CHANGES IN FATHERS' AND MOTHERS' TIME WITH CHILDREN DURING THE GREAT RECESSION IN SPAIN

Tomás Cano[1]
Pompeu Fabra University

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ABSTRACT

Parental time spent with children is a critical determinant for a child's cognitive, educational and socio-emotional development. Using two waves of the Spanish Time Use Surveys, this study aims to investigate how mothers and fathers reorganised the time invested in physical and developmental childcare between 2002 and 2010. Results show that, during the period analysed (marked by the start of the Great Recession in 2007), there had been: (i) a significant increase in the time fathers and mothers invested in childcare (i.e., 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 childcare time invested between parents with and without a university degree remained unchanged. The decomposition of the results shows that the increase in father-child time is explained by a combination of changes in behavioural and compositional factors (i.e., increase in unemployment and level of education), whereas for changes in mother-child time, behavioural factors predominantly applied. These findings reinforce ideas of the rapid intensification of parenting, and a slow movement towards gender convergence in parental time spent with children.

Keywords

Gender, Child Development, Social Stratification, Time Use.

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INTRODUCTION

Since the 1970s, fathers and mothers have continued to invest more time in their children across a considerable number of industrialized countries (Dotti-Santi and Treas, 2016). The factors driving increased parental time investments have been argued to be both compositional (e.g. increase in female labour force participation, 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 spent 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; Dotti-Santi and Treas, 2016), 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 aim of this article is to investigate how mothers and fathers reorganised the time they invested in the physical and developmental care of children between 2002 and 2010, using Spain as a case study. 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 dedicated to developmental activities (i.e. reading or play) (Cano et al., 2019;). 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 at the end of the 2000s, have stimulated a wave of research in recent years on the evolution of paternal and

maternal time with children. Evidence shows that during the years of the Great Recession, market work hours declined and parental time with children significantly increased (Aguiar, Hurst and Karabarbounis, 2014). Several studies in the United States have found that fathers invested more time in physical care (i.e., feeding, bathing) at the end of the 2000s (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 in the context of economic 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 changes in parent-child time investments in a context of economic recession in three key ways. Firstly, it uses couple-level data and 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 period analyzed, 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 age of children. Finally, this study draws from high-quality time-use data from a case study in Spain, where socio-economic changes were especially rapid, and the economic recession of 2007 particularly severe.

Spain is a country categorized within the term "southern welfare state regime" (i.e., low expenditure in social services, weak spending on families, or healthcare as a right of citizenship) (Arts and Gelissen, 2002; Ferrera, 1996), among the lowest low-fertility countries (i.e., fertility rate below 1.3 children) (Kohler et al., 2006) and relatively advanced in terms of pro-gender egalitarian attitudes when compared with other industrialized countries (Esping-Andersen, 2013).

During the 1990s and 2000s in Spain, there was a rapid modernization of women's roles, concentrated in younger generations; by 2008, the percentage of women in tertiary-level education (29%), and the female employment rate (58%), met the OECD mean (OECD, 2011). In short, during these two decades, the transformation of Spain has been considered "truly revolutionary over a surprisingly short period of time" (Esping-Andersen et al., 2013: 18).

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 it 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). In addition, rising levels of social inequality have been linked to diverging parental investments in childcare (Schneider et al., 2018). 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 in early 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.

Physical childcare

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 primary responsibility for physical care (Sullivan et al., 2018 for a review). Despite a trend towards paternal involvement in physical 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, 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 primary 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 parental employment status. 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 in paid work. This prediction, however, is challenged by the doing gender theory (West and Zimmerman, 1987), which claims that unemployed fathers do not increase time spent in physical care activities compared to those that are employed. The idea, later reframed as "gender deviance neutralization", is that when couples are in unconventional families (e.g., where only the mother provides for the family financially), "women and men take part in gender deviance neutralizing behaviour, that is, they exaggerate behaviours that contradict a deviant economic identity" (Evertsson and Nermo, 2004: 1273). Therefore, unlike the relative resources theory, the gender neutralization perspective would predict that, in a couple where the father is unemployed and the mother works full-time, the mother will continue to spend more time on childcare than the father. This is because a breadwinning wife and unemployed husband face social stigma for deviating from the more socially accepted norms

(e.g., dual earners, father as breadwinner), and therefore aim to protect their perceived femininity and masculinity overdoing those tasks that are socially linked to traditional gendered roles (i.e., women doing housework, men avoiding housework) (e.g., 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 status, 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 study 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 the 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.

Developmental childcare

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 the 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 parent-child 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, increased levels of education - especially among women of reproductive age-, and severe economic recession.

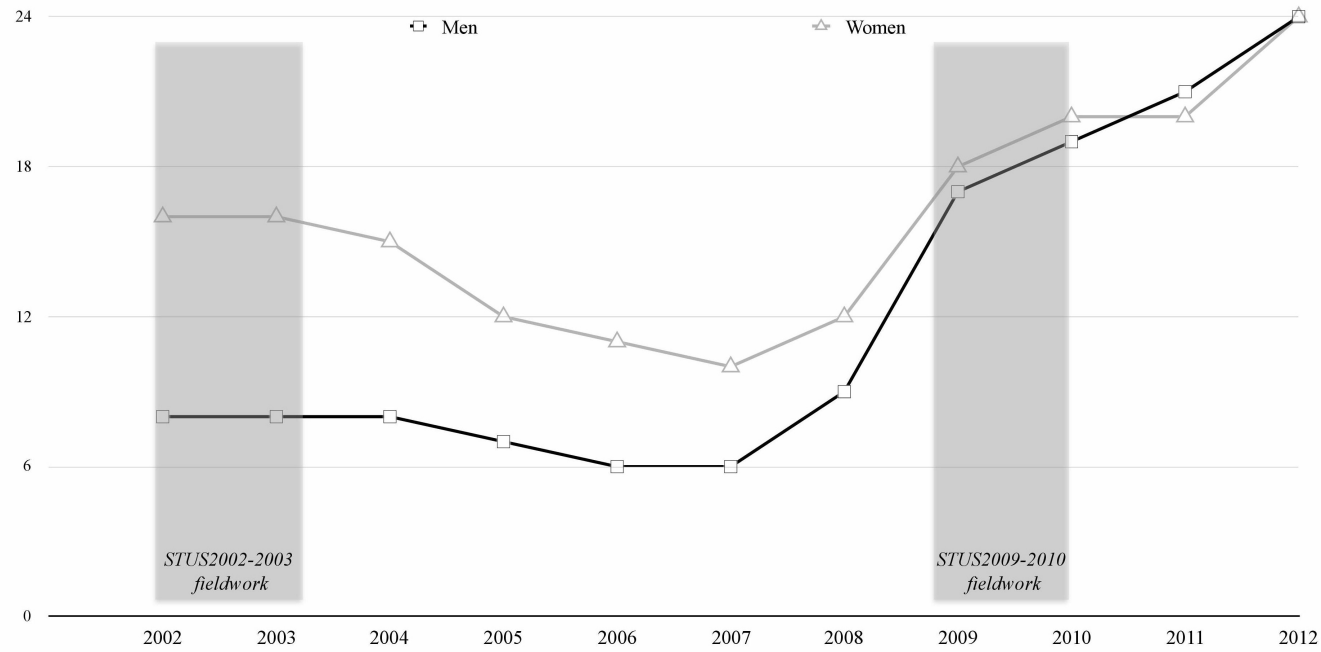
THE SPANISH CASE

Spain affords us an interesting case by which to study changes in parental time spent with children during the period 2002 to 2010 because of the rapid socio-economic change in this time. As noted above, Spain experienced rapid modernization of women's roles, significant changes in gender-egalitarian values, increases in levels of education, changes to the parental leave system, and severe economic recession.

Starting in 2007, the Great Recession saw the construction sector collapse, 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 period analysed, Spain's social inequality increased, from a Gini coefficient of 31 in 2002, to 36 in 2012 (World Bank, 2017).

Figure 1: Unemployment rates by gender (Spain, 2002-2012)



Source: Spanish Labour Force Survey [for details, see www.ine.es]).

In 2007 a new paternity leave regulation was introduced in Spain. 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 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 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 in 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. In Spain, education is free and compulsory for all children aged 6-16 years. Before age 6, there are two stages of education divided by age: children aged 3-6 have free access to education in schools. Below that age (0-3), education is offered at early care centres and is not free for all children. For ages 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 for ages 0-3 (below 10% of average wages) (OECD, 2012). However, the cost of childcare for ages 0-3 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 countries (Esping-Andersen, 2013). Data from the International Social Survey Program (ISSP) show that in 2012, 18% of people in Spain agreed with the statement: "men should earn money and women take care of the house and family", ranking above countries like the United States (25,5%), Switzerland (24,9%), Japan (24,4%) or Portugal (23,5%). Spain ranked similarly to Germany (16,8%) and Belgium (18%), and below Scandinavian countries, France, the UK or Canada (all below 15%). In addition, between 2002 and 2012, this percentage dropped from 24.3% to 18%, suggesting a marked trend towards more gender-egalitarian values, especially among younger cohorts (Castro-Martín and Seiz, 2014). Importantly, in the 2000s,

Spain ranked highly among the OECD countries comparing parental time spent with children, surpassed only by Australia, Canada, and Sweden in physical care, and Australia, the US, Poland, Finland and Denmark in developmental care (OECD Child Well-Being Data Portal).

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 advanced rich democracies spent one quarter of the parent-child time they would spend several decades later (Dotti-Santi and Treas, 2016; 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 period analysed, 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, with parents opting to assume this themselves rather than pay someone else. Following these arguments,

Hypothesis 1.— *I predict that, between the years 2002 and 2010, the amount of time parents spent on physical and developmental care will have increased.*

The second hypothesis refers to the variation in the gap between paternal and maternal time spent on physical childcare between the years 2002 and 2010. The time availability theory contends that gender variations in time devoted to physical childcare are explained primarily by the employment status of parents. In 2010, 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 (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.— *In 2010, 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 in 2010 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 between survey years 2002 and 2010. In the case of Spain, an education gap in developmental care has already been noted (Gracia, 2014). In 2010, social inequality had risen in Spain, and parents might have decided to increase their time investments in developmental childcare. This increase, however, may be unequally effective for parents depending on socio-economic position. It could be that, in a context of economic 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 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, in 2010, the level of inequality in Spain markedly increased, we might expect that:

Hypothesis 3a. — *In 2010, 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, in 2010, 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, in 2010 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.— *In 2010 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.*

DATA AND METHODS

Data was drawn from two waves of Spanish Time Use Surveys (STUS) conducted to date; the first carried out in 2002-2003, and the second in 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: Sample of married or cohabiting fathers and mothers with at least one child aged 13 or less at home. 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 the increase in the level of education. Between 2002 and 2010 employment status 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. 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 previously acquired in the market, such as domestic work (Greenwood and Hercowitz, 1991). The sample also reflects a major shift: higher rates of mothers and fathers holding university degrees.

Dependent variables: physical and developmental care

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).

Key explanatory variables: year of the survey, employment status and 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 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 (0=2002-2003, reference category; 1=2009-2010). Employment status is a set of three dummy variables (full-time [reference category], part-time and not working). Full-time refers to schedules of at least 8 hours per day, and part-time captures those parents working 7 or less hours per day. "Not working" includes both unemployed and inactive persons. I have merged the two categories into "not working" due to the low sample number of unemployed cases when considering them separately (n=168 unemployed fathers and 318 unemployed mothers in 2002-2003; 221 unemployed fathers and 251 unemployed mothers in 2009-2010). Educational attainment is one dummy variable (0=Below university degree [reference category]; 1=University degree).

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 on weekends; and (iii) type of day, 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).

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 in years 2002-2003 and 2009-2010. T-tests are used to identify significant variations in the 2009-2010 survey respective to 2002-2003.

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 year of survey 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 the 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 it allows for partition of change in the two dependent variables 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.

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:

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

$$T_{t} = \beta_{0t} + \beta_{1}t\ \mathbf{X}_{t} + e \qquad (2)$$

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:

$$T_{t+1} - T_{t} = \beta_{0t+1} + \beta_{1\,t+1}\mathbf{X}_{t+1} - \beta_{0t} + \beta_{1t}\,\mathbf{X}_{t} = (\beta_{0t+1} - \beta_{0t}) + (\beta_{1t+1} - \beta_{1t})\,\mathbf{X}_{t} + \beta_{1t+1}(\mathbf{X}_{t+1} - \mathbf{X}_{t+1}) \qquad (3)$$

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 survey year 2002-2003 – the explained change, or compositional change $[\beta_{t+1}(\mathbf{X}_{t+1} - \mathbf{X}_{t+1})]$, and the amount of change that is unexplained, or behavioural $[(\beta_{t+1} - \beta_{t})\mathbf{X}_{t}]$.

RESULTS

Descriptive results

Table 2 illustrates the descriptive means of paternal and maternal time spent on physical childcare by employment status in 2002 and 2010. Significant differences across the survey years are shown in the "difference" column. Focusing on the difference column, parents in 2010, regardless of their employment status, increased their time spent on physical childcare, compared to the sample of parents in 2002. It is possible that this reflects a heightened adherence to gender egalitarianism and intensive parenting ideals for 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 in 2010 (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				
	Survey year 2002-2003		Survey year 2009-2010			Survey year 2002-2003		Survey year 2009-2010		
	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 between the two survey waves are also shown in the "difference" column. Less educated mothers in the sample of 2010 increased their developmental childcare time by 8.6 minutes per day, compared to those mothers who were less educated in 2002, while fathers did so by 5.6 daily minutes. The difference in developmental time between parents holding a university degree in 2010 and their counterparts in 2002 was a ~7.5 daily minutes increase, and this change 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 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			
	Survey year 2002-2003		Survey year 2009-2010		Survey year 2002-2003		Survey year 2009-2010	
	Mean	*SD*	*Mean*	*SD*	Difference	*Mean*	*SD*	*Mean*	*SD*	Difference
Educational level										
University degree	22.50	42.84	30.11	53.59	7.60**	26.43	42.30	33.81	47.87	7.37**
Secondary or lower	15.62	35.61	21.22	43.65	5.60***	17.31	34.53	25.62	45.01	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: ** $p < 0.01$, *** $p < 0.001$.

Multivariate results

In the following section hypotheses are tested. 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 of Table 4 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. Secondly, Table 5 shows ten regressions divided by child's age in order to observe changes in the gender gap in physical care across developmental stages. Thirdly, Table 6 shows the results of Oaxaca

decomposition. Finally, the study runs a set of supplementary analyses, with results are shown in Supplementary Materials (Table A3).

Changes in physical and developmental care time

Hypothesis 1 anticipated that parents will have increased the time invested in physical and developmental care in 2010 compared to 2002. The key variable capturing the change in parental care (year of survey) in Panel A of Table 4 shows that fathers and mothers were investing significantly more time in physical and developmental care time in 2010 as compared to parents in 2002, net of control variables. Totalling the minutes spent on both types of care, there was an overall increase of 14 daily minutes, which is consistent with the expectation of Hypothesis 1. Spanish children in 2010 received ~3 hours more per week of face-to-face engaged parental care, as compared to children in 2002. 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	88.35***	24.62	191.89***	39.46	11.06	19.85	-38.68*	19.51
Adjusted R^2	0.18		0.31		0.07		0.05	
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	10.95	1.95	3.85
Year 2009-2010*Not working	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	88.33***	24.62	195.12***	39.50	11.27	19.50	-37.59*	19.54
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, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Hypothesis 2 was divided along two levels. The first (*Hypothesis 2a*) predicted a narrowing gender gap in physical care during the period analysed. Looking at the *physical care* columns in Panel A of Table 4, we can observe that fathers in 2010 were spending about 8 minutes more in physical care as related to fathers in 2002. For the case of mothers in 2010, they were spending

about 8 minutes more as compared to mothers in 2002. These results are in line with expectations of Hypothesis 2a. However, it should be noted that the overall reduction of the gender gap was substantially small.

To observe the changing associations between employment status and physical care in 2010, 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 in 2010 as related to fathers not working in 2002. This is in line with predictions, as this group greatly increased in size, and became more diverse in 2010. 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 in 2010. Fathers with degree-holding partners spent 2.3 more daily minutes engaged in physical care in 2010 as compared to the same group in 2002. 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.

Hypothesis 3 concerns the variation of the education gap in developmental care between 2002 and 2010. Looking at the column *developmental care* of Panel A in Table 4, time spent in this type of care also rose in 2010. Fathers in 2010 increased their time spent by 6.5 daily minutes ($p<0.01$), while mothers in 2010 increased theirs by 9.3 daily minutes ($p<0.001$) as related to parents in 2002. The main variable of interest to test hypothesis 3 (i.e. interaction between recession and possession of a university degree) shows that parents with University degree in 2010 were dedicating about 4 minutes more to developmental care compared to parents with University degree in 2002. However, the difference in parental developmental time between 2002 and 2010 was not statistically significant, which demonstrates that the education gap in parental developmental care time did not widen in 2010, this result being consistent with predictions of the null Hypothesis 3b.

Children's Developmental stages

Hypothesis 2b predicted that the narrowing of the gender gap in physical care will have been driven by the increase in father-child time during the early stages of childhood. Table 5 shows the results of ten OLS models regressing physical care time for fathers and mothers disaggregated by child's age. Fathers with children below 1 year old in 2010 were dedicating around 20 daily minutes more in physical care related to fathers with children below 1 in 2002, and this change was similar (16 minutes more) for fathers with children between 1 and 2 years old. Mothers with children between 0 and 2 years old in 2010, however, dedicated the same amount of time to physical care as compared to mothers with children within these age ranges in 2002. This result shows a remarkable gender convergence in physical care for couples with very young children, consistent with expectations of Hypothesis 2b. In these couples, the gap reduced by ~2 hours per week in only 7 years.

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*
Year of survey (ref. cat.: Year 2002-2003)																				
Survey year 2009-2010	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, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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

Δ 2002-2003 to 2009-2010	Total		Not working		Partner's Not working		University degree		Partner's University degree	
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
Fathers										
	3.1***	5.0***	1.45***	.78	.82	.55	.53**	-1.56	1.40***	0.78
Physical care	(.96)	(1.44)	(.29)	(.68)	(.19)	(1.50)	(.11)	(1.2)	(.98)	(1.2)
	2.8***	3.9**	.46*	-.53	.45	1.16	.37***	.94	.45*	-1.1
Developmental care	(.87)	(.94)	(.43)	(.51)	(.18)	(1.11)	(.12)	(1.08)	(.13)	(1.2)
Mothers										
	-2.1	6.2*	-2.99	3.4	-1.06	.21	2.2***	2.55	.01	-.5
Physical care	(1.82)	(2.12)	(.48)	(2.33)	(.31)	(.78)	(.44)	(2.22)	(.21)	(1.91)
	-0.2	9.4***	-.78	-.03	-.36	.15	.91***	-.3	.24*	-.4
Developmental care	(.62)	(1.31)	(.15)	(1.12)	(.27)	(.45)	(.20)	(1.10)	(.12)	(-.40)

Source: Spanish Time Use Surveys (2002-2003 and 2009-2010). *Note:* Decompositions using Ordinary Least Squares regressions from Panel A, Table 4. Standard errors in parenthesis. Significance levels: * $p < 0.05$; ** $p < 0.01$; ** $p < 0.001$.

Decomposition of results

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 and level of education. 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. Also, there is a substantive increase in the level of education of parents in the second wave. The variation of parental care time might also be driven by behavioural changes (i.e. not explained by the compositional change of sample), or by a combination of compositional and behavioural changes.

Results from the Oaxaca decomposition are shown in Table 6. Each of the columns is divided into the explained part (compositional change) and the unexplained part (behavioural change). The first column of the table illustrates the total variation over the period, and subsequent columns show changes by employment status and level of education. Looking at the first column (i.e., the total change), 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 $p<0.001$. Total change for mothers, however, demonstrates different dynamics; all change appears to be behavioural. This applies for both physical and developmental care. When we disaggregate changes by employment status and level of education, we observe that, for fathers, compositional changes in physical care are mainly driven by an increase in the

number of fathers unemployed, and the increase of the level of education *of their partners*. If fathers in 2010 had the same composition as in 2002 (i.e., less unemployment, lower level of education, and lower level of partner's education), they would dedicate 3.38 minutes less per day to physical care. Similar patterns with smaller coefficients appear for developmental care. For mothers, *their own* level of education appears as the main significant driving factor.

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. Unemployed fathers in 2010 were dedicating 12 daily minutes more than unemployed fathers in 2002 ($p<0.05$). However, inactive fathers in 2010 were dedicating the same amount of time as related to inactive fathers in 2002 (β=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.

A second sensitivity analysis is concerned with the variable level of education. As noted in the method section, one of the main variables 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 for 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.

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.

DISCUSSION AND CONCLUSION

This study has investigated the evolution of parental time investments in childcare in Spain between 2002 and 2010, 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 in a context marked by rapid changes in employment and education and, specifically, at which stages of child development. Secondly, it evaluates 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). 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, the socio-political changes, and the rapid increase in level of education during the period analysed make Spain an excellent case for this study.

The results of this study have shown that, between 2002 and 2010, 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, 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. 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 that 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, 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 were 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. Increasing income inequality might point to this line of argument. In addition, the study did not test other potential sources of gender inequality (e.g., who provides urgent care in case of sickness, or when childcare took place - i.e., day, evening or night). 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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APPENDIX

Table A1: Correspondence between time categories and activities

Variable	*Codes in STUS**	*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 (2002-2003 and 2009-2010).
Notes: *Both STUS (2002-2003 and 2009-2010) 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	11.35***	1.92	26.24***	2.22	6.74***	1.98	7.95***	1.44
Level of Education								
University degree	5.77***	1.53	16.56***	2.01	4.36***	2.01	6.56***	1.24
Interactions								
Recession*Not working	9.01*	2.34	4.12	3.34	0.21	2.44	1.82	3.84
Recession*University 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.