Time, Love and Parenting

The Role of Fathers in the Intergenerational Transmission of Advantage

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A mis padres, quienes me dedicaron el mejor de su tiempo y su amor

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"...our use of time is like a language. We speak through it. By either what we say we want to spend time doing or what we actually spend time doing, we say what it is we hold sacred. Maybe we don't think of it just this way, but we assume that each "spending time" or each statement of feeling about time ("I wish I could spend time") is a bow from the waist to what we hold dear. It is a form of worship."

"...nuestro uso del tiempo se asemeja a un lenguaje: nos sirve para hablar. Cuando decimos cómo queremos pasar el tiempo o cómo pasamos el tiempo, en realidad, estamos diciendo qué cosas consideramos sagradas. Quizá no lo pensemos exactamente así, pero damos por sentado que cada "empleo del tiempo" o cada enunciado de nuestros sentimientos en relación con el tiempo ("Ojalá pasara el tiempo así") es una profunda reverencia a lo que consideramos sagrado: una forma de adoración."

Arlie Hochschild
The Commercialization of the Intimate Life, p. 143.
La Mercantilización de la Vida Íntima, p. 211.

Abstract

Over the last decades, fathers are getting involved in their children's lives. The "New Fathers" are not expected to act as breadwinners but also to engage in their family life and take a similar responsibility than their partners in the care of their children. However, we know surprisingly little about how the new role of fathers in childcare varied during the last decades and how it affects children's life chances. This dissertation aims to analyse how fathers' involvement evolved during the Great Recession and how this involvement shapes children's cognitive and non-cognitive development. To respond to these questions, the Spanish Time Use Surveys and the Longitudinal Study of Australian Children are analysed. Overall, the results of this thesis show that fathers increased their involvement during the economic crisis and that involvement plays a relevant role in child development. Specially, when fathers engage in educational activities with their children and they display a warm but "consistent" parenting.

Resumen

En las últimas décadas los padres se están implicando cada vez más en el cuidado de sus hijos. De los "Nuevos Padres" no solo se espera que actúen como *ganadores del pan* sino también que se involucren en la vida familiar y establezcan vínculos, estrechos y emocionales, con sus hijos. Sin embargo, se sabe muy poco sobre cómo este nuevo rol de los padres está cambiando en las últimas décadas y cómo éste afecta al desarrollo de sus hijos. Esta disertación tiene como objetivo el análisis de cómo la implicación paterna en el cuidado de los hijos evolucionó durante la Gran Recesión, y cómo dicha implicación impacta en el desarrollo cognitivo y no cognitivo de los hijos. Para contestar estas cuestiones se han analizado los datos procedentes de las Encuestas de Empleo del Tiempo y el Estudio Longitudinal de Niños Australianos. Los resultados de esta tesis muestran que, durante la crisis económica, los padres aumentaron su implicación en el cuidado, y que dicha implicación juega un papel relevante en el desarrollo de los hijos. Especialmente, cuando los padres pasan tiempo con sus hijos en actividades de tipo educativo y su implicación tiene un cariz "consistente".

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CHAPTER 1

GENERAL INTRODUCTION

1.1. Presentation

During the last three decades, the amount of time that parents spend with their children has dramatically increased in the vast majority of Western countries (Dotti-Sani and Treas, 2016; Sayer, Bianchi and Robinson, 2004). Not only do parents spend more time with their children, but the content of that time is also changing (Kalil et al., 2016), as are parent-child attachments and styles of parenting (Doepke and Zilibotti, 2017). These changes have been especially significant in the case of fathers, whose base rate of time spent with children was far lower (Craig et al., 2014). The "new fathers" are not only expected to act as income providers, but also to actively engage with the cognitive and socio-emotional development of their children (Coltrane, 1996; O'Brien, 2005; Doucet, 2004; Barbeta and Cano, 2017; Dermott, 2008). The concept of the "authoritarian father figure" is in freefall (Trifan et al., 2014), whereas paternal time spent engaged in cognitively enriching activities, such as play or reading, is on the rise (Raley, Bianchi and Wang, 2012; Hook and Wolfe, 2014).

These developments are not only reconfiguring the internal dynamics of families, but they also affect the inequalities between families. A growing body of research is documenting how, while most Western societies are experiencing a gender convergence with regard to time spent with children, social polarization in parenting – i.e., time invested and style of parenting - is also growing (Duncan, Kalil and Ziol-Guest, 2017; Altintas, 2015; Putnam, 2015). The increasingly stratified profile of parenting, and the new role of fathers in the

domestic sphere, have relevant consequences not only in terms of gender equalization, but also for children's skill formation. As the gender revolution advances, children's exposure to paternal influence beyond economic provision might also increase. This dissertation aims to analyse the changing role of fathers in family life, and the consequences for children's development.

In this introductory chapter, I set the scene for the dissertation. In section 1.1, I review the literature and empirical evidence showing the current changes in parenting in terms of time investments and styles of parenting. In section 1.2, I draw a general theoretical framework for understanding, from different perspectives, what skills are, how they are created and why they are important. This leads me to section 1.3, where I set the general questions guiding the three empirical chapters. In section 1.4, I summarize the institutional designs and socio-demographic characteristics of the contexts of analysis, and the chapter concludes by giving shape to the main contributions of the dissertation.

1.2. Understanding Parenting

Since written evidence has existed, fathers and mothers have been searching for advice on how to raise their children. The Bible included advice on correct ways of parenting, with the new testament speaking of God's discipline of us like a father disciplining his son (Hebrew 12:6-7, Proverbs, 3:11-12). It explicitly referred to the use of the "rod" and physical discipline, with fathers thus respected by

their sons and daughters. In the 17th century, first John Locke, and then Jean-Jacques Rousseau separately published books highlighting the relevance of parenting for a child's development and eventual achievement. However, they each proposed opposing ways of parenting. While Locke stressed the importance of parental rigor and discipline, Rousseau considered how children should be encouraged to explore the world themselves with little parental scrutiny. Thus, Locke's approach would fall closer to an intensive style of parenting, with Rousseau more toward a natural growth of children. If during the 1960s and 70s natural growth became fashionable, Western societies are facing a new shift toward an intensive form of parenting over the last three decades, objectivised through, among other behaviours, a tremendous increase of both mothers' and fathers' time with children. But why are fathers and mothers changing their practices of child upbringing? Next, I will discuss the empirical evidence with regard to this question.

1.2.1. *Fathers' and mothers' time with children*

That parents spend much more time with their children today than in the 1960s is one of the most robust findings in time-use research (Sayer et al., 2004; Craig et al., 2014). Although with different intensities, this increase applies for both fathers and mothers, and across all Western countries (Dotti Santi and Treas, 2016). This might be surprising for several reasons: First, because during the same decades, women have experienced a massive increase in their time devoted to market work, which would negatively correlate with

maternal time dedicated to childcare, since time is a zero-sum game. Second, because of the increasing rates of divorce and family complexity, which might lead to a decrease in paternal time dedicated to childcare, as after divorce fathers typically experience a decrease in the amount of contact they have with their children.

However, parallel to these two social changes, many other compositional and behavioural shifts have occurred that might have cancelled out the negative effect of maternal market work time and divorce on parental time with children. Following on, I first review the socio-demographic changes that have occurred over the last four decades, and that might explain the increase in parental time with children. Then, I consider the cultural or behavioural changes. However, it is worth noting that compositional changes also drive behavioural changes in a complex web of causal relationships. As noted by Gershuny and Robison (1988: 542): "taking the long view, all structure is behaviour. Having or not having a paid job (or a child) are actions, however chosen or constrained".

One relevant compositional change was induced by technological devices; especially remarkable was the birth control pill. Birth control offered the possibility to enjoy greater power over decisions about how many children parents would like to have, and when. By reducing the number of children in a family, the quality of care might be boosted (Becker and Lewis, 1973), and selecting when to have children may allow parents to strategically postpone pregnancy until they have more available time to devote to childrearing through

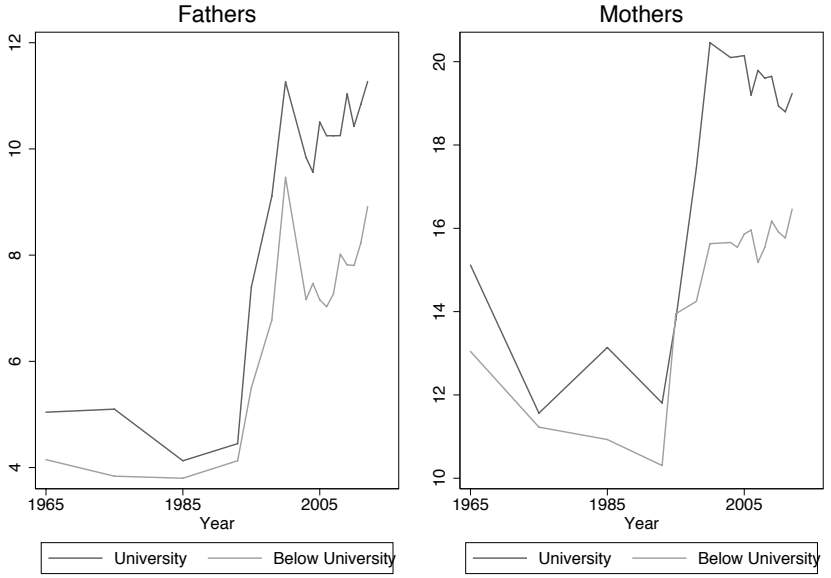
employment stability. Importantly, the pill has been suggested to enhance "self-selection" in parenthood (Sayer et al., 2004b). Those men and women who unintentionally became parents before the arrival of birth control, could now avoid the unintended consequences. In low fertility societies, like most Western countries, children have turned into a *scarce good*. Because children are scarce goods, parents might increase the time and effort they invest in them – they have more resources, more information, and fewer children to distribute their time and energy between.

A second main change was the increase in the relative percentage of higher-educated parents, defined as those who have a University degree, during the second half of the 20th century. It is well-known that the level of education is positively correlated with childcare time (Sayer et al., 2004a; Guryan et al., 2008; Craig and Mullan, 2011). Therefore, an increase in the relative percentage of higher-educated parents over the total population might partially explain the increase of parental time spent with children (Sayer et al., 2004b). The level of education might affect not only the quantity of time, but also the content of that time. Studies based on time-diary data have repeatedly shown that parents with greater levels of education disproportionally focus on cognitively stimulating activities, such as reading or playing educational games (Craig et al., 2014; Gracia, 2014).

A third relevant shift was the arrival of the so-called *intensive mothering ideology*. Intensive mothering ideology is a cultural narrative enhancing the important role that mothers play in raising

their children. Sharon Hays defined this ideology as a model of parenting that "advises mothers to expend a tremendous amount of time, energy and money in raising their children". Therefore, mothers are "expected to acquire detailed knowledge of what the experts consider proper child development and then spend a good deal of time and money attempting to foster it" (Hays, 1996: 8). Recent studies suggest that such ideology is slowly starting to appear among those fathers that have more education and greater stability at work (Shirani et al., 2012; Barbeta and Cano, 2017). Bianchi (2011) also suggested that as more children are growing up in bigger cities with relatively riskier neighbourhoods than before, parents may choose - through a sense of fear somewhat induced by the intensive parenting ideology - to take them to school, or accompany them to other outdoor activities. And as the cities are bigger, these routes may be longer and consume more time. In Figure 1, I plot changes in fathers' and mothers' time with children using the longest repeated cross-sectional time-use data available, the one for US. Looking at this graph we observe that in US (i) the *boom* of the narrative of intensive parenting appeared in the 90s and (ii) more educated fathers and mothers most embraced intensive parenting.

Figure 1: Fathers' and mothers' time with children by level of education (United States, 1965 – 2012). Hours per week.



Source: American Time Use Surveys (waves 1965, 75, 85, 93, 95, 98, 00, 03, 04, 05, 06, 07, 09, 10, 11 and 12). N=24,360 fathers and 33,730 mothers (pooled sample).

The fourth shift was the (uncompleted) "gender revolution" (England, 2010; Gerson, 2010; Esping-Andersen, 2009). The gender revolution meant an increase in mothers' educational attainment and labour market involvement, as well as an increase in paternal time with children. However, a general finding in gender studies is that gender convergence in educational attainment and the labour market has not been matched by a similar equalization of childcare responsibilities. Two main theories explain why gender inequality remains in unpaid work. On the one hand, the relative resources theory (England and Farkas, 1986; Breen and Cooke, 2005; Gupta, 2007) argues that parents bargain to avoid unpaid work. Because men have a higher income on average, they have greater power when

bargaining over less desirable and unpaid tasks (e.g., housework or routine childcare). On the other hand, *doing gender* theory (West and Zimmerman, 1987) argues that the unequal dedication to care is not a matter of power relations, but the social construction of gender. Because contemporary culture continues to identify "good mothers" as women who take on the main responsibility for childcare, and "good fathers" as men who assume the main responsibility for providing wages, couples still share the market's and care's work unequally. These two competing theories stimulated a considerable amount of research in order to understand why and how couples decide over childcare and housework (Brines, 1994; Schneider, 2012; Bittman et al., 2003, Evertsson and Nermo, 2004; Yu and Xie, 2012; Gupta, 2007; Sullivan, 2011; Risman, 2011; Aassve et al., 2014; Hook, 2017). However, recent studies (Craig and Mullan, 2011; Craig et al., 2014) suggest that these two theories are obsolete when trying to understand and explain fathers' involvement in childcare. This is because, due to the intensive parenting ideology and the pleasure linked to childcare (in opposition to housework), couples tend to bargain out only some dimensions of childcare, like routine activities.

In parallel to these four big societal changes, the father figure of the "new fathers" has emerged (Hook and Wolfe, 2011). As shown in Figure 1, fathers are clearly increasing their involvement in family life, and the more gender-equal societies are, the more there will be paternal involvement in childcare, shifting societies toward a modern *return to the family* and a new gender equilibrium (Esping-Andersen

and Billari, 2015). The "new fathers" are not only expected to act as income providers, but also to actively engage in more gender egalitarian relationships with their partners, and to take a greater role in the socio-emotional care of their children (Marsiglio, Amato, Day and Lamb, 2000).

A recent qualitative study explored the cultural repertoires of fatherhood in contemporary Spain (Barbeta and Cano, 2017) arriving to two main conclusions in this line. The first one was that, the way culture brings into mind the idea of fathers have passed from a monolithic vision based on a hegemonic masculinity (Connell and Messerschmidt, 2005), linked to economic provision, to a multidimensional conception where the gender differences are much narrower. There is, they concluded, a feminization of the perception of fathers' roles. If at cultural level gender differences are progressively disappearing, we might expect these narratives turn, although slower, into behaviour. As noted by Esping-Andersen (2016: 35): "The 'masculinization' of women's economic behavior is one facet of emerging gender symmetry (…) this is—albeit slowly—emerging also in the domestic sphere. Here, then, we see a 'feminization' of men's roles. If the primary gains to marriage derive from couple specialization, the ongoing transformation of gender roles would logically imply its demise". The second main conclusion was that, due to the high speed the transition from one model of fatherhood to the newish one is occurring, the new fathers see themselves devoid of references. As they do not identify themselves with their own fathers anymore, they search for other references to

look at (mostly, their partners). When asked what means nowadays to be an accessible father, they respond to listen to their children's problems, and to share their own with them. One conversation of a focus group with fathers in their thirties put it this way:

> *"I played football, and my father never came to see me; my daughter plays basketball, and I never miss a chance, not even a Sunday, to go and see her play"* (Pedro, higher-educated / unstable job).
> *"I don't remember asking my father to explain something to me … because it wouldn't have occurred to me; he was like an elite"* (Nicolás, higher-educated / unstable job).
> *"They weren't as accessible* (Carlos, higher-educated / unstable job).
> *Yeah, I like this comment. Now we're more accessible to our children"* (Jose, higher-educated / unstable job).
> *WHAT DOES IT MEAN TO BE MORE ACCESSIBLE?* (Moderator)
> *"That we're open to listening and for them to share their problems with us and trying to help them…"* (Miguel, higher-educated / unstable job).
> *"Yeah and also to sharing your problems with them…"* (Marc, higher-educated / unstable job)[1].

Importantly, there is not only an appreciable gender convergence in paid and unpaid work, but at the same time class disparities in both

[1] The original version, in Spanish:
Yo jugaba al futbol y mi padre nunca vino a verme; mi hija juega al baloncesto y yo nunca pierdo una oportunidad, ni siquiera en Domingo, para ir a verla. (Pedro).
Yo no recuerdo preguntarle a mi padre, explícame esto… porque no se me ocurría, estaba como en la élite (Pedro).
No eran tan accesibles (Nicolás).
Sí, me gusta ese comentario. Ahora somos más accesibles a los hijos (Carlos).
¿QUÉ ES SER MÁS ACCESIBLES?
Que estamos dispuestos a escuchar y a compartir sus problemas y a intentar ayudarles… (José)
Oye y a compartir problemas tuyos con ellos… (Miguel)
(see Barbeta and Cano, 2017: 26).

realms are widening. In recent years we have seen a revival of class studies, mainly due to the arrival of the Great Recession, and because social inequality is rising (Piketty, 2014). The distance that separates the upper- and lower- classes is not only growing in terms of available income, but also in terms of family (Altintas, 2015). The increase in paternal and maternal childcare time is skewed towards the higher social strata. The "return to the family" seems to be reserved for a select group of privileged people. This is important because diverging parental investments in children are at the core of the intergenerational transmission of (dis)advantage.

Differential resources defined by social position lead families to play the rules of the game unequally. Higher educated fathers (and mothers) have greater access to cultural and social capitals and they use them in a variety of ways to promote their family and their children's well-being, and ultimately reproduce their status. They have, also, greater flexibility at work (Li et al., 2014); they can more easily negotiate with their bosses and colleagues to stay at home (Clawson and Gerstel, 2014), they have more gender egalitarian values (Castro-Martín and Seiz, 2014; González and Jurado, 2015), job stability (Cairó and Cajner, 2016), or they outsource more of the housework tasks (Sevilla-Sanz et al., 2010), which allows the liberation of free time that can potentially then be invested in their children. These resources and strategies allow upper-class fathers to better coordinate with their partners in childcare responsibilities, and thus re-allocate their time. The story becomes more complex as studies highlight, as noted before, that upper-class parents not only

allocate more time to childcare, but they also engage more in cognitively stimulating activities with their children. The stratified profile of parenting is evident – and it is widening over time (Altintas, 2015).

1.2.2. *Styles of parenting*

Styles of parenting is an analytical tool synthesizing and conceptualizing a variety of strategies that parents put into practice during their childrearing. These differ in their definition and operationalization depending on the discipline of study. In developmental psychology, parenting style refers to the classic study of Diana Baumrind (1967) where she defined three broader styles: authoritarian, authoritative and permissive. In sociology, the analytical concept "parenting styles" refers to those defined by Annette Lareau (2003; 2011): "Concerted cultivation" and "natural growth". In psychological studies the three different styles are usually taken as independent variables, and the main concern is – although not exclusively - to study how each style effects different children's outcomes. On the contrary, Lareau focused more on taking the two analytical styles she defined as dependent variable. That is, here the aim was to observe how upper- and lower-class parents differ in the way they educate their children.

What differentiates one style from another, in both psychology and sociology, is the level of effort and time parents devote to childrearing. It is not only a matter of the quantity of time, but

especially the content of that time that matters most. The main difference between the styles defined by Baumrind and Lareau is that the latter focuses on specific practices, while the former involves both practices as well as the emotional climate at home.

"Concerted cultivation" is a style of parenting typically found in upper- and middle-class parents. They prioritize – more consciously than unconsciously – the development of language use, manners or abilities, that are more often rewarded in institutions (e.g. schools, labour market). To cultivate these behaviours and abilities in their children, fathers (and mothers) use different strategies, such as investing in extracurricular activities, sharing books' readings at home, planning a more structured use of time, or taking part in particular activities where highbrow culture is on display (e.g., museums). Within these micro-practices of 'concerted cultivation', the recent study of Putnam (2015) especially highlighted one: the dinner at home. When observed the "Chelsea Family", he noted: "The whole family ate together every night, except when her brother was playing football. "Family dinner is critical," Wendy says, "because the kids learn how to discourse with other people." (Putnam, 2015: 84). This style of parenting would be closer to what John Locke already noted in the 17th century.

On the contrary, "natural growth" is a style typically found in working class and low-income families. This type of style, closer to the one defined by Rousseau, is less frenetic and slower, leaving more freedom to children to occupy their time as they want – commonly in

a more unstructured way. Usually low-income parents face relevant economic constraints, meaning having less money available to invest in extracurricular activities, to outsource housework in order to devote more time to childcare, or to hire other kinds of help[2]. Abilities cultivated in children through this style of parenting are, on average, less rewarded outside the family and thus they face lower economic returns. The study of Lareau is heavily inspired by the work of sociologist Pierre Bourdieu.

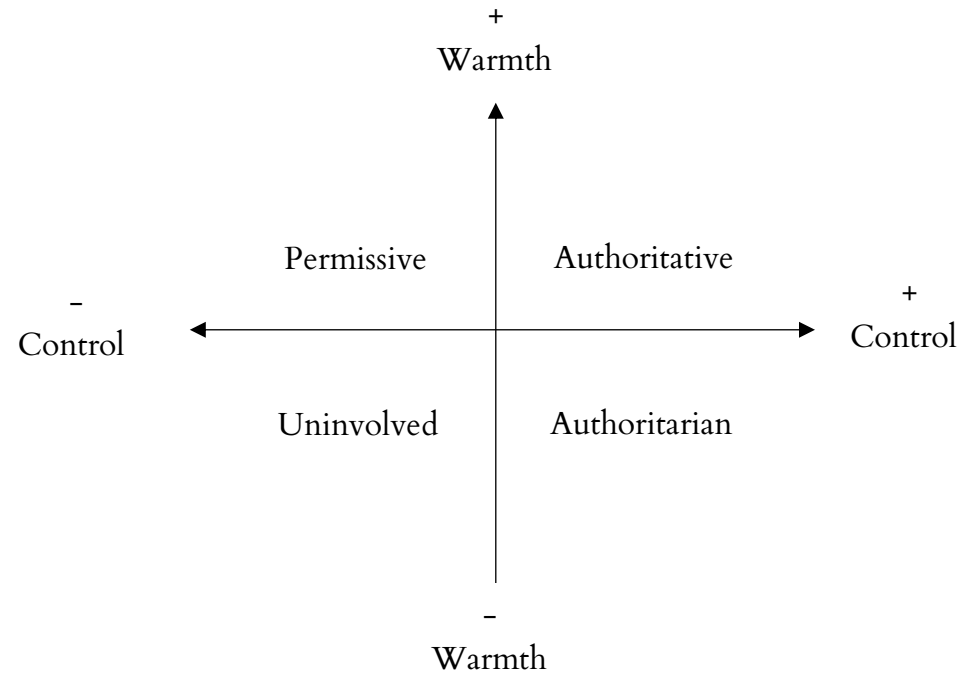
In this dissertation, different theories and perspectives from sociology, economics and psychology are used. However, there is one concept that articulates the three empirical chapters: *concerted cultivation*. In Chapter 2 I study how the prevalence of *paternal* concerted cultivation varies with business cycles. In Chapters 3 I analyse how some of the most typical dimensions of concerted cultivation – i.e., total parent-child time or time spent in educational

[2] Here might be noticed that income inequality directly affects time inequality and the ability to hire (or not hire) other's help. At this point, the relevant issue is not the position one family occupies in the income distribution but the gap's size between those at the top and those at the bottom, as noted by Jencks (1972: 34): "*The rich are not rich because they eat filet mignon or own yachts.... The rich are rich because they can afford to buy other people's time. They can hire other people to make their beds, tend their gardens, and drive their cars. These are not privileges that become more widely available as people become more affluent. If all workers' wages rise at the same rate, the highly paid professional will have to spend a constant percentage of his income to get a maid, a gardener, or a taxi."* In addition to this, time is also a dependent resource. Time works as a *waterfall*: depending how one uses his/her time depends the time of his/her family/work environment (and vice-versa). And where there is dependency, there is power. While upper class families have greater power over decisions of time-use, the lower the social position, the more time-dependency. The fact that the ability to control the use of time varies by social position is what makes time especially interesting to study. Because it can empirically reveal its links with structural relations of power, inequality and individual behaviour.

activities – affect children's cognitive development. What is new in this chapter is that I focus on the role of *paternal* time inputs; an unexplored channel of (dis)advantage transmission. In Chapter 4 I move further to include dimensions of the styles defined by Lareau – inductive reasoning – *and* dimensions from the styles defined by Baumrind, such as warmth and anger.

The parenting styles defined by Baumrind (1967) were: authoritarian, authoritative and permissive. These three styles are defined by two axes; parental *control* and *warmth.* As shown in Figure 2, authoritative parents are those who display a high measure of control - i.e., discipline or consistency - *and* are emotionally attached to their children. Authoritarian parents rank high in control but low in emotional attachment, and permissive parents are warmer but impose low control. Previous studies (Steinberg et al., 1992; Chan and Koo, 2010) show that those children raised in authoritative families fare better in cognitive and socio-emotional outcomes than those raised by authoritarian or permissive parents.

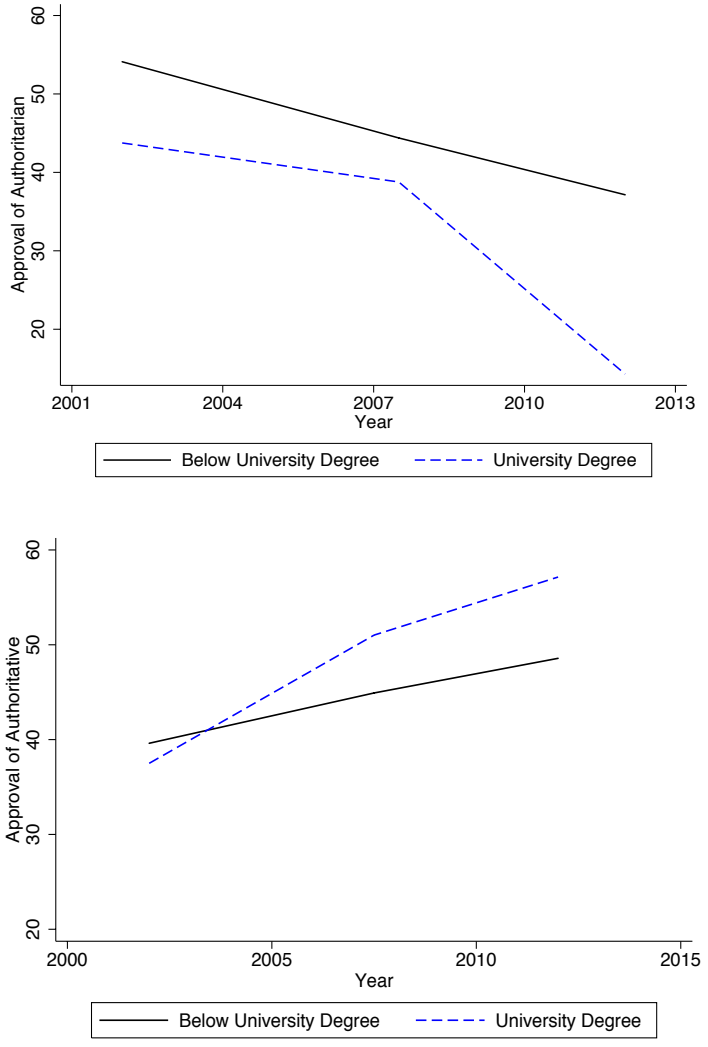
Figure 2: Structuration of parenting styles' dimensions.



Source: Own elaboration based on Baumrind (1991).

Societies change over time, and the way parents raise their children change with them, not only in terms of time but also in their styles and the attributes they value in their children. The previous generation of fathers were expected to be the main providers of money in families, but not to be so emotionally attached to their children. As noted before, the current idea of a good father in contemporary Western societies goes beyond economic provision. This change in the social perception of fatherhood, and the relationships fathers develop with their children, has come hand-in-hand with a decline of approval for the authoritarian father figure, as shown in Figure 3

Figure 3: Trends in fathers' approval of authoritarian (left) and authoritative (right) styles of parenting by level of education (Spain, 2002 – 2012).



Notes: World Values Survey (Longitudinal File), waves 1999-2004, 2005-2009 and 2010-2014. The measures of authoritarian and authoritative styles have been created using the questions asking parents which attributes they value in their children. Authoritative are those parents responding that they do not value imagination and independence, but that they do value obedience and hardworkingness. Authoritative are those valuing imagination, independence and hardworkingness, but not so obedience. N=736 fathers, pooled sample.

In sum, fathers are clearly reshaping the role they used to occupy in their families, and in their children's lives. However, it is empirically unclear whether greater father-child time and attachment relates to children's outcomes, and if so, how. Previous studies in economics and sociology have put great attention on how the gender revolution affected the role of fathers in society and vice-versa, how the new role of fathers affects gender bargaining at home and the sexual division of labour. However, how father-child time and attachment relates to the child's skill formation remains a black box – possibly due to the lack of high quality longitudinal data until recently. Nevertheless, developmental psychologists (see Lamb, 2010) have shown that there are persuasive reasons to believe that fathers play a key role in children's skill formation. But, what do we talk about when we talk about children's *skills?*

1.3. Understanding Children's Skill Development

Skills are multiple in nature and comprise a variety of attributes ranging from personality to cognition. They represent capacities through which individuals are able to act in societies. In recent years they have become in vogue, especially within economics literature (Cunha and Heckman, 2007; Heckman, Stixrud and Urzua, 2006). Within this literature, two broad groups of skills are commonly used: cognitive and non-cognitive skills. Cognitive skills are those "classic" abilities related to memory, information processing, and speed of thinking. There is less agreement in the definition of non-cognitive skills (also labelled socio-emotional skills, soft-skills,

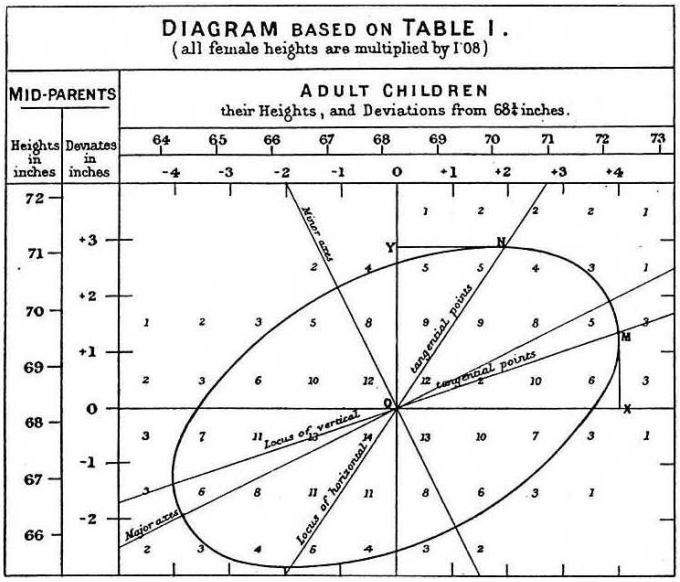
personality or character). The label "non-cognitive" is controversial partially because of the ambiguity in its definition. In a recent OECD report, non-cognitive skills were defined as "personality traits, goals, character, motivations, and preferences that are valued in the labour market, in school, and in many other domains" (Kautz et al., 2015: 2). This is an astonishingly broad definition, and therefore risks meaning everything and thus nothing. Psychologists do not feel comfortable with the economists' idea of non-cognitive skills (Lundberg, 2017) and sociologists try to distinguish between definitions. For example, Lareau (2015) has recently made an effort to separate out the concept of *cultural knowledge* from the idea of non-cognitive skills: "these forms of cultural knowledge are not the same as academic knowledge, nor should they be seen as the same as non-cognitive knowledge (and soft skills)". If the definition is still blurry, the measuring of non-cognitive skills follows a similar line. In this dissertation I will use the label "non-cognitive" consistently (mainly in Chapter 4) because it is familiar to the reader and because no other superior definition has (yet) emerged. As a measuring instrument I will use the "SDQ" (Strength and Difficulties Questionnaire) because it is one of the most widely used measurement indices (e. g. Kiernan and Huerta, 2008; Emerson, 2005; Jackson, Kiernan and McLanahan, 2012). It should also be acknowledged that SDQ mainly captures socio-emotional skills and behavioural problems but omits characteristics such as motivation, locus of control, agreeableness or conscientiousness.

That skills - whatever their nature - are relevant precursors of educational attainment (Jencks et al., 1979; DiPrete and Jennings, 2012; Duncan and Magnuson, 2011) and labour market performance (Jackson, 2006; Hall and Farkas, 2011), is a well-established finding in the social sciences. And that the environment in which children are raised shapes their skill development is another well-established finding (for a review, see Heckman and Mosso, 2014). The reasons behind their relevance, and the process through which they are created are, however, not yet clear. Two theoretical traditions offer a set of mechanisms to understand how skills are created and why they matter. On the one hand is the human capital theory, and on the other, the social closure approach.

1.3.1. The Human Capital Approach

Human capital theory posits that parents transmit their skills to children through genetics, as well as through investments in time and money (Becker and Tomes, 1976). The work of Becker is originally rooted in the studies of Francis Galton (1869; 1889) on intergenerational correlations of stature. Galton was one of the first in applying statistical methods to the study of intergenerational correlations. Beginning with the correlation between fathers and sons in their stature, he further observed that there was a correlation between most of the characteristics surveyed: education, income, wealth or skill.

Figure 4: Diagram of intergenerational correlation of stature.



Source: Francis Galton (1889). Image in public domain.

The Becker model departs from Galton's heredity one. Becker's theory of human capital (1981) starts under the assumption that couples are formed by two heterosexual individuals that rationally choose to specialize in market (men) and non-market (women) work. Such gender specialization would maximize their productivity in each gendered realm. Therefore, under this theory, child development is understood as a responsibility of one parent (usually the mother), denying the role that fathers play in the intergenerational transmission of inequality beyond status-related attributes such as income or education. In addition, Becker considered child development as a static process, not taking into account the dynamic nature of skill formation over the course of a lifetime. Recently, James Heckman and his colleagues have developed the human capital model, taking hints from developmental psychology, neuroscience

and philosophy to overcome some of the issues related to Becker's theory.

The work of Heckman et al. (2008) reframed the human capital model by stressing the role of skills in what is usually referred to as *"the technology of skills formation"*. This theoretical model affords several new insights. The starting point is based on the idea that (i) skills are multiple in nature; (ii) they are susceptible to the environment in which they are developed (including in-utero exposures); and (iii) they are key determinants of children's life chances. A relevant point in Heckman's proposition rests upon the broad definition of "skill" and the special focus on the role of non-cognitive skills. Heckman et al. support the idea that non-cognitive skills are equally, if not more strongly, determinant of children's life chances as cognitive skills are. This, however, is subject to debate. Recent research concludes that cognitive skills are stronger mediators in the intergenerational transmission of status than non-cognitive skills (Hsin and Yie, 2016). These authors argue that "while both types of skills positively affect later achievement, the effects of socio-behavioral skills are about one third the size of the effects of cognitive skills on later achievement" (op. cit., p. 11).

A second relevant point within the technology of skill formation is the so-called "*dynamic complementarity"*. This idea, originally rooted in psychoanalysis (Erikson, 1950), considers children's life courses divided into a sequence of stages where each stage corresponds to a determined age. Each of these stages has a different impact on the ability of skill formation of the child. For example,

cognitive skills are more malleable between ages 0–6 years old, while the non-cognitive skill formation process takes longer, stretching out until adulthood. In addition, some environments and investments might be highly productive for the child in some periods, but not in others. For instance, reading to a child at age 4 has stronger beneficial effects than reading to a child at age 9.

In line with this, studies rooted in embryology (Stockard, 1921) suggest that animals have sensitive time periods in which the effects of inputs on specific skills are stronger. In addition, critical periods refer to developmental stages when the effects of the environment on ability are directly irreversible (Brown, 2005). These developments were first extended to neuroscience and then to socialization research, suggesting that humans have *windows of opportunity* for skill acquisition (e.g., the older one is, the more difficult it is to learn a new language). Therefore, *sensitive* periods are those at which input x has a stronger effect on the child (y) at time t than at time $t+1$, while *critical* periods refer to those at which x has an effect on y *only* at time t, but no effect at $t+1$.

A third central idea is represented by the "*self-productivity"* concept. This idea highlights the fact that some skills causally affect others. Heckman et al. argue that non-cognitive skills enhance cognition. Self-productivity is usually summarized under the lemma *skills beget skills*. Developmental studies propose that children with higher self-esteem and trustful children (both non-cognitive skills) are more able to explore themselves and their surroundings, increasing their

exposure to a variety of scenarios and stimuli, and ultimately boosting cognition. Thus, skills are "self-reinforcing" and "cross fertilizing".

The combination of *dynamic complementarity* and *self-productivity* lead to the ideas of *path dependency* and *accumulation of advantage.* These concepts have been developed since the 60s (Merton, 1968) and represent core conceptual tools in social stratification research. The central idea is that the current level of a given disadvantage of one resource, in this case skills, at time *t*, causally affects its level at time *t+1* (i. e., *path dependency*). Therefore, a prior (dis)advantage in the level of skills tends to grow over time (i. e. *it is accumulative*) (DiPrete and Eirich, 2006). The resource could be skills, but also educational outcomes, income, or wealth. This causal mechanism represents a "vicious" cycle of skills accumulation over an individual's life course and across generations. To put it simply, *the poor get poorer* (and *the rich get richer*). In line with this, Heckman (2006: 1900) warned: "a child who falls behind may never catch up".

To sum up, the basic idea is that human development can be modelled through adequate and early investments in skills. By having a well-developed set of skills, children's life chances will be improved. This perspective is, however, challenged by the *social closure* approach.

1.3.2. The Social Closure Approach

Social closure (or status maintenance) perspective is the sociological tradition originally developed by Max Weber and somehow inspired the credentials thesis (Collins, 1979), cultural reproduction theory (Bourdieu and Passeron, 1990; Jæger and Breen, 2015), the filter theory of education (Arrow, 1973) or the correspondence principle (Bowles and Gintis, 2002). In broad terms, social closure perspective argues that credentials that can be obtained through skills put into practice (i.e., University degree, master, PhD, etc.) do not reflect ability, but rather pertinence to *the appropriate* social group, as well as a command of the "rules of the game" valued by that particular group. Murphy defines social closure as "*a process of subordination whereby one group monopolizes advantages by closing off opportunities to another group"* (1988:8). The basic idea is that social elites monopolize access to resources as well as defining rewards for specific assets in the form of educational credentials, skills or tastes[3]. Under the social closure approach, education or skills open doors to those who have them because they build up walls for those who do not. The social value of a skill or an educational title, therefore, depends on its scarcity.

The massification of higher education has made educational title no longer scarce as well as changed the meaning of graduate work. This

[3] For more recent work along this line, see Weeden, 2002; Barone and van de Werfhorst, 2011; Fasang et al., 2014; Ruggera and Barone, 2017; Martín-Criado, 2017.

change is breaking the traditional association between holding a University degree and being classified as more knowledgeable and deserving. In line with this, new ways to create distinction among different social strata arise. A first basic example is based on the increase in the levels of titles now needed to see similar returns as before. After the expansion of the educational system during the second half of the 20th century, a bachelor's degree began to lose its value as a signal of social position, and thus its economic returns diminished. A master's degree is needed in order to attain similar rewards to those attained a few decades earlier by holding a bachelor's degree. Through this shift, titles can continue serving its function of separation and classification.

A second example of new forms of social closure is the increasing relevance of the non-cognitive skills -one of the four variables explained in this dissertation. In the last decade there has been a dramatic shift toward an increasing value of non-cognitive skills to explain positive outcomes in the labour market. Brown considered that companies are selecting workers "based on a combination of credentials, skills and charismatic qualities which need to be repackaged and sold in the market for managerial and professional work" (1995: 42). We can observe this, for example, in an ad of Neurolink, a neuro-technology company founded by Elon Musk, a current highly influential personality defined by the magazine The Economist as "the world's most famous inventor". The ad's filter mechanism of selection is not previous titles or experience but "exceptional ability". They stress two components of the ability:

talent and *drive*, that is, a combination of cognitive (e.g., memory, speed of thinking) and non-cognitive skills (e.g., perseveration, sociability, motivation, inventiveness):

> *Neuralink is developing ultra-high bandwidth brain-machine interfaces to connect humans and computers.*
>
> *We are looking for exceptional engineers and scientists. No neuroscience experience is required: talent and drive matter far more. We expect most of our team to come from other areas and industries.*
>
> *We are primarily looking for evidence of exceptional ability and a track record of building things that work.*
>
> *All positions are full time and based in San Francisco.*
>
> (Neurolink.com, October 2018).

We can refer to the increasing use of charismatic personality traits and non-cognitive skills for positive selection into professional and managerial positions as a *symbolic closure.* The way commonly expressed in mass media to acquire non-cognitive skills is not far from cognitive ones and is based on specific techniques (e.g. body posture, make eye contact, take initiative, seek for challenges) that can be put into practice by going "out of the comfort zone" and working hard on them.

The discourse of working hard to achieve "talent" and "drive" or being charismatic rest upon the idea of *meritocracy.* Meritocracy was a concept developed by Michael Young in the 1940s. This concept is a new way of social engineering, making able to identify the talented people so that individuals can be selected for appropriate rewards and

opportunities (Khan, 2011). The concept was created by the elites -in particular, by the England Labour Party- and it has been successful in its diffusion among Western societies (for a visualization of such trend, see Mijs, 2018): An increasing amount of people are convinced that poverty (or richness) show the fair results of a meritocratic process. However, as expressed by Khan (2011: 9) the rise of the believe in meritocracy "has obscured how outcomes are not simply a product of individual traits. This meritocracy of hard work and achievement naturalized socially constituted distinctions, making differences in outcomes appear a product of who people are rather than a product of the conditions in the making".

This sociological perspective provides a dynamic model of structural inequality, drawing specific attention to conflict and social change. Children coming from different social positions are socialized differently. Such socialization provides children a set of skills that they can later transform into capitals when interacting with institutions. However, the skills that parents transmit to their children are differently rewarded outside home. As Lareau (2011: 362) posited, "cultural training in the home is awarded unequal value in dominant institutions because of the close compatibility between the standards of childrearing in privileged homes and the (arbitrary) standards proposed by these institutions" (e.g., talent, drive, charisma).

In sum, the social closure approach confronts the "technology of skills formation" approach in the way that, even though societies

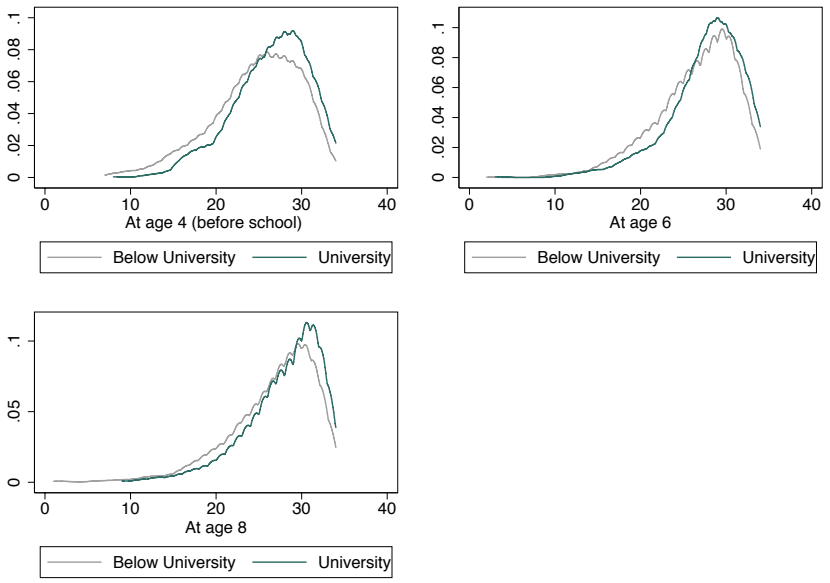
invest massive amounts of resources in improving lower-class children's skills to equalize outcomes by social origin, upper class families will always find the way to be distinguishable from lower-classes. Social closure, contrary to the idea of Galton and Becker, does not consider that societies *regress to the mean*[4]. Rather, it argues that the cycle of advantage reproduction is perpetuated because social elites will "monopolize advantages by closing off opportunities to another group".

However, these two theoretical approaches have, at least, three points in common. First, that social inequality begins at home. Second, that schools do little, if anything, to reduce such inequality; schools neither reinforce nor mitigate social background effects. On the contrary, schools reproduce socio-economic status (SES) gaps in ability. Since the influential Coleman report, which was the first to empirically demonstrate that the effectiveness of schools in reducing gaps in attainment by social origin is weak to non-existent (Coleman et al., 1966), many other studies have confirmed this idea (e.g., Adler et al. 1994; Currie and Stabile 2003; Duncan, Ziol-Guest, and Kalil 2010). One of the datasets used in this dissertation seems to confirm this argument for the Australian case. In Figure 5 I plot non-cognitive outcomes for children before starting school (at age 4) and after starting school (at ages 6 and 8), who have fathers with and without a University degree. These figures show that gaps in skills by father's social position - measured using level of education - opens early in

[4] "Endowments tend to increase from parents to children at lower income levels and to decrease from parents to children at higher levels because of regression to the mean in endowments" (Becker and Tomes, 1986: S18).

life and remains constant, at least, four years later. The gap size is 2 points at age 4 -before starting school-, and the exact same number at age 8 -after three years of mandatory school. In most countries where data is available, similar gaps in skill by social origin have been found (Brooks-Gunn et al., 2006; Esping-Andersen, 2007).

Figure 5: Non-cognitive skill outcomes by father's level of education and child's age.



Note: Waves 1 to 3 of K Cohort, *Longitudinal Study of Australian Children*. These are unadjusted means from a sample of 7,264 observations from 3,348 children. Non-cognitive skills are measured using the Strength and Difficulties Questionnaire (SDQ) reverse coded. 33.8% of fathers hold University degree while 66.1% are below University.

A final common argument is that, through competition for the limited number of elite slots in society, parents might decide to invest more resources and efforts in their children in the hope of promoting a chance to access to one of the limited slots at the upper-side of the

social ladder. This may be at the core of the different factors explaining why parents continue to increase their time investments on children.

1.4. Research Aims

The aim of this dissertation is to analyse the conditions under which fathers become involved in childcare, and how this involvement shapes children's skill formation. Therefore, in the first part of the thesis, parental care works as dependent variable, while in the second part parental care is the explanatory variable, with children's outcomes (cognitive and non-cognitive) being the variables to explain. The general objective is divided into three sub-questions across the three empirical chapters:

The first part of the dissertation, **Chapter 2**, looks at how the gender and education gaps in physical and developmental care have evolved during the Great Recession, using Spain as a case study. This study takes two Spanish time-use surveys (one conducted before the recession -2002/2003- and another during -2009/2010-) to respond to the following question: *have gender and education gaps in care time been ameliorated or exacerbated during the Great Recession?* Beside the variations in the gender gap of physical care, and the education gap of developmental care, this study also looks at how these gaps increased or decreased depending on the developmental stage of the child.

The second part is formed by Chapters 3 and 4 where the focus is to analyse how parental care affects child development. The question that guides **Chapter 3** is as follows: *does fathers' time matter for children's cognitive outcomes?* This chapter responds to three specific objectives. First, to analyse whether, and how, the quantity of father-child time is associated with children's cognitive development. The second aim focuses on what sort of activities engaged in during the father-child time are the most beneficial for the child's cognition. The third and last aim focuses on the examination of whether paternal education moderates these associations. To respond to this question, the dataset analysed is the *Longitudinal Study of Australian Children*.

In **Chapter 4**, using the same dataset, the aim is to examine how social class shapes the styles of parenting and how these styles affect children's cognitive and non-cognitive outcomes. Rather than look at broader styles, like concerted cultivation or authoritarian, this chapter explores specific dimensions of these styles. In particular, it analyses four dimensions of parenting styles: (i) the use of inductive *reasoning* with the child, (ii) being a *consistent* parent during childrearing, (iii) parental *warmth*, and (iv) parental *anger*. Therefore, the question guiding this study is as follows: *Do parental emotional investments matter in the intergenerational transmission of (dis)advantage?*

Three clarifications may be articulated at this point. First, in order to narrow down the aim of the study, the dissertation only analyses samples of two-parent families and, as noted, only looks at non-

tangible family resources (i.e., parental time, practices and emotions). Nevertheless, it obviously controls for family background characteristics (i.e., income, education, age, ethnic background, etc.).

Second, although the main aim is to investigate the role of fathers in the intergenerational transmission of skills, mothers are equally considered across the three empirical chapters. Mothers are included across all the statistical modelling in order to isolate the effect of fathers in transmitting (dis)advantage to their children. This is especially relevant since (i) one of the main determinants of fathers' involvement in childcare is actually the social position of the mother (Raley et al., 2012; Hook, 2006), and (ii) the main effects in child development are mostly via maternal social position, responsiveness and care – except in those families where fathers are more involved than mothers, which represent a small percentage.

Third, this thesis is not a comparative analysis of different contexts. That is, the contexts of analysis of this dissertation -Spain and Australia- are not chosen to be compared. Rather, they are analysed in their own right. The reason to select Spain as one of the two countries analysed is due to the severity of the Great Recession and the available of high-quality time use data before and during the crisis. The aim of Chapter 2 was to analyse how parental childcare time changed during the Great Recession. Therefore, giving the strong impact the financial crisis had in Spain, it represented an excellent case to be studied. As noted before, the analyses done in this chapter about changes in paternal (and maternal) childcare time

led me to the following question: Does paternal childcare time investments really matter for child development? The fact that the only panel dataset including time diaries and measures of child development in more than two waves is in Australia[5], makes this case an appropriate context of study. Thus, contexts of analyses are introduced separately, and comparative lessons are not derived from their study -neither in the introduction, nor in the corpus, nor in the conclusion of the dissertation.

1.5. **Contexts of analysis: Spain and Australia.**

Australia is the country in the world where discourses of intensive parenting have impacted with greatest intensity. As shown in Figure 6, there is no other country[6] where parents spend more time with their children in physical/routine care than in Australia. This applies for both mothers and fathers. In this country, mothers spend near 140 minutes per day with their children in physical care[7], while fathers 38. Given the fact that one of the main aims of this thesis is to study the role of fathers' time and parenting practices in child development, Australia represents an excellent case of study. Not only that, but

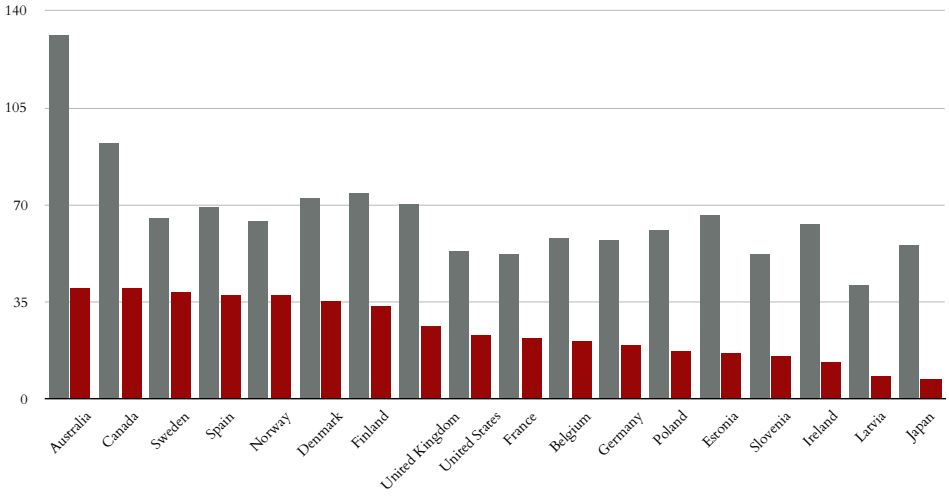
[5] There is a second data set in the world of this kind: The American CDS-PSID (Child Development Supplement of the Panel Study of Income Dynamics). However, LSAC (Longitudinal Study of Australian Children) has a number of advantages when compared with CDS-PSID. First, it includes around the double of sample size. Second, children are on average much younger. Third, children in LSAC are surveyed every two years, while in CDS-PSID is every five. Finally, LSAC has already eight waves and it continues running, while CDS was a supplement only included in PSID three times, in 1997, 2002 and 2007. These characteristics make LSAC an excellent dataset for the aims of this dissertation.

[6] I only consider OECD countries.

[7] Physical care refers to activities such as feed the child, bathing or changing nappies and is related with the basic development of the child. This type of care is usually referred to in the literature as *routine* care or *basic* care.

Australia is one of the few countries in the world where I was able to empirically test one of the main hypotheses of the thesis. The idea that paternal time and attachment with children affect skill's development and is, therefore, a contributing factor within the reproduction of social inequality. This is because in Australia is located the only dataset (besides the American PSID) allowing to link parents' time investments

Figure 6: Time parents aged 18-64 spent in physical childcare by sex (in minutes per day).



Notes: OECD child well-being portal. The chart is ordered by considering the gradual decrease in fathers' involvement across countries. For details, see www.oecd.org/els/family/CWB7a-d.xlsx

Surprisingly, Spain ranks among the upper countries in parental physical time with children (number four, only surpassed by Australia, Canada and Sweden, and above Nordic European countries such as Norway, Denmark and Finland). This is surprising because Spain is one of the contemporary advanced democracies with one of the harshest environment in terms of reconciliation of family and

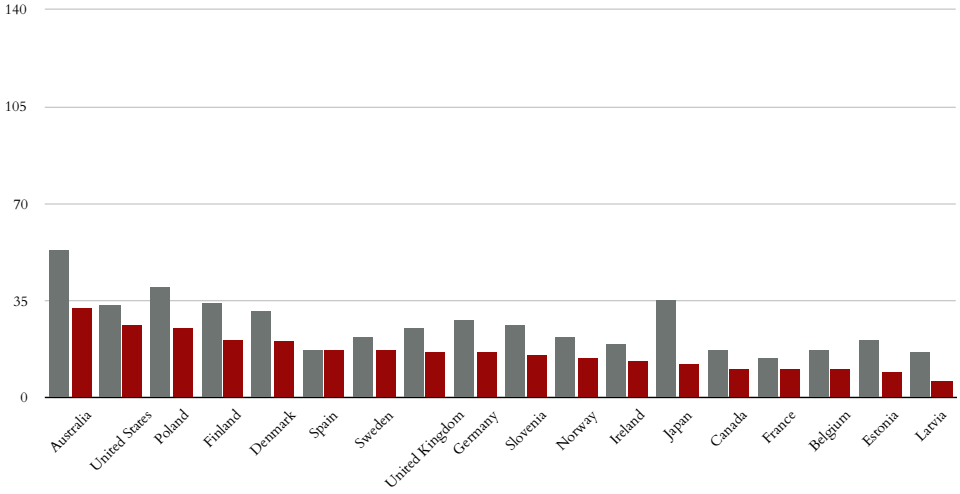
career (Esping-Andersen, 2009: 43). Such political environment would be expected to have a strong effect in decreasing time with children. However, this is not the case. As noted, in Chapter 2 I test the hypothesis that such high figure in physical care is partially due to Spain's massive rates of unemployment, which ultimately leaves mothers but especially low-skilled fathers a great amount of involuntary free time that tends to be reallocated with family and children.

For the case of developmental[8] care, Australia and Spain rank in similar positions than in physical care time, compared with other Western countries. As shown in Figure 7, Australia is definitely the world's leader in all kinds of childcare, while Spain lose (only) two positions in developmental care, being the number six and surpassed by Australia, United States, Poland, Finland and Denmark. On average, parents dedicate less than the half of time to developmental care than to physical across all selected countries. Besides that, the most relevant difference compared with physical care is its greater gender equality. The variation in the level of gender balance between the two types of care is a common finding in the literature (Raley et al., 2012). These authors suggest that fathers are getting more involved in childcare, reducing the gender gap, but this involvement is mainly concentrated within the *fun* part of care (i.e., developmental

[8] Developmental care refers to activities such as reading with the child or play developmental games together. It is also referred to in the literature as *educational* care or *interactive* care. This type of care covers the intellectual developmental of the child. Across this thesis I call it developmental care (chapter 2) and educational time (chapter 3).

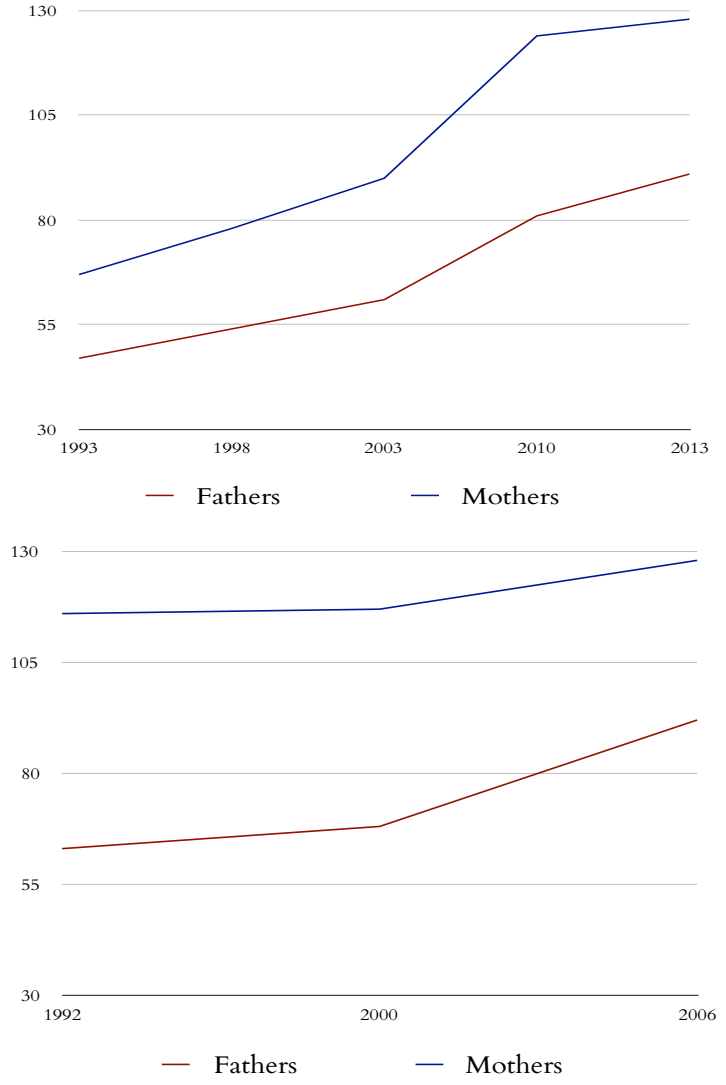
care), while leaving the *dirty* part (i.e., more time-consuming, physically demanding, and time-inflexible) to mothers.

Figure 7: Time parents aged 18-64 spent in developmental childcare by sex (in minutes per day).



Notes: OECD child well-being portal. The chart is ordered by considering the gradual decrease in fathers' involvement across countries. For details, see www.oecd.org/els/family/CWB7a-d.xlsx

Figure 8: Time spent by fathers and mothers in childcare in Spain (left) and Australia (right)



Notes: Spanish Time Use Surveys (Spain) and Australian Time Use Surveys (Australia). Since in Spain only two Time Use Surveys have been conducted to date, the Basque Country Time Use Survey was used for years 1993, 1998 and 2013, as a proxy for Spain. In these figures, childcare's time included all types of childcare's activities.

1.5.1. The case of Spain

To better understand patterns of fathers' (and mothers') involvement in childcare in Spain, it is important to bear in mind what sort of political, demographical and cultural environment this country is located in. In general, Spain was categorized within southern or familistic welfare regimes (i.e., low expenditure in social services, weak spending on families, or low rates of female employment) (Ferrera, 1996), among the lowest-low fertility countries (Kohler et al., 2006) and relatively advanced in terms of pro-gender egalitarian views (Castro-Martín and Seiz, 2014).

Regarding welfare, efforts invested since the 90s by governments in reverse the "familistic patterns" led towards significant increases on female education, employment and reduction of gender discrimination (Naldini and Jurado, 2013). First, children's day-care system was expanded. Spain has a system of universal education from 3 years old onwards. Under that age (0-3), 43% of children are currently institutionalized (INE, 2017). In terms of parental leave, in 2007 there was a relevant policy reform of the Spanish family benefit system that changed the fathers' quota in the leave from two days to two weeks exclusively reserved for fathers, fully paid, and non-transferable to mothers. Farré and González (2017) found that this reform had a strong impact in boosting fathers' take-up rates (by 400% increase), an increase of 11% in female employment shortly after childbirth, but very limited impact in changing household behaviour after the two weeks.

The demographical situation in this country is marked by a very low fertility rate. Spain is among the countries with lowest fertility rate in Europe (Total Fertility Rate [TFR]: 1.32). In this country, the average age for the first child in 2015 was 30.1 (the oldest of Europe). Regarding divorce Spain moved from having 0 crude divorce rate (i.e., number of divorces per 1000 habitants) during the 70s (it was illegal under Franco's regime) to 1.0 in the 90s and escalating up to 2.4 in the 2000s, which placed the country among the high divorce group of European countries (i.e., U.K., Germany or France) (Esping-Andersen et al., 2013).

Another relevant characteristic of Spain to keep in mind when looking at parental time with children is the long working hours, with daily schedules usually including a long lunch break (commonly from 2:00pm to 4:00pm). Gracia and Kalmijn (2016) concluded that this institutionalized split-shift rooted in traditional "siesta" has a strong negative effect on fathers' and mothers' childcare time. They also find that in Spain couples compensate the time lost by the partner's split-shift by increasing his or her time at home. However, mothers are especially responsive to variations in work-hours compared to fathers, as also found by Craig and Powell (2011). In line with this, it is not trivial that Spain's daily time structuration lags behind most Western countries. In this country, lunch are typically at 2:30pm, dinners at 10:00pm and TV prime-time covers from 10:00pm to 1:00am. Children's institutionalization goes, however, in line with Western countries (i.e., from 9am to 5pm). It is not

surprising that several previous time-use studies focused in Spain find that having a standard work-schedule (i.e., from 9am to 5pm), is a critical variable explaining fathers (and mothers) time with children (Gutierrez, 2010). This situation implies great efforts on couple's juggling in balancing work and family, with certainly low support from the State.

But if something makes Spain interesting in studying the evolution of parental care during the economic recession is the severe impact the recession had in Spain. The Great Recession of 2007 had devastating effects at all levels in this country, with the strongest negative effect placed over unskilled men. It also stopped the on-going pre-2007 political efforts in reversing the familistic welfare, somewhat forcing families to go back to pre-2007 levels of family responsibility in bearing individual risks (Leon and Pavolini, 2014). Also, the crisis turned net migration rate (i.e., the difference between the number of immigrants and the number of emigrants) from 13.4 in 2005 to -2.5 in 2015, which had the effect of decreasing fertility (boosted during the years of economic bonanza mainly through migrants' higher fertility levels) and in the distribution of the responsibilities of care within Spanish couples. Migration in this context is relevant because migrant women in Spain are key in bearing the bulk of unpaid work, including childcare. By transferring unpaid work to migrants, Spanish mothers were more able to invest in their career and, also, a low-skilled feminine migration flow through global chains of care was created (Benería, 2008). However, the recession seems to have reverted this tendency. Finally, during

the economic crisis, Spain increased its levels of social inequality, moved from having a Gini coefficient of 31 in 2002 to 36 in 2012 (World Bank, 2017). Altogether make Spain a unique case to study changes of parental time investments during the Great Recession, the focus of Chapter 2.

1.5.2. The case of Australia

The case of Australia is dramatically different to the Spanish case. Australia is among countries within the "liberal" welfare state regime (Orloff, 1996) (i.e., low government support to families and high commodification of individual risks), it has relatively high fertility (TFR: 1.88 in 2010), low involvement of mothers in the labour market and relatively conservative gender values (Perales et al., 2015) The latter and the fact that the federal government does not support families in work-family reconciliation might be also partially explaining why such high rates of parental care work (Craig et al., 2010) (see Figures 6 and 7). This, besides its unique data to analyse parental effects on child development, make Australia an ideal case study.

During the years analysed in this thesis (2004 – 2008), Australia was governed by a liberal-conservative political party. During this time, Australia experienced economic growth (which started much before and continues nowadays –i.e., Australia is currently the country in the world under the longest period without suffering an economic recession). Contrary to the economic volatility of Spain, Australia

enjoys a stable economic situation. At the end of the 90s the Liberal Coalition introduced a generous money transfers for couples with children. The final amount is estimated based on the income of the household's secondary earner. Previous studies like Apps (2006) found that that policy incentivised mothers' preferences to stay at home after childbirth or work part time, somewhat redefining the Australian labour market's landscape.

The Australian labour market is characterized by the low participation of mothers. Looking at employment patterns among couples with children, data show how in Australia the dominating couple's model is between the 1.5 earner households (i.e., father works full-time and mother part-time) and the traditional male-breadwinner/female-caregiver. In 2017, for those mothers who were partnered, the rate of stay-at-home is surprisingly high (27%), placing Australia at the very bottom of the OECD countries in terms of labour market's participation of mothers. On the other hand, mothers working part-time is also high in OECD comparative terms, representing 45% of the total mothers aged 25-45. Among those, four-fifths of them cite family reasons for doing so (OECD, 2017). Another relevant characteristic of the Australian labour market is its low unemployment. In this country, unemployment rates for people aged 15-45 between 2000 and 2015 was 5% fluctuating at 3% of variance at its maximum (ABS, 2018).

1.6. Main Contributions

The first contribution of this dissertation is an up-to-date the empirical knowledge, literature, and trends on paternal (and maternal) childcare dedication. The next contributions are divided by the chapters where they are developed.

Chapter 2

This study was motivated by the lack of studies looking at how inequalities in time spent with children varied during the Great Recession. Although this is a sub-field of study developed in US, there is no previous research outside this country. Importantly, the few papers that have addressed this topic have all spotlighted the father involvement variation in care time, but no previous study has looked at the evolution of the gender or education gaps during the Great Recession. If fathers, especially those at the lower end of skill distribution, suffered severe economic hits in the form of unemployment, there are powerful reasons to believe that the dynamics of paternal involvement with children was also affected. Taking advantage of the rich time-use dataset, I was able to distinguish among different types of activities fathers do with their children. Here I looked at two different types of activities: those that mainly serve to cover children's basic needs, such as feeding or changing nappies (physical care), and those which mainly cover children's intellectual needs, such as reading or play (developmental

care). Physical care is the most gendered type of care because it is time-inflexible, physically demanding, or, perhaps, because it is the least desirable (although to my knowledge no study has tested the latter statement). Developmental care represents a key resource through which cultural capital can be transmitted from one generation to another and it is therefore a channel of advantage reproduction. Given the qualities of each of these types of activity, I focused the study on the variation of the size of the gender gap in physical care, and the variation of the class gap in developmental care.

Therefore, this chapter contributes to the literature in three key ways. First, it extends previous US research on economic cycles and paternal childcare involvement to Europe. Spain is an excellent case study to examine how childcare time changed during the Great Recession. This is because the labour market in Spain was one of the most affected by the Great Recession.

Second, I add to the literature by considering changes in paternal involvement over time *and* across children's developmental stages. Therefore, this chapter considers gender inequality in time with children from a life course perspective. Even though the dataset does not have a panel structure, by observing changes in time investments by child's age we can approach a life course perspective. This is relevant because within couples, the greatest gender gap -in time with children- is found just after childbirth. Therefore, to study trends by child's age tell us how fathers are changing their contributions at

different stages of the life course, with different implications for children and mothers.

Third, while previous research has revealed a relationship between paternal educational level and time spent with one's children, this is the first study to evaluate how educational differences varied during the recession. It is well known that for the vast majority of the Western countries there is a positive relationship between parental level of education and developmental (or educational) time with children, but very few studies have tracked how such relationship is changing over time (three exceptions are Craig et al., 2014; Altintas, 2015; Dotti-Sani and Treas, 2016). If we consider that educational time with parents is among the most relevant inputs for child development, as commonly argued in the literature (Heckman and Mosso, 2014), we need to know whether the education gap is shrinking or widening. Good news for social equality would be to find the education gap shrank, while the opposite holds for widening.

Finally, previous studies tracking how parents changed their childcare time contributions during the Great Recession (i.e., Berik and Kongar, 2013; Gorsuch, 2016; Knop and Brewster, 2015; Hofferth and Lee, 2015; Bauer and Sonchak, 2017) not only they all focused only in US but also none of them analyzed the change in *mothers*. If fathers increased their time with children during the recession, as found by these studies, but we do not know the change in maternal care time, we cannot really observe the variation of the gender gap. This is a key contribution of this study: that it is able to

track changes in education *and* gender gaps by different types of time and child's ages.

Chapter 3

While writing Chapter 2, I came across many papers highlighting how father-child time is crucial for child development (e.g., Fagan et al., 2014; Lamb, 2010; Pleck, 2010), but no study empirically tested that theoretical assumption using time-diary data connected with children's outcomes. While there is lively debate on the role that mother-child time plays in child development (see Table A1 in Appendix), this literature has neglected the role of the father. Thus, I searched whether there was an existing dataset in the world allowing to connect both time diaries and measures of child development, and that was the Longitudinal Study of Australian Children. By analysing this dataset, the main contribution of this chapter is the empirical testing of the widely held assumption that father-child time matters for children's cognitive development. If that holds to be true, father-child time appears as another resource through which social inequality is perpetuated.

Another contribution of this chapter is due to the fact that my colleagues and I were able to approximate, with some degree of confidence, a child's total time expenditure. This approach constitutes an important step forwards relative to studies that focus on a single type of time, or a subset of such types. This is because the estimated effect of a given input depends on what other inputs are

considered in estimation. Time is a zero-sum game, and increasing allocations to one activity or one guardian necessarily involves reducing allocations to others (Fiorini and Keane, 2014). This line of reasoning opens up complex and unresolved questions about time substitution, and the myriad ways in which substitution could operate.

By taking advantage of the rich dataset, and our approximation of a child's total time expenditure across weekdays and weekends, this chapter contributes to the literature by looking not only at how father-child time relates to child development, but also at which types of activity are the most beneficial. We specially focus, following the literature on mother-child time, on educational, structured and unstructured activities. However, we take one step forward in also controlling for time at school, social activities, sleeping or routine (with father, mother, alone or others). The fact that we were able to control for all activities the child was doing during a day, enabled us to develop what we called a *ranking of productivities* between different activity types.

Finally, chapter 3 contributes to previous literature by considering heterogeneity by level of education in the effect of paternal time on child cognition. This is crucial for social stratification research because if we find that children from upper-class fathers are not only exposed to more educational time but *also* the effect of this time input is greater, we will see a multiplicative effect, leading to stronger "diverging destinies". In other words, we do know that paternal

educational time is unequally distributed among children, but we do not know whether the *impact* of paternal educational time is different across the social strata. This chapter fills this gap in research.

Chapter 4

Like Chapter 2 led me to Chapter 3, the same happened in the transition from Chapter 3 to 4. While reading about the relationship between parental time inputs and child development, I observed that these studies neglected that parental time with children is affected by how parents and children *feel* during that time. While the classic theory of social reproduction and intergenerational transmissions of Pierre Bourdieu or Gary Becker payed great attention to time and money, they did not look at how emotional labour could mediate the transmission of status. Studies following the "social reproduction" tradition have gone deeper in these mechanisms of transmissions and nowadays we have a great explanandum analysing different mechanisms derived from the two main channels of time and money (i.e., social contacts, paying elite schools, paying extracurricular activities, spending more time reading or playing, tailoring specific activities to specific child's developmental stages, holding great aspirations, buying a bigger house or moving to a richer neighbourhood, among others).

Previous studies have tested all these mechanisms but sociological (and economic) literatures rarely consider the role played by parent-child attachment in the intergenerational transmission of abilities. We

might expect that, if upper-class parents have enough resources to put into practice all the above-mentioned strategies to transmit advantage to their children, they should also use these resources to implement rearing or *emotional strategies*. For instance, we do know that self-controlling the externalization of *anger* and calming it down before approach a child, instead of letting it go, is going to be beneficial for the child. But some parents may have more resources to block such release than others (e.g., by paying yoga classes, attending to stress management courses or having more available time to devote to relaxing leisure). Put it in the opposite way, some parents may have, for instance, intermittent employment with precarious conditions that should be correlated with increasing difficulties to be *consistent* in the education of the child. The abilities of parents to suppress or express different rearing practices (e.g., consistency) or emotional attachment (e.g., anger) might be linked with their socioeconomic status. And they can use such emotional labour -either consciously or unconsciously- to transmit advantage to their children. Therefore, micro-rearing practices and parental emotional labour may also be another mechanism through which inequality is reproduced across generations.

Chapter 4 opens a new line of research for studies on intergenerational transmissions of (dis)advantage by looking at the emotional climate at home, and parent-child attachment occurred during that father- or mother-time. Instead of looking at specific activities conducted during the time together, as it is common in the literature, it looks at the emotional intensity and specific parenting

practices occurred during that time. Therefore, this chapter contributes to this literature by arguing that a third channel of transmission, beyond time and money, should be considered: parental emotional investments. If parents transmit their (dis)advantage through a variety of time investments, another key way in the transmission of inequality should be the ability of parents to expressing or suppress their emotions during that time.

This chapter also takes advantage of the richness of LSAC data. Methodologically, it contributes to the literature by controlling for a great number of possible cofounders. It also advances sociological knowledge by using recent developments of dynamic models of intergenerational transmissions, which allows to control for unobserved heterogeneity and reverse causality. Compared to previous research, the main benefit of this study is that it shows how a set of specific emotions and practices vary by class and education, and how these dimensions shape children's skill formation. In doing so, it shows an encompassing model of skill reproduction that has been absent from previous studies in the field. It therefore helps to identify and quantify the causal effect of specific parent-child practices and attachment.

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1.8. Appendix

Table A1: Summary of results from previous research.

Author / Dataset / Country	*Clusters of time*	*Activities included*	*With whom?*	*Main effect*	*Days of the week*
Fiorini and Keane (2014) LSAC - Australia	Educational activities	"Read a story, talked to, sung to"; "Colour, look at book, educational game"; "Taught to do chores or read"	Mother *and* Father	Positive effect	Weekdays
			Other adults than parents	Positive effect	
	General care	"Eating, drinking, being fed"; "Bathe, dress, hair care, health care"; "Do nothing, bored, rest-less"; "Crying, upset"; "Destroy things, create mess"; "Held, cuddled"; "Being reprimanded, corrected"; "Walk for travel or for fun"; "Ride bicycle, trike, etc. travel or fun"; "Travel in pusher or on a bicycle seat"; "Travel in a car, other household vehicle"; "Travel on public transport, ferry, plane"; "Taken places with adult e.g., shopping"	Mother *and* Father	Positive effect	
			Other adults than parents	Positive effect	
	School	School, day care	Any	Positive effect	
	Social activities	"Other exercise—swim, dance, run about"; "Visiting people, special event, party"; "Other play, other activities"	Any	Positive effect	
	Media activities	Watching television, DVD, movie"; "Listening to tapes, CDs, radio, music"; "Use computer"	Any	Positive effect	
	Bed	All time slots between 10 p.m. and 6 a.m.; "Sleeping, napping"; "Awake in bed"	Any	No effect	
	Unknown	"Not sure what child was doing"	Any	No effect	
Hsin and Felfe (2014) PSID - US.	Educational activities	Studying, doing homework, and reading or being read to	Mother	Positive effect	Weekdays and weekends
			Father	No effect	

	Structured activities	Organized leisure activities (e.g., arts and crafts, music and theater), classes for leisure (e.g., music, art, and dance lessons), playing sports.	Mother	Positive effect	
			Father	No effect	
	Unstructured activities	Watching television, listening to music, and unspecified leisure activities (e.g., activities reported as "doing nothing" and "wasted time").	Mother	Negative effect	
			Father	No effect	
	Total	Any	Not specified	No effect	
Milkie et al. (2015) PSID - US.	Accesible time ("Who (else) was there but not directly involved in the activity?")	Any, except grooming, sleeping (Waves 1 and 2) school and work (wave 2).	Mother exclusive (without father) and inclusive (with father)	No effect	Weekdays and weekends
			Father exclusive (without father) and inclusive (with father)	No effect	
			Mother and Father	Positive effect	
	Engaged time ("Who was doing the activity with the child?")	Like above	Mother exclusive & inclusive	No effect	
			Father exclusive & inclusive	No effect	
			Mother and father	Positive effect	

Note: All measures are based in hours per week.

CHAPTER 2:

FATHERS' AND MOTHERS' TIME WITH CHILDREN DURING THE GREAT RECESSION IN SPAIN, 2002-2010

Abstract

Parental time spent with children is a critical determinant for a child's cognitive, educational and socio-emotional development. This study aims to investigate how mothers and fathers reorganised the time they invested in physical and developmental childcare during the Great Recession. I have used two waves of the Spanish Time Use Surveys; the first carried out before the economic crisis (2002-2003), and the second during (2009-2010). Results show that during the Great Recession there had been: (i) an intensification of parenting; (ii) a gender convergence in physical care time, primarily driven by couples with very young children; and (iii), that the gap in developmental time spent between parents with and without a university degree remained unchanged. The decomposition of the results shows that the increase in father-child time was driven by a combination of compositional and behavioural factors, whereas for changes in mother-child time, only behavioural factors applied. The findings reinforce ideas of the rapid intensification of parenting, and a slow movement towards gender convergence in parental time spent with children.

Keywords

Time Use, Parenting, Gender, Social Stratification, Child Development

The crisis consists precisely in the fact that the old is dying and the new cannot be born; in this interregnum a great variety of morbid symptoms appear.

A. Gramsci (1971[1930]: 275[311])

2.1. Introduction

Since the 1970s, fathers and mothers have continued to invest more time in their children across all Western countries (Dotti-Santi and Treas, 2016). The factors driving increased parental time investments have been argued to be both compositional (e.g. increase in maternal employment, low fertility rates) and behavioural (e.g. discourses of intensive parenting, diffusion of gender egalitarian values) (Sayer et al., 2004). However, the rise of parental childcare time in the last forty years has been unequal: parents holding a university degree have increased the time they spend with their children significantly more than those without a university degree (Altintas, 2015), and paternal time spent has increased slightly more than maternal (father-child time departed from a much lower base) (Craig et al., 2014). The unequal trends in parental involvement in childcare have ultimately led to a gender convergence, but a growing disparity in time investments between parents by level of education.

The relevance of this study into how parental time invested in children diverges (or converges), is twofold. Firstly, parental time investment is one of the major determinants of a child's skill

formation - particularly when this time is spent on developmental activities (i.e. reading or play) (Fiorini and Keane, 2014). Secondly, father-child time - particularly when children are very young - is crucial in mitigating the negative impact of childrearing on mothers' wages, and human capital development (Budig and England, 2001). Relatedly, equal childcare responsibilities among genders is key in promoting similar career opportunities for mothers and fathers.

The availability of time-use data series, and the occurrence of the Great Recession, have stimulated a wave of research in recent years on the evolution of paternal and maternal time with children. Evidence shows that during the Great Recession, market work hours declined and parental time with children significantly increased (Aguiar, Hurst and Karabarbounis, 2014). Several studies have found that fathers invested more time in physical care (i.e., feeding, bathing) during the recession (Knop and Brewster, 2015; Hofferth and Lee, 2015). However, these studies did not look at mother-child time spent, and thus it remained empirically unclear whether the gender gap in physical care varied during the recession. In addition, no study has looked at whether the gap in developmental care time between parents with and without a university degree changed in the context of severe economic recession. This study fills this gap in research.

This article contributes to the pre-existing literature on parent-child time investments during recessionary periods in three key ways. Firstly, it looks at both fathers and mothers, while disaggregating by types of care (physical and developmental). This is important because

it allows us to observe whether, during the Great Recession, gender and education gaps increased, decreased, or persisted. If parental time with children is a contributing factor in gender and education inequality, it is critical to study if and how these gaps are narrowing or expanding. Secondly, this study specifically looks at the change in parental time engaged in physical childcare across stages of child development. If mothers' career prospects are particularly affected by fathers' involvement in physical care during the first few years after childbirth, it is especially relevant to look at trends by children's ages. Finally, this study draws from high quality time-use data from a case study in Spain, where the Great Recession was particularly severe. This contrasts with previous studies analysing data from the US or Australia, where the socio-economic effects of Great Recession were less severe or negligible.

The aim of this article, therefore, is to investigate how mothers and fathers reorganised the time they invested in physical and developmental care with children during the Great Recession. To accomplish this, I use two waves from the Spanish Time Use Survey, the first carried out before the financial crisis (2002-2003), and the second during (2009-2010).

2.2. Background

In recent decades, there has been a significant shift towards an intensification of parenting (Bianchi, 2011; Craig et al., 2014). This may be somewhat unexpected, as the increase in parental time with

children has also paralleled an increase in mothers' time spent in the labour market, as well as a growing divorce rate. However, other compositional changes occurring over previous decades might help to explain why parental time spent on childcare has risen. Higher levels of education, along with selection into parenthood - determined by birth control - appeared to account for most of the compositional changes that occurred during the 1980s and 90s (Sayer et al., 2004).

During the 2000s, the Great Recession arrived, also affecting the composition of parents by employment status. The number of unemployed parents increased. Unemployment is positively correlated with parental time spent with children (Aguiar et al., 2014; Bauer and Sonchak, 2017), which might lead to the intensification of parenting. Nevertheless, other behavioural changes have also contributed to the increase in, and content of, parent-child time.

One commonly accepted explanation for behavioural shifts in parenting, is the changing conception of what means to be a "good parent". For mothers, the ideology of "intensive mothering" (Hays, 1996) reinforces maternal time as necessary to the cognitive and socio-emotional development of children. For fathers, the unprecedented number of women in the labour market during the second half of the twentieth century led to a modification of the conception of fatherhood (Barbeta and Cano, 2017). The notion of a "good father" is no longer only about economic provision, but also involvement in childcare and active engagement in the day-to-day care of their children (Jurado and Gonzalez, 2015).

The arrival of the Great Recession might also have altered behavioural factors. In an increasingly unequal and competitive world (Piketty, 2014), the idea of a good parent might shift towards the intensification of childcare practices in the hope of promoting the best possible educational and labour market career for children (Ramey and Ramey, 2010; Jæger and Breen, 2015), particularly during the first years (Craig, 2007), as these are especially sensitive and critical developmental periods (Brown, 2005).

Childcare, however, is a multidimensional category, and each type has different characteristics and consequences for both children and parents. In the following sections, I review the literature on dimensions of childcare, as well as the Spanish context, to develop testable hypotheses.

2.1.1. Gendered division of physical care

In recent years, studies analysing time-use data have begun to distinguish not only between housework and childcare, but also between different types of childcare. This differentiation sheds light on the understanding of gender and education divergence in parental time with children. The two key types are physical and developmental care. Physical care was conceptualised by Bittman et al. (2004: 142) as "high contact childcare: Face-to-face parent–child interaction that revolves around physical care of children" (e. g. feeding, bathing or dressing). Physical care tends to a child's basic needs, as well as the child's security and well-being. It is time-

inflexible, physically demanding, and concentrated in early infancy. Given these characteristics, it is not surprising that the partner who dedicates more time to physical care sees her or his career prospects negatively affected (Waldfogel, 1997). Since there has been data on this available, mothers have consistently held the main responsibility for physical care (Sullivan et al., 2018 for a review). Despite a trend towards paternal involvement in childcare (Craig et al., 2014), there is still a remarkable gender gap (Raley et al., 2012). For example, Craig (2006) found that, on average, mothers spend triple the amount of time performing physical care than fathers do, and this gap is especially pronounced in the first three years after childbirth (Craig, 2007).

These first years are important for both child development and gender equality. In infancy, the effects of parental time on children's skills development is stronger (Heckman and Mosso, 2014), due to greater brain plasticity and malleability (Brown, 2005). It is also a key time for couples, because if one parent is less involved during the years when the physical care work is at its most demanding, the main caregiver will be more likely to see a decline in future wages (Waldfogel, 1997).

Three main theories serve to explain why gender inequality remains in unpaid work in general, and physical care in particular. First, the relative resources theory (Lundberg and Pollak, 1996) argues that parents bargain to avoid routine and physically demanding unpaid work. Because men have a higher income on average, they have greater power when bargaining over less desirable and unpaid tasks

(e.g. housework or physical care). Second, the time availability theory (Coverman, 1985) contends that gender variations in childcare time are explained by parents' employment statuses. The more time the mother spends in the labour market, the more time the father will spend on physical care. Similarly, the more time the father spends in paid work, the less physical care he will be able to provide. This theory leads to the prediction that the most involved fathers will be those that are not working. This prediction, however, is challenged by the doing gender theory (West and Zimmerman, 1987), which claims that unemployed fathers do not increase their time in physical care activities compared to those that are employed. The idea, later reframed as "gender deviance neutralization", is that unemployed men face social stigma for deviating from the norm, and therefore aim to protect their masculinity by not doing activities that are considered feminine tasks of physical childcare (Brines, 1994).

These competing theories have stimulated a considerable amount of research into how couples decide and assign unpaid work (e.g. Wight, Raley and Bianchi, 2008; Bittman et al., 2003, Yu and Xie, 2012; Gupta, 2007). A recent and extensive review of this strand of research concluded that the gender deviance neutralization hypothesis could be misleading, as it may instead be that a woman's social position matters most in determining the dedication of unpaid work, rather than her position within the relationship (Sullivan, 2011, but see also England, 2011; Risman, 2011). Importantly, most of these studies have focused on housework, excluding the study of childcare and its different dimensions. As England (2011: 25) puts it, "another large pattern ignored until recently in scholarship on gender and household

work is how time spent in child care varies by gender, by socioeconomic status, and over time". In addition, relevant scholarship has highlighted the importance of context (Evertsson and Nermo, 2004; Aassve et al., 2014), suggesting that time availability and relative resources matter particularly in countries with relatively high levels of gender egalitarianism.

In the context of the Great Recession, one clear mechanism through which parents could increase time spent on physical care is via time availability due to changes in employment statuses, and the reallocation of time from work to household production (e.g. childcare). In addition, increased levels of paternal unemployment (above maternal) in Spain (De la Rica and Rebollo, 2017) might result in a reduction in men's bargaining power due to lower income. Four studies have approached this question, all using either the American Heritage Time Use Surveys (Gorsuch, 2016; Hofferth and Lee, 2015; Bauer and Sonchak, 2017) or the National Survey of Family Growth (Knop and Brewster, 2015). Each conclude that there was a significant increase in fathers' physical care time during the Great Recession. However, there is a lack of studies from outside the US, and of research on maternal time investments during this period. It could be that mother-child physical time also increased, meaning the gender gap remained the same, or potentially even increased. This study expands on this body of research with data from a European country, and by looking at mother-child time. In addition, this study pays particular attention to parents' changing contributions to physical care dependent on stages of child development.

2.2.2. Education divide in developmental care

Developmental time with children is regarded by parents as more enjoyable than physical care, and also as an investment strategy (Doepke and Ziliboti, 2017; Ramey and Ramey, 2010). Parents spend developmental time with their children in the hope that this will promote the development of skills and lead to future success in education and the labour market (Jæger and Breen, 2015). The sense by which parents may see developmental care as an investment is also rooted in the narrative of intensive parenthood; a discourse that emphasises parental responsibility and control. This cultural narrative suggests that "high-quality time" maximises a child's brain development through ample and appropriate stimulation in early years (Wall, 2010). However, the extent to which parents adhere to the narrative of intensive parenting may differ according to level of education, and socio-economic status.

Lareau's ethnography (2011) suggests that middle and upper class parents adhere more strictly to an ideal of intensive parenting, which she calls the "concerted cultivation" style of parenting. Parents who develop a concerted cultivation strategy focus on cognitively stimulating activities that promote enhanced child development. On the contrary, less educated parents tend to develop a "natural growth" style of parenting. Natural growth parenting does not involve a constant focus on educational activities (i.e. developmental care) or close monitoring of a child's academic performance. It affords

children more autonomy, liberating them from the persistent parental scrutiny of "intensive parenthood".

Only two studies have looked at how the education gap in developmental time has changed over time, and these studies find mixed results. Altintas (2016), using American Time Use data, concluded that the education gap in developmental care had widened substantially in the preceding forty years. On the contrary, Craig et al. (2014), using Australian Time Use data, found that the effect of education on parent-child developmental time had diminished in recent decades, and that the linear association between education and time spent with children saw a reversal in 2006.

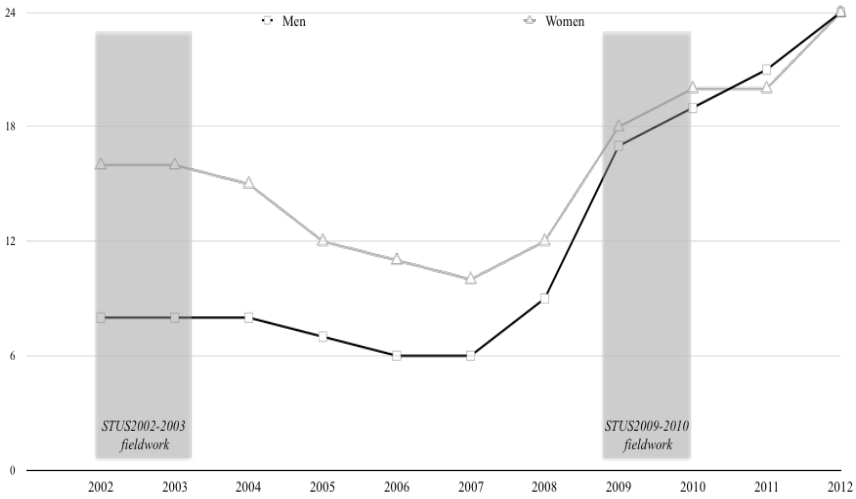
This study contributes to the literature analysing changes in the education gap in developmental time in a context characterized by increasing income inequality, substantial unemployment for men, and severe economic recession.

2.3. The Spanish case

Spain affords us an excellent case by which to study changes in parental time spent with children during the Great Recession. Parental childcare investments are endogenous to parental labour market involvement through a bidirectional relation between paid work and family time (Hook, 2012), and Spain experienced an especially severe economic recession, within which the construction sector collapsed, dragging down the economy as a whole. There was

a significant increase in unemployment: male unemployment rose from 8.1% in 2002, to 19.2% in 2010. For fathers between the ages of 25 and 55 with at least one child at home, the unemployment rate almost trebled, from 5% in 2002 to 14% in 2010 (INE, 2012). For mothers, unemployment also increased, from 9% to 15% within the same period. However, the dynamics of the increase differed by gender: while the increase in male unemployment was primarily a consequence of the transition from employment to unemployment, the increase in female unemployment was the consequence of both the activation of women that were out of the labour market and the transition from employment to unemployment (De la Rica and Rebollo, 2017). The increase in unemployment was especially pronounced among those with lower levels of education. At the end of 2010, unemployment levels among fathers between 25 and 55 years of age was 27.6% for those with primary education, 19.3% for those with secondary education, and 11.2% for those with university degrees. For mothers, these figures represented 26.8%, 19.7% and 10.8% respectively (INE, 2012). Consequently, male and female unemployment reached similar rates for the first time in history (see Figure 1). Similarly, during the economic crisis, Spain's levels of social inequality increased, from a Gini coefficient of 31 in 2002, to 36 in 2012 (World Bank, 2017).

Figure 1: Unemployment rates by gender, ages 25-55 (Spain, 2002-2010).



Source: Encuesta de Población Activa (Spanish Institute of Statistics, 2017 [for details, see www.ine.es]).

In 2007, the year the Great Recession started, a new paternity leave regulation was introduced. The quota for paternal leave within the 15-week parental leave period increased from two days, to two weeks, fully paid, and reserved exclusively for fathers (non-transferable to mothers). The aim of this new paternity leave was to promote gender equality at home and at work, as well as to strengthen the father-child contact. The vast majority of fathers have taken this leave since its introduction (~85% [INE, 2017]). Farré and González (2017) found that the take-up of parental leave by fathers increased by 400%, from 0.2-0.3% to 0.9-1.3%. In addition, they found this reform had the effect of increasing female employment shortly after childbirth by 11%. Similar results were found in other countries, such as Germany (Bunning, 2015) and Sweden (Ekberg et al., 2013).

In terms of family and child policy, the level of per-capita expenditure on these policies before the financial crisis (year 2006) was 54.8% of the European Union's [UE-15] average. This figure decreased by 2011 due to austerity measures enforced during the economic crisis, down to 51.3% of the EU-15 average (Leon and Pavolini, 2014). Within family and child policies, one is of special interest here: children's education. Spain has a system of universal education for children aged 3 upward. Below that age (0-3), 40% of children were institutionalized in 2003, and 36% in 2010 (EU-SILC database). Spain is classified among countries with low childcare costs (below 10% of average wages) (OECD, 2012). However, the cost of childcare varies greatly depending on region, (Comunidades Autónomas) and family income. In general, costs range between 0 EUR for low-income families in specific regions, to a maximum of 450 EUR per child per month.

Lastly, Spain is a country relatively advanced in terms of pro-gender egalitarian views when compared with other Western countries (Dorius and Alwin, 2010). Data from the International Social Survey Program (ISSP) suggests a rapid rise in gender egalitarian values during the period analysed. Between 2002 and 2011, the percentage of people that agreed with the statement: "men should earn money and women take care of the house and family" dropped from 24.3%, to 18%, suggesting a marked trend towards more gender egalitarian values, especially among younger cohorts (Castro-Martín and Seiz, 2014).

2.4. Hypotheses

Contemporary ideologies of parenting emphasize investments of intensive time with children. However, this has not always been the case. Between the 1950s and 1970s, when social inequality reached its lowest point to date (Piketty, 2014), parents in Western countries spent one quarter of the parent-child time they would spend several decades later (Sayer et al., 2004). This period also represented a historical moment; the educational system and welfare states were expanding, and social mobility became more fluid. As Doepke and Ziliboti argue (2017: 1333), "in those days, the returns to pushing children to study hard were low relative to the value of granting them freedom and independence". Ever since, inequality has increased, along with parental time spent with children. Doepke and Ziliboti (2017) argue that increasing levels of inequality should lead to more intensive parenting. The less social mobility there is within society, the higher the returns of education, which in turn sparks more intensive parental time investments aimed at boosting the child's drive for achievement in an increasingly unequal and competitive environment. Ramey and Ramey (2010) gave empirical support to this idea. They argue that competition for college admission should partially explain the growing trend of intensive parenting. If, during the Great Recession, levels of inequality rose - particularly in countries like Spain - we might expect that parents became more concerned with enhancing their children's future chances in an ever more demanding and unstable labour market. Meanwhile, working wages decreased as unemployment rose. In line with this, perceived

or real changes in a family's economic stability would impact parents' expenditure on childcare; opting to assume this themselves rather than pay someone else. Following these arguments,

> Hypothesis 1.— *I predict that, during the Great Recession, the amount of time parents spent on physical and developmental care will have increased.*

If this hypothesis stands, I ask whether the intensification of parenting has also brought about a gender equalization in the performance of physical care through a greater increase in father-child time than that of mother-child time.

The second hypothesis, therefore, refers to the variation in the gap between paternal and maternal time spent on physical childcare during the Great Recession. The time availability theory contends that gender variations in time devoted to physical childcare are explained primarily by the employment status of parents. During the Great Recession in Spain, there was an increase in mothers' market work hours, and a decrease in fathers' market work hours (Domínguez, 2015). This may have constrained mothers' available time, but also increased their bargaining power in negotiations of physical childcare (Esping-Andersen, 2009; Bloemen, 2008). This, together with the fact that nearly one fifth of men were unemployed in Spain by 2010 (and thus had more available time), leads me to the following prediction:

> Hypothesis 2a.— *During the Great Recession, there will have been a greater increase in time invested in physical*

childcare by fathers, compared with that of mothers. Therefore, the gender gap will have narrowed.

Furthermore, couples tend to move toward "traditionalization" of gender roles during the transition to parenthood (Craig and Mullan, 2010). This is largely due to an increase in the mother's dedication to childcare. When children are older, parental time invested at work and at home tend towards a gender convergence again (Domínguez, 2015). There are several convincing reasons to expect that the narrowing of the gender gap is driven by fathers within couples with very young children. These are the years where the gap is greater, and thus fathers have more opportunity to increase their involvement. If younger parents (and especially men) were more affected by unemployment and income loss during the Great Recession, we might also expect that the increase in father-child time was particularly salient in these couples. The extension of paternity leave within the child's first year might also play a role, either directly or indirectly (i.e. via endogeneity between social policy advancements toward gender equality and progressive attitudes and behaviours). Therefore,

Hypothesis 2b.— *The reduction of the gender gap in physical care will have been driven by the increase in father-child time during the early stages of childhood.*

The third hypothesis concerns the variation in the education gap in developmental care during the recession. In the case of Spain, an education gap in developmental care has already been noted (Gracia,

2014). During recessionary periods, when inequality rises, parents might decide to increase time investments in developmental childcare. This increase, however, may be unequally effective for parents depending on socio-economic position. It could be that, during the recession, parents with access to higher education had greater resources and could invest more in developmental time with their children. This is in line with recent advances in demography (McLanahan, 2004), sociology (Esping-Andersen, 2009) and family economics (Doepke and Ziliboti, 2017), which find a strong link between increasing levels of income inequality and diverging parenting behaviour, especially manifested in time investments in developmental activities (Ramey and Ramey, 2010). Following these strands of research, if, during the Great Recession, the level of inequality in Spain markedly increased, we might expect that:

> Hypothesis 3a. — *During the Great Recession, parents with university degrees will have significantly increased time invested in developmental activities - more so than those without a university degree. Therefore, the education gap in developmental care will have grown.*

Nevertheless, during the Great Recession, parents with lower levels of education experienced higher rates of unemployment, and therefore had more time available. Meanwhile, parents with higher levels of education faced lower rates of unemployment, as well as increased workloads and job uncertainty (De la Rica and Rebollo, 2017). Therefore, during the recession the willingness to adopt intensive parenting practices among higher educated parents was

somewhat constrained, whereas lower educated parents had more time available to adopt this intensive approach. These mechanisms lead to the following null hypothesis:

> Hypothesis 3b.— *During the Great Recession there was a similarly significant increase in parental developmental childcare time for both lower and higher educated parents. Therefore, the education gap in developmental time will have remained unchanged.*

2.5. Data and methods

Data was drawn from two waves of Spanish Time Use Surveys (STUS) conducted to date; the first carried out before the recession (2002-2003), and the second during (2009-2010). The first wave included a sample of 46,774 individuals from 20,603 households. The second wave was itself affected by the Great Recession and, due to lack of funding, the sample size was reduced to 19,295 individuals from 9,541 households. However, the sample size reduction does not hamper comparability, as both waves use complex probabilistic methods, and both are representative of time use of Spanish residents aged 10 and over. For further details on the study methodology, see INE (2011).

STUS include socio-demographic information at an individual and household level, and time diaries for each member of the household aged 10 and over. Individuals record details of most activities performed over 24 hours, documented in 144 intervals of 10-minutes,

twice a week (on one specified weekday, and again on a specified weekend day). These surveys have a long tradition in sociological research (Robinson, 1985), and although they are not completely free of social desirability bias, measurements collected using these surveys are preferable to the alternative stylised time-use questionnaires (Yee-Kan, 2008).

The analytical sample consists of married or cohabiting heterosexual couples with at least one child under the age of 13 living at home. Therefore, the unit of analysis is couples who both filled out the time diary. I have focussed on children under 13 years of age because this study is concerned with high-intensity care, and above age 13 children are typically engaged in less intense interactions with parents (Cano, 2018). During the early stages of a child's life, parental developmental time input has an especially significant impact on skill formation (Fiorini and Keane, 2014). The older the child is, the less time he or she spends with parents, and the less effect parental time has on the child's cognitive and socio-emotional development. Significantly, gender imbalance in physical childcare time is also greater during the first years of a child's life (Craig and Mullan, 2011). In addition, at age 12-13, Spanish children transition from primary to secondary school. I exclude cases with information missing on: education (n=1,053), type of the day (n=63), partnership status (n=46) and domestic help (n=6). The final sample includes 3,804 couples in 2002 and 1,762 couples in 2010. Table 1 shows the descriptive statistics of the sample

Table 1. Descriptive statistics.

	2002-2003				2009-2010			
	Fathers		Mothers		Fathers		Mothers	
	Mean/%	*SD*	*Mean/%*	*SD*	*Mean/%*	*SD*	*Mean/%*	*SD*
Employment status								
Full time	89%	0.33	42%	0.49	79%	0.38	43%	0.49
Part time	1%	0.07	6%	0.24	2%	0.15	19%	0.39
Not employed	9%	0.22	51%	0.50	18%	0.36	39%	0.49
Level of education								
University degree	27%	0.44	27%	0.45	34%	0.48	38%	5.90
Individual controls								
Age	39.37	5.93	37.20	5.66	40.30	6.37	38.22	5.90
Weekday diary	66%	0.48	65%	0.48	61%	0.49	61%	0.49
Ordinary day	81%	0.39	82%	0.38	72%	0.43	73%	0.44

Household controls	*Mean/%*	*SD*	*Mean/%*	*SD*
Age youngest child (in years)	5.33	3.76	5.00	3.77
Two children	51%	0.50	48%	0.50
Three or more children	11%	0.31	10%	0.30
Other adults living at home	21%	0.40	18%	0.37
Domestic help	27%	0.45	12%	0.32
Cohabitant couple	20%	0.48	18%	0.49

Source: Spanish Time Use Surveys (2002-2003 and 2009-2010).
Note: N=3,804 couples in 2002-2003 and 1,762 couples in 2009-2010.

Table 1 illustrates a remarkable change across the two survey waves. Differences reflect both the economic recession in Spain, and demographic changes. In 2009-2010 employment statuses varied dramatically, particularly for fathers. The percentage of fathers in full-time employment fell from 89% in 2002, to 79% in 2010, and the rate of fathers not working increased from 9% in 2002, to 19% in 2010, mainly driven by an increase in unemployed fathers. Another recession-related change is the decrease in the number of households employing domestic help, from 27% in 2002 to only 12% in 2010. It is reasonable to assume that during recessionary periods, households utilize their own capacity for labour that was previously acquired in the market, such as domestic work (Greenwood and Hercowitz, 1991). The sample also reflects the major demographic shifts that were taking place in Spanish society: higher rates of mothers holding university degrees, and a decline in - and postponement of - childbearing (Esping-Andersen et al., 2013).

2.5.1. Dependent variables: Physical and developmental childcare time

There are two dependent variables. First, physical childcare, which is a continuous variable that includes the total amount of time a parent spends on activities related to the physical development of the child (e. g. bathing, feeding, changing nappies), and second, developmental childcare. This continuous variable accounts for the total amount of time a parent spends on cognitively stimulating

activities (e. g. reading, educational play). These two variables represent direct parent-child interactions, and their survey codes are defined thus (for specific activities included in each variable, see Table A1 in appendix). I have converted these two measures of care into temporal quantities by multiplying the 144 segments marked with any of the Table A1 survey codes, by 10. The metric of the two dependent variables is minutes per day. I have selected these two variables because they represent high-intensity face-to-face parent-child interactions. The activities included in each variable, and the metric, follow previous studies in the field (e. g. Gracia, 2014; Altintas, 2015; Craig et al., 2014).

2.5.2. Key explanatory variables: Year of the survey, employment status and level of education

The explanatory variables of interest are year of survey, employment status, and level of education. Year of survey is the primary independent variable and serves to track the association between the recessionary period and paternal and maternal time spent on physical and developmental care. I merge the two survey waves to create a dummy variable identifying the wave conducted before (0=2002-2003, reference category), and during (1=2009-2010) the recession. Employment status is a set of three dummy variables (full-time [reference category], part-time and not working). "Not working" includes both unemployed and inactive persons. I have merged the two categories into "not working" due to the low number of cases when considering them separately. Educational attainment is one

dummy variable (0=Below university degree [reference category]; 1=University degree).

2.5.3. Control variables

Control variables are those regarded as the most important factors affecting parental involvement in childcare. At the individual level, the controls are: (i) age and age squared (continuous); (ii) day of the week (dummy [1=weekday]) - because in Spain, as a result of the long working day, parental childcare is concentrated to weekends; and (iii) a dummy variable capturing whether the time diary was completed during an ordinary day. At the household level, I control for: (i) age of children (categorical [1=youngest child 0-4; 2=youngest child 5-12), because childcare needs vary depending on the age of the child (Kalil et al., 2012); (ii) number of children at home (two dummy variables: [1=two children] and [1=three or more children]), as the number of children is related to time spent on childcare, and the total load of care work required; (iii) adults other than parents at home (dummy), given that when there are other relatives at home they usually contribute to childcare, thereby reducing fathers' and mothers' involvement (Meil and Rogero-García, 2015). This variable captures (a) grandparents living at home, (b) other relatives, (c) older (adult) siblings. The final control variables are (iv) a dummy capturing whether the couple is cohabiting or married, because cohabitation has been shown to be positively correlated with childcare time (Kalenkonski et al., 2005); (v) partner's employment status: as noted, this is a key variable

explaining parental time involvement (Craig, 2007); and, (vi) domestic help (dummy), because when families outsource domestic labour they usually do so for housework in order to allocate more time to childcare (Bianchi, 2011).

2.5.4. Analytical strategy

The empirical analyses follow a three-step process. As noted, previous evidence suggests that time spent on physical care is especially dependent on parental employment status (Craig, 2007), and developmental time on level of education (Altintas, 2015). Therefore, the first part of the analysis shows descriptive means of time spent in physical care by employment status, and time spent in developmental care by level of education before and during the recession. T-tests are used to identify significant variations in the 2009-2010 survey.

The second part of the analysis runs pooled Ordinary Least Squared (OLS) regressions similar to those used in previous studies (e. g. Craig et al., 2004; Altintas, 2015). In testing hypotheses 1 and 2a, OLS models regress physical and developmental care separately, on "year of survey", and controls. To test hypothesis 3, I expand the previous models by interacting "year of survey" and level of education. Because the main mechanisms through which the Great Recession might be associated with variations in parental care include changes in time availability and relative resources, the latter models also include interaction between year of survey, as well as (i)

employment status and (ii) partner's level of education. Partner's level of education is included as an absolute measure, as suggested by Gupta (2007). To test hypothesis 2b, I replicate similar OLS models to those used to test H1 and 2b, splitting the sample into five different subsamples depending on age of the child (less than 1 year, 1, 2, 3, 4, and 5 or more years of age). All models are run separately for fathers and mothers because the effects of the covariate variables may differ by gender.

Finally, to further investigate wave differences, I conduct a decomposition analysis (Kitagawa, 1955; Oaxaca, 1973). This analysis is inspired by and follows the same lines as previous studies on changes in parental time with children (Sandberg and Hofferth, 2001; Sayer et al., 2004). The main advantage of Oaxaca decomposition for this study is that allows to partition of change in the two dependent variables (before and during the economic recession) into two components. The first component is "explained", i.e., the change in trend as a result of variations in the studied population; the compositional change. The second component is "unexplained", i.e., the variation in trend that does not relate to changes in the composition of the sample; the behavioural change.

2.6. Results

2.6.1. Descriptive results

Table 2 illustrates the descriptive means of paternal and maternal time spent on physical childcare by employment status before and during the recession. Significant differences across the survey years are shown in the "difference" column. Focusing on the difference column, all parents, regardless of their employment status, increased their time spent on physical childcare during the Great Recession. It is possible that this reflects a heightened adherence to gender egalitarianism and intensive parenting ideals by fathers and mothers in 2010. Among all categories, the largest increase was among non-employed fathers (~23 more minutes per day), suggesting the dramatic increase in the size of this group, and its changing composition. In 2010, fathers who were not working were slightly younger and more educated; both of which are also variables that correlate with parental care. Nonetheless, mothers and fathers in full-time employment also spent significantly more time on physical childcare during the recession (10 more daily minutes each). It is possible, as previous research argues, that "it may not require a job loss to change; change in hours or job insecurity may also lead to changes in the division of labor at home" (Hofferth and Lee, 2015: 320).

Table 2: Fathers' and Mothers' time in physical childcare by employment status *(minutes per day)*

	Fathers					Mothers				
	Pre-recession		Recession			Pre-recession		Recession		
	Mean	*SD*	*Mean*	*SD*	Difference	*Mean*	*SD*	*Mean*	*SD*	Difference
Employment status										
Full Time	24.08	48.32	34.52	58.21	10.43***	60.36	75.45	71.26	97.34	10.90**
Part time	35.00	63.45	34.19	50.86	0.81	69.87	66.95	79.97	82.30	10.09
Not employed	33.21	65.68	55.99	90.33	22.78**	93.98	99.83	103.01	104.12	9.02*
N	3,804		1,762			3,804		1,762		

Source: Spanish Time Use Surveys (2002-2003 and 2009-2010).
Notes: T-tests are used to identify significant variation across time.
Significance levels: *$p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3 shows the descriptive means of paternal and maternal time in developmental childcare by level of education. Significant differences before and during the Great Recession are also shown in the "difference" column. During the recession, less educated mothers increased their developmental childcare time by 8.6 minutes per day, while fathers did so by 5.6 daily minutes. Parents holding a university degree increased their developmental time by ~7.5 daily minutes, and this increase was similar for fathers and mothers. Interestingly, as we can observe from the table, there is no gender gap in developmental childcare time, while for physical care, mothers spent more than the double the time of fathers. This falls in line with previous research demonstrating that gender differences are critical in physical care, but not so in developmental care (Sayer et al., 2004).

Table 3: Fathers' and mothers' time in developmental childcare by level of education

	Fathers					Mothers				
	Pre-recession		Recession			Pre-recession		Recession		
	Mean	*SD*	*Mean*	*SD*	Difference	*Mean*	*SD*	*Mean*	*SD*	Diff.
Educational level										
University degree	15.62	35.61	21.22	43.65	7.60**	17.31	34.53	25.62	45.01	7.37**
Secondary or lower	22.50	42.84	30.11	53.59	5.60***	26.43	42.30	33.81	47.87	8.30***
N	3,804		1,762			3,804		1,762		

Source: Spanish Time Use Surveys
Notes: T-tests are used to identify significant variation across time.
Significance levels: ** $p < 0.01$, *** $p < 0.001$.

2.6.2. Toward a more *intensive parenting?*

Table 4 shows the results of the regression models estimating time (expressed as minutes per day) in physical and developmental care spent by fathers and mothers. Panel A shows time with children regressed on year of survey and covariates. Panel B extends Panel A by including interactions between year of survey and employment status, and level of education of the parent and his or her partner.

The key variable capturing the change in parental care during the Great Recession (year of survey) in Panel A of Table 4 shows a substantial significant increase for both fathers and mothers in physical and developmental care time, net of control variables. Totalling the minutes spent on both types of care, there was an overall increase of 14 daily minutes, and this increase was similar for both fathers and mothers. This means that during the recession, there was a significant and substantial increase in parental time spent with children. Spanish children received ~3 hours more per week of face-to-face engaged parental care, compared with the pre-recession period (2002-2003). Control variables (shown in Table A2) are generally consistent with expectations and will not be further discussed here.

Table 4: OLS regressions – Fathers' and mothers' time in physical and developmental care (minutes per day).

	Physical time				Developmental time			
	Father		Mother		Father		Mother	
	β	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*
Panel A								
Year of survey (ref. cat.: Year 2002-2003)								
Survey year 2009-2010	8.04***	1.56	4.01**	1.24	6.52**	2.46	9.28***	1.22
Controls	Yes		Yes		Yes		Yes	
Constant	88.3***	24.6	191.8***	39.4	11.0	19.8	-38.6*	19.5
Adjusted R^2	0.18		0.31		0.07		0.05	
N	5,566		5,566		5,566		5,566	
Panel B								
Year of survey (ref. cat.: Year 2002-2003)								
Survey year 2009-2010	7.99***	2.12	0.66	4.59	4.36*	1.71	9.92***	2.27
Employment status (ref. cat.: Full time work)								
Part time	12.99	11.13	-2.43	5.68	1.50	8.98	1.50	2.81
Not working	14.15***	3.25	27.53***	2.90	8.13**	2.62	7.71***	1.44
Education								
University degree	8.33***	2.03	14.32***	3.37	3.41*	1.63	7.28***	1.67
Partner's information								
Partner has University degree	10.13***	2.07	1.64	3.28	4.57**	1.67	3.22*	1.62
Interactions								
Year 2009-2010*Part time	-15.65	13.57	4.89	7.78	2.79	10.9	1.95	3.85
Year 2009-2010*Not workin	7.34†	4.69	7.19	5.26	-4.93	3.79	-0.12	2.60
Year 2009-2010*University degree	-4.65	3.40	5.88	5.53	3.39	2.75	-1.00	2.73
Year 2009-2010*Partner has University degree	2.31	3.34	-0.99	5.49	-2.85	2.70	-0.67	2.72
Controls	Yes		Yes		Yes		Yes	
Constant	88.3***	24.6	195.1***	39.5	11.2	19.5	-37.5*	19.5
Adjusted R^2	0.18		0.31		0.07		0.05	
N	5,566		5,566		5,566		5,566	

Source: Spanish Time Use Surveys (2002-2003 and 2009-2010).
Note: Models in Panel B control for age, age squared, age of the youngest child in the household, number of children, partner's employment status, domestic help, partnership status, type of the day, day of the week, and whether other people are living at home. Models in Panel A include similar controls than Panel B and employment status, level of education, partner's level of education. Full set of coefficients are shown in Table A2. Significance levels: † < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001.

2.6.3. Physical care

When looking only at physical care, we can observe that both fathers and mothers significantly increased their time in this type of care. The increase in father-child time was double (8.04 minutes daily, $p<0.001$) that of the increase in mother-child time (4.01, $p<0.01$). To observe the changing associations between employment status and physical care during the recession, I interact these variables with year of survey (Panel B, Table 4). None of the interactions were significant, with the exception of fathers not in work (only at $p<0.1$), which suggests that fathers not working spent significantly more time engaged in physical childcare during the Great Recession than previously. This is in line with predictions, as this group greatly increased in size, and became more diverse, during the recession. The association between level of education and fathers' time was reversed, although not significantly. The interaction between partner's level of education and year of survey may capture changes in couple power dynamics during the recession. Fathers with degree-holding partners spent 2.3 more daily minutes engaged in physical care during the recession than before. The opposite (-1 daily minute) is found for mothers. This might reflect a slight increase in maternal bargaining power (or decrease in paternal bargaining power). These coefficients, however, are substantially trivial and not statistically significant.

2.6.4. Trend in fathers' and mothers' time in physical care across children's developmental stages

Table 5 shows the results of ten OLS models regressing physical care time for fathers and mothers disaggregated by child's age. For fathers, the statistically most substantial and significant increase in physical care during the recessionary period was within households with children below 1 year old (20 daily minutes increase; $p<0.01$) followed by couples with children between 1 and 2 years of age (16 daily minutes; $p<0.05$). Mothers with children within these age ranges, however, did not increase time spent on physical care during the Great Recession. This result shows a remarkable gender convergence in physical care for couples with very young children. In these couples, the gap reduced by ~2 hours per week in only 7 years. Mothers in couples with older children (5+ years) significantly increased their investment in physical care time (by 8.31 daily minutes).

Table 5: OLS regressions – Fathers' and mothers' time in physical care in couples with children of different ages.

	Child < 1 years old				Child 1 - 2 years old				Child 2 - 3 years old				Child 3 - 4 years old				Child 5 + years old			
	Father		Mother		Father		Mother		Father		Mother		Father		Mother		Father		Mother	
	β	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*
Physical care																				
Recession	20.20**	7.56	0.10	12.25	15.50*	6.64	-0.34	8.76	4.84	5.43	-3.49	7.07	8.65†	4.70	0.74	6.35	2.88*	1.18	8.31***	1.91
Adjusted R^2	0.10		0.06		0.10		0.07		0.09		0.08		0.04		0.05		0.02		0.03	
$N^{couples}$	674				700				678				712				2,802			

Source: Spanish Time Use Surveys.
Notes: The models are based on the age of the youngest child at home and they are run separately for fathers' time and for mothers' time. Models control for employment status, partner's employment status, level of education, partner's level of education, age, age squared, age of the youngest child in the household, number of children, domestic help, partnership status, type of the day and day of the week in which the diary was filled out and whether other people are living at home. Significance levels: † < 0.1, * $p < 0.05$, ** $p < 0.01$, *** $p < 0$

2.6.5. Developmental care

Parental time in developmental care also rose during the Great Recession. Fathers increased their time spent by 4 daily minutes ($p<0.01$), while mothers increased theirs by 9.3 daily minutes ($p<0.001$). The main variable of interest to test hypothesis 3 (i.e. interaction between recession and possession of a university degree) shows a small increase, in absolute terms, for higher educated parents during the recession (less than 2 daily minutes), and is not significantly associated with time spent engaged in developmental care, which demonstrates that the education gap in parental developmental care time did not widen during the economic recession, for fathers or for mothers.

2.6.6. Decomposition of trends

Keeping the results reported so far in mind, it should be noted that the increase in parent-child time might be the result of changes in the composition of the sample, and/or changes in the behaviour of the population. To disentangle this question, the study runs an Oaxaca decomposition analysis. This analysis allows us to observe which part of the change in parental care time is driven compositionally, and which part is driven by behavioural changes. Compositionally - although there are other minor changes - the key variations between the two samples are those related to employment status. In the second wave, there is a noticeable decrease of employed fathers and a

considerable increase of fathers not working. Abrupt changes in employment status are also noted in the sample for mothers. It is safe to assume that changes in employment status are primarily related to the Great Recession. The variation of parental care time might also be driven by behavioural changes (i.e. not explained by the compositional change of the sample), or by a combination of compositional and behavioural changes.

The Oaxaca decomposition method first estimated wave-specific regressions for physical and developmental care using the OLS models reported in Panel A of Table 4. The equation estimated is as follows:

$$T_{t+1} = \beta_{0t+1} + \beta_{1\ t+1}\mathbf{X}_{t+1} + e \quad (1)$$

$$T_t = \beta_{0t} + \beta_1 t\ \mathbf{X}_t + e \quad (2)$$

Whereby *T* indexes time - the two dependent variables -; *ß* indexes the coefficients to be estimated; *X* is a vector of independent and control variables - i.e. determinants of physical and developmental care time -; e is the error term or "luck", and subscripts t and *t+1* refer to the period of economic expansion (2002-2003) and economic recession (2009-2010), respectively. Given these two models, the between-waves difference can be estimated as follows:

$$T_{t+1} - T_t = \beta_{0t+1} + \beta_{1\ t+1}\mathbf{X}_{t+1} - \beta_{0t} + \beta_{1t}\ \mathbf{X}_t = (\beta_{0t+1} - \beta_{0t}) + (\beta_{1t+1} - \beta_{1t})\ \mathbf{X}_t +$$

$$\beta_{1t+1}(\mathbf{X}_{t+1} - \mathbf{X}_{t+1}) \quad (3)$$

The between-wave difference is then decomposed into two components. The first being the change we would see during the

recessionary period (2009-2010) based on the sample characteristics of the pre-recession (2009-2010) – the explained change, or the compositional change [$ß_{t+1}(X_{t+1}- X_{t+1})$], and the amount of change that is unexplained, or behavioural [(ßt+1-ßt)Xt].

Table 6. Oaxaca decomposition results comparing 2002-2003 and 2009-2010.

	Physical time		Developmental time	
	Father	Mother	Father	Mother
Δ 2002-2003 to 2009-2010	8.1***	4.0*	6.8***	9.2***
Explained	3.1***	-2.1	2.8***	-0.2
Unexplained	5.0***	6.2*	3.9**	9.4
N	5,566	5,566	5,566	5,566

Source: Spanish Time Use Surveys (2002-2003 and 2009-2010).
Note: Decompositions using ordinary least squares from Panel A, Table 4. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Results from the Oaxaca decomposition are shown in Table 6. The first row of the table illustrates the total variation over the period, and subsequent rows show the explained and unexplained changes respectively. For fathers, the increase in physical care time was driven by a combination of compositional and behavioural changes. 63% of the change is driven by behavioural changes, while the rest (37%) is due to compositional effect. Results for paternal developmental care show a very similar trend, i.e. a combination of compositional and behavioural shifts. All change in paternal time is significant at $p<0.001$. Results for mothers, however, demonstrate different dynamics; all change appears to be behavioural. This applies for both physical and developmental care.

2.6.7. Supplementary analyses

Three supplementary analyses were carried out to check the sensitivity of the associations reported in the main analyses. Findings of these additional analyses are cited in the appendix, Table A3. The results of these robustness checks confirm the findings reported in the above sections. In the first analysis, the variable "fathers not working" is divided into those unemployed and those out of the labour market. We can expect that the composition and behaviour of these two groups may differ, and therefore also the effect of the variable when interacted with the recessionary period. Indeed, results of Panel A - Table A3 suggest that unemployed fathers strongly influenced the associations between "not working" fathers and childcare time shown in Table 4. Physical care time invested by unemployed fathers significantly increased during the recession ($p<0.05$), up by almost 12 daily minutes. However, childcare time invested by inactive fathers did not change between waves (ß=0.5, non-significant). This result reinforces the idea the paternal unemployment was a key contributing factor in the reduction of the gender gap in physical childcare. However, these results should be interpreted with caution, due to the small sample size of these categories (n=158 fathers in 2002; n=221 fathers in 2010).

A second sensitivity analysis concerned with the variable level of education. As noted in the method section, one of the main variable of interest -level of education- had more than one thousand cases with

missing information. This was addressed through Multiple Imputation by Chained Equations (MICE) based on 25 multiply-imputed samples (Royson and White, 2011). Panel B in Table A3 shows the results of the regressions after applying MICE to those cases having missing information in level of education and other variables. The results of these regressions do not show remarkable substantial variations of those reported in the main body of the article. However, even though the conclusions of the article remain after imputing missing cases, it is worth noting that there is a substantial change in the association between not working fathers and time in physical childcare: After the imputation, the coefficients of this association significantly grow, passing from 6 minutes to 14.

In a final supplementary analysis, OLS models were replicated using only a subsample of dual-earner couples. We can presume that those who did not lose their jobs were less affected by the recession. An analysis of this subsample can partially cancel out the structural effect of the recession in its estimates. This does not mean that the sensitivity analysis should be interpreted as an attempt to claim causality between the Great Recession and parental care time. However, it may serve as a proxy for a counterfactual, and thus contribute toward a more accurate interpretation of the results. Results of Panel C - Table A3 show a slower process of intensification of parenting for dual earner couples and, importantly, in this subsample, gender inequality in parental time spent with children increased (for physical and developmental care). This result also suggests that paternal unemployment during the recession played an important role in reducing the gender gap. Results for this

subsample reported a similarly unchanging education gap in developmental care.

2.7. Discussion and conclusion

This study has investigated the evolution of parental time investments in childcare during the Great Recession, paying particular attention to variations across stages of child development, as well as variations in the gender gap with regard to physical care, and the education gap with regard to developmental care. In doing so, the study makes two relevant contributions to the literature thus far. Firstly, it looks at whether the gender gap in physical care changed during the recession and, specifically, at what stage of child development. Secondly, it analyses whether, during the recession, parental investments in developmental care by level of education continued to diverge. This article also contributes to debates on gender inequality in domestic labour (Evertsson and Nermo, 2004; Aassve et al., 2014; Sayer et., 2004; Sullivan, 2011; Raley et al., 2012) and on the diverging parental behaviour and intergenerational transmission of advantage (McLanahan, 2004; Esping-Andersen, 2009; Altintas, 2015; Craig et al., 2014; Gracia, 2014). Building on these debates, this study shows how economic recession facilitates a better understanding of differential parental involvement across disaggregated types of intensive childcare and, therefore, helps us to understand the conditions within which gender and education inequality in types of time investments decrease, persist or increase. The dramatic

deterioration of employment conditions during the recession makes Spain an excellent case for this study.

The results of this study have shown that, during the Great Recession, both fathers and mothers continued to intensify parenting practices, concurring with previous research in Australia (Craig et al., 2014) and the United States (Sayer et al., 2004). All else being equal, over the period analysed (2002-2010), fathers and mothers increased their time investments in both types of engaged care, consistent with Hypothesis 1. Importantly, one of the key contributions of this study is that it allows for analysis of change over time - both in total engaged parental time, and by subtypes of childcare. For physical care, father-child time increased more than mother-child time, and, therefore, the gender gap in this subtype of care reduced, consistent with Hypothesis 2a. The increase in paternal physical care time was especially significant for unemployed fathers. Particularly interesting is that the most significant increase in physical care time for fathers, was within couples with very young children. In these families, the gender gap in the physical component of care was substantially and significantly reduced, as posited by Hypothesis 2b.

However, maternal time invested in developmental childcare increased more than paternal childcare time did. Therefore, when looking at total engaged childcare time, gender inequality remained unchanged during the recession. The increased time investment in maternal developmental care over paternal developmental care suggests that mothers compensated for the paternal increase in the

most gendered part of care (physical care) by increasing time engaged in developmental activities. This, ultimately, cancels out the reduction of the gender gap in total engaged childcare time (i.e. physical plus developmental). Additionally, it points towards similarly increasing time investments *between* gender, but a changing composition of time investments *by* gender: fathers became more involved in the tasks classically perceived as more feminine - such as changing nappies or feeding - and this was counterbalanced by an increase in developmental care time invested by mothers. This is in line with previous studies that have suggested a slow but progressive "fathers' feminization in the domestic sphere, [where] we see a 'feminization' of men's roles" (Esping-Andersen, 2009: 35). All in all, there has been a slow movement towards gender equality only appreciable in physical childcare.

In terms of diverging parental investments in developmental care time, results indicated that this gap remained unchanged, consistent with Hypothesis 3b, and against the predictions of Hypothesis 3a. Parents significantly increased their participation in developmental childcare, and this increase was similar for parents with and without a university degree, thus the education gap persisted with no variation. This result concurs with previous results in Australia (Craig et al., 2014), but diverges from recent research in the United States finding an increase in the education gap in developmental care (Altintas, 2015).

As noted before, three main mechanisms could be speculated as drivers of this change in parental behaviour. The first key factor is the economic recession. We can think of the increase in paternal time as reflecting changes in the labour market - predominantly the increase of paternal unemployment. Results of this study fall in line with this, suggesting that during the recessionary period couples responded to the uncertainty of austerity by employing available resources - such as fathers' free time -, as previous research has found regarding the US (Knop and Brewster, 2015). Previously non-working mothers moved into the labour market, and fathers responded with an increase in time spent on unpaid tasks (Aguiar et al., 2014; Berik and Kongar, 2013) such as physical care. These results are also congruent with previous studies analysing the Great Recession and increased paternal physical childcare time in the US (Bauer and Sonchak, 2017).

The second key factor is cultural. Results of the decomposition analysis have shown that behavioural changes explain more than half of the changes in childcare time investments for fathers, and all childcare time investment changes for mothers. Trends towards more gender egalitarian values, as well as contemporary narratives of intensive mothering, appear to be translating into behaviour. In addition, decreasing fertility rates in countries such as Spain may have intensified the intensive parenting discourse. Children are effectively becoming "scarce goods" in the contexts of Southern European countries, which may have boosted the intensification of parenting in the hope of granting children the best future in an

increasingly competitive and unequal environment. Finally, the increase in paternity leave in Spain over the period analysed might also partially explain the increase in paternal time devoted to physical care. However, it is important to keep in mind that data shows how both gender and education inequalities in physical and developmental care remain.

Despite the high quality of time-use data and a case study affording investigation into trends in parental care during the recession, several limitations should be noted. These limitations point towards potential avenues for methodological improvement and further scholarly inquiry. First and foremost, the cross-sectional nature of time-use surveys makes impossible any claim of causal effect of the Great Recession on parental time investments in childcare. This study does not observe the same individuals over time, but two different samples. Unfortunately, there is not as yet longitudinal time-use data available in Europe, neither does there exist a long-duration panel dataset of any kind for Spain. Second, the reduction of the sample in the second wave may have affected the estimates of regressions through sampling error. However, although the sample shrank to less than half the original size in the second wave, the later survey used probabilistic methods to remain equally representative of the Spanish population. As noted in the methodological report of STUS 2009-2010, "after the analysis of the STUS 2002-2003's results and the experience in other countries, it was estimated that to reach the objectives [of representation], the sample would be ~9,000 households" (INE, 2011: 32. See also pp. 34-45). Patterns of non-

response in the analytic subsample ware similar in both waves, avoiding the risk of systematic non-responses in specific demographic subgroups in one of the two waves. Finally, there is no information in the data about other investments in children, such as financial. It could be that, during the recession, the investment gap that most significantly increased in childcare was in parental spending, rather than in time spent. The increasing income inequality might point to this line of argument. Future research should address these important questions not covered in this study.

To conclude, the results reported here are relevant to policy and practice. Data shows that changes in employment status are associated with increased paternal involvement in the most traditionally gendered part of care. Particularly when there is a reduction in work market hours, fathers appear to reallocate time to childcare and family. The case for investing in paternal involvement in childcare and family life is more compelling when these results are considered together with previous studies highlighting the benefit of paternal involvement in childcare, on mothers' labour force participation, couple union stability, and child development. This does suggest that improving work-family balance among fathers should lead to an increase in paternal time invested at home, enhancing family life overall.

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2.9. Appendix

Table A1: Specification of parent-child activities do together and its survey codes included in the dependent variables

Variable	*Codes in STUS* & MTUS†*	*Examples of activities*
Physical childcare	381	Feed, bath, putting child to bed, taking care when the child is ill.
Developmental childcare	382 and 383	Read, play, talk, do homework together

Source: Spanish Time Use Surveys (Spanish Institute of Statistics).
Notes: *Both STUS use same codes for similar activities.
†For information on the harmonization procedure, see: http://www.timeuse.org

Table A2: OLS regressions estimating fathers' and mothers' time in physical and developmental care – full set of coefficients.

	Physical time				Developmental time			
	Father		Mother		Father		Mother	
	β	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*
Year of survey (ref. cat.: Year 2002-2003)								
Survey year 2009-2010	8.04***	1.56	4.01**	1.24	6.52**	2.46	9.28***	1.22
Employment status (ref. cat.: Full time work)								
Part time	1.76	6.33	2.70	5.02	-0.56	3.79	2.70	1.87
Not working	17.82***	2.35	29.67***	2.47	5.74**	1.90	7.75***	1.22
Education								
University degree	6.70***	1.64	16.39***	2.71	4.62***	1.32	6.96***	1.34
Partner's information								
Partner works part time	0.52	2.40	4.50*	1.90	-6.40	10.07	1.63	4.98
Partner is not working	-8.10***	1.53	-12.74***	3.78	-0.69	1.23	-4.22*	1.87
Partner has University degree	10.94***	1.68	1.22	2.66	3.57**	1.35	3.04*	1.31
Controls								
Age	-0.03	1.24	0.87	2.11	1.68†	1.00	3.22**	1.04
Age squared	-0.01	0.02	-0.04	0.03	-0.02†	0.01	-0.04**	0.01
Two children at home	3.53*	1.48	5.65*	2.39	1.02	1.19	-0.27	1.18
Three plus children at home	0.44	2.37	-2.70	1.88	5.79	3.72	-0.38	1.84
Youngest child 5-12 years	-31.74***	1.52	-85.01***	2.48	-13.65***	1.23	-8.44***	1.22
Other adults living at home	-5.79**	1.91	-12.07***	3.11	-6.44***	1.54	-4.94**	1.54
Domestic help	-0.46	2.96	-0.39	4.74	0.25	2.39	2.66	2.35
Cohabitant couple	-1.55	2.93	0.35	2.32	0.43	4.60	3.07	2.27
Weekday	-8.12***	1.41	11.18***	2.27	-9.17***	1.14	4.24***	1.12
Ordinary day	1.42	1.67	15.47***	2.71	1.02	1.35	5.28***	1.34
Constant	88.35***	24.62	191.89***	39.46	11.06	19.85	-38.68*	19.51
Adjusted R^2	0.18		0.31		0.07		0.06	
N	5,566		5,566		5,566		5,566	

Source: Spanish Time Use Surveys (2002-2003 and 2009-2010). Significance levels: † < 0.1, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A3. Supplementary analyses.

	Physical time				Developmental time			
	Father		Mother		Father		Mother	
	β	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*
Panel A. ***Sensitivity analysis 1: Imputation of missing information***								
Year 2009-2010	8.80***	1.41	5.08**	2.35	4.58***	1.11	9.61***	1.12
Employment status								
Not working	6.35***	1.92	26.24***	2.22	6.74***	1.98	7.95***	1.44
Level of Education								
University degree	5.77***	1.53	17.56***	2.01	4.36***	2.01	6.56***	1.24
Interactions								
Recession * Not working	9.01*	2.34	-2.12	3.34	3.21	2.44	1.82	3.84
Recession * Uni. degree	-2.85	2.88	6.70	4.60	4.01†	2.23	-1.92	2.22
N	6,498		6,498		6,498		6,498	
Panel B. ***Sensitivity analysis 2: Individuals not working - disaggregated***								
Year 2009-2010	8.12***	1.63	2.80	3.53	4.21*	1.71	8.92***	2.27
Employment status								
Unemployed	13.40***	3.94	24.97***	4.90	9.26**	1.66	8.84***	1.77
Inactive	19.63***	5.40	28.74***	2.95	5.83	4.40	7.33***	1.48
Interactions								
Recession * Unemployed	11.85*	5.29	9.17	7.47	-5.43	4.33	1.10	3.75
Recession * Inactive	0.51	9.64	3.70	5.54	-6.61	7.76	-1.16	2.79
N	5,566		5,566		5,566		5,566	
Panel C. ***Sensitivity analysis 3: Subsample of dual-earner couples***								
Year 2009-2010	5.36*	2.16	9.60**	3.22	3.08*	1.83	8.69***	1.70
N	2,644		2,644		2,644		2,644	

Source: Spanish Time Use Surveys (2002-2003 and 2009-2010).
All models use similar control variables as those shown in Table A2.

CHAPTER 3

A MATTER OF TIME? FATHER'S INVOLVEMENT AND CHILDREN'S COGNITIVE OUTCOMES[9]

[9] This chapter is based on a co-authored article written with Francisco Perales and Janeen Baxter - ARC Centre of Excellence for Children and Families over the Life Course, University of Queensland, Brisbane. A slight modified version of this chapter has been published in *Journal of Marriage and Family.*

Abstract

Fathers in Western countries allocate progressively more time to childcare. However, most research on how parental time inputs affect child development focuses on maternal time, and it remains empirically unclear how paternal involvement in the child's upbringing influences child outcomes. This study provides the first systematic account of how father-child time (in total and across activity types) relates to children's cognitive development, measured using the Peabody Picture Vocabulary Test. In addition, it examines whether and how paternal education moderates these associations. To accomplish this, the study uses unique, longitudinal, time-diary data from an Australian sample of children aged 4-8 years (Longitudinal Study of Australian Children; n=3,273 children/6,960 observations). Results show that the total amount of father-child time is associated with small improvements in children's cognitive functioning, whereas the amount of father-child time in educational activities is associated with moderate-to-large improvements. Such associations are similar for highly and less-highly educated fathers.

Keywords
child development; cognitive development; social stratification, time diaries; panel data; Australia

Time is NOT money! If anything, it is MORE important than money. The time we have to care for one another, especially for our children and our elderly, is more precious to us than anything else in the world. Yet, we have more experience accounting for money than we do for time.

Nancy Folbre and Michael Bittman (2004): "Family Time. The Social Organization of Care."

3.1. Introduction

During the past few decades many Western countries have witnessed a rise in fathers' involvement in childcare –defined as the time father and child spend together (Gauthier et al., 2004). This shift has been attributed to increasing maternal labour force participation and the spread of gender egalitarian and intensive parenting ideologies (Esping-Andersen, 2009). In this emerging model of involved fatherhood, fathers are not only expected to act as income providers, but also to actively engage with the day-to-day caring and upbringing of their children (Barbeta and Cano, 2017).

The importance of fathers' involvement in childcare is twofold. First, it can be a precursor to increasing gender equality within families, by 'freeing up' time for mothers to develop their skills, (re-)enter the labour market, and realise their economic potential (Hook, 2006). Second, theoretical perspectives in sociology, psychology and economics suggest that fathers' time in childcare should be positively associated with child development (Cabrera, Shannon and Tamis-LeMonda, 2007; Pleck, 2010). For instance, children with involved

fathers are exposed to more varied stimuli, resulting from interacting with two parents with different values, behaviors, vocabulary and parenting styles, and this can lead to better cognitive outcomes for the child (Lamb, 2010).

The increasing availability of quality time-use data on families has spurred a wave of research and academic debate on whether and how parental time investments contribute to child development. Recent studies have focused on the time allotments made by mothers (e.g. Hsin and Felfe, 2014; Milkie et al., 2015; Fomby and Musick, 2017) or parents, in general (Fiorini and Keane, 2014). The findings are mixed. While some authors find that maternal time is an important determinant of children's cognitive functioning (Del Bono et al., 2016), others report very small associations (Fomby and Musick, 2017) and no relationship (Milkie et al., 2015). This research has motivated a lively discussion on the topic (see Waldfogel, 2016; Kalil and Mayer, 2016; Nomaguchi et al, 2016; Wolfers, 2015). Importantly, some studies suggest that not all types of parental time are beneficial for children (Hsin and Felfe, 2014; Fiorini and Keane, 2014). Activity content matters and parent-child time spent in educational activities is comparatively more productive than parent-child time spent in other activities (Hsin, 2009). However, this literature has largely neglected how the time children spend with their *fathers* (as opposed to their mothers or any parent) influences child outcomes. This study fills this gap in knowledge by considering father-child time in its own right.

We contribute to the literature on father's involvement in childrearing and the incipient literature on parental time investments and child outcomes in two main ways. First, we use detailed time-use information on the amount of time fathers spend with their children, and the nature of their joint activities. This contrasts with previous research relying on coarse proxy measures for parental time investments, such as employment hours (Bernal, 2008), or considering certain types of time in isolation, such as educational or recreational time (Del Bono et al., 2016). Second, we consider effect heterogeneity by paternal education (Lareau, 2011). Time-use research indicates that more educated parents spend more time with their children than less educated parents, and also allocate more time to shared activities that enhance child development (Guryan et al., 2008). This time expenditure gap is widening over time (Putnam, 2015; Altintas, 2015). Hence, if fathers' time in childcare has positive impacts on children's cognitive capacities, it could be a contributing factor to the intergenerational (re)production of inequalities and the 'diverging destinies' of children from more and less advantaged families (McLanahan, 2004; Kalil, Ryan and Corey 2012).

The goal of this paper is therefore to provide the first encompassing empirical account of the associations between father-child time and children's cognitive outcomes, focusing on two-parent families. To accomplish this, we use high quality, time-diary, panel data from the *Longitudinal Study of Australian Children* (LSAC) on the amount of time that fathers spend with their children.

3.2. Theoretical Framework

Cognitive skills are core skills that relate to individual learning and problem solving, and encompass aspects such as attention, memory, reasoning and thinking. These crucial skills enable individuals to process sensory information (e.g. evaluate, analyze, remember, make comparisons, etc.), and are important precursors of academic success (Duncan et al., 2007) and labor-market outcomes (Heckman, 2006). Cognitive skills develop at a faster rate during childhood, when brain plasticity is greatest, and through children's interactions with their parents, relatives and peers in their school, neighborhood and family home (Shonkoff et al., 2000). Hence, such skills are socially reproduced, transmitted from generation to generation, and highly dependent on the socio-economic context in which childhood takes place. In the following sections, we draw on principles from developmental psychology, economics and social stratification research, and previous empirical evidence, to develop testable hypotheses about how father-child time contributes to shaping children's cognitive outcomes.

Although father and child may undertake activities that also involve the child's mother, here we focus on the time that fathers spend with their children without maternal involvement. During that time, it is safe to assume that the sole (or chief) responsibility for the child rests upon the father. We take this course of action because, when the child shares time with both mother and father, parents tend to adopt gender-typical roles: mothers can act as 'gatekeepers' to father-child

interactions and decision making, while fathers often enact a secondary role as 'helpers', taking direction from mothers (Coltrane, 1996; Pleck, 2010). More importantly, we are interested in the effect of paternal time in its own right, as it remains unclear whether and how this type of time is related to children's cognitive outcomes. This separates our study from previous research focusing on mother-child time (see e.g. Del Bono et al., 2016; Milkie et al., 2015; Fomby and Musick, 2017) or time spent between the child and any parent (see e.g. Fiorini and Keane, 2014). We consider two separate components of father-child time: (i) the quantity of time that fathers spend with their children, and (ii) the content of the joint activities undertaken during that time.

3.2.1. Father-Child Time Quantity

To our knowledge, no previous study has provided an encompassing empirical account of how the amount of time that fathers spend engaging with their children affects child development. However, this type of time has been previously recognized as an important dimension of father's involvement in the child's upbringing (Russell, 1983; Wilson and Prior, 2010). Different theoretical perspectives suggest plausible mechanisms that link the amount of father-child time with children's cognitive development.

First, spending time with the father may benefit the child by exposing him/her to two involved parental figures, instead of just one. A vast majority of mothers are highly involved in the day-to-day care of

their children, but this is the case for only a fraction of all fathers (Craig, 2006). Hence, to the extent that mother and father are different in their behaviors and personalities, father's involvement may result in greater heterogeneity in the stimuli to which the child is exposed (Amato, 1998; Lamb, 2010). For example, fathers and mothers tend to spend time with their children in different ways: mothers spend a greater share of time in routine care, while fathers spend a greater share in playful and educational activities (Craig and Mullan, 2011; McBride and Mills, 1993). In addition, fathers and mothers talk differently to their children, and have different conversation topics (Pancsofar and Vernon-Feagans, 2006). Fathers' language skills are more predictive of children's vocabulary than mothers', and have been argued to afford children extra capabilities in talking to strangers and in public settings (Rowe et al., 2004).

During play, fathers are more likely than mothers to encourage their children to take risks, while mothers are more likely than fathers to encourage them to take account of others' feelings (Clarke-Stewart, 1978). Diversity in parental inputs should result in enhanced cognitive capacity in the child (Cook et al., 2011). This is because, as argued in social-learning theory, skills are acquired by observation (Bandura, 1977). Similarly, as posed by role-model theory, *"individuals influence role aspirants' achievements, motivation, and goals by acting as behavioral models, representations of the possible, and/or inspirations"* (Morgenroth et al., 2015: 4). Hence, an involved father can act both as a role model for children to reinforce, adopt and pursue goals, and as an 'observation point' for them to learn problem-

solving behaviors. These interactions should promote child development in both cognitive and non-cognitive skills, and these are known to be mutually reinforcing –*skills beget skills* (Heckman, 2006).

Second, regardless of whether or not fathers exert different parenting to mothers, the time fathers spend with their children may be a substitute for time spent with other guardians. That is, spending more time with a father may mean spending less time with individuals who are less interested in, are less committed to, or are less able to enhance the child's cognitive upbringing than a father (Cooke and Baxter, 2010). For example, when fathers do not spend time with their children, relatives (e.g. grandparents), neighbors or external carers (e.g. *au pairs*, or nannies) may take responsibility for the child. The activities and interactions that the child undertakes with these other agents may be less conducive to cognitive development than those initiated by fathers (Belsky et al., 2007). This could occur if the alternative guardians are less educated or less knowledgeable about parenting practices than that child's father (which may be the case for grandparents), or have less knowledge about the child's abilities and dispositions (which may be the case for external carers). It is also possible that paternal time acts as a substitute for time alone. Therefore, paternal time with the child may have a positive effect on child outcomes through substitution, by crowding out less productive time uses.

Third, fathers' involvement in childcare improves certain aspects of family life, which may in turn have downstream positive effects on the child (Lamb, 2010; Pleck, 2010). Increasing father-child time expenditure shifts some of the childcare burden away from mothers. In doing so, it eases maternal time pressure and work-family conflict, and 'frees' up time for mothers to increase their social and economic participation, or to spend on leisure (Kalil, Ziol-Guest and Coley, 2005). Critically, paternal involvement in childcare is a contributing factor to maternal employment, and this is associated with better child cognitive development (see e.g. Brooks-Gunn, Han and Waldfogel, 2002). In contrast, low paternal involvement in childcare can exacerbate maternal stress and mental strain, and result in suboptimal parenting practices amongst mothers through 'parenting stress' (Kalil, Ziol-Guest and Coley, 2005; Schober, 2012). Therefore, greater paternal involvement in childcare should indirectly enhance the quality of mother-child relationships and, through that channel, the child's cognitive development (Lamb, 2010). In addition, families in which fathers contribute to childcare are characterized by a range of positive outcomes (Goeke-Morey and Cummings, 2007), including positive parenting practices (Jia, Kotila and Schoppe-Sullivan, 2011) and a lower propensity for family breakdown (Kalil and Rege, 2015). In these circumstances, parents may behave in richer ways towards each other and the child, creating a safe and warm environment that is conducive to children's learning and improved cognitive functioning (Lamb 2010). Based on these postulations, we expect that:

Hypothesis 1. *More father-child time should be related to better child cognitive outcomes.*

As noted, empirical literature in this area is limited. Most previous studies have lacked time-use data, having to resort to poor proxies of paternal time allocations to the child (for a review, see Sarkadi et al., 2008). In these studies, the general finding is that fathers' time availability enhances children's cognitive development, particularly amongst children from disadvantaged backgrounds. Closest to our research are Hofferth (2006) and Milkie et al. (2015), two US studies that leverage time-diary data from the Panel Study of Income Dynamics Child Development Supplement (PSID-CDS). Both of these found no relationships between father-child time (measured as hours per week of time accessible to and engaged with the child) and children's academic and behavioral outcomes. Our study expands their scope by considering the content of the father-child shared activities, effect differences by parental education, and longitudinal estimation.

3.2.2. The importance of father-child time content

There is growing recognition that activity content is important when considering the effects of parent-child time on children. As Hsin (2009: 125) puts it: the *"simple quantity of time by itself is not sufficient for producing positive achievement outcomes in children* […] *the returns to time investments depend on the amount of cognitive stimulation parents provide during that time"*. Some

commentators go as far as arguing that high-*quality* parent-child time is more important to child development than high-*quantity* parent-child time (Amato, 1998).

Exposure to different types of activities has different consequences for the child's cognitive development (Hsin, 2009). Activities such as reading, playing games, doing homework, and participating in social events are argued to be associated with positive child outcomes. This is because, in undertaking these activities, children exercise their thinking skills, and this stimulates and contributes to building their brain structure (Takeuchi et al., 2015; Diamond and Lee, 2011). More importantly, when these activities are undertaken with an engaged adult and more specifically a parent, they provide opportunities for the child to improve his/her reasoning, analysis and problem-solving skills through parental role modelling, direct instruction and language exchanges (Lareau, 2011; Waldfogel, 2006). That is, these activities are more stimulating for the child if shared with the father (or mother), which should have positive flow-on consequences on the child's cognitive development. In contrast, when the child and the father (or mother) spend their joint time in other activities, such as unstructured activities (e.g. watching television) or routine care (e.g. helping the child wash or dress), their interactions may be fewer and less intense, and consequently less conducive to children's cognitive development (Hsin and Felfe, 2014). For example, father and child may talk less and in a less engaged way when watching television, compared to when playing a board game.

Recent time-use research on how parent-child time in different activity types affects child outcomes has focused on time between the child and the mother (Hsin and Felfe, 2014) or any parent (Fiorini and Keane, 2014), but to date has neglected father-child time. These studies typically split parent-child time into two or three categories, according to the type of activity. The most common categories are: educational time (i.e. activities which have a clear learning components, e.g. reading, playing games); structured time (i.e. scheduled activities, e.g. dance lessons, organized sport); routine care time (i.e. activities aimed at covering basic child needs and which are usually time fixed, e.g. helping the child eat, bath or dress); and unstructured time (i.e. activities without a clear structure –e.g. media activities such as watching TV, and vague categories, e.g. other play, doing nothing).

Within this literature, there is consensus that educational time with the mother (Hsin and Felfe, 2014) or any parent (Fiorini and Keane, 2014) is more valuable for children's cognitive outcomes than joint time in other activities. The hierarchy across other activities is less clear. In analyses of PSID-CDS data, Hsin and Felfe (2014) found that the most productive input for children's cognitive development after educational time was structured time, followed by a 'catch-all' reference category capturing all other time uses, and finally unstructured time. In their analyses of verbal ability using LSAC data, Fiorini and Keane (2014) used a more nuanced time categorization. Their 'value added' model yielded the following

hierarchy of time inputs, from most to least productive: educational time spent with parents, educational time with non-parents, media time, social time, general care with parents, general care with non-parents, bed time, and school time.

While there is no available evidence on how activity type shapes the relationships between father-child time and child outcomes, we expect the associations to be similar to those for mother-child time or parent-child time. We therefore hypothesize that:

> Hypothesis 2. *Father-child time in educational activities will be more conducive to child cognitive development than father-child time in other activities.*

3.2.3. Effect heterogeneity by paternal education

Different bodies of work lead to the prediction that parental education should moderate the effect of father-child time on children's cognitive outcomes. Both the amount of time parents spend with their children and the content of such time have been shown to differ markedly by social strata (Guryan et al., 2008; Craig and Mullan, 2011; Bonke and Esping-Andersen, 2011; Kalil, Ryan and Corey, 2012; Cha and Song, 2017). First, highly educated parents spend more time with their children than less highly educated parents –see Monna and Gauthier (2008) for a review. For instance, Australian fathers with University degrees spend about 10 more minutes per day with their children than Australian fathers without University degrees

(Craig, Powell and Smyth, 2014). Second, there is evidence of heterogeneity by parental education in the content of the activities that fathers and children share when they spend time together. In particular, highly educated parents engage more in activities that stimulate children's cognitive functioning, such as educational play (Kalil et al., 2012; Altintas, 2016). In addition, highly educated parents are comparatively better in tailoring shared activities to their children's age and developmental stage (Kalil et al., 2012). Collectively, these arguments suggest that father-child time should have a stronger positive effect on child outcomes when fathers have high levels of education.

Furthermore, there are reasons to expect higher returns to father-child time amongst children of more educated fathers, net of differences in the amount and content of father-child time. Highly educated fathers dispose of a wider set of skills and socio-cultural capital than lowly educated fathers, including problem-solving, information-seeking and language abilities (Mirowsky and Ross, 2003), and hold higher expectations for their children (Davis-Kean, 2005). Highly educated fathers can use their socio-cultural capital to acquire, develop and exert cognitively stimulating parenting practices that enhance children's cognitive development. They have both 'more' to transfer to their offspring, as well as a greater predisposition to transfer (Bourdieu and Passeron, 1990). For example, children of more educated fathers will be exposed to broader, more complex and more sophisticated vocabulary and knowledge inputs from their parents during both highly productive shared activities (e.g. educational play)

and not so productive shared activities (e.g. unstructured time). Therefore, children of more highly educated parents are likely to attain greater cultural capital, reaping its benefits on cognitive outcomes (Lareau, 2011; Jæger and Breen, 2016; Harding et al., 2015 for a review). Altogether, we hypothesize that:

> Hypothesis 3. *Fathers' total time with children (as well as time on each activity type) will show a stronger positive association with children's cognitive outcomes when parents are highly educated.*

3.3. Data and methods

3.3.1. Dataset and sample selection

We use data from *Growing Up in Australia: The Longitudinal Study of Australian Children* (LSAC). LSAC is a biannual birth-cohort study which since 2004 collects information on Australian children and their families from the study child, his/her parents and a teacher/carer through a combination of face-to-face and self-complete questionnaires. The LSAC sample was identified using complex probabilistic methods, and is largely representative of two cohorts of Australian children: one born between March 1999 and February 2000 (n=4,983 children) and one born between March 2003 and February 2004 (n=5,107 children). For further details on the study's methodology, see AIFS (2015).

LSAC is one of only two longitudinal studies in the world (with the US PSID-CDS) to collect 24-hour time-use diaries for children on multiple occasions. Parents (or the study child, depending on his/her age) provide detailed information about *what* the child was doing, as well as *where* and *with whom* the child was, splitting the day into 96 15-minute intervals. This was done for two days allocated at random, a weekend day and a weekday (Mullan, 2014). The LSAC time-diary data has some advantages over the analogous PSID-CDS data: it features a much larger analytical sample (∽10,000 children in LSAC, compared to ∽3,500 in the PSID), and closer observation points (two years in LSAC, compared to five years in PSID-CDS).

We restrict our analyses to children in the older LSAC cohort, and to study waves 1 (2004), 2 (2006) and 3 (2008), when these children were 4, 6 and 8 years of age, respectively. We focus on this subsample for both theoretical and pragmatic reasons. Theoretically, this age range (particularly 4-6 years) constitutes a sensitive period in children's skill acquisition, and a life-course stage in which gaps in cognitive skills between advantaged and disadvantaged children begin to widen (Ermisch et al., 2012; Cuhna and Heckman, 2007). Pragmatically, the collection of the LSAC time-use diaries for the selected cohort changed drastically between study waves 1-3 and study waves 4-6 in ways that hamper comparability. In the latter waves, diaries were no longer filled by parents but by study children themselves, and there were substantial changes in the coding of the activities. In addition, our measure of cognitive ability was only

collected in LSAC waves 1-3 for the selected cohort. An example of the LSAC time-use instrument completed by the child's parents can be found online (2018, October 8). Retrieved from http://data.growingupinaustralia.gov.au/studyqns/wave1qns/TUD14.pdf.

We restrict our analyses to children living with both biological parents. This is because the processes linking parent-child shared time-use and children's cognitive development are more complex in other family types, such as single-parent families, step families and reconstituted families (Furstenberg 1988; Hofferth 2006). We excluded observations with missing information on the day which the time diary was completed (n=7), in which only one of the two time diaries had been completed (n=468), and those who, as an error, had duplicated diaries (n=35). In addition, we excluded observations with missing information on the outcome variable capturing cognitive functioning (n=298), father's or mother's education (n=67) and Indigenous status (n=55). Our final analytical sample comprises 6,960 observations from 3,273 children. In this sample, 91.2% of the *weekday* time-use diaries were completed by the child's mother, 6.2% by the father, and 2.6% by another person or an unreported person. Of the *weekend* time-use diaries, 88.4% were completed by the child's mother, 7.8% by the father, and 3.8% by someone else or an unknown person.

3.3.2. Key explanatory variables: Total father-child time

LSAC includes a variable capturing who was with the child in each of the 96 15-minute blocks that comprise a day. To derive our measure of total father-child time we first sum up each of the blocks in which the child was reportedly spending time with the father – except for those in which the mother was also present. Following previous studies (see e.g. Bianchi et al., 2006; Hofferth, 2006; Milkie et al., 2015), we undertook separate summations for the number of father-child hours in the weekday and weekend day diaries, and derived an estimate of weekly father-child hours by multiplying the weekday diary amount by 5 and the weekend-day diary amount by 2, and summing the resulting figures. Hence, our measure of total father-child time is an estimate of the *total number of hours per week that the father spends as the main carer of the child*. Similar measures were created for time with the mother alone, mother and father together, and neither father nor mother. When a 15-minute time block did not contain information on who was with the child, we allocated that time to a residual category ('unknown').

3.3.3. Key explanatory variables: Activity categories

In the study waves that we use, parents could choose one or more activities from a list of 22-24 pre-coded activities for each 15-minute interval when completing the LSAC time-use diaries. Similar to Hsin and Felfe (2014) and Fiorini and Keane (2014), we recoded these activities into eight activity categories: (i) educational, (ii) routine

(iii) unstructured, (iv) social, (v) school/kindergarten, (vi) structured, (vii) sleep, and (viii) unknown. See Table A1 in the Appendix for further detail. Then, for each of the three time categories of key analytic interest (educational, structured and unstructured time), we derived variables capturing the amount of time the child spent on that category with (i) the father alone, (ii) the mother alone, (iii) the mother and the father together, and (iv) neither father nor mother. Again, we allocated missing data to the residual activity category 'unknown', with some exceptions. Following Fiorini and Keane (2014), we recoded missing data for activities occurring between 10:00pm and 6:00am as sleep time. In wave 1, we recoded missing data for activities between 8:00am and 3:00pm in ordinary weekdays as school/kindergarten time. In waves 2 and 3, when school is mandatory (ages 6-8), we recoded all time between 8:00am and 3:00pm in ordinary weekdays as school time. Where parents reported multiple activities for a single 15-minute time slot and these activities belonged to different activity groups, we allocated a portion of those 15 minutes to each of the groups. For example, if a parent reported that the child was both doing homework and listening to music, we would allocate 7.5 minutes to educational activities and 7.5 minutes to unstructured time. After these adjustments, our time categories add up to 168 hours, or the total number of hours in a week.

3.3.4. Outcome variable: Children's cognitive outcomes

Children's cognitive ability is captured by their scores in a short version of the Peabody Picture Vocabulary Test, version three

(PPVT-III) administered by a survey interviewer. The PPVT-III is a validated and widely used psychometric test that measures children's knowledge of the meanings of spoken words and his/her receptive vocabulary (Dunn and Dunn, 1997). Its implementation involves an examiner presenting the child with four images, together with a word that describes one of these images. The examiner then asks the child to identify the appropriate image. The complexity of the words and images varies by child's age to match the test's difficulty with developmental stages. PPVT scores ranges from 0 to 100, where higher scores denote higher cognitive ability. Across all children and study waves in our sample, the PPVT has a mean of 72.75 (SD=7.77) (see Table 1).

Table 1. Descriptive statistics for analytic variables

	Mean/%	SD	Min.	Max.
Outcome variable				
Peabody Picture Vocabulary Test	72.75	7.77	34.18	96.98
Weekly time spent…				
Alone with father	6.92	10.39	0	142.5
Alone with mother	26.46	23.25	0	168
With mother and father together	34.80	33.38	0	168
With neither mother nor father	95.40	40.07	0	168
Unknown	4.41	4.43	0	34.25
Weekly time in different activity types				
With father				
Educational activities	0.70	1.62	0	21.12
Structured activities	0.94	2.21	0	38.25
Unstructured activities	1.36	2.79	0	33.62
With mother			0	
Educational activities	2.72	3.71	0	33.56
Structured activities	2.17	3.30	0	37.35
Unstructured activities	4.77	6.13	0	56.25
With mother and father together			0	
Educational activities	2.46	3.34	0	35.12

Structured activities	1.76	2.99	0	30.88
Unstructured activities	4.91	5.44	0	55.46
With neither mother nor father			0	
Educational activities	2.60	3.81	0	42.50
Structured activities	5.22	6.69	0	59.50
Unstructured activities	5.29	7.12	0	42.50
Time in other activities			0	
Attending school/kindergarten	23.84	11.04	0	61.25
Social activities	4.87	6.86	0	99.12
Routine care	18.49	6.18	0	62.00
Sleeping	78.22	6.66	20.75	126.54
Unknown	7.66	7.99	0	45.37
Control variables				
Child's age (in months)	80.67	19.74	51	114
Child is female	49%		0	1
At least one other child in household	43%		0	1
Child speaks English at home	91%		0	1
Child is Indigenous	2%		0	1
Child had low birth weight	5%		0	1
Child's father has a University degree	34%		0	1
Child's mother has a University degree	36%		0	1
Family income, in $10,000	10.30	6.54	0	71.28
Child's father weekly work hours, in 10s	4.51	1.53	0	10
Child's mother weekly work hours, in 10s	1.69	1.62	0	10
Both diaries completed in ordinary day	56%		0	1
Child's mother completed both diaries	85%		0	1

Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. Observations are pooled across waves. n(observations)=6,960; n(children)=3,273).

3.3.5. Control variables

In our multivariate models we adjust for a set of control variables commonly used in studies of children's cognitive development. These include (i) *study child characteristics*: sex (male/female),

ethnicity (Indigenous/Not Indigenous), low birth weight (below 2.5 kg.) and age (in months); and (ii) *family characteristics*: father's and mother's weekly work hours (expressed in 10s), father's and mother's highest educational qualification (University degree/lower than University degree), parental annual income (mothers' plus fathers' weekly income times 52, adjusted for inflation using the Consumer Price Index), presence of a study child's sibling at home (yes/no), and language spoken at home (English/other language). Additionally, all models control for a set of dummy variables denoting whether both the weekday and weekend time diaries were completed on ordinary days, and (ii) whether it was the mother (vs. anyone else) who completed the diary. Table 1 shows means and standard deviations for all control variables.

3.3.6. Estimation approach

In our main analyses, we examine the relationships between paternal time investments and children's cognitive functioning using two estimation techniques: (i) base ordinary-least squares (OLS) models similar to those used in previous studies (see e.g. Milkie et al., 2015; Fomby and Musick, 2017), and (ii) longitudinal 'value added' models that make better use of the panel data at hand (previously used in Fiorini and Keane, 2014). The OLS models used to test the time-quantity hypothesis (Hypothesis 1) take the form:

$$PPVT_{ct} = \beta_0 + \beta 1 T_{ct} + \beta_2 F_{ct} + \beta_3 M_{ct} + \beta_4 X_{ct} + e_{ct} \quad (1)$$

where subscripts *c* and *t* refer to child and time period, respectively; *T* captures all time inputs; *F* and *M* denote paternal and maternal characteristics, respectively; *X* is a vector of other control variables; β_0 is the model's grand intercept; β_1 to β_4 are coefficients or vectors of coefficients to be estimated; and *e* is the usual random error term. The standard errors are adjusted for the clustering of observations within children. We run OLS models with basic covariates (child's age and gender, diary characteristics) to establish basic associations, and more conservative models with extended covariates (adding also information on birthweight, Indigeneity, siblings, language spoken at home, parental education and work hours, and family income). The 'value added' model takes into account the correlation between current and previous outcomes, and thus considers that children's skills develop cumulatively (see Todd and Wolpin, 2007 for details). This is accomplished by including a lag of the outcome variable ($PPVT_{ct-1}$) amongst the model predictors:

$$PPVT_{ct} = \beta_0 + \beta 1 T_{ct} + \beta_2 F_{ct} + \beta_3 M_{ct} + \beta_4 X_{ct} + \beta_5 PPVT_{ct-1} + e_{ct} \quad (2)$$

These 'value added' models are better equipped to reduce the possible bias introduced by the fact that parental time investments may be endogenous to children outcomes, i.e. that parents may decide how much time they spend with their children based on their cognitive development. Value added models are estimated using the extended set of covariates.

To test the time-content hypothesis (Hypothesis 2), we substitute the time-investment variables in equations (1) and (2) by more detailed variables that also consider activity type (as described before). To test the effect heterogeneity hypothesis (Hypothesis 3), we expand all previous models by interacting the time-investment and paternal education variables.

3.4. Results

3.4.1. Children's time use

The mean amount of weekly father-child time across all child-year observations in our pooled sample is 6.92 hours (SD=10.39), substantially lower than for mother-child time (M=26.46; SD=23.25) or time with mother and father together (M=34.80; SD=33.38) (see Table 1). When considering different activity types, weekly father-child time is 0.70 hours (SD=1.62) in educational activities, 0.94 hours (SD=2.21) in structured activities and 1.36 hours (SD=2.79) in unstructured activities. These figures are again much lower than those for mother-child time: 2.72 hours (SD=3.71) in educational activities, 2.17 hours (SD=3.30) in structured activities and 4.77 hours (SD=6.13) in unstructured activities; and time with mother and father together: 2.46 hours (SD=3.34) in educational activities, 1.76 hours (SD=2.99) in structured activities and 4.91 hours (SD=5.44) in unstructured activities. Altogether, these results are consistent with previous evidence, pointing to lower paternal than maternal involvement in childcare (Craig, 2006) and higher heterogeneity in

involvement amongst mothers than fathers (Craig and Mullan, 2011). When fathers spend time with their children, the mother is typically also present.

3.4.2. Hypothesis 1: Father-child time quantity

Table 2 shows the results from a first set of regression models examining the associations between total father-child time and children's PPTV scores. Since time-use measures add up to 168 hours, due to collinearity, one of them must be left out of the model to serve as reference category (Fiorini and Keane, 2014). Here, we exclude the variable capturing time with neither father nor mother. Relative to one hour of time spent with neither father nor mother, one hour of father-child time is associated with improved children's PPVT scores in the OLS models with basic (β=0.027; p<0.001) and extended (β=0.020; p<0.001) covariates, and in the value added model (β=0.018; p<0.05). These results are consistent with our first hypothesis. However, the magnitude of the estimated associations is very small: 5 additional weekly hours of father-child time increase PPVT scores by about 1.2-1.7% of a standard deviation. This pattern of weak results is nevertheless consistent with recent US findings for mothers (Hsin and Felfe 2014; Milkie et al., 2015). Mother-child time and time with both father and mother are not statistically related to the child's PPVT scores in any of these models (p>0.05). Results on the control variables are generally consistent with expectations with the only exception of maternal work hours, which appears to be negatively correlated with child cognitive development.

Table 2. Regression models of children's Peabody Picture Vocabulary Test scores, time quantity

	OLS		OLS		VA	
	β	*SE*	*β*	*SE*	*β*	*SE*
Weekly time spent with…						
(ref cat. With neither mother nor father)						
Alone with father	0.027***	0.006	0.020***	0.006	0.018*	0.007
Alone with mother	-0.002	0.003	-0.003	0.003	-0.001	0.003
Together with mother and father	-0.004	0.002	-0.002	0.002	0.001	0.002
Unknown	-0.006	0.016	0.006	0.015	-0.014	0.016
Basic controls						
Child's age (in months)	0.292***	0.003	0.288***	0.003	0.045***	0.008
Child is female	0.085	0.156	-0.006	0.148	-0.453***	0.137
Both diaries completed in ordinary day	-0.193	0.129	-0.088	0.124	-0.142	0.141
Child's mother completed both diaries	0.022	0.198	-0.031	0.187	-0.009	0.188
Extended controls						
At least one other child in household			-0.822***	0.148	-0.420**	0.142
Child speaks English at home			2.583***	0.275	0.554*	0.260
Child is Indigenous			-0.608	0.494	0.241	0.426
Low weight at birth			-1.418***	0.345	-0.395	0.307
Child's father has University degree			1.240***	0.171	0.962***	0.160
Child's mother has University degree			1.122***	0.168	0.469**	0.161
Family income, in $10,000			0.056***	0.012	0.024*	0.011
Father's weekly work hours, in 10s			0.038	0.048	-0.018	0.052
Mother's weekly work hours, in 10s			-0.094*	0.046	-0.052	0.045
Lag of PPVT score					0.386***	0.015
Intercept	49.290***	0.385	46.212***	0.485	45.124***	0.792
R^2	.54		.58		.39	
AIC / BIC	42,79 / 42,85		42,29 / 42,41		20,65 / 20,77	
n (children) / n (observations)	3,27 / 6,96		3,27 / 6,96		2,21 / 3,62	

Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. OLS: Ordinary Least Squares; VA: Value added. Significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

3.4.3. Hypothesis 2: Father-child time content

In a second set of models (Table 3), we examine the associations between children's PPVT scores and time spent between children and parents on different types of activities. Here, following Fiorini and Keane (2014), we leave out sleep time as the reference category. Consistent with Hypothesis 2, our results yield evidence of 'productivity hierarchies' in father-child time by activity type. In the OLS models with base controls, the stronger associations with PPVT scores are found for father-child time in educational activities (β=0.263; p<0.001), followed by structured activities (β=0.133; p<0.001), and finally unstructured activities (β=0.065; p<0.01). In the OLS model with extended covariates, a similar hierarchy can be observed –with the coefficient on time spent on unstructured activities no longer being statistically significant (p>0.05). In the value added model, only the coefficient on father-child time in educational activities remains statistically significant (β=0.138; p<0.01), with Wald tests (not shown) revealing that this is larger than the coefficients on structured and unstructured time (p<=0.05). To get a sense of the magnitude of the association, 5 additional weekly hours of father-child time in educational activities would increase PPVT scores by 9% of a standard deviation.

Table 3. Regression models of children's Peabody Picture Vocabulary Test scores, time content

	OLS		OLS		VA	
	β	*SE*	*β*	*SE*	*β*	*SE*
Weekly time in activity types (reference category: Time sleeping)						
With father						
Educational activities	0.263***	0.043	0.199***	0.042	0.138**	0.047
Structured activities	0.133***	0.030	0.104***	0.029	0.026	0.032
Unstructured activities	0.065**	0.025	0.042	0.024	0.045	0.032
With mother						
Educational activities	0.143***	0.022	0.106***	0.021	0.044	0.026
Structured activities	0.101***	0.022	0.077***	0.022	0.030	0.024
Unstructured activities	0.012	0.017	0.006	0.016	-0.013	0.023
With mother and father together						
Educational activities	0.159***	0.023	0.131***	0.022	0.094***	0.026
Structured activities	0.078**	0.026	0.065**	0.025	0.033	0.025
Unstructured activities	-0.019	0.016	-0.010	0.015	0.003	0.019
With neither mother nor father						
Educational activities	0.112***	0.021	0.094***	0.020	0.068**	0.021
Structured activities	0.056***	0.013	0.041**	0.013	0.015	0.015
Unstructured activities	0.000	0.015	0.006	0.014	0.022	0.018
Time in other activities						
Attending school/kindergarten	0.045***	0.012	0.042***	0.012	0.007	0.014
Social activities	0.045***	0.012	0.032**	0.012	-0.009	0.012
Routine care	-0.004	0.014	0.006	0.014	0.006	0.015
Unknown	0.085***	0.013	0.075***	0.013	0.024	0.014
Basic controls	Yes		Yes		Yes	
Extended controls	No		Yes		Yes	
Lag of PPVT score	No		No		Yes	
R^2	0.565		0.590		0.398	
AIC / BIC	42,551 / 42,695		42,151 / 42,356		20,635 / 20,827	
n (children) / n (observations)	3,273 / 6,960		3,273 / 6,960		2,215 / 3,628	

Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. OLS: Ordinary Least Squares; VA: Value added. Full set of estimates available from the authors upon request. Significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

3.4.4. Alternative specifications

To test the robustness of the associations reported thus far, we replicated the models presented before using alternative estimators (Table 4). First, we re-estimated the associations of interest via fixed effects models. These panel regression models better account for time-constant unobserved heterogeneity by considering only within-cluster changes in the panel data, i.e., by comparing the outcomes of the same children at different time points (Allison, 2009). Second, we used random effect panel regression models, which capture unobserved effects via the inclusion of a child-specific random intercept but require orthogonality between the observable and unobservable variables (Wooldridge, 2010: Chapter 10). Third, we re-estimated the associations using a 'value-added plus lagged inputs' model that includes lags of all time-varying covariates and the outcome variable amongst the controls. By doing this, the model allows achievement at a given age to depend not only on achievement at time *t*-1, but also on a cumulative history of productive inputs (see Todd and Wolpin, 2007; Fiorini and Keane, 2014: 805). The pattern of results in these models was similar to that in the models discussed before. Total time with father was positively and significantly associated with higher PPVT scores (top panel), with father-child time in educational activities being particularly productive (bottom panel). As an exception, the coefficient on total father-child time was not statistically significant in the fixed effects model. This suggests that the small positive associations observed in other models

disappear in this more conservative estimation approach which accounts better for time-constant unobserved heterogeneit

Table 4. Alternative estimation approaches

	Fixed effects		Random effects		Value-added + lagged inputs	
	β	*SE*	*β*	*SE*	*β*	*SE*
Total time model						
(ref. cat. Total time with neither father nor mother)						
Total time with father	0.007	0.007	0.014*	0.006	0.016*	0.008
R^2	0.746		0.743		0.388	
AIC / BIC	34,44 / 34,54		42,29 / 42,42		20,09 / 20,23	
n (children) / n (observations)	3,273 / 6,960		3,273 / 6,960		2,215 / 3,523	
Time-content model						
(ref. cat. Sleep time)						
Educational activities with father	0.133**	0.045	0.167***	0.038	0.130**	0.049
Structured activities with father	0.087**	0.032	0.103***	0.027	0.021	0.033
Unstructured activities with father	-0.019	0.028	0.020	0.023	0.032	0.034
R^2	0.755		0.473		0.394	
AIC / BIC	34,22 / 34,39		42,29 / 42,40		20,086/ 20,37	
n (children) / n (observations)	3,273 / 6,960		3,273 / 6,960		2,215 / 3,523	

Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. All models control for a set of basic and extended controls. The total time model controls for unknown time and the time-content model controls for other time uses (as in Table 3). The 'value-added + lagged inputs' model is specified as in Fiorini and Keane (2014: 805): predictors include lags of all time-changing time-use and control variables, as well as the lag of the outcome variable (i.e. the PPVT). Random effects models are estimated using maximum likelihood estimation. The R^2 statistics for the fixed effects models refer to the *within* R^2. Full set of estimates available from the authors upon request. Significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

We also tested the robustness of the results to different methodological choices (see Table A2 in the Appendix). First, we tested the sensitivity of our father-child time estimates to possible downward bias due to 'noisy' time-use measures derived from non-representative days (Wolfers, 2015). To accomplish this, we estimated models using only the subsample of children for whom the weekday and weekend time-diary days were ordinary days (56% of all observations). The estimates on total father-child time are similar in magnitude to those reported in the main models, but fail to reach statistical significance. The coefficients for father-child time in different types of activities are also similar, with the estimate on educational time being large and statistically significant across specifications. Second, we tested the sensitivity of the results to using discrete rather than continuous time-use categorizations, separating fathers who do not spend any time with their child, fathers who spend some time, and more involved fathers (see Fomby and Musick, 2017; Kalil and Mayer, 2016). Results from the value added model provide evidence of gradual improvements in children's PPVT scores with the degree of paternal involvement for total time, returns to time in educational activities only amongst highly involved fathers, and no differences by degree of involvement for time in structured or unstructured activities. Third, we considered quadratic specifications of the father-child time variables to capture potential non-linear associations. Our results reveal little evidence of the latter – as denoted by mostly statistically insignificant parameters on the square terms. Fourth, we replicated our analyses excluding a small subset of observations from children who were not yet at school during wave

1 (28% of all observations), as these children may undertake significantly different daily routines. The results from these models were again consistent with those presented in the body of the text. Results from a fifth sensitivity analysis are discussed below.

3.4.5. Hypothesis 3: Effect heterogeneity by paternal education

In a final set of models we examine whether or not the estimated associations between children's PPVT scores and father-child time (in general and across activity types) differ by paternal education (Table 5). This is accomplished by adding to the models variables interacting paternal highest educational qualification (degree/lower than degree) and the father-child time-use variables. Against the predictions of Hypothesis 3, all of the interaction terms were statistically insignificant ($p>0.05$), indicating that the degree to which children's cognitive functioning benefits from paternal involvement does not differ in families with highly and less highly educated fathers.

Table 5. Regression models of children's Peabody Picture Vocabulary Test scores, interactions with paternal education

	OLS		OLS		VA	
	β	*SE*	*β*	*SE*	*β*	*SE*
Total time						
Child's father has University degree	1.939***	0.186	1.303***	0.196	0.980***	0.188
Total time with father	0.028***	0.007	0.023***	0.007	0.019*	0.008
University degree * Total time with father	-0.014	0.012	-0.009	0.012	-0.003	0.015
R^2	0.560		0.581		0.391	
AIC / BIC	42,606 / 42,681		42,293 / 42,423		20,655 / 20,779	
n (children) / n (observations)	3,273 / 6,960		3,273 / 6,960		2,215 / 3,628	
Time content						
Child's father has a University degree	1.611***	0.185	1.164***	0.193	0.890***	0.189
Educational time with father	0.126***	0.021	0.106***	0.021	0.044	0.026
Structured activities with father	0.092***	0.022	0.077***	0.022	0.030	0.024
Unstructured activities with father	0.012	0.017	0.006	0.016	-0.013	0.023
University degree * Educational activities with father	0.014	0.083	0.021	0.079	-0.013	0.090
University degree * Structured activities with father	-0.027	0.055	-0.026	0.054	-0.015	0.061
University degree * Unstructured activities with father	-0.042	0.048	-0.046	0.047	0.029	0.063
Basic controls	Yes		Yes		Yes	
Extended controls	No		Yes		Yes	
Lag of PPVT score	No		No		Yes	
R^2	0.573		0.590		0.398	
AIC / BIC	42,423 / 42,594		42,155 / 42,381		20,641 / 20,852	
n (children) / n (observations)	3,273 / 6,960		3,273 / 6,960		2,215 / 3,628	

Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. OLS: Ordinary Least Squares; VA: Value added. Full set of estimates available from the authors upon request. Significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

In alternative specifications we replicated these analyses using a more disaggregated categorization of paternal education (see Cha and Song, 2017). This differentiates between degree or higher qualifications (33.8% of observations), professional qualifications (43.1%), Year 12 (11.3%) and below Year 12 (11.8%). Results, shown in Table A3 in the Appendix, were similar to those presented here. We also re-estimated the models splitting the sample by the dichotomous indicator of paternal degree education, which is statistically equivalent to interacting paternal University education with all predictors. The coefficients on father child time were comparable in the models for degree-educated and non-degree-educated fathers. Altogether, results from these robustness checks are consistent with those in the main models, providing no evidence that paternal education moderates the relationships between father-child time (overall or educational) and children's PPVT scores in our Australian sample.

3.5. Discussion

In this paper we have provided what, to our knowledge, constitutes the first systematic account of how father-child time is associated with children's cognitive functioning (operationalized using the PPVT) using longitudinal time-diary data. In doing so, we contribute to both the literature on the role of fathers in child development (Cabrera et al., 2007; Lamb, 2010; Pleck, 2010) and emerging empirical evidence documenting how parental time inputs and

involvement in childcare are associated with child development – a body of work which has focused almost exclusively on maternal rather than paternal time with children (Milkie et al., 2015; Fomby and Musick, 2017). We accomplished this by leveraging high-quality panel survey data from the *Longitudinal Study of Australian Children* spanning from 2004 to 2010, which collects information from children aged 4 to 8. Our results lead to three conclusions regarding the associations between father-child time and children's cognitive functioning, which we discuss in turn.

First, our analyses provided some evidence that higher amounts of father-child time overall are associated with higher levels of cognitive development in their children, consistent with Hypothesis 1. However, the magnitude of association was rather small. For example, in the value-added model, 5 additional hours of father-child time in a given week were associated with an increase of about 0.1 in the PPVT, which ranges from 0 to 100, or about 2% of its standard deviation. In alternative, more conservative, fixed effects models that account for time-constant unobserved heterogeneity, the effects of total father-child time were in fact not statistically significant. This suggests that unobserved effects may be responsible for the small associations observed in the other specifications. Yet fixed effects models are known to be (i) highly susceptible to 'noisy' data (Griliches and Hausman, 1986), such as time-use diary data, and (ii) not as helpful in accounting for reverse causation as some of the other specifications considered here, such as the value-added models (Gunasekara, Richardson, Carter and Blakely, 2014). Jointly, these

issues may have led to downward-biased estimates in the fixed effects models. In any case, the small or inexistent associations between total father-child time and child outcomes reported here are consistent with earlier US literature focusing on motherhood. For example, Fomby and Musick (2017) found very small associations between mother-child time and children's reading scores. Similarly, Milkie et al. (2015) found no evidence of statistically significant associations between mother-child time and several measures of children's academic and behavioral outcomes.

Interestingly, while the estimated associations between total father-child time and child cognitive outcomes ranged from very small to non-significant, those for mother-child time were even smaller and statistically insignificant in our sample. In fact, the estimated associations between PPVT scores and total father-child time are significantly larger than those of mother-child time (at $p<0.01$) (results not shown). This result is perhaps surprising and might be due to different factors. First, children coming from families with an involved father might be exposed to other unobserved characteristics that enhance their development (e.g. higher levels of social capital, or less parental conflict) (Cabrera et al., 2007; Lamb, 2010), some of which may remain unaccounted in our models. Consistent with this notion, differences between the coefficients on maternal and paternal overall time with the child in fixed-effects models are not statistically significant ($p>0.05$) – which despite the aforementioned *caveats* are generally deemed as better able to account for unobserved effects. Second, mothers may be more likely than fathers to make sure that

the child is undertaking appropriate developmental activities, even when they are unable to be present themselves. This is consistent with the notion of "extensive mothering", whereby mothers who delegate substantial amounts of day-to-day childcare to others define "good mothering" as ensuring their children's wellbeing through controlling their daily routines (Christopher, 2012). Hence, mothers may be more likely than fathers to positively affect their children's wellbeing while being away. A final possible explanation is that maternal behavior may be aligned more tightly than paternal behavior with contextual factors such as parental education or family income which are already included in the models.

A second conclusion drawn from our analyses is that father-child time is more strongly associated with children's cognitive outcomes when that time is spent in educational activities (such as reading or educational play), which is consistent with Hypothesis 2. Irrespective of the modelling approach used, father-child time spent in educational activities displayed larger positive associations with children's cognitive functioning than father-child time spent in structured activities (such as extracurricular activities or sports) or unstructured activities (such as watching TV or using a computer). The magnitude of these associations appeared to be moderate to large. For instance, in the value-added model the increase in PPVT scores associated with 5 extra weekly hours of father-child time in educational activities was equivalent to about 9% of the standard deviation in the PPVT, and comparable to the estimated effect of having a parent with University-level qualifications. The *hierarchy*

of productivity across activity types is highly consistent with findings on maternal involvement in the US by Hsin and Felfe (2014), as well as findings for time spent with either parent in Australia by Fiorini and Keane (2014). This result is generally robust to different model specifications, and estimation approaches (see Fiorini and Keane, 2014). Our findings therefore add to theoretical perspectives and a growing body of evidence demonstrating that it is not the amount of parent-child time that matters, but the content of the activities undertaken between the parent and the child during their joint time (Amato, 1998; Hsin, 2009; Lamb, 2010; Pleck, 2010). Sharing activities such as reading, playing games, doing homework, or participating in social events with their father appears to lead to more positive outcomes amongst children than father-child time that is spent somehow else. Whether it is father-child time expenditure in specific educational activities or a 'healthy' packaging of different father-child educational activities that makes a difference remains an open question to be addressed in further research.

A third conclusion drawn from our analyses is that father-child is *not* more strongly associated with children's cognitive functioning when fathers are highly educated. Against the predictions contained in Hypothesis 3, we found no evidence that one-hour of father-child time yields more benefit to the child when fathers have tertiary education qualifications. Instead, our results indicate that one hour of father-child time (overall, as well as across activity types) yields the same returns to the children of highly and less highly educated fathers. This finding can be taken in a positive light: it suggests that

paternal involvement matters for disadvantaged children as much as it does for advantaged children. That is, paternal involvement in childcare *need not* be a mechanism driving social inequalities and diverging destinies amongst children. Fathers with low educational credentials can compensate for their children's developmental deficits (see Ermisch et al., 2012) by spending more time with them – provided that, as previously discussed, they engage in educational activities.

Nevertheless, this is not to say that parental paternal does not matter. Paternal education remains important in two key ways. First, even after controlling for multiply observable and unobservable sources of confounding and several intervening mechanisms (e.g., parental income and father-child time), paternal education significantly and substantially improves children's cognitive functioning in our Australian sample. For example, in the value-added model in Table 2, having a parent with University qualifications was associated with an increase of nearly one-unit (or 12% of a standard deviation) in PPVT scores, *ceteris paribus*. This pattern of results is consistent with findings from other studies examining the effect of paternal education on child outcomes (see e.g. Chevalier, 2004; Dickson et al., 2016). Second, consistent with recent scholarship (see e.g. Craig and Mullan, 2011; Altintas, 2015; Cha and Song, 2017), we find that fathers who hold University degrees spend more time with their children than parents who do not have University degrees. More specifically, degree-educated parents spent an average of 7.75 hours per week with their children, of which 0.84 hours were in educational

activities. In contrast, fathers with lower educational credentials spent an average of 6.79 hours per week overall, 0.55 hours in educational activities (see Figures A1 and A2 in the Appendix). The existence of these differences, which were statistically significant ($p<0.05$), stresses the importance of differential time investments in children between highly and lowly educated fathers as a driver of differences in their children's cognitive functioning. Altogether, our findings about the relationships between paternal education, time-use and child outcomes suggest that the main mechanism whereby highly educated parents transfer their advantage onto their children is via an investment surplus in educational activities, consistent with the theory of 'concerted cultivation' (Lareau, 2011).

Although the impact of father-child time overall and in educational activities on children's cognitive functioning was not found to vary by paternal education, such impact may vary by other paternal characteristics that may be associated with cognitively stimulating father-child exchanges. Putative candidates include paternal work in a cognitively demanding job (a proxy for paternal day-to-day engagement in complex thinking), paternal parenting style (e.g., autonomy-encouraging, warm, or consistent parenting), paternal self-efficacy and paternal aspirations for the child. Future research should examine whether these and other father characteristics moderate the relationships between different sorts of father-child time and the cognitive functioning of their offspring.

3.5.1. Study limitations and avenues for further research

Despite the uniqueness of our study, the data at hand and our methodological approach, some *caveats* to our findings need to be acknowledged. These point towards potential avenues for methodological refinement and further scholarly inquiry. First, an inherent problem with time-diary data, such as the LSAC data, is the relatively large incidence of 'missingess'. For example, even after making assumptions about missing data during some parts of the day as sleep or school time, we are still unable to determine which type of activity the child was doing for about 6 hours per week. This issue may have led to attenuation of our estimates on the effects of father-child time on children's PPVT scores.

Second, the majority of the time-use data on father-child time in LSAC was reported by mothers (91.2% of weekday and 88.4% of weekend diaries), rather than fathers (6.2% of weekday and 7.8% of weekend diaries). When mothers are not present, they may be unaware of whether or not the child was indeed with the father or, perhaps more obviously, of the content of father-child activities. This may introduce measurement error to our measures of father-child time, which may in turn dilute their associations with children's cognitive outcomes. Social desirability biases may also result in downward bias in the mother-reported amount of father-child time, as mothers may follow normative scripts of 'women as main carers' and over-report their own involvement. A few studies have examined the validity of maternal reports of father involvement in childcare.

Their findings indicate that mothers report less paternal involvement than fathers do, although the correlations between maternal and paternal reports are high (Coley and Morris, 2002; Hernandez and Coley, 2007; Mikelson, 2008; Charles et al., 2018). A common conclusion is that *"the use of maternal survey reports of father involvement appears to be a defensible practice"* (Hernandez and Coley, 2007: 8). Some studies find that mother-father agreement is higher about behavioral aspects of father involvement – including hours of care (Coley and Morris, 2002), though others find less agreement on concrete, direct forms of involvement/engagement – such as playing or reading stories (Charles et al., 2018). Two factors add confidence to our results. First, LSAC requests that data be collected from the parent who knows more about the child and his/her routines (the Parent 1 or P1) (Mullan, 2014). Second, our sample comprises only co-resident biological parents – for which studies find disagreement to be smaller (Coley and Morris, 2002; Charles et al., 2018), with some exceptions (Mikelson, 2008). Co-resident parents should be more knowledgeable about the activities undertaken between the child and the other parent than parents sharing parenting responsibilities with a non-resident parent. They may also be able to consult each other when completing the diaries, or complete them in tandem. While the number of children whose diaries were exclusively completed by fathers is too small for meaningful analysis, in sensitivity analyses we re-estimated our models excluding these cases. The results were highly consistent with those reported here (see Table A2 in the Appendix).

Third, we would not claim that the results reported here represent causal effects. Not only unobserved heterogeneity – as previously discussed – but also reverse causality remains a looming cause of bias to estimates of how parental involvement in childcare relates to child wellbeing: parents may spend more time (particularly educational time) with their children if they perceive that their children's cognitive development is slowed or impaired. This would result in downward-biased estimates on the effects of parent-child time on child outcomes in this and other studies. Unfortunately, traditional solutions to correct for reverse causation –including pseudo-experimental approaches– are difficult, if at all possible, to implement in this context –see Fiorini and Keane (2014: 792) or Todd and Wolpin (2007) for further discussion. For instrumental-variable regression specifically, finding appropriate instruments for multiple endogenous time-investment variables remains an insurmountable challenge. Methodological developments aimed at minimizing these possible sources of bias using survey data are required to respond to this concern. More radical innovation could be attained by implementing experimental designs that manipulate the amount and content of father-child time, which would require careful thinking about ethical challenges.

3.6. Conclusion

To conclude, our findings are not only novel but also relevant for policy and practice: they are indicative that enabling paternal involvement in their children's upbringing (e.g. by promoting work-

family balance amongst fathers) should bring moderate-to-high gains to their children in terms of cognitive functioning. The case for investing in paternal involvement in childcare becomes even more compelling when these results are considered vis-à-vis evidence suggesting that such involvement is also a factor contributing to improved maternal mental health, maternal labor force participation, and enhanced family functioning. Future studies should also address important questions that we have not covered in this study, such as how father-child time affects other child outcomes (e.g. children's socio-emotional functioning). In addition, our results relate to a single country, Australia, which features a highly idiosyncratic constellation of institutional features concerning parental involvement in childcare. For example, Australia is characterized by high levels of intensive parenting and policies that encourage mothers dropping out of the labor market or moving into part-time work to undertake the lion's share of the childcare. Identifying whether and how these and other features of the institutional environment contribute to the mix of parental time inputs on their children, and their outcomes, constitutes an important avenue for further research. The available evidence base is currently confined to the US and Australia, and so studies focusing on country contexts with differing institutional settings are urgently needed.

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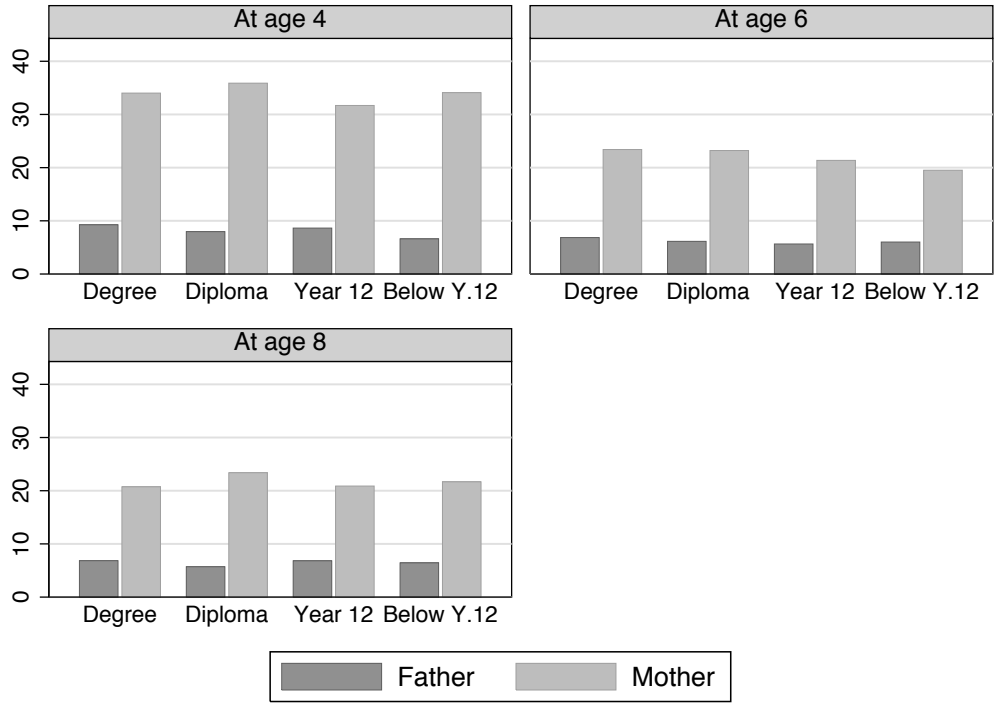
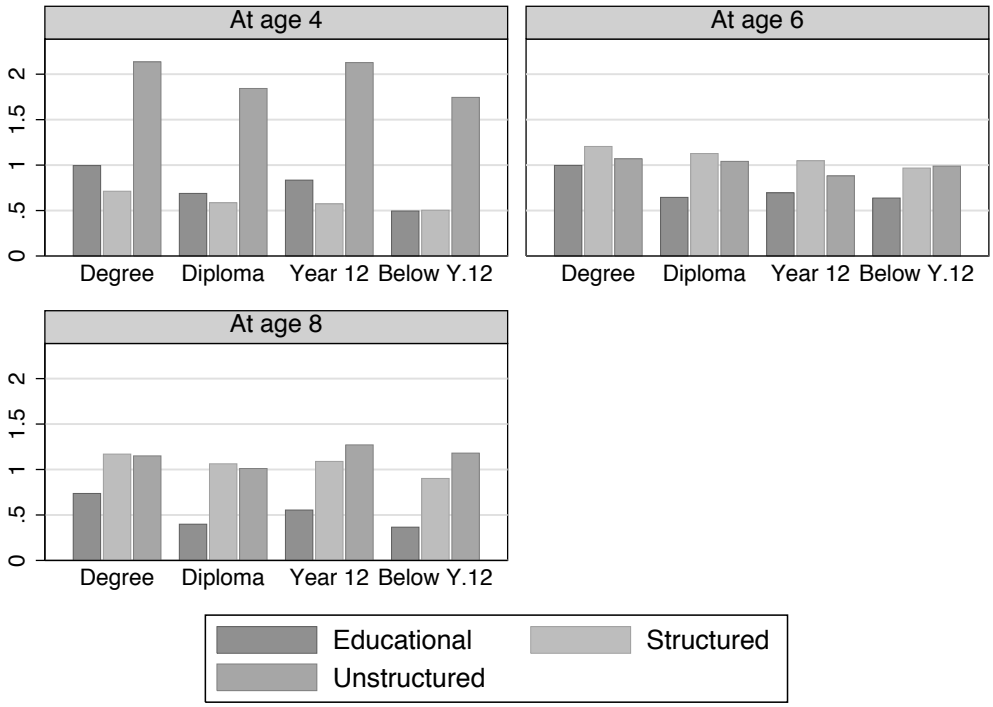
3.8. Appendix

Figure A1: Total time with father and mother alone by father's level of education and child's age.



Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. Time is measured in hours per week.

Figure A2: Time with father alone in different activities by father's level of education and child's age.



Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. Time is measured in hours per week.

Table A1. Correspondence between activities and time categories

Category	Activities
Educational	Reading, being read to, playing educational games, being taught to do chores
Structured	Lessons, structured physical exercise
Unstructured	Watching TV, computer, listening to music, doing nothing, other activity, other play
School	School, day care
Social	Visiting people, special event, party
Routine	Eating, drinking, being fed, bathe, dress, hair care, crying, upset, arguing, fighting, destroying things, held, cuddled, being reprimanded, corrected, walk for travel or for fun, riding bicycle, scooter, rollers
Sleep	Sleep, bed
Unknown	Not sure what child was doing, missing

Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3.

Table A2. Alternative specifications

	OLS		VA	
	β	*SE*	*β*	*SE*
Sensitivity analysis 1: Subsample of ordinary days				
Total time model				
Total time with father	0.012	0.009	0.016	0.011
n (children/ observations)	2,542 / 3,898		1,520 / 1,975	
Time-content model				
Educational activities with father	0.210***	0.058	0.191**	0.063
Structured activities with father	0.109**	0.036	0.044	0.042
Unstructured activities with father	-0.005	0.033	0.025	0.046
n (children/ observations)	2,542 / 3,896		1,520 / 1,975	
Sensitivity analysis 2: Categorical specifications				
Total time model				
Father not involved (0 hours)	Ref.	Ref.	Ref.	Ref.
0-6 hours per week	0.607***	0.155	0.368*	0.176
>6 hours per week	0.766***	0.157	0.412*	0.183
n (children/ observations)	3,273 / 6,960		2,215 / 3,628	
Time-content model				
Educational activities				
Father not involved (0 hours)	Ref.	Ref.	Ref.	Ref.
0-2 hours per week	0.250	0.171	0.156	0.200
>2 hours per week	0.900***	0.204	0.525*	0.233
Structured activities				
Father not involved (0 hours)	Ref.	Ref.	Ref.	Ref.
0-2 hours per week	0.298	0.187	0.289	0.212
>2 hours per week	0.823***	0.182	0.338	0.194
Unstructured activities				
Father not involved (0 hours)	Ref.	Ref.	Ref.	Ref.
0-2 hours per week	0.333*	0.167	-0.015	0.194
>2 hours per week	0.130	0.172	0.129	0.202
n (children/ observations)	3,273 / 6,960		2,215 / 3,628	
Sensitivity analysis 3: Quadratic specifications				
Total time model				
Total time with father	0.032**	0.011	0.025*	0.012
Total time with father, squared	-0.000	0.000	-0.000	0.000
n (children/ observations)	3,273 / 6,960		2,215 / 3,628	
Time-content model				
Educational activities with father	0.330***	0.071	0.167	0.086
Educational activities with father, squared	-0.017*	0.007	-0.004	0.009
Structured activities with father	0.172***	0.048	0.084	0.065

Structured activities with father, squared	-0.006	0.004	-0.006	0.006
Unstructured activities with father	0.026	0.044	0.045	0.062
Unstructured activities with father, squared	0.001	0.003	-0.000	0.005
n (children/ observations)	3,273 / 6,960		2,215 / 3,628	
Sensitivity analysis 4: Excluding children in early childcare education				
Total time model				
Total time with father	0.020**	0.007	0.018*	0.007
n (children/ observations)	2,922 / 5,057		2,215 / 3,628	
Time-content model				
Educational activities with father	0.197***	0.049	0.138**	0.047
Structured activities with father	0.091**	0.032	0.026	0.032
Unstructured activities with father	0.061*	0.030	0.045	0.032
n (children/ observations)	2,922 / 5,057		2,215 / 3,628	
Sensitivity analysis 5: Excluding time diaries completed by fathers				
Total time model				
Total time with father	0.021**	0.006	0.020*	0.008
n (children/ observations)	3,194 / 6,675		2,155 / 3,488	
Time-content model				
Educational activities with father	0.221***	0.044	0.160**	0.051
Structured activities with father	0.083**	0.029	0.000	0.034
Unstructured activities with father	0.031	0.025	0.041	0.034
n (children/ observations)	3,194 / 6,675		2,155 / 3,488	

Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. OLS: Ordinary Least Squares; VA: Value added. The time thresholds used to define categorical measures of time are chosen so that sample members with non-zero variables are split into two similarly sized groups. For total time, 33.9% of fathers spent 0-6 weekly hours with the child, and 37.8% more than 6 hours. For educational time, 18.4% of fathers spent 0-2 hours, and 11.4% more than 2 hours. For structured time, 15.8% of fathers spent 0-2 hours, and 20.2% more than 2 hours. All models control for basic and extended covariates. Full set of estimates available from the authors upon request. Significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Table A3. Regression models of children's Peabody Picture Vocabulary Test scores, interactions with paternal education (disaggregated)

	OLS		VA	
	β	*SE*	*β*	*SE*
Total time model				
Total time with father	0.014	0.010	0.016	0.013
Child's father has a professional qualification	-1.260***	0.210	-0.857***	0.201
Child's father has Year 12 education	-0.895**	0.295	-0.939***	0.283
Child's father has below Year 12 education	-1.992***	0.287	-1.649***	0.292
Total time with father * Professional qualification	0.010	0.013	-0.003	0.016
Total time with father * Year 12 education	0.010	0.017	0.009	0.023
Total time with father * Below Year 12 education	0.000	0.020	0.015	0.022
n (children/ observations)	3,273 / 6,960		2,215 / 3,628	
Time-content model				
Educational activities with father	0.212***	0.059	0.130	0.070
Structured activities with father	0.088*	0.042	0.016	0.049
Unstructured activities with father	0.009	0.041	0.064	0.051
Child's father has a professional qualification	-1.098***	0.207	-0.743***	0.202
Child's father has Year 12 education	-0.907**	0.295	-0.894**	0.295
Child's father has below Year 12 education	-1.790***	0.288	-1.551***	0.294
Educational activities with father * Professional qualification	-0.018	0.088	0.067	0.100
Educational activities with father * Year 12 education	0.156	0.111	0.063	0.138
Educational activities with father * Below Year 12 education	-0.274	0.171	-0.272	0.141
Structured activities with father * Professional qualification	0.018	0.059	0.013	0.068
Structured activities with father * Year 12 education	0.080	0.095	0.020	0.110
Structured activities with father * Below Year 12 education	-0.007	0.093	-0.026	0.096
Unstructured activities with father * Professional qualification	0.040	0.050	-0.098	0.069
Unstructured activities with father * Year 12 education	-0.006	0.072	-0.017	0.094
Unstructured activities with father * Below Year 12 education	0.106	0.076	0.222*	0.093
n (children/ observations)	3,273 / 6,960		2,215 / 3,628	

Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. OLS: Ordinary Least Squares; VA: Value added. Full set of estimates available from the authors upon request. Significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

CHAPTER 4:

THE SOCIAL STRATIFICATION OF EMOTIONS: PARENTAL REARING PRACTICES AND THE INTERGENERATIONAL TRANSMISSION OF SKILLS

Abstract

Social reproduction highlights how upper- and lower- class parents develop different styles of parenting that ultimately lead to children's unequal skill development. A less explored pathway in the intergenerational transmission of skills is represented by the dimensions of parenting (i.e., reasoning, consistency, warmth and anger). This study provides the first systematic account of how parents' social class shapes the dimensions of parenting and how these dimensions affect children's cognitive and non-cognitive outcomes. To accomplish this, I use a unique, longitudinal data from an Australian sample of children aged 4-8 years (Longitudinal Study of Australian Children; n=5,518 children/8,806 observations), and both random and dynamic panel regression models. Results show that patterns of social stratification are mainly structured through specific practices and behaviour with children (i.e., reasoning and consistency), while no social class differences are found within those dimensions addressing emotions investments (i.e., warmth and anger). I find parental "consistency" as the main dimension of parenting through which upper class mothers and fathers reproduce their social advantage. Children's non-cognitive outcomes are greatly affected by the four dimensions, while cognitive outcomes are only affected by paternal "consistency".

Keywords

Skills Development, Emotion Work, Social Stratification, Panel Data, Australia.

In a social system animated by competition for property, the human personality was metamorphosed into a form of capital. Here it was rational to invest oneself only in properties that would produce the highest return. Personal feeling was a handicap since it distracted the individual from calculating his best interest and might pull him along economically counterproductive paths.

Jean-Jacques Rousseau

4.1. Introduction

Children's family background is a critical indicator of their future destinies. In Western countries, children coming from privileged backgrounds have better skill development than disadvantaged children (OECD, 2015). As adults, they are more likely to have higher income, better health or to be employed (Duncan et al., 2010). This fact shows the constrained possibilities for disadvantaged children to develop their full potential across the life course as well as it has risen a deep academic debate about the mechanisms through which families transmit their skills and resources across generations.

Sociologists and economists alike suggest that parents transmit their socioeconomic status through investments of time and money (Bourdieu and Passeron, 1990; Becker and Tomes, 1979). Parents make these investments in the hope that they will promote future children's educational and economic success. The mechanisms forming this complex system of reproduction are at the core of social

stratification research. Previous research in this field have offered strong evidence on the role played by parental time inputs (Hsin and Felfe, 2014), cultural capital (Jæger and Breen, 2016), income (Yeung, Linver and Brooks-Gunn, 2010; Khanam and Nghiem, 2016), the compensation of disadvantageous life events (Bernardi, 2014) or the tailoring of educational activities to the developmental stages of children (Kalil et al., 2015). A less explored pathway within this literature is, however, the emotional work done at home (i.e., the parenting's *dimensions*).

In parallel to sociological research, developmental psychologists have been studying the role these dimensions play on child development since the 30s of past century (e.g., Symonds, 1939). This body of work concludes that, while some dimensions are detrimental for children's development, others play a crucial role in predicting future children's educational and socio-economic success (Conger et al., 2010). The assumption under which these dimensions play a central role in the intergenerational transmission of (dis)advantage is based on two connected ideas: (a) that there is a pattern of dimensions that vary by social class and (b) those dimensions where upper-class parents invest more efforts should be those having strongest positive effects on children's skill development.

This study identifies how social class shapes the dimensions of parenting and how these dimensions affect children's skill development, contributing to the literatures on social stratification, gender and child development in three key ways. First, this study

goes beyond the two parenting styles defined by Lareau (2011) (i.e., "concerted cultivation" and "natural growth") or the three styles defined by Baumrind (1991) (i.e., "authoritarian", "authoritative" and "permissive"). Rather, it focuses on the specific dimensions of such styles, bringing conceptual clarity and enabling a broader range of parenting components to be assessed. To my knowledge, this is the first study focusing on how social class shapes these dimensions. Second, it uses high quality longitudinal data and dynamic models of intergenerational transmissions in order to control for unobserved heterogeneity and endogeneity biases. Third, it explicitly models the role of fathers, bringing them into the equation of children's skill formation. To do so this study uses three waves from the K cohort of the *Longitudinal Study of Australian Children* and a sample of 8,806 observations from 5,518 children aged 4, 6 and 8 years old.

4.2. Theoretical framework

Following Darling and Steingberg (1993: 488), we can define the dimensions of parenting as "a constellation of attitudes toward the child that are communicated to the child and that, taken together, create an emotional climate in which the parent's behaviour are expressed." This definition is interesting because puts together values, behaviours and emotions. A critic on previous research about the intersection of class and parenting is based on its isolated analyses of either values (Hays, 1996), emotions (Hochschild, 1979) or behaviour (Kalil et al., 2014). The analysis of the dimensions of parenting solves this issue by capturing these three aspects

simultaneously. But, how does social class shape such dimensions and how do they impact child development? Next, I review the literature regarding the first arrow pointing from the social structure to parenting's dimensions and then the second arrow from dimensions to children's outcomes.

4.2.1. Dimensions of parenting

Parents transmit their social position to their children through three different channels: genetics, money and time (Becker and Tomes, 1979). Besides genetics, it is well-known that higher-class parents invest more resources (i.e., money and time) on their children than lower-class parents (Kornrich and Furstenberg, 2012; Sayer et al., 2004; Guryan et al., 2008). They invest these resources in the hope of promoting educational and economic success for their children (Jæger and Breen, 2016) and to prevent intergenerational downward mobility (Breen and Goldthorpe, 1997). This theoretical model is usually referred to as the *Family Investment Model* (FIM). However, while the FIM has devoted a great attention on how diverse sets of parental practices (e.g., time use, number of books at home, expectations, school monitoring) affect the intergenerational transmission of advantage, the psychological aspect of parent-child attachment and the emotional work at home have received surprisingly less attention.

Here I identify four dimensions capturing different aspects of parent-child attachment. Firstly, parental control, measured through two

distinct dimensions: reasoning and consistency[10]. *Reasoning* is based on a parental guide to children through communicative negotiations about *why* he or she has been corrected or punished, rather than the use of directives. *Consistency* is the process of setting clear rules and make sure the child understands them and follows correctly the requested tasks. Consistency also means parents dedicate special efforts in adapting the rules to the child's developmental stage. This is an important dimension because it sets the logic of cause and effect when jumping the rules as well as serves children to build up an important non-cognitive skill: the feeling of trust (for parents, themselves and others) (Corsini and Marsella, 1983). Trustful children tend to be more confident in their own abilities and those of others, facilitating self-direction, self-expression and independence. Secondly, parental support, captured through two dimensions: warmth and anger. *Warmth* is the expression of enthusiasm and praise for children's accomplishments, and demonstration of affection and love, while *anger* refers to frustration and irritability toward the child and negative emotional reactivity (Amato, 1990). A detailed list of

[10] Although consistent parenting is quite close to the concept of discipline, I distinguish it from other forms of discipline, like physical punishment. Previous research has documented that working-class parents correct their children using physical punishment more than upper-class parents, while the latter do so using reasoning, control or appeals to guilty (i.e., threats of loss of love) (Bronfenbrenner, 1958). Notably, social classes differ not only in *what* they do but also *when* they do it. In this regard, Kohn (1963) argues that working-class parents use discipline (physical punishment) to correct wild play (e.g., intolerable noise levels, damage of furniture) when these actions are extreme (i.e., they punish depending on the *intensity* of the wild play). However, middle-class parents use discipline (i.e., inductive reasoning and consistent-discipline) depending on their *interpretation* of the child's context: "they will punish a furious outburst when the context is such that they interpret it to be a loss of self-control, but will ignore equally extreme outburst when the context is such that they interpret it to be merely an emotional release" (op. cit., p. 478).

the specific questions included in each of the dimensions is shown in Table A1 in Appendix. The four dimensions have something in common: they imply parents emotional work and cognitive effort (i.e., attention).

Emotional work stresses the interplay between social structure, feeling's rules and emotions' management (Hochschild, 1979). Some ambiguity in its definition persists nowadays, but in previous conceptualizations the general underlying assumption is that emotional work involves managing emotions so that they are consistent with organizational display rules regardless of whether they are discrepant with internal feelings (Glomb et al., 2004). Illich (1981) labelled these efforts as *the shadow work* in an analogy to housework, that is, a type of parental activities that are unseen, do not count as work, but are critical in the creation of well-being. Hochschild argues the socialization learning includes feelings' control: the way in which parents express and suppress their emotions is in relation with culturally defined rules of feeling. She concludes that each social class, through the capacity in modulating the management of their emotions, "prepares its children to psychologically reproduce the class structure" (1979: 551). Households emotional resources are limited, and parents allocate them within a specific frame of constrains and preferences. Given a structure of preferences and constrains, parents might prioritise some emotional investments over others depending on the structure of skills' rewards they perceive as more valuable for their children's future jobs.

Because upper- and lower-class parents differ in their conditions of life, they develop different conceptions of both appropriate emotions and what is desirable for their children (Kohn, 1963). Thus, middle-class parents focus on *self-direction* while working-class parents focus on *conformity*. This is because middle-class occupations require greater doses of autonomy and imagination while working-class occupations require to follow rules set by someone else in authority. Bronfenbrenner's (1958) classic argument was based on the idea that in upper class households, due to higher level of education, the adaptation of their childcare practices is more responsive to those techniques suggested by experts as right or appropriate for the child. Cunha (2015) calls this the *subjective rationality:* upper-class do so because they are able to gather more information before taking decisions over childrearing. Bourdieu (1984) argues that these decisions will go in two directions: (a) to be visible distinguishable from lower-class parents and (b) to show the children "the rules of the game".

Strong parental control (i.e., high consistency and high reasoning) should lead children to better internalize the values of their parents (Baumrind, 1991) (i.e., their conceptions about "the rules of the game"). If upper-class parents have strong interests in reproducing their status and better knowledge of such rules, they might display forceful *consistency* as a mechanism of channelizing the cultivation of those skills that have higher returns in the labour market, which should be somewhat conditioned to their own job experiences. The

opposite would be what Lareau (2011) calls the "natural growth" style of parenting, typically found in lower-class parents: they leave more laissez-fare to their children, which is a combination of high *warmth* but low *consistency* and *reasoning*. On the contrary, she argues that working class families "tell their children what to do rather than persuading them with reasoning" (2011: 3). But certainly not only preferences and values regarding childrearing might explain differential emotional investments. The diminishing of material resources might affect the ability of parents to allocate efforts in their feeling's management.

In line with this, the Family Stress Model (FSM) focuses on stress as the underlying mechanism through which parents may see their parenting dimensions turn into negative (for a review see Masarik and Conger, 2017). The FSM highlights that difficult situations typically happening in lower-class and poor households like permanent low or inconsistent income would work as a stressor for parents and, therefore, reducing parental warmth and increasing anger between parents and children (Conger, Conger and Martin, 2010). Based on these postulates, I expect:

> Hypothesis 1: *Education and social class will have a positive effect on parents reasoning, consistency and warmth, while negative in anger.*

To my knowledge, only one sociological study has empirically tested this postulate (Chan and Koo, 2010). Using a sample of 1,138 households from the Youth Panel of the British Household Panel

Study, they did not find any significant association with social class. However, they focused on the "classics" styles of parenting (i.e., authoritative, authoritarian and permissive) and families with children into mid-teenhood (15-16 years old). They did find, however, associations between these styles and family structure, which was in line with the work of Astone and McLanahan (1991). A much larger body of research focusing on socio-economic status (SES) and parenting is found within developmental psychology. Yet, this body of research mainly focuses on the effect of poverty on parenting's dimensions. The results of this literature are mixed. As Bradley and Corwyn (2002: 384) postulated, "longitudinal studies provide substantial empirical support for the path linking low-SES to lower competence and maladaptive behaviour via harsh and neglectful parenting". However, a closer look within the developmental literature stands out that this common finding is not as robust as we might think. Some studies find weak (or lack of) relationship between SES and parental warmth (Davis et al., 2001; Davis-Kean, 2005). Yeung et al. (2002) even reported evidence of a negative relationship.

4.2.2. Children's skill development

Skill development is the precursor of children's future educational attainment. Cognitive skills are those set of abilities associated with learning and problem solving. Children with well-developed cognitive skills have a good command of memory and speed of thought and also well-coordinated psychomotor, verbal and spatial

abilities. On the other hand, non-cognitive skills are those abilities defined by a good balance of emotional maturity, empathy, motivation, discipline, mental well-being, interpersonal skills or verbal and non-verbal communication. These sort of skills, as well as cognitive ones, strongly influence educational (DiPrete and Jennings, 2012; Duncan and Magnuson, 2011) and labour market outcomes (Cunha et al., 2010; Hall and Farkas, 2011).

During the last two decades economists have invested great efforts in studying how these skills are created during early and mid-childhood and how they affect outcomes later in live (Heckman, 2006; for a review see Heckman and Mosso, 2014), following the ideas postulated by Rousseau more than two hundred years ago; namely, that the human personality was metamorphosed into a form of capital, leading parents to rationally invest only in properties that would produce the highest returns in their children. Recent developments within this strand of work have started to consider that parents not only modulate children's development through time and money investments but also through the style they parent (Cosconati, 2013; Doepke and Zilibotti, 2017).

As noted above, an important distinction must be made between those dimensions addressing specific practices (i.e., reasoning and consistency) and those addressing emotional work (i.e., warmth and anger). Practices represent the channel through which mothers and fathers directly support their children in developing their skill (Darling and Steinberg, 1993), while emotional work serves as a

mechanism through which children may open (warmth) or close (anger) themselves to greater parental influence, seriously enhancing or undermining the parent-child connection and closeness (Aston and McLanahan, 1991). Therefore, the four dimensions represent four direct and indirect channels via which cognitive and non-cognitive outcomes are affected. Previous research in sociology and developmental psychology has shown the different pathways through which these practices and emotional investments affect children's outcomes.

Firstly, reasoning and consistency are two dimensions shown by Lareau (2011) not only as more typical of upper class families but also offering formidable advantage to their children through a complex system of interactions. On the one hand, children exposed to greater doses of reasoning have the chance of, after being corrected, discuss with parents *why*. That offers children the possibility to learn at home communicative tools that are rewarded in other institutions (e.g., schools) (Han, 2017). Examples of specific tools are the ability to defend their own decisions over individual preferences and tastes, articulate coherent arguments in support of their cultural orientations and engage in conversations on a variety of topics with other agents outside home (e. g., teachers). On the other hand, the consistency of the parenting offers children tools to behave in a structured order during their everyday life. Details like always being on time or table manners represent the sort of behaviours that pay well off outside home. Overall, developmental psychology highlights how consistent parenting is a key way in boosting

children's trust on themselves, their parents and others. Trusting children end up developing a strong *sense of security* (Waldfogel, 2006). Also, consistent parenting includes *responsiveness;* that is, parents with greater consistency adopt their interactions depending on the child's needs, status and developmental stage (Waldfogel, 2006). Therefore, the combination of high doses of reasoning and consistency might offer a wide set of tools for children to feel confident on the knowledge of the structure of power's divisions inside and outside home (parents-children; teachers-students; employer-employee) and behave in accordance to them. Importantly, it also gives the ability to know *how* to challenge someone's else authority and *when* is the appropriate moment to do so (Lareau, 2011).

Secondly, warmth and anger are two dimensions repeatedly shown by developmental psychologists to be in the core of non-cognitive skills development. The Family Stress Model explicitly argues that children exposed to parental anger may see their socio-emotional development threatened by the lack of attention and parent-child connection (Conger et al., 2010). Conversely, children in households where the emotional climate is characterized by high levels of warmth might experience a decrease of the risk of internalizing (e.g. symptoms of depression and anxiety) and externalizing (e.g. problems of conduct and hyperactivity) (Fiorini & Keane, 2014). On the contrary, anger might increase children's resistance to parental advice, and this resistance might attenuate the otherwise beneficial

effects of parental involvement (Darling and Steinberg, 1993). Therefore, I consider that:

> Hypothesis 2: *Reasoning, consistency and warmth will have a positive effect on children's cognitive and non-cognitive outcomes while the effect of anger will be negative.*

Previous research like Chan & Koo (2010) finds a strong association between the style of parenting (e. g. authoritarian, authoritative, permissive) and a wide range of youth outcomes, including subjective well-being and self-esteem, health and risky behaviour. Kiernan & Huerta (2008) and Ermisch (2008) using the Millennium Cohort Study found an association between parental discipline and a reduction of children behavioural problems, suggesting that the dimensions of parenting represent a relevant channel in the intergenerational transmission of advantage.

4.3. Data and method

This study uses data from *Growing Up in Australia: The Longitudinal Study of Australian Children* (LSAC). LSAC is a biannual birth-cohort study which since 2004 collects information on Australian children and their families from the study child, his/her parents and a teacher/carer through a combination of face-to-face and self-complete questionnaires and it is expected to continue running until at least 2020. The LSAC follows two cohorts of children: one born March 1999–February 2000 (4,983 children) and one born

March 2003–February 2004 (5,107 children). These are known as the "Kindergarden cohort" (K) and the "Birth cohort" (B) respectively (see Table 1). The LSAC sample is largely representative of two cohorts of Australian children. For further details on the study's methodology, see Australian Institute of Family Studies (2015). One of the great advantages of LSAC is that it provides extensive information about the interactions children have with their parents, allowing to construct several measures of the dimensions of parenting that capture the emotional climate at home and the specific parental practices.

This study is restricted to the first three waves of K cohort, when children are 4, 6 and 8 years old, for both theoretical and technical reasons. First, that age is when children's skills are more malleable by parents (Heckman, 2006). Second, waves 1-3 of K cohort provide the same tests scores to measure skills across the three different waves. Third, this age represents a developmental stage when all dimensions are applicable (e.g., inductive reasoning is not applicable in infancy). The final subsample is formed by children living with both biological cohabiting or married parents. This decision is motivated by the specific interest in modelling the role of fathers in child development and non-resident fathers vary dramatically in their child's attachment. Non-resident fathers or mothers' new partners are considered to develop different ways to cultivate children's skill formation (Hofferth, 2006). Motivations, expectations and interactions significantly vary across different father figures raising children who are not biological. Mothers' new partners have shorter

relationships on average, they invest less in children and, even when they have responsibility in the childcare, they do not have similar perceptions and legitimation (Manning, Smock, and Majumdar, 2004). Altogether children from non-biological unmarried fathers have been found to fare significantly worse (Hofferth, 2006). Also, previous research (Hsin and Felfe, 2014) argues that estimates from non-resident fathers' data collection are not reliable since mothers do not reliably report what the child was doing with a non-resident father when she was not present. After excluding children with missing information in the variables included in the analyses, the final sample is 6814 observations from 3109 children.

Table 1: Average age and year at field's interview.

	Wave 1	**Wave 2**	**Wave 3**
"K" cohort	4 years and 9 months	6 years and 10 months	8 years and 10 months
"B" cohort	9 months	2 years and 10 months	4 years and 10 months
Year	2004	2006	2008

Note: "K" stands for Kindergarten and "B" stands for Birth.

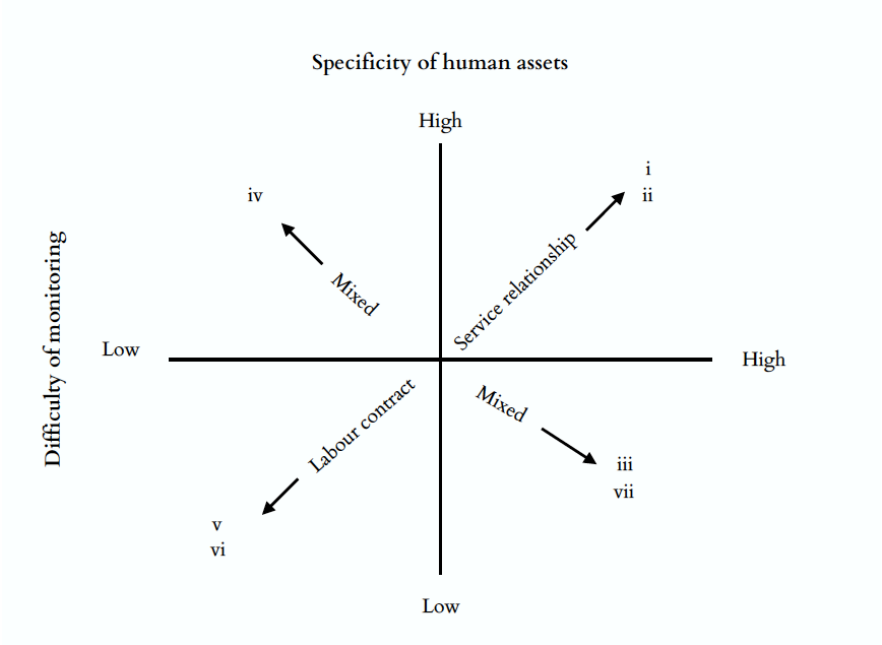
4.3.1. Education and class.

Parents' education are two categorical variables, one for fathers and one for mothers. They are divided in three ordered categories: (i) University degree, (ii) Professional qualifications or more than 12 years of education (High secondary) and (iii) Below 12 years of education (Low secondary). Class is based on labour force status, skill level and occupation as defined by the Australian and New

Zealand Standard Classification of Occupations (ANZSCO) (for more information see Australian Bureau of Statistics, 2006). The measure defined by ANZSCO is connected to the relations of production account of Wright (1997) and the class scheme defined by Erikson and Goldthorpe (1992) (see also Figure 1). I consider both father's and mother's class. The class categories are (i) *Managers*, defined by the possession or control of properties and operations of government, commercial, agricultural, industrial and other organizations, and skills levels 1 (bachelor degree) or 2 (diploma) (e.g., general managers, legislators, finance managers; farm managers); (ii) *Professionals*, defined only by the possession of skill assets and the performance of analytical, conceptual and creative tasks (skills levels 1 and 2) (e.g., engineers, physical and social scientists, lawyers, educators or actors); (iii) *Skilled technicians*, defined by a limited power over others' labour, lack of properties and the performance of a variety of skilled tasks applying in-depth technical, industrial or trade specific knowledge (skill levels 2 and 3 [higher certificate]) (e.g., motor mechanics, construction workers, scientific technicians or chefs); (iv) *Intermediate production workers*, defined by the provisions of service, the organization and manipulation of information, the sale of goods and/or operation machinery (skill levels 3, 4 [lower certificate] and 5 [secondary]); (v) *Labourers,* defined by nonsupervisory employees, work is predominantly blue-collar and manual in character (skills levels 4 and 5) (e.g., cleaners, farm workers, packers); and (vi) *Unemployed.* The latter category represents an especially interesting critical life event, which is relevant to capture possible sources of variation in the

dimensions of parenting as defined by the Family Stress Model. Finally, I also include a seventh category only for mothers capturing those who are (vii) *not in the labour market* (i.e., predominantly housewives).

Figure 1: Dimensions of work as sources of contractual hazard, forms of employment contract, and location of employee classes of the schema.



Note: Adaptation based on Goldthorpe (2000: 223, figure 10.2).

4.3.2. Dimensions of parenting.

I use four dimensions mother- and father-reported: reasoning, consistency, warmth and anger. The items used to measure reasoning and warmth in LSAC data were developed by Paterson and Sanson (1999), while the items of consistency and anger were inspired by those previously included in the National Longitudinal Study of

Children & Youth in Canada (Statistics Canada, 1999). All four dimensions are created by using the mean of a number of items capturing the distinct dimensions (for the specific item included in each dimension, see Table A1 in appendix). All questions' responses were on a 5-point Likert scale, ranging from 1 = "never/almost never" to 5 = "all the time". The final four dimensions follow the same ranging, scoring from 1 (lowest) to 5 (highest). The focus in measures of dimensions instead of styles has at least two advantages. First, this approach uses all of the existing data and it can examine the independent effects of each of the parenting's dimensions (Power, 2013). Second, it maximises conceptual clarity and enable to a broad range of parenting construct to be assessed (Zubrick et al., 2014). For more information about the measurement of the dimensions of parenting as included in LSAC, see Zubrick et al. (2014).

4.3.3. Children's cognitive and non-cognitive outcomes

Cognitive outcomes are measured using a short version of the Peabody Picture Vocabulary Test, version three (PPVT-III) administered by a survey interviewer. The PPVT-III is a validated and widely used psychometric test that measures children's knowledge of the meanings of spoken words and his/her receptive vocabulary (Dunn and Dunn, 1997). Its implementation involves an examiner presenting the child with four images, together with a word that describes one of these images. The examiner then asks the child to identify the appropriate image. The complexity of the words and images varies by child's age to match the test's difficulty with

developmental stages. PPVT-III scores range from 0 to 100, where higher scores denote higher cognitive ability.

Children's non-cognitive skills are captured using the Strengths and Difficulties Questionnaire (SDQ) (Goodman 1997). This is a well-established measure commonly used in developmental literature (e.g., Kiernan and Mensah 2009). The version of the SDQ included in LSAC consists of 25 questions about typical child behaviours over the preceding 6 months that are grouped into 5 domains: (i) hyperactivity, (ii) emotional symptoms, (iii) conduct problems, (iv) peer problems and (v) pro-social behaviour. Possible responses for every item were [0] 'not true', [1] 'somewhat true', and [2] 'certainly true'. Child functioning in each of the 5 domains is summarized by adding up the scores in each of the 5 items. The overall SDQ index is calculated by summing scores in all 5 domains and can range from 0 (best outcome) to 35 (worst outcome). The specific items measured in each of the 5 domains are as follow:

1) *Hyperactivity:* (i) restless, overactive, cannot stay still for long; (ii) constantly fidgeting or squirming; (iii) easily distracted, concentration wanders; (iv) can stop and think things out before acting; (v) sees tasks through to the end, good attention span.
2) *Emotional symptoms:* (i) often complains of headaches, stomach aches or sickness; (ii) many worries, often seems worried; (iii) often unhappy, down-hearted or tearful; (iv)

nervous or clingy in new situations, easily loses confidence; (v) many fears, easily scared.

3) *Conduct problems*: (i) often has temper tantrums or hot tempers; (ii) generally obedient, usually does what adults request; (iii) often fights with other children or bullies them; (iv) often argumentative with adults; (v) can be spiteful to others.
4) *Peer problems*: (i) rather solitary, tends to play alone; (ii) has at least one good friend; (iii) generally liked by other children; (iv) picked on or bullied by other children; (v) gets on better with adults than with other children.
5) *Pro-social behaviour:* (i) considerate of other people's feelings; (ii) shares readily with other children (treats, toys, pencils etc.); (iii) helpful if someone is hurt, upset or feeling ill; (iv) kind to younger children; (v) often volunteers to help others (parents, teachers, other children).

4.3.4. Control variables.

When regression models are used, I adjust for a set of control variables commonly used in studies of social reproduction and child development. Control variables address the specific concerns that the Family Investment Model and the Family Stress Model highlight as possible determinants of both parenting's dimensions and child development. Controls are divided into four blocks. First, *basic controls,* where I include study child's characteristics like sex (male/female), ethnicity (indigenous/not indigenous), low weight at

birth (below 2.5 kg.), health (1=excellent) and age (in months); family characteristics like the presence of a study child's sibling at home (yes/no), language spoken at home (English/other language), household income (in 10s) and father's and mother's working hours (in 10) and its squared term. Second, *home emotional stability* where I include a scale measuring depression levels for both mother and father (5-point Likert scale), an index binding several questions together to measure the level of conflict within the couple (5-point Likert scale of argumentative relationship) and parents' addictions, addressed using a dichotomous question of whether they have a problematic alcohol use (1=yes). In the third block I control for three variables capturing *parents' time investments*: accessible time with father, accessible time with mother, accessible time with both father and mother, and time in structured activities (e.g., private lessons). These three continuous variables are constructed using the time use data included in LSAC (for more information about the algorithm computing LSAC's time use, see Chapter 3). The fourth and last block captures *parents' goods-investments* through two dichotomous variables: whether the child has access to a computer at home (1=yes) and whether the house is uncluttered (1=yes). Table 2 shows means and standard deviations for all control variables.

Table 2: Descriptive statistics, pooled sample.

	Mean/%	SD	Min.	Max.
Child Development				
Peabody Picture Vocabulary Test	75.9	7.6	34.1	96.9
Strength and Difficulties Quest.	7.4	4.8	0	33
Mother's dimensions				
Reasoning	4.21	0.63	1.00	5.00

Consistency	4.24	0.59	1.00	5.00
Warmth	4.41	0.49	1.33	5.00
Anger	2.15	0.58	1.00	4.50
Father's dimensions				
Reasoning	3.96	0.69	1.00	5.00
Consistency	4.11	0.64	1.00	5.00
Warmth	4.12	0.58	1.00	5.00
Anger	2.17	0.60	1.00	5.00
Mother's education				
University degree	39%		0.00	1.00
High secondary	49%		0.00	1.00
Low secondary	12%		0.00	1.00
Father's education				
University degree	35%		0.00	1.00
High secondary	55%		0.00	1.00
Low secondary	11%		0.00	1.00
Mother's occupation				
Managers	29%		0.00	1.00
Professionals	9%		0.00	1.00
Skilled technicians	24%		0.00	1.00
Intermediate workers	6%		0.00	1.00
Labourers	2%		0.00	1.00
Unemployed	2%		0.00	1.00
Not in the labour market	28%		0.00	1.00
Father's occupation				
Managers	41%		0.00	1.00
Professionals	16%		0.00	1.00
Skilled technicians	26%		0.00	1.00
Intermediate workers	12%		0.00	1.00
Labourers	4%		0.00	1.00
Unemployed	1%		0.00	1.00
Basic Controls				
Mother's weekly work hours, in 10s	1.64	1.58	0.00	10
Father's weekly work hours, in 10s	4.66	1.32	0.00	10
Child's age (in months)	74.67	20.0	50	114
Child is female	49%		0.00	1.00
Child speaks English at home	92%		0.00	1.00
Child's family income, in AUS$10K	10.72		0.00	71
Child's Indigenous	1%		0.00	1.00
At least one other child in the household	42%		0.00	1.00
Child had low birth weight	5%		0.00	1.00
Child is in excellent health (1=yes)	59%		0.00	1.00

Home's emotional stability				
Depression scale for father	4.49	0.52	1.00	5.00
Depression scale for mother	4.48	0.52	1.00	5.00
Argumentative relationship scale	2.09	0.59	1.00	5.00
Mother's problematic alcohol use	9%		0.00	1.00
Father's problematic alcohol use	28%		0.00	1.00
Time investments [a]				
Father's accessible time	6.76	10.1	0.00	137
Mother's accessible time	26.48	22.6	0.00	157
Both parents accessible time	36.41	33.7	0.00	167
Time in structured activities	11.17	9.07	0.00	56
Goods investments				
Child has computer at home	90%		0.00	1.00
Home is uncluttered	95%		0.00	1.00

Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. n=8,806 observations from 5,518 children. [a]Time measured hours*week

4.3.5. Analytical strategy

One of the main advantages of LSAC data are the richness of information and its panel structure. To exploit this, I use panel regression models and a wide set of covariates that might be confounding the estimates of interest. To test the first hypothesis, I use random effect regression models (REM). This methodological approach constitutes an improvement over classic cross-sectional regressions. REM allow to control for person-specific omitted measures that may be affecting the increase or decrease of the dimensions of parenting's levels. The estimation of the parenting's dimensions and the emotional climate at home using REM takes the next form:

$$D_{it} = \beta_1 E_{it} + \beta_2 SC_{it} + \beta_3 X_{it} + \beta_4 CH_{it} + \beta_5 EM_{it} + \eta_i + e_{it} \quad (1)$$

Where D are the dimensions of parenting, i indexes fathers and mothers (i = 1,…, N) t indexes time (t = 2004, 2008 and 2010); E is a variable indicating the level of education; SC captures the social class of the parent; X is a vector of sociodemographic variables including ethnicity, household income, number of siblings and the language spoken at home; CH addresses child's indicators of specific development that might be affecting D including low weight at birth, health, sex and age; EM is capturing relevant confounders like the mental health, addictions and the emotional stability of the parents and includes variables like depression scale tests of both father and mother, problematic alcohol consumption of both parents and the level of conflict among parents; η is the person specific intercept (i.e., the random effect); e is the typical error term (i.e., "luck"); and β_1 and β_2 are the coefficients of main interest, which estimate the association of education and class and the parenting's dimensions of both mother and father. The results produced by the random-effect models are unbiased estimates of the effects of education and class on dimensions of parenting. It is worth noting that biases coming from reverse causality in the parameters to be estimated here range from very low to nonexistence since education and class might affect dimensions of parenting and parent-child emotional connection but rarely in the other way around.

Reverse causality is the source of endogeneity that actually affects with greater intensity the estimation of hypothesis 2. In other words, do warmer parents raise nicer children or do nicer children make parents warmer? To address this issue, I rely on Generalized Methods

of Moments (GMM) (see Arellano and Bond, 1991 for specification; and Roodman, 2009 for implementation). GMM is a modelling technique extended in econometrics but not so in other social sciences. However, a recent application in the theory of social reproduction (Jæger and Breen, 2016) has shown its fruitfulness in the study of parental investments and children's outcomes. Like REM, GMM exploits the longitudinal nature of the dataset, therefore controlling for sources of biases coming from unobserved heterogeneity. Besides that, the main advantage is its dynamic treatment of the dependent variable, taking into account (a) that parental investments at time *t* increases the returns of investments at time *t+1* and (b) that past levels of children's skills causally affect its current values (i.e., *path dependency* in skill's accumulation [Eirisch and DiPrete, 2006] and *dynamic complementarity* in terms of Cuhna and Heckman [2007]). Using Stata's ado xtabond2 created by David Roodman, I estimate the following equation:

$$S_{it} = \beta_0 S_{i(t-1)} + \beta_1 D_{it} + \beta_2 E_{it} + \beta_3 SC_{it} + \beta_4 X_{it} + \beta_5 CH_{it} + \beta_6 EM_{it} + \beta_7 PI_{it} + T + \delta_i + e_{it} \quad (2)$$

Where *S* is child's skill at time *t,* which depends on the level of skill at time *t-1* (i.e., β_0 which corresponds with wave 2 when children are 6 years old); δ is a child-specific effect that indexes time-invariant unobserved dispositions that might affect child's skill and parents' investments (i.e., fixed effects); *PI* captures other parental investments in the form of time (father's and mother's time and structured activities [Lareau, 2011]) and goods (whether there is

computer access at home and whether the home is uncluttered); *T* indexes dummy variables for the three time periods covered in the data. Problems also may arise using this method and one of the issues is the *overidentification* of instrumental variables (IVs) (Roodman, 2009). The Sargan test is applied and an adequate number of IVs is used, as recommended by Bond (2002). The standard errors are adjusted for the clustering of observations within children.

Finally, following Khanam and Nghiem (2016) I add a wide range of control variables in testing both hypotheses 1 and 2, which reduces possible biases coming from individual unobserved heterogeneity, under the assumption that what is observed through the indicators of LSAC data are highly correlated with unobserved characteristics of individuals. However, I also acknowledge that this approach cannot eliminate all possible sources of individuals unobserved heterogeneity (e.g., motivation).

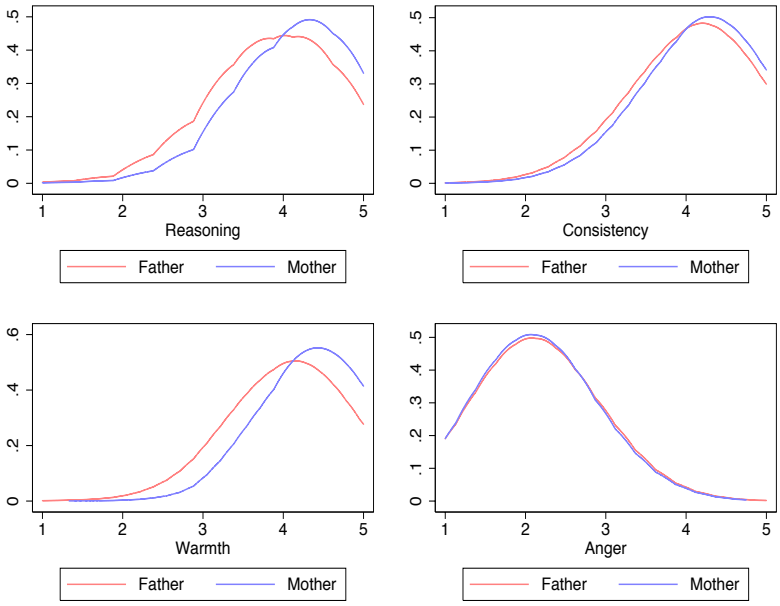
4.4. Results

4.4.1. Descriptive results

Figure 2 shows the distribution of parenting's dimensions by gender. The first remarkable result is represented by the gendered distribution of parenting's dimensions. As shown in Figure 2, mothers display more reasoning, consistency, warmth and anger than do fathers. Consistent with previous studies (McKinney and Renk, 2008), the most gendered dimension is warmth (M=4.41 and SD=0.49 for

mothers; M=4.12 and SD=0.58 for fathers). On the contrary, the dimensions where father and mothers have more similar distribution in found in anger. As shown in Figure 2, on average, parents tend to display high doses of reasoning, consistency and warmth and low doses of anger.

Figure 2: Distribution of the parenting's dimensions by parent's gender.



Notes: Longitudinal Study of Australian Children, K cohort, waves 1-3 (pooled sample).

Table 3 shows descriptive results for the dimensions of parenting disaggregating by education and class. The strongest differences are found in consistency and, with less intensity, in reasoning. For the case of consistency, highest educated fathers (i.e., University degree) display disproportionally more consistency (M=4.19; SD=0.59) than do fathers with lowest level of education (i.e., low secondary) (3.92;

SD=0.69) (p<0.001). Variation of consistent parenting by father's social class shows precisely same results as shown by father's level of education (i.e., a clear positive gradient in consistency by both education and class). Similar results are found in consistent parenting for the case of mothers. Highest educated mothers tend to be significantly more consistent (M=4.32; SD=.053) with their children than do lowest educated mothers (M=4.07; SD=0.63) (p<0.001). Again, mother's social class shows a similar positive gradient in consistency than mother's education, with the exception of mother's out of the labour market (i.e., predominantly housewives). Housewives display similar levels of consistency than do middle class mothers (i.e., professionals and skilled technicians). For the case of those dimensions that address more directly parental emotion's investments, descriptive results show a different story. For example, lower educated mothers tend to be warmer than higher educated mothers (University degree: M=4.39 and SD=0.48; High secondary: M=4.44 and SD=0.48; Low secondary: M=4.40 and SD=0.50; p<0.005). This difference in warmth by mother's education is not found by father's education. Lowest educated fathers tend to be slightly less warm than those holding University degree. However, this difference is not significant. The opposite holds in warmth when looking at variations by mothers' and fathers' social class. Fathers show a negative gradient in warmth by social class (p<0.005). For mothers, however, there is not any sort of significant differences in warmth by social class. Finally, anger shows a positive relationship by fathers' and mothers' levels of education and social class. However, differences in anger are not significant. Descriptive

results highlight two points. First, variations by parents' levels of education and class are mainly given in those dimensions addressing practices (i.e., reasoning and consistency), while less strong differences are found in those addressing emotions (i.e., warmth and anger). Second, when the dimensions vary, they vary more for the case of fathers than mothers (with the exception of warmth). This does suggest that fathers are more sensitive to contextual factor (i.e., level of education and labour market position) than mothers. Altogether, descriptive results seem to point in the direction of hypothesis 1 but only for the dimensions of reasoning and consistency.

Table 3: Distribution of fathers and mothers parenting dimensions by level of education and social class, pooled sample.

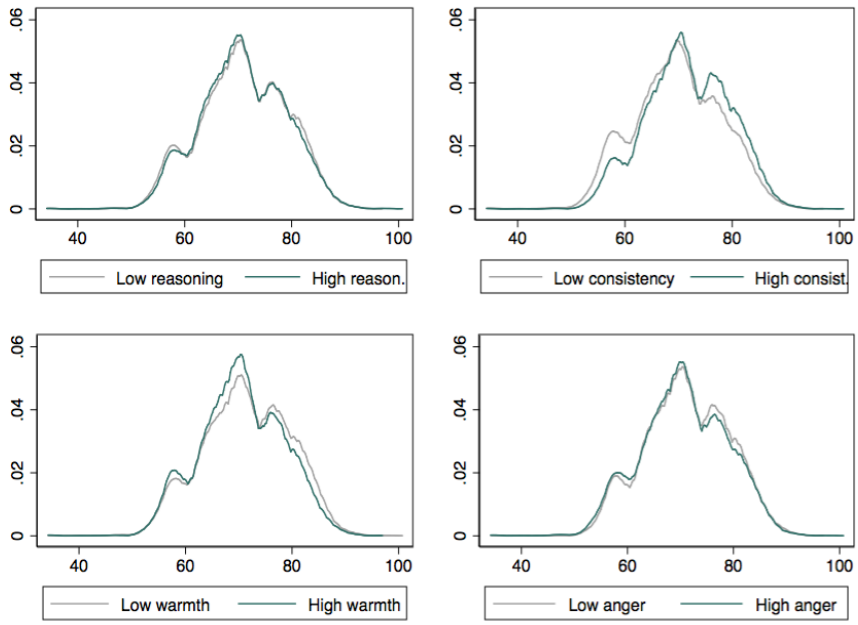
Panel A: Father's dimensions	Reasoning	Consistency	Warmth	Anger	
By father's level of education	*Mean*	*Mean*	*Mean*	*Mean*	*N*
University degree	4.00	4.19	4.09	2.16	3177
High secondary	3.95	4.08	4.09	2.18	4926
Low secondary	3.89	3.92	4.04	2.19	961
By father's occupation					
Managers	4.00	4.17	4.10	2.15	3712
Professionals	3.97	4.15	4.12	2.18	1425
Skilled technicians	3.92	4.03	4.07	2.21	2334
Intermediate workers	3.88	3.96	4.04	2.20	1084
Labourers	3.85	3.93	4.02	2.22	408
Unemployed	3.92	3.85	4.01	2.25	101
Panel B: Mother's dimensions	*Mean*	*Mean*	*Mean*	*Mean*	*N*
By mother's education					
University degree	4.26	4.32	4.39	2.14	3507
High secondary	4.21	4.19	4.44	2.16	4427
Low secondary	4.10	4.08	4.40	2.16	1130
By mother's occupation					
Managers	4.25	4.32	4.40	2.12	2587
Professionals	4.19	4.21	4.42	2.13	823
Skilled technicians	4.19	4.19	4.45	2.16	2177
Intermediate workers	4.21	4.18	4.46	2.12	522
Labourers	4.07	4.12	4.40	2.20	209
Unemployed	4.17	4.11	4.44	2.16	168
Not in the labour market	4.24	4.20	4.39	2.19	2578

Notes: Longitudinal Study of Australian Children, K cohort, waves 1-3.

Figures 2 and 3 graphically present the bivariate association between dimensions of parenting and children's cognitive and non-cognitive outcomes (only for the case of mothers. Results for fathers show similar patterns). Graphs show a number of interesting descriptive findings. Firstly, a great variation in the strength of the association depending on the type of skill considered. For cognitive outcomes, the variation by dimensions of parenting is minimal and only

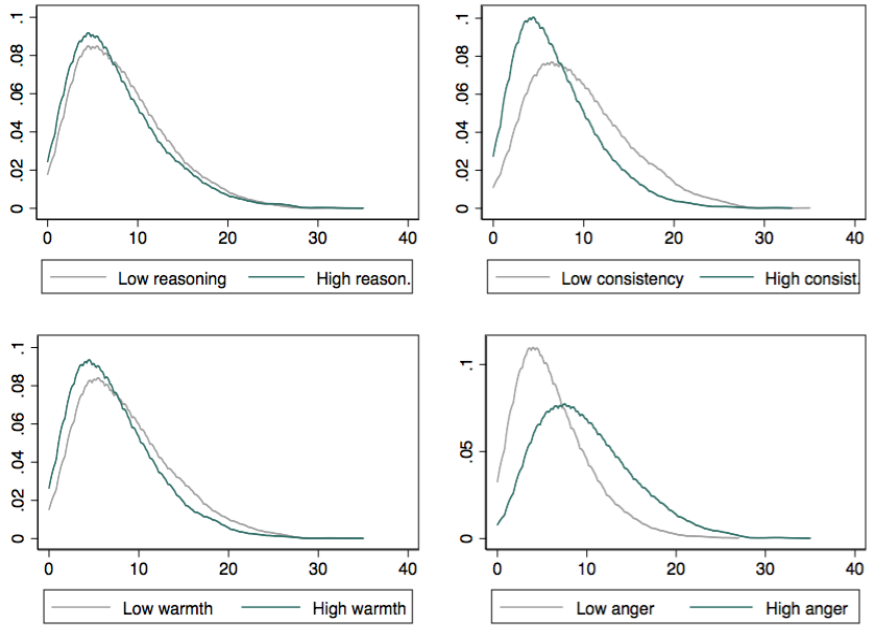
appreciable in the case of consistency and slightly in warmth. On the contrary, differences in non-cognitive outcomes by dimensions of parenting are exceptionally salient. Children whose parents rank above the 50% of the mean in consistency have on average better non-cognitive development, while those children whose parents rank above 50% in anger show exceptionally negative non-cognitive outcomes. This is coherent with Darling and Steinberg, when they argued that "depending on the specific developmental outcome of interest, different parenting practices would be more or less important" (1993: 493).

Figure 3: Cognitive development (PPVT) by mother's dimensions of parenting



Notes: Density plots, Longitudinal Study of Australian Children, K cohort, waves 1-3 (pooled sample). To define "high" and "low", the means of each dimension are used. "High" captures children whose mothers fall above the mean in each of the dimensions. "Low" captures children whose mothers fall below the mean. For example, the mean in warmth is 4.3, therefore, children whose mothers rank in warmth between 1 and 4.2 are defined as children with "low warm" mother. Results for father's dimensions of parenting show similar patterns.

Figure 4: Non-cognitive development (SDQ) by mother's dimensions of parenting



Notes: Density plots, Longitudinal Study of Australian Children, K cohort, waves 1-3 (pooled sample). To define "high" and "low", the means of each dimension are used. "High" captures children whose mothers fall above the mean in each of the dimensions. "Low" captures children whose mothers fall below the mean. For example, the mean in warmth is 4.3, therefore, children whose mothers rank in warmth between 1 and 4.2 are defined as children with "low warm" mother. Results for father's dimensions of parenting show similar patterns.

4.4.2. The effect of education and social class on mothers' and fathers' dimensions of parenting

Table 4 presents results from models estimating the effect of education and social class on mothers' and fathers' dimensions of parenting. In order to observe also possible gendered effects of education and social class, the table shows two separate panels, one for mothers and one for fathers.

For the case of mothers (Panel A, Table 4), the effect of education and class are especially strong and significant for the dimension of consistency. After controlling for a set of variables affecting dimensions, there is a persistent gradient in maternal consistency by level of education. Mothers with high secondary display significantly less consistency (β=-0.092; p<0.001) than those with University degree, while mothers with the lowest level of education (low secondary) appears much less consistent in their childrearing (β=-0.214; p<0.001). The educational gradient in the level of consistency also appears when looking at mothers' social class, however, with less intensity, hierarchy and significance (p<0.05, with the exception of labourers, that is not significant). Regarding reasoning, lowest educated mothers exhibit significant less reasoning than those with University degree (β=-0.134; p<0.001). Mothers' social class shows again a positive relationship with reasoning, although only significant for labourers (β=-0.099; p<0.05, compared with mothers in managers positions). As found in descriptive analyses, results for warmth show a different picture. Mothers' education is negatively related with warmth, but only significant for the case of high secondary and showing a relatively small effect (β=0.064; p<0.001). Finally, the level of anger is not significantly related with mothers' education or class.

Table 4: Random effects panel data models: effect of parents' education and social class on parenting's dimensions

	Reasoning		Consistency		Warmth		Anger	
	β	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*
Panel A: Mothers								
Mother's level of education (ref. cat.: University degree)								
High secondary	-0.021	.019	-0.092***	.018	0.064***	.015	-0.002	.017
Low secondary	-0.134***	.029	-0.214***	.026	0.025	.022	0.014	.026
Father's level of education								
High secondary	0.007	.020	-0.007	.018	0.020	.015	0.011	.018
Low secondary	-0.006	.031	-0.087**	.028	-0.019	.023	0.055*	.028
Mother's social class (ref. cat.: Managers)								
Professionals	-0.015	.027	-0.060**	.023	-0.017	.019	0.004	.023
Skilled technicians	-0.029	.022	-0.046*	.019	-0.001	.016	0.030	.019
Intermediate workers	0.030	.033	-0.025*	.028	0.020	.024	-0.007	.028
Labourers	-0.099*	.049	-0.022	.041	-0.017	.034	0.003	.041
Unemployed	-0.065	.055	-0.094*	.046	0.030	.038	-0.019	.046
Not in the labour market	-0.018	.031	-0.062*	.026	-0.021	.022	0.048	.026
Father's social class								
Professionals	-0.000	.021	-0.029	.018	0.016	.015	0.009	.018
Skilled technicians	0.007	.020	-0.024	.018	0.045**	.015	-0.008	.017
Intermediate workers	-0.008	.026	-0.058*	.023	0.064***	.019	-0.033	.022
Labourers	-0.043	.036	-0.092**	.031	0.030	.026	0.024	.031
Unemployed	-0.009	.088	-0.121	.074	0.117	.062	-0.060	.074
Controls	YES		YES		YES		YES	
Intercept	4.397***	.037	3.974***	.034	4.545***	.028	2.251***	.034
$N^{observations}$	8307		8304		8308		8305	
R^2	0.029		0.106		0.076		0.116	
Panel B: Fathers.								
Mother's level of education (ref. cat.: University degree)								
High secondary	-0.011	.021	-0.067***	.019	-0.018	.018	0.021	.018
Low secondary	-0.047	.031	-0.156***	.029	-0.055*	.027	0.024	.027
Father's level of education								
High secondary	-0.029	.022	-0.063**	.020	0.028	.018	-0.006	.018
Low secondary	-0.059†	.033	-0.167***	.031	-0.005	.029	-0.006	.029
Mother's social class (ref. cat.: Managers)								
Professionals	0.033	.030	-0.029	.026	0.026	.023	-0.018	.024
Skilled technicians	0.004	.024	0.017	.021	0.053**	.019	-0.047	.020
Intermediate workers	0.039	.036	-0.015	.032	0.049	.028	-0.011	.030
Labourers	-0.031	.053	-0.003	.046	0.023	.041	-0.061	.044
Unemployed	0.013	.060	-0.042	.051	0.069	.046	-0.022	.049
Not in the labour market	0.018	.033	-0.043	.029	0.026	.026	-0.004	.028
Father's social class								
Professionals	-0.000	.023	0.003	.020	0.031	.018	0.004	.019
Skilled technicians	-0.038†	.022	-0.034†	.019	-0.028	.018	0.025	.018
Intermediate workers	-0.074**	.028	-0.032	.025	0.006	.023	0.007	.024
Labourers	-0.096*	.039	-0.035	.034	-0.032	.031	-0.004	.033

Unemployed	-0.054	.095	-0.074	.082	-0.021	.074	-0.103	.079
Controls	YES		YES		YES		YES	
Intercept	4.397***	.037	3.974***	.034	4.545***	.028	2.251***	.034
$N^{observations}$	8312		8304		8313		8318	
R^2	0.036		0.095		0.049		0.092	

Notes: Longitudinal Study of Australian Children, K cohort, waves 1-3. All models control for child's age, sex, ethnicity, heath, weight at birth, whether English is the language spoken at home, household income, father's and mother's depression scales, problematic alcohol use, working hours, working hours squared, and argumentative relationship scale. All coefficients in covariates are shown in Tables A2 and A3 in Appendix. *Ref. cat.* stands for reference category. Significance levels: $^{\dagger}p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Results for fathers (Panel B, Table 4) show a similar story than those found in mothers, with the exception of warmth, a dimension of parenting that does not significantly vary across fathers' levels of education and social class. Like in the descriptive results, the biggest effect for fathers are also found in the dimension of consistency. There is a clear and significant positive relationship between fathers' level of education and paternal consistency. Fathers with low secondary display significantly less consistency than do fathers with University degree (β=-0.167; $p<0.001$). Random effect models show the significant relationship found in reasoning by father's level of education disappears and it only remains for the case of father's social class. Lower class fathers (i.e., intermediate workers and labourers) display significantly less reasoning than managers (β=-0.074 and $p<0.010$ for the case of intermediate workers and β=-0.096 and $p<0.05$ for the case of labourers). Finally, for the case of paternal warmth and anger, there is not significant differences by levels of father's education and social class. This suggests that, as shown by descriptive statistics, there is a pattern of social stratification for paternal practices but not so for paternal emotional attachment with

children. However, it is worth noting that the substantive sizes of these effects are rather small.

In terms of gendered effects of social class on the dimensions of parenting, Table 4 shows how fathers' social class significantly impacts on maternal consistency and warmth in two opposite directions. While fathers' social class is positively related with mothers' consistency, the opposite holds for warmth. On the contrary, mothers' social class does not affect fathers' dimensions of parenting (with the exception of skilled technicians mothers). This result indicates that mothers are significantly warmer, more consistent and reasoners than fathers (as suggested by descriptive results), their dimensions vary less by their own social position, *and,* they are more sensitive to father's social position than fathers are to mother's position. On the contrary, paternal dimensions are more affected by their own social position *and* insensitive to the mother. This does suggest that fathering is more dependent on the social position and contextual situations, which might be related with the higher necessity for fathers to define their social role in terms of occupation and education than mothers. This is not surprising since the bulk of childcare rests upon the mothers and, although in decline, femininity is more defined by childrearing than masculinity is (see West and Zimmerman, 1987). This might be especially relevant in a country like Australia, where after childbirth, women tend to move toward part time position or to directly be stay-at-home mothers (in our sample, representative of the Australian population, 28% of mothers are out of the labour market).

4.4.3. The effect of the dimensions of parenting on children's cognitive and non-cognitive outcomes.

Table 5 presents estimates of the effect of mothers' and fathers' dimensions of parenting on children's non-cognitive and cognitive outcomes from GMM regressions. In this analysis, the four dimensions of parenting are additively included into four different models. Model 1 includes only reasoning; Model 2 reasoning and consistency; Model 3 reasoning, consistency and warmth and Model 4 includes all the four dimensions. Models are run separately for non-cognitive (Panel A) and cognitive outcomes (Panel B).

Table 5: Results from GMM regressions of mothers' and fathers' dimensions of parenting and children's non-cognitive and cognitive outcomes.

	M1		M2		M3		M4	
	ß	*SE*	*ß*	*SE*	*ß*	*SE*	*ß*	*SE*
Panel A: ***Strength and Difficulties Questionnaire***								
Reasoning (M)	-0.035	.098	0.058	.099	0.366***	.109	0.171	.103
Reasoning (F)	0.005	.088	0.056	.089	0.263**	.100	0.131	.095
Consistency (M)			-0.624***	.140	-0.607***	.139	-0.201	.132
Consistency (F)			-0.181	.116	-0.191	.115	-0.004	.113
Warmth (M)					-0.979***	.166	-0.184	.154
Warmth (F)					-0.483***	.139	-0.034	.132
Anger (M)							1.741***	.165
Anger (F)							0.895***	.127
Controls	YES		YES		YES		YES	
Intercept	13.25***	2.90	15.74***	2.99	19.09***	3.06	4.45	2.86
N observations	3287		3284		3284		3284	
Panel B: ***Peabody Picture Vocabulary Test***								
Reasoning (M)	-0.073	.125	-0.103	.128	-0.122	.138	-0.105	.138
Reasoning (F)	0.272*	.111	0.206	.115	0.128	.130	0.138	.130
Consistency (M)			0.195	.163	0.196	.164	0.160	.167
Consistency (F)			0.369*	.150	0.365*	.150	0.354*	.151
Warmth (M)					0.031	.180	-0.036	.190
Warmth (F)					0.210	.167	0.168	.178
Anger (M)							-0.139	.170
Anger (F)							-0.082	.162
Controls	YES		YES		YES		YES	
Intercept	46.16***	4.45	45.11***	4.43	44.48***	4.50	45.80***	4.64
N observations	3138		3135		3135		3135	

Notes: Longitudinal Study of Australian Children, K cohort, waves 1-3. "M" stands for *mothers* while "F" stands for *fathers*. All models control for a set of extended covariates including mother's and father's social class, education, hours at work, depression scale, problematic alcohol use and time investments. At child and household level control include household income, argumentative relationship, whether English is the language spoken at home, good investments (computer access at home and uncluttered house), child's age, sex, ethnicity, weight at birth and health. For a detailed list of covariates, see Table 2. For the detailed list of coefficients in all covariates, see Tables A4 and A5 in Appendix. Models 1 to 4 differ in their hierarchical inclusion of the dimensions of parenting, as shown in the table. Significance levels: $^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$

Panel A of Table 5 shows how dimensions of parenting significantly affect non-cognitive skills ($p<0.001$) except for the case of fathers'

consistency. The strongest positive effect is found in warmth (β=-0.979 for mothers and β=-0.483 for fathers; p<0.001; Panel A, Model 3). As expected, the warmer the parents are, the better socio-emotional development of the child (in these models, negative scores mean better outcomes). This effect is almost the double in the case of mothers than fathers, which does suggest that mothers spend more time with their children and have greater attachment on average than fathers. As expected, anger has a detrimental effect on children's non-cognitive skills. Interestingly, the negative effect of anger on children non-cognitive outcomes is that strong (β=1.74 for mothers p<0.001; ß=0.89 for fathers p<0.001) that when controlling for, the effect of all dimensions disappears, suggesting that the lack of anger at home is the most relevant aspect for the better child's non-cognitive development. Unexpectedly, mothers' and fathers' reasoning appear to decrease children's levels of non-cognitive skills, although with small effects (in Model 3: β=0.36 for mothers p<0.001 and β=0.26 for fathers p<0.005). To get sense of the size of these results, an increase by one point (out of five) has stronger beneficial effect on child's socio-emotional development than any of the socio-economic variables (i.e., education, income or occupation) and it is equivalent to the beneficial effect of having a mentally stable mother -the most relevant variable affecting child's socio-emotional development.

Panel B of Table 5 presents the results for cognitive skills. As we can observe in the table, the dimensions of parenting do not have any significant effect for cognitive development, with one exception:

fathers' consistency (β=0.354; p<0.05; Panel B, Model 4). This result is coherent with previous research (Fiorini and Keane, 2014) suggesting that the dimensions of parenting and the emotional climate at home are highly relevant for children's non-cognitive skills development but not so for cognitive outcomes (with the exception of paternal consistency).

4.5. Discussion

This study opens a new route in studying the role played by previously unexplored parenting practices and emotions in the intergenerational transmission of (dis)advantage. Using a sample of Australian children from the Longitudinal Study of Australian Children, it shows how upper- and lower- class parents tend to diverge in their practices and emotion's investments, ultimately leading to unequal children's skills developments. It therefore contributes to the literature on parenting and the social stratification of child development (Ermisch et al., 2012; Kalil et al., 2012; Chan and Koo, 2011; Jæger and Breen, 2016) by looking at how social class shapes unequal development of parental investments in four specific dimensions (reasoning, consistency, warmth and anger) and how these dimensions affect children's cognitive and non-cognitive skills development.

In testing the first hypothesis (i.e., education and class are positively related with reasoning, consistency and warmth but negatively related with anger), I find that upper class parents display

disproportionally more consistency than do lower-class parents. Patterns of social stratification in displaying reasoning is less strong than in the case of consistency. The hypothesis is therefore partially confirmed. Unexpectedly, warmth is somewhat unique in showing a negative relationship with education, although with small effect and only for middle educated mothers. For the case of anger, there are not significant differences by class. Results for hypothesis 1 do suggest that patterns of stratification are clearly shown in the most *behavioural* (reasoning and consistency) part of parenting, while they are almost not apparent in the most *emotional* (warmth and anger) part of parenting.

Therefore, the findings of this study do not support the argument of Hochschild that each social class emotionally prepares their children to reproduce the class structure but do support the 'concerted cultivation' thesis of Lareau (2011) in suggesting that upper-class parents reproduce their status through the display of specific communicative strategies and parenting behaviours, like offering greater reasoning with their children after correction. None of these two studies, however, looked at the dimension of consistency. The results of this study actually show that the strongest effects of social class are found in consistency.

In testing hypothesis 2 (i.e., reasoning, consistency and warmth have a positive effect on children's skills development while anger has a negative effect), I find that the strongest positive effects are those driven by consistency and warmth. This is coherent with previous

studies in developmental psychology that show how the authoritative parenting style (i.e., high control -reasoning and consistency- and high support -warmth but lack of anger-) (Baumrind, 1991) shapes better development of children. The effect of anger is especially strong and, as expected, negative. Children whose parents show anger at home see their non-cognitive skills greatly diminished (an increment of 1 point in the 5-Likert scale of mothers' anger decreases in 1.74 the SDQ 35-points scale, $p<0.001$). This negative effect is almost the half in the case of fathers ($ß=0.89$; $p<0.001$). Unexpectedly, results do not support the 'concerted cultivation' thesis of Lareau (2011), showing that increasing parental reasoning leads toward a negative effect on children's non-cognitive skills development. The findings of this study do suggest that *consistency* is the main channel of social reproduction within the dimensions analysed. It is the most stratified aspect of parenting and, simultaneously, the dimension that positively affects children's outcomes the most (only surpassed by the effect of maternal warmth on non-cognitive outcomes).

In addition, as found by Fiorini and Keane (2014), the production function for non-cognitive skills seems to be different to the function for cognitive skills development. While the latter are mainly dependent of time and goods investments, the former vary accordingly emotional work (i.e., the abilities of parents to supress anger and express warmth) and consistency (i.e., proportionate adequate discipline and adapt it to the specific child's developmental stages).

Finally, this study is not without limitations. First, the dimensions of parenting might be greatly affected by social desirability bias. This bias might induce measurement error and be especially strong in a child-centred society, as it is the case of Australia. The discourses of intensive parenting might lead parents to over rate their own involvement and abilities with children, under the threat of being judged as maladapted father or mother. Second, the panel structure of the data over-represents higher educated parents, leaving out those families in economic hardship and strong welfare dependency (e. g. in our sample, only 1% of fathers are unemployed). Lastly, the instrument to measure non-cognitive outcomes (SDQ) is rated by parents and not by others (e.g. teachers) which might be also introducing measurement error, since parents tend to judge their children more subjectively than other agents. Future research should carefully look at these limitations.

4.6. References

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4.7. Appendix

Table A1: Parenting dimensions are produced from responses to the following questions about parent-child interaction over the last six months.

Dimensions of parenting	*Questions*
Reasoning	1. Talking it over and reason with this child when he/she misbehaved?
	2. Explain to this child why he/she was being corrected?
Consistency	1. When you give this child an instruction or make a request to do something, how often do you make sure that he/she does it?
	2. If you tell this child he/she will get punished if he/she doesn't stop doing something, and he/she keeps doing it, how often will you punish him/her?
	3. How often does this child get away with things that you feel should have been punished?
	4. How often is this child able to get out of punishment when he/she really sets his/her mind to it? (reverse coded)
	5. When you discipline this child, how often does he/she ignore the punishment? (reverse coded)
Warmth	1. How often do you express affection by hugging, kissing and holding this child?
	2. How often do you hug or hold this child for no particular reason?
	3. How often do you tell this child how happy he/she makes you?
	4. How often do you have warm, close times together with this child?
	5. How often do you enjoy doing things with this child?

	6. How often do you feel close to this child both when he/she is happy and when he/she is upset?
Anger	1. Of all the times you talk to this child about his/her behavior, how often is this praise? *(reverse scored)*
	2. Of all the times you talk to this child about his/her behavior, how often is this disapproval?
	3. How often are you angry when you punish this child?
	4. How often do you feel you are having problems managing this child in general?

Table A2: Results from GMM regressions of mothers' and fathers' dimensions of parenting and children's non-cognitive outcomes. Full list of covariates.

	M1		M2		M3		M4	
	β	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*
Dimensions								
Reasoning (M)	-0.035	.098	0.058	.099	0.366***	.109	0.171	.103
Reasoning (F)	0.005	.088	0.056	.089	0.263**	.100	0.131	.095
Consistency (M)			-0.624***	.140	-0.607***	.139	-0.201	.132
Consistency (F)			-0.181	.116	-0.191	.115	-0.004	.113
Warmth (M)					-0.979***	.166	-0.184	.154
Warmth (F)					-0.483***	.139	-0.034	.132
Anger (M)							1.741***	.165
Anger (F)							0.895***	.127
Controls								
Child's age (months)	0.008	0.023	0.007	0.023	0.008	0.022	0.019	0.022
Child is female	1.082***	0.156	1.056***	0.153	0.997***	0.148	0.765***	0.137
Child is Indigenous	-0.640	0.751	-0.499	0.700	-0.478	0.710	-0.533	0.682
At least one other child in household	0.347*	0.143	0.341*	0.142	0.457**	0.143	0.440**	0.135
Low weight at birth	-0.084	0.323	0.036	-0.322	-0.047	0.309	-0.153	0.290
Child speaks English at home	0.098	0.268	-0.121	0.263	-0.159	-0.264	0.170	0.261
Family income, in $10,000	-0.003	0.010	-0.002	0.010	0.005	0.010	-0.003	0.009
Father has University degree	*Ref.*		*Ref.*		*Ref.*		*Ref.*	
Father's high secondary	-0.627**	0.215	-0.605**	0.216	-0.601**	0.217	-0.602**	0.217
Father's low secondary	-0.800**	0.308	-0.729*	0.311	-0.726*	0.310	-0.723*	0.310
Mother has University degree	*Ref.*		*Ref.*		*Ref.*		*Ref.*	
Mother's high secondary	-0.321	0.178	-0.243	0.176	-0.284	0.174	-0.301	0.164
Mother's low secondary	-0.700**	0.268	-0.536*	0.265	-0.600*	0.262	-0.599*	0.252
Father is manager	*Ref.*		*Ref.*		*Ref.*		*Ref.*	
Father is professional	-0.011	0.194	0.007	0.194	0.008	0.191	0.037	0.180
Father is skilled technicians	-0.122	0.190	-0.100	0.189	-0.147	0.186	-0.141	0.177
Father is Intermediate worker	-0.242	0.249	-0.234	0.248	-0.282	0.245	-0.389	0.233
Father is labourer	-0.277	0.358	-0.245	0.357	-0.243	0.360	-0.187	0.354

Father is unemployed	-0.065	0.476	0.127	0.475	0.154	0.451	0.088	0.444
Mother is manager	*Ref.*		*Ref.*		*Ref.*		*Ref.*	
Mother is professionals	0.132	0.243	0.144	0.242	0.137	0.242	0.112	0.229
Mother is skilled technicians	-0.015	0.209	-0.000	0.207	-0.092	0.204	-0.074	0.191
Mother is intermediate worker	-0.053	0.339	-0.017	0.336	-0.052	0.329	-0.156	0.314
Mother is labourer	0.239	0.530	0.243	0.532	0.212	0.532	0.235	0.488
Mother is unemployed	0.594	0.467	0.700	0.465	0.658	0.446	0.586	0.412
Mother is out of the labour market	0.062	0.207	0.063	0.206	0.080	0.203	-0.031	0.191
Depression scale for mother	1.547***	0.178	1.457***	0.175	1.353***	0.171	1.141***	0.158
Depression scale for father	0.499**	0.156	0.469**	0.158	0.458**	0.155	0.252	0.146
Argumentative relationship scale	-0.476***	0.128	-0.395**	0.127	-0.345**	0.125	-0.091	0.122
Chid is in excellent health	0.853***	0.138	0.823***	0.138	0.775***	0.136	0.743***	0.130
Total time with father	-0.006	0.008	-0.005	0.008	-0.005	0.008	-0.005	0.008
Total time with mother	0.005	0.003	0.006	0.003	0.006	0.003	0.006*	0.003
Total time with both parents	0.000	0.002	0.000	0.002	-0.001	0.002	-0.000	0.002
Child has computer at home	0.494	0.268	0.495	0.270	0.522	0.269	0.372	0.263
House is uncluttered	-0.009	0.322	-0.011	0.322	-0.058	0.320	-0.046	0.299
Time in structured activities	0.004	0.007	0.004	0.007	0.006	0.007	0.004	0.007
Lag of SDQ score	0.301***	0.052	0.306***	0.052	0.298***	0.051	0.277***	0.048
Intercept	13.25***	2.90	15.74***	2.99	19.09***	3.06	4.45	2.86
$N^{observations}$	3287		3284		3284		3284	

Notes: Longitudinal Study of Australian Children. K Cohort, waves 1-3. Models also include dummy variables for year of the survey. Models 1 to 4 differ in their hierarchical inclusion of the dimensions of parenting, as shown in the table. "M" stands for mothers while "F" stands for fathers. Significance levels: * p<0.05, ** p<0.01, *** p<0.001.

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CHAPTER 5

GENERAL CONCLUSION

This closing chapter concludes by returning to the questions posited in the introduction chapter. The discussion here is in conversation with previous works of literature and theory, and contextualizes findings while identifying possible lines for policy intervention and future research.

Have gender and education gaps in physical and developmental childcare been ameliorated or exacerbated during the Great Recession in Spain?

Fathers and mothers increased their time with children during the Great Recession in Spain. Parents continue intensifying their involvement with their children ("helicoptering"). This effect is driven by a combination of compositional, but primarily behavioural, changes. In terms of composition the biggest increase during the recession was the rate of fathers' not working. In terms of behavioural shifts, general trends toward a gender equality and intensive parenting seem to be behind the increase.

The gender gap separating mothers and fathers in the time they each devote to the most routine and time-inflexible part of childcare (i. e., physical care) was ameliorated during the Great Recession in Spain. The evidence in this chapter suggests that the reduction of the gender gap has been largely driven by families with very young children

(below 3 years of age). The significant increase in paternal physical care during the period analysed might be due to the compositional effect of an increased relative percentage of unemployed fathers in 2010, which would mean an increase in the fathers' available free time.

Two causal mechanisms would explain this increase in the physical care of children by unemployed fathers. First, compensatory fatherhood, which claims that "fathers re-signify their problematic situation (unemployment) in terms of an opportunity to be with their children and take care of them" (Barbeta and Cano, 2017: 21). Second, the "attenuation effect" (Oesch and Lipps, 2013), which refers to the fact that the higher the rate of employment amongst men is, the less negatively the experience of unemployment impacts the father.

If the coefficient of the interaction between the year of the survey, and of being unemployed in 2010, was insignificant, "doing gender" would still be at play. Doing gender claims that unemployed fathers would not significantly increase their time in traditionally feminine routine tasks, such as physical care, so as to avoid any resulting threat to their perceived masculinity. However, this was not the case.

I have also considered how the gender gap evolved across time *and* between children's developmental stages. This is important for both children's skill development and gender equality. As noted, children's developmental stages include critical and sensitive time

periods, and these offer *windows of opportunity* for parental influence. If fathers are increasingly involved with their children very early in life (0-3 years old), this does suggest that paternal influence on children's skill formation during these windows might be heightened. Early paternal engagement is significant not only in terms of skill formation, but also in subsequent father-child relationships as children grow up. Exposure to two involved and communicative parental figures from early on in life is a strong predictor for a child's future educational attainment (Putnam, 2015). Paternal involvement in children's early years also bears relevance to gender equality, as this is typically when mothers face a higher probability of being precluded from career opportunities. If fathers are involved in childcare when children are very young, mothers may also see enhanced economic returns in the labour market.

The second hypothesis of this chapter deals with the evolution of the parents' education gap in developmental childcare during the economic crisis. The interaction of the year of the survey and parents' level of education in 2010 is not significant, and the magnitude of the coefficient is very low. This result suggests that the education gap in developmental care neither increased nor decreased, but persisted. It might be suggested that lower-skilled fathers had greater available time following the employment situation in Spain. This may have effectively cancelled out the otherwise widening education gap in developmental care observed in other countries prior to the recession (Altintas, 2015).

The evolution of the gender and education gaps in care time can be interpreted in both a positive and a negative light: Positive, because the reduction of gender and education divides means a more equal society, and negative because the findings may be masking an institutional design lacking government support for families during hard times. When looking at the results in this chapter, it is important to keep in mind the socio-political situation and the welfare system in Spain (drafted in Chapters 1 and 2). Thus, the reduction in male employment opportunities during the 2007-2010 period may have led to new forms of re-familiarization of care and the individualization of social risk. Future research should carefully evaluate how families under different typologies of welfare reacted to the economic downturn.

Does fathers' time matter for children's cognitive development?

Fathers are not commonly studied as caregivers and potential agents of social reproduction in the literature of social stratification, as mothers have more generally been identified in this area of study, and with reason. However, as shown in Chapter 1, the amount of time fathers spend with their children has doubled in the last few decades. This provides a new opportunity for stratification research, in studying the causal mechanisms employed by the paternal figure, and in explaining inequality in children's life chances beyond the "classic" father-income-provider. This is what this chapter does; study whether and how fathers transmit their abilities to their children during the time that they share together. To do so, we use The

Longitudinal Study of Australian Children (LSAC). LSAC is the only available survey, besides the American PSID, to include longitudinal time use data. It therefore allows for an adequate study of the effects of paternal time on child development.

The short reply to the question posited is yes, father's time matters, in a variety of ways. The findings of this study support the widely spread notion that is not the quantity of time spent with children that matters, but the content of that time. We do not find strong evidence for the total father-child time hypothesis. However, we do find strong evidence that time with fathers in educational (or developmental) activities has a positive and substantial effect on children's cognitive outcomes. We find that an increase in father's educational time with children (e. g. reading, playing) by 5 extra hours per week is associated with a 10% increase of the standard deviation in the cognitive test score. To get a sense of this result, the effects on the child are analogous to having one parent with a University degree, compared with neither parent.

Importantly, we do not find heterogeneity in the effects by paternal education. Therefore, one hour spent reading to a child has similar benefits in families with higher and lower levels of education. This is an important and novel contribution for stratification research and has relevant policy implications. It does suggest that by increasing social work and stimulating fathers' involvement in disadvantaged households, gaps in children's educational and income attainment should be partially reduced. Furthermore, paternal involvement also

has clear beneficial effects for maternal well-being, which is correlated with better child development.

Future studies should address important questions that we have not covered in this study, such as how father-child time affects other child outcomes (e.g. children's socio-emotional functioning). In addition, our results relate to a single country, Australia, which presents a highly idiosyncratic constellation of institutional factors concerning parental involvement in childcare. As shown in Chapter 1, Australia is characterized by high levels of intensive parenting, and policies that encourage mothers to drop out of the labour market or move into part-time work to undertake the lion's share of the childcare. Identifying whether and how these (and other features) of the institutional environment contribute to the makeup of parental time spent with children, and the subsequent outcomes, constitutes an important avenue for further research. The available evidence base is currently confined to the US and Australia, so studies focused on country-specific contexts with differing institutional settings are urgently needed.

Do parental emotional investments matter for the intergenerational transmission of (dis)advantage?

The main motivation of this chapter is to reach beyond parental time investments and look at specific practices and emotions that parents perform when interacting with their children. It has two aims: First,

to explore whether and how social classes differ in their emotional investment in their children. Second, to analyse how these practices and emotions shape children's cognitive and non-cognitive outcomes.

The results of this chapter show that parental practices in children significantly vary by class and education. Out of the four dimensions of parenting styles considered (reasoning, consistency, warmth and anger), consistency is strong and positively associated with parental class and education. A similar pattern is found for inductive reasoning, although with less intensity. On the contrary, the association between class and education with regard to emotional investment is weak to non-existent. For warmth, findings suggest that middle-lower educated parents are slightly warmer than those at the top of the social ladder. In the case of anger, no statistical association is found.

With regard to the second aim, findings show how the four dimensions analysed greatly affect children's non-cognitive outcomes. The strongest (negative) effect is found in anger. Angry parenting seriously damages the development of children's non-cognitive skills. The opposite, however, holds for warmth. As developmental psychologists usually argue, parental warmth is a key factor in raising socio-emotionally stable children. However, it is not just the emotional climate at home that matters for non-cognitive outcomes, but also specific parental practices. Maternal consistency shows a strong positive effect on children's non-cognitive outcomes.

On the contrary, reasoning with children appears to have a small effect on non-cognitive skills and somewhat counterintuitively, it is negative. In the case of cognitive skills, findings show that the emotional investments do not play any role. Only paternal consistency affects child's cognitive outcomes.

In terms of gender differences, this chapter shows that mothers are warmer than fathers, and that mothers also display significantly more consistency and reasoning with their children. It appears that, in the case of anger, mothers and fathers do not differ. Regarding differential effects on children's skill formation by parent's gender, this chapter shows that fathers' involvement matters. Fathers' practices and emotional investment in their children have around the half the effect as mothers'.

Before ending this general conclusion, it is worth noting that this dissertation is limited by its quantitative nature. Large-N studies like this thesis have the advantage of identifying and quantifying the importance of specific social interactions. But they are limited in the sense that they cannot really uncover how these interactions work or how individuals verbalize and justify the reasons behind the interactions. What are the motivations behind fathers' involvement in childcare? How do they justify the lack of involvement? What are the cultural repertoires of fatherhood? Do these cultural repertoires and justifications vary by social origin? This dissertation was not able to answer these questions, but more research in this line is needed.

5.1. Policy Implications

Life is unfair in the sense that nobody chooses when or how to be born. Our genetic and social inherences are determined by a simple component: luck. Therefore, it is somehow unfair for people to be more or less advantaged simply because they had (or did not have) the luck of being born genetically stronger or economically secure. The gap between the two groups, the richer and the poorer (in whatever variable one measures), was only the outcome of natural and social lotteries nobody chose to play.

This dissertation has analysed intergenerational transmission of advantage occurred beyond classic channels, like direct transmission of money, properties or social networks. Rather than that, it focuses on non-tangible resources. Thus, it uncovers mechanisms through which social advantage is transmitted across generations, in order to better target policy and practice, and thus close attainment gaps by social origin. More than to show whose parents are socially advantaged, it disentangles *how* parents (especially fathers) exert their influence on children through time, practices and emotions.

I focus on non-tangible resources for one reason: During the last decades social scientists across a variety of disciplines agree that the learning culture at home have stronger effects in transmitting advantage to children than income-related effects (Bowles, Gintis and Groves, 2005; Heckman and Mosso, 2014; Bourdieu and Passeron, 1990). Some even argue that parenting effects are twice as

strong as income effects (Esping-Andersen, 2009). And as we saw in Chapter 1, schools do little if anything in equalizing children from different social background. Therefore, the 'micro-practices' of child's upbringing, asides genetics, seem to be one of the most powerful channels within the transmission of social inequality.

What can be done, then, to counterbalance the lottery of birth? This is a complex question when looking at family inputs to children, because the space of the family is private, and states cannot regulate the way fathers or mothers decide to engage with their children. However, there are several political interventions that can be developed aimed at closing achievement gaps.

First of all, in countries like Spain is not possible to analyse family dynamics or child development in a proper and accurate way. This is so because, in this country, there is not available any sort of longitudinal data that researchers can analyse to approximate the developmental processes of children and their families, or, approximate any causal estimation. We need to know how children fare under a variety of social circumstances, how these circumstances affect them later in life and, then, we will be able to create programs and interventions to help those in disadvantaged positions. The lack of panel datasets implies that Spanish children and their culture learnings at home and beyond remain a black box. If we do not know, with precision, how Spanish children are feeling and doing, with their parents, peers and at schools, we cannot uncover the causal mechanisms through which some of these children are left behind.

What we know about causal processes in child development, we know it mainly because of research in other countries like US, UK, Germany, Australia or Scandinavia. If we believe the results of this dissertation using Australian data are universal (or at least applicable to Western societies), the political recommendations are extensible to other countries like Spain. There are not persuasive reasons to believe these results are not extensible. Therefore, I consider the policy recommendations coming from Chapters 3 and 4 are applicable beyond the Australian case.

Second, if children with an involved father fare better than those without, as is one of the main conclusions of this dissertation, policies should aim at promoting fathers' involvement in childcare. Not only because it fosters children's skills but also because it allows for greater gender equality at home and at work. The most known policy intervention in this regard is the one allowing similar parental leaves rights among genders. While governments continue regulating gender inequality through unequal attribution of benefits after birth, the gender revolution will continue uneven and children will continue lacking a similar dose of paternal and maternal influence during the first year(s). This policy intervention also has powerful effects at cultural levels. As it has been shown in previous chapters, fatherhood (like motherhood) are particularly linked with how culture defines what is (and what is not) the appropriate and socially accepted behaviour. The more gender equal policy is, the more socially accepted the idea of a father taking care of the child. In this respect, companies play a key role, because increasing paternal leaves may

lead towards demand-side discrimination to involved fathers, under the assumption of a decrease in productivity. Therefore, targeting at incentives for companies to maintain these fathers taking time off work should be a priority.

Third, improving job quality and work conditions for fathers and mothers. Policies aimed at improving work-family balance are key in stimulating better family functioning and improving children's outcomes. Importantly, Western countries are moving toward the so-called 24/7 economy. That is, populations concentrated in big cities where services for consumers are open 24 hours, 7 days a week. Some workers, mostly people in disadvantaged positions occupy these jobs, in precarious conditions and low paid. There is a growing body of literature showing the negative effects this new world economy has over child development (Li et al., 2014 for a review). If paternal time and attachment have more significant effects on children's skill formation than income per se, the move towards the 24/7 economy might have considerable negative effects over parental ability for creating emotionally stable and nurturing environments to boost up children's human capital and well-being.

Fourth, direct interventions with fathers. One issue might arise when, if after allowing for paternal time off work, this time is not reallocated in engaging in stimulating activities with children. We know from previous research a well-stablished gradient between level of education and time in enriching activities with children. The main hypothesis explaining why father with less education engage less in

enriching activities is because they lack information about the benefits. Therefore, stimulating social work and spreading knowledge about the relevance of putting care as a priority should help these families. As it has been shown in Chapter 3, fathers with low levels of education can compensate the educational deficit by engaging in cognitive stimulating activities with their children (five extra weekly hours of father-child time in educational activities has the same effect than having a University degree). This is crucial. There is causal evidence for the case of US that public programs increasing social work with disadvantaged parents have positive effects on children's health and skill development. For example, the "Nurse-Family Partnership Program" in the US provided weekly visits of nurses in low-income families. Mothers were treated in this program (but not fathers). During the first year of the child's life, nurses helped mothers in low-income households improving child's health through specific care practices. Experimental evaluation showed causal positive effects of the program. A similar initiative in promoting low-income fathers engaging practices in enriching activities with their children should lead to increase children's attainment and health. However, if applying this, two things might be seriously considered. First, the "blaming the victim" discourse and the sanctity of the privacy within families. Second, the low take-up and high rates of attrition, which might lead towards insignificant effects of the intervention.

Finally, early child care education centres (ECEC). There is a stablished literature concluding that investing in ECEC has causal

positive effects on both child development and mothers' career prospects. This initiative should also help fathers, especially those from disadvantaged background, in coordinating schedules with partners and leading toward greater within couple gender equilibrium. In this regard, the source of risk in continue reproducing social inequality will be through segregation in ECEC. If ECEC is expanded but access for families is unequally distributed, effects in closing gaps in children will be ameliorated.

5.2. Future Lines of Research

It is well understood, and theoretically grounded, that fathers play a crucial role in child development and latter achievement (Lamb, 2010 for a review). However, the question of *how* fathers' inputs affect children's destinies remains far from clear. This dissertation helps to shed light on a few of these unresolved puzzles, but there is still much that we do not yet know. There is a scarcity of empirical studies addressing the role of fathers in the transmission of advantage, and therefore considerable room for further research. Next, I present a summary of the gaps that, to my knowledge, remain either unexplored or unclear in the literature, and that this dissertation did not address.

This dissertation does not look at divorced or separated parents. The percentage of children that at some point in their lives experience parental union dissolution is around 30-50%, depending on the country. Union dissolution is a critical life event for children when

fathers play a key role in compensating for (or multiplying) the negative effects of such an event on children's skill development and/or educational outcomes. There is robust evidence on the cases of US, UK and Germany about the negative causal effect of union dissolution on children's skills and school outcomes (McLanahan et al., 2013). After union dissolution fathers-child time plays a key role. This is because children usually suffer a significant decrease of paternal time, attachment and influence. However, not many studies have analysed whether such effect varies by social origin, with a few exceptions (Gratz, 2015; Bernardi and Radl, 2014). None of these studies have, however, looked at father-child time as a mechanism in compensating for or multiplying the effect of dissolution on children's outcomes. This represents an important aspect for future research.

Future research should also use selection models when exploring paternal effects on children's outcomes in two-parent families. Fathers in two-parent families might be highly selected (in that they have stayed with their partners and children for many years), and the same unobserved characteristics that may be driving union stability may also be driving the father's effect on children's outcomes. Modelling fathers' self-selection into union stability and involvement represents another relevant issue for further study.

Another route for future research might include increasing efforts to isolate the father's causal effects on children's outcomes by using randomized experiments. This dissertation presents evidence

demonstrating that fathers, especially when they are consistent in childcare and engage in educational activities with their children, can make a considerable impact on their children's skill formation. Randomized experiments have the advantage of achieving causal estimates and potentially contributing toward the development of policies aimed at closing children's attainment gaps by social origin. If it is true that fathers do not become more involved with their children partially because they lack information on the benefits that their involvement has on their children (Cuhna, 2016), conducting an experiment that evidences this knowledge to the aforementioned fathers should increase paternal awareness and involvement. If the results presented in this dissertation have external validity, children's skill gaps by social origin should be partially reduced through stimulating paternal involvement.

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