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Fathers' Leave, Fathers' Involvement and Child Development: Are They Related? Evidence from Four OECD Countries

María del Carmen Huerta,
Willem Adema,
Jennifer Baxter,
Wen-Jui Han,
Mette Lausten,
RaeHyuck Lee,
Jane Waldfogel

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FATHERS' LEAVE, FATHERS' INVOLVEMENT AND CHILD DEVELOPMENT: ARE THEY RELATED? EVIDENCE FROM FOUR OECD COUNTRIES

OECD SOCIAL, EMPLOYMENT AND MIGRATION WORKING PAPERS N°140

Maria C. Huerta, Willem Adema, Jennifer Baxter, Wen-Jui Han, Mette Lausten, RaeHyuck Lee and Jane Waldfogel

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Maria C. Huerta and Willem Adema are economists in the Social Policy Division of the OECD Directorate for Employment, Labour and Social Affairs. Jennifer Baxter is Senior Research Fellow at the Australian Institute of Family Studies. Mette Lausten is Senior Researcher in the unit on Children and Family at SFI – the Danish National Centre for Social Research. Wen-Jui Han is Professor at The Silver School of Social Work at New York University. RaeHyuck Lee is researcher at Columbia University School of Social Work. Jane Waldfogel is Professor of Social Work and Public Affairs at Columbia University School of Social Work and Visiting Professor at London School of Economics.

This paper uses data from four cohort studies: Growing Up in Australia, the Longitudinal Study of Australian Children (LSAC); the Danish Longitudinal Survey of Children (DALSC); the Millennium Cohort Study (MCS) of the United Kingdom; and, the Early Childhood Longitudinal Study (ECLS) of the United States. The Australian study is conducted in partnership between the Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA), the Australian Institute of Family Studies (AIFS) and the Australian Bureau of Statistics (ABS). The Danish study is carried out by the Danish National Centre for Social Research (SFI). The UK study is run by the Centre for Longitudinal Studies (CLS), an Economic and Social Research Council (ESRC) resource centre, within the Institute of Education, in the University of London. Data is available through the UK Data Archive and Economic and Social Data Service. The US study is conducted by the National Center for Education Statistics (NCES), within the Institute of Education Sciences, in the US Department of Education.

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ABSTRACT

Previous research has shown that fathers taking some time off work around childbirth, especially periods of leave of 2 or more weeks, are more likely to be involved in childcare related activities than fathers who do not do so. Furthermore, evidence suggests that children with fathers who are 'more involved' perform better during the early years than their peers with less involved fathers. This paper analyses data of four OECD countries — Australia; Denmark; United Kingdom; United States — to describe how leave policies may influence father's behaviours when children are young and whether their involvement translates into positive child cognitive and behavioural outcomes. This analysis shows that fathers' leave, father's involvement and child development are related. Fathers who take leave, especially those taking two weeks or more, are more likely to carry out childcare related activities when children are young. This study finds some evidence that children with highly involved fathers tend to perform better in terms of cognitive test scores. Evidence on the association between fathers' involvement and behavioural outcomes was however weak. When data on different types of childcare activities was available, results suggest that the kind of involvement matters. These results suggest that what matters is the quality and not the quantity of father-child interactions.

RÉSUMÉ

Comme l'ont montré des travaux de recherche antérieurs, les pères qui prennent un congé à la naissance de leur enfant, en particulier des périodes de congé de 2 semaines ou plus, ont davantage tendance à s'occuper de leurs enfants que les autres pères. De plus, les chiffres semblent indiquer que les jeunes enfants dont le père est « plus impliqué » obtiennent de meilleurs résultats que les autres. À partir de l'analyse des données issues de quatre pays de l'OCDE — Australie; Danemark; Royaume Uni; États-Unis —, ce rapport décrit en quoi les politiques relatives aux congés peuvent influer sur le comportement des pères de jeunes enfants et évalue si l'implication paternelle produit, chez l'enfant, des effets positifs sur les plans cognitif et comportemental. L'analyse montre que les pères qui prennent un congé de paternité, et particulièrement ceux dont le congé dure au moins deux semaines, ont davantage tendance à s'occuper de leurs jeunes enfants. Certaines données paraissent indiquer que les enfants de pères très impliqués ont tendance à obtenir de meilleurs scores aux tests cognitifs. Toutefois, cette association positive est modeste, et l'association observée sur le plan du comportement est faible. Il faut peut-être en déduire qu'en matière d'interactions père-enfant, c'est la qualité qui compte, et non la quantité.

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INTRODUCTION

1. Fathers of the twenty-first century are more involved in children's lives than before (Gauthier *et al.,* 2004; Hook, 2006; Maume, 2010; O'Brien *et al.*, 2007; and, United Nations, 2011). Although the timing and pace of change varies widely across countries, a change in the role of fathers is observed worldwide (O'Brien *et al.,* 2007). Men are no longer expected to be exclusive breadwinners but are frequently expected to share the caring responsibilities with their partners. However, despite important progress, women still are the main caregivers. This is true even in the Scandinavian countries, who are the pioneers in supporting gender equality in the division of work inside and outside the household (Rostgaard, 2002).

2. Numerous factors have contributed to men's increased participation in housework and care activities, including: growing female employment; increased family diversity; changes in attitudes towards work and care; and, availability of family-friendly policies. O'Brien and Moss (2010) and Maume (2011) argue that the main determinant has been women's increased participation in paid work and their contribution to households' earnings. Today in most OECD countries the majority of couple families are dual earners (OECD, 2011). Thus, both mothers and fathers have had to find a new balance between work and family responsibilities.

3. Many OECD countries have introduced family-friendly policies to help parents find their preferred balance between parenting and employment (OECD, 2011). Moreover, in recent years, there has been increasing interest in developing policies to support fathers in contributing more to caring for young children. The underlying objectives behind these policies may differ across countries, but, in general, they aim to increase gender equality at home and at the workplace as well as to strengthen father-child relationships and thus improve child well-being outcomes (Rostgaard, 2002).

4. Available evidence shows fathers want to spend time caring for and being with their children as in many countries an overwhelming proportion of fathers takes time off work around childbirth (Moss, 2011 and O'Brien *et al.*, 2007). What is more, in countries without legal parental-leave provisions in place, fathers use other types of leave to spend time with their children during the first months of life (La Valle *et al*., 2008; and, Whitehouse *et al.*, 2007). However, the number of fathers who takes time off work and the amount of time they take off is greatly influenced by their leave entitlements.

5. Fathers' leave taking positively influences fathers' involvement in childcare and housework related tasks (Brandth and Gislason, 2012; Haas and Hwang, 2008; O'Brien and Moss, 2010; Nepomnyaschy and Waldfogel, 2007; and, Tanaka and Waldfogel, 2007). Positive father involvement, in turn, is associated with numerous benefits, including better outcomes for children (Baxter and Smart, 2011; Cabrera *et al.*, 2007; Lamb, 2010; OECD, 2012a; Sarkadi *et al*., 2008; and, WHO, 2007) and for fathers themselves (Baxter and Smart, 2011; Eggebben, 2001; Smith, 2011; and, WHO, 2007). For instance, fathers who spend more time with their children have, on average, more favourable labour market outcomes – earn more per hour and work fewer hours per week – than their peers who spend less time with their children (Smith, 2011); fathers who contribute more to housework and childcare experience a lower risk of divorce than fathers who contribute less (Sigle-Rushton, 2010); and, fathers who are more engaged with their children are more satisfied with their lives than their counterparts who engage less (Eggebeen, 2001).

6. The aim of this study is twofold. First, following work by Nepomnyaschy and Waldfogel (2007), for the United States, it uses longitudinal data of four OECD countries to examine whether taking leave around the time of birth (paternity leave, parental leave or annual leave) is associated with father's involvement in childcare-related activities. Second, building on research on Australian fathers by Baxter and Smart (2011), it investigates whether children with more involved fathers have better cognitive and behavioural outcomes than their peers with less involved fathers. Results from these analyses are critical for policy recommendations on the development and promotion of parental-leave policies for the exclusive use of fathers.

7. In the next section, the main findings of the study are presented. The second section sets the background of this research by presenting a picture of fathers' involvement and relevant family policies in OECD countries. The third section provides information on the data, the variables and the methodology used in the analysis. The fourth section describes the results; and the final section provides a discussion of the key findings of the study and concludes.

Main findings

8. In the four OECD countries analysed – Australia, Denmark, the United Kingdom and United States – an overwhelming majority of fathers – around 80% or more – took some time off work around childbirth. This percentage was highest in Denmark, but it was also high in the Anglophone countries, where at the time these children were born there were no statutory paid leave entitlements for fathers. This suggests that fathers are interested in taking time off work to be around their children when these are born. On the other hand, the number of days off work differed markedly across countries. The largest proportion of fathers taking two or more weeks was observed in Denmark (90%) and the smallest in United States (33%). Difference in number of days is clearly related to differences in leave entitlements between Denmark and the Anglophone countries.

9. The characteristics of fathers who took time off work during the child's first year of life differed markedly from those who did not take leave. The former tended to be from more advantaged backgrounds (to be highly educated, native-born, married, to work full-time, to have high incomes) than the latter. Differences in leave taking by fathers' socio-economic characteristics were smaller in Denmark, where legal provision of paternity and parental leave for fathers has been in place for almost three decades. By contrast, in the Anglophone countries, leave policies for fathers were unavailable at the time children in these cohort studies were born, early 2000s. In these countries, children in less advantaged households are more likely to start with some inequalities including lack of father's availability and involvement.

10. Fathers' leave-taking is associated with involvement in childcare activities, especially periods of leave of two or more weeks. Fathers in Australia, Denmark and the United States were more likely to be involved in childcare-related tasks (*e.g.,* helping the child to eat, changing diapers, getting up at night for the child) when they took periods of leave of two or more weeks compared with fathers who did not take leave. Fathers in the United Kingdom who took parental or paternity leave during the child's first year of life were also more likely to participate in children's lives than fathers who did not take time off work.

11. Father's involvement was associated with some positive cognitive outcomes. The clearest and strongest association was observed in the United Kingdom, where children with highly involved fathers were faring better in terms of cognitive outcomes than children with less involved fathers. In the United States, some evidence of a positive relationship was observed but the pattern of association was not consistent. Children with medium involved fathers did better on some tests, but this tended not to be the case for those with the most highly involved fathers. In Australia, fathers' involvement was linked with better scores for one out of four cognitive tests. In Denmark, there was no clear evidence of a positive link between paternal involvement and child cognitive outcomes.

12. The association between paternal involvement and child cognitive outcomes was stronger when assessing involvement at ages 2 or 3 compared with involvement during child's first year of life. When paternal involvement includes personal care activities such as helping the child to eat, changing diapers, or getting the child to bed, there is little or no evidence of a positive association with cognitive or behavioural outcomes. However, when paternal involvement includes activities such as reading and playing, there is some evidence of a positive link between fathers' involvement and child cognitive outcomes. These results suggest that the importance of paternal involvement is not just a matter of time but foremost an issue of quality.

13. Overall, there was little evidence that behavioural problems were less likely amongst children with fathers who reported medium or high levels of involvement during infancy. Only in the United Kingdom were associations significant and consistent.

14. This paper shows that fathers' leave, father's involvement and child development are related. Parental leave policies can contribute to encouraging fathers to participate in child-care related tasks. However, they need to be well-designed to be attractive to working parents. There is evidence that fathers' use of paternity and parental leave is largest when leave is well-paid and when part of the entitlement cannot be transferred to his partner and it is lost if not used. In addition, to facilitate fathers' role as carers, leave policies have to be complemented with other family-friendly policies such as flexible working practices and availability and support for childcare services.

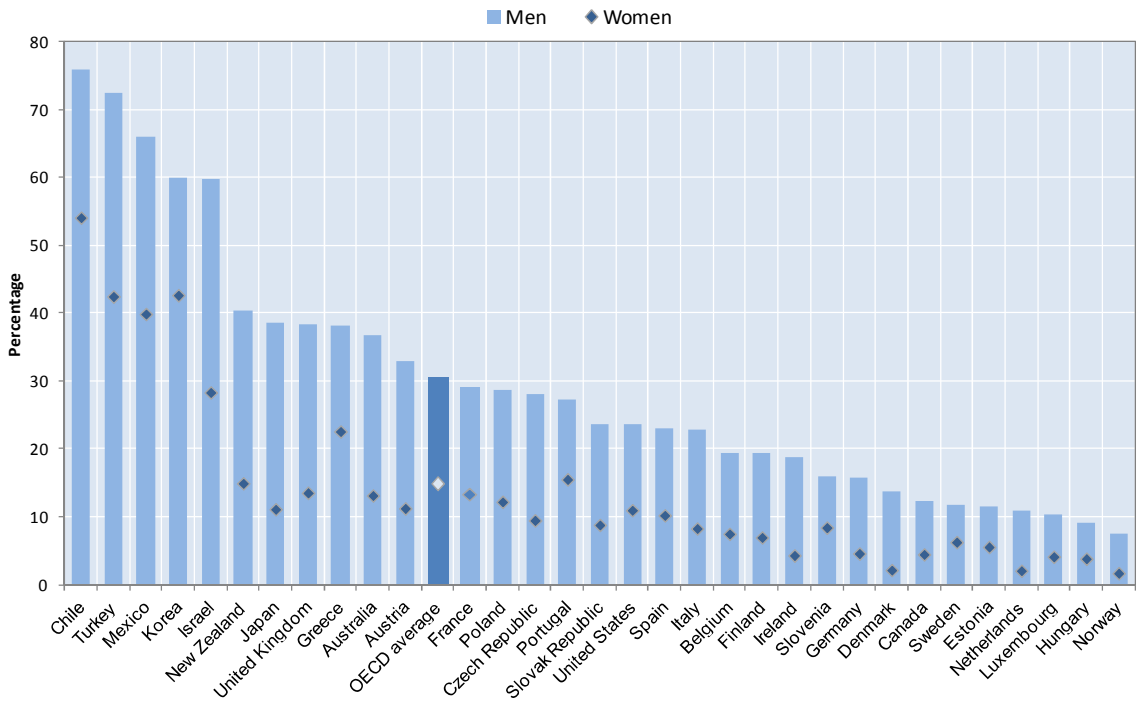
Background and literature

What does fathers' involvement look like across the OECD?

15. An important barrier to paternal involvement in children's lives is the time fathers dedicate to other activities, especially the time they spend at work. Working practices such as long and atypical working hours may negatively influence the amount of time fathers spend with their children. Overall, men spend longer hours in paid work than women. Across the OECD, around 30% of men aged 25 -54 report working long hours - 45 or more hours per week. These rates are highest in Chile, Israel, Korea, Mexico and Turkey, where more than 50% of men have long working hours. On the other hand, few men report working long hours in Hungary, Luxembourg, the Netherlands, and Norway. In countries, where formal female employment is low (Chile, Korea, Mexico and Turkey) or where many women work part time (Australia, Austria and United Kingdom), men tend to work long hours. In the Netherlands, however, in spite of a large number of women working part-time, the proportion of men working long hours is also relatively low.

Figure 1. In several OECD countries men work long hours

Percentage of men and women aged 25 - 54 working 45 hours or more per week, 2011

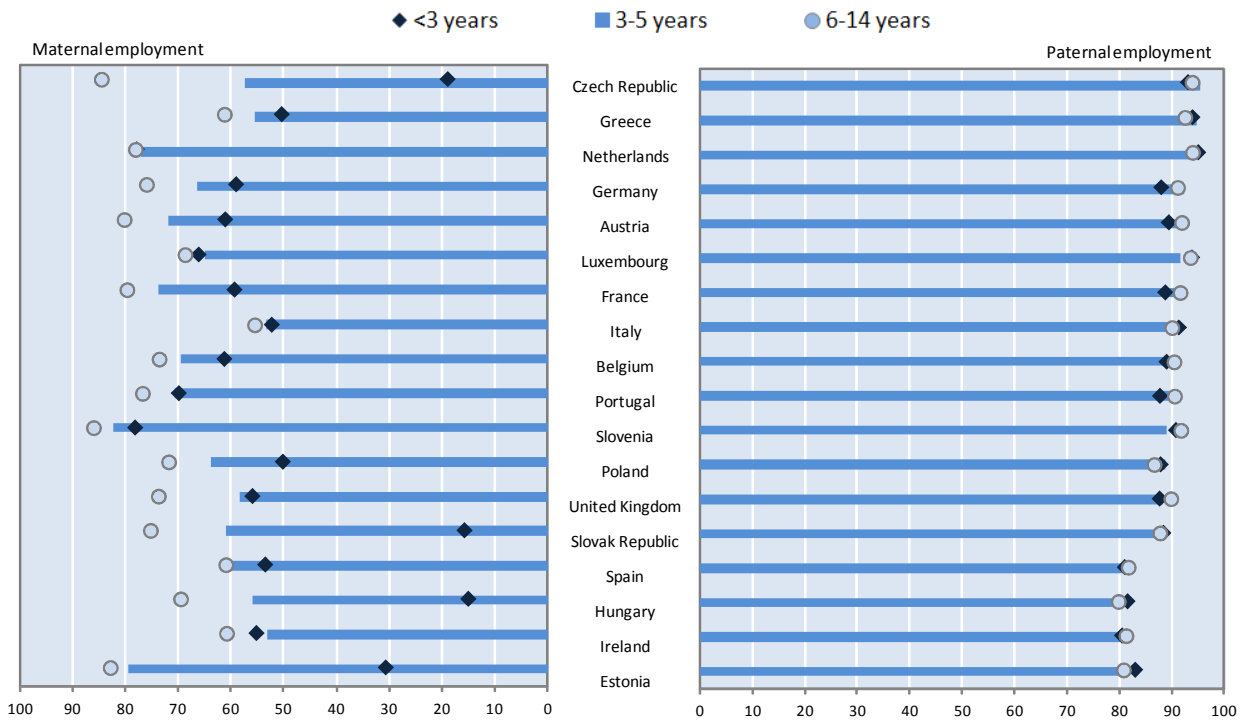


Note: Countries are ranked in ascending order of the percentage of men working 45 hours or more per week. Source: OECD Employment database (www.oecd.org/employment/database).

16. Compared to women, men are less likely to adjust their working hours or to withdraw from the labour market in the presence of young children (OECD, 2011). Figure 2 shows that mothers with very young children are less likely to be in paid work than those whose youngest child is in compulsory schooling. Fathers' employment participation, by contrast, does not seem to be affected by the presence of children. What is more, some studies have shown men tend to slightly increase their number of working hours and commitment to work with the arrival of children (O'Brien *et al.*, 2007 and OECD, 2011).

Figure 2. Fathers' employment participation is not affected by the presence of young children

Maternal and paternal employment rates by age of youngest child, persons aged 15-64, 2009



Note: Countries are ranked in ascending order of the percentage of fathers in employment with youngest child aged 3 to 5.

Source: European Union Labour Force Survey, 1998-2009

17. Fatherhood may put some pressure on fathers' working behaviours as they tend to be the main household earner. However, "earning" seems to have become more compatible with "caring". Across all countries for which time-use data are available, father's time as caregivers has increased compared with previous generations. For example, Hook (2006) estimates that, in 2003, resident fathers in industrialised countries spent on average 6 more hours per week in unpaid work (*i.e.*, childcare and housework activities) than fathers in 1965. Likewise, Gauthier *et al.* (2004) and Bianchi *et al.* (2006) show that married fathers in 2000 spent more time in childcare activities than fathers in the 1960s (48 minutes per day more, Gauthier *et al.,* 2004). Recent estimates from France also show an upward trend between 1999 and 2010 (Ricroch, 2012).

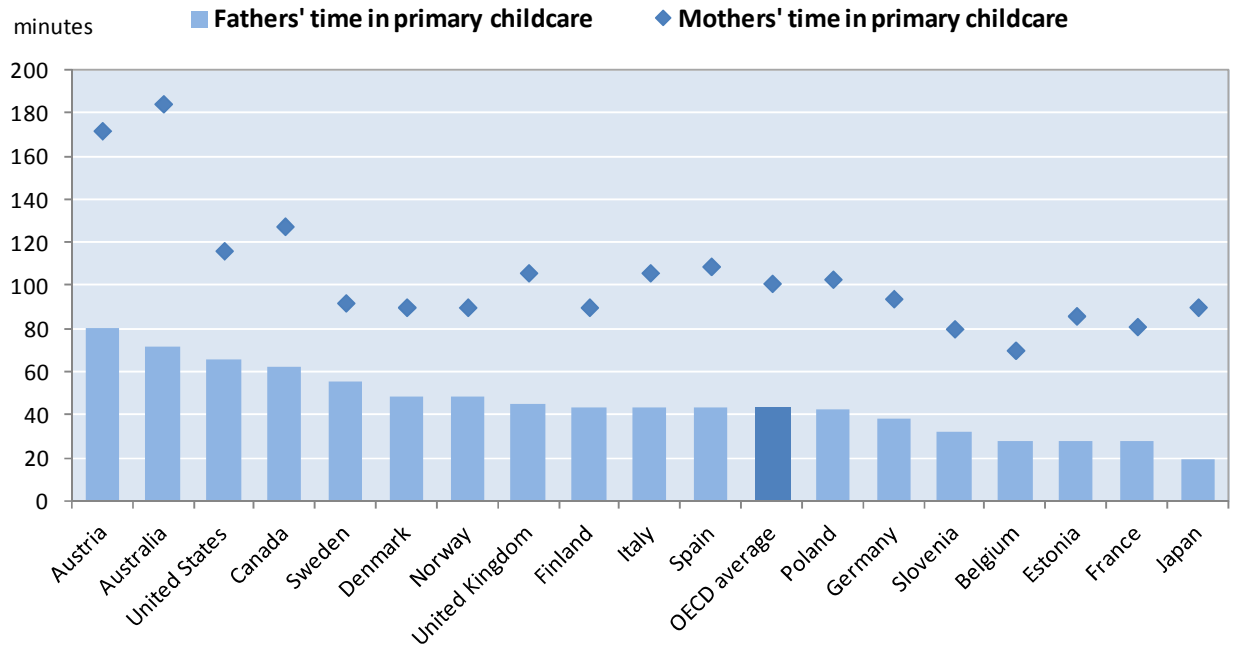
18. Studies distinguishing time use between workdays and weekends have observed that fathers' time in childcare tasks has increased mainly on weekends (Maume, 2011 and Yeung *et al.*, 2001), when their availability to contribute to childcare is less constrained by their time in paid work. Evidence from the United States shows that most mothers remain the main caregiver during weekdays, but that during the weekends there is a more equal sharing of care responsibilities between parents (Yeung *et al.*, 2001). This "weekday-weekend" difference in care suggests the parental gap is narrowing during weekends only. This is apparent for Australia also, when examining children's co-presence with mothers and fathers on weekends and weekdays in couple households (Baxter, 2009).

19. Fathers spend more time caring for young children than previous cohorts. Nevertheless, this has not translated into a reduction in women's time in caring for children or other household activities. Bianchi *et al.* (2006) estimate that fathers' time in childcare activities more than doubled between 1965 and 2000 (from 2.6 hours a week to 6.5 hours a week). By contrast, albeit at a smaller rate, mothers' time in these activities also increased during the same period (from 10.6 to 12.9 hours per week). Hence, the care gap between fathers and mothers has barely changed as men continue to invest less time than mothers in unpaid activities (Miranda, 2011 and van der Lippe *et al.*, 2011). To some extent, the greater involvement by mothers in children's personal care tasks, relative to fathers, reflects the differences in mothers' and fathers' engagement in paid work when children are young.

20. Figure 3 presents the amount of time devoted to childcare by mothers and fathers with children under the age of 18 across the 18 OECD countries for which data are available. These statistics clearly show the total amount of time devoted to childcare as a primary activity differs significantly between mothers and fathers. Fathers spent on average a total of 42 minutes per day on childcare, while mothers devoted an average of 1 hour and 40 minutes a day. Across all countries, fathers spent less than half as much time on childcare as mothers did. The total amount of time devoted to children also differs considerably across countries. Father's total time invested in childcare was highest in Australia, Austria, Canada and the United States - with more than 1 hour a day; and lowest in Belgium, Estonia, France, Japan and South Africa - with less than 30 minutes a day.

Figure 3. Across all countries, fathers spent less time in childcare than mothers did

Primary childcare in minutes per day for parents aged 15-64, disaggregated by sex, over the period 1998-2010



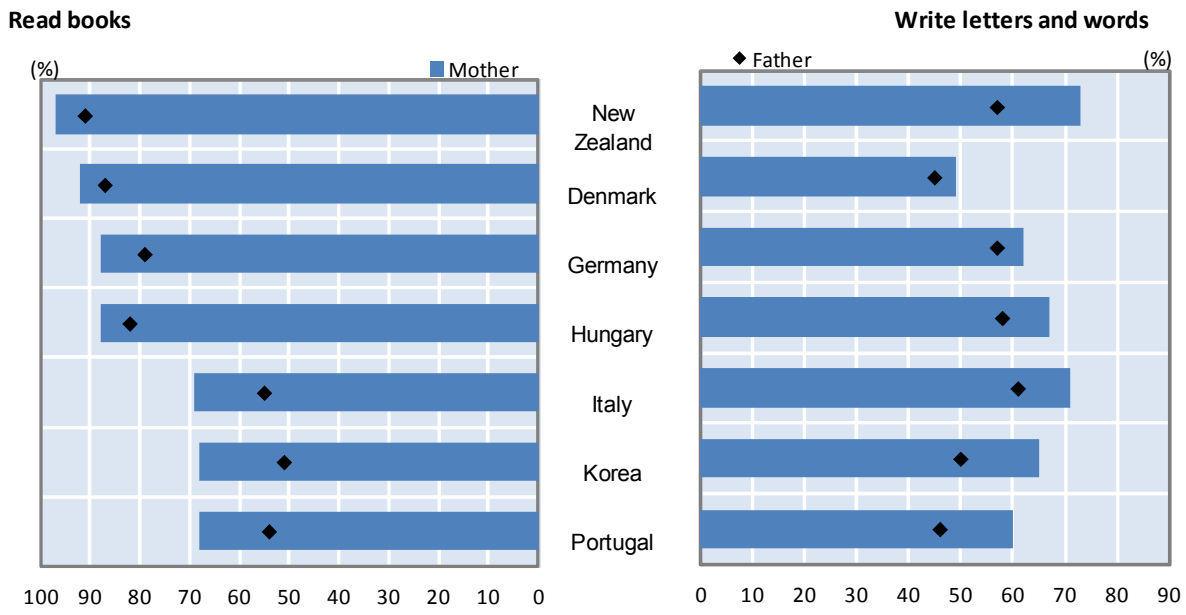
Note: Countries are ranked in ascending order of the minutes per day fathers spend in primary childcare. The definition of "parents" is based on resident children. Source: OECD (2012b).

21. Likewise, evidence from the OECD Programme for International Student Assessment (PISA) shows that fathers are less likely than mothers to be involved in activities that research indicates are strongly associated with better cognitive outcomes for children (Figure 4). In the 7 OECD countries participating in the parental questionnaire, fathers were less likely than mothers to engage in interactive or enriching activities when children enter primary school, such as reading to children, writing letters and

words, telling stories and singing songs. Once again, paternal involvement shows considerable cross-country differences, with the highest rates of involved fathers in New Zealand and Denmark and the lowest in Italy, Korea and Portugal.

Figure 4. Fathers are less likely than mothers to read and write with their children

Proportion of fathers and mothers who read books or write letters and words with the child during child's first year in primary school



Note: Countries are ranked in ascending order of the percentage of parents who read books to their child.

Source: PISA 2009 Database.

22. Differences between mothers and fathers are not only observed in the amount of time they invest in childcare-related activities, but also in the type of activities. Mothers usually dedicate more time to personal care and routine tasks (*e.g.,* dressing, feeding, changing diapers, providing medical care and supervising), while fathers generally devote more time to educational and recreational activities (*e.g.*, helping with homework, reading and playing) (Craig, 2006; Lamb, 2010; and, Miranda, 2011). Furthermore, fathers are rarely alone when undertaking childcare activities; in general, they do not substitute mothers' caring time (Craig, 2006). In sum, parental involvement is not the same for fathers than for mothers.

23. The degree of parental involvement is influenced by numerous factors including children's age, attitudes towards work and care, social expectations, workplace culture and the availability of family-friendly policies. In the Nordic countries, where work-family policies have been operating for over 40 years, views towards work and care are more gender equal. Hence, it is easier for Nordic fathers to make use of their leave entitlements and to spend more time caring for children than for their peers in countries with traditional views on work and care commitments and with less developed family-friendly policies.

Parental leave provision for fathers across the OECD

24. Many OECD countries have introduced family-friendly working arrangements to help parents reduce some of the barriers that make it difficult for them to spend more time with their children. These

family-friendly arrangements include leave from work around childbirth and/or when children are young, as well as support with childcare and out-of-school care services, and flexibility to adjust working practices (OECD, 2011). Moreover, in the last two decades, several OECD governments have taken steps to further promote policies encouraging fathers to spend more time caring for children and promote a more gender equal division of care work.

25. There are two kinds of leave entitlements fathers may have access to: paternity leave and/or parental leave. Paternity leave is a father-specific right to take some time off work soon after the birth of a child. Belgium and Luxembourg were the first countries to introduce paternity-leave entitlement in the 1960s (Table 1). Today, about two-thirds of OECD countries provide paternity-leave entitlements. In general, these entitlements are of short duration, except in Germany, Iceland, Slovenia and Sweden. Parental leave is a form of leave that either parent can take. The parental-leave period generally follows the period of maternity or paternity leave and is often supplementary to maternity and paternity-leave periods. Sweden was the first country to introduce parental leave for both parents in 1974 (Brandth and Gislason, 2012). Twenty years later other countries started extending parental-leave entitlements to fathers (O'Brien, 2009). Today most OECD countries award fathers the right to use some of the parental-leave period (Table 1).

26. Some OECD countries have introduced additional measures to motivate fathers to make use of their leave entitlements: father's "quotas" and "bonus". "Quotas" were introduced in 1993 in Norway (O'Brien *et al.*, 2007) with the aim of reserving some part of the parental-leave period for the exclusive use of fathers. The entitlement cannot be passed to the mother: if it is not used, it is lost. Currently, only the Nordic countries have a "quota" system, with Iceland having the largest quota (3 month quota for each parent and 3 months to share). Several countries (Austria, Finland, Germany, Italy, Portugal and Sweden) provide a "bonus" to the total period of parental leave if fathers take at least some part of the parental-leave period. .

27. Overall, there are important cross-country differences in the design, duration and generosity of child-related leave policies. Taking into account paternity leave and parental leave for the use of fathers, the countries with the most generous leave models, in terms of duration and income replacement, are the Nordic countries (except Denmark), Germany, Portugal and Slovenia (O'Brien, 2009). At the other end of the spectrum, Mexico, Turkey and the United States have no statutory paid leave entitlements for fathers.

28. In the early 2000s, at the time children in the cohort studies here analysed were born, only Denmark provided paid parental-leave entitlements to fathers. In the United Kingdom, a two-week paid paternity statutory leave was introduced in 2003. In Australia, there are currently no statutory paternity leave provisions, but it is expected that a two week paid paternity leave provision will be introduced in 2013. In the United States, however, to date no statutory leave entitlements for fathers (or mothers) are available. Fathers working in medium or large firms may take 12 weeks of unpaid, job-protected leave through the federal Family and Medical Leave Act (FMLA), while other workers may be covered by state or employer policies. Today, ten states plus the District of Columbia have laws that give at least some male workers job-protected paternity leave.

29. Despite increased availability of statutory leave entitlements for fathers in many countries, use remains low. Mothers rather than fathers continue to make use of leave entitlements since income loss is usually smallest when mothers take leave (OECD, 2012c). Fathers' take-up rates are low and the period they stay at home is short when payments are low; when parents can share the entitlement as they choose (family right); and/or when the entitlement is transferable to the other parent (transferable individual right). For example, in Austria, the Czech Republic and Poland, where leave entitlements are fully transferrable, the proportion of fathers taking parental leave is less than 3 % (Moss, 2011).

30. Alternatively, fathers' use of paternity and parental leave is largest when leave is well-paid and when part of the entitlement cannot be transferred, and is lost if not used (O'Brien, 2009 and O'Brien and Moss, 2010). Countries with parental-leave policies that have been successful in encouraging fathers to take leave meet these criteria. These include Sweden, Iceland and Norway, where around 90% of fathers take some part of the parental leave period (Moss, 2011). Moreover, in these countries a considerable number of fathers stay at home for a relatively long period. For example, in Norway, 70 % of eligible fathers took more than five weeks of leave in 2006, after the extension of the father's quota to six weeks (Moss, 2011).

31. Parental leave policies are more likely to influence parental behaviour than other family-friendly policies as the former intervene at a critical point in the life-course; that is, around childbirth (Tanaka and Waldfogel, 2007 and Dex, 2010). At this decisive point, parents, especially fathers, may be more open to changing behaviours. For example, parental leave may facilitate fathers sharing childcare-related tasks with their partners. Sharing these activities during a child's first year of life may promote less stereotyped gender roles; that is, mother as exclusive caregiver and father as exclusive breadwinner. Moreover, taking care of children from the early days may facilitate father-child bonding (Tanaka and Waldfogel, 2007). Early paternal involvement may lead to continued engagement and involvement and to a more equal division of work between parents (Baxter and Smart, 2011 and Brandth and Gislason, 2012).

Table 1. Paternity and parental leave schemes across the OECD, 2011

	Paternity leave[1]	% rate of allowance[2]	FRE paid paternity leave	Year of introduction - paternity leave (or parental leave for fathers)	Parental leave[3]	Characteristics of parental leave	Incentives for fathers to take leave		Transferring part of maternity leave to fathers without execptional circumstances
							Father's quota	Bonus	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)	(8)
Australia[4]	..	..	..	2013	52 weeks per parent - unpaid	**Individual** entitlement	..	..	..
Austria	..	..	..	1990 (parental leave)	Parents can choose between 5 payment and duration options until child reaches age 2	**Family entitlement** to be divided between parents as they choose	..	Bonus - in the 5 different schemes there are paid 'partner' months for the exclusive use of the other parent	..
Belgium	2 weeks (three days obligatory)	87.4	1.2	1961	16 weeks per parent	**Individual** entitlement	..	..	..
Canada (Quebec)	3 to 5 weeks	75 or 70	..	2006	35 weeks	**Family entitlement** to be divided between parents as they choose	..	..	..
Chile	1.0	100.0	1.0	2005	..	..	..	..	..
Czech Republic	..	..	..	2001 (parental leave - job protected for fathers)	156 weeks per parent until child reaches age 3	**Individual** entitlement	..	..	yes
Denmark	2.0	55.0	1.1	1984	32 weeks	**Family entitlement** to be divided between parents as they choose, but the total leave period cannot exceed more than 32 weeks per family	3 weeks (only in industrial sector)	..	..
Estonia	2.0	0.0	0.0	2008	156 weeks per parent until child reaches age 3	**Family entitlement** to be divided between parents as they choose	..	..	..
Finland	3+4 bonus weeks	70.0	4.9	1991	26.5 weeks	**Family entitlement** to be divided between parents as they choose	..	4 'bonus weeks' if father takes last 2 weeks of parental leave	..
France	2.0	100.0	2.0	2002	156 weeks per parent until child reaches age 3	**Family entitlement** to be divided between parents as they choose	..	..	..
Germany[5]	8.0	67.4	5.4	2007	156 weeks per parent until child reaches age 3	**Family entitlement** to be divided between parents as they choose	..	Overall length of benefit payment is extended to 14 months if father takes at least 2 months of leave	..
Greece	0.4	100.0	0.4	2000	14 weeks per parent - unpaid	**Individual** entitlement	..	..	..
Hungary	1.0	100.0	1.0	2002	156 weeks per parent until child reaches age 3	**Family entitlement** to be divided between parents as they choose	..	..	..
Iceland	13.0	64.6	8.4	1998	13 weeks per parent	**Mixed** entitlement, a total leave of 9 months (including maternity, paternity and parental leave) can be used	13 weeks	..	..
Ireland	..	..	..	..	14 weeks per parent - unpaid	**Individual** entitlement	..	..	..
Italy	..	..	..	..	26 weeks per parent	**Individual** entitlement, with total amount of leave not exceeding 10 months	..	1 month bonus if father takes at least 3 months of leave	..

	Paternity leave[1]	% rate of allowance[2]	FRE paid paternity leave	Year of introduction - paternity leave (or parental leave for fathers)	Parental leave[3]	Characteristics of parental leave	Incentives for fathers to take leave		Transferring part of maternity leave to fathers without execptional circumstances
							Father's quota	Bonus	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)	(8)
Japan	..	..	..	2010 -introduction of bonus	52 weeks + 8 weeks 'sharing bonus'	**Individual** entitlement	..	2 month bonus if parents share leave	..
Korea	0.4	100.0	0.4	2008	45.6 weeks	**Individual** entitlement, but parents cannot take leave at the same time	..	..	..
Luxembourg	0.4	100.0	0.4	1962	26 weeks per parent - paid	**Individual** entitlement	..	..	..
Mexico	..	..	..	..	..	..	..	..	..
Netherlands	0.4	100.0	0.4	2001	26 weeks per parent until child is 8	**Individual** entitlement	..	..	..
New Zealand	1 or 2 depending on eligibility	0.0	0.0	1987 - extension of parental leave to fathers	52 weeks including maternity and paternity leave	**Family entitlement** to be divided between parents as they choose	..	..	..
Norway	2 + 12 fathers' quota	85.7	12.0	1993	27 or 37 weeks depending on payment level	**Mixed** entitlement, part family part individual	12 weeks	..	..
Poland	2.0	100.0	2.0	1996	156 weeks until child reaches age 4	**Family entitlement** to be divided between parents as they choose	..	..	yes
Portugal	4 weeks (10 days obligatory)	100.0	4.0	1995	12 weeks to be shared	**Mixed** entitlement, part family part individual	..	1 month bonus if parents share intial leave and father takes 2 weeks of paternity leave (the latter compulsory)	..
Slovak Republic	..	..	..	..	136.0	**Family entitlement** to be divided between parents as they choose	..	..	..
Slovenia	13.0	26.9	3.5	2003	37 weeks	**Family entitlement** to be divided between parents as they choose	..	..	..
Spain	3.0	100.0	3.0	2007	156 weeks per parent - unpaid	**Individual** entitlement	..	..	yes
Sweden	10.0	80.0	8.0	1980	68.6 weeks in total: 8.5 weeks reserved for each parent and 51.6 to be split into half (the latter can be transferred between parents)	**Mixed** entitlement, part family part individual	8.5 weeks	Gender equality bonus: parents receive €5.6 each per day for every day they use the leave equally	..
Switzerland	..	..	..	..	..	..	..	..	..
Turkey	..	..	..	..	26.0		..	..	..
United Kingdom	2.0	20.0	0.4	2003	13 weeks per parent - unpaid	**Individual** entitlement	..	..	yes
United States[6]	..	..	..	1993	12 weeks unpaid	..	..	..	..

1 Information refers to the entitlement for paternity leave in a strict sense and the bonus (for example, Germany) or father quota included in some parental leave regulations (for example, Finland, Iceland and Norway). In Finland,

2 The "rate of allowance" is defined as the ratio between the full-time equivalent payment and the corresponding entitlement in number of weeks.

3 Information refers to parental leave and subsequent prolonged periods of paid leave to care for young children (sometimes under a different name as for example, "childcare leave" or "Home care leave", or the *Complément de Libre Choix d'Activité* in France). In all, prolonged periods of leave can be taken in Austria, the Czech Republic, Estonia, France, Finland, Germany, Norway, Poland and Spain.

4. In Australia, the introduction of two weeks paid paternity leave will take place from 1 January 2013.

5. This 8 weeks correpond to the bonus given if fathers make use of 2 months of parental leave.

6. Through the Family and Medical Leave Act (FMLA), entitled eligible employees may take up to 12 weeks of unpaid, job-protected leave in a 12-month period for specific family and medical reasons. Although the table presents federal statutory entitlements, the United States also has parental leave schemes at the state level. Ten states plus the District of Columbia have laws that give some male workers job-protected paternity leave. The length of leave varies between 4 and 18 weeks.

Source: Moss (2012) and OECD (2012b) - indicator PF2.5

32. Available evidence shows paternity leave does influence father's involvement in childcare activities. A Swedish study shows fathers who take more leave than average are more involved in childcare-related tasks and household work than fathers taking shorter periods of leave (Haas and Hwang, 2008). Evidence from the United Kingdom and United States suggests that, in spite of having no formal leave entitlements, fathers who take leave after childbirth are significantly more involved in childcare activities than fathers who do not take time off work (Tanaka and Waldfogel, 2007). Nevertheless, in the United States, this positive association was observed only when fathers took periods of leave of two or more weeks (Nepomnyaschy and Waldfogel, 2007). These results are, however, not universal. For Australia, Hosking *et al.* (2010) observed the amount of time fathers spent with their infants was no different for those who had taken 4 or more weeks of leave after the birth compared with those who had taken less than 4 weeks of leave or no leave.

33. Father's involvement is linked to a number of positive child outcomes (Amato and Dorius, 2010; Baxter and Smart, 2011; Cabrera *et al.,* 2007; and, Sarkadi *et al.,* 2008). A systematic review of longitudinal studies conducted by Sarkadi *et al.* (2008) concluded that fathers' involvement has a positive effect on children's academic performance as well as on their behavioural and social emotional wellbeing. The authors, however, indicate some methodological problems in the studies reviewed including differences in the measures used to examine fathers' involvement and the age at which both fathers' involvement and child outcomes are measured. Studies looking at the effect of early father involvement on outcomes of pre-school children show a weak association when fathers' involvement is measured using fathers' presence (Sarkadi *et al.,* 2008), but it is significant when measured using positive, supportive or warm parenting (Baxter and Smart, 2011 and Cabrera *et al.,* 2007). This suggests that it is the quality and not the quantity of time that matters.

34. In exploring associations between fathers' involvement with children and children's outcomes, it is important to take account of the factors that might explain greater levels of involvement as well as better outcomes for children. This was done by Baxter and Smart (2011), who explored links between different indicators of fathers' involvement with children in Australia, and children's social emotional and cognitive outcomes. Their analyses found no links between the amount of time fathers spent with children and children's outcomes, after taking account of a range of background factors and also the amount of time mothers spent with children. They did find, however, that children's social emotional outcomes were better when fathers had a warmer parenting style.

Data and methods

35. This study uses information from four OECD countries which have gathered longitudinal data on birth cohorts and which share similar methods of data collection. The main criteria used for considering inclusion in this study were: 1) comparable information on fathers' use of leave around childbirth; fathers' involvement with young children; and child developmental outcomes; 2) cohort members being born around same time; 3) children being monitored during early childhood; 4) nationally representative sample. The cohort studies included were:

- **Australia**: *Growing Up in Australia: The Longitudinal Study of Australian Children*. The analysis here uses data of the B-cohort, children who were born between March 2003 and February 2004. The sample size of this cohort at wave 1 was 5 107 and children were aged between 3 and 14 months. The first three waves of the study have been used here: 1) in 2004, when children were aged 0 to 1; 2) in 2006, when children were aged 2 to 3; and 3) in 2008, when children were aged 4 to 5.

- **Denmark:** *Danish Longitudinal Survey of Children* (DALSC). This is a representative sample of Danish children born within 6 weeks in the fall of 1995. The sample size of DALSC is around 6

000 children. Four waves of the study were used here: 1) in 1996, when babies were about 6 months old; 2) in 1999, when children were about 3½ years old; 3) in 2003, when children were about 7½ years old; and 4) in 2007, when children were about 11 years old.

- **United Kingdom:** *Millennium Cohort Study* (MCS). This is a multi-disciplinary survey of around 19 000 children born in the four constituent countries of the United Kingdom in 2000-01. The first three waves of data collection have been used here: 1) in 2001-02, when children were aged around 9 months; 2) in 2004-05, when children were aged 2 to 3; and 3) in 2006, when children were aged 4 to 5.

- **United States:** *Early Childhood Longitudinal Study* (ECLS) program. Here the analysis considers data of the Birth Cohort (ECLS-B), a sample of approximately 10 700 children born across the United States in 2001[1]. This study considers data collected in the following waves: 1) in 2001-02, when children were 9 months old, 2) in 2003-2004, when children were 2 years old, 3) in 2005-06, when children were 4 years old and 4) in the Autumn of 2006 or 2007, when children were 5 or 6 years old (while in kindergarten).

36. Information about fathers' use of leave around childbirth and fathers' childcare is available for a sub-sample of cohort members. The reasons for this are work and residence related. First, fathers have to be employed in order to be entitled to paternity leave or annual leave around childbirth. Second, detailed information on paternal behaviour, such as childcare related activities, is difficult to collect from non-resident fathers. Therefore, the working sample is restricted to: 1) fathers who were in paid work at birth; and 2) fathers living with cohort member and with cohort member's mother at birth and at the time of data collection of father's activities. In addition, fathers had to complete the self-completed questionnaire to be included in the analytic sample.

37. These sample restrictions mean that data concerns a "selected" group of children as those living in sole-parent families or with unemployed fathers are not included in the "analytic sample". These restrictions are necessary for conducting the analysis but they need to be taken into account when interpreting findings.

38. All the analyses were adjusted using sampling weights in order to account for the stratifying nature of the surveys.[2] This was done using the SVY commands of Stata.

Measurement of variables

39. The selection of variables in this study was driven by findings from previous studies examining parental-leave taking (Nepomnyaschy and Waldfogel, 2007; and, Tanaka and Waldfogel, 2007) and fathers' involvement (Baxter and Smart, 2011). The variables analysed here include: leave around childbirth (paternity, parental or annual leave); father's involvement; child cognitive and behavioural development; and, a set of socio-economic control background variables.

Leave around childbirth – focal variable

40. The independent variable of main interest in the first stage of the analysis is fathers' birth-related leave. In these cohort studies, parents were asked if fathers took a period of leave after the cohort member was born. In Australia, mothers provided information on fathers' employment and leave use around the birth of the child. In addition, in three of the four countries, respondents were asked how many days fathers

[1] Sample sizes from ECLS-B have been rounded to the nearest 50.

[2] The Danish Longitudinal Study is representative and not stratified, hence sampling weights have not been used.

took off work to care for their child. Responses were converted into a categorical variable with the following groups: no leave, less than 1 week, 1 week, and 2 or more weeks. The MCS survey in the United Kingdom did not collect information on the number of days taken off work, but it distinguished between the different types of leave taken: paternity and or parental leave, annual leave and other kind of leave. In this case, a categorical variable was constructed with each type of leave representing a different category.

Father's involvement –outcome variable

41. Father's involvement is assessed using a fairly narrow definition. Researchers looking at fatherhood define father's involvement as including three major components: a) engagement: direct interaction through caretaking, play or leisure; b) accessibility: being available to the child; and c) responsibility: making sure child needs are met. More recently, this conceptualization has been revisited to account for qualitative dimensions of parenting (*e.g.,*positive interaction, warmth, responsiveness and control) (Pleck, 2010). Due to data availability, in this study paternal involvement is examined by considering one component: the extent of engagement in caretaking and other child-related activities.

42. In the four cohort studies, fathers were asked about the extent of involvement (frequency in the past month) in a number of childcare tasks. These included personal care as well as social and educational tasks and were asked in more than one wave of data collection. The type of activities differed across waves (as these are age-related) and between countries.

43. The first part of the analysis considers fathers' involvement in childcare activities as an outcome variable. This part of the analysis focuses on fathers' activities collected early in childhood. This information was collected before age one in Denmark, the United Kingdom and the United States. However, in Australia, information on fathers' child-related activities was first collected when children were between 2 and 3 years old. Each activity was converted into a binary variable with a value of one if fathers were involved – if they performed the task frequently – and zero if not. The definition of "frequently" varied with the nature of the activity. For example, for bathing, fathers were considered to be "involved" when giving a bath several times a week, but for feeding, this had to take place at least once a day (Table 2).

Table 2. Father's child-related activities collected around childbirth and when child was between 2 and 3 years old.

	Before age 1			Between 2 and 3 years old			
	Denmark	UK	US	Australia	UK	US	Involvement = 1, if
Personal care activities							at least daily
Assist child with eating	√	√	√	√	√	√	at least daily
Change child nappies or help use toilet	√	√	√	√	√	√	at least daily
Get child ready for bed or put child to bed	√	√	√	√	√	√	at least daily
Give child a bath or shower	√	-	√	√	-	√	few times per week
Help child get dressed/ready for the day	-	-	√	√	-	√	at least daily
Looks after child on his own	-	√	-	-	√	-	at least daily
Help child brush her/his teeth	-	-	-	√	-	√	at least daily
Social and educational activities							
Reading to the child	-	-	√	-	√	√	at least three times per week
How often talk to child about school	-	-	-	-	-	-	at least daily
Play with the child	√	-	-	-	√	√	at least daily
Eat an evening meal with child	-	-	-	√	-	-	at least daily

Father's involvement – focal variable

44. The second part of the analysis investigates whether fathers' involvement is associated with child cognitive and behavioural outcomes. Fathers' involvement is here considered as an independent or focal variable. A summary measure of fathers' involvement was constructed by using all the child related activities in each country. The number and type of activities differed across countries so these summary measures are not comparable. Nevertheless, this strategy was preferred over having a summary measure with the same type of activities because the number of items coinciding across countries was small; and, hence, the meaning of a similar summary measure was limited.

45. The summary measure was derived by adding the responses of each of the underlying activities. These were standardized to a mean of 100 and a standard deviation of 10 with higher scores indicating more involvement. This continuous measure was then converted into a categorical variable by dividing it into three groups: low (approximately: 0 to 33.3% of the distribution of the summary measure), medium (33.4 to 66.6%) and high (66.7 to 100%).

46. The influence of fathers' involvement on child outcomes was assessed using information on involvement collected at one point in time for Australia (around age 2-3 years) and Denmark (around age 6 months), and at two points in time for the United Kingdom and the United States (around 9 months and again around 2-3 years).

47. As mentioned above, the type of activities differs over time because they are age-related. Table 2 shows that before age one year, activities mainly included personal care tasks while, at older ages they also included items related to social and educational activities. Therefore, the summary measure of paternal involvement also changed within countries and this should be kept in mind when interpreting findings.

Child development - outcome variables

48. Child developmental outcomes are assessed using information on cognitive ability, conduct problems and attention-hyperactivity problems. Raw scores from cognitive tests (Annex 2) were standardised to a mean of 100 and a standard deviation of 10, with higher scores meaning better outcomes. The cognitive tests vary according to age and, depending on data availability, some countries include more than one measure per wave of data collection (Table 3).

49. Behavioural outcomes are converted into binary variables, with a value of 1 if cohort members are considered to have high conduct or attention-hyperactivity problems and zero otherwise. A categorical measure was used instead of a continuos on for ease of interpretation. Children were considered as showing behavioural problems if their scores were located at the top 15% of the distribution. The conduct problems dimension includes reports on whether the child: a) frequently fights with other children; b) often has temper tantrums; c) is often disobedient; d) is often argumentative; and, e) is often spiteful. Similarly, the variable measuring attention problems uses reports on whether the child: a) is squirmy or fidgety; b) cannot settle down to anything; c) is very restless; d) is easily distracted; and, e) does not take time to think and does not finish tasks.

Table 3. Collection of Child Developmental Outcomes by age and country

	Australia	Denmark	United Kingdom	United States
Cognitive scores				
Age 2-3	√	-	√	√
Age 4-5	√	-	√	√
Kindergarten	-	-	-	√
Age 11	-	√	-	-
Behavioural outcomes				
Age 2-3	√	√	√	√
Age 4-5	√	-	√	√
Kindergarten	-	-	-	√
Age 11	-	√	-	-

Socioeconomic characteristics – control variables

50. Numerous covariates were included in the analysis to control for possible spurious associations between the outcome variables and the focal ones. For instance, Yeung *et al*. (2001) found that better educated fathers are more likely to spend more time with children as they tend to be more concerned about their children's development than less educated fathers. At the same time, better educated fathers are more likely to have jobs with more family-friendly work arrangements than less educated fathers so it is easier for them to take time off work when children are born. However, fathers with better education and better jobs may be more reluctant to take leave as this may be perceived as damaging their careers. Hence, it is important to control for fathers' education to avoid overestimating or underestimating the association between leave and involvement.

51. Other characteristics of the father that may affect their involvement include age, ethnicity, mental health, the number of hours at work, occupation and attitudes towards care and work. Some studies have found older fathers spend less time with their children (Maume, 2010), but others have found that, depending on the measure used, fathers' involvement either does not vary with age, or is sometimes greater for older fathers (Baxter and Smart, 2011). Younger fathers may have higher energy levels and less gender stereo-typed attitudes towards care than older fathers, making it easier to engage in childcare activities. On the other hand, younger fathers may be starting their careers and hence therefore have less flexibility in "managing" their time with children than older fathers. The father's marital status may reflect father's commitment to the relationship (Wiik *et al.,* 2009), which in turn may facilitate a more equal share of childcare and other responsibilities. Baxter and Smart (2011) found, however, that difference in fathering between cohabiting fathers and married fathers tend to be small. Attitudes towards fathers' involvement in child-related tasks may also differ according to ethnicity, but such effects could be expected to differ also across countries. For example, in the United States, Yeung *et al.* (2001) observed that Black fathers are less involved than Latino fathers, but only during the weekends. Baxter and Smart (2011) found quite small differences according to fathers' ethnicity in Australia. Fathers with better mental health may be more likely to engage in positive parenting practices and to provide more co-parental support than their counterparts with poorer mental health (Baxter and Smart, 2011). Despite its possible association with paternal involvement and child outcomes, father's mental health is not included here as it was not asked in all countries. Finally, fathers' working practices may negatively affect paternal involvement, especially when working long hours.

52. A number of mother's characteristics are likely to influence father's involvement in care giving. Better-educated mothers tend to be more knowledgeable of children's development and needs and may demand that partners spend time with their children. Mother's employment is positively associated with paternal involvement: the more time mothers spend in the labour market and the more they contribute to the family income, the more involved fathers will be (Baxter and Smart, 2011 and Yeung *et al.,* 2001). Mothers' mental health is likely to influence the amount of time fathers spend with their children. The direction of the association is, however, not clear: fathers with a depressed partner may spend more time in primary care activities to compensate for mothers lack of involvement, but on the other hand maternal depression may lead to high conflict between partners which, in turn, may pose disincentives for paternal involvement. In addition, mothers' poorer mental health may also reflect poorer family relationships and so may actually be an outcome of fathers being less engaged in the family.

53. Father's involvement is likely to vary according to child's characteristics. For example, the literature shows that the age of the child is an important determinant of the time parents devote to childcare activities (Baxter and Smart, 20011; Lamb, 2010; and, Yeung *et al*., 2011). Fathers' childcare time seems to reach a peak level at pre-school age and then rapidly declines with increasing age of the child (Baxter and Smart, 2011 and Maume, 2010). Similarly, parental involvement is likely to change with children's needs. While children need more assistance with personal care tasks when they are young, it is less so when they grow old. Through the primary school years and beyond, parental involvement is likely to be related to activities that promote children's social emotional and cognitive development (Baxter, 2012). Temperament is another characteristic of the child that may influence parental involvement. Parents may find it difficult to engage in activities with children with difficult temperament (Baxter and Smart, 2011 and Lamb, 2010). It appears, however, that the relationship between child's temperament and parental involvement is stronger for fathers than for mothers (McBride *et al.*, 2002). The sex of the child may also affect how fathers interact with their children. Although there is no conclusive evidence on whether fathers are more involved with boys or girls, it is possible that for certain tasks fathers engage differently with sons and daughters (Lamb, 2010). For example, Baxter (2012) found that fathers are somewhat more involved with sons than with daughters in the more personal of the care activities, such as helping children with the toilet and with bathing or showering. The number of children in the household may also affect the amount of time fathers spend in childcare-related tasks. Fathers dedicate less time to their children when they are in large families, perhaps in part because additional time is spent on other domestic work in these families (Baxter and Smart, 2011).

54. The list of control variables includes:

- **Father's characteristics**: age at child's birth; educational level; number of working hours at the time of data collection (classified into: less than 35 hours a week; 35 to 44 hours a week; and 45 hours or more); and, whether he was born outside the country.

- **Child characteristics**: sex; age in months; ethnicity; foreign language spoken at home; whether child was born prematurely (<37 weeks); whether child was born with low weight at birth (< 2.5 kilograms); child's temperament (see Annex 2 for details); and, number of siblings.

- **Mother's characteristics**: age at child's birth; educational level; employed during pregnancy; number of working hours at the time of data collection (classified into part-time (less than 35 hours a week) and full-time (35 hours a week or more); whether she was born outside the country; and, mental health.

- **Family characteristics**: parents' partnership status (married or cohabiting); family income; and, housing (owned or buying, rented privately or living in publicly subsidised, and other).

Missing data

55. For each explanatory variable, information is included on whether such data is missing for a particular respondent. This is done by using a separate category for missing data when the variable is categorical and by including a mean value if the variable is continuous. For the outcome variables, however, only cases that have complete information are included in the analysis. Thus, the analytical sample was further reduced because key data items were not available for the whole of the sample in some countries.

Analytical methods

56. First, the study will present descriptive statistics of all the measures discussed above. This is done to gain a first insight into the characteristics of fathers who took time off work at childbirth compared with their counterparts who did not. These results inform how fathers taking leave differ from those not taking leave across countries.

57. Second, the study uses multivariate logistic regressions for each of the father's involvement binary outcome measures, controlling for leave taking ('focal' independent variable), child characteristics, and a number of socioeconomic characteristics. Models are run separately for each outcome variable, each age group and each country.

58. Third, the study uses multivariate regressions to examine child outcomes, controlling for father's involvement in categorical form together with the set of child, father and family background factors described above. Models examining cognitive scores are estimated using ordinary least square (OLS) regressions and models for behavioural outcomes are calculated using logistic regressions. Like in the previous analytical stage, models are run separately for each outcome variable, each age group and each country.

59. There are issues around omitted variables and unobservable characteristics when estimating the relationship between paternity leave and father involvement as well as between father involvement and child outcomes. A bias from omitted variables may arise if fathers' decisions to take paternity leave or to engage in childcare activities are correlated with unobservable characteristics such as fathers' mental health or fathers' pre-birth commitment to their partner that may also affect fathers' involvement or child development. The approach followed here is to make use of the rich set of variables in these datasets and control for as many variables that may allow reducing this selection bias. Nevertheless, estimates should be considered as indicative of associations rather than causal effects since it is not possible to completely eliminate individual heterogeneity and reverse causality problems.

Robustness tests

60. A number of robustness tests were carried out to examine whether the associations examined changed once the models accounted for other variables that could be associated with fathers' leave taking and involvement as well as with child outcomes (presented in Annex 3). First, supplementary analyses were conducted to account for maternal involvement because fathers' behaviours are likely to be influenced by the degree of involvement of their partners. For instance, it may be that assortative mating means that within a couple, parents may have similarly positive or negative approaches to parenting, and so the involvement of one parent may be positively correlated with the involvement of the other (Baxter and Smart 2011). On the other hand, it may be possible that fathers with less involved partners may need to spend more time doing childcare-related tasks than their counterparts with more involved partners to compensate for the lack of maternal involvement. Hence, not accounting for maternal involvement may lead to overestimating father's involvement and its role in influencing child outcomes. It was possible to

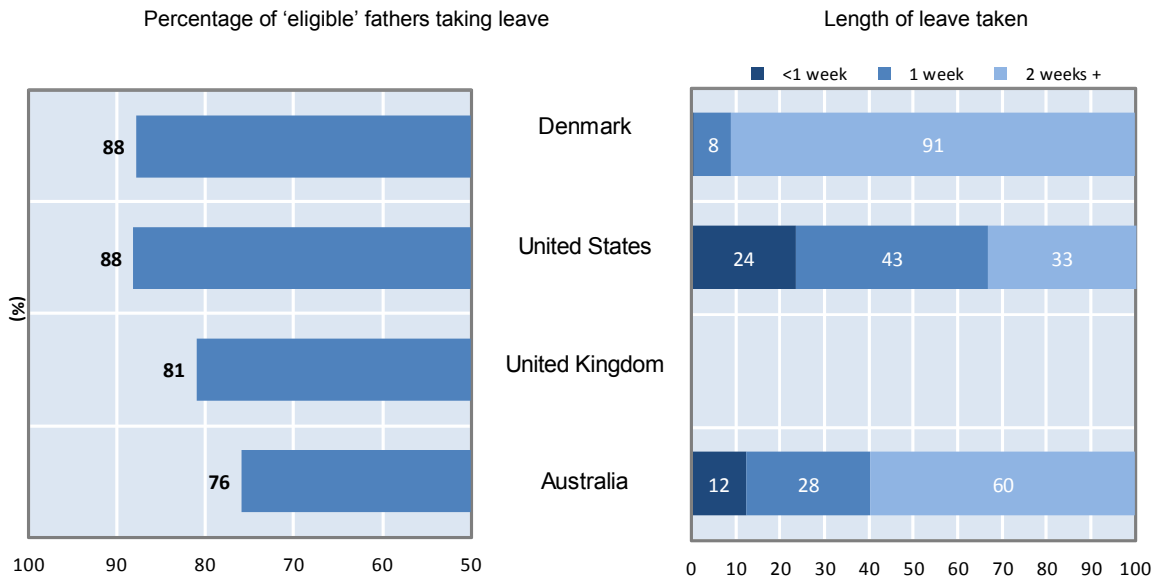
run these tests for Australia and the United Kingdom as they collected data on involvement of a family member other than the father. For the case of Australia, the robustness test was estimated using an item about an adult in the household reading to the child (on 6-7 days per week, as opposed to less than this). Hence, the model controls for the involvement of a household member (results are presented in Model 5 in Table A3.1). For the United Kingdom, this robustness test was estimated using indicators of the amount of time mothers spend with the child (at age 9 months - Model 5 in Table A3.2 and Model 4 in Table A3.4) or how frequently they read to the child (at age 2-3 years - Model 4 in Table A3.5). 61. Second, supplementary models were estimated to control for possible selection bias associated with unobserved variables discussed above, such as fathers' pre-birth commitment. Fathers who were committed to their partner and baby before the child was born are likely to be more engaged in childcare activities than less committed fathers. These tests were run with data for the United Kingdom (Model 4 in Table A3.2, Model 3 in Table A3.4, Model 3 in Table A3.5) and United States (Model 4 in Table A3.3, Model 3 in Table A3.6, Model 3 in Table A3.7) only because these were the countries which collected data on these items. The models were estimated for both cognitive and behavioural outcomes for all ages of the child.

Results

62. Descriptive statistics show fathers do take some time off work for parental purposes at the time children are born, despite the absence of legal provision (Figure 6). In the four countries analysed, the great majority - more than 80% - of resident working fathers took some time off work around childbirth. Cross-country differences in the proportion of leave takers were small, with the largest proportion observed in Denmark (88%) and the United States (88%), and the smallest in Australia (76%). As mentioned above, "leave" here includes specifically designated paternity or parental leave, but can also include other time off taken by fathers at this time. This may include holiday leave or other unpaid absences from work.

63. The length of leave among those who took leave, however, varied considerably across countries. As expected, Danish fathers took the longest period off work: of those who took any time off, 90% took two weeks or more and less than 1% took less than one week off. Australian fathers followed: almost 60% took two weeks or more, 28% took one week and 12% took less than one week. By contrast, US fathers did not take much time off work around childbirth: only 33% took more than two weeks off and 24% took less than one week. Information on the number of days taken off work by British fathers was not available. Yet, estimates from a national survey conducted at the time these fathers were likely to take leave indicate British fathers did not take much time off work around the time of birth of their child: 25% took more than 10 days, 37% took between 6 and 10 days, and 39% took between 1 and 5 days (Hudson *et al.*, 2004). These patterns are close to those observed among fathers in the United States.

Figure 5. Most fathers took some time off work around childbirth, but the number of days taken varied considerably across countries.



Note: Eligible fathers include: 1) those in paid work at birth and at the time of data collection of father's activities; and 2) those living with cohort member and cohort member's mother at birth and at the time of data collection of father's activities. There is no data available on length of leave for the United Kingdom.

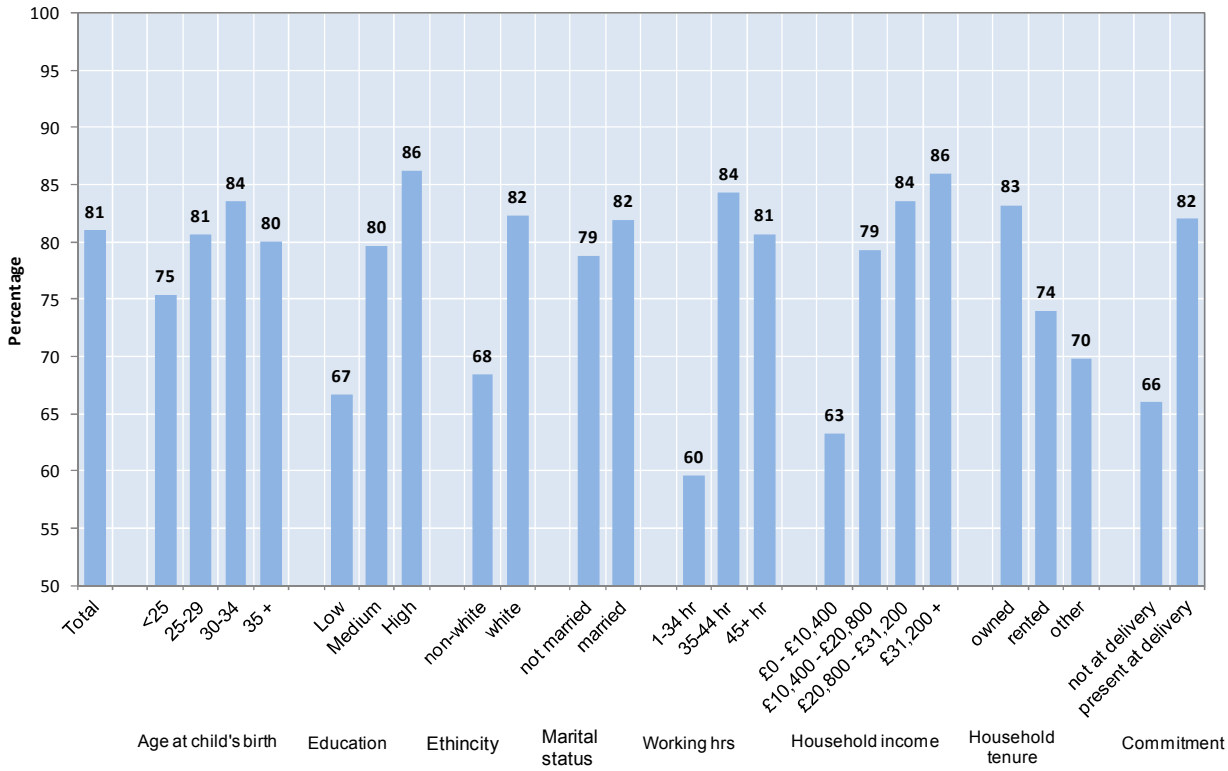
64. Figure 6 presents the proportion of British fathers who took time off around childbirth by fathers' characteristics. These figures clearly show there are important socio-economic differences in leave-taking. Fathers who took leave were more likely to be aged between 30 and 34, to be highly educated, to be white, to be married, and to be more committed at birth (present at delivery room) than fathers who did not take some days off work. Furthermore, fathers who took leave were more likely to work full-time, though not very long working hours, to be in the highest income groups and to own a house than fathers who did not take time off work. Table A2.1 in Annex 2 presents descriptive statistics on father's characteristics by leave-taking for the four countries. These figures corroborate that in all countries there are important socio-economic differences between fathers who took leave and those who did not.

65. These figures describe the characteristics of working and resident fathers and not of all fathers in these countries. As mentioned before, by excluding families with non-resident fathers and families with not-employed fathers, the sample represents a group of more advantaged fathers. These differences should be born in mind when interpreting results as fathers and children from the most vulnerable groups are not examined.

66. Comparisons by mothers' characteristics indicate that fathers who took leave were more likely to be with mothers who were in the middle age groups, were highly educated, and who were not working during the child's first year of birth and (Table A2.2 in Annex 2). One possible explanation for this is that these parents are prioritising childcare and parental involvement at this time; and hence fathers want to support mothers in taking time off work. These differences were, however, not statistically significant in Denmark, suggesting that in this country mothers' characteristics were less relevant in fathers' use of leave. Finally, there were no differences in fathers' leave-taking patterns according to child characteristics, except for number of siblings. In all countries, except Denmark, fathers who took leave were less likely to have big families (three or more children) than fathers who did not take leave.

Figure 6. Fathers from more advantaged backgrounds were more likely to take leave around childbirth than fathers from less advantaged backgrounds

Proportion of British fathers who took leave by socio-economic characteristics



Note. All numbers were weighted using sampling weights.

67. Overall, these descriptive statistics indicate that fathers who take leave are more advantaged than fathers who do not take leave. These results are in line with other studies showing fathers who take leave tend to be those from more privileged backgrounds and with more secure and well-paid jobs (Nepomnyaschy and Waldfogel, 2007 and O'Brien and Moss, 2010). It is possible that, in the Anglophone countries, differences between fathers were larger because leave-taking is more likely amongst fathers for which a break from work does not represent a significant financial loss (O'Brien *et al.*, 2007). On the other hand, differences were somewhat smaller in Denmark, where, at the time of data collection, legal provision of paternity and parental leave for fathers had been in place for several years (since 1984). Leave-taking amongst Danish fathers was therefore less driven by financial incentives.

68. Outcomes based on comparisons of leave-taking by the amount of days taken off work are likely to generate a different picture. In the Nordic countries, for example, there is a positive correlation between fathers' work status and use of leave entitlements –the higher the income-status-occupation of fathers the more leave they take, except fathers with jobs at the very top (Duvander and Lammi-Taksula, 2012). Likewise, in the United States, taking longer periods of leave – two or more weeks – is associated with fathers being in middle- and high-prestige jobs, highly educated and native born (Nepomnyaschy and Waldfogel, 2007).

Fathers' leave-taking and father's involvement

69. Table 4 shows the proportions of fathers who during the child's first year of life regularly carried out a number of childcare activities according to leave-taking and country. Table 5 shows similar estimates but for fathers' involvement at age 2-3 years. These statistics refer to any type of leave taken including annual leave, other leave and paternity or paternal leave. Fathers' involvement is expected to differ according to the type of leave taken. The association is expected to be small for annual leave as this includes vacation; a somewhat larger association is expected with other leave as this includes taking days off beyond vacation; and the largest association with paternity leave.

70. Overall, these figures suggest that fathers who took leave were more likely to be involved with their child on a regular basis than fathers who did not take leave. The activities that were carried out by a larger proportion of fathers during the first year of life included diapering, giving a bath and getting child to bed. Although the activities here reported differ across countries, it is possible to observe the highest proportion of involved fathers when children were less than one year old in Denmark (from 77.0% playing to 18.7% getting up at night) and the smallest in the United Kingdom (from 36.1% giving a bath to 15.3% getting up at night).

Table 4. Fathers who took leave were more likely to be involved in child-care related tasks when children were less than one year old than fathers who did not take leave

Fathers' involvement when children were less than one year old, by leave-taking and country

	Denmark: involvement before age 1				United Kingdom: involvement before age 1				United States: involvement before age 1			
	All	Took leave	No leave	p-value	All	Took leave	No leave	p-value	All	Took leave	No leave	p-value
	%	%	%		%	%	%		%	%	%	
At least once a day												
Feed child	28.9	29.7	23.2	**	24.5	25.0	22.5	***	41.7	42.0	40.1	
Help child get dressed	-	-	-		-	-	-		40.1	40.7	35.6	*
Get child to bed	21.2	21.6	18.4	+	-	-	-		55.0	55.1	55.2	
Diaper child	47.5	48.7	39.0	***	-	-	-		47.0	48.0	39.1	***
Looks after the child on his own	-	-	-		15.5	15.3	16.2		-	-	-	
Gets up at night for child	18.7	18.6	19.3		15.3	15.7	13.7	**	-	-	-	
Help child brush her/his teeth	-	-	-		-	-	-		-	-	-	
Evening meal	-	-	-		-	-	-		-	-	-	
At least few times a week												
Give child a bath	37.7	38.1	34.4		36.1	38.1	29.4	***	53.4	53.6	52.1	
Read books to child	-	-	-		-	-	-		26.5	26.9	24.1	
Play with the child	77.0	77.5	73.4	*	-	-	-		-	-	-	
Summary indicator of all items [1]												
Low (1st tertile)	34.4	35.0	29.9	*	35.7	33.7	44.2	***	33.9	33.2	39.3	*
Medium (2nd tertile)	32.7	32.9	31.2		39.2	40.7	33.0	***	34.5	34.7	32.3	
High (3rd tertile)	33.0	32.1	39.0	**	25.1	25.6	22.7	+	31.7	32.1	28.4	

Note: + p<.10;** p<.05; **p<.01; ***p<.001.

1) The number of activities in each summary indicator was the following: 6 in Denmark; 4 in the United Kingdom; and, 6 in the United States.

71. Similarly, Table 5 shows that, when children were aged 2-3 years old, fathers who had taken leave around childbirth were more likely to be involved with their child than fathers who did not take

leave. In Australia and the United Kingdom, differences in involvement by leave taking were statistically significant for most activities; however, in the United States only reading to the child was more likely when fathers had taken some time off work. Nevertheless, it seems that the positive association between leave and involvement seems to prevail during child's early years.

Table 5. Fathers who took leave were more likely to be involved in child-care related tasks when children were 2 -3 years old than fathers who did not take leave

Fathers' involvement when children were 2 -3 years old, by leave-taking and country

	Australia: involvement at age 2-3				United Kingdom: involvement at age 2-3				United States: involvement at age 2-3			
	All	Took leave	No leave	p-value	All	Took leave	No leave	p-value	All	Took leave	No leave	p-value
	%	%	%		%	%	%		%	%	%	
At least once a day												
Feed child	30.9	31.5	26.3	+	-	-	-		42.9	43.0	42.0	
Help child get dressed	27.2	27.8	23.5	+	-	-	-		45.5	45.1	48.7	
Get child to bed	26.3	27.9	19.3	***	23.5	24.1	21.3	**	60.5	61.0	56.7	
Diaper child	38.8	40.5	34.3	**	-	-	-		41.8	42.3	38.0	
Looks after the child on his own	-	-	-		-	-	-		-	-	-	
Gets up at night for child	-	-	-		-	-	-		-	-	-	
Help child brush her/his teeth	20.0	21.4	13.9	**	-	-	-		34.1	34.2	33.6	
Evening meal	54.8	53.5	55.0		-	-	-		-	-	-	
Take child outside to play	-	-	-		-	-	-		29.3	29.1	30.2	
At least few times a week												
Give child a bath	73.1	75.5	66.2	***	-	-	-		23.2	23.2	23.4	
Read books to child	-	-	-		23.0	24.2	18.5	***	43.4	45.0	30.3	***
Play with the child	-	-	-		41.6	41.5	42.2		-	-	-	
Summary indicator of all items [1]												
Low (1st tertile)	29.0	24.3	30.5	**	35.7	33.7	44.2	***	33.9	33.2	39.3	*
Medium (2nd tertile)	32.4	30.1	33.6		39.2	40.7	33	***	34.5	34.7	32.3	
High (3rd tertile)	38.6	45.6	35.9	***	25.1	25.6	22.7	+	31.7	32.1	28.4	

Note: *Note*: + p<.10;** p<.05; **p<.01; ***p<.001.

1) The number of activities in each summary indicator was the following: 7 in Australia; 3 in the United Kingdom; and, 8 in the United States

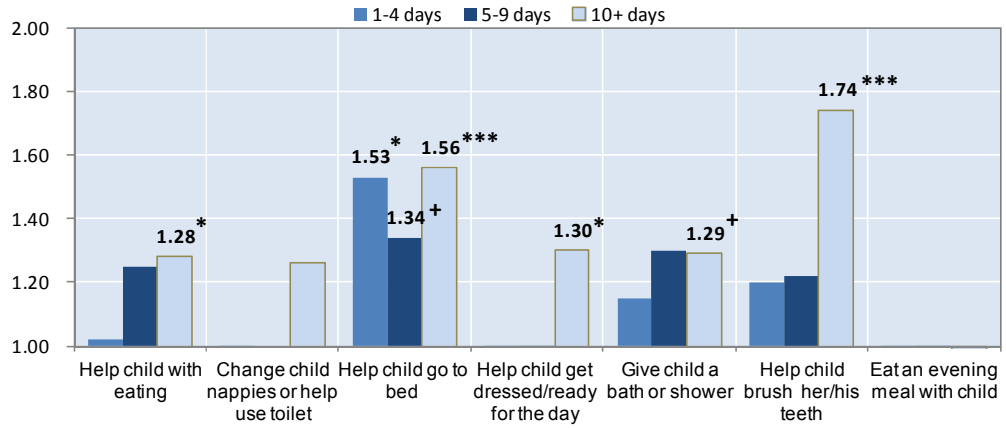
72. Figure 7 presents estimates of the relationship between fathers' leave taking and different measures of fathers' involvement after controlling for child, father, mother and family-related characteristics. The numbers shown are odds ratios. An odds ratio with a value of 1 indicates that involvement is equally likely amongst fathers in the specific leave-duration category and fathers who did not take leave (the omitted or reference category). An odds ratio greater (smaller) than 1 suggests that involvement is more (less) likely amongst fathers in the specific leave-duration category than fathers who took no leave. Only the odds ratios for which there is evidence that the result did not occur by chance – statistically significant – are presented.

73. In Australia, fathers who took 10 or more days off work around childbirth were more likely to be involved in childcare-related activities when children were 2 to 3 years old than fathers who did not take leave . For instance, fathers who took the longest periods of leave (10 or more days) were more likely to help their child with eating at least once a day than fathers who did not take leave (with an odds ratio of 1.28). The odds of being involved amongst fathers who took at least 10 days off were significant for all

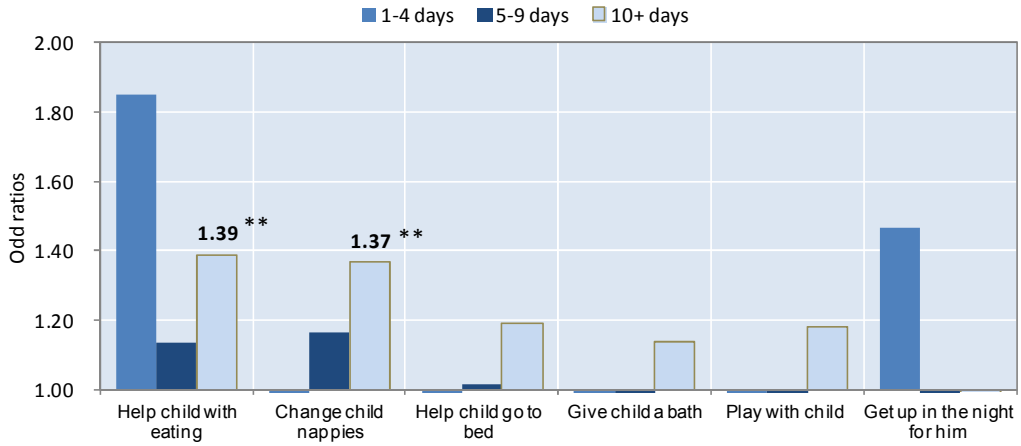
activities (odd ratios ranging between 1.28 and 1.74), except for changing diapers or helping the child use the toilet. In addition, even fathers who took shorter periods of leave (less than 10 days) were more likely to help their child go to bed than fathers who took no leave.

Figure 7. Fathers' leave-taking is associated with fathers' involvement

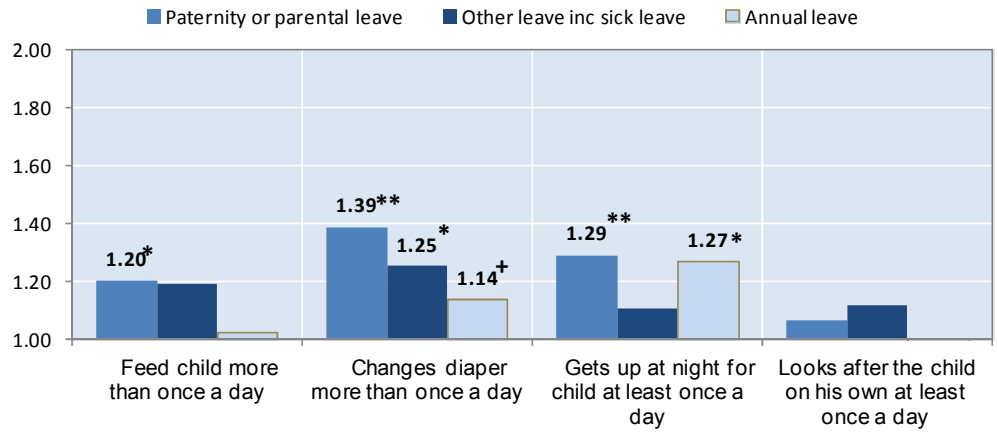
Australia – odds ratios of fathers' leave-taking on fathers' involvement when children were 2 to 3 years old



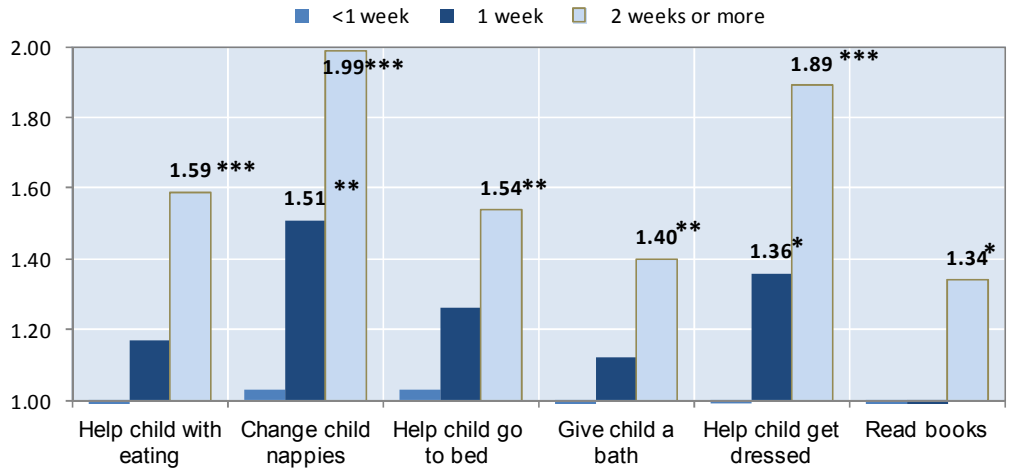
Denmark - odds ratios of fathers' leave-taking by number on fathers' involvement when children were around 6 months old



United Kingdom - odds ratios of paternity leave-taking and other types of leave on fathers' involvement when children were around 9 months old



United States - odds ratios of fathers' leave taking on fathers' involvement when children were around 9 months old



Note: + p<.10;** p<.05; **p<.01; ***p<.001.

1. Estimates presented here were drawn from logistic multivariate regressions. Although not presented here, estimates belong to models that control for child-related factors (sex, age in months, ethnicity, whether child was born prematurely, weight at birth, whether foreign language spoken at home, number of siblings and temperament); paternal characteristics (age at child's birth, born outside the country of study, educational level, number of working hours);, maternal characteristics (age at child's birth, born outside the country of study, educational level, employment during pregnancy, working hours and mental health); and, family-related variables (parents' partnership status, family income and housing).

2. Figures are odd ratios and the omitted category is fathers who did not take leave.

3. Fathers are defined as involved if they performed frequently the task: all tasks at least once a day, except giving a bath and reading which had to be carried out several times a week (Table 2).

74. Amongst Danish fathers, the relationship between leave-taking and fathers' involvement when the child was around 6 months old is somewhat weaker. Fathers taking 10 or more days of leave were more likely to be involved in feeding and changing diapers (odds ratios of 1.39 and 1.37 times, respectively) than fathers who did not take leave. However, for shorter periods of leave or for other activities, there is no evidence of a relationship. This weaker association is possibly explained by the fact that in Denmark there is a more equal share of childcare-related tasks between partners irrespective of the use of leave entitlements.

75. In the United Kingdom, leave-taking is also associated with fathers' involvement when the child is around 9 months old. Estimates suggest that parental- or paternity leave-taking is associated with regular paternal involvement. Fathers who took time off work through this type of leave were more likely to regularly participate in three out four activities than those not taking leave (1.39 times the odds of changing diapers; 1.29 times the odds of getting up at night for the child; and, 1.20 times the odds of daily feeding their child). Furthermore, it is clear that fathers who took time off through this type of leave were those showing the highest odds of involvement.

76. In the United States, taking some time off work around child birth is associated with higher odds of fathers' involvement in their children's lives, especially periods of leave of 2 or more weeks. Fathers who took two or more weeks of leave had greater odds of regularly carrying out all of the childcare-related tasks analysed here than fathers who took no time off work The odds were highest for changing nappies (odds ratio of 1.99) and smallest for reading books to the child (odds ratio of 1.34). It is possible that many more fathers engage in reading to their child than in doing personal care activities irrespective of their use of leave. Hence, taking time off work facilitates their engagement in activities they would not do otherwise.

77. Estimates presented in Figure 7 come from models that control for a wide set of factors that could influence fathers' participation in children's live. Nevertheless, it is still possible that these results are driven by other unobserved characteristics that differ between fathers who take leave and those who don't. For example, fathers who take longer periods of leave or who are entitled to paternity or parental leave are possibly those who more strongly seek opportunities for actively engaging with children for reasons other than leave-taking. That is, some fathers may be more committed to taking care of their children than others. To control for possible differences in fathers' commitment a supplementary analysis was conducted controlling for fathers' pre-birth commitment to caring: present at delivery and attending pre-birth classes. These models were estimated for the United Kingdom and the United States, countries with this type of information. The new estimates (model 4 in Tables A3.2 and A3.3) show the association between leave-taking and fathers' involvement remained unchanged. That is, fathers who took paternity leave in the United Kingdom or 2 weeks or more of leave in the United States were more likely to be involved with their children than their peers who took no leave, irrespective of their commitment to parenting prior to child's birth.

78. Finally, fathers' leave-taking and involvement is likely to be influenced not only by mothers' working practices (already accounted for in the models) but also by mothers' involvement in childcare practices at home. The main models do not control for mothers' involvement as this is likely to be endogenous. However, to test for the robustness of our results, an additional test was carried out to account for involvement of a family member other than the father. These models were run for Australia and the United Kingdom, countries with information on family's time and mothers' time respectively. Results from this additional model specification did not change the associations previously examined (model 5 in Tables A.3.1 and A3.2). Fathers who took leave had higher odds of regularly participating in childcare-related activities than fathers who did not, irrespective of the time mothers or other family members spent with children.

Fathers' involvement and child outcomes

79. The next section presents results from multivariate regressions examining the relationship between fathers' involvement and child outcomes. First, results are presented concerning involvement during the first year of life followed by results regarding involvement at ages 2-3. The cognitive and behavioural outcomes were measured from ages 2-3 up to age 11 (see Table 3).

Cognitive development

80. Figures 8 and 9 present the relationship between fathers' involvement and subsequent cognitive scores. The figures show the estimated coefficients as well as the lower and upper bounds of 95% confidence intervals. A coefficient is considered statistically significant if the 95% confidence interval does not overlap with the zero value. Estimated coefficients indicate how much test scores are expected to increase (if coefficient is positive) or to decrease (if coefficient is negative) relative to children whose fathers were classified as having low levels of involvement (the benchmark or omitted category).

81. Cognitive test scores vary across studies, and across ages of children, as described in Annex 2. However, they have all been standardised with a mean of 100 and a standard deviation of 10. Hence, coefficients can be divided by 10 to represent effect sizes (*i.e.*, the magnitude of the effect relative to the standard deviation of the outcome variable in question). Father involvement is assessed using a summary measure whose underlying items vary across and within countries (see Tables 5 and 6). Annex 2 (Tables A2.3 and A2.4) presents detailed results of two sets of models: one using a categorical measure of involvement and a second one using a continuous measure.

82. In general, paternal involvement (medium and high levels) during child's first year of life was associated with somewhat higher cognitive scores on most items relative to fathers with low levels of involvement, even after controlling for a wide range of father, child, mother and family factors (Figure 8). However, these positive associations were of small size and significant (sometimes at the marginal level - at 10% level) only in the United Kingdom and the United States. In Denmark, the association was not significant. The reason for this may be the difference in time between involvement and child cognitive outcome. Australian data were not included in these analyses since data on fathers' involvement during the child's first year of life were not available.

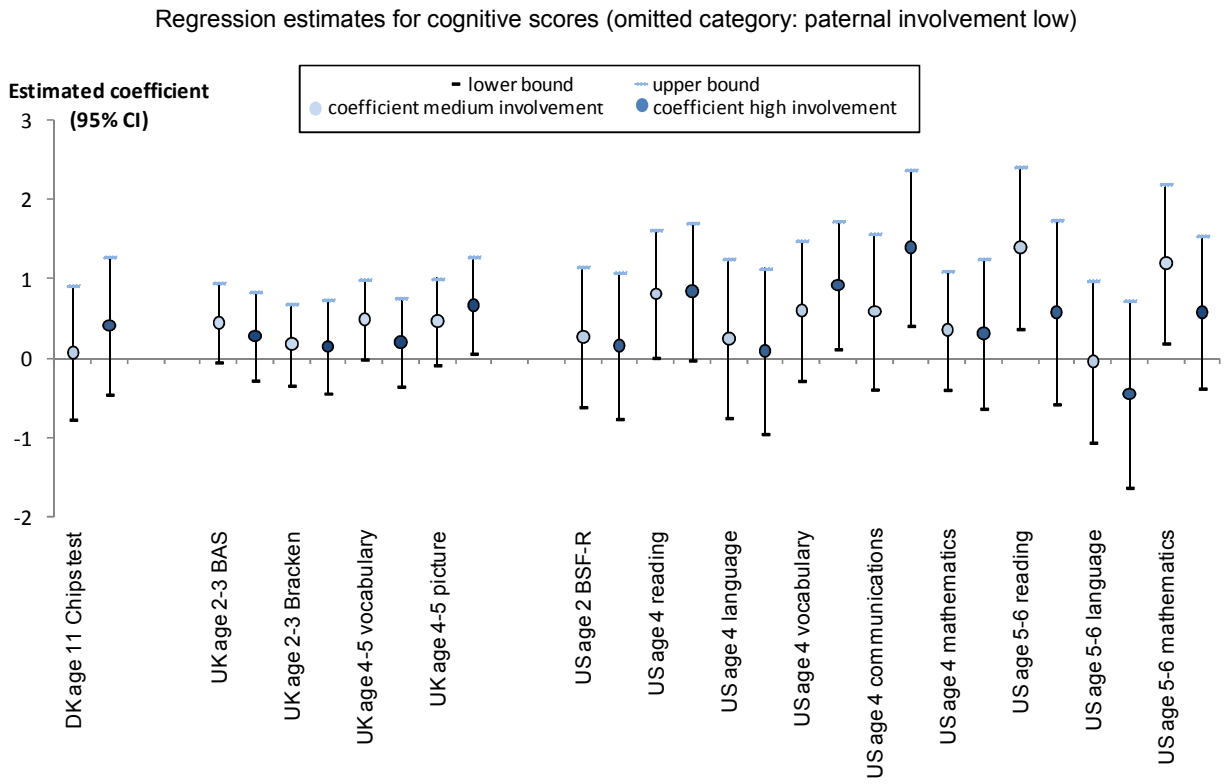
83. For children in the United Kingdom, medium-levels of paternal involvement at around 9 months were positively associated with three out of four test scores: at 2-3 years BAS naming vocabulary test and at 4-5 years vocabulary and picture similarity, but the association was very small (an effect size of around 0.05 standard deviations), and only marginally significant (at the 10% level). High levels of paternal involvement showed a significantly stronger association (0.07 standard deviations), but only with one of four test scores: picture similarity. At this first wave of data collection, the items collected to assess fathers' involvement included personal care activities such as assisting child to eat, changing nappies, getting child ready for bed. These activities may be aspects of fathers' involvement that are less likely to positively influence children's vocabulary or readiness for school.

84. In the United States, children with fathers reporting medium levels of involvement had a small positive association with three out of nine test scores at ages 4 (preschool) and 5 or 6 (kindergarten) . The association persisted, and was somewhat larger for reading and maths scores in kindergarten (0.14 and 0.12 standard deviations, respectively). In addition, children with highly involved fathers appeared to have better scores in three cognitive tests (reading, vocabulary and communications) compared with their peers with low involved fathers. Estimates from models using a continuous measure corroborated the findings using a categorical measure (Table A2.3). That is, paternal involvement during the first year of the child's life was positively associated with cognitive scores. This association is, however, small and statistically significant for only one-third of the items.

85. In Denmark, although positive values were also observed between paternal involvement during infancy and cognitive scores, these were not statistically significant. This may be due to the fact that Danish children are not assessed with cognitive tests until they reach age 11 (before this age no cognitive scores are available). This suggests that the possible influence of fathers' engagement during infancy in cognitive scores is not evident by the time cohort members are teenagers, but it is not possible to assess

whether it might be present earlier. Another reason for lack of significant results for Denmark may be that most of the fathers' activities collected at 6 months referred to personal care, activities which are less likely to have a positive association with cognitive outcomes.

Figure 8. Father's involvement during child's first year of life and child cognitive measures



Notes: 1) CI: confidence interval; lower and upper bound signs refer to 95% confidence intervals.

2) The benchmark for paternal involvement is fathers reporting low levels of involvement.

3) This Table presents estimates from multivariate regressions on cognitive scores at different ages. Although not presented here, estimates belong to models that control for child-related factors (sex, age in months, ethnicity, whether child was born prematurely, weight at birth, whether foreign language spoken at home, number of siblings and temperament); paternal characteristics (age at child's birth, born outside the country of study, educational level, number of working hours); maternal characteristics (age at child's birth, born outside the country of study, educational level, employment during pregnancy, working hours and mental health); and, family-related variables (parents' partnership status, family income and housing).

86. Figure 9 presents estimates of the link between fathers' involvement at age 2-3 years and cognitive scores across all available ages. For Australia and the United Kingdom, cognitive outcomes were assessed at 2-3 years (that is, the age at which father involvement was measured) and at 4-5 years. For the United States, cognitive outcomes were assessed at 2 years (that is, the age at which father involvement was measured), at 4 (preschool) and 5 or 6 (kindergarten). The summary measures of father involvement at age 2-3 include items different to those measured during child's first year of life; it includes not only personal care activities but also social and educational ones.

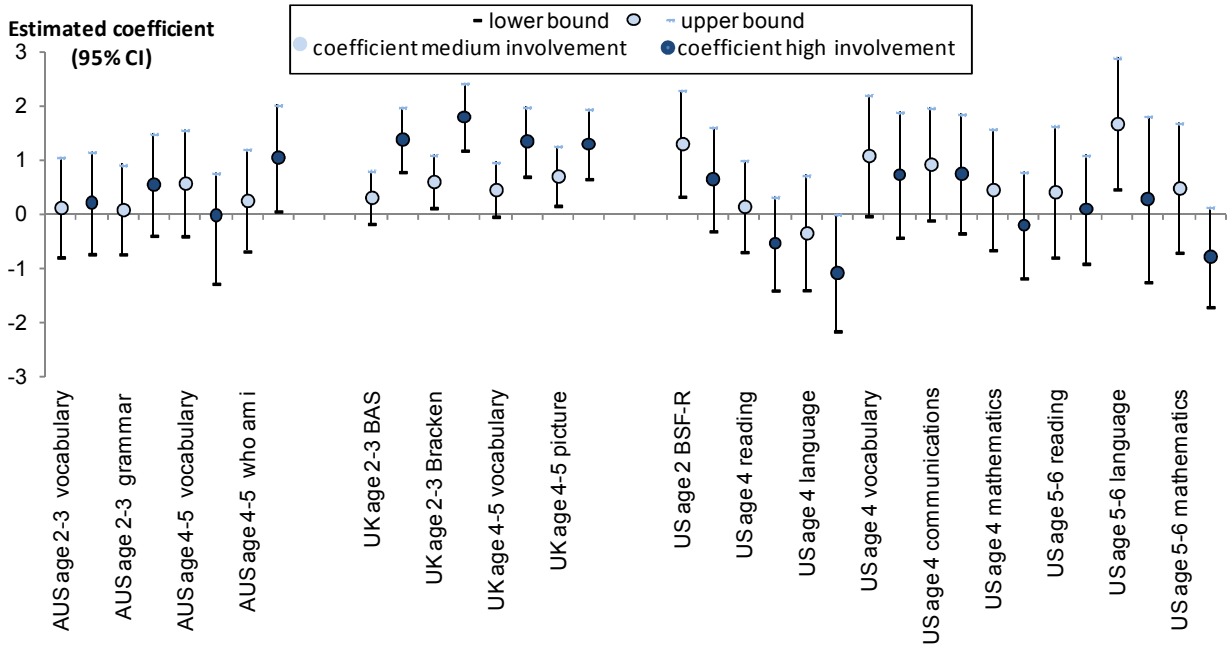
87. Results indicate that the association between paternal involvement and cognitive development was significant in some but not all test scores. Australian children at ages 2-3 years and 4-5 years whose fathers were engaged in childcare by the time the child was 2-3 years old reported higher cognitive scores

than children whose fathers were not involved at this age in one out of four cognitive tests. A possible explanation for not observing a positive result regarding vocabulary test is that the Australian summary measure of involvement did not include an item related to reading, which might be an important aspect of father involvement associated with better cognitive outcomes.

88. British children at ages 3 and 5 whose fathers were involved in childcare-related tasks by the time the child was 3 years old reported slightly higher cognitive scores than children whose fathers were not involved at this age. Estimates were significant for all test scores and were highest for children with highly involved fathers. Results using the continuous measure of paternal involvement support the latter findings: the more British fathers were involved with their children, the higher the test scores (see Table A2.4). Here fathers' involvement was assessed including reading and playing, activities that may be more closely related with children's development of cognitive skills.

Figure 9. Father's involvement at age 2-3 and child cognitive measures

Regression estimates for cognitive scores (omitted category: paternal involvement low)



Notes: 1) CI: confidence interval; lower and upper bound signs refer to 95% confidence intervals.

2) The benchmark for paternal involvement is fathers reporting low levels of involvement.

3) This Figure presents estimates from multivariate regressions on cognitive scores. Although not presented here, estimates belong to models that control for child-related factors (sex, age in months, ethnicity, whether child was born prematurely, weight at birth, whether foreign language spoken at home, number of siblings and temperament); paternal characteristics (age at child's birth, born outside the country of study, educational level, number of working hours); maternal characteristics (age at child's birth, born outside the country of study, educational level, employment during pregnancy, working hours and mental health); and, family-related variables (parents' partnership status, family income and housing).

89. In the United States, results indicate a less consistent association between paternal involvement at age 2 and children's cognitive scores. Children whose fathers reported medium levels of involvement at age 2 showed higher cognitive scores than children whose fathers reported low levels of involvement. The association, though small, was statistically significant for four out of nine items. By contrast, children with

the most highly involved fathers did not have better cognitive scores than children with minimally involved fathers. What is more, the parameter estimates were significantly negative for two test scores (language at age 4 and mathematics at age 5-6 (kindergarten)). However, estimates from models using the continuous measure of involvement did not find evidence of a significant negative relationship between fathers' involvement and cognitive test scores (Table A2.4). The negative sign of highly involved fathers may be explained by other characteristics of fathers at the top of the involvement distribution such as occupation and status, which were not possible to control for in these models.

90. A possible explanation for the differences in results between outcomes at younger and older ages is that the summary measure of involvement included items related to personal care only, which are less likely to influence child cognitive outcomes than educational or recreational activities. Changing diapers or helping feed the child may be associated with other benefits not examined here, but they may not necessarily lead to better cognitive development.

91. Models controlling for fathers' pre-birth commitment and maternal or family involvement show similar results to those of models not including these variables (Tables A3.1 – A3.3 in Annex 3). In general, the association between fathers' involvement and child outcomes remained unchanged after introducing this set of variables. Hence, the influence of unobserved paternal characteristics is not likely to affect the overall findings obtained from these models.

Conduct and attention problems

92. Figures 10 and 11 present estimates of the relationship between paternal involvement and behavioural outcomes: conduct and attention problems. The results represent odds ratio. An odds ratio with a value of one indicates that experiencing behavioural problems is equally likely in both groups - *i.e.,* children with fathers in the involvement category examined and children whose fathers were less involved (the omitted category). These figures present the estimated odd ratios as well as the lower and upper bounds of 95% confidence intervals. An odd ratio is considered statistically significant if the 95% confidence interval does not overlap with the value one. An odds ratio greater (smaller) than 1 suggests that experiencing behavioural problems is more (less) likely for children in the category examined than for children in the omitted category.

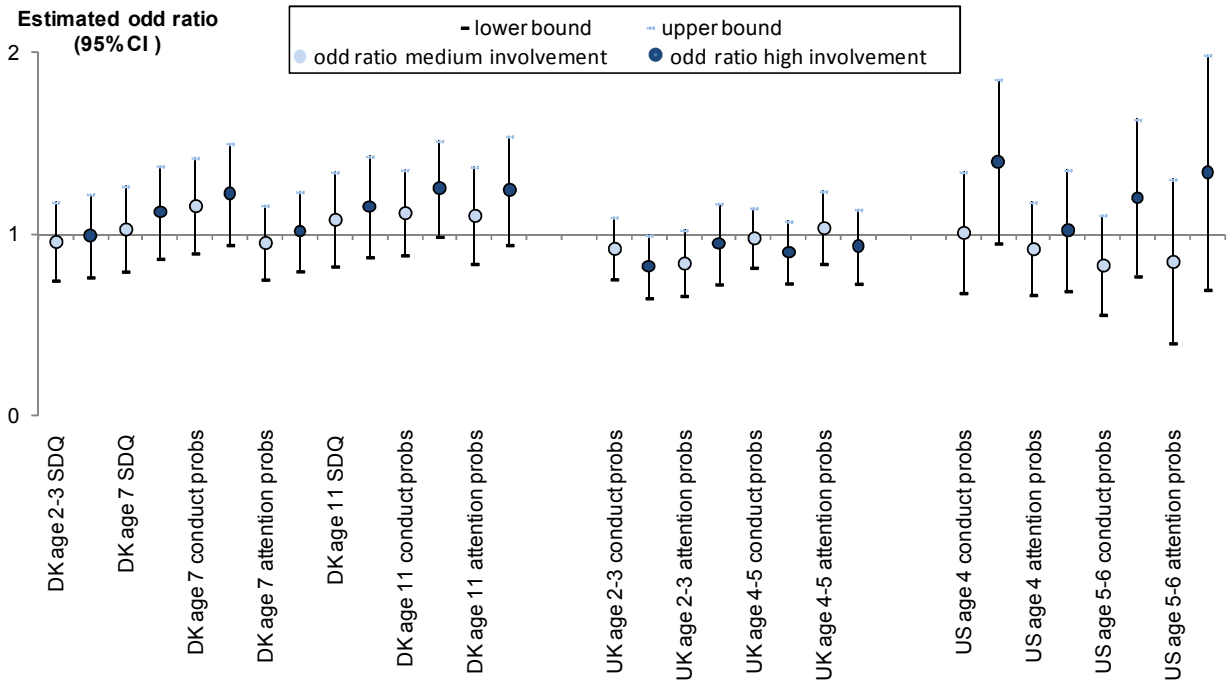
93. As above, these analyses were first done by examining the relationship between fathers' involvement in the child's first year of life and behavioural outcomes at subsequent ages. Australia was not included in this first set of analyses as fathers' involvement was not gathered at this wave of data collection. These analyses were then repeated looking at the link between fathers' involvement at age 2-3 years with outcomes at the same age and at subsequent ages. Annex 2 (Tables A2.5 and A2.6) present detailed results of these models.

94. Overall, there is little evidence that behavioural problems are less likely amongst children with fathers who reported medium or high levels of involvement during infancy (Figure 10). Only in the United Kingdom is there some evidence that high paternal involvement by the time the child was around 9 months old was associated with smaller odds of experiencing conduct problems at age three (odds ratio of 0.82). This result was, however, marginally significant and not observed at other ages or for other behavioural outcomes. By contrast, paternal involvement during infancy showed a different pattern in other countries. Danish children with highly involved fathers during infancy had somewhat higher odds of experiencing conduct and attention problems than children whose fathers were less involved in childcare, but these were mostly marginally significant. Likewise, US children whose father was highly involved during infancy had higher odds (1.40) of experiencing conduct problems at age 4 than their peers whose fathers were less involved. A possible reason for the Danish and US results is that fathers may engage more with their children when children experience behavioural problems. This finding coincides with another study in the

US which found a similar relationship between fathers' involvement and behavioural outcomes (Han *et al.*, 2001).

Figure 10. Father's involvement during child's first year of life and child behavioural measures

Logistic regression estimates for behavioural outcomes (omitted category: paternal involvement low)



Notes: 1) CI: confidence interval; lower and upper bound signs refer to 95% confidence intervals.

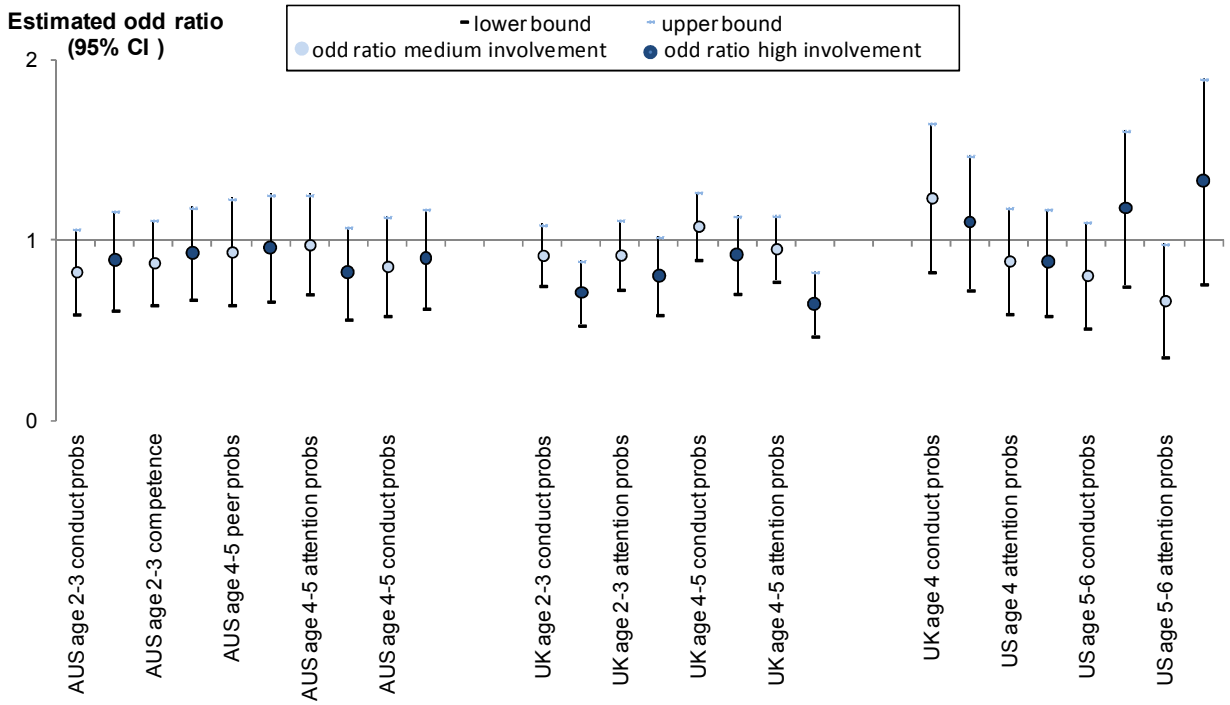
2) The benchmark for paternal involvement is fathers reporting low levels of involvement.

3) This Figure presents estimates from multivariate logistic regressions on behavioural measures. Although not presented here, estimates belong to models that control for child-related factors (sex, age in months, ethnicity, whether child was born prematurely, weight at birth, whether foreign language spoken at home, number of siblings and temperament); paternal characteristics (age at child's birth, born outside the country of study, educational level, number of working hours); maternal characteristics (age at child's birth, born outside the country of study, educational level, employment during pregnancy, working hours and mental health); and, family-related variables (parents' partnership status, family income and housing).

95. Similarly, there is little evidence that children whose fathers were involved in childcare-related tasks when they were 2-3 years old had smaller odds of conduct or attention problems than their peers with less involved fathers (Figure 11). In Australia, the odds of experiencing conduct and attention problems did not differ significantly according to fathers' involvement. In the United States, results were marginally significant and only observed in one out of four outcomes. By contrast, in Britain, children whose father reported being highly involved in childcare at age 3 were less likely to experience conduct problems at age 2-3 (odds of 0.71) and attention problems at ages 2-3 and 4-5 (odds of 0.81 and 0.65, respectively). Medium involvement, on the other hand, did not differ significantly from low involvement. Like with cognitive scores, it is possible that reading and playing, two indicators of British fathers' involvement at age 3 are influencing the latter results.

Figure 11. Father's involvement at age 2-3 and child behavioural measures

Logistic regression estimates for behavioural problems (omitted category: paternal involvement low)



Notes: 1) + p<.10; * p<.05; **p<.01; *** p<.001 standard errors in brackets.

2) The benchmark for paternal involvement is fathers reporting low levels of involvement.

3) This Table presents estimates from multivariate regressions on cognitive scores at different ages. Although not presented here, estimates belong to models that control for child-related factors (sex, age in months, ethnicity, whether child was born prematurely, weight at birth, whether foreign language spoken at home, number of siblings and temperament); paternal characteristics (age at child's birth, born outside the country of study, educational level, number of working hours); maternal characteristics (age at child's birth, born outside the country of study, educational level, employment during pregnancy, working hours and mental health); and, family-related variables (parents' partnership status, family income and housing).

Conclusions

96. Using longitudinal data from four OECD countries – Australia, Denmark, the United Kingdom and United States – this paper conducted for the first time a cross-national analysis of the associations between fathers' leave, fathers' involvement and child development. Results showed a positive and significant association between fathers' leave taking and fathers' involvement with their children. Fathers who took long periods of leave (of two or more weeks) were likely to engage more regularly in childcare activities than their peers who did not take time off at the time of birth. Additionally, associations were found between paternal involvement and child cognitive test scores, though these association were of small size and not always significant. Weak evidence for an association between paternal involvement and behavioural outcomes was observed. When data on different types of childcare activities was available, results suggested that the kind of involvement matters.

97. In the four countries analysed, an overwhelming majority of fathers – around 80% or more – took some time off work around childbirth. This percentage was highest in Denmark, but it was also high in the Anglophone countries, where at the time children in this study were born there were no statutory paid leave entitlements for fathers. The number of days off work, however, differed considerably across countries.

Whereas the vast majority of Danish fathers (90%) took two or more weeks, only one-third of US fathers took a similar amount of days off. These differences are clearly related to differences in leave entitlements between Denmark and the Anglophone countries.

98. Results showed that fathers' leave-taking is associated with involvement in childcare-related activities such as helping the child to eat, changing diapers, getting up at night for the child, give child a bath and read books. Furthermore, when data on duration of leave was available, results showed that, compared with fathers who took no leave, fathers who took periods of leave of two or more weeks were more likely to carry out these childcare tasks.

99. Parental leave policies can contribute to encouraging fathers to participate in child-care related tasks. However, they need to be well-designed to be attractive to working parents. This study shows that fathers' leave-taking is related with childcare involvement when leave-taking is of two or more weeks. Additionally, evidence suggests that fathers' use of paternity and parental leave is largest when leave is well-paid and when part of the entitlement cannot be transferred to his partner and it is lost if not used.

100. Father's involvement was positively associated with cognitive test scores, but the size of the associations was small and not always significant. The strongest association was observed in the United Kingdom, where children with highly involved fathers were faring better than children with less involved fathers. In the United States, a less consistent association emerged: children with medium involved fathers did better on some tests, but this was not the case for those with the most highly involved fathers. In Australia, fathers' involvement was linked with better scores for one out of four cognitive tests. In Denmark, there was no clear evidence of a positive link between paternal involvement and child cognitive outcomes. On the other hand, there was little evidence of an association between paternal involvement and behavioural problems. Only children in the United Kingdom with highly involved fathers showed smaller odds of experiencing conduct or attention problems. In the other countries, no clear associations emerged.

101. A possible explanation for the small associations between paternal involvement and child outcomes is that the summary measures of involvement mainly included items related to personal care. Changing diapers or helping feed the child may be associated with other benefits not examined here, but they may not necessarily lead to better cognitive or behavioural development. In addition, it is possible that fathers' involvement as measured using personal care items is limited. Men tend to undertake less this kind of activities, and, when they do so, it is likely that the mother is around. Hence, even fathers reporting high levels of involvement may not be sufficiently involved to have a positive influence on children's developmental outcomes.

102. Fathers' involvement may be associated with other child and family benefits that this study was unable to examine. For instance, children with more involved fathers during early childhood are exposed to more equal gender roles towards care and work, which they may try to replicate when adults. Fathers' involvement thus may contribute to changing attitudes and behaviours towards fathers' role as carer for future generations. Similarly, fathers' involvement may positively affect family relationships. Both mothers and fathers may be happier when fathers are more involved in childcare and other household responsibilities, which in turn is beneficial to child development and well-being.

103. The degree of parental involvement is influenced by numerous factors including attitudes towards work and care and the availability of family-friendly policies. The fact that associations between paternal involvement and child outcomes were strongest in the United Kingdom may be in part due to a possible change in expectations and attitudes towards fathers' roles in the early 2000s. During this period, family policies received considerable attention from the government and a package of reforms to increase investments in families with children were implemented. It is possible that men from more privileged backgrounds with access to family-friendly jobs were more susceptible to change attitudes towards care

and better able to engage in activities with their children than their less privileged peers. In Australia and the United States, public policies to promote father involvement were less developed and more traditional views on work and care commitments prevailed. By contrast, in Denmark, where work-family policies have been operating for over 40 years, views towards work and care are more gender equal. Hence, it is easier for most Danish fathers to make use of their leave entitlements and to spend time caring for children. Thus, it is possible that child outcomes are less sensitive to different levels of fathers' involvement.

104. Parental leave is one of many polices that could contribute not only to a more equal share of caring and earning between parents, but also to enhancing child development. Parental leave polices, however, need to be complemented with other family-friendly policies, such as flexible working practices and availability and support for childcare services. Where needed, policy should also contribute to changing mindsets and inform parents on the important role fathers play in children's development. Communication campaigns could be developed to promote men's use of leave entitlements and other workplace family-friendly practices. Similarly, pre- and postnatal visits could be used as an opportunity for informing parents about the importance of both maternal and paternal involvement on child development and the importance of getting involved early in life.

105. One limitation of this study is that the sample analysed over-represents better-off fathers and their children as it only included couple-parent families with working fathers. This study does not distinguish between biological and social fathers (step-fathers or mothers' cohabiting partners). However, some evidence suggests that social fathers engage in parenting practices of equal quality than those of biological fathers (Berger *et al*., 2008). Hence, not making this differentiation is unlikely to influence our results. It is the most vulnerable children, those growing up in sole-parent families, who are excluded from this study. These children are likely to have reduced or no contact at all with their fathers. Thus, they are less likely to benefit from fathers' involvement than their peers living with a resident social or biological father.

106. Overall, these results lend support to the importance of promoting policies that encourage and promote fathers' involvement with children. A greater involvement of men may not only reduce the persisting gender gaps in paid and unpaid work but may also enhance child development and well-being.

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ANNEX 1: DATA ON COHORT STUDIES

107. Data for **Australia** have been taken from *Growing Up in Australia: The Longitudinal Study of Australian Children*. This study follows two cohorts of children. The analysis here uses data of one cohort only: children born between March 1999 and February 2000 (B cohort). This cohort has been followed up every two years since 2004, with some additional data collected between these main waves. The first three waves of the study have been used here: 1) in 2004, when children were aged 0 to 1; 2) in 2006, when children were aged 2 to 3; and 3) in 2008, when children were aged 4 to 5. In addition, the analysis uses information from the Parental Leave in Australian Survey, which was conducted in the between-waves questionnaire for the B cohort of LSAC, in 2005. The sample was limited to children in couple-parent families, whose father were in paid work at birth and at the time of data collection of father's activities. The working sample size was of around 3 000 children.

108. Data for **Denmark** have been taken from the *Danish Longitudinal Survey of Children* (DALSC). This is a representative sample of Danish children, all born within 6 weeks in the fall of 1995. The sample size of DALSC is of around 6 000 children. This cohort has been followed up during five sweeps of data collection: 1) in 1996, when babies were about 6 months old; 2) in 1999, when children were about 3½ years old; 3) in 2003, when children were about 7½ years old; 4) in 2007, when children were about 11 years old; and 5) in 2011, when children were about 15 years old. Survey data has been merged with information from administrative registers at Statistics Denmark. The information used here comes from the first four waves as well as from registers. For example, parental education, household income and household tenure come from the registers. The sample sizes were reduced because of sample restrictions to 3 372 number of children. The DALSC is representative and not stratified, hence sampling weights have not been used.

109. Data for the **United Kingdom** come from the *Millennium Cohort Study* (MCS). This is a multi-disciplinary survey of children born in the four constituent countries of the United Kingdom between September 2000 and November 2001. The first sweep was carried out at age 9 months and contained information on 18,819 babies. Successive interviews have been conducted at ages 3, 5 and 7. The age 11 survey is taking place during 2012. The information collected at these surveys was gathered from face to face interviews to parents and from cognitive tests administered to cohort members. Full details on the survey, its origins, objectives, sampling and content of the surveys are contained in the documentation attached to the data deposited with the UK Data Archive at Essex University.

110. The analysis was restricted to one child per household, twins and triplets were not included (267 children). The response rates at waves 2 and 3 were around 80% (84% and 82%, respectively). Sample restrictions lead to a working sample of around 11 000 children. These sample sizes further reduced because only cases with complete information on outcome variables are included. Sampling weights were used in all the analyses.

111. The **United States** data come from the *Early Childhood Longitudinal Study* (ECLS) program. ECLS gathers nationally representative data of three longitudinal samples of children. Here the analysis considers data of the Birth Cohort (ECLS-B), a sample of approximately 10 700 children born in 2001 who were followed up when they were 9 months old (2001-02), 2 years old (2003-2004), 4 years old (2005-06) and while in kindergarten (fall of 2006 or fall of 2007). The sample analysed here excludes multiple births (*e.g.*, twins and triplets). The total number of children in the working sample was approximately 4 600. These sample sizes further reduced because only cases with complete information on outcome variables are included

Measurement of outcome variables

Below is a detailed description of the outcome variables as well as of those items with some discrepancies between countries.

1. Cognitive outcome measures

Australia: Waves 2 (age 2-3) and 3 (age 4-5): Peabody Picture Vocabulary Test (PPVT) ; Wechsler Intelligence Scale for Children (WISC); Matrix Reasoning subscale; Academic Rating Scale (ARS); Language and Literacy; and, Mathematical Thinking.

Denmark: *Children's Problem Solving* test (CHIPS) – this is a multiple choice test of cognitive skills consisting of 40 question applied to children aged 11. It is a non-math test that asks children to choose among a range of possible figures to complete a logical sequence.

United Kingdom: *Bracken Basic Concept Scale* (BBCS) - at the three-year-old interview, children's cognitive development was assessed via six tests of the BBCS which assessed comprehension of colours, letters, numbers, sizes, comparisons of objects and shapes. These provide an indication of the child's readiness for formal schooling (Bracken, 2002).

British Ability Scale (BAS) naming vocabulary– at ages 3 and 5, children were assessed using a subtest of the BAS that included a Naming Vocabulary test. This test consists of a booklet with pictures of objects which the child is asked to name. The assessment is used to evaluate children's spoken vocabulary. At age 7, children were given a BAS reading test that examines children's reading ability.

BAS Picture Similarity – at age 5, children were asked to identify from a set of pictures the one that looks more similar (similar element or concept). This test is also used to evaluate children's non-verbal reasoning ability.

United States: *The Bayley Short Form – Research Edition* (BSF-R) - This is a standardized measure for developmental status of children from birth to 42 months old. The mental scale of BSF-R is composed of 19 items to measure children's cognitive development, including memory, means-end behaviour, exploratory competence, and communication (Nord *et al.*, 2006). The ECLS-B 2-year data file provides the total scale scores. Total scores were standardised by converting them into z-scores. Higher scores indicate higher cognitive development. The mean value of the standardised BSF-R score at age 2 is 101.6 (SD = 9.6).

Early reading – The early reading assessment at preschool (age 4) originally included several items to measure language and literacy skills. However, the final dataset provides one unidimensional assessment at both preschool (age 4) and kindergarten (age 5-6) that represents various language-based items. These include receptive language, Peabody Picture Vocabulary Test (PPVT) items and literacy items (Snow *et al.*, 2009). The scores were standardised. The mean scores of the early reading assessment are 99.8 (SD = 9.6) in the preschool wave and 99.5 (SD = 9.6) in the kindergarten wave.

Expressive language – The expressive language assessment was measured by using the Let's Tell Stories subset of PreLAS. To measure expressive language the field interviewer read two stories to the child, recorded the child's response and scored the response with a range from 0 to 5 (Snow *et al.*, 2007). The ECLS-B data set provides the average score across both stories, and these were standardized. The mean of the expressive language score for the preschool wave is 100.6 (SD = 9.9), and 100.5 (SD = 9.8) for the kindergarten wave.

Vocabulary growth – The MacArthur Communicative Development Inventory (M-CDI) was used to measure children's vocabulary at the preschool wave. Parent respondents reported whether their children could say the target 25 words (Snow *et al.*, 2007). The vocabulary growth variable was constructed by adding up the 25 items and standardising the total score. The total score has a high degree of reliability (alpha = .77), and yields a mean score of 100.9 (SD = 9.6). .

Communication skills – The measure for children's communication skills was based on Leventhal's (1998) study. Parent respondents answered 6 items relevant to their children's general communication skills (Snow *et al.*, 2007). The communication skill scale for the preschool wave was constructed by adding the 6 items and standardizing the summed score. The mean of the standardized score is 100.9 (SD = 9.4) and the scale has a moderately high degree of reliability (alpha = .69).

Mathematics – The mathematics measure administered at the preschool and kindergarten waves included the following items: counting, number sense, properties and operations (Snow *et al.*, 2007, 2009). The scores were standardised. The mean score of the mathematics scale is 100.0 (SD = 9.6) for the preschool wave and 99.9 (SD = 9.7) for the kindergarten wave.

2. Behavioural outcome measures

Two main measures of behavioural problems were examined: conduct problems and attention (or hyperactivity) problems. Both were examined using parental reports on children's behaviour. In most of the surveys considered here, the instrument used to examine these aspects of child development is the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997), a 25 item behavioural screening questionnaire. The conduct problems dimension includes reports on whether the child: (a) frequently fights with other children, (b) often has temper tantrums, (c) is often disobedient, (d) is often argumentative and (e) is often spiteful. Similarly, the variable measuring inattention problems uses reports on whether the child: (a) is squirmy or fidgety, (b) cannot settle down to anything, (c) is very restless, (d) is easily distracted and (e) doesn't stop to think and doesn't finish task. Each attribute was rated by parents using a scale from 0 to 2 (not true, somewhat true, and certainly true). Responses were added to obtain a total score for each dimension, with higher scores indicating more problems. Total scores of each dimension were then converted into binary variables, with the top 15% of the distribution of the total score considered as having problems. These variables take a value of 1 if cohort members have high scores of conduct or attention issues.

Measures of behavioural development that were collected differently across countries and that were nevertheless included in the analysis are described below.

Australia: Social emotional outcomes were measured using the Brief Infant Toddler Social Emotional Assessment (BITSEA), with a subscale for competence and a subscale for problems at age 2-3 years. The BITSEA subscales are derived from parents' responses to questions about the extent to which their child had shown certain competencies and problem behaviours in the previous month. Each of these was dichotomised such that 20% of the sample fell in the category identified as having more problems or lower competence.

Denmark: Data on behavioural adjustment (conduct and attention-hyperactivity measures) at ages 7 and 11 were constructed using information from the SDQ questionnaire, which was answered by the mother.

United States: Data include five items asked of parents about the following socio-emotional behaviours: (a) temper tantrums, (b) aggressiveness, (c) annoyance, (d) destructiveness and (e) angry behaviours. The conduct problem measure was constructed by taking the sum of parents' report of the 5 items. The attention/hyperactivity measure included the following items: 1) "child acts impulsively without thinking",

2) "child keeps working until finished" (reverse coded), 3) "child pays attention well" (reverse coded), and 4) "child is overly active" with a 5-point Likert scale (1 = "never" to 5 = "very often"). Two additional questions were asked of the teacher – "child had difficulty concentrating or staying on task" and "child is restless and fidgety." Likewise, children with the top 15% of the total scores were categorized as having hyperactivity or inattention problems.

Other explanatory variables included in the analysis that have been collected differently across countries include:

1. Child's temperament

Australia: *Short Temperament Scale for Children.* The items included in this scale measure: approach-sociability: how comfortable the child is in new situations or with unfamiliar children or adults; reactivity: how intense and volatile the child is; and persistence: the child's capacity to see tasks through to completion. High scores reflect high sociability, high reactivity and high persistence.

Denmark: Temperament was assessed using answers to the following question, which was asked of fathers and mothers: "All in all, how is the temper of your child?"

1. Very temperamental
2. As an average child, normal
3. Not very temperamental

United Kingdom: *Carey Infant Temperament Scale.* Items from this scale (Carey and McDevitt, 1977, 1995) aim at gauging three dimensions of child's temperament: mood (5 items), adaptability to new situations (5 items), and regularity (4 items).

United States: *The Infant/Toddler Symptom Checklist.* Child temperament in the ECLS-B was assessed using the Infant/Toddler Symptom Checklist (ITSC). The items chosen include the following: 1) child is frequently irritable or fussy; 2) child goes easily from a whimper to an intense cry; 3) Child is unable to wait for food or toys without crying or whining/falling apart; 4) child is easily distractible or has fleeting attention; 5) child needs a lot of help to fall asleep; 6) child tunes out from activity and is difficult to re-engage; 7) child can't shift focus easily from one project or activity to another.

2. Parental education

Parental education was constructed using the highest degree of either mother's or father's (if present) education and classified into three categories: low (below secondary education: ISCED 0 to 2), medium (secondary education: ISCED 3 to 4) and high (tertiary education and above: ISCED 5 to 6). In Demark, the low parental educational category included elementary and high school, the medium category vocational and short post-secondary, and the high category medium and long post-secondary.

3. Maternal or family invovlement

In Australia, involvement of a family member other than the father was assessed with an item about an adult in the household reading to the child on 6-7 days per week, as opposed to less than this. By contrast, in the United Kingdom, maternal involvement was assessed with the amount of time mothers reported spending with their child when she/he was aged 9 months. Involved mothers were those who reported spending "plenty of time" with the child as opposed to those reporting "just enough" or "not enough". At age 2-3 years, involved mothers were those reading to the child at least three times a week as opposed to less than this.

ANNEX 2: STATISTICAL TABLES

Table A2.1 Fathers' characteristics by leave-taking around childbirth (columns add 100% per category)

	Australia			Denmark			United Kingdom			United States		
	Took leave	No leave		Took leave	No leave		Took leave	No leave		Took leave	No leave	
	(%)	*(%)*	p-value	*(%)*	*(%)*	p-value	*(%)*	*(%)*	p-value	*(%)*	*(%)*	p-value
Father's age												
<25	2.4	3.6		6.0	6.1		7.5	10.5	***	14.4	20.7	**
25-29	15.2	12.9		30.2	24.6	*	20.8	21.4		24.5	20.8	+
30-34	39.5	33.5	**	38.7	35.3		38.1	32.2	***	31.4	30.1	
35+	42.9	50.0	**	25.1	33.5	***	33.7	35.9	+	29.8	28.5	
Total	*100*	*100*		*100*	*100*		*100*	*100*		*100*	*100*	
Father's education												
Low	9.6	14.0	**	26.7	33.3	**	8.0	18.2	**	11.0	20.4	***
Medium	56.5	58.6		63.3	57.2	**	50.7	54.7		51.9	52.7	
High	33.9	27.4	**	10.1	9.5		41.4	27.1	***	37.1	27.0	***
Total	*100*	*100*		*100*	*100*		*100*	*100*		*100*	*100*	
Foreign born (vs native-born)[1]	21.6	26.4	*	2.6	4.5	*	7.6	15.0	***	18.2	30.2	***
Cohabiting (vs married)	14.3	13.6		41.1	42.5		26.3	30.4	***	13.6	20.6	***
Father's usual working hours												
not employed	2.1	6.2	***	-	-		-	-		-	-	
<35 hours	4.2	9.6	***	1.9	5.3	***	3.5	10.1	***	4.4	8.7	***
35-44 hours	41.6	27.0	***	69.5	39.1	***	41.9	33.7	***	48.0	43.2	*
45 or more	52.2	57.3	*	28.6	55.6	***	54.5	56.3		47.6	48.2	
Total	*100*	*100*		*100*	*100*		*100*	*100*		*100*	*100*	
Father's commitment at birth												
Was present in delivery room	-	-		-	-		94.3	87.4	***	96.5	87.8	***
Attended birth class	-	-		-	-		-	-		48.2	35.7	***
Household income [2]												
lowest 20% (approx)	9.4	21.1	***	17.9	35.3	***	4.4	11.4	***	10.1	19.0	***
2nd quintile	18.0	17.6		20.8	14.5	***	32.0	37.5	***	20.4	26.7	**
3rd quintile	23.8	20.4	+	21.1	11.9	***	29.4	25.9	***	39.0	33.8	*
4th quintle	23.3	16.4	***	20.9	13.4	***	34.2	25.2	***	30.5	20.5	***
top 20%	21.5	18.6		19.3	24.7	***	-	-		-	-	
missing	4.1	6.0	*	-	-		-	-		-	-	
Total	*100*	*100*		*100*	*100*		*100*	*100*		*100*	*100*	
Household tenure												
own/buying	77.5	74.7		69.9	65.1	**	81.5	70.3	***	65.6	50.0	***
rent/board	19.9	19.4		28.3	34.0	**	15.8	24.7	***	29.2	44.4	***
other	2.6	5.9	***	1.9	0.9		2.7	5.0	***	5.2	5.9	
Total	*100*	*100*		*100*	*100*		*100*	*100*		*100*	*100*	
Sample size	*2293*	*704*		*3310*	*462*		*8,709*	*2,524*		*?4,050*	*?500*	

Note. All numbers were weighted using sampling weights. Significance tests were conducted to compare fathers who took any leave with those who took no leave. +p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001.

1. For the UK, figures represent non-white (vs. white).

2. For the UK, household income is grouped as follows: £0-£10,400; £10,400-£20,800; £20,800-£31,200; £31,200 +. For the US, the categories are: $0-$20,000; $20,001-$35,000; $35,001-$50,000; $50,001+.

Table A2.2 Child, mother and family characteristics by fathers' leave-taking (columns add 100% per category)

	Australia			Denmark			United Kingdom			United States		
	Took leave	No leave		Took leave	No leave		Took leave	No leave		Took leave	No leave	
	(%)	*(%)*	p-value	*(%)*	*(%)*	p-value	*(%)*	*(%)*	p-value	*(%)*	*(%)*	p-value
Child characteristics												
Boys (vs. girls)	47.3	50.9		52.3	50.4		51.0	51.5		51.3	53.0	
Age in months	8.7	8.8		-	-		9.2	9.2		10.3	10.4	
Ethincity: white	98.1	98.6		99.7	98.7	**	91.7	84.6	***	69.3	55.2	***
Non-native language (vs. native)	12.3	20.7		1.1	3.0	*	7.2	15.2	***	14.9	26.1	***
Prematurity (<37weeks)	5.8	6.1		4.7	6.3		7.5	7.5		9.5	9.6	
Low birthweight (<2.5kg)	4.3	5.6		3.8	5.0		5.7	6.3		6.1	5.9	
Number of siblings at 9-month												
None	40.8	34.2		44.8	42.4		44.6	36.1	***	40.2	38.7	
One	39.3	40.1		37.8	37.4		38.0	38.5		36.2	31.5	*
Two or more	19.9	25.8		17.4	20.1		17.4	25.5	***	23.6	29.8	**
Child's temperament												
Very temperamental	32.9	29.5		18.2	18.6		36.9	38.7		33.8	38.4	*
Average temperament	31.5	31.7		70.3	69.7		37.2	34.4		29.0	28.1	
Not very tempermental	29.9	31.1		11.3	11.5		25.8	27.0		23.6	33.5	
Mother's characteristics												
Worked during pregnancy	70.8	65.8		75.8	70.6	*	78.9	68.3	***	74.0	71.6	
Not working at 9-month	59.0	50.3		97.5	96.5		45.4	39.5	**	52.6	47.7	*
Mother's usual working hours												
0 hours	59.0	50.3		8.6	10.6		39.1	48.2	**	45.7	48.9	
1-34 hours per week	33.5	40.3		18.6	21.9	+	44.4	36.7	**	23.3	18.6	*
35+ hours per week	7.5	9.4		72.7	67.5	**	16.5	15.1		31.1	32.4	
Age at child's birth												
<20	0.6	0.4		0.7	0.9		2.8	4.3		5.0	6.5	*
20-24	5.4	6.0		12.3	11.2		11.1	14.7		18.5	24.0	***
25-29	23.1	21.4		40.7	37.8		29.3	28.3		29.3	29.9	
30-34	42.5	38.5		34.0	35.0		37.4	32.4		30.1	21.8	***
35+	28.4	33.8		12.3	15.1		19.5	20.3		17.2	17.7	
Mother's education at chid's birth												
Low	12.6	16.2		32.7	36.3		5.5	11.0		37.2	52.4	***
Medium	52.5	55.8		60.0	55.1	+	51.0	53.9		24.8	20.9	*
High	35.0	28.1		7.0	7.1		43.5	35.2	***	38.1	26.7	***
Foreign-born (vs. native born)	20.0	27.7		0.8	1.9		8.4	13.5		18.5	29.5	***
Depressed at 9 month	32.8	35.0		2.4	1.7		22.1	20.3		33.8	35.8	
Family characteristics												
Household income at child's first year												
lowest 20% (approx)	9.0	19.9		17.9	35.3	***	4.1	10.3	**	10.1	19.0	***
2nd quintile	18.2	18.3		20.8	14.5	***	30.2	33.7	*	20.4	26.7	**
3rd quintile	23.8	20.3		21.1	11.9	***	27.7	23.2	*	39.0	33.8	*
4th quintle	23.6	16.8		20.9	13.4	***	22.8	16.8	**	20.5	20.5	***
top 20%	21.6	19.0		19.3	24.7	***	15.1	16.1				
Household tenure at 9-month												
Owned	77.6	75.2		67.2	62.4		81.6	70.3	***	65.6	50.0	***
Renting	19.8	19.2		27.2	32.6		8.7	13.9	**	29.2	44.4	***
Other	2.6	5.6		1.8	0.9		9.7	15.9	**	5.2	5.9	
Father commitment at birth												
Was present in delivery room	-	-		-	-		95.3	89.5	*	96.5	87.8	***
Attended birth class	-	-		-	-		-	-		48.2	35.7	***

Notes: 1. All numbers were weighted using sampling weights. Significance tests were conducted to compare fathers who took any leave with those who took no leave. +p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001.

Table A2.3. Father's involvement during child's first year of life and child cognitive measures

Regression estimates for cognitive scores (omitted category: paternal involvement low)

		Fathers' involvement					
		Categorical measure				Continuous measure	
		Medium		High			
	Cognitive scores	*coefficient*	*std error*	*coefficient*	*std error*	*coefficient*	*std error*
Denmark	**Age 11: Chips test**	0.07	*[0.43]*	0.41	*[0.44]*	0.05	*[0.05]*
United Kingdom	**Age 2-3: BAS**	0.45+	*[0.26]*	0.28	*[0.28]*	0.02	*[0.01]*
	Age 2-3: Bracken	0.17	*[0.26]*	0.15	*[0.30]*	0.01	*[0.01]*
	Age 4-5: vocabulary	0.49+	*[0.26]*	0.20	*[0.28]*	0.02	*[0.01]*
	Age 4-5: picture	0.46+	*[0.28]*	0.67*	*[0.31]*	0.02	*[0.01]*
United States	**Age 2: BSF-R**	0.27	*[0.45]*	0.16	*[0.47]*	0.02	*[0.02]*
	Age 4: reading	0.81+	*[0.41]*	0.84+	*[0.44]*	0.06*	*[0.02]*
	Age 4: language	0.25	*[0.51]*	0.09	*[0.53]*	0.01	*[0.03]*
	Age 4: vocabulary	0.60	*[0.45]*	0.92*	*[0.41]*	0.06*	*[0.03]*
	Age 4: communications	0.59	*[0.50]*	1.39**	*[0.50]*	0.09**	*[0.03]*
	Age 4: mathematics	0.35	*[0.38]*	0.31	*[0.48]*	0.03	*[0.03]*
	Age 5-6: reading	1.39**	*[0.52]*	0.58	*[0.59]*	0.03	*[0.04]*
	Age 5-6: language	-0.04	*[0.52]*	-0.45	*[0.60]*	-0.03	*[0.04]*
	Age 5-6: mathematics	1.19*	*[0.51]*	0.58	*[0.49]*	0.04	*[0.03]*

Notes: 1) + p<.10; * p<.05; **p<.01; *** p<.001; standard errors in brackets.

2) The benchmark for paternal involvement is fathers reporting low levels of involvement.

3) This Table presents estimates from multivariate regressions on cognitive scores at different ages. Although not presented here, estimates belong to models that control for child-related factors (sex, age in months, ethnicity, whether child was born prematurely, weight at birth, whether foreign language spoken at home, number of siblings and temperament); paternal characteristics (age at child's birth, born outside the country of study, educational level, number of working hours); maternal characteristics (age at child's birth, born outside the country of study, educational level, employment during pregnancy, working hours and mental health); and, family-related variables (parents' partnership status, family income and housing).

Table A2.4. Father's involvement at age 2-3 and child cognitive measures

Regression estimates for cognitive scores (omitted category: paternal involvement low)

		Fathers' involvement					
		Categorical measure				Continuous measure	
		Medium		High			
	Cognitive scores	*coefficient*	*std error*	*coefficient*	*std error*	*coefficient*	*std error*
Australia	**Age 2-3: vocabulary**	0.12	*[0.47]*	0.20	*[0.48]*	0.01	*[0.02]*
	Age 2-3: grammar markers	0.08	*[0.42]*	0.54	*[0.48]*	0.04	*[0.02]*
	Age 4-5: vocabulary	0.57	*[0.50]*	-0.27	*[0.52]*	-0.01	*[0.02]*
	Age 4-5: who am i	0.25	*[0.48]*	1.03*	*[0.50]*	0.04*	*[0.02]*
United Kingdom	**Age 2-3: BAS**	0.31	*[0.25]*	1.37**	*[0.30]*	0.06**	*[0.01]*
	Age 2-3: Bracken	0.60*	*[0.25]*	1.79**	*[0.32]*	0.07**	*[0.01]*
	Age 4-5: vocabulary	0.45+	*[0.26]*	1.33**	*[0.33]*	0.05**	*[0.01]*
	Age 4-5: picture	0.70*	*[0.28]*	1.29**	*[0.33]*	0.05**	*[0.01]*
United States	**Age 2: BSF-R**	1.30*	*[0.50]*	0.64	*[0.49]*	0.07*	*[0.03]*
	Age 4: reading	0.14	*[0.43]*	-0.55	*[0.44]*	0.00	*[0.02]*
	Age 4: language	-0.35	*[0.54]*	-1.09*	*[0.55]*	-0.04	*[0.03]*
	Age 4: vocabulary	1.08+	*[0.57]*	0.72	*[0.59]*	0.05	*[0.03]*
	Age 4: communications	0.92+	*[0.53]*	0.74	*[0.56]*	0.08*	*[0.03]*
	Age 4: mathematics	0.45	*[0.57]*	-0.21	*[0.50]*	0.00	*[0.03]*
	Age 5-6: reading	0.41	*[0.62]*	0.08	*[0.51]*	0.01	*[0.04]*
	Age 5-6: language	1.67**	*[0.62]*	0.27	*[0.78]*	0.01	*[0.05]*
	Age 5-6: mathematics	0.48	*[0.61]*	-0.80+	*[0.47]*	-0.04	*[0.03]*

Notes: 1) + p<.10; * p<.05; **p<.01; *** p<.001; standard errors in brackets.

2) The benchmark for paternal involvement is fathers reporting low levels of involvement.

3) This Table presents estimates from multivariate regressions on cognitive scores at different ages. Although not presented here, estimates belong to models that control for child-related factors (sex, age in months, ethnicity, whether child was born prematurely, weight at birth, whether foreign language spoken at home, number of siblings and temperament); paternal characteristics (age at child's birth, born outside the country of study, educational level, number of working hours); maternal characteristics (age at child's birth, born outside the country of study, educational level, employment during pregnancy, working hours and mental health); and, family-related variables (parents' partnership status, family income and housing).

Table A2.5. Father's involvement during child's first year of life and child behavioural measures

Logistic regression estimates for behavioural outcomes (omitted category: paternal involvement low)

	Behavioural outcomes	Categorical measure			
		Medium		High	
		odds ratio	*std error*	*odds ratio*	*std error*
Denmark	**Age 2-3: SDQ non-cognitive score**	0.96	*[0.11]*	0.99	*[0.12]*
	Age 7: SDQ non-cognitive score	1.03	*[0.12]*	1.12	*[0.13]*
	Age 7: conduct problems	1.16	*[0.13]*	1.22+	*[0.14]*
	Age 7: attention problems	0.95	*[0.10]*	1.01	*[0.11]*
	Age 11: SDQ non-cognitive score	1.08	*[0.13]*	1.15	*[0.14]*
	Age 11: conduct problems	1.12	*[0.12]*	1.25*	*[0.13]*
	Age 11: attention problems	1.10	*[0.14]*	1.24+	*[0.15]*
United Kingdom	**Age 2-3: conduct problems**	0.92	*[0.09]*	0.82+	*[0.09]*
	Age 2-3: attention problems	0.84	*[0.09]*	0.95	*[0.11]*
	Age 4-5: conduct problems	0.98	*[0.08]*	0.90	*[0.09]*
	Age 4-5: attention problems	1.04	*[0.10]*	0.93	*[0.10]*
United States	**Age 4: conduct problems**	1.01	*[0.17]*	1.40*	*[0.23]*
	Age 4: attention problems	0.92	*[0.13]*	1.02	*[0.17]*
	Age 5-6: conduct problems	0.83	*[0.14]*	1.20	*[0.22]*
	Age 5-6: attention problems	0.85	*[0.23]*	1.34	*[0.33]*

Notes: 1) + p<.10; * p<.05; **p<.01; *** p<.001; standard errors in brackets.

2) The benchmark for paternal involvement is fathers reporting low levels of involvement.

3) This Table presents estimates from logistic multivariate regressions on behavioural outcomes at different ages. Although not presented here, estimates belong to models that control for child-related factors (sex, age in months, ethnicity, whether child was born prematurely, weight at birth, whether foreign language spoken at home, number of siblings and temperament); paternal characteristics (age at child's birth, born outside the country of study, educational level, number of working hours); maternal characteristics (age at child's birth, born outside the country of study, educational level, employment during pregnancy, working hours and mental health); and, family-related variables (parents' partnership status, family income and housing.

Table A2.6. Father's involvement at age 2-3 and child behavioural measures

Logistic regression estimates for behavioural problems (omitted category: paternal involvement low)

	Behavioural outcomes	Categorical measure			
		Medium		High	
		odds ratio	*std error*	*odds ratio*	*std error*
Australia	**Australia - conduct problems**	0.83	*[0.12]*	0.89	*[0.14]*
	Australia - competence	0.88	*[0.12]*	0.93	*[0.13]*
	Australia - peer problems	0.94	*[0.15]*	0.96	*[0.15]*
	Australia - attention problems	0.98	*[0.14]*	0.82	*[0.13]*
	Australia - conduct problems	0.86	*[0.14]*	0.90	*[0.14]*
United Kingdom	**Age 2-3: conduct problems**	0.92	*[0.09]*	0.71**	*[0.09]*
	Age 2-3: attention problems	0.92	*[0.10]*	0.81	*[0.11]*
	Age 4-5: conduct problems	1.08	*[0.10]*	0.92	*[0.11]*
	Age 4-5: attention problems	0.96	*[0.09]*	0.65**	*[0.09]*
United States	**Age 4: conduct problems**	1.24	*[0.21]*	1.10	*[0.19]*
	Age 4: attention problems	0.89	*[0.15]*	0.88	*[0.15]*
	Age 5-6: conduct problems	0.81	*[0.15]*	1.18	*[0.22]*
	Age 5-6: attention problems	0.67+	*[0.16]*	1.33	*[0.29]*

Notes: 1) + p<.10; * p<.05; **p<.01; *** p<.001 standard errors in brackets.

2) The benchmark for paternal involvement is fathers reporting low levels of involvement.

3) This Table presents estimates from logistic multivariate regressions on behavioural outcomes at different ages. Although not presented here, estimates belong to models that control for child-related factors (sex, age in months, ethnicity, whether child was born prematurely, weight at birth, whether foreign language spoken at home, number of siblings and temperament); paternal characteristics (age at child's birth, born outside the country of study, educational level, number of working hours); maternal characteristics (age at child's birth, born outside the country of study, educational level, employment during pregnancy, working hours and mental health); and, family-related variables (parents' partnership status, family income and housing.

ANNEX 3: ROBUSTNESS TESTS

Table A3.1. Effects of leave taking on father's involvement at 2-3 years old – Australia

	Model 1	Model 2	Model 3	Model 5
	Without controls	Model 1 + controls for child, father, mother and hh charact	Model 2 + child temperament	Model 3 + family's time reading
Feed child more than once a day				
Father's leave (ref.=no leave)				
1-4 days	1.06	1.02	1.02	1.01
	[0.19]	[0.18]	[0.18]	[0.18]
5-9 days	1.20	1.26	1.25	1.25
	[0.17]	[0.18]	[0.18]	[0.18]
10+ days	1.36	1.29	1.28	1.28
	[0.17]**	[0.16]**	[0.16]**	[0.16]**
Change diaper or help use toilet more than once a day				
Father's leave (ref.=no leave)				
1-4 days	1.06	0.94	0.92	0.91
	[0.18]	0.17	0.17	0.17
5-9 days	1.08	1.00	1.00	0.99
	[0.15]	0.15	0.15	0.15
10+ days	1.44	1.26	1.26	1.25
	[0.16]***	[0.15]**	[0.15]*	[0.15]+
Get child to bed more than once a day				
Father's leave (ref.=no leave)				
1-4 days	1.60	1.54	1.53	1.53
	[0.31]**	[0.30]**	[0.30]**	[0.30]**
5-9 days	1.36	1.34	1.34	1.34
	[0.20]**	[0.21]+	[0.21]+	[0.21]+
10+ days	1.70	1.57	1.56	1.56
	[0.22]***	[0.21]***	[0.21]***	[0.21]***
Help child get dressed more than once a day				
Father's leave (ref.=no leave)				
1-4 days	0.97	0.88	0.88	0.88
	[0.19]	[0.17]	[0.17]	[0.17]
5-9 days	0.97	0.91	0.91	0.91
	[0.15]	[0.15]	[0.15]	[0.15]
10+ days	1.43	1.30	1.30	1.30
	[0.17]***	[0.17]**	[0.17]**	[0.17]**
Give child a bath several times a week				
Father's leave (ref.=no leave)				
1-4 days	1.37	1.15	1.15	1.13
	[0.27]	[0.24]	[0.24]	[0.23]
5-9 days	1.54	1.30	1.30	1.30
	[0.23]	[0.21]	[0.21]	[0.21]
10+ days	1.62	1.29	1.29	1.29
	[0.20]***	[0.17]*	[0.17]*	[0.17]*
Help child brush teeth				
Father's leave (ref.=no leave)				
1-4 days	1.33	1.22	1.20	1.17
	[0.28]	[0.26]	[0.25]	[0.25]
5-9 days	1.23	1.22	1.22	1.21
	[0.23]	[0.23]	[0.23]	[0.23]
10+ days	1.94	1.74	1.74	1.72
	[0.29]***	[0.27]***	[0.29]***	[0.29]***
Share evening meal				
Father's leave (ref.=no leave)				
1-4 days	0.91	0.87	0.87	0.87
	[0.15]	[0.14]	[0.14]	[0.14]
5-9 days	0.94	0.92	0.92	0.92
	[0.12]	[0.12]	[0.12]	[0.12]
10+ days	0.92	0.82	0.82	0.82
	[0.10]	[0.10]	[0.10]	[0.10]

Note. + p<.10;** p<.05; **p<.01; ***p<.001. Figures are odd ratios and the omitted category is fathers who did not take leave. Standard errors in brackets . Family time reading refers to and adult in the household reading to the child.

Table A3.2. Effects of leave taking on father's involvement at 9 months – United Kingdom

	Model 1	Model 2	Model 3	Model 4	Model 5
	Without controls	Model 1 + controls for child, father, mother and hh charact	Model 2 + child temperament	Model 3 + father present at delivery	Model 3 + mother's time for care
Feed child more than once a day					
Father's leave (ref.=no leave)					
Paternity or parental leave	1.12	1.20	1.20	1.21	1.21
	[0.077]+	[0.089]*	[0.089]*	[0.089]*	[0.089]*
Annual leave	0.99	1.02	1.02	1.03	1.02
	[0.077]	[0.083]	[0.083]	[0.083]	[0.083]
Other leave inc sick leave	1.15	1.19	1.19	1.19	1.20
	[0.118]	[0.126]	[0.127]	[0.127]+	[0.128]+
N	*11268*	*11246*	*11246*	*11246*	*11246*
Changes diaper more than once a day					
Father's leave (ref.=no leave)					
Paternity or parental leave	1.46	1.39	1.39	1.38	1.38
	[0.090]**	[0.092]**	[0.092]**	[0.092]**	[0.092]**
Annual leave	1.23	1.14	1.14	1.14	1.13
	[0.085]**	[0.082]+	[0.082]+	[0.082]+	[0.082]+
Other leave inc sick leave	1.27	1.25	1.25	1.25	1.25
	[0.118]*	[0.121]*	[0.121]*	[0.121]*	[0.122]*
N	*11277*	*11252*	*11252*	*11252*	*11252*
Gets up at night for child at least once a day					
Father's leave (ref.=no leave)					
Paternity or parental leave	1.27	1.29	1.29	1.28	1.28
	[0.106]**	[0.113]**	[0.114]**	[0.113]**	[0.113]**
Annual leave	1.22	1.27	1.27	1.26	1.26
	[0.113]*	[0.122]*	[0.122]*	[0.121]*	[0.121]*
Other leave inc sick leave	1.05	1.10	1.10	1.10	1.10
	[0.135]	[0.142]	[0.143]	[0.142]	[0.142]
N	*11275*	*11251*	*11251*	*11250*	*11245*
Looks after the child on his own at least once a day					
Father's leave (ref.=no leave)					
Paternity or parental leave	0.95	1.07	1.07	1.07	1.06
	[0.075]	[0.091]	[0.091]	[0.091]	[0.090]
Annual leave	0.69	0.79	0.79	0.79	0.78
	[0.064]**	[0.076]*	[0.076]*	[0.076]*	[0.076]*
Other leave inc sick leave	1.07	1.12	1.12	1.12	1.12
	[0.126]	[0.134]	[0.134]	[0.134]	[0.135]
N	*11273*	*11257*	*11257*	*11257*	*11257*

Note. + p<.10;** p<.05; **p<.01; ***p<.001. Figures are odd ratios and the omitted category is fathers who did not take leave. Standard errors in brackets

Table A3.3. Effects of leave taking on father's involvement at 9 months – United States

	Model 1		Model 2		Model 3		Model 4	
	Without controls		Model 1 + controls for child, father, mother and hh charact		Model 2 + child temperament		Model 3 + father present at delivery	
	Odds	se	Odds	se	Odds	se	Odds	se
Preparing meals for child more than once a day								
Father's leave (ref.=no leave)								
<1 week	0.86	(0.15)	0.89	(0.16)	0.89	(0.16)	0.87	(0.15)
1 week	1.01	(0.11)	1.17	(0.14)	1.17	(0.14)	1.14	(0.14)
2+ week	1.37*	(0.16)	1.59***	(0.20)	1.59***	(0.20)	1.54**	(0.20)
Changing diapers more than once a day								
Father's leave (ref.=no leave)								
<1 week	1.02	(0.16)	1.03	(0.17)	1.03	(0.17)	1.00	(0.16)
1 week	1.39*	(0.20)	1.51**	(0.21)	1.51**	(0.21)	1.45**	(0.21)
2+ week	1.93***	(0.27)	1.99***	(0.28)	1.99***	(0.28)	1.90***	(0.26)
Getting child to bed at least once a day								
Father's leave (ref.=no leave)								
<1 week	0.92	(0.14)	1.03	(0.17)	1.03	(0.17)	0.99	(0.16)
1 week	0.95	(0.13)	1.26	(0.17)	1.26	(0.17)	1.19	(0.16)
2+ week	1.13	(0.15)	1.54**	(0.20)	1.54**	(0.20)	1.46**	(0.19)
Giving child a bath few times per week								
Father's leave (ref.=no leave)								
<1 week	0.82	(0.12)	0.84	(0.12)	0.84	(0.12)	0.82	(0.12)
1 week	1.05	(0.13)	1.12	(0.14)	1.12	(0.14)	1.08	(0.14)
2+ week	1.30*	(0.16)	1.40**	(0.16)	1.40**	(0.16)	1.35**	(0.15)
Helping child get dressed at least once a day								
Father's leave (ref.=no leave)								
<1 week	0.95	(0.16)	0.99	(0.16)	0.99	(0.16)	0.96	(0.16)
1 week	1.16	(0.15)	1.36*	(0.17)	1.36*	(0.17)	1.31*	(0.17)
2+ week	1.61***	(0.21)	1.87***	(0.25)	1.88***	(0.25)	1.80***	(0.24)
Reading books to child at least three times per week								
Father's leave (ref.=no leave)								
<1 week	0.83	(0.16)	0.79	(0.16)	0.79	(0.16)	0.78	(0.16)
1 week	1.04	(0.15)	0.90	(0.14)	0.90	(0.14)	0.88	(0.13)
2+ week	1.61**	(0.23)	1.34*	(0.20)	1.34*	(0.20)	1.31+	(0.19)

Note. + p<.10;** p<.05; **p<.01; ***p<.001. Figures are odd ratios and the omitted category is fathers who did not take leave. Standard errors in parentheses.

Table A3.4. Father's involvement at 9 months, paternity leave and child development measures at age 3 - United Kingdom

	Father's involvement categorical				Father's involvement continuous				
	Model 1	Model 2	Model 3	Model 4		Model 1	Model 2	Model 3	Model 4
	Controls for child, father, mother and hh charact	Model 1 + child temperament	Model 2 + father present at delivery	Model 3 + mom's time		Controls for child, father, mother and hh charact	Model 1 + child temperament	Model 2 + father present at delivery	Model 3 + mom's time
British Ability Scales (BAS)					**British Ability Scales (BAS)**				
Father's involvement 9-months (ref.=low)					**Father's involvement 9-months**				
Medium	0.46	0.45	0.46	0.45	Continuous	0.02	0.02	0.02	0.02
	[0.255]+	[0.255]+	[0.255]+	[0.255]+		[0.012]	[0.012]	[0.012]	[0.012]
High	0.31	0.31	0.30	0.29					
	[0.284]	[0.285]	[0.285]	[0.285]					
Observations	*7905*	*7905*	*7905*	*7905*	Observations	*7905*	*7905*	*7905*	*7905*
Bracken Scores					**Bracken Scores**				
Father's involvement 9-months (ref.=low)					**Father's involvement 9-months**				
Medium	0.17	0.17	0.18	0.17	Continuous	0.01	0.01	0.01	0.01
	[0.262]	[0.262]	[0.262]	[0.262]		[0.012]	[0.012]	[0.012]	[0.012]
High	0.13	0.14	0.12	0.12					
	[0.299]	[0.299]	[0.299]	[0.299]					
Observations	*7515*	*7515*	*7515*	*7515*	Observations	*7515*	*7515*	*7515*	*7515*
Conduct problems					**Conduct problems**				
Father's involvement 9-months (ref.=low)					**Father's involvement 9-months**				
Medium	0.93	0.92	0.92	0.92	Continuous	0.99	0.99	0.99	0.99
	[0.088]	[0.087]	[0.087]	[0.087]		[0.004]	[0.004]+	[0.004]+	[0.004]+
High	0.81	0.82	0.80	0.80					
	[0.088]+	[0.087]*	[0.087]*	[0.087]*					
Observations	*7407*	*7407*	*7407*	*7407*	Observations	*7407*	*7407*	*7407*	*7407*
Attention problems					**Attention problems**				
Father's involvement 9-months (ref.=low)					**Father's involvement 9-months**				
Medium	0.84	0.84	0.84	0.83	Continuous	1.00	1.00	1.00	1.00
	[0.092]	[0.091]+	[0.091]+	[0.091]+		[0.005]	[0.005]	[0.005]	[0.005]
High	0.95	0.95	0.94	0.94					
	[0.113]	[0.111]	[0.112]	[0.112]					
Observations	*7013*	*7013*	*7013*	*7011*	Observations	*7013*	*7013*	*7013*	*7011*

Note. + p<.10;** p<.05; **p<.01; ***p<.001. Figures are odd ratios and the omitted category is fathers who did not take leave. Standard errors in brackets.

Table A3.5. Father's involvement at age 3, paternity leave and child development measures at age 3 - United Kingdom

	Father's involvement categorical				Father's involvement continuous				
	Model 1	Model 2	Model 3	Model 4		Model 1	Model 2	Model 3	Model 4
	Controls for child, father, mother and hh charact	Model 1 + child temperament	Model 2 + father present at delivery	Model 3 + mom's time		Controls for child, father, mother and hh charact	Model 1 + child temperament	Model 2 + father present at delivery	Model 3 + mom's time
British Ability Scales (BAS)					**British Ability Scales (BAS)**				
Father's involvement at age 3 (ref.=low)					**Father's involvement at age 3**				
Medium	0.31	0.31	0.31	0.14	Continuous	0.06	0.06	0.06	0.04
	[0.250]	[0.250]	[0.250]	[0.251]		[0.012]**	[0.015]**	[0.012]**	[0.013]**
High	1.37	1.37	1.36	1.02					
	[0.304]**	[0.303]**	[0.304]**	[0.308]**					
R2	*0.19*	*0.19*	*0.19*	*0.20*	*R2*	*0.19*	*0.19*	*0.19*	*0.20*
Observations	*7905*	*7905*	*7905*	*7905*	Observations	*7905*	*7905*	*7905*	*7905*
Bracken Scores					**Bracken Scores**				
Father's involvement at age 3 (ref.=low)					**Father's involvement at age 3**				
Medium	0.59	0.60	0.60	0.44	Continuous	0.07	0.07	0.07	0.05
	[0.252]*	[0.251]*	[0.251]*	[0.250]+		[0.013]**	[0.013]**	[0.013]**	[0.013]**
High	1.79	1.79	1.78	1.43					
	[0.315]**	[0.315]**	[0.315]**	[0.317]**					
R2	*0.20*	*0.21*	*0.21*	*0.22*	*R2*	*0.20*	*0.21*	*0.21*	*0.21*
Observations	*7196*	*7196*	*7196*	*7196*	Observations	*7196*	*7196*	*7196*	*7196*
Conduct problems					**Conduct problems**				
Father's involvement at age 3 (ref.=low)					**Father's involvement at age 3**				
Medium	0.92	0.92	0.92	0.96	Continuous	0.99	0.99	0.99	0.99
	[0.086]	[0.086]	[0.086]	[0.090]		[0.004]**	[0.004]**	[0.004]*	[0.004]+
High	0.70	0.71	0.71	0.75					
	[0.089]**	[0.089]**	[0.090]**	[0.097]*					
Observations	*7073*	*7073*	*7073*	*7073*	Observations	*7073*	*7073*	*7073*	*7073*
Attention problems					**Attention problems**				
Father's involvement at age 3 (ref.=low)					**Father's involvement at age 3**				
Medium	0.93	0.92	0.92	0.94	Continuous	1.00	1.00	1.00	1.00
	[0.099]	[0.098]	[0.098]	[0.101]		[0.005]	[0.005]	[0.005]	[0.005]
High	0.81	0.81	0.81	0.84					
	[0.110]	[0.111]	[0.111]	[0.117]					
Observations	*6679*	*6679*	*6679*	*6679*	Observations	*6679*	*6679*	*6679*	*6679*

Note. + p<.10;** p<.05; **p<.01; ***p<.001. Figures are odd ratios and the omitted category is fathers who did not take leave. Standard errors in brackets.

Table A3.6. Father's involvement at 9 months and child development measures at age 3 - United States

	Father's involvement categorical							Father's involvement continuous					
	Model 1		Model 2		Model 3			Model 1		Model 2		Model 3	
	Controls for child, father, mother and hh charact		Model 1 + child temperament		Model 2 + father present at delivery			Controls for child, father, mother and hh charact		Model 1 + child temperament		Model 2 + father present at delivery	
	coef	se	coef	se	coef	se		coef	se	coef	se	coef	se
Vocabulary growth at preschool							**Vocabulary growth at preschool**						
Father's involvement at 9-month (ref.=low)							**Father's involvement at 9-month**						
Medium	0.60	(0.45)	0.45	(0.47)	0.54	(0.45)	Continuous	0.06*	(0.03)	0.05*	(0.03)	0.05	(0.03)
Constant	101.83***	(1.84)	99.98***	(2.64)	101.37***	(2.18)	Constant						
Observations	3,850		3,850		3,850		Observations	3,850		3,850		3,850	
R-squared	0.11		0.12		0.11		R-squared	0.11		0.11		0.12	
Communication skills at preschool							**Communication skills at preschool**						
Father's involvement at 9-month (ref.=low)							**Father's involvement at 9-month**	0.09**	(0.03)	0.08**	(0.03)	0.07*	(0.03)
Medium	0.59	(0.50)	0.42	(0.51)	0.49	(0.50)	Continuous						
High	1.39**	(0.50)	1.17*	(0.51)	1.30*	(0.50)							
Observations	4050		4050		4050		Observations	4,050		4,050		4,050	
R-squared	0.10		0.11		0.11		R-squared	0.10		0.11		0.11	
Reading ability at preschool							**Reading ability at preschool**						
Father's involvement at 9-month (ref.=low)							**Father's involvement at 9-month**	0.06*	(0.02)	0.06*	(0.02)	0.05*	(0.02)
Medium	0.81+	(0.41)	0.71+	(0.42)	0.85*	(0.41)	Continuous						
High	0.84+	(0.44)	0.68	(0.45)	0.83+	(0.44)							
Observations	3,800		3,800		3,800		Observations	3,800		3,800		3,800	
R-squared	0.22		0.22		0.22		R-squared	0.22		0.22		0.22	
Conduct problems							**Conduct problems**						
Father's involvement at age 3 (ref.=low)							**Father's involvement at 9-month**	1.00	(0.01)	1.00	(0.01)	1.00	(0.01)
Medium	0.83	(0.14)	0.82	(0.13)	0.84	(0.13)	Continuous						
High	1.20	(0.22)	1.21	(0.23)	1.22	(0.23)							
Observations	3,100		3,100		3,100		Observations	3,100		3,100		3,100	
Attention problems							**Attention problems**						
Father's involvement at age 3 (ref.	0.85	(0.23)	0.87	(0.24)	0.88	(0.24)	**Father's involvement at 9-month**	1.01	(0.02)	1.01	(0.02)	1.01	(0.02)
Medium	1.34	(0.33)	1.44	(0.38)	1.43	(0.36)	Continuous						
High													
Observations	3,100		3,100		3,100		Observations	3,100		3,100		3,100	

Note. + p<.10;** p<.05; **p<.01; ***p<.001. Figures are odd ratios and the omitted category is fathers who did not take leave. Standard errors in parentheses.

Table A3.7. Father's involvement at 3 years and child development measures at age 3 - United States

	Father's involvement categorical							Father's involvement continuous						
	Model 1		Model 2		Model 3			Model 1		Model 2		Model 3		
	Controls for child, father, mother and hh charact		Model 1 + child temperament		Model 2 + father present at delivery			Controls for child, father, mother and hh charact		Model 1 + child temperament		Model 2 + father present at delivery		
	coef	se	coef	se	coef	se		coef	se	coef	se	coef	se	
Vocabulary growth at preschool							**Vocabulary growth at preschool**							
Father's involvement at 9-month (ref.=low)							**Father's involvement at 9-month**							
Medium	1.08+	(0.57)	1.13+	(0.57)	0.96+	(0.56)	Continuous	0.05	(0.03)	0.05	(0.04)	0.03	(0.04)	
High	0.72	(0.59)	0.73	(0.60)	0.55	(0.60)								
Observations	3,400		3,400		3,400		Observations	3,400		3,400		3,400		
R-squared	0.10		0.10		0.11		R-squared	0.10		0.11		0.10		
Communication skills at preschool							**Communication skills at preschool**							
Father's involvement at 9-month (ref.=low)							**Father's involvement at 9-month**	0.08*	(0.03)	0.07*	(0.03)	0.06+	(0.03)	
Medium	0.92+	(0.53)	1.03+	(0.53)	0.84	(0.51)	Continuous							
High	0.74	(0.56)	0.75	(0.56)	0.58	(0.54)								
Observations	3,600		3,600		3,600		Observations	3,600		3,600		3,600		
R-squared	0.10		0.11		0.11		R-squared	0.10		0.11		0.11		
Reading ability at preschool							**Reading ability at preschool**							
Father's involvement at 9-month (ref.=low)							**Father's involvement at 9-month**	0.00	(0.02)	0.00	(0.03)	-0.01	(0.03)	
Medium	0.14	(0.43)	0.19	(0.43)	0.07	(0.43)	Continuous							
High	-0.55	(0.44)	-0.55	(0.45)	-0.68	(0.45)								
Observations	3,400		3,400		3,400		Observations	3,400		3,400		3,400		
R-squared	0.20		0.21		0.21		R-squared	0.20		0.21		0.21		
Conduct problems							**Conduct problems**							
Father's involvement at age 3 (ref.=low)							**Father's involvement at 9-month**	1.00	(0.01)	1.00	(0.01)	1.00	(0.01)	
Medium	0.81	(0.15)	0.79	(0.15)	0.83	(0.16)	Continuous							
High	1.18	(0.22)	1.18	(0.22)	1.23	(0.23)								
Observations	2,750		2,750		2,750		Observations	2,750		2,750		2,750		
Attention problems							**Attention problems**							
Father's involvement at age 3 (ref.=low)							**Father's involvement at 9-month**	1.01	(0.02)	1.01	(0.02)	1.01	(0.02)	
Medium	0.67+	(0.16)	0.68	(0.16)	0.70	(0.17)	Continuous							
High	1.33	(0.29)	1.42	(0.32)	1.43	(0.32)								
Observations	2,750		2,750		2,750		Observations	2,750		2,750		2,750		

Note. + p<.10;** p<.05; **p<.01; ***p<.001. Figures are odd ratios and the omitted category is fathers who did not take leave. Standard errors in parentheses.

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