008) available post-2000 surveys were used.

country-years. If nothing else, including all the 2003-2008 US data would result in 17 per cent of all diaries coming from the US-2000s data. Since we are using a mixed-effects model, the resulting (potential) extreme influence of the US would be undesirable.

Four surveys (France 1966, Norway 1971, Israel 2001 and Slovenia 2002) are used in the descriptive analysis but excluded from the multivariate one due to missing data either at the individual or country level.

Table 5.1 Contextual variables and sample size

Country	Year	Total paid leave	Female labour force participation	Wage ratio	N (mothers)	N (fathers)
Canada	1971	15	43.6	0.47	326	245
	1981	15	59.0	0.54	243	219
	1986	15	64.0	0.58	827	651
	1992	25	67.3	0.64	762	547
	1998	25	68.6	0.65	691	512
Denmark	1987	28	76.5	0.84	335	248
Finland	1979	35	68.9	0.75	851	815
	1987	205.1	72.9	0.77	944	856
	1999	213.4	71.4	0.76	537	462
France	1966	14	46.1	0.77	364	370
	1974	14	50.1	0.76	570	539
	1998	172	63.1	0.81	884	825
Germany	1991	170	61.3	0.74	2294	2073
	2001	170	64.2	0.74	1525	1339
Italy	1989	47.5	43.7	0.83	886	858
	2002	65.7	48.4	0.82	1018	955
Israel	1991	NA	NA	NA	581	499
Netherlands	1975	12	31.0	0.75	1465	875
	1980	12	35.5	0.75	2465	1298
	1985	12	40.9	0.74	2583	1779
	1990	12	53.0	0.75	2867	1563
	1995	16	59.0	0.75	2412	1703
	2000	16	65.5	0.78	1030	566
	2005	16	70.1	0.82	943	740

Table 5.1 (cont.) Contextual variables and sample size

Country	Year	Total paid leave	Female labour force participation	Wage ratio	N (mothers)	N (fathers)
Norway	1971	12	50.4	0.76	541	446
	1981	18	63.9	0.83	631	564
	1990	24	71.2	0.86	673	1563
	2000	143	76.2	0.87	893	494
Slovenia	2000	NA	NA	NA	766	633
Spain	2002	16	55.2	0.77	2378	2089
Sweden	1991	64	80.2	0.89	859	710
	2001	64	75.5	0.91	887	593
UK	1974	18	55.0	0.65	1593	1293
	1983	18	57.1	0.67	916	625
	1987	18	63.3	0.66	1143	422
	2000	18	67.8	0.76	1213	884
US	1965	0	45.4	0.65	299	256
	1975	0	54.3	0.67	699	585
	1985	0	63.8	0.70	155	137
	1994	0	68.8	0.80	456	260
	2003	0	70.4	0.85	1922	1361
	2004	0	69.8	0.85	1201	929
	2005	0	69.9	0.85	1301	930
	2006	0	70.0	0.84	1308	872
2007	0	70.2	0.85	1198	865	
2008	0	70.4	0.80	1217	874	

Source: Gauthier 2011

5.5 METHODS

Five multilevel models are specified to estimate mothers' and fathers' time spent in primary childcare, of which the first three are the same for both mothers and fathers. The data at hand has a three-level structure: diary days are nested within individuals, and individuals are nested within surveys (country-years). Modelling the diaries nested within individuals allows us to account for repeated observations per individual in some surveys (e.g. Germany, Netherlands) and not others. All models are estimated for mothers and fathers, the results of which are labelled by model number and A (for mothers) or B (for fathers).

The first model is a random intercept model with no controls:

Model 1:

$$Y_d = \alpha + \zeta_d + \varepsilon_{i[j]} + \xi_{j[i[d]]}, \text{ where}$$

$$\zeta_d \sim N(0, \delta),$$

$$\varepsilon_i \sim N(0, \sigma),$$

$$\xi_j \sim N(0, \upsilon), \text{ where}$$

Y_d is the observation of minutes spent in childcare in a diary day, $i[d]$ is the individual who completes the diary (level 2), $j[i]$ is the survey (country-year) in which individual i was sampled (level 3), with generic indices d , i , j respectively indicating diary, individual and country levels. The first model ("empty model") provides variance decomposition: it shows what percentage of the variation comes from the first, second and third level.

The second model is also a random-intercept model in which we control for diary completion day, number of children, age of respondent and having a college degree. The coefficient of education shows the effect of having a college degree on parents' time spent in primary childcare.

Model 2:

$$Y_d = \alpha_{i[d]}^0 + \alpha^1 week\ day_d + \zeta_d, \text{ where}$$

$$\zeta_d \sim N(0, \delta)$$

$$\alpha_i^0 = \beta_{j[i]}^0 + \beta^1 age_i + \beta^2 number\ of\ children_i + \beta^3 college_i + \varepsilon_i, \text{ where}$$

$$\varepsilon_i \sim N(0, \sigma)$$

$$\beta_j^0 = \gamma_0^0 + \xi_{0,j}, \text{ where}$$

$$\xi_j \sim N(0, \upsilon)$$

The third model is a random-intercept, random-slope model in which we allow the slope of having a college degree to vary across surveys (country-year). The model shows the extent to which the effect of having a college degree on minutes spent in childcare differs across surveys.

Model 3:

$$Y_d = \alpha_{i[d]}^0 + \alpha^1 week\ day_d + \zeta_d, \text{ where}$$

$$\zeta_d \sim N(0, \delta)$$

$$\alpha_i^0 = \beta_{j[i]}^0 + \beta^1 age_i + \beta^2 number\ of\ children_i + \beta_{j[i]}^3 college_i + \varepsilon_i, \text{ where}$$

$$\varepsilon_i \sim N(0, \sigma)$$

$$\beta_j^0 = \gamma_0^0 + \xi_{0,j}$$

$$\beta_j^3 = \gamma_3^0 + \xi_{3,j}, \text{ where}$$

$$\begin{pmatrix} \xi_{0,j} \\ \xi_{3,j} \end{pmatrix} \sim N(0, \epsilon)$$

In Model 4, contextual measures are added. In the case of mothers, these are total paid leave available for mothers (*paid leave*), percentage of female labour force participation (*FLFP*), and wage ratio between men and women (in manufacturing) in the country (*wage ratio*). In the case of fathers, we do not control for total number of paid leave weeks available for mothers. This model shows whether the contextual factors affect mothers' and fathers' minutes spent in primary childcare. Below, Model 4 for mothers is shown only.

Model 4A

$$Y_d = \alpha_{i[d]}^0 + \alpha^1 \text{week day}_d + \zeta_d, \text{ where}$$

$$\zeta_d \sim N(0, \delta)$$

$$\alpha_i^0 = \beta_{j[i]}^0 + \beta^1 \text{age}_i + \beta^2 \text{number of children}_i + \beta_{j[i]}^3 \text{college}_i + \varepsilon_i, \text{ where}$$

$$\varepsilon_i \sim N(0, \sigma)$$

$$\beta_j^0 = \gamma_0^0 + \gamma_0^1 \text{paid leave}_j + \gamma_0^2 \text{FLFP}_j + \gamma_0^3 \text{wage ratio}_j + \xi_{0,j}$$

$$\beta_j^3 = \gamma_3^0 + \xi_{3,j}, \text{ where}$$

$$\begin{pmatrix} \xi_{0,j} \\ \xi_{3,j} \end{pmatrix} \sim N(0, \epsilon)$$

Model 4B is the corresponding model for fathers with no control for paid leave available for mothers.

In the final model for mothers, *education* (having a college degree) is interacted with the number of total *paid leave weeks* available for mothers. The interaction term shows

whether living in a country with extensive paid leave provisions would mediate the effect of having a college degree on time spent with children. In the case of fathers, having a college degree is interacted with the wage ratio in the country and female labour force participation rate, in order to see whether living in a gender egalitarian macro-economic structure affects high- and low-educated fathers similarly. Below, the formal model for mothers is shown only:

Model 5A

$$Y_d = \alpha_{i[d]}^0 + \alpha^1 week\ day_d + \zeta_d, \text{ where}$$

$$\zeta_d \sim N(0, \delta)$$

$$\alpha_i^0 = \beta_{j[i]}^0 + \beta^1 age_i + \beta^2 number\ of\ children_i + \beta_{j[i]}^3 college_i + \varepsilon_i, \text{ where}$$

$$\varepsilon_i \sim N(0, \sigma)$$

$$\beta_j^0 = \gamma_0^0 + \gamma_0^1 paid\ leave_j + \gamma_0^2 FLFP_j + \gamma_0^3 wage\ ratio_j + \xi_{0,j}$$

$$\beta_j^3 = \gamma_3^0 + \gamma_3^1 paid\ leave_j + \xi_{3,j}, \text{ where}$$

$$\begin{pmatrix} \xi_{0,j} \\ \xi_{3,j} \end{pmatrix} \sim N(0, \epsilon)$$

5.6 RESULTS

5.6.1 DESCRIPTIVE ANALYSIS

Figure 5.1 shows the average time spent in primary childcare by mothers who have at least one child under the age of 5 years. Overall, the figures show a positive trend in maternal childcare time, particularly between the 1980s and the 2000s with two major exceptions: Sweden and France. Average time spent in childcare by Swedish mothers

decreases from 158 minutes in 1991 to 107 minutes in 2001. Similarly in France, average time spent in primary childcare decreases from 170 minutes in 1966 to 146 in 1974 and to 136 in 1998. In Norway, we also observe a 10-minute decline between the 1990s and the 2000s, yet the recent figures are still higher compared to figures from the pre-1990 period. The trends in mothers' primary childcare time between the 1960s and mid-1980s are more complex, not showing a clear pattern.

Overall, there is considerable variation in mothers' average time spent in primary childcare both across countries and across time. For example, in the 2000s the difference between the average time spent in childcare between Finland and Sweden is as high as 78 minutes per day.¹¹¹ The difference between Germany, Canada, Spain, Italy and Slovenia is approximately half an hour or more. Additionally, variation across countries is not limited to the post-1990s period. For example, around the mid-1970s average time spent in maternal childcare in France is 75 minutes higher than in the UK, and about 45 minutes higher than in the US or the Netherlands. As for the trends across time, we observe a substantial increase between the 1970s/1980s and 2000s in Finland, the Netherlands and the UK; while the figures rise considerably between the 1990s and the 2000s in Italy, Germany, the Netherlands and particularly the US.

¹¹¹ This might be due to an error in the Swedish 2001 data. See the footnote at the beginning of the Chapter for more on this point (page 204).

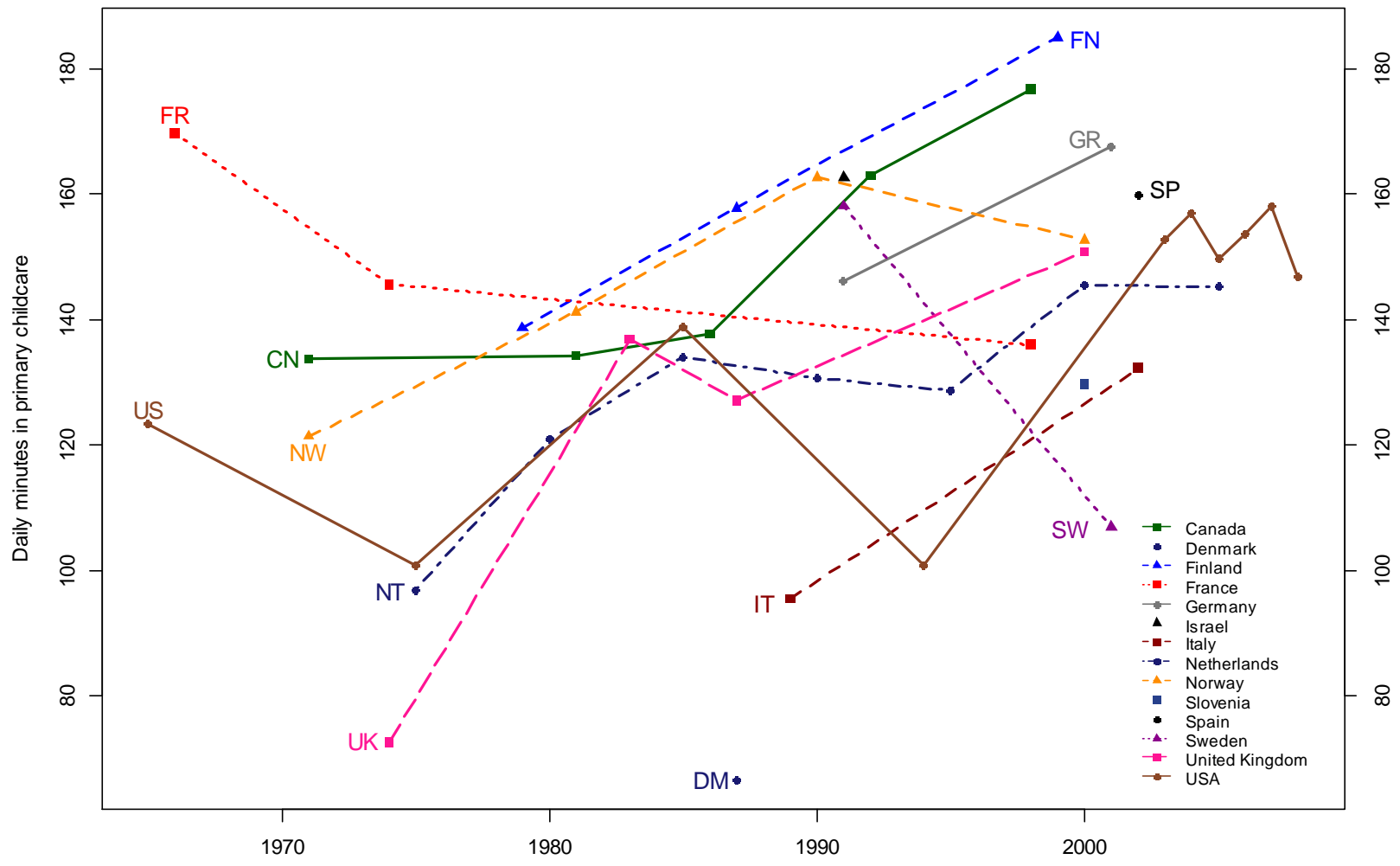


Figure 5.1 Average minutes spent in primary childcare by mothers
Note: Survey weights are applied to account for sampling design and non-response.

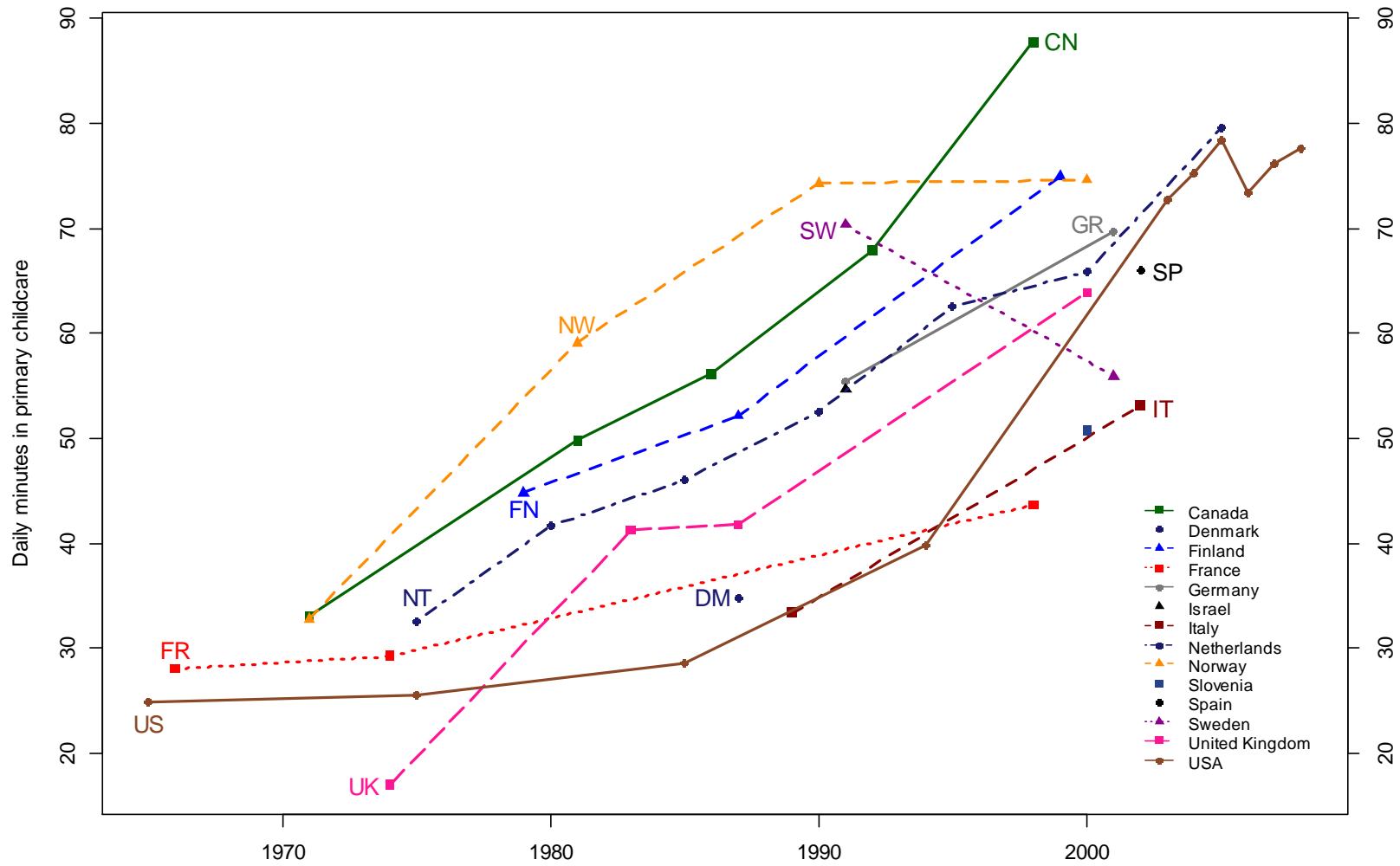


Figure 5.2 Average minutes spent in primary childcare by fathers
Note: Survey weights are applied to account for sampling design and non-response.

Figure 5.2 shows the childcare trends of fathers from the 1960s to the 2000s. There is a clear and steady increase in the parental time of fathers in the last four decades. Sweden is again the only exception to this positive trend: The average time of fathers' primary childcare in the country dropped by 14 minutes between the 1990s and the 2000s. Overall, minutes spent in primary childcare on a given day have increased from approximately 20-30 minutes in the 1960s/1970s to 44-88 minutes in the 2000s. The descriptive results show that not only the mean but also the variation across countries has increased in the 2000s compared to earlier periods. The next two figures show the difference in average time spent in childcare between high- and low-educated mothers and fathers respectively (i.e. "college gap"). The countries are sorted according to the magnitude of the college gap: from lowest to highest. The dotted horizontal line shows the average college gap.

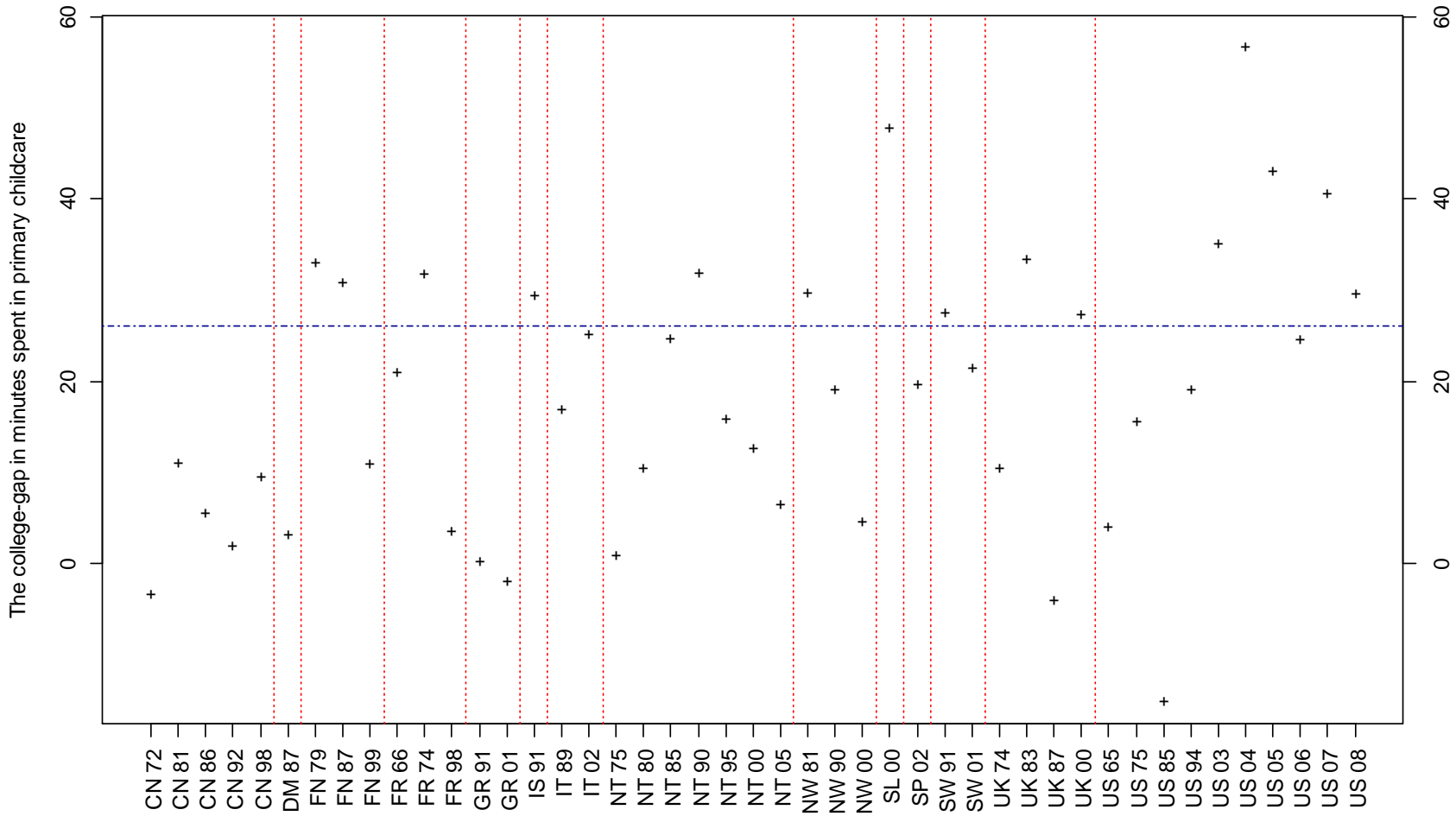


Figure 5.3 The difference between high- and low-educated mothers' average minutes spent in primary childcare

Note: Survey weights are applied to account for sampling design and non-response.

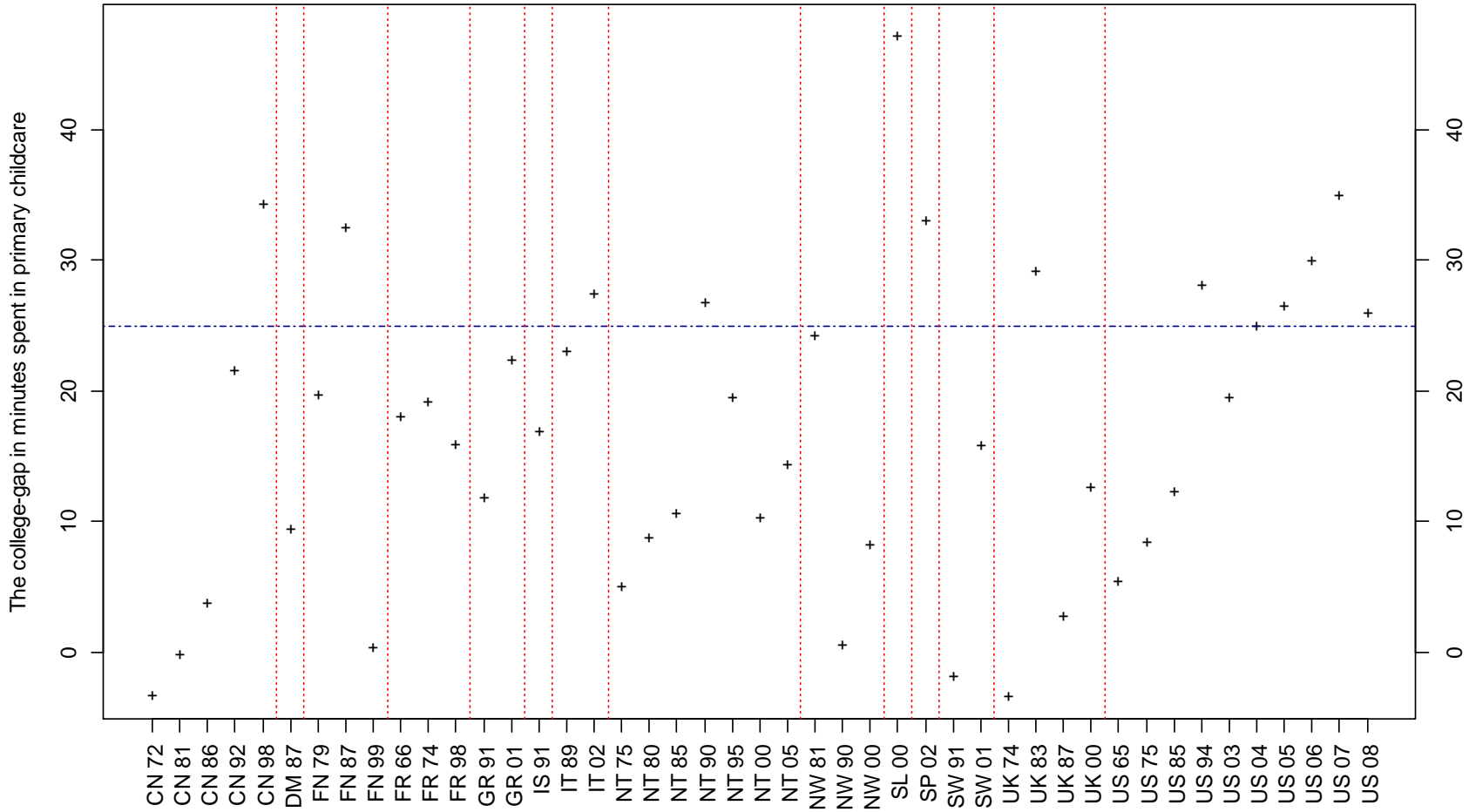


Figure 5.4 The difference between high- and low-educated fathers' average minutes spent in primary childcare
Note: Survey weights are applied to account for sampling design and non-response.

As shown in Figure 5.3, at the lower end of the spectrum lies Germany: here there is virtually no gap between the average time spent in primary childcare by high- and low-educated parents. The figure increases by 20 minutes between the early 1990s and the early 2000s in Germany, but unlike in the US high- and low-educated mothers increased their care time at a similar rate. In line with the figures shown in the previous chapter (based on AHTUS data, not MTUS), the gap in the US has grown beginning in the mid-1990s. On the contrary, in France for example, a 32-minute college gap in the mid-1970s dropped to a mere 4-minute one in the late 1990s. In France, both high- and low-educated mothers decreased their childcare time between the mid-1960s and late 1990s, but high-educated mothers decreased their childcare time at a faster rate, closing the college gap. In Norway, the college gap also dropped from half an hour in the 1980s to 20 and 5 minutes in the 1990s and the 2000s, respectively. Similarly, we observe a 20-minute decline in the college gap in Finland over the last two decades. On average, high-educated mothers provide 26 minutes more childcare time for their children¹¹² compared to low-educated mothers. However, there is considerable variation across countries and across time. Countries such as France, Norway and Finland are trending downwards, while there is a widening gap in the US, the UK (between 1987 and 2000) and, to a lesser extent, in Italy.

Figure 5.4 shows the corresponding estimates for fathers. Similar to the case of mothers, in Slovenia and in the US (2000s) the college gap in fathers' childcare time is relatively high. Trends in paternal care in Canada resemble those in the US. Both high- and low-educated fathers have increased their primary care time between the 1970s and

¹¹² The 2003-2008 US data increases this figure by approximately 6 minutes.

1990s/2000s. However, high-educated fathers increased at a much faster rate, leading to approximately a half an hour gap in the 2000s. Finland is the only country where the parenting gap between high- and low-educated fathers declined between 1987 and 1999. In a similar time period, the gap in paternal care increased in Canada, Sweden, Germany and Norway.

Overall, descriptive results show considerable variation in childcare trends across countries and across time. There is also cross-national variation in the college gap in parental time investment. However, such results can be driven by demographic differences across countries. We next control for such factors and isolate the effect of education on primary care time.

5.6.2 MULTIVARIATE ANALYSIS

This section presents the findings from the multilevel models specified in the Methods section. Tables 5.2 and 5.3 show the respective results from multilevel models for both mothers and fathers. In both tables, the first model is a random-intercept model with no controls at any levels (“empty model”). The second model adds diary- and individual-level controls. The third model allows the slope of the education variable to vary by survey. The fourth and fifth models are different for mothers and fathers.

Table 5.2 Multilevel models estimating mothers' primary childcare time

	Model 1A	Model 2A	Model 3A	Model 4A	Model 5A
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
Intercept	135.14 (4.36)	118.03 (4.90)	118.53 (4.89)	130.38 (32.30)	127.39 (32.57)
College degree		17.69 (1.74)	17.09 (2.44)	16.75 (2.43)	20.32 (2.84)
<i>Contextual measures</i>					
Total paid leave				0.21 (0.06)	0.19 (0.07)
FLFP				0.52 (0.36)	0.53 (0.36)
Wage ratio				-0.71 (0.44)	-0.67 (0.44)
<i>Interaction terms</i>					
Total paid leave: college					-0.07 (0.03)
<i>Variance components</i>					
Diary level					
Residual	61.24	60.97	60.97	60.97	60.97
Individual level					
Intercept	93.53	91.85	91.77	91.76	91.77
College			8.99	9.02	7.48
Country level					
Intercept	26.28	26.23	26.07	22.77	22.86
AIC	498854	490139	490128	490125	490123
N	41700	41700	41700	41700	41700

Note: Standard errors in parenthesis. All models control for diary completion day, age of the respondent and number of children (coefficients not shown).

Table 5.3 Multilevel models estimating fathers' primary childcare time

	Model 1B	Model 2B	Model 3B	Model 4B	Model 5B
Intercept	53.40 (2.90)	51.21 (3.51)	51.70 (3.37)	-1.51 (17.08)	-2.98 (17.13)
College degree		18.13 (1.19)	15.96 (1.72)	15.99 (1.70)	-5.51 (14.64)
<i>Contextual measures</i>					
FLFP				0.71 (0.18)	0.70 (0.19)
Wage ratio				0.13 (0.23)	0.16 (0.23)
<i>Interaction terms</i>					
FLFP: college					-0.04 (0.17)
Wage ratio: college					0.32 (0.20)
<i>Variance components</i>					
Diary level					
Residual	51.91	50.62	50.62	50.62	50.62
Individual level					
Intercept	52.22	51.85	51.77	51.77	51.78
College			6.92	6.71	6.63
Country level					
Intercept	17.43	15.76	14.50	11.58	11.59
AIC	352955	351711	351695	351686	351690
N	31303	31303	31303	31303	31303

Note: Standard errors in parenthesis. All models control for diary completion day, age of the respondent and number of children (coefficients not shown).

Model 1A for mothers in Table 5.2 (empty model) shows that the highest proportion of unexplained variation is at the second level. More specifically, 66 per cent of all the unexplained variation comes from the individual level, while unexplained variation at the country-year level is 5 per cent. The model therefore illustrates the importance of individual-level factors in explaining the variation in mothers' time spent with children. This is understandable given the significance of child- and parent-related factors in explaining time spent with children. 5 per cent variation at the country level, though smaller, still shows that contextual factors have some role in explaining variations in mothers' primary care time. In the case of fathers, unexplained variation at the country level is still 5 per cent, yet the unexplained variation at the individual level (47 per cent) is only slightly higher than at the diary level (Model 1B in Table 5.3).

In the second model, diary- and individual-level variables are added, namely diary completion day, age of diarist, number of children at home (coefficients are not shown) and having a college degree. Having a college degree is significantly and positively associated with minutes spent in childcare for both mothers and fathers (Model 2A and Model 2B respectively). High-educated parents provide approximately 18 minutes more primary childcare time per day compared to low-educated parents. Adding individual-level variables decreases the unexplained variation at the individual level only slightly, indicating that there are many other individual-level factors associated with minutes spent in childcare. Two such factors are the employment and marital status of the respondent. At the end of the Results section, we add those two controls and show that the effect of having a college degree is robust to additional controls (Table 5.4). In fact,

the association between the education and primary care time of parents becomes even stronger with additional controls. In brief, the results provide convincing evidence that the positive association between high-education and time spent with children holds in a cross-national setting.

The third model (Model 3A and Model 3B) allows the slope of education to vary by country-year. In order to interpret the findings in this model clearly, we plot the coefficient of education for each survey (country-year) for mothers and fathers separately. Figure 5.5 presents the estimated coefficient of *college degree* for each country-year for mothers based on Model 3. Figure 5.6 shows the corresponding figures for fathers. Vertical lines show 1 standard error above and below point estimates. There are most notably two reasons why we have large standard errors in the figures: we have only 39 cases at the third level, hence the small sample size does not allow us to have a precise estimate of level-three quantities, for example γ_3^0 and ϵ . Second, Model 3 on which Figures 5.5 and 5.6 are based does not include country-year covariates to explain the effect of having a college degree. In other words, estimating the unobserved variation of the effect of education is imprecise because (i) there are few country-year “observations”, and (ii) there are no country-year explanatory variables in the model.

In line with findings from previous chapters, there is a substantial increase in the effect of having a college degree on mothers’ time spent in primary childcare in the US, starting from the mid-1990s but especially in the 2000s.¹¹³ In recent periods, the US stands out as the country where the gap between high- and low-educated mothers’ time

¹¹³ Note that the effect of having a college degree is smaller in 2008 compared to 2003.

investments in children is widest. There is no other country where we observe a similar amount of increase in the effect of having a college degree on the primary childcare time of mothers. In Germany and in the UK, we also observe a positive trend in the corresponding period, but to a much smaller degree. The college gap between the late 1980s/early 1990s has widened by 5 minutes in those two countries. The association between being high-education and time spent in primary childcare has also widened in Canada between 1992 and 1998 by approximately 7 minutes. There is an opposite trend in France, Sweden and Norway. Additionally, the effect of education on mothers' time spent in primary childcare follows a u-shaped pattern in the Netherlands: it increases up until the 1990s and decreases thereafter.

Figure 5.6 shows that the effect of having a college degree in the US increases substantially for fathers as well. In Canada, Italy, Germany and Sweden, the effect of having a college degree on fathers' time spent with children also increases. It is hard to discern a general pattern from the findings, but in general being highly-educated is more strongly associated with fathers' time spent in childcare in the 2000s compared to earlier periods. Finland stands out as the only country where the effect of having a college degree actually shrank between the late 1980s and late 1990s. Overall, the results show that high-educated parents provide more childcare for their children compared to low-educated parents, but that the strength/extent of that association varies across countries and across time.

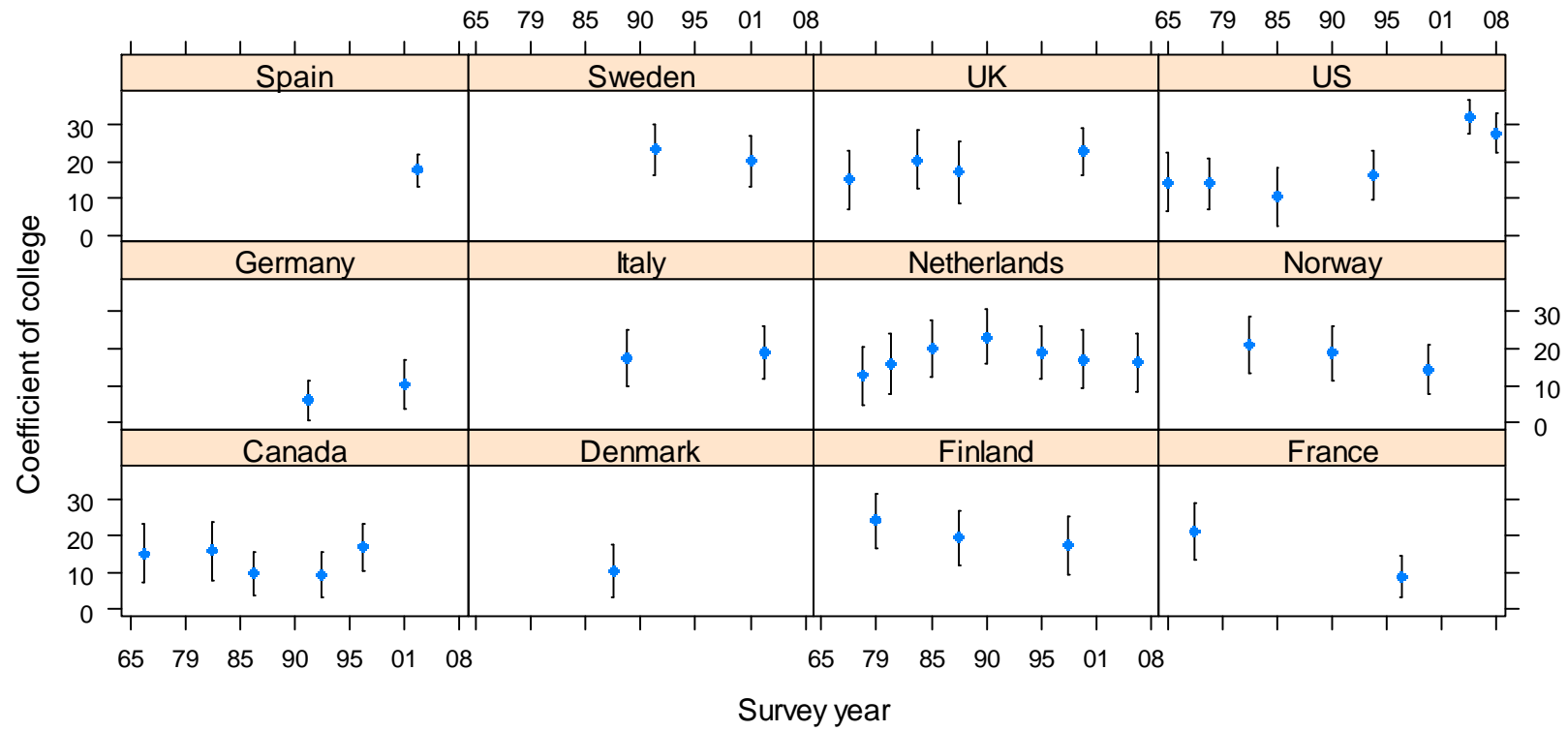


Figure 5.5 Coefficient of college degree by country-year for mothers, based on Model 3 (no country-year covariates)

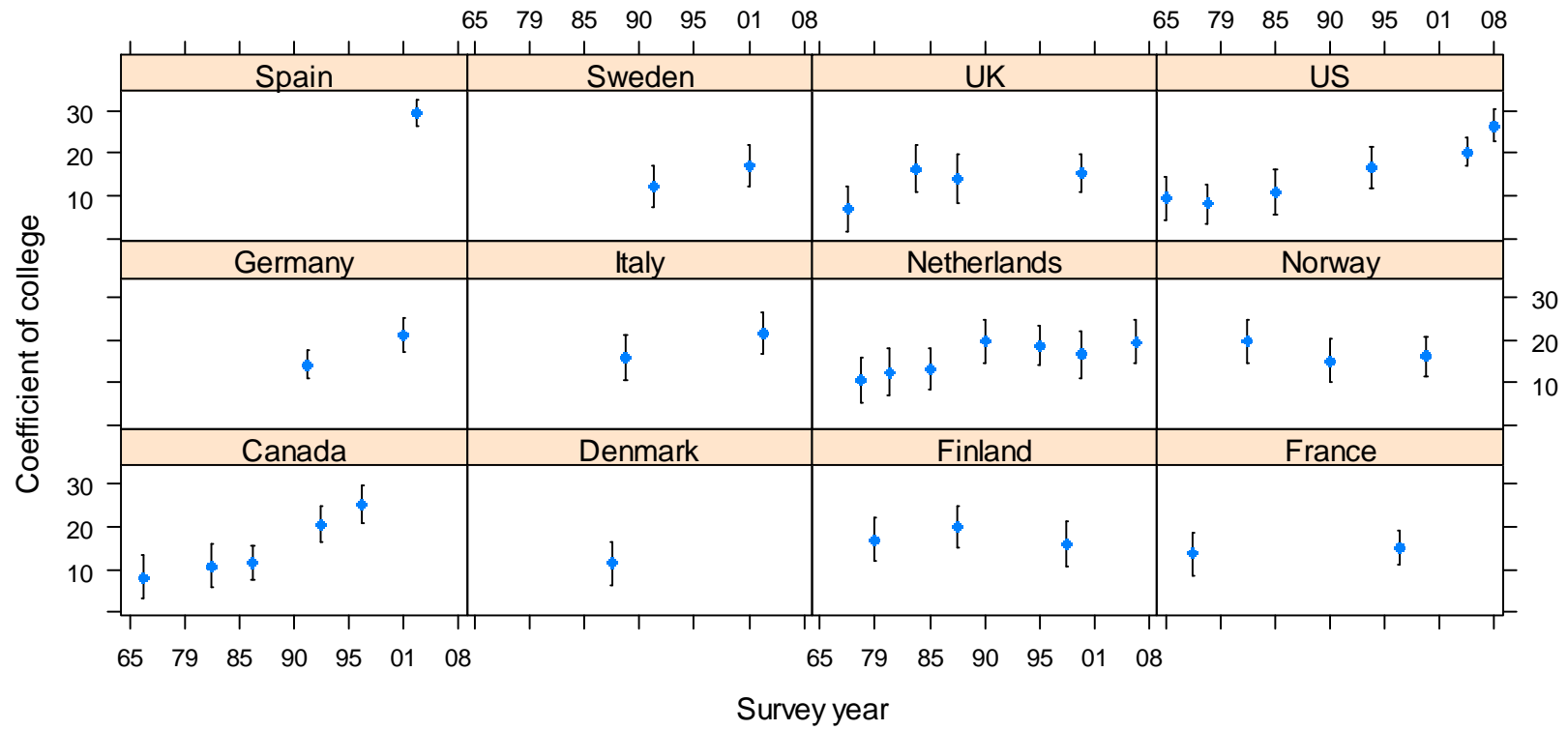


Figure 5.6 Coefficient of college degree by country-year for fathers, based on Model 3 (no country-year covariates)

In Model 4A where we estimate mothers' time spent in primary childcare, we add three contextual variables. The results show that female labour force participation and wage ratio do not have a direct significant effect on minutes spent in childcare for mothers. One of the reasons behind these variables not being significant may be that these are measures that relate to *all* women in society, not just mothers. However, it is interesting that the signs of these two variables are in the opposite direction: we would expect these two variables to act in the same direction.

Availability of paid leave for mothers is positively associated with mothers' time spent with children. The association is significant but weak: that is, 0.21 minutes for each additional week of paid leave. Still, this figure cumulates to a noticeable amount of time when the available paid leave period is long. For example, 104 weeks of paid leave is associated with 22 minutes more childcare per day, which results in 134 hours of more primary childcare time in two years. The provision of paid leave for longer than two years, while uncommon, does occur. As shown in Table 5.1, for example, the number of paid parental leave weeks varies between 0 in the US to more than 140 weeks in France, Germany, Norway and Finland.

Moreover, the effect of paid leave on mothers' primary childcare time is likely underestimated. As noted previously, the sample of the study is limited to mothers with at least one child under the age of 5 years. Only in a few countries are mothers with a child older than two years eligible to take paid leave. Furthermore, many children aged 3 years or older are in institutional care. In the countries sampled, between 50 per cent (e.g.

in Finland) and 100 per cent (e.g. in France or Germany) of all children under the age of 5 years are in institutional care in recent periods (Gauthier 2011). Consequently, the effect of paid leave on the primary childcare time of mothers with relatively older children is likely to be very small. However, the data does not provide us with a more precise measure of the distribution of children's age. Our sample of mothers with a child under the age of 5 years includes mothers who are no longer eligible to take leave, or those whose children are in institutional care. Additionally, the sample also includes home-maker mothers or those who could not take leave due to eligibility restrictions. The effect of the provision of paid leave on mothers' primary childcare, as shown in these results, is therefore possibly underestimated.

Model 4B for fathers has controls for the female labour participation rate and female-male wage ratio. As the female participation rate in the labour market increases, fathers' time spent in childcare increases. In other words, fathers' contribution to childcare is positively associated with women's general participation rate in the labour market in the country they live in. There could be several possible reasons for this association: As noted before, female labour participation is a proxy for a gender egalitarian society within which we would expect a more equal distribution of domestic labour. In other words, there could be a spurious relationship between women's labour force participation and men's time spent in childcare due to "gender egalitarian social norms" in society. It is also possible that the contextual variable is capturing the effect of some omitted variables at the individual level, in particular the employment status of the spouse. As shown previously (Chapter 2), fathers who have an employed spouse provide

more primary childcare for their children compared to those whose spouse is unemployed. If fathers who live in a country with a high female labour force participation rate are more likely to have an employed spouse, our contextual variable could be partially capturing the positive effect of this individual-level factor.

In the final models, we try to explain the variation in the college coefficient with a number of policy variables. In the case of mothers, we use an interaction term between education and paid leave available for mothers, the only variable that has a significant direct effect on mothers' time with children. Results from Model 5A show that the positive association between having a college degree and time spent in childcare gets weaker as the number of paid leave weeks increases. To show the associations clearly, we present two plots based on Model 5A. Figure 5.7 shows the direct effect of paid leave on primary childcare (effect on the regression intercept), while Figure 5.8 shows the effect of paid leave on the education slope (coefficient of education). The dotted blue linear lines are from OLS regressions where the regression intercept and the education coefficient are regressed on the length of paid leave by country-year respectively.

Figure 5.7 shows the direct positive effect of paid leave provision on the primary childcare time of mothers. Holding all other aspects constant, as the number of paid leave weeks increases, mothers' time spent in primary childcare also increases. As shown before, high-educated mothers provide more primary childcare for their children compared to low-educated mothers, and this gap has been growing in certain countries. We previously argued in this thesis that the college gap in mothers' time investments

contributes to early childhood inequality, which is likely to be perpetuated further during adolescence and adulthood. Could universal leave policies help alleviate such inequalities? Our empirical findings do provide an affirmative answer. Figure 5.8 illustrates that provision of paid leave indeed decreases the effect of having a college degree on primary childcare. In all countries, low-educated mothers provide less childcare for their children compared to high-educated mothers, particularly in the most recent periods. However, availability of universal paid leave decreases the negative effect of being poorly educated. Hence, our findings provide some support for the claim that a generous paid leave for mothers may help alleviate inequality in time investments in children.¹¹⁴

¹¹⁴ The analysis is replicated without any US data, and also with a control for year. All the results are robust to the exclusion of the US and the inclusion of year as a control variable.

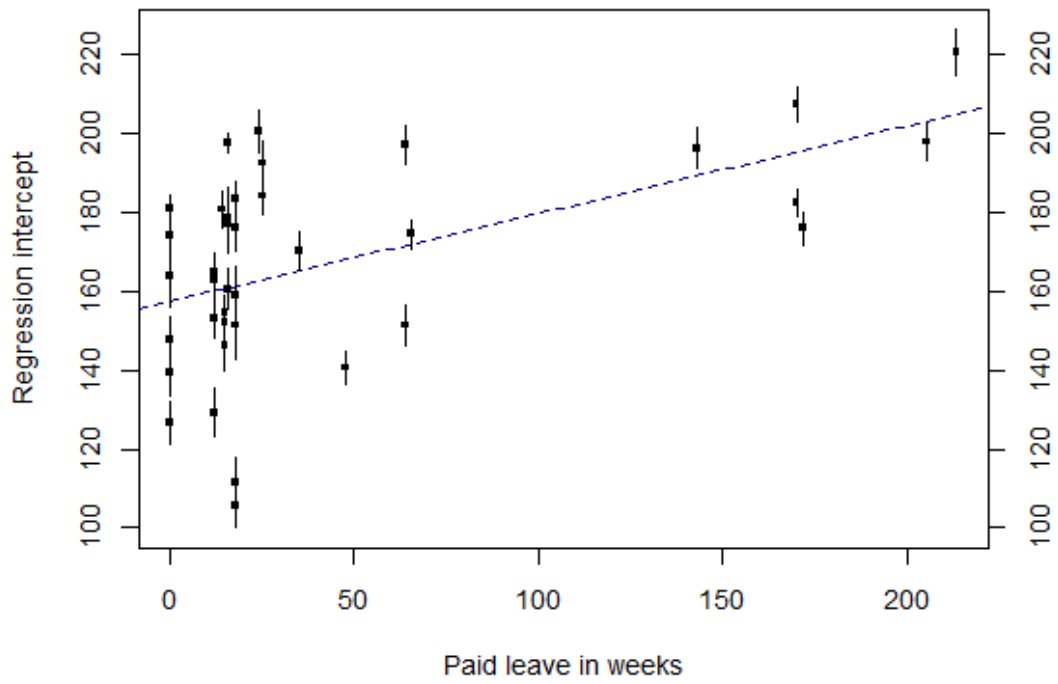


Figure 5.7 Effect of paid leave on minutes spent in primary childcare
 Notes: Vertical lines show plus and minus one standard error.

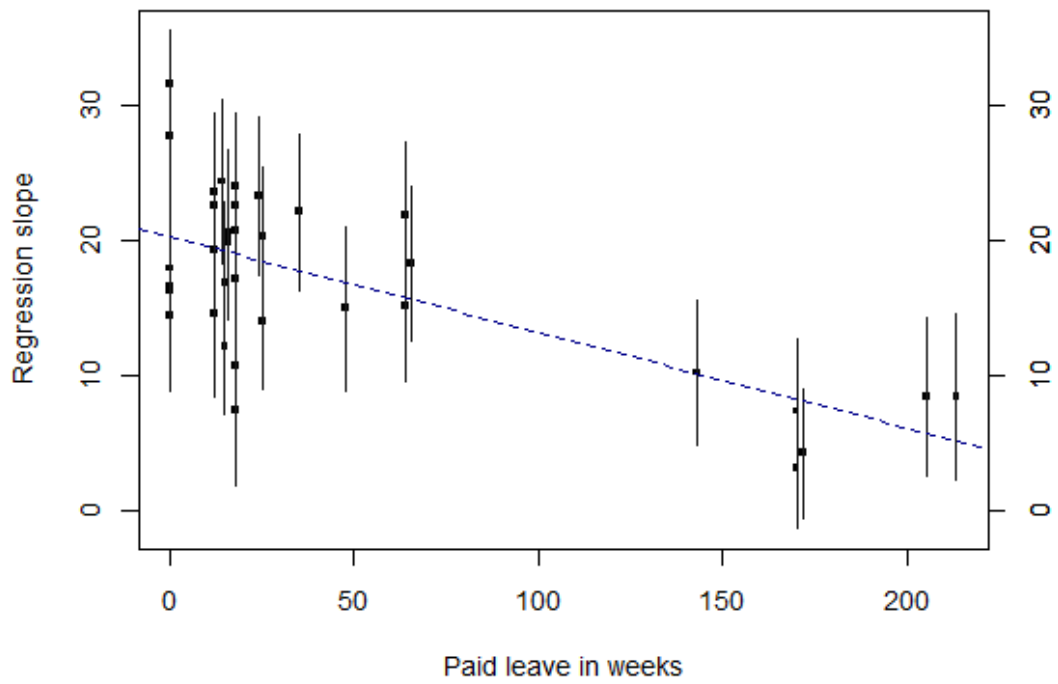


Figure 5.8 Effect of paid leave on the regression coefficient of college degree
 Notes: Vertical lines show above and below one standard error.

The employment and marital status of parents are significant factors in explaining parents' time spent in childcare activities. Due to data limitations, we cannot control for these factors without the loss of some country-year data points. In order to test whether the results are robust to controls of employment and marital status, we excluded the countries with missing or problematic data and re-ran regressions with the appropriate controls.¹¹⁵ Table 5.4 contains the results for mothers and fathers. Note that the models for mothers and fathers are not identical. The findings are largely in line with the previous models run with the larger sample. The effect of having a college degree on primary childcare is even larger in these models, particularly for mothers. Paid leave in weeks is significantly associated with more minutes for maternal care and female labour participation is associated with more primary childcare for fathers. However, the interaction term between paid leave and college degree is no longer significantly different from zero. Because the sample on which these models were run is different from the previous ones, we cannot conclude that this change is due to the additional controls. One can only speculate that, due to the decrease in the number of countries in the sample, we no longer have enough power to have significance at the 10 level (note that the SE has increased from only 0.03 to 0.04). Yet, the positive effect of education on parents' time spent with children and the importance of contextual factors in explaining parental behaviour are established once again.

¹¹⁵ A large proportion of the 1994 US survey does not have information on marital status of the respondent, while there is clearly an error in the employment status variable in the Netherlands 1975, 1980 and 2000 surveys. The percentage of mothers who are in paid employment fluctuates immensely: In 1975, 12 per cent; in 1980, 99 per cent; in 1985, 1990 and 1995, 91-92 per cent; in 2000, 50 per cent; and in 2005, 70 per cent. There is clearly some error since it is extremely unlikely for the percentage of employed mothers in the Netherlands to increase by 87 per cent or decline by 42 per cent in five years. We therefore excluded the 1975, 1980 and 2000 Netherlands data from the last analysis. The distributions of the other variables were also examined. There were no other oddities.

Table 5.4 Multilevel model with additional controls for employment and marital status

	Mothers (+ Model 5A)	Fathers (+ Model 4B)
Intercept	104.12 (35.91)	-5.42 (16.65)
College	25.40 (3.09)	16.36 (1.80)
Employed	-50.21 (1.64)	-22.60 (2.11)
Married	20.92 (2.43)	17.76 (3.20)
<i>Contextual measures</i>		
Total paid leave	0.18 (0.07)	
FLFP	0.74 (0.48)	0.89 (0.21)
Wage ratio	-0.40 (0.49)	0.09 (0.22)
<i>Interaction terms</i>		
Total paid leave: college	-0.06 (0.04)	
<i>Variance components</i>		
Diary level		
Residual	62.43	51.64
Individual level		
Intercept	89.31	51.40
College	8.28	7.01
Country level		
Intercept	24.81	10.66
AIC	426093	28240
N	36137	318418

Note: Standard errors in parenthesis. All models control for diary completion day, age of the respondent and number of children (coefficients not shown).

5.7 SUMMARY AND DISCUSSION

Using repeated cross-sectional/cross-national time use data, this chapter showed that high-educated parents provide more primary childcare for their children. The strength of the association varies considerably across countries and across time. In some countries, particularly in the US and in Canada, the effect of having a college degree on parental time is on the rise; indicating a widening college gap in parental time investments in children. Such a parenting gap likely contributes to a transmission of differential advantages to children born to affluent families.

The chapter also shows that the provision of paid leave could be a partial remedy for inequalities in parental time investments. Paid parental leave has a direct positive effect on mothers time spent in primary childcare. Although the association is weak, the accumulated effect of a long parental leave is non-negligible. Also, the effect of paid leave is likely underestimated since our sample includes mothers who are not eligible to take leave.

Provision of paid leave is not only directly related to minutes spent in childcare, it also mediates the effect of education on childcare. Low-educated mothers spend less time in primary childcare compared to high-educated mothers. However, as the number of available paid leave weeks increases, the college gap shrinks. The study therefore provides some empirical evidence that generous family policies could help alleviate inequalities in parental time investments.

The study has several limitations, of which the most significant ones are data-related. First, the number of survey year observations (39) is not large enough to allow precise estimations at the country level. For example, there are only 6 surveys (country-year) where we observe a paid leave over 100 weeks, and only 10 countries with repeated cross-sectional data. The inclusion of more data points is necessary to ensure that the results are not driven by a few observations. Second, future research should incorporate more policy variables. One important policy provision that needs further investigation is the compensation rate, which varies significantly across time and across countries. For example, the compensation rate of maternity leave in France has increased from 50 per cent in the mid-1960s to 90 per cent in the mid-1970s to 100 per cent in the late 1990s (Gauthier 2011).¹¹⁶ Around the 2000s, the compensation rate of maternity leave varied between 31 per cent (in the UK) and 100 per cent (in the Netherlands). Additionally, the compensation rate does not always remain the same throughout the leave period. This may have an effect on the number of paid leave weeks mothers take, and hence their time spent with children. In brief, there are considerable variations in financial incentives attached to leave provisions which need to be incorporated in an analysis of the effect of leave policies on parents' childcare patterns.

Future research should investigate the effect of other macro-level variables such as availability of leave for fathers and the percentage of children in public childcare. These two factors were not examined in this thesis for data-related reasons. The provision of extensive leave periods for fathers is a rather recent phenomenon. In many countries, the duration of leave is too short to have a discernible effect on fathers' time spent with

¹¹⁶ The rates apply up to a certain point, which also varies across countries.

children, and take-up rates are very low. More country-level observations from recent years are necessary to fully account for the effect of fathers' leave policies. Additionally, there is no comparable data on the percentage of children in public childcare that goes back to the 1960s. There are significant discrepancies in the existing sources, which sheds doubt on the reliability of the data.¹¹⁷

Another limitation of the study is that it ignores within-country variation in leave provisions. In some countries, there are considerable regional disparities in family policies. The US is an exemplary case. Unlike other industrialized countries, the US does not have any clearly articulated nationwide family policy.¹¹⁸ The country's federal structure assigns certain regulatory powers to states while others remain under the domain of federal regulation. The states have considerable autonomy in the legislation and implementation of social programs because of the traditional and constitutional divisions between the role of the federal government and the rights of the states (Spedding 1993). As a result, there is a certain amount of variation across states in the provision of leave policies or childcare services. For example, California, Hawaii, New Jersey, New York and Rhode Island actually provide paid leave. Moreover, some states amended the conditions of FMLA to make it more accessible by removing eligibility restrictions, providing longer leaves or a certain level of compensation during leave (Phillips 2004). For example, Alaska, Oregon and Minnesota increased the coverage of FMLA by decreasing the requirement of the minimum number of employees, while

¹¹⁷ We initially used the data on the enrollment ratio in pre-primary education for the analysis. It was later dropped because the data provider noted that the data is likely to have certain problems.

¹¹⁸ For a detailed account of family policy in the US, see Kamerman and Kahn (1997); for a summary of childcare subsidy programs, see Blau (2002).

other states, such as Tennessee, legislated additional eligibility restrictions. In brief, although the US lags significantly behind other industrialized countries in its provision of universal paid leave, there are considerable variations within the country.¹¹⁹ Such within-country variations are ignored in this study. Similarly, we are not able to account for the additional leave provisions offered by other intermediary institutions, in particular employers.

Finally, the problem of disentangling the effect of policy or macro-economic conditions remains since neither of the two are independent from prevailing social norms in the country. For example, we show that fathers contribute more to primary childcare as the percentage of women in the labour market increases. Both fathers' contribution to domestic labour and women' participation in the labour market can be a result of gender egalitarian attitudes in a country. In nations such as Sweden and Norway where female labour participation is very high, there have been campaigns to increase public awareness of father-friendly legislation and encourage fathers to use their parental or paternity leaves and provide care for their children (Smith and Williams, 2007; Wilkinson 1997). Such public campaigns give significant insight regarding both the gender egalitarian motivation behind the implemented policies and the reinforcement of involved fatherhood in a particular national context. With the work presented here it is not possible to practically disentangle the effect of macro-economic conditions (or the effect of family policy for that matter) from prevailing social norms surrounding gender roles. Hence, further research that accounts for this potential problem is needed.

¹¹⁹ That being said, an analysis of the US data does not reveal any significant variation in mothers' time spent in childcare between states.

Despite these stated limitations, the study provides convincing empirical evidence that macro-conditions have non-negligible effects on parenting behaviour. Fathers increase their contribution to childcare as national labour market conditions become more gender equal. Mothers increase their primary childcare as the number of paid leave weeks increases. Provision of paid leave also decreases the parenting gap between high- and low-educated mothers. Although inequality in parental time investments across countries remains a prevalent phenomenon, carefully designed family policies and gender egalitarian socio-economic contexts can provide at the very least a partial solution.

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CHAPTER 6:

CHALLENGES AND POSSIBILITIES OF CHILDCARE RESEARCH

6.1 SUMMARY

This thesis provides a detailed and extensive empirical documentation of inequalities in parental time investments. High-educated parents provide significantly more primary childcare for their children compared to low-educated parents. The decomposition of primary childcare activities into specific activity categories demonstrates that high-educated parents are more likely to be involved in developmental and out-of-home childcare compared to low-educated parents. More specifically, high-educated mothers are more likely than low-educated parents to read to or talk with their children as well as play with them.

There are also significant variations in parental time spent in specific secondary childcare activities. High-educated parents spend substantially less time watching television while their child is in parental care compared to low-educated parents. The findings presented in the first two chapters of this thesis were largely in line with theoretical expectations that high-educated parents engage in a distinct logic of child rearing, *concerted cultivation* (Lareau 2003), which involves a set of behavioural patterns to improve the social and cognitive skills of children.

However, not all findings confirmed the formulated hypotheses. Unlike the implicit assumption in the theoretical framework provided by Annette Lareau, the effect of *class* (as measured by education) does not always operate similarly for mothers and fathers. All else equal, time spent in secondary childcare decreases substantially as the educational attainment of mothers increases, but there is no such significant relationship between fathers' education and time spent in secondary childcare. Similarly, being high-educated increases mothers' minutes spent in developmental childcare significantly, but not fathers'. Also, the results show no significant difference between high- and low-educated parents' involvement in school-related activities, casting doubt on some of the ethnographic findings of Lareau (2003).

An analysis of childcare patterns over time shows that the effect of education on mothers' primary childcare time is larger in the 2000s compared to the 1970s (Chapter 4). The main source of this widening gap is high-educated mothers' increased involvement in developmental childcare, rather than basic childcare. The strong positive effect of education on primary childcare is not unique to the US, but rather is a cross-national phenomenon (Chapter 5). This being said, the strength of the association varies across time and across countries. The findings also demonstrate the importance of the macro context on parental behaviour. Mothers spend more time in primary childcare in countries where there is more paid leave time available. Fathers increase their minutes spent in primary childcare when the labour market structure is more gender egalitarian. Universal paid leave availability also mediates the effect of education on mothers' time spent in primary childcare: as the number of available paid leave weeks increases, the education gap shrinks.

This thesis is among the first to present a detailed account of variations in parental time spent with children by educational attainment and to incorporate macro-level variables with individual-level data to examine parental behaviour. It provides thorough empirical documentation of inequalities in parental time investments across time and across countries. Incorporating macro-level information with individual-level data on parents' time spent in childcare, this thesis demonstrates the importance of policy context in explaining individuals' allocation of time. In the following section, we list some of the limitations of the study, address potential criticisms and suggest avenues for future research.

6.2 NON-PARENTAL TIME INVESTMENT

The focus of this research was on *parental* time investments. To investigate variations in non-parental time investments in children is beyond the scope of this research. However, there are non-parental actors that could help alleviate (or exacerbate) childhood inequalities. For example, an extensive family generally provides a significant social support network, particularly for low-income and minority groups (Bengston 2004). A large proportion of grandmothers contribute to the care of their grandchildren (Baydar and Brooks-Gunn 1998), and play a central role most notably in "at-risk" families where a teenage pregnancy is followed by the abandonment of the child (Anderson 1999). For children born into such families, grandmothers fill the role of mothers. Future research that investigates time spent in childcare by extended family members, particularly grandmothers, is therefore recommended.

Institutional care (centre care for young children or school at later ages) presents another alternative care option that can substitute for parental time investments. Whether children fare best in parental care or in centre care is still debated in the literature, although recent findings based on longitudinal data casts doubts on the benefits of centre care over home care (Hickman 2006). There is also disagreement regarding whether schools reproduce or alleviate existing inequalities (See Downey, Hippel and Browh 2004 for a review). Future study that uses both parent and child diaries can identify whether time spent in institutional care helps exacerbate or alleviate documented inequalities.

6.3 “HIGH QUALITY TIME” OR A “HIGH QUALITY DIARY”?

A consistent finding of this thesis is that high-educated parents spend more time in primary childcare compared to low-educated parents. One may ask: Could this finding be attributed to measurement error? High-educated parents may not be spending more time in childcare, but may be *reporting* it to a greater extent as they are more aware of the importance of parental care. In other words, they could be over-reporting time spent in childcare due to social desirability response bias. For a similar reason, they could be more likely to categorize their childcare activities as *primary* activities, rather than secondary activities, compared to low-educated parents.

Two responses can be given to answer this potential criticism. First, as stated previously, the diary method is less prone to such social desirability bias compared to stylized questions, since it asks individuals to report a sequence of activities rather than estimate the total amount of time spent with children. Second, even if high-

educated parents are more likely to categorize their childcare activities as *primary* rather than secondary compared to low-educated parents, for the purposes of our research this is not a shortcoming. The findings are still informative. Since a time use diary is nothing but a *narrative* of a diarist, it depends heavily on how he/she perceives his/her activities. If a particular group of parents tend to perceive their interaction with children consistently as a *primary* activity, this indicates parents' prioritization of their activities with children over other activities. In brief, preference to report childcare as a primary activity rather than a secondary one is informative since it is more likely to be an indication of involved and attentive parenting.

The second and more significant problem which is largely ignored in the literature is the failure to disentangle the effect of diary quality from the effect of being high-educated and/or being busy. High-educated individuals (and those who are not busy) may be more likely to complete "high-quality" diaries. A good diary keeper likely reports a large number of episodes and a variety of (childcare) activities, while a busy diarist may be reporting less episodes and less time spent in childcare.¹²⁰ How to develop a diary quality measure separate from diarists' daily rhythm still stands as a methodological challenge for time use researchers.¹²¹ Future research that controls for diary quality in explaining the effect of education on time use patterns would be a very valuable contribution.

¹²⁰ The study of Abraham, Maitland and Bianchi (2004) on the non-response in the 2004 ATUS argues that busy individuals are not necessarily more likely to have a higher refusal rate. That does not necessarily imply that those same individuals are also not more likely to provide low quality diaries in MTUS.

¹²¹ The best available measure of diary quality we have is the number of episodes diarist reported. Reporting less than seven episodes is in fact one of the criteria used to define low quality diaries. However, while the variable could well be a measure of diary quality, especially for very low reports, it also captures the busyness of the respondent or the variety of activities she happened to be involved in on a given day.

6.4 ALARMING INEQUALITIES OR OVER-CONCERNED SOCIOLOGISTS?

The main research interest of this thesis was *parents'* time spent in childcare, but the discourse was mainly *child-centred*. In other words, the issue was approached from a child's perspective, and time spent in childcare was conceptualized as a form of *investment in children*: an investment that would help them be successful in various fields, particularly in school. We relied on a large body of empirical research that establishes a link between parental involvement, particularly in interactive and developmental childcare activities, and positive child outcomes. Hence, the discrepancy in parental time investments between high- and low-educated parents was portrayed as a form of early childhood inequality, a social problem that contributes to the persistence of intergenerational inequality. There is, however, a recent line of research that is sceptical towards such assumptions and critical of dominant parenting ideals and middle class child rearing strategies.

According to this perspective, what we observe as a dominant parenting norm in the contemporary "Western" world is best described as "exaggerated parenting" (Beck and Beck-Gernsheim 1995). A recent wave of scientific as well as non-academic work questions parents "over-involvement" in their children and its outcomes (Caplan 2011; Douglas and Michaels 2005; Furedi 2008; Nelson 2010; Rosenfeld and Wise 2001; Warner 2005). Critics describe the dominant parenting ideal in the US as "hyper-parenting" (Rosenfeld and Wise 2001), "paranoid parenting" (Furedi 2008), "parenting out-of-control" (Nelson 2010), "perfect madness" (Werner 2005) and as a "psychological police state" (Douglas and Michaels 2005). At the core of this criticism lies two arguments, the first of which is related to mothers. Existing mothering ideals are too demanding and even harmful for mothers. Time and

financial costs of “good motherhood” and the expectations for mothers to be understanding, attentive, helpful, involved and alert all the time create anxious, exhausted mothers who constantly feel “not-good-enough”. According to one of the critics, “intensive mothering is the ultimate female Olympics” (Douglas and Michaels, 2005: 6). Furthermore, too much emphasis on the importance of parental involvement on child outcomes may lead to “mother-blaming” for children’s wrong doings.

The second line of argument is about children: that *intensive parenting* at best does not produce the promised returns, and at worst is detrimental to the well-being of the child. Parents’ over-involvement and over-protective attitudes towards their children result in dependent, entitled and even dysfunctional young people. In an attempt to help children develop their social skills and competency in several fields, parents over-schedule children with extracurricular activities causing stress, pressure and anxiety. To put it simply, according to the critical perspective, intensive motherhood has become too intense.

For the purposes of our research, this new wave of criticisms is important for confirming the extent to which the ideals of *intensive mothering* have permeated society, particularly among middle-class parents. Obviously, the marginal return of parental time investment cannot be linear; however, it is unclear at what point it diminishes. It is beyond the scope of this thesis to identify when parental involvement stops being beneficial to children. Such identification would require time diary data in panel format that contains information on child outcomes. Future

research that can link parental time use data directly with information on children's well-being, social and cognitive skills would help to form the missing link.

This thesis began with a review of a series of scholarly and non-academic works that raise concerns over "child neglect". Now it ends with a review of new research that raises concerns of "over-involvement" with children. The explanation for the conflicting views lies in the material presented in between. Time spent in childcare, particularly the most involved, interactive and attentive forms of childcare, has increased substantially in the US, starting from the mid-1990s. However, this is an increase that masks significant polarizations. Some children receive considerably less primary childcare time from their parents compared to others. As articulated in this thesis, children who are born to underprivileged households therefore likely to suffer from a dual disadvantage, as they receive both less financial investment and time investment from their parents compared to children born to high-educated and affluent parents. A new line of research claims that children who are at the upper end of the "investment spectrum" may not be as advantaged as they are currently thought to be.

6.5 CONCLUDING REMARKS

This thesis studies how parents spend time with their children, and what determines this phenomenon at the individual and macro level. It argues that children born to low-educated parents suffer from multiple disadvantages: they are disadvantaged due to limited material resources that the household has at its disposal, and it is precisely these children that also receive less parental time investment. This dual-disadvantage contributes to the persistence of intergenerational inequality.

However, as shown in the latter part of the thesis, macro-economic incentives and policy provisions can partially address this growing social inequality. Gender egalitarian socio-economic structures encourage fathers to increase their contributions to childcare. The provision of paid leave policies alleviates the inequalities in parental time investments of mothers. Well-designed family policies and institutional support for underprivileged families can, via parental behaviour, help lessen disadvantages accrued at birth. Children are not born equal, but they can grow up in more equal circumstances.

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APPENDIX A: METHODS AND ROBUSTNESS

APPENDIX A1: GAMMA MODELS REFERRED TO IN THE TEXT

Table 2.9 Mothers and fathers time spent in primary and secondary childcare (gamma regression)

	Primary childcare		Secondary childcare	
	Mothers	Fathers	Mothers	Fathers
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)
Intercept	4.50 ^{***} (0.15)	3.82 ^{***} (0.29)	6.38 ^{***} (0.10)	6.47 ^{***} (0.17)
0-11th grade	-0.07 (0.05)	-0.17* (0.09)	0.07* (0.03)	-0.03 (0.05)
High school graduate	-0.03 (0.03)	-0.05 (0.05)	0.03* (0.02)	-0.07 ^{**} (0.03)
College degree	0.11 ^{***} (0.03)	0.12 ^{**} (0.05)	-0.07 ^{***} (0.02)	-0.04 (0.03)
Post-college degree	0.20 ^{***} (0.04)	0.25 ^{***} (0.06)	-0.13 ^{***} (0.02)	-0.08 ^{**} (0.03)
Age of youngest child	-0.12 ^{***} (0.00)	-0.12 ^{***} (0.01)	0.00 ^{**} (0.00)	0.01 ^{**} (0.00)
# of children <13	0.09 ^{***} (0.01)	0.14 ^{***} (0.02)	0.07 ^{***} (0.01)	0.05 ^{***} (0.01)
Age	0.03 ^{***} (0.01)	0.06 ^{***} (0.01)	0.00 (0.01)	-0.01 (0.01)
Age sq	0.00 ^{**} (0.00)	0.00 ^{***} (0.00)	0.00 (0.00)	0.00 (0.00)
Full-time employed	-0.44 ^{***} (0.02)	-0.61 ^{***} (0.07)	-0.37 ^{***} (0.01)	-0.46 ^{***} (0.04)
Part-time employed	-0.20 ^{***} (0.03)	-0.33 ^{***} (0.11)	-0.18 ^{***} (0.02)	-0.25 ^{***} (0.07)
Spouse is not emp	-0.20 ^{***} (0.05)	-0.30 ^{***} (0.07)	0.10 ^{***} (0.03)	0.18 ^{***} (0.04)
Spouse is part-time employed	-0.09* (0.04)	-0.16 ^{**} (0.07)	0.18 ^{***} (0.03)	0.20 ^{***} (0.04)
Spouse is full-time employed	-0.06 ^{**} (0.02)	-0.05 (0.06)	0.15 ^{***} (0.02)	0.24 ^{***} (0.04)

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

APPENDIX A2:

DESCRIPTION AND JUSTIFICATION OF METHODOLOGY

Statistical analysis of diary data is far from being straightforward for many reasons: the response variable is only defined in $[0,1440]$; the distribution of the response variable could be highly skewed and zero-inflated depending on activity type; sampling usually occurs on a single day, meaning the window of observation is very narrow. A variety of statistical methods have been applied to time use data, and the contradictory assumptions of these methods shows the extent of the lack of consensus in the literature regarding how to deal with these issues. Among the statistical techniques applied to time use data are OLS regression (e.g. Bittman 2004; Gershuny 2000), Tobit (e.g. Kimmel and Connely 2007; Hofferth and Sandberg 2001, Kalenkoski and Pabilonia 2008), Gamma regression (Andersen, Curtis and Grabb 2006), the double hurdle model (Cardoso, Fontainha and Monfardini 2010) and Poisson regression (Hook 2010). At the core of the methodological disagreement lies how to interpret and statistically deal with excessive zeros.¹²² Because linear regression by OLS estimation and Tobit regression by maximum likelihood estimation are the two techniques most frequently applied and discussed in the literature, we first briefly clarify why Tobit is in fact not an appropriate model to apply to diary data.¹²³ We then explain and justify the statistical models applied in this study, namely OLS linear, logistic and gamma regression.

¹²² We do not encounter the problem of excessive zeros while analysing everyday activities such as sleeping. However, even when the sample is limited to parents, the percentage of non-participants in childcare (i.e. respondents who do not report the activity on a given diary day) is non-negligible in all surveys. According to the Harmonized European Time Use Survey, on average, one third of mothers and more than half of fathers in 15 European countries do not report any primary care on a given diary day (Pacholok and Gauthier 2010). The figures for mothers vary between 17 per cent in Sweden to 48 per cent in Bulgaria, and for fathers from 32 per cent in Sweden to 76 per cent in Latvia. Corresponding figures for the US based on 2003-06 ATUS data are 17 per cent for mothers and 40 per cent for fathers (author's calculation).

¹²³ We disregard Poisson regression because in this case the conditional mean is not equal to the conditional variance as assumed in the Poisson (Long 1997), although the double hurdle model is another plausible alternative.

Tobit regression assumes a latent response variable which cannot be observed directly for all values (Tobin 1958). Instead, what we observe according to this model is a censored dependent variable in which all negative values of the latent variable are reported as zero. More specifically, in our case Tobit assumes that the latent variable (minutes spent in childcare) can be negative. The conceptualization of childcare used here, however, cannot be negative for the simple reason that it is meaningless to state “an individual spends -5 minutes in activity x.”¹²⁴ Although in an alternative interpretation of Tobit the latent variable is not necessarily assumed to take on negative values, even in this case the model is problematic because it assumes the process that determines whether an individual does the activity or not is the same as the process that determines how many minutes he/she will spend in that activity (Stewart 2009). We do not employ Tobit estimation precisely because such assumptions do not hold in the case of time use data. To put it simply, zeros in time use data are not produced as a result of a censoring process as assumed in the Tobit regression: our variable of time use is only *defined* in the interval [0, 1440].

Zeros produced in a time use diary could be generated through one of three mechanisms. First, the respondent does not happen to be doing the activity on a given diary day (e.g. paid work on Sunday by an employed person). Second, the respondent engages in an activity on a diary day but fails to or prefers not to report it (e.g. sexual intercourse). Third, the respondent never engages in that activity (e.g. going to church for a non-religious person). In the first of these three cases, zeros arise from sampling design: that is, the observation period is shorter than the required period for that individual to be observed during the activity. For example,

¹²⁴ Although it seems obvious to us, this is actually quite a contentious claim. Loosely speaking, some economists interpret this statement as if the respondent would not be spending time in childcare even if one had a budget of more than 1440 minutes in a day.

parents may not happen to provide any childcare for their children on a given diary day because the child happened to spend the day with her grandparents. In the second of these three cases, there are potentially two reasons why excessive zeros in time spent in primary childcare could be generated (Pacholok and Gauthier 2010: 251-252): first is the failure of childcare activity codes in some surveys to capture time spent with older children, as these codes are geared more towards activities with young children; and second is the difficulty in measuring childcare activities that usually take place in tandem with other activities (multi-tasking).

A recent study by Foster and Kalenkoski (2010) reports that approximately 15 per cent of “zero minutes in child care time” disappears when 48-hour windows of observation are taken into account, rather than 24-hour ones. Even longer observation windows (e.g. a week diary) are likely to result in a further decline of excessive zeros. Although there is not enough empirical evidence to determine whether *zero-type* parents who never provide primary or secondary care for their children disappear entirely when the window of observation is extended, it is hard to imagine that such parents (especially mothers) would be in great numbers, if they exist at all. Yet, the same study of Foster and Kalenkoski (2010) also reports 83 percent of zeros as “correct zeros” in the sense that in at least 83 per cent of the cases where no childcare was reported zeros represent true non-participation rather than a data artefact.¹²⁵

¹²⁵ Indeed a study on the Canadian time use survey by Pacholok and Gauthier (2010) asserts that non-participation among fathers is far from being entirely a data artefact. On the contrary, non-involved fathers (i.e. those who report zero minutes spent in both primary childcare *and* time spent in the presence of children) constitute a distinct group different from fathers who are in the *low-involved* category. Non-involved fathers are, for instance, more likely to have a non-biological child or have a lower education.

In summary, there are significant issues that need to be addressed, or at the very least taken in to account, while analysing time use data. For us, the excessive number of zeros and highly skewed nature of the data is of central concern. To make matters more difficult, the severity of the problem depends on the activity type. As we move to more specific childcare activities, the per cent of respondents reporting no time spent in the activity can exceed 90 per cent. Hence, different types of activities require different statistical techniques. In order to sufficiently address the problem of excessive zeros discussed above as well as the shortcomings of different estimation techniques, we follow a practice that has become increasingly common (Hamermesh 2010, Price 2008): reporting results from more than one estimation procedure. The consistency of the overall findings based on various estimation techniques would stand as a robustness test of our conclusions. We next briefly review those techniques and then justify our decisions to use those.

Three types of models are used in this thesis. OLS linear regression, logistic and gamma models, all of which are special cases of a more general class of models: the Generalized Linear Model (GLM) family, which can be used to model data (conditionally) distributed as any member of the exponential family of distributions. The GLM equation can be written as:

$$g(E[Y|X, \theta]) = X\theta$$

Where Y is the dependent variable, X is a data matrix, and θ is a vector of parameters. The function g , the link function, relates how the conditional mean of the dependent variable is associated to linear predictors. GLM estimation assumes the

conditional mean of the dependent variable is some function of a linear combination of independent variables. The function in question can be quite general, permitting estimation when the dependent variable is binary, continuous, non-negative, etc. When the response variable is a binary variable (the diarist reported the activity or not), a linear combination of control and explanatory variables is connected to the dependent variable via a logit link function: that is, $\ln(\mu_i/(1 - \mu_i)) = X\theta$, where μ_i is the probability of observing “positive” for the observation i . When the response variable is continuous (minutes spent in activity) and errors are assumed to be normally distributed, the identity link function is used and GLM reduces to OLS regression. Lastly, when minutes in an activity are assumed to follow a (conditional) Gamma distribution (as is done in gamma regression), we used the log link function. Gamma distributions are a continuous two-parameter family (*shape* and *scale*) which roughly correspond to the central tendency and the spread of the distribution, respectively (Fox 2008).

As noted, when the variable of interest is an uncommon specific type of activity, the number of respondents who do not participate in such an activity is relatively high. This is likely to leave us with little variation to explain in minutes spent in the activity, especially in our case where there is a natural maximum to many specific childcare activities. For example, the amount of time spent reading to a child is limited by both parent’s and child’s patience. In such cases therefore, interest lies in the presence or absence of the activity rather than the average number of minutes spent in it, which can be quite sensitive to outliers. We therefore use logistic regression to estimate respondents’ probability of providing infrequent specific childcare activities. More specifically, in Chapter 3 and Chapter 4, when the

response variable is a specific childcare activity with excessive zeros, we first report the logistic regression results. We then apply OLS regression to estimate minutes spent in the activity on the full sample and/or on *participating* parents only, in order to show whether the explanatory variable of interest has an effect on the amount of minutes spent in childcare, *conditional on* reporting at least one minute spent in the activity.

When the response variable is measured in minutes and highly skewed, gamma is an appropriate alternative. We would prefer it to OLS because in a finite sample OLS assumes the dependent variable is continuous and conditionally normally distributed.¹²⁶ However, as shown in Figures 2.8 and 2.9, this assumption does not hold when the response variable is highly skewed. Figure 2.8 shows the quantile-quantile plot resulting from an OLS regression using time spent in secondary childcare (4 per cent of the sample is zero) as the dependent variable. Figure 2.9 shows the same plot for an OLS regression where the response variable is minutes spent in school-related activities (87 per cent zero). As shown in the figures, when the response variable has excessive zeros, violation of normality becomes grotesque. Especially notice the scale of the Y-axis in each. Despite this, we assume normality on occasion for several reasons: (i) unlike gamma regression, coefficients from linear normal models are directly interpretable; (ii) depending on the response variables some models do not exhibit significant violations of linear normal model assumptions; (iii) it is a widely applied technique among sociologists. To guard against particular parametric assumptions, we perform both OLS and gamma regressions and report inconsistencies, if any. While calculating predicted minutes,

¹²⁶ Asymptotic OLS theory does not assume a distributional form for the errors, but we do not have infinite data.

we present results based on gamma models only because OLS regression results may lead to negative predicted minutes.

Summing up, in the absence of a consensus in the methodological literature on how to analyse time use data, and due to the limitations of every proposed method, we decided to employ three distinct parametric models: OLS, logit and gamma. We present results from OLS, logistic and gamma regressions (not shown in main text). When the problem of excessive zeros becomes more severe and the assumption of non-participant parents becomes more plausible, we report results from logistic regressions. Otherwise, we show coefficients of OLS regression and predicted minutes based on gamma regression.¹²⁷ We report the results from the gamma models to indicate the extent to which the robustness of the findings depends on the parametric assumptions of OLS.

¹²⁷ All the data management is done by SPSS version 11. All the analysis and graphs are done by R 2.10.1. Main packages used in R are as follows: for multiple imputation we used the package *Amelia II*, version 1.2-17 written by James Honaker, Gary King and Matthew Blackwell; to combine results of analyses on multiple imputed data sets we used the package *mitools*, version 2.0.1, written by Thomas Lumley; for graphical effect displays of glm we used the package *effects*; version 2.0-10 (written by John Fox and Jangman Hong); and to extract tables we used the package *xtable*, version 1.5-6, written by David B. Dahl.

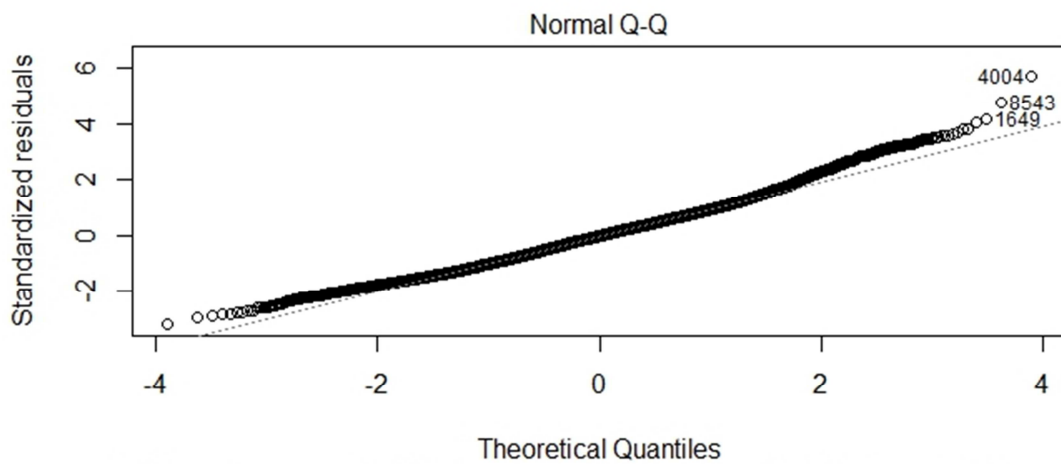


Figure 2.8 QQ plot of an OLS regression in which the response variable is minutes spent in secondary childcare

Notes: The model controls for educational attainment, number of children under the age of 13 years, age of youngest child, employment and marital status of respondent, employment status of spouse and diary completion day.

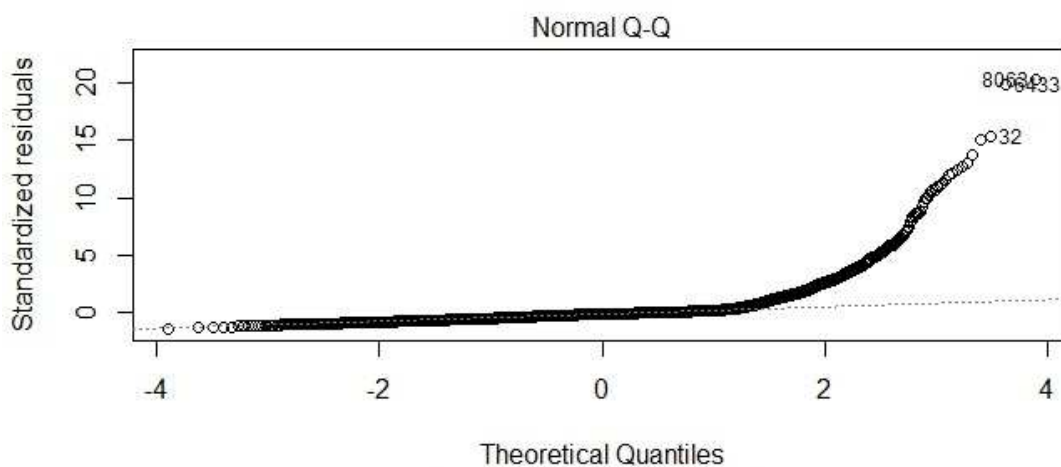


Figure 2.9 QQ plot of an OLS regression in which the response variable is minutes spent in school-related activities

Notes: The model controls for educational attainment, number of children under the age of 13 years, age of youngest child, employment and marital status of respondent, employment status of spouse and diary completion day.

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APPENDIX B: ADDITIONAL TABLES FOR CHAPTER 3

Table 3.18 Mothers' and fathers' probability of providing basic childcare

	Mothers		Fathers	
	Baseline reference model	Full model	Baseline reference model	Full model
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
(Intercept)	0.71*** (0.06)	0.75 (0.46)	-0.18*** (0.07)	-0.58 (0.43)
0- 11th grade	-0.04 (0.13)	-0.38** (0.15)	-0.63*** (0.12)	-0.70*** (0.13)
High school graduate	-0.24*** (0.07)	-0.17** (0.08)	-0.30*** (0.07)	-0.30*** (0.08)
College degree	0.12* (0.07)	0.09* (0.07)	0.25*** (0.07)	0.22*** (0.07)
Post-college degree	0.17* (0.09)	0.14 (0.10)	0.45*** (0.08)	0.47*** (0.09)
Age of youngest child		-0.30*** (0.01)		-0.19*** (0.01)
Number of children <13		0.08* (0.04)		0.26*** (0.03)
Full-time employed		-0.53*** (0.07)		-0.61*** (0.10)
Part-time employed		-0.29*** (0.08)		-0.35** (0.17)
Spouse is not employed		-0.43*** (0.12)		-0.29*** (0.10)
Spouse is part-time emp.		0.09 (0.13)		0.06 (0.10)
Spouse is full-time emp.		0.04 (0.06)		0.01 (0.09)
Age		0.09*** (0.03)		0.07*** (0.02)
Age squared		0.00*** (0.00)		0.00** (0.00)
AIC	13388	11003	11143	10140

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response.

*p<0.10, ** p<0.05, ***p<0.01.

Table 3.19 Mothers' and fathers' probability of providing developmental childcare (logistic regression)

	Mothers		Fathers	
	Baseline reference model	Full model	Baseline reference model	Full model
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
(Intercept)	-0.53*** (0.05)	-1.91*** (0.34)	-0.87*** (0.07)	-3.06*** (0.47)
0- 11th grade	-0.23** (0.11)	-0.34*** (0.12)	-0.49*** (0.14)	-0.47*** (0.14)
High school graduate	-0.13** (0.06)	-0.08 (0.06)	-0.16** (0.08)	-0.13* (0.08)
College degree	0.32*** (0.05)	0.25*** (0.06)	0.24*** (0.07)	0.19** (0.07)
Post-college degree	0.47*** (0.07)	0.40*** (0.08)	0.49*** (0.08)	0.45*** (0.09)
Age of youngest child		-0.14*** (0.01)		-0.12*** (0.01)
Number of children <13		-0.01 (0.03)		0.08** (0.03)
Full-time employed		-0.71*** (0.05)		-0.72*** (0.10)
Part-time employed		-0.29*** (0.06)		-0.53*** (0.16)
Spouse is not employed		-0.08 (0.10)		0.06 (0.10)
Spouse is part-time emp.		-0.08 (0.10)		0.24** (0.11)
Spouse is full-time emp.		0.02 (0.05)		0.13 (0.10)
Age		0.11*** (0.02)		0.16*** (0.02)
Age squared		0.00*** (0.00)		0.00*** (0.00)
AIC	16445	15616	10530	10109

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

*p<0.10, ** p<0.05, ***p<0.01.

Table 3.20 Mothers' and fathers' probability of providing out-of-home childcare (logistic regression)

	Mothers		Fathers	
	Baseline reference model	Full model	Baseline reference model	Full model
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)
(Intercept)	-1.18*** (0.06)	-3.80*** (0.36)	-1.54*** (0.08)	-2.25 (0.49)
0- 11th grade	-0.15 (0.11)	0.03 (0.12)	-0.46*** (0.15)	-0.44*** (0.16)
High school graduate	-0.18*** (0.06)	-0.16** (0.06)	-0.11 (0.08)	-0.12 (0.08)
College degree	0.22*** (0.06)	0.14** (0.06)	0.02 (0.08)	0.07 (0.08)
Post-college degree	0.30*** (0.07)	0.22** (0.08)	0.25*** (0.09)	0.33*** (0.09)
Age of youngest child		0.00 (0.01)		0.01 (0.01)
Number of children <13		0.21*** (0.03)		0.21*** (0.03)
Full-time employed		0.12** (0.05)		-0.41*** (0.11)
Part-time employed		0.14** (0.06)		-0.06 (0.17)
Spouse is not employed		-0.77*** (0.10)		-1.23*** (0.10)
Spouse is part-time emp.		-0.50*** (0.10)		-0.80*** (0.10)
Spouse is full-time emp.		-0.28*** (0.05)		-0.27*** (0.09)
Age		0.12*** (0.02)		0.04* (0.02)
Age squared		0.00*** (0.00)		0.00 (0.00)
AIC	15361	15182	8856	8541

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

*p<0.10, ** p<0.05, ***p<0.01.

Table 3.21 Mothers' time spent in specific primary childcare activities (gamma regression)

	Basic childcare	Developmental childcare	Out-of-home childcare
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
(Intercept)	3.82*** (0.21)	3.99*** (0.26)	0.60* (0.31)
0- 11th grade	0.08 (0.07)	-0.18** (0.09)	-0.21** (0.11)
High school graduate	-0.01 (0.04)	0.00 (0.05)	-0.14** (0.06)
College degree	0.03 (0.04)	0.12*** (0.04)	0.17*** (0.05)
Post-college degree	0.09 (0.05)	0.25*** (0.06)	0.22*** (0.07)
Age of youngest child	-0.17*** (0.00)	-0.12*** (0.01)	0.01 (0.01)
Number of children<13	0.11*** (0.02)	-0.02 (0.02)	0.28*** (0.02)
Full-time employed	-0.38*** (0.03)	-0.68*** (0.04)	-0.01 (0.05)
Part-time employed	-0.18*** (0.04)	-0.31*** (0.04)	0.04 (0.05)
Spouse is not employed	-0.21*** (0.06)	-0.12 (0.08)	-0.39*** (0.09)
Spouse is part-time employed	0.03 (0.06)	-0.12 (0.07)	-0.26*** (0.09)
Spouse is full-time employed	-0.05 (0.03)	-0.06 (0.04)	-0.16*** (0.05)
Age	0.03*** (0.01)	0.02 (0.01)	0.08*** (0.02)
Age squared	0.00* (0.00)	0.00 (0.00)	0.00*** (0.00)
AIC	103299	91790	80346

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

*p<0.10, ** p<0.05, ***p<0.01.

Table 3.22 Fathers' time spent in specific primary childcare activities (gamma regression)

	Basic childcare	Developmental childcare	Out-of-home childcare
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
Intercept	3.36*** (0.45)	2.38*** (0.41)	0.34 (0.54)
0- 11th grade	-0.04 (0.14)	-0.06 (0.12)	-0.56*** (0.16)
High school graduate	0.03 (0.08)	0.00 (0.07)	-0.17* (0.10)
College degree	0.14* (0.08)	0.14** (0.07)	0.06 (0.09)
Post-college degree	0.32*** (0.14)	0.25*** (0.08)	0.15 (0.10)
Age of youngest child	-0.17*** (0.01)	-0.13*** (0.01)	0.03*** (0.01)
Number of children<13	0.19*** (0.03)	0.06* (0.03)	0.30*** (0.04)
Full time employed	-0.73*** (0.11)	-0.57*** (0.10)	-0.47*** (0.13)
Part-time employed	-0.58*** (0.17)	-0.14 (0.16)	-0.13 (0.21)
Spouse is not employed	-0.37*** (0.10)	-0.12 (0.09)	-0.76*** (0.12)
Spouse is part-time employed	-0.18* (0.11)	-0.04 (0.10)	-0.51*** (0.13)
Spouse is full-time employed	-0.10 (0.10)	-0.03 (0.09)	-0.10 (0.12)
Age	0.05* (0.02)	0.11*** (0.02)	0.09*** (0.03)
Age squared	0.00 (0.00)	0.00*** (0.00)	0.00** (0.00)
AIC	62741	60780	48426

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

*p<0.10, ** p<0.05, ***p<0.01.

Table 3.23 Mothers' and fathers' probability of spending some time in out-of-home leisure activities during secondary childcare (logistic regression)

	Mothers		Fathers	
	Baseline reference model	Full model	Baseline reference model	Full model
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)
(Intercept)	0.08 (0.05)	-0.64* (0.35)	-0.01 (0.07)	-0.51 (0.45)
0- 11th grade	-0.40*** (0.12)	-0.39*** (0.12)	-0.42*** (0.14)	-0.41*** (0.14)
High school graduate	-0.23*** (0.06)	-0.22*** (0.06)	-0.15** (0.08)	-0.15* (0.08)
College degree	0.20*** (0.06)	0.12** (0.06)	0.14** (0.07)	0.13* (0.07)
Post-college degree	0.28*** (0.07)	0.20*** (0.08)	0.33*** (0.08)	0.27*** (0.09)
Age of youngest child		0.00 (0.01)		0.05*** (0.01)
Number of children <13		0.03 (0.03)		0.17*** (0.03)
Full-time employed		-0.57*** (0.05)		-0.15 (0.11)
Part-time employed		-0.21*** (0.06)		-0.16 (0.17)
Spouse is not employed		0.14 (0.11)		0.28*** (0.11)
Spouse is part-time emp.		0.52*** (0.10)		0.41*** (0.11)
Spouse is full-time emp.		0.53*** (0.06)		0.37*** (0.10)
Age		0.02 (0.02)		-0.02 (0.02)
Age squared		0.00 (0.00)		0.00 (0.00)
AIC	16150	15825	9909	9817

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

*p<0.10, ** p<0.05, ***p<0.01.

Table 3.24 Mothers' and fathers' probability of watching television during secondary childcare (logistic regression)

	Mothers		Fathers	
	Baseline reference model	Full model	Baseline reference model	Full model
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)
(Intercept)	0.52*** (0.05)	1.00*** (0.34)	0.50*** (0.07)	0.56 (0.41)
0- 11th grade	0.35*** (0.11)	0.26** (0.12)	0.17 (0.12)	0.14 (0.12)
High school graduate	0.23*** (0.06)	0.22*** (0.06)	0.08 (0.07)	0.08 (0.07)
College degree	-0.22*** (0.05)	-0.19*** (0.06)	-0.21*** (0.07)	-0.19*** (0.07)
Post-college degree	-0.65*** (0.07)	-0.59*** (0.08)	-0.50*** (0.08)	-0.48*** (0.08)
Age of youngest child		0.02*** (0.01)		0.04*** (0.01)
Number of children <13		-0.02 (0.03)		0.05 (0.03)
Full-time employed		-0.36*** (0.05)		-0.53*** (0.10)
Part-time employed		-0.37*** (0.06)		-0.30* (0.16)
Spouse is not employed		0.06 (0.10)		0.42*** (0.09)
Spouse is part-time emp.		0.23** (0.10)		0.42*** (0.10)
Spouse is full-time emp.		0.13** (0.05)		0.60*** (0.09)
Age		-0.02 (0.02)		-0.01 (0.02)
Age squared		0.00 (0.00)		0.00 (0.00)
AIC	16498	16442	11067	10982

Note: Standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. All models control for diary completion day (coefficient not shown). Reference categories are *some college education* for educational attainment, *not employed* for employment status and *spouse is not present* for spousal employment status/marital status.

APPENDIX C: DATA SPECIFICATION AND ADDITIONAL TABLES FOR CHAPTER 4

APPENDIX C1: DATA SPECIFICATION OF AHTUS

Table 4.8 Technical Description of AHTUS

	Age range	Response rate	Number of diary days	Survey period	Type of diary	Mode of data collection	Time interval in the diary
1965-66	19-65	44 cities sample - 74%	1-day	15 November - 15 December, 1965; 1 January - 18 February 1966; 7 March - 20 May, 1966	Diaries were collected on the day of the activity	Pen and paper	Diarists recorded starting and stopping times
1974-75	18+	Wave 1: 72% Wave 2: 68% Wave 3: 60% Wave 4: 58% 45% participated in all four waves.	1 diary per wave (up to 4 diaries per diarist in total)	October-December 1975; February-March 1976; May-July 1976; September-October 1976	Diaries were collected on the day of the activity in the first wave, and from the previous day for waves 2-4	Pen and paper in Wave 1; telephone Waves 2-4	Free (diarists recorded starting and stopping times)
1992-94 1994-95	0-94 18-94	1992-94: 63% 1994-95: 65%	1-day	September 1992 to October 1994; July 1994 to July 1995 (1 August 1995 diary)	Recall	Telephone interview	Free
2003-10	15+	2003: 58%; 2004, 2005, 2009, 2010: 57%; 2006, 2008: 55%; 2007: 53%	1-day	Whole year of 2003, 2004, 2005, 2006, 2007, 2008, 2009 and 2010	Recall from yesterday	CATI (computer assisted telephone interview)	Free (nominated start/stop times)

Table 4.9 The decomposition of primary childcare categories

	1965-66 original category	1974-75 original category	1985 original category	1992-94 original category	2003-10 original category
Basic childcare					
33 - care of infants children	same as for 34, look at who in care care for older children	same as for 34, look at who in care care for children of mixed ages	same as for 34, look at who in care care of children 5-17 or mixed ages	same as for 34, look at who in care older child care	same as for 34, look at who in care physical care for children
34 - general care of older children in heritage codes, care of children from own household coded here, but care of children from other household lumped with the care of adults - same applies to other child care activities		care for children aged 5-17	care for children of mixed ages care for child aged 5-17 get lunch money, allowance, gifts		organization and planning for children looking after children care for children nec use paid childcare waiting associated with paid child care use paid childcare nec calls from child care providers
35 - medical care of children	medical services for child	medical care at home for child	acts related to child health	medical child-care	provide medical care to children obtain medical care for children waiting associated with child's health activity for child health

Source: The American Heritage Time Use Study Codebook (www.timeuse.org)

Table 4.9 (cont.) The decomposition of primary childcare categories

	1965-66 original category	1974-75 original category	1992-94 original category	2003-10 original category
Developmental childcare				
36 - play with children	indoor games & instruction with child	indoor playing with children	indoor playing	play with children, not sports
	supervise, help with school work	teach skill show child how to do things help with homework	helping, teaching	arts & crafts with children help/teach children help with homework meetings at school home schooling waiting associated with child education activity related to child's education nec
37 - supervise/help with homework				
38 - read to/with, talk with children	read to children	Read to children	talk with	read to/with children talk with/listen to children
		conversations with children	/read to children	
39 - accompany/out-of-home care/other	other child care	babysitting other child care	other child care	attend child events waiting for children picking-up/dropping off children other care for hhold

Source: The American Heritage Time Use Study Codebook (www.timeuse.org)

APPENDIX C2: OLS MODELS PERFORMED ON FULL SAMPLE

Table 4.10 Mothers' minutes spent in basic childcare (*all mothers* - OLS)

	Model 1	Model 2	Model 3	Model 4	Model 5
	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)
Intercept	26.77*** (2.65)	26.97*** (2.77)	-19.14 (11.83)	-2.86 (12.04)	-60.26*** (10.77)
College degree or more	9.09*** (1.34)	7.25 (8.34)	10.52 (7.16)	9.14 (7.53)	8.17 (5.96)
1960s	20.93*** (4.49)	22.03*** (4.51)	23.11*** (4.24)	20.63*** (4.14)	12.55*** (3.64)
1990s	-0.13 (3.46)	4.49 (3.99)	3.35 (3.90)	7.74** (3.93)	1.88 (3.86)
2000s	13.71*** (2.68)	12.97*** (2.84)	14.08*** (2.75)	19.70*** (2.80)	13.72*** (2.49)
Age of diarist			4.95*** (0.62)	1.91*** (0.64)	2.85*** (0.57)
Age squared			-0.10*** (0.01)	-0.06*** (0.01)	-0.05*** (0.01)
Number of children				18.42*** (3.22)	17.37*** (3.19)
Number of children sq.				-0.89 (0.71)	-1.49*** (0.71)
Child under age 5					58.59 (1.04)
College:1960s		-11.64 (19.43)	-9.72 (18.15)	-6.03 (18.04)	-0.07 (15.68)
College:1990s		-15.46 (9.36)	-12.25 (8.28)	-9.20 (8.62)	-15.92** (7.42)
College:2000s		2.87 (8.46)	5.96 (7.29)	7.26 (7.65)	-0.46 (6.09)
Adj R.	0.01	0.01	0.08	0.10	0.20
N	19534	19534	19534	19534	19410

Note: Clustered standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. 124 cases with missing values for presence of a child under the age of 5 years are excluded from the analysis shown in Model 7. Having a college degree or more and 1975 are omitted categories. All models correct for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

Table 4.11 Mothers' minutes spent in developmental childcare (*all mothers- OLS*)

	Model 1	Model 2	Model 3	Model 4	Model 5
	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)
Intercept	6.70 ^{***} (1.72)	8.80 ^{***} (1.86)	-75.3 ^{***} (10.09)	-65.4 ^{***} (10.21)	-99.05 ^{***} (9.54)
College degree or more	12.93 ^{***} (1.18)	-3.61 (2.93)	-3.49 (3.25)	-4.34 (3.58)	-4.92 (3.89)
1960s	-0.79 (2.32)	-0.16 (2.52)	-1.39 (2.70)	-2.89 (2.84)	-7.63 ^{***} (2.90)
1990s	7.89 ^{***} (2.46)	6.82 ^{**} (2.68)	5.20 [*] (2.79)	7.87 ^{***} (2.86)	4.44 (2.90)
2000s	30.84 ^{***} (1.77)	28.38 ^{***} (1.97)	29.44 ^{***} (2.15)	32.42 ^{***} (2.24)	28.93 ^{***} (2.17)
Age of diarist			5.81 (5.34)	3.96 ^{***} (0.56)	4.52 ^{***} (0.53)
Age squared			-0.09 ^{***} (0.01)	-0.07 ^{***} (0.01)	-0.06 ^{***} (0.01)
Number of children				11.07 ^{***} (2.70)	10.39 ^{***} (2.66)
Number of children sq.				-0.51 (0.58)	-0.85 (0.56)
Child under age 5					34.27 ^{***} (1.29)
College:1960s		3.34 (4.98)	4.06 (5.02)	6.30 (5.53)	9.44 (5.84)
College:1990s		12.82 ^{**} (5.49)	14.53 ^{***} (5.63)	16.40 ^{***} (5.80)	14.12 ^{**} (6.39)
College:2000s		17.24 ^{***} (3.18)	17.86 ^{***} (3.49)	18.65 ^{***} (3.79)	14.15 ^{***} (4.08)
Adj R.	0.03	0.03	0.05	0.06	0.10
N	19534	19534	19534	19534	19410

Note: Clustered standard errors in parenthesis. Survey weights are applied to account for sampling design and non-response. 124 cases with missing values for presence of a child under the age of 5 years are excluded from the analysis shown in Model 5 Having a college degree or more and 1975 are omitted categories. All models correct for diary completion day (coefficient not shown).

*p<0.10, ** p<0.05, ***p<0.01

