GENDER

Fathers' household and childcare involvement in New Zealand:

A snapshot, determinants and consequences

NEW ZEALAND WORK RESEARCH INSTITUTE

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DISCLAIMER

The views and interpretations in this report are those of the researchers and not the Ministry of Social Development.

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EXECUTIVE SUMMARY

This report focused on three main research aims using data from the Growing Up in New Zealand (GUiNZ) birth cohort:

1. To provide a snapshot of fathers' engagement during the early years of their children's lives.

2. To analyse the determinants of fathers' engagement.

3. To analyse potential consequences of different levels of fathers' engagement on children's outcomes.

The current international literature focuses on the difference between mothers' and fathers' involvement in domestic duties, the so-called 'gender care gap'. The gap has potentially significant consequences for gender equality, as it is likely an underlying driver of gender differences in labour force participation, career advancement, occupational choice and wage rates. Indeed, both internationally and in New Zealand (NZ), these gender gaps in labour market outcomes are higher among parents than non-parents, highlighting the potentially important contribution of the gender care gap to the 'motherhood penalty'. In the NZ context, evidence on this gap is sparse. While parental leave entitlements sit with the mother in NZ, and although she can transfer all or part of her entitlements to her spouse or de facto partner, uptake of paid parental leave (PPL) by fathers is less than 1%. This low uptake of PPL by fathers could indicate the presence of a substantial gender care gap in NZ. However, while many existing studies use paternity leave as a measure of fathers' involvement in childcare, GUiNZ also provides more direct measures of involvement. Indeed, comparing these more direct measures available in GUiNZ with the amount of paternity leave taken highlights that paternity leave is not a particularly good measure of how involved fathers are.

This also highlights that GUiNZ has the distinct advantage of including information that allows us to draw a very detailed picture of the involvement of NZ fathers in their children's upbringing in the first years after birth. The data allow us to measure fathers' involvement in a number of ways. This provides an advantage over many previous studies which often use the amount of paternity leave taken as a proxy for fathers' involvement. Using these data, we first compared indicators of direct involvement relative to the mothers in the sample. We get an overview of different levels and forms of engagement observed with respect to not only parental leave taking, but also direct involvement in day-to-day care, and activity indicators that proxy for quality of care (such as frequency of playing games and reading books). We then analyse the determinants of differing levels of paternal involvement. A novel contribution of this research is to delve into the psycho-social characteristics and personality traits as mechanisms behind NZ fathers' involvement with their children. In the final research aim of this study we undertook exploratory analysis of the association between paternal involvement in the child's early years and children's cognitive, physical and psychological development at later time points.

The key findings are as follows:

Aim 1

- Most fathers take less parental leave than they would like to. Before their child is born, more than half of employed fathers anticipate that they will take less leave than they would prefer to, and the amount they actually end up taking is even less than that anticipated. In addition, before their child is born, fathers overestimate how much they will be involved in their child's care.
- Fathers are distinctly less involved in their child's care than mothers, although their involvement does increase as the child grows from an infant to a toddler. They also spend less time engaged in quality-care activities (i.e. enriching activities such as playing games, reading books etc.).
- It is often assumed that fathers who take more paternity leave are more involved in childcare. However, we do not find evidence to support this. Fathers who take more leave are not more involved in childcare nor do they provide a higher quality of care.

Aim 2

- Unsurprisingly, fathers with greater work commitments (such as self-employment, full-time employment and overtime work) are less involved in the day-to-day care of their child.
- Similarly, fathers who earn much more than the child's mother are less likely to be involved in childcare. This probably reflects that it makes financial sense for these families to have a higher degree of specialisation, with the father focusing on paid work and the mother focusing on unpaid work, including childcare.
- However, a greater share of fathers (71%) than mothers (56%) perceive this distribution of childcare responsibilities to be fair.
- A range of factors is associated with the amount of time spent engaged in quality childcare activities, such as reading books and playing games. For example, fathers spend less time on these activities if the child has siblings, likely reflecting greater time constraints. Fathers who have more helpful families and good relationships with the child's mother spend more time on these activities.
- In terms of personality traits, conscientious fathers spend more time on their child's day-to-day care, while extraverted and open fathers are more likely to engage in high quality care activities.
- There are clear ethnic differences in the quantity and quality of fathers' involvement, although these should be interpreted with caution due to the small sample size for non-European fathers. Relative to NZ European fathers, Māori and Pasifika fathers are more involved in their child's care and Pasifika fathers are more likely to undertake high quality care activities.

Aim 3

- There is no clear association between the amount of paternal leave a father takes and their child's developmental outcomes.
- On the other hand, there is a positive relationship between fathers' involvement in day-to-day care and psychological outcomes.
- Higher quality of care is positively associated with language development, motor skills and most psychological outcomes. Thus, both the quantity and quality of care appear to be important for developmental outcomes.

1. INTRODUCTION

There is a growing national and international interest among academics and policymakers in paternal family engagement and division of domestic duties in households. Numerous international studies have focused on the difference between mothers' and fathers' involvement in domestic duties, the so-called 'gender care gap'. This gap is evident in nearly all developed countries and persists despite increases in female labour force participation. The gap has potentially significant consequences for gender equality, as it is likely an underlying driver of gender differences in labour force participation, career advancement, occupational choice and wage rates. Furthermore, it could have important consequences for children's development and wellbeing. The New Zealand (NZ) evidence on this front is sparse. This project will contribute to the limited knowledge in this space by delivering an empirical analysis of the involvement of fathers in their children's upbringing and other domestic duties in NZ.

This research uses a contemporary birth cohort dataset from the Growing Up in New Zealand (GUiNZ) survey, which tracks both child and household information from the antenatal period through the early childhood years. It is important to note that in the context of GUiNZ, 'fathers' are defined as being the second parental figure next to the mother, and includes stepfathers, co-mothers, foster and adoptive parents as well as other family members who play a father-figure role. However, the vast majority (97%) are the biological fathers. A clear advantage of this dataset is that in addition to collecting data about the child and mother, the father is also regularly surveyed– this is imperative for our research aims, which are three-fold and detailed next.

Aim 1 – To provide a snapshot of fathers' engagement during the early years of their children's lives.

This is done by using information on parental leave taking, self-reported day-to-day involvement, hours spent on housework as well as the frequency of child interaction activities such as playing and reading books. This overview is complemented by a comparison with mothers' engagement, as well as a comparison between actual paternal involvement and anticipated antenatal involvement.

Aim 2 – To analyse the determinants of fathers' engagement.

The second research aim analyses both the external and internal determinants of different levels of paternal involvement. This is done by estimating conditional associations between reported engagement and individual characteristics such as labour market status, education, relationship to the child and the mother, availability/use of external help, as well as inherent norms, values and traits such as parental identity and psychological traits.

Aim 3 – To analyse potential consequences of different levels of fathers' engagement on children's outcomes.

In the third research aim, we focus on a range of measures of cognitive and non-cognitive development of children surveyed in GUiNZ. While this research is exploratory in nature, it provides insights into potential impacts of varying levels of paternal engagement during the early years of a child's life.

The remainder of this paper is organised as follows: Section 2 provides a brief scan of the relevant international literature (particularly with respect to the first two research aims); Section 3 describes the current context in NZ; Section 4 describes the data and variables used in this analysis; Sections 5, 6 and 7 present the identification strategy and results for each research aim consecutively; Section 8 describes

the limitations and caveats that need to be acknowledged; while Section 9 provides an overall conclusion including key policy insights and direction for future research.

2. INTERNATIONAL LITERATURE REVIEW

As indicated earlier, there is growing interest in paternal family engagement and division of domestic duties in households. Much of the existing international literature focuses on the difference between mothers' and fathers' involvement in domestic duties, the so-called 'gender care gap'. This gap is evident in nearly all developed countries. Women, and specifically mothers, still perform a significantly higher share of unpaid domestic work, irrespective of their labour force status (Bianchi 2000; Cunningham 2007; Hook 2010; Samtleben 2019; Sanchez and Thomas 1997). This gap is a potentially important determinant of observed differences in the economic outcomes of men and women, including persistent differences in labour force participation, career advancement, occupational choice and wage rates (Blau and Kahn 2007; 2017; Bütikofer, Jensen, and Salvanes 2018; Bertrand, Goldin, and Katz 2010). Both internationally and in NZ, these gender gaps in labour market outcomes are higher among parents than non-parents, highlighting the role of the gender care gap in this observed 'motherhood penalty' (for example, Anderson, Binder, and Krause 2002; Budig and England 2001; Dixon 2000; Gangl and Ziefle 2009; Gough and Noonan 2013; Stats NZ 2017; Wilner 2016; Sin, Dasgupta, and Pacheco 2018).

2.1 Earmarked father's leave

Internationally, much of the debate and literature on the gender division of domestic duties has been dominated by consideration of 'daddy months' in national parental leave schemes such as in the Nordic countries (Sweden, Norway, Denmark, Iceland and Finland) as well as in Germany and Canada. 'Daddy months' can broadly be described as schemes where some paid parental leave is exclusively reserved for fathers. Such policies are aimed at increasing paternal leave and thereby fathers' involvement with their children in their early years. These policies are politically motivated by the idea that the active involvement of fathers benefits child development and promotes gender equality, in addition to the notion that a more equal household division of labour could boost fertility (Haas and Rostgaard 2011).

Empirical evidence on the effect of daddy months on fathers' leave taking and childcare involvement are very mixed. Most studies do find that the introduction of daddy months increases fathers' leave taking (Ekberg, Eriksson, and Friebel 2013; Patnaik 2019; Cools, Fiva, and Kirkebøen 2015; Bartel et al. 2018). Moreover, many studies find that the reforms boost fathers' involvement in childcare and promote a more even household division of labour (Tanaka and Waldfogel 2007; Tamm 2019; Kotsadam and Finseraas 2011) as well as mothers' relative income and labour force attachment (Druedahl, Ejrnæs, and Jørgensen 2019; Farré and González 2019). Additionally, in line with the early motivation of these policies, the increase of fathers' involvement due to the introduction of earmarked leave was also observed to have a positive effect on children's development as, for example, measured by school performance (Cools, Fiva, and Kirkebøen 2015; El Nokali, Bachman, and Votruba-Drzal 2010; Mangiavacchi, Piccoli, and Pieroni 2021).

On the other hand, the international literature is still skeptical about whether daddy months are the right way to promote a more equal division of childcare. This is driven by the observation in most countries that fathers' parental leave take-up is still largely restricted to the earmarked time and only very rarely exceeds one or two months (Eriksson 2005 for Sweden; Samtleben, Schaeper, and Wrohlich 2019 for Germany). Additionally, many studies also find that the gender care gap and the persistent traditional allocation of parent's labour supply remained largely unaffected by these reforms (Cools,

Fiva, and Kirkebøen 2015; Ekberg, Eriksson, and Friebel 2013). Although daddy months seemed to have contributed positively towards a more equal division of domestic duties as well as the household allocation of labour supply by reducing the financial constraints of fathers who are willing to take leave, other factors and drivers of paternal and maternal involvement still seem to overshadow the parental decision making.

Additionally, the parental leave literature largely suffers from severe selection issues due to the low take-up rates of parental leave by fathers as well as the selectivity of take-up, especially with respect to education and workplace characteristics. This is shown in Geisler and Kreyenfeld (2019), where highly educated fathers as well as fathers with permanent contracts and fathers working in the public sector are those taking parental leave.

2.2 Drivers of paternal involvement and the gender care gap

The existing knowledge on drivers of the gender care gap can be categorised into three main groups: 1) financial and economic considerations, 2) social norms and gender identity, and 3) biological reasons.

2.2.1 Financial and economic considerations

The economic literature has for a long time concentrated on economic considerations as the main driver of the division of labour within households. This stream of research is largely based on the theoretical framework developed by Gary Becker's model of intra-household specialisation (Becker 1981). Becker's theory is that household members will always specialise according to their comparative advantages determined by relative human capital levels. The relative wage income should thus determine the choice about leave taking, predicting that the secondary earner will take over the larger share of domestic duties. International statistics do show that large parts of household decision making can potentially still be explained using this theory, some 40 years after Becker's seminal work (Heim 2007; Juhn and Murphy 1997; Blau and Kahn 2017; 2007). As has been prominently shown by Bertrand et al. (2015) and is discussed in detail in section 3.2, female breadwinning remains a rather rare phenomenon with married women having substantially lower employment rates, higher part-time employment rates and lower average earnings than their partners.

Due to low replacement rates of parental leave payments as well as low maximum payment thresholds, high-income fathers in particular face strong financial disincentives when considering taking parental leave (Sigurdardottir and Garðarsdóttir 2018). This is also supported by the research of Hennecke and Pape (2021), who find that after losing their jobs fathers increase their time investment with children and housework, and the outsourcing of tasks (e.g. external childcare facilities) decreases. Nevertheless, the authors also found that the increased time investment is only observed for the time of unemployment and time spent with children or housework decreases below the original level after re-employment.

There is also an important role played by workplace characteristics. This is supported by findings from economic, sociological and management literature about the importance of the role of company policies, workplace culture and workplace support among employers and coworkers (Birkett and Forbes 2019; Samtleben et al. 2019; Brandth and Kvande 2019; Bygren and Duvander 2006; T. D. Allen 2012).

2.2.2 Social norms and gender identity

Existing research on workplace support among employers and coworkers shows that it is often inextricably linked with the prevailing social norms within a firm. Researchers such as Dahl, Løken and Mogstad (2014) have found very strong peer effects in the take-up rates of parental leave among male coworkers in addition to those observed in the family network.

The dominance of traditional gender role norms has often been named the most important cause of the gender care gap in the sociological literature in recent years. An important seminal work in this respect was the study by Bertrand, Kamenica and Pan (2015) who find that women who out-earn their partners are more likely to spend more time on household chores. The authors take this as evidence in line with the identity concepts by Akerlof and Kranton (2000) where deviating from the behavioural prescription for the category you belong to (whether men or women) is costly.

2.2.3 Biological and psychological factors

One of the biggest challenges of empirical research which attempts to identify the role of social norms and gender identity to understand gender gaps in the division of childcare and housework is the difficulty of separating these social preferences from individual preferences. The gender care gap could also be driven by individual preferences if mothers have different preferences for childcare responsibilities than fathers purely because mothers are the birthing parent and/or because of the biological sex differences between them.

An often-given explanation from opponents to the social identity theory is that the hormone levels of mothers lead to them having a stronger attachment to their newborn babies (Barrett and Fleming 2011). The so-called phenomenon of maternal gatekeeping leads to mothers wanting to take over the major part of the childcare responsibilities and having a hard time granting responsibilities to their partners (Allen and Hawkins 1999). Furthermore, the biological aspects around giving birth, such as puerperium and breastfeeding, are factors which cannot be transferred between birthing and non-birthing parents, making it harder for fathers to bond with their children (Brady et al. 2017). The literature has begun to delve further into this space by comparing adoptive and biological parents, which enables them to compare birthing and non-birthing mothers with respect to their parental leave take-up (Moberg and Van der Vleuten 2021).

3. GENDER CARE GAP IN THE NZ CONTEXT

This section outlines the context in NZ and how this compares with the international situation. It first discusses parental leave policies and briefly describes additional relevant policies with respect to childcare, welfare and tax. This provides background for the subsequent discussion on labour market outcomes and time spent in paid versus unpaid work of men and women in NZ, and where information is available, of mothers and fathers.

3.1 Policy background in NZ

3.1.1 Parental leave in NZ

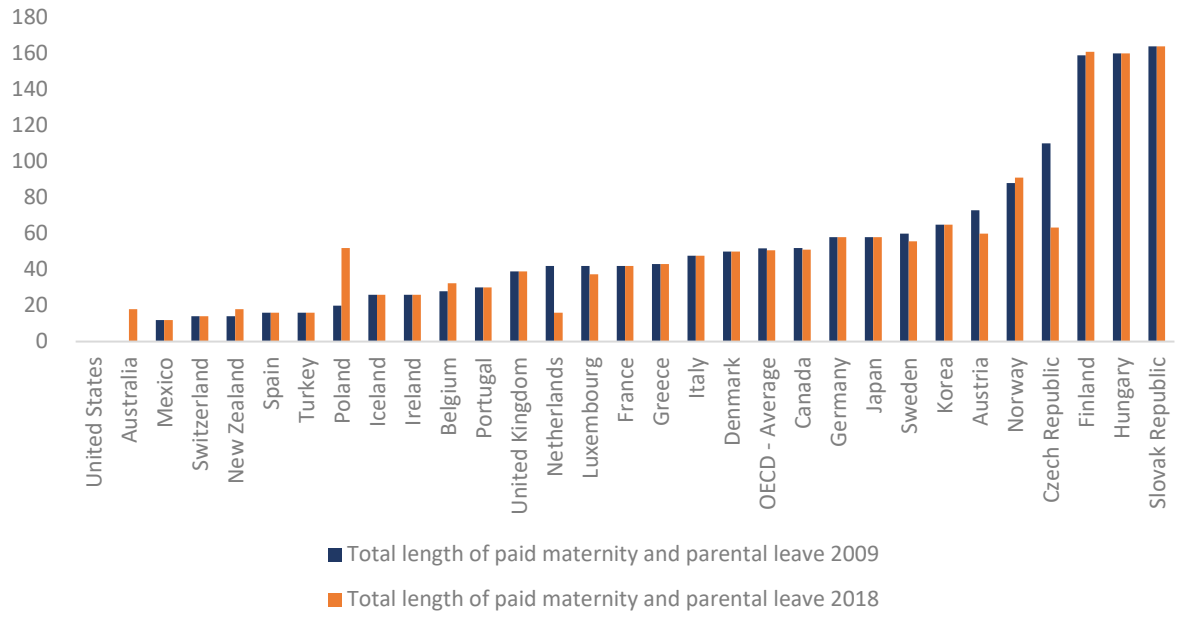
The provision of unpaid and government paid parental leave (PPL) is set out in the Parental Leave and Employment Protection Act 1987 and its subsequent amendments. At the time GUiNZ children were born in 2009-2010, eligible mothers were entitled to up to 12 months of unpaid job-protection leave and 14 weeks of government-funded PPL. Mothers must have been employed with the same employer or self-employed for the preceding six or 12 months and have worked for an average of 10 hours or more a week over this period to qualify for PPL, and 12 months to qualify for up to 12 months of unpaid leave. Since then, the length of PPL has been gradually extended, with the most recent increase to 26 weeks effective from July 2020. In addition, the eligibility criteria have been reduced over time. For example, in 2016, the requirement for employment to have been with the same employer was removed to extend coverage to mothers with less stable employment histories. The payment amount for PPL has not changed in relative terms since paid parental leave was introduced in 2002. It is set at the maximum of the mother's pre-parental leave pay or an amount approximately equivalent to the full-time minimum wage ($429.74 per week in July 2009).

While parental leave entitlements sit with the mother,[2] she can transfer all or part of her entitlements to her spouse or de facto partner. However, this occurs very infrequently, with the uptake of PPL by fathers being less than 1% (Morrissey 2020). Under the Act, NZ fathers who have been employed continuously for 12 months are entitled to two weeks' unpaid partner leave upon the birth of a child. However, it appears that uptake of this is also very low, with only about 4% of fathers taking this unpaid leave (Reilly and Morrissey 2017).

OECD data shows that in 2009, around the time the GUiNZ children were born, the length of NZ's PPL was one of the shortest in the OECD. By 2018, the latest year of data available, the situation has changed little with respect to NZ's ranking in this statistic. Not shown in Figure 1 is the fact that NZ does not have a fathers' quota for PPL. While this situation was not unusual amongst OECD countries in 2009, an increasing number of countries have introduced earmarked paternal PPL quotas and by 2018, NZ was one of just six OECD countries with PPL that does not have dedicated paid paternal leave.

[2] More gender-neutral language was adopted as part of the 2016 amendment to this Act, by replacing the term 'mother' with 'primary caregiver'. However, the entitlement to parental leave still sits with the mother since the Act defines the primary caregiver as "a female (the biological mother)", who is entitled to transfer her entitlement to her spouse or de facto partner, who then becomes the primary caregiver for the purpose of the Act.

Figure 1 - Number of weeks of paid maternity and parental leave in OECD countries, 2009 and 2018



Source: Own calculations based on data from OECD (2021).

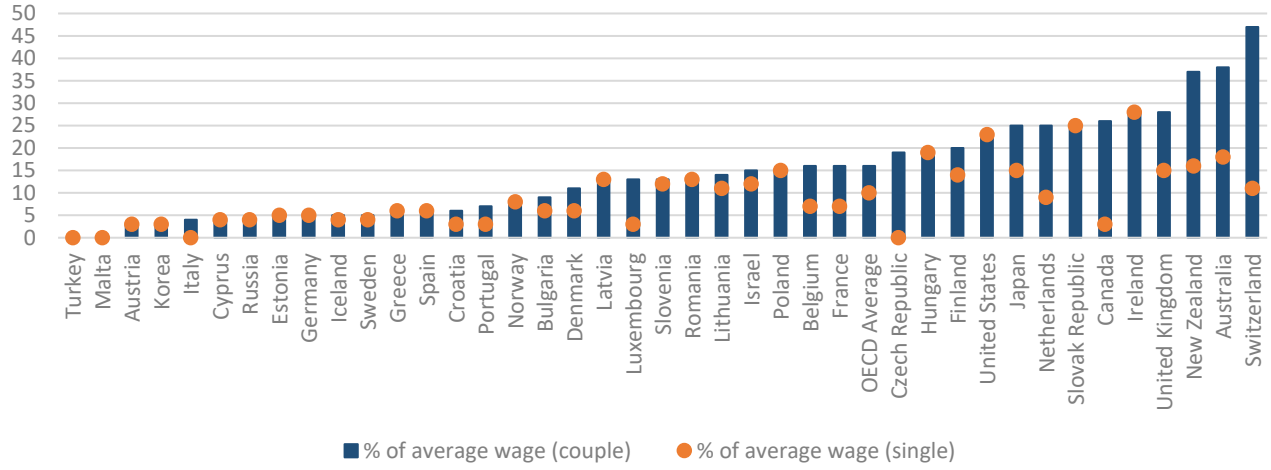
The payment level is also low in NZ. Data from the OECD Family Database (2021) show that, on average across OECD economies, maternity leave benefits replace approximately 77% of previous earnings for a mother with average full-time earnings; whereas NZ replaces less than 50% of gross earnings. Note that this is similar to several other anglophone countries – such as Australia, Canada, Ireland and the United Kingdom. Furthermore, NZ also does not differentiate between PPL (home care leave) available to the mother and maternity leave (pregnancy leave), i.e. leave covering the weeks immediately before and after birth. The latter has higher payment rates (up to 100% in countries like Germany, Spain and many South American countries) and is often covered by the health insurance system (OECD Family Database 2021).

3.1.2 Other policy influences: Childcare, welfare and tax

While parental leave generally and dedicated paternal leave specifically are important policy considerations, it is only one of a set of factors that could influence how parents choose to divide their time between work within and outside the home. Indeed, there is a wide range of policy settings that can influence fathers' involvement, not to mention a wider set of non-policy factors such as cultural norms.

One policy setting that is particularly relevant in the NZ context is childcare costs. Lack of affordable, quality childcare could result in more household specialisation and mean that more mothers take on the primary caregiving role while more fathers specialise in paid employment and have less involvement in child rearing. NZ has one of the highest out-of-pocket childcare costs in the OECD (Figure 2) and the high effective marginal tax rate of returning to work that high childcare costs imply, may reinforce traditional gender specialisation within households.

Figure 2 - Net childcare costs



Source: Own calculations based on 2018 data from OECD (2021).

Welfare and tax settings also influence household division of labour and choices about whether to work inside or outside the home. It is beyond the scope of this report to discuss these in any detail. However, one example of this is evidence that changes to in-work incentives and financial support for families with dependent children implemented between 2004 and 2007 increased the labour force participation and hours of solo parents but reduced participation and hours of married men and women, with particularly large reductions among married women with children (Mercante and Mok 2014).

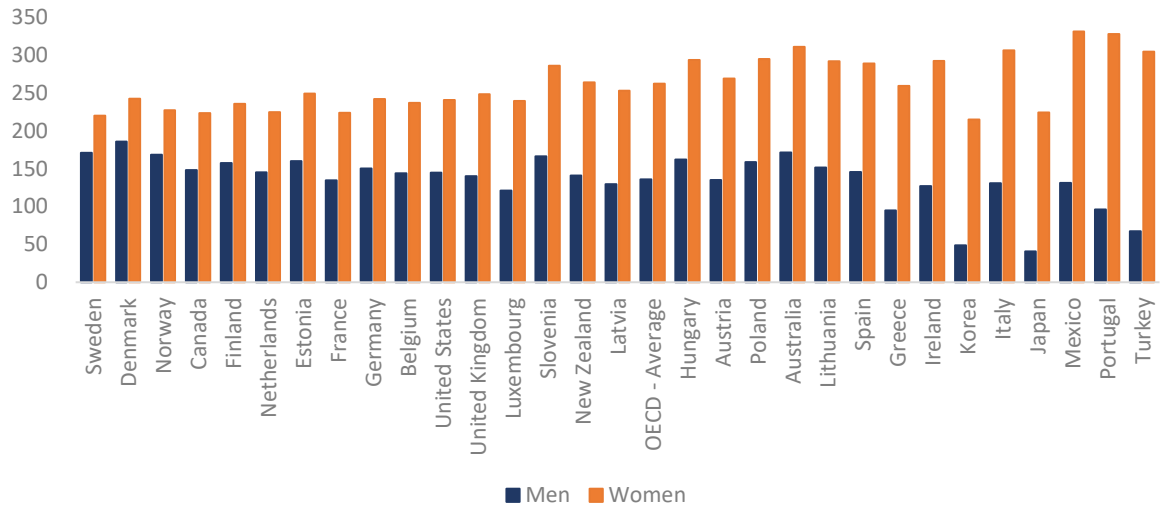
3.2 NZ gender care gap in the international context

As mentioned, few NZ fathers use their statutory entitlement of two weeks' unpaid leave, and it is rare that part or all of their partner's PPL entitlement is transferred to them. On average, NZ mothers take about the same length of time off work as the job-protection period of one year, which is much longer than the PPL period. Using GUiNZ data, Noy & Sin (2021) find that mothers take 53 weeks of leave on average. Mothers who were working antenatally would prefer to take 69 weeks of parental leave, with 70% taking less leave than they would have liked.

Among other factors, differences in parenting responsibilities may be due to, as well as potentially contribute to, gender differences in employment and earnings. The employment rate in 2020 among NZ men was 72.8% versus 62.8% for women. Additionally, and similar to other developed countries, gender gaps in labour market outcomes are higher among parents than non-parents (Dixon 2000; Stats NZ 2017). Recent estimates of the so-called 'motherhood penalty' for NZ in Sin et al. (2018) confirms that parenthood increases employment gaps between men and women. This reflects that women across the income distribution are less likely to be employed after becoming parents, although women with higher antenatal earnings return to employment more quickly. In contrast, men do not decrease their employment after parenthood regardless of prior earnings. Mothers also reduce their hours worked, with almost all of the greater propensity to work part-time among women being driven by mothers being more likely to work part-time than fathers. Moreover, Sin et al. (2018) find that the average woman earns 4.4% lower hourly wages as a parent than if she hadn't had children, whereas there is no significant effect on fathers' pay.

These gender differences are also apparent in the time spent in unpaid work by men and women. NZ is in the mid-range among OECD countries, with a difference between men and women of 123 minutes per day, which is close to the OECD average (126.6 minutes/day) (Figure 3). Scandinavian countries and Canada are among the countries with the lowest differences (between 50 and 75 minutes/day) and countries like Mexico, Portugal and Turkey have the highest gaps (up to 238 minutes/day).

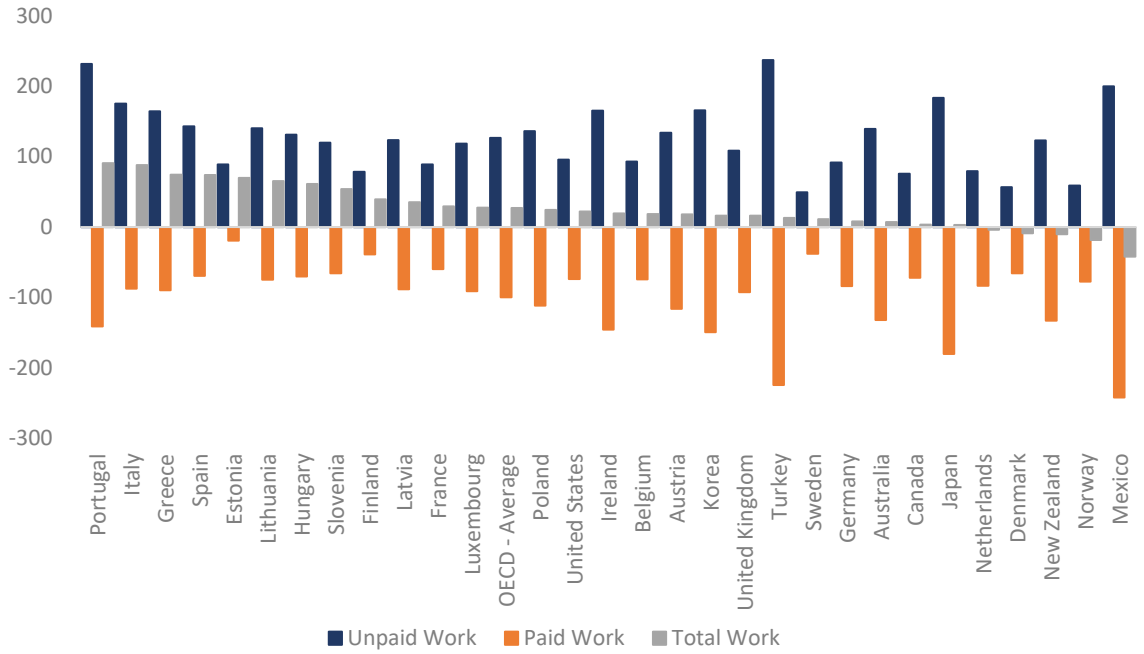
Figure 3 - Time spent on unpaid work (minutes per day) in OECD countries, by gender



Source: Own presentation based on data from OECD (2021).

Figure 4 depicts the gender difference in unpaid work (blue bars), paid work (orange bars), and the cumulative difference in total minutes per day spent in both paid and unpaid work (grey bars). NZ is among only five OECD countries with a negative gender difference in total work. Kiwi men, on average, spend 10 more minutes per day engaged in any form of work (paid or unpaid) than women.

Figure 4 - Gender differences in paid, unpaid and total work – minutes per day



Source: Own calculations and presentation based on data from OECD (2021).

In NZ, this negative gender work gap is driven by a relatively large difference in the time spent in paid work (133 minutes/day), which is higher in only six other OECD countries, including those with more traditional gender norms such as Turkey, Mexico and Portugal. This pattern potentially signals an interesting dynamic behind the observed gender care gap in NZ, in which the unequal labour market background (opportunities and constraints) of men and women plays a more important role in explaining the unequal distribution of domestic duties than underlying intra-household gender norms which have been observed to be the main driver in many other OECD countries. This is potentially driven, at least in part, by policy settings such as NZ's high childcare costs (discussed above).

This suggests that NZ has some unique characteristics that may limit the applicability of overseas research in this area. Despite this, NZ literature on fathers' involvement in domestic duties is scant. One relevant study from the Families Commission, based on a representative survey of fathers, provides a general overview of the involvement of fathers as well as paternalistic styles and role models (Luketina, Davidson, and Palmer 2009). In line with the OECD data, it finds that work commitments and time pressure are the most common barrier to fathers' involvement in their children's care among Kiwi fathers. Callister (2005) also argues that there is a 'double burden' of paid and unpaid work carried by fathers in NZ.

4. DATA

4.1 Growing Up in New Zealand

The data used for our analysis is obtained from the Growing Up in NZ survey (GUiNZ).[3] This is NZ's largest contemporary longitudinal study of child development, funded by the Ministry of Social Development and conducted by a team at the University of Auckland (Morton et al. 2010; 2013). It is a longitudinal survey of more than 6,000 children born in the Auckland, Waikato, and Counties-Manukau regions in 2009-2010 and their families. Pregnant women were recruited based on their expected delivery date (April 2009 – April 2010) such that they are roughly representative of all families in the NZ population at that time in terms of ethnic diversity and socio-economic status (Morton et al. 2010; 2013).[4]

The survey follows the children and their families from the time of pregnancy onwards. This has resulted in interviews at a total of 14 points in time in the past 11 years with 8 major data collection waves (DCW's): antenatal (DCW0), 9 months (DCW1), 2 years (DCW2), 31-months (DCW3), 45-months (DCW4), 54-months (DCW5), 6 years (DCW6) and 8 years (DCW8) (Morton et al. 2020). A key focus of the survey is always the child. For instance, the researchers follow the child when the household attachment changes. In most cases the mother is the primary respondent especially in the first years, in which the children were not able to respond to the interviewers' questions themselves. Mothers thus answer their own questionnaire as well as in DCW2, a proxy questionnaire for their child. In data collection waves 0, 1 and 2, the partner of the mother answers an additional questionnaire. According to Growing Up in New Zealand (2017), 97% of these partners are the biological fathers of the child and 93% live in the same household. It nevertheless has to be noted that these partners, who we will label 'fathers' in the following, include co-mothers (due to a lack of observed gender for the mothers' partners), stepfathers, foster and adoptive parents as well as other family members who have a father role. In line with Growing Up in New Zealand (2017), the focus is less on the gender aspect of the paternal role and more on the availability of a family member who takes on a fathering role. We define 'fathers' as being the second parental figure in the household next to the mother. The possibility of linking fathers to their children is one of the distinct features of GUiNZ. Longitudinal studies of children have typically not included fathers in the past (Pryor et al, 2014).

The questionnaire answered by the fathers was equivalent to the mothers' questionnaire, in which they give personal information about themselves, their relationship with the child and the mother of the child as well as answer questions on the child. Thus, for much information on the children in the early DCWs, two versions (one from the mother and one from the father) are available. If not indicated otherwise, we will always draw on the child's information given by the mother in order to 1) avoid missing information for families in which no partner is observed and 2) reduce endogeneity of the information with respect to the father's involvement.

It is important to acknowledge that the GUiNZ survey, and therefore our analysis, uses the nuclear family as the unit of analysis. However, other family structures and modes of child-rearing are

[3] GUiNZ questionnaires and data dictionaries can be found on survey website https://www.growingup.co.nz/available-data-2 (accessed 1 April 2022).

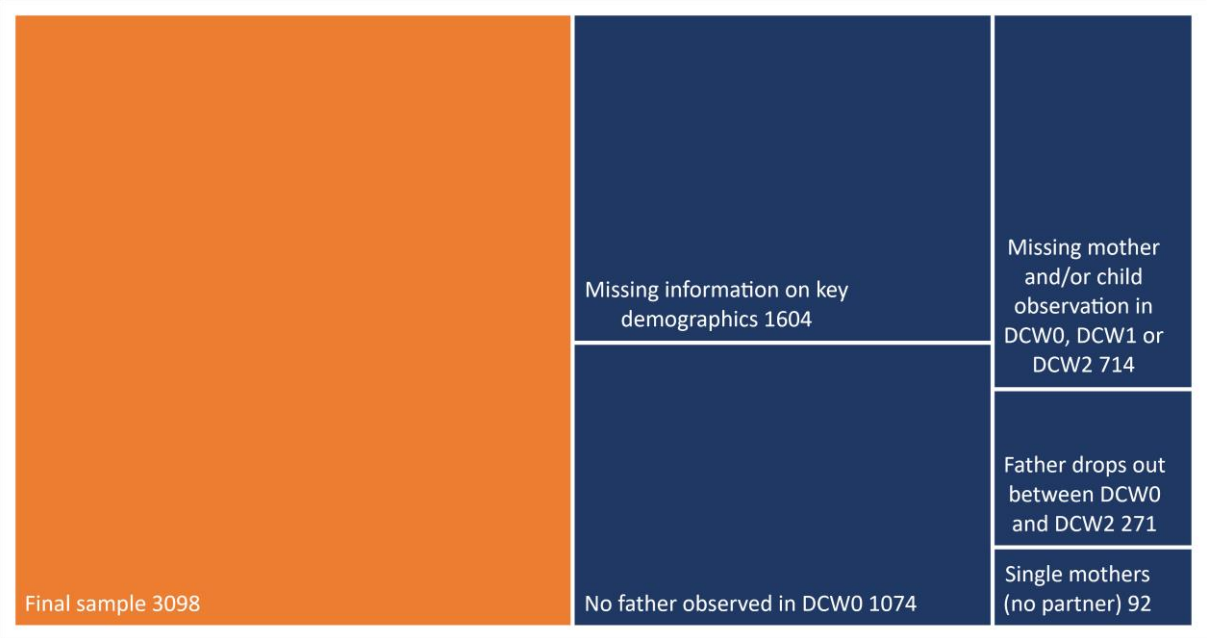
[4] While Asian and Pasifika families are slightly oversampled in the survey, Māori mothers are undersampled overall (Morton et al. 2013).

important, particularly in non-western countries and cultures. Within NZ, for example, communal and extended family approaches are more commonplace among non-European families, including Māori, Pasifika and Asian communities. While it is beyond the scope of this report to examine these approaches, it would be interesting for future research to explore the contribution of these and how they could be supported in NZ.

4.2 Sample construction

We construct our estimation sample in a way which ensures the use of a homogeneous sample throughout the later analysis steps. The stepwise reduction of the sample is documented in Figure 5.

Figure 5 - Sample restriction steps (6,853 children)



Source: GUiNZ 2020, own calculations and illustrations.

We start with the full GUiNZ dataset of 6,853 children included in the database. First, we drop 714 children (and their mothers) from the sample who were not observed in at least one of the first three observation waves (DCW0, DCW1 or DCW2). Secondly, we drop all families with missing information on key demographics (including the father's demographics in the cases where fathers are observed), which reduces the sample by around a quarter (1,604 observations). Thirdly, we drop 92 single mothers as defined by their partnership status, i.e. mothers who indicate that they do not have a partner.[5]

For the remaining 4,443 children in the full sample, roughly three-quarters (3,369) of the partners in the same household agreed to participate in GUiNZ and were thus surveyed in the antenatal interview. In a final data-cleaning step, we drop 271 children whose fathers do not participate in GUiNZ at a later interview (either DCW1 or DCW2), leaving us with a final sample of 3,098 children with the same father-

[5] See Pryor et al. (2014) for a detailed overview of the characteristics of the families in the unrestricted full GUiNZ sample. The share of single mothers in our sample is already reduced since we have already dropped observations with missing information. Pryor et al. (2014) report that "just over 5% of pregnant women stated that they were not currently in any relationship'' (p.7).

figure in their first two years of life who is permanently present in the GUiNZ data.[6] The resulting sample is utilised for research aims 1 and 2.[7]

4.3 Descriptive statistics

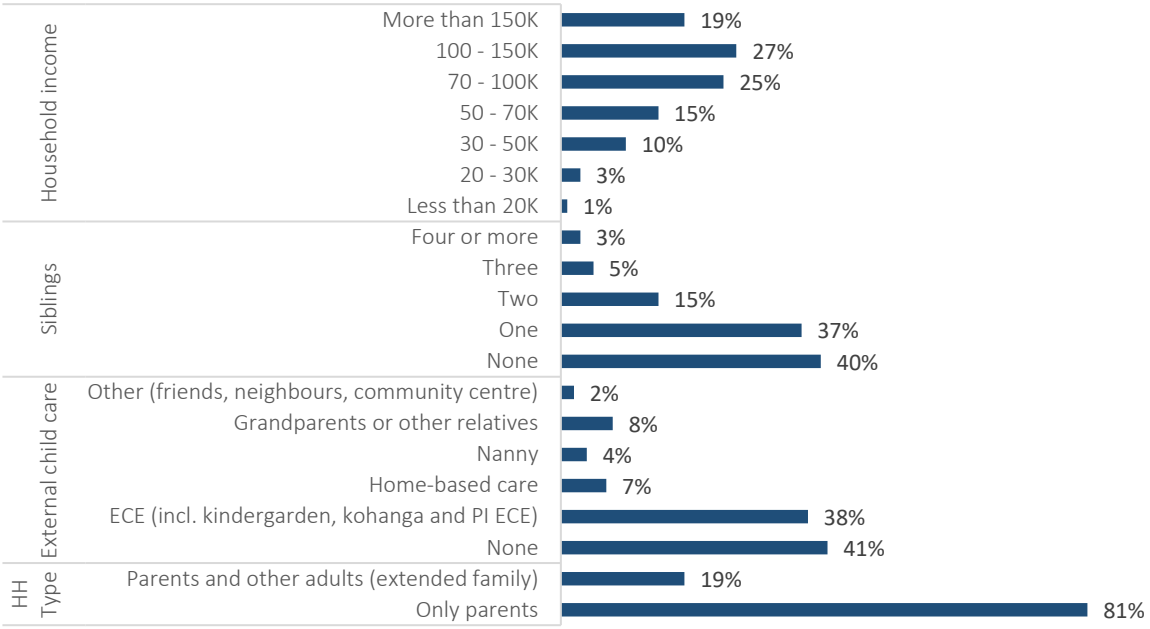
4.3.1 Comparison of fathers who did and did not participate in GUiNZ

We first compare a range of characteristics of families in which the partners did versus did not participate in GUiNZ in the first three DCWs. These descriptions, as well as the t-test results of whether means between the samples are significantly different from each other, are provided in Table A.1 in the Appendix. We find that lower household income and unplanned pregnancy are more prominent in households where the father did not participate in GUiNZ. Furthermore, there is overrepresentation of younger mothers and mothers who are not employed in this group. These differences result in household incomes and mother's education being higher in the final sample (as compared to the full sample of families) due to the need to drop observations where the father did not participate in GUiNZ.

4.3.2 Final sample descriptive statistics

Figures 5 and 6 give an overview of some key statistics of the households, mothers, and fathers in our final sample. The full set of descriptive statistics can be found in Table A.2 (for mothers and households) and Table A. 3 (for fathers) in the Appendix.

Figure 6 - Summary statistics of households (final sample, N=3,098)



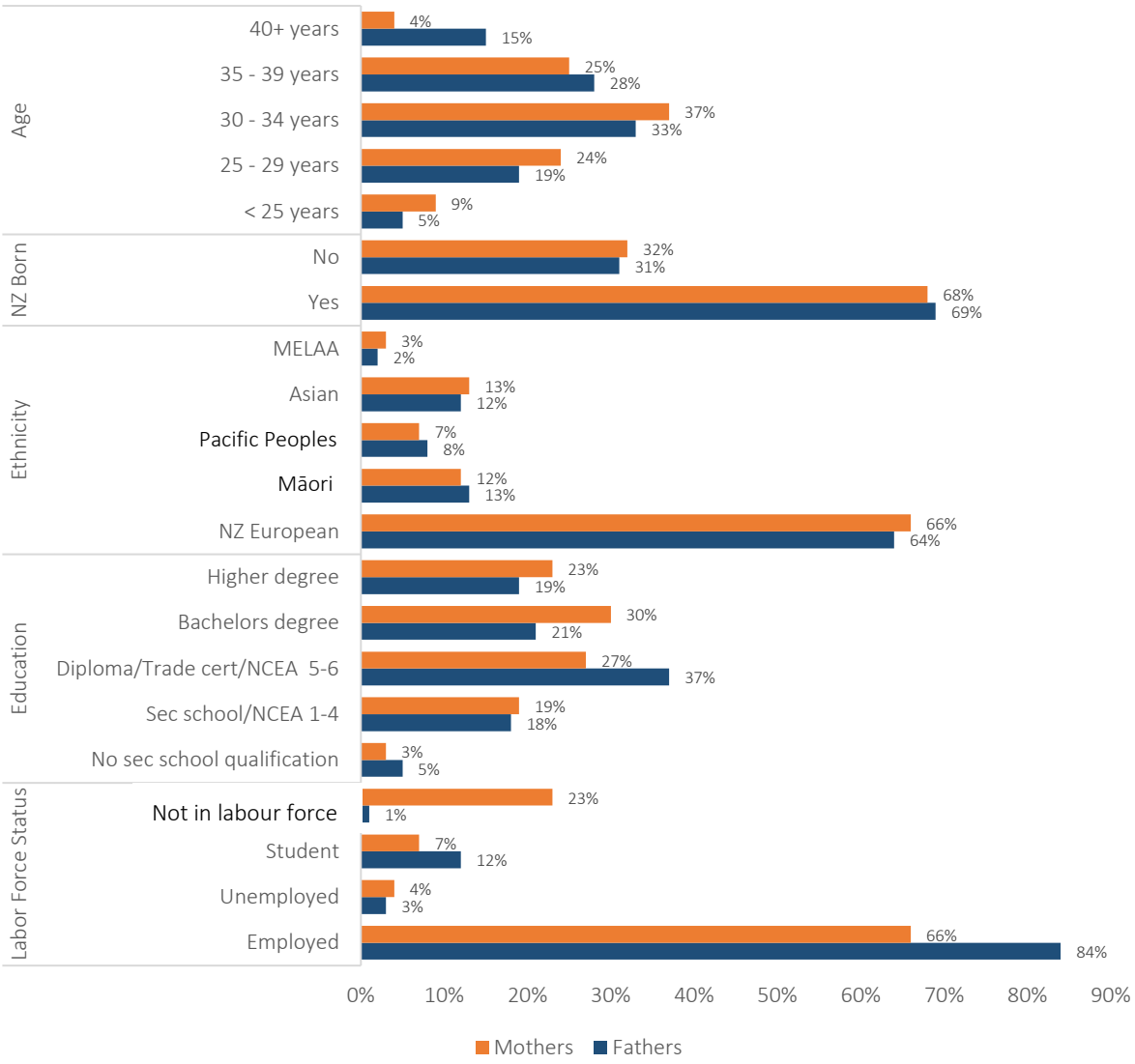
Source: GUiNZ DCW0 (Household income, HH type) and DCW2 (external childcare) as well as the 16-month interview (siblings), own calculations.

[6] Approximately 42% of fathers who drop out between the antenatal phase and the 2-year interview do so because of a separation with the mother (i.e. the mother indicates not having a partner in DCW2).

[7] As research aim 3 includes the child's outcomes at a later stage (most at 8 years), we reduce the sample further for this final aim (details provided later).

Figure 6 shows that 40% of the children in our sample have no other siblings, 37% have one and 23% have more than one older sibling at the time of birth. In 81% of the households the parents live alone while 19% of households consist of the parents and other adult persons such as the extended family. At the age of two, 41% of the GUiNZ children are not in any external care while 38% are in a type of early childhood education (ECE) facility and another 7% are in a home-based care facility. The other 14% are cared for in the private space, for example by grandparents, nannies or other relatives and friends. As has been discussed above, the average household income of the families in our sample is relatively high with 71% of families having NZ$70,000 or more per year and only 4% have less than NZ$30,000.

Figure 7 - Summary statistics of mothers and fathers (final sample, N=3,098)



Source: GUiNZ DCW0, own calculations and illustrations.

Figure 7 indicates that the majority of both mothers and fathers are in the prime child-bearing age with 61% of mothers and 52% of fathers aged between 25 and 34 years. More than two-thirds of parents

were born in NZ (69% of fathers and 68% of mothers). In terms of their prioritised ethnicity,[8] 65% (66%) of fathers (mothers) are NZ European, 13% (12%) Māori, 8% (7%) Pacific Peoples, 11% (13%) Asian and another 2% (3%) MELAA or any other ethnicity. Figure 7 also reveals that mothers are on average better educated than fathers in the sample, with 53% of mothers but only 40% of fathers having a bachelors or higher degree. We also find that 84% of fathers are employed during the antenatal interview while only 66% of mothers are, and the share of mothers who are not in the labor force is much higher (23% as opposed to only 1% for fathers).

[8] The prioritised ethnicity assigns one ethnicity to a person if multiple ethnicities are reported by prioritising Māori, Pacific Peoples, Asian, MELAA/ Others and NZ European in this order. MELAA is Middle Eastern, Latin American or African.

5. RESEARCH AIM 1

The first research aim is to provide a snapshot of fathers' engagement during the early years of their children's lives. This includes a comparison between fathers' actual engagement and anticipated engagement prior to birth, relative to mothers' engagement. We will do so by looking into self-reported childcare and housework involvement (section 5.1), quality of care as measured by child interaction activities such as playing and reading books (section 5.2) and parental leave taking (section 5.3).

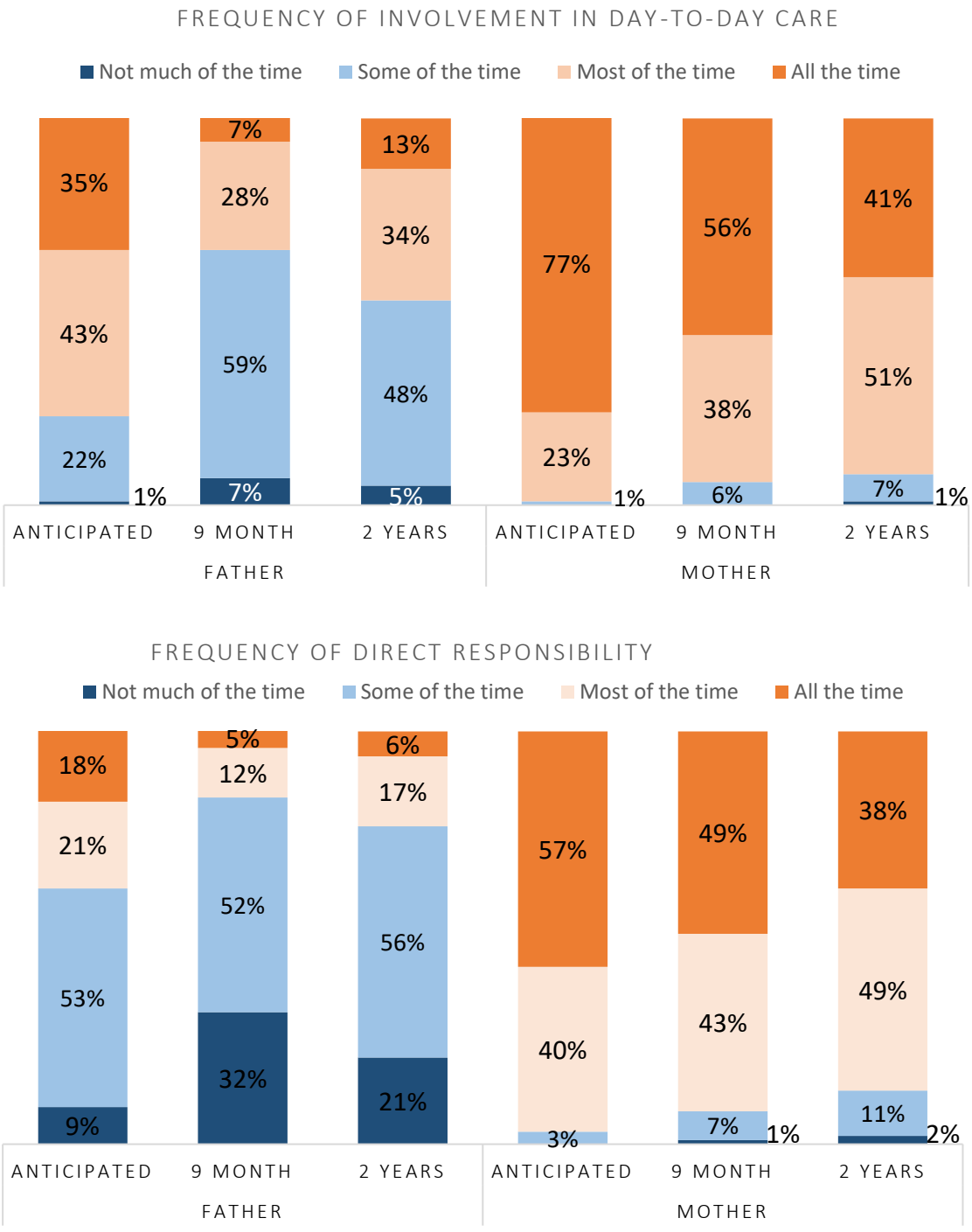
5.1 Self-reported childcare and housework involvement

Figure 8 gives an overview of the available measures of self-reported direct involvement in childcare. Our two main outcome variables are the self-reported frequency of involvement (upper graph) in the child's day-to-day care as well as the self-reported frequency of direct responsibility for the child (lower graph). Both are measured on a scale from 1 (Not much of the time) to 4 (All the time). For both outcomes, information on both anticipated and actual involvement (at 9 months and 2 years) are reported for both fathers and mothers.

The figure shows that fathers are distinctly less involved than mothers, with more fathers being involved 'some of the time' rather than 'most of the time' during the first two years of the child's life. The differences are even stronger if direct responsibility for the child is considered, with only 5% (6%) of fathers reporting to be directly responsible for the child all the time in the 9-month (2-year) interview. As opposed to this, while 32% (21%) of fathers report to be directly responsible not much of the time for their 9 months (2 year) old child, hardly any mothers (1% and 2% respectively) report no direct responsibility.

Figure 8 also shows that fathers strongly overestimate their anticipated involvement in day-to-day care and direct responsibility in childcare with respect to (at least) the first 2 years after birth. In the antenatal interview 78% of fathers anticipated they would be involved in the day-to-day care of their child at least most of the time while only 35% (47%) actually did at 9 months (2 years). Interestingly, mothers also overestimate their anticipated involvement in day-to-day care and direct responsibility, although the degree of overestimation among mothers is much less. Given that both parents overestimate their involvement, it is possible that part of this finding is due to the wording of the questions. Mothers and fathers were asked about "the plans you and your partner may have about being involved with your baby after they are born". No specific time period after birth was given. Parents may have interpreted this to mean immediately after the child is born when they are a newborn, rather than when the child is 9-months or 2-years old, which may, at least partly, explain this overestimation.

Figure 8 - Descriptive statistics of childcare involvement



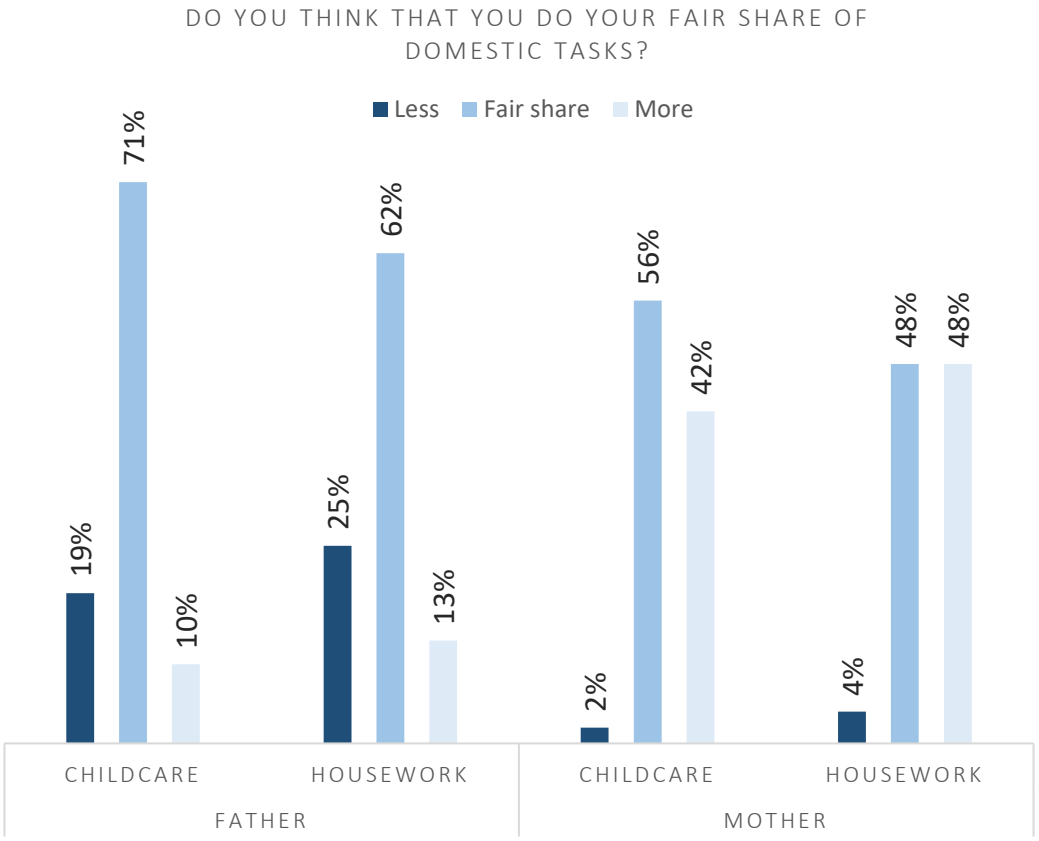
Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Furthermore, and not shown in the figure, we find that 61% of fathers report a higher involvement category in DCW0 (the antenatal interview), when anticipating involvement, relative to the actual involvement reported in DCW1 (at 9 months). The comparable figure for mothers is 33%. Nevertheless, as can be seen in Figure 8, fathers' involvement and direct responsibility increases from DCW1 to DCW2, indicating higher involvement of fathers with children over time in the first two years.

Gender differences are also evident, although not shown in the figure, for hours spent on domestic housework. The weekly hours spent on domestic housework is 10.24 hours for men and 17.49 hours for women in DCW2.

Based on these strong differences in childcare involvement between mothers and fathers, we take a closer look at the satisfaction with these shares. Figure 9 reports the responses to a question in DCW2 on whether the father (mother) perceives the current division of care and housework as fair. Although fathers are observed to be involved less, 71% (62%) of fathers still perceive this distribution of responsibilities in childcare (housework) as fair as opposed to only 56% (48%) of women. Not shown in Figure 9, only 53% (49%) of partners agree on this with only 42% (32%) agreeing on a fair distribution of tasks while 11% (16%) agree that the mother does more than her fair share. Thus, it appears that fathers not only take on fewer domestic tasks, they are generally more satisfied with this arrangement than mothers are.

Figure 9 - Fair shares of childcare and housework



Source: GUiNZ DCW2, own calculations and illustrations.

5.2 Quality of care

Table 1 provides an overview of the available measures for activities undertaken by the parent with the child. These include playing games, playing with toys, telling stories / singing songs and reading books. Fathers (and mothers) report the frequency in which they engage in these activities. Responses are categorised into 'seldom' or 'never', 'at least once a week', 'once a day' and 'several times a day'. We expect that higher frequency of these activities proxy as a higher 'quality of care'. While the activities

playing games and playing with toys are only reported in DCW1, telling stories / singing songs as well as reading books are reported in DCW1 and DCW2, allowing for a dynamic perspective.

Table 1 - Descriptive statistics of quality of care

	Father		Mother	
	DCW1	DCW2	DCW1	DCW2
Playing games				
Seldom or Never	0.01		0.01	
At least once a week	0.19		0.12	
Once a day	0.26		0.19	
Several times a day	0.54		0.68	
Playing with toys				
Seldom or Never	0.01		0.00	
At least once a week	0.16		0.04	
Once a day	0.24		0.11	
Several times a day	0.58		0.84	
Telling stories / singing songs				
Seldom or Never	0.14	0.38	0.03	0.34
At least once a week	0.36	0.50	0.15	0.46
Once a day	0.25	0.10	0.28	0.14
Several times a day	0.25	0.02	0.54	0.05
Reading books				
Seldom or Never	0.36	0.10	0.13	0.03
At least once a week	0.40	0.40	0.31	0.22
Once a day	0.19	0.31	0.37	0.28
Several times a day	0.05	0.20	0.20	0.47

Source: GUiNZ DCW1 and DCW2, own calculations and illustrations.

In general, fathers are less engaged in the activities reported on in Table 1, compared to mothers. Fathers are less likely to report daily participation in these activities than mothers especially in the 9-month interview. Interestingly, engaging once a day is relatively more common among fathers while the majority of mothers engage in most activities several times a day, supporting the idea of the fathers being the storytellers and entertainers in the evenings after work.

In line with the findings on involvement in the previous section, the gap in involvement in these activities between mothers and fathers decreases as the children age. In particular, the share of fathers who read books to their children once a day or more increases. It is useful to note that only a very small fraction of fathers respond saying they 'seldom or never' play with toys or play games with their children. Nearly all fathers report playing with their children at least once a week.

5.3 Parental leave taking

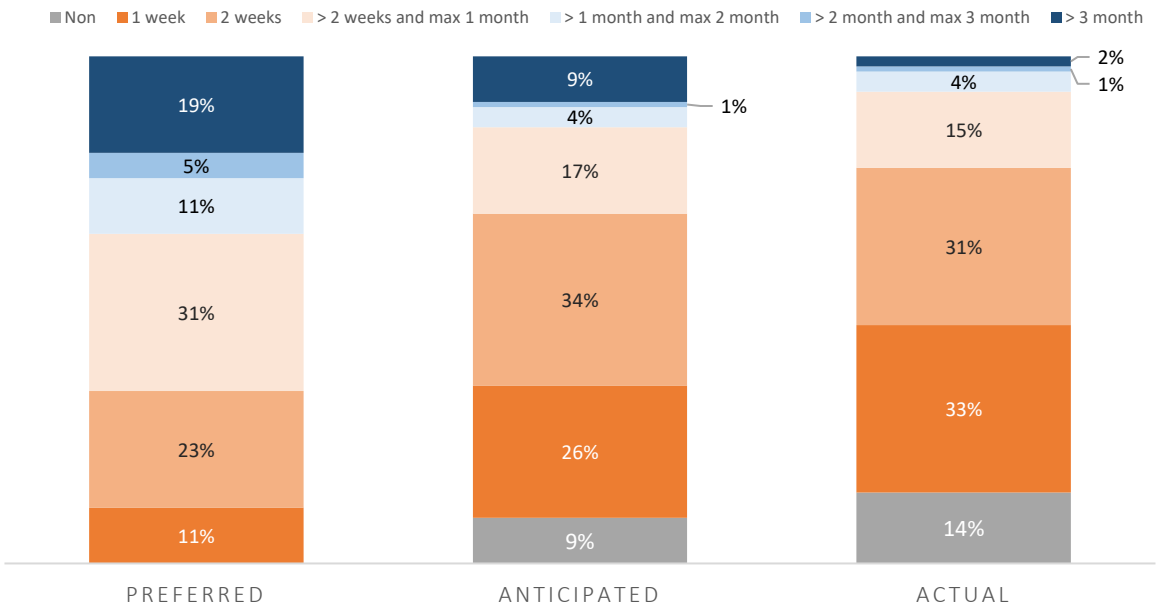
As a last group of variables to measure paternal involvement, we analyse paternal leave taking. In the literature, parental leave taking is the most widely used measure of fathers' involvement. This is because studies often lack good measures of the within-household division of unpaid work and care responsibilities, so parental leave taking is often the only observed proxy for paternal involvement, especially when administrative data sources are used. Contrasting the observed leave taking of fathers with the other measures of involvement will thus form an important part of the later analysis to capture

how representative leave taking is for the informal division of care responsibilities in families. Of course, the amount of parental leave taken will be influenced by government policy. Mothers who had children during the GUiNZ window of March 2009-April 2010 were eligible for a year of unpaid right-to-return-to-work leave and 14 weeks of government-funded paid parental leave provided they met certain employment criteria. Fathers were entitled to two weeks unpaid leave if they met certain employment criteria. In addition, the mother's leave entitlement could be transferred to the father – while data on how frequently this occurred is scant, indicators suggests that this was not common.

Figure 10 gives an overview of parental leave taken by employed fathers in GUiNZ. It includes the actual leave taking as reported in the 9-month interview (DCW1) as well as the reported preferred and anticipated leave taking from the antenatal interview (DCW0). The reported preferred, anticipated, and actual leave is categorised into the following seven categories: No Leave; 1 week; 2 weeks; between 2 weeks and 1 month; between 1 month and 2 months; between 2 months and 3 months; more than 3 months (including still on leave at 9 months).

As opposed to the two earlier involvement variables, parental leave taking is only measured for employed fathers, reducing the sample to 2,539 households.

Figure 10 - Paternal leave taking of employed fathers



Source: GUiNZ DCW0 and DCW1, own calculations and illustrations.

As the results in the left bar show, all fathers would prefer to take some leave with 66% having a preference for more than two weeks and 19% wanting to take more than 3 months. In comparison, 9% anticipate they will not be taking any leave and we find that for 57% of the employed sample, anticipated leave is shorter than the preferred amount. Turning to the right bar, the actual leave is again shorter than the anticipated leave in 30% of the cases with 14% of fathers ending up not taking any leave.

In addition, Table 2 reports the answers of fathers to the question about why their anticipated leave is shorter than their preferred leave as well as why they ended up taking no leave. The most common reason for taking no / shorter leave is professional or work commitments (36% and 47%) followed by

financial reasons (16% and 25%). Parenting preferences are the reason in only 4% and 10% of the sample.

It is noteworthy that most fathers would like to take more leave than they do, and that work commitments and financial considerations are the main reasons for taking less leave than they would like, while parenting preferences are given as a reason by only a small share of fathers. These results suggest that the low levels of paternity leave are not just being driven by traditional gender norms, but also reflect financial realities. This is particularly relevant in the NZ policy context where no parental leave is specifically set aside for fathers, unlike in the majority of other OECD countries. However, it should also be kept in mind that the international evidence on daddy months is mixed. Daddy months are found to contribute positively to a more equal division of domestic duties and labour supply by reducing the financial constraints of fathers who are willing to take leave, but other factors seem to be overshadowing families' decisions about how to divide paid and unpaid work.

Table 2 - Reason for no / shorter leave

Reason why …	…anticipated shorter than prefered	…no actual leave
Observations	1,840	470
Financial Reasons	25%	16%
Government Regulations	4%	2%
Company or Employer Regulations	13%	4%
Professional or Work Commitments	47%	36%
Parenting Preferences	4%	10%
Resigned or Redundancy		5%
Flexible work arranged		3%
Self employed		13%
Other		12%

Source: GUiNZ DCW0 and DCW1, own calculations and illustrations.

Finally, Table 3 gives an overview of the types of leave fathers take. Categories include paid, unpaid, annual, sick and / or other types of leaves, with the groups not being mutually exclusive. Most fathers take annual leave (54%) with an average of 2.22 weeks taken. About 28% of fathers indicate taking paid leave and 22% take unpaid leave. Unfortunately, we cannot split out paid leave into governmental paid and employer paid. However, we know from other sources that the take up of governmental paid leave by fathers is extremely low (less than 1%) – see Morrissey (2020) and Meehan (forthcoming).[9] We can therefore assume that the majority of the 28% is likely to be employer paid parental leave.

Table 3 - Types of paternal leave

Leave types	share	mean length
Paid leave	0.28	2.37
Unpaid leave	0.22	2.78
Annual leave	0.54	2.22
Other types of leave		4.54
Sick leave	0.02	
Other leave	0.03	

Source: GUiNZ DCW1, own calculations and illustrations. Length of leave is in weeks.

[9] Based on the share of fathers who received any IRD paid parental leave payments within one year of having a child.

5.3.1 How representative is leave taking of paternal involvement?

One issue, which has been discussed extensively in prior literature, is whether leave taking is a good proxy for paternal involvement in childcare in general, i.e. is the observed paternal leave taking representative of paternal involvement in the day-to-day care as well as the quality of care and engagement provided by fathers. This is an important issue because, due to the lack of available measures of direct involvement, leave taking is frequently used as a proxy measure for paternal engagement. Drawing conclusions on drivers and consequences of paternal involvement from findings on leave taking thus crucially depends on the assumption those that take longer leave are more involved relative to those that take shorter leave.

The advantage of the GUiNZ data is that we are able to observe both measures of involvement and leave taking and derive correlations as well as mean equality tests. Table 4 summarises the results of a mean equality test of the direct involvement measures by leave taking (i.e., whether the father took 2 weeks or less or more than 2 weeks of leave).

Table 4 - Direct involvement measures by leave taking

	Leave Taking		
Direct involvement measure	2 weeks or less	More than 2 weeks	
Frequency of involvement in day-to-day-care at 9 months			
Not much of the time	0.07	0.06	
Some of the time	0.61	0.56	**
Most of the time	0.26	0.30	
All the time	0.06	0.08	**
Frequency of direct responsibility at 9 months			
Not much of the time	0.32	0.32	
Some of the time	0.53	0.52	
Most of the time	0.11	0.12	
All the time	0.04	0.04	
Frequency of involvement in day-to-day-care at 2 years			
Not much of the time	0.05	0.05	
Some of the time	0.49	0.45	*
Most of the time	0.34	0.35	
All the time	0.12	0.14	*
Frequency of direct responsibility at 2 years			
Not much of the time	0.22	0.22	
Some of the time	0.58	0.55	
Most of the time	0.15	0.18	
All the time	0.05	0.06	
Quality of care			
Total score	12.27	12.79	***
Total score > median	0.49	0.56	***
Observations	**2,081**	**574**	

Source: GUiNZ DCW1 and DCW2, own calculations.
Notes: Total quality of care score is based on the sum of all activity categories in DCW1 and DCW2. See section 6.1 for details. Significant stats in column 3 refer to the significance levels of a t-test for mean equality between columns 2 and 3 with *** for p<0.01, ** for p<0.05 and * for p<0.1.

Interestingly, the results show that in the GUiNZ survey, leave taking is not a good proxy for paternal involvement. Average involvement in day-to-day care as well as direct responsibility at the ages 9 months and 2 years only weakly differ between fathers who took 2 weeks or less and fathers who took more than 2 weeks leave. Only the quality of care index seems to be positively linked to leave taking.

Two reasons can be responsible for this finding. First, paternal leave taking could be a bad proxy for paternal involvement in general as each could be caused by very different determinants. It also highlights that parental leave taking is often the only observed proxy for paternal involvement, especially in the absence of time-use data that provide measures of the within-household division of paid work and unpaid work, including childcare responsibilities. It suggests that time-use data can provide valuable insights into how cultural gender norms at work are shifting, and that these factors are difficult to proxy with administrative data sources on parental-leave taking. Second, these observations could be a result of generally low levels of leave taking in NZ and thus a less accurate description of intrinsic leave taking based on the external restrictions imposed on fathers. It may also somewhat limit the applicability of this finding to international literature since the leave period is generally shorter in NZ, although even in countries with earmarked paternity leave, the amount of leave taken rarely exceeds one or two months (e.g., Eriksson 2005 for Sweden; Samtleben, Schaeper, and Wrohlich 2019 for Germany).

6. RESEARCH AIM 2

The second research aim is to analyse the external and internal determinants of the different levels of paternal involvement discussed above. The focus of this section is on the empirical identification of the relationship between different involvement variables and a number of key demographic, socio-economic and psychological characteristics of the father, mother and child.

6.1 Variables and empirical approach

For the purpose of this analysis, we concentrated on five main outcome variables based on the different involvement measures discussed above. To simplify the interpretation of estimated associations, all outcome measures will be analysed in a binary form:[10]

1. **Father in GUiNZ** – Dummy variable for whether a father participates in GUiNZ.
2. **High childcare involvement at 9 months** – Dummy variable for whether a father is involved in the day-to-day care of the child at least most of the time at 9 months.
3. **High childcare involvement at 2 years** – Dummy variable for whether a father is involved in the day-to-day care of the child at least most of the time at 2 years.
4. **Long leave** – Dummy variable for whether a father takes more than 2 weeks of leave.
5. **High quality care** – Dummy variable for whether a father provides a higher-than-median amount of activities based on the sum of all activity categories in DCW1 and DCW2 (1 if father has higher than median value of total quality care, 0 otherwise). [11]

We use **multivariate logit analysis** as our key estimation method:

$$P(Y_i = 1) = P(\beta_1 + \beta_2 C_i + \beta_3 HH_i + \beta_4 M_i + \beta_5 F_i + \varepsilon_i > 0) \quad (1)$$

With Y_i being the binary outcome variable from the list above for child i. The explanatory variables cover the following domains:

- **Child's characteristics (C_i)**: twin birth; gender; planned pregnancy; number of siblings; indicators for young siblings (under 5 and under 2); subjective health; developmental problems.
- **Household characteristics (HH_i)**: household type; household income; perceived helpfulness of family; perceived relationship quality.[12]

[10] Estimation results of continuous or ordinal versions of the outcome variables (in the case of leave taking and quality care) are additionally provided in the Appendix and discussed in Section 6.2.

[11] A summarised continuous measure of quality care is generated by assigning point-values to the four different possible responses to the quality care questions: seldom or never (=0), at least once a week (=1), once a day (=2), several times a day (=3). These scores are summed up for the seven different activities: playing games, playing with toys, talking, telling stories at DCW1 and DCW2 and reading books at DCW1 and DCW2. This results in a continuous scale ranging from 0 to 21.

[12] Perceived helpfulness of the families as well as relationship quality are used from the father's survey responses in order to capture the subjective reasoning of fathers most closely.

- **Mother's socio-economic and demographic characteristics (M_i)**: marital status; age, migration status; education; ethnicity; employment status/occupation).[13]
- **Father's socio-economic, demographic and psychological characteristics (F_i):** biological father; age; criminal history (DCW1); migration status; ethnicity; education; employment status/occupation; income differences between mother and father; shiftwork (DCW1); self-employment (DCW2); working hours (DCW1); mental health diagnosis; physical health diagnosis; subjective health; Big Five personality traits; perceived stress scale.

If not indicated otherwise, all explanatory variables (except the child characteristics) are observed in the antenatal interview to avoid endogeneity in the later estimation models due to reverse causality. A detailed list of the explanatory variables including a definition and summary statistics are provided in Tables A.2 and A.3 in the Appendix.

We also analyse the role of additional psycho-social characteristics of the fathers in the parental context such as perceived work-life balance, parental influence, parental identity, parental confidence, subjective parental quality, and parental satisfaction. Nevertheless, these variables are highly endogenous and can potentially explain important relationships between the explanatory and outcome variables and should not be treated as confounders. These variables are thus not included in the main estimation models but are discussed separately at the end of Section 6.2.

6.2 Results

Table 5 summarises the estimation results of the full estimation model in line with equation (1) for all five outcome variables. Average marginal effects are reported. Results for the stepwise inclusion of explanatory variables in which we add 1) children's + household characteristics, 2) mother's characteristics and 3) father's characteristics in a stepwise manner are reported in Table A.4, Table A.5, Table A.6 and Table A.7 in the Appendix.

Table 5 - Determinants of paternal involvement (marginal effects of logit estimation)

	Father in GUiNZ	Long leave	High CC involvement (9 month)	High CC involvement (2 years)	High quality care
CHILD AND PREGNANCY CHARACTERISTICS					
Is twin	0.015	0.174***	-0.019	0.179***	-0.031
Is girl	-0.006	-0.009	-0.013	0.003	-0.017
Pregnancy planned	0.048***	0.005	-0.027	-0.007	0.028
Number of siblings (Ref: None)					
One	-0.062***	-0.066**	-0.001	0.010	-0.112***
Two	-0.081***	-0.107***	-0.024	-0.004	-0.193***
Three	-0.123***	-0.094**	0.051	-0.038	-0.190***
Four or more	-0.141***	-0.133***	-0.052	0.065	-0.153**
Youngest sibling under 5	-0.005	0.032	-0.030	-0.026	-0.060**
Youngest sibling under 2	0.014	0.020	0.009	0.008	0.003

[13] Employment status/occupation and ethnicity of the mother are only used as explanatory variables in the estimation of father's participation in GUiNZ, in which father's characteristics are not available. In all other estimation models, including mother's detailed information, this causes issues of multicollinearity and perfect prediction due to the strong overlap with the paternal information.

Child's subjective health (Ref: Excellent)					
Very good	-0.018	0.010	0.009	-0.026	-0.013
Good	-0.022	-0.005	-0.017	0.034	-0.090***
Fair	0.038	-0.114***	0.025	-0.011	0.003
Child has developmental problems	-0.013	0.026	0.004	-0.021	-0.007
HOUSEHOLD CHARACTERISTCS					
Household type = Multiple adults	-0.040**	-0.015	-0.017	-0.006	-0.040*
Household income (Ref: Less than 20K)					
20-30K	0.046	0.016	0.011	-0.049	-0.017
30-50K	0.111**	0.016	0.000	-0.095	0.017
50-70K	0.136***	0.073	-0.000	-0.123	0.028
70-100K	0.143***	0.065	0.016	-0.045	0.043
100-150K	0.173***	0.106	0.031	-0.062	0.065
More than 150K	0.180***	0.066	0.055	-0.059	0.069
Relationship quality *(rated by father)*		0.019**	0.018*	0.031***	0.045***
Average helpfulness of family *(rated by father)*		-0.020**	0.039***	0.022**	0.025***
MOTHER'S CHARACTERISTICS					
Mother is married	0.085***	-0.027	-0.020	-0.012	0.029
Mother is cohabiting with partner	0.222***	0.018	-0.163*	-0.200*	-0.029
Mother's age (Ref: <25 years)					
25-29 years	0.070***	-0.020	0.006	-0.072*	0.040
30-34 years	0.068***	0.006	0.029	-0.052	0.059
35-39 years	0.094***	0.044	0.033	-0.050	0.008
40+ years	0.089**	0.081	0.015	-0.100*	0.031
Mother born in NZ	0.013	-0.001	-0.033	-0.073***	0.067***
Mother's prioritised ethnicity (Ref: NZ European)					
Māori	-0.067***				
Pacific Peoples	-0.173***				
Asian	-0.101***				
MELAA and Other	-0.004				
Mother's education (Ref: No sec qualification)					
Secondary school/NCEA 1-4	0.064*	0.058	0.060	0.134**	0.093
Diploma/Trade cert/NCEA 5-6	0.031	0.038	0.041	0.119**	0.081
Bachelors degree	0.085**	0.055	0.024	0.094*	0.061
Higher degree	0.099**	0.029	0.048	0.089	0.139**
Mother's occupation (Ref: Professional or admin. worker)					
Not employed	-0.036**				
Managers	-0.027				
Technic./ trades workers/ mach. operators	-0.097**				
Other	-0.002				
FATHER'S CHARACTERISTICS					
Partner is biological father		-0.188**	-0.062	0.132	0.014
Fathers' age (Ref: <25 years)					
25-29 years		0.013	0.001	0.062	0.021
30-34 years		0.029	-0.009	0.062	-0.006
35-39 years		0.022	-0.017	0.084	-0.030
40+ years		0.044	0.066	0.131**	-0.008
Father has criminal history		-0.163	-0.029	0.005	-0.096
Father born in NZ		0.021	-0.062***	-0.017	0.004

Fathers' prioritised ethnicity (Ref: NZ European)					
Māori		0.006	0.087***	0.040	0.041
Pasifika		0.019	0.081**	0.106***	0.071**
Asian		0.060*	-0.050	-0.006	-0.047
MELAA and other		0.007	0.037	0.058	-0.111*
Fathers' education (Ref: No sec qualification)					
Sec school/NCEA 1-4		0.026	-0.040	-0.011	0.106**
Diploma/Trade cert/NCEA 5-6		0.077**	-0.037	-0.027	0.080*
Bachelors degree		0.055	-0.091**	-0.038	0.096**
Higher degree		0.098**	-0.052	0.012	0.127***
Fathers' occupation (Ref: Professional or admin. worker)					
Not employed			0.025	-0.011	-0.002
Managers		-0.071***	-0.025	-0.031	-0.037
Technic./ trades workers/ mach. operators		0.002	0.065**	0.006	-0.029
Other		0.013	0.057*	0.037	0.026
Income difference in $10K		0.001	-0.009***	-0.016***	-0.006***
Father shiftwork (DCW1)		0.091***	0.040*	0.006	-0.018
Father self-employed (DCW2)		-0.077***	-0.028	-0.058**	0.017
Father fulltime (DCW1)		-0.083***	-0.131***	-0.032	-0.131***
Father overtime (DCW1)		0.013	-0.079***	-0.083***	0.005
Mental health		0.024	-0.023	-0.070**	0.027
Physical health		0.011	-0.017	0.004	0.011
Subjective health		-0.061**	0.009	0.012	0.045*
Extraversion		-0.011	-0.016	0.026*	0.036***
Agreeableness		-0.014	0.024	0.005	0.028
Conscientiousness		-0.040***	0.041***	0.024	0.007
Neuroticism		-0.020	0.008	0.035**	0.020
Openness		0.014	0.026*	0.021	0.072***
Perceived stress scale		-0.011	0.009	0.008	0.018
Observations	**4,443**	**2,539**	**3,098**	**3,098**	**3,098**

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Notes: Explanatory variables are sourced from DCW0 unless specified otherwise. Standard errors as well as models in which explanatory variables are included in a stepwise fashion are reported in Table A.4, Table A.5, Table A.6 and Table A.7 in the Appendix.

6.2.1 Participation in GUiNZ

Results of the estimation using the binary indicator for father's participation in GUiNZ as the outcome variable for the full sample (N=4,443) are shown in the first column of Table 4. The estimated effects are very much in line with the descriptive comparison and mean equality test between the final sample and the excluded sample of families in which the father does not participate in GUiNZ (discussed earlier in Section 4.3 and detailed in Table A.1 in the Appendix). We can see that a planned pregnancy as well as marriage and cohabitation and a mother's age above 25 are positively associated with the father participating in GUiNZ, pointing towards the role of a stable family structure encouraging the father's GUiNZ participation. For example, in households in which the mother is cohabiting with her partner, the partner is 22.2 percentage points more likely to participate in GUiNZ.

An increasing number of siblings as well as additional adults in the household decreases the probability of the father's GUiNZ participation. In a family with four or more children, the father is on average 14.1 percentage points less likely to participate than in a family with no children other than the GUiNZ child.

This is true even through the estimation in Table 5 for many aspects of family socio-economic status, indicating the especially important role of the size of the childcare and housework workload.

Another significant factor is socio-economic status. Fathers in households with an annual household income of above NZ$150,000 are 18 percentage points more likely to participate in GUiNZ than households with less than NZ$20,000. Lastly, ethnicity was also strongly associated with GUiNZ participation even when socio-economic differences are controlled for. Using mother's ethnicity (which is the sole ethnicity indicator available for the household irrespective of whether the father participated in GUiNZ), we find that fathers in Māori, Pasifika as well as Asian households are less likely to participate in GUiNZ as compared to NZ European households. For example, fathers in Pasifika households are on average 17.3 percentage points less likely to participate, relative to NZ European households.

6.2.2 Leave taking

Column 2 of Table 5 summarises the estimation results of the full model (including all explanatory variables in line with equation 1) for the binary indicator of taking leave for more than 2 weeks. Recall that Figure 10 earlier (in Section 5.3) indicated that 64% of employed fathers in the GUiNZ sample took either one or two weeks leave; with a further 14% taking no leave. Therefore, understanding the determinants of having a leave length greater than the two-week threshold is useful for further investigating determinants of greater paternal involvement. Given that leave taking is only observed of fathers who indicate they are employed prior to birth, equation 1 is estimated for the subsample of 2,539 employed fathers.

In addition, estimation results for the stepwise inclusion of explanatory variables are presented in columns (1) to (4) of Table A.6 in the Appendix, while columns (5) to (8) report the results for the linear estimation using the continuous measure of weeks of leave as the outcome variable. As results from the linear estimation are very much in line with the findings using the binary indicator, we concentrate on the discussion of the results of the binary model that are presented in column 2 of Table 4.

We find that the results on number of siblings are very similar to the findings on GUiNZ participation, i.e. the more children already in the household, the lower the probability that the father is taking more than two weeks leave. For instance, fathers of four or more children are 13.3 percentage points less likely to take more than two weeks leave than first-time fathers. Having twins increases the likelihood of father's taking more than two-weeks leave by 17.4 percentage points, again relative to first-time fathers.

Holding everything else constant, the father's rating of the relationship quality with the mother is on average positively associated with taking more than two weeks leave, indicating two distinct potential mechanisms which we are not able to distinguish between: 1) fathers with healthy relationships with the mothers are more likely to be involved, and/or 2) fathers being involved is good for the relationship between the mother and father.

Biological fathers are observed to be less likely to take more than two weeks leave than non-biological fathers. However, this result should be interpreted with caution due to the very small number of non-biological fathers in our sample. This particular finding might be at risk of being driven by a small group of outliers.

With respect to fathers' characteristics, several observations can be made. First, paternal leave taking on average seems to increase with higher levels of education (although not linearly). Second, in line with the known connection between the internal substitutability of leave-takers within firms and parental leave length (Huebener et al. 2021), managers and self-employed fathers as well as full-time employed fathers are less likely to take more than two weeks leave, likely to the consideration of firm-side problems with substitution of own work. In contrast, fathers working in shifts are on average 9 percentage points more likely to take more than two weeks leave, potentially driven by shift work being more common in routine jobs (i.e. again better internal substitutability).

In terms of personality traits, conscientiousness in particular stands out as it is negatively associated with taking more than two weeks leave. This is likely due to an increased sense of responsibility in the workplace.

6.2.3 Childcare involvement

Columns 3 and 4 of Table 5 summarises the estimation results of the full model for the binary indicator of high childcare involvement, separately for the ages 9 months (DCW1) and 2 years (DCW2). High involvement here is defined as the father involved at least most of the time in the day-to-day care of the child. If we compare the determinants of high childcare involvement with the determinants of taking more than two-weeks leave, there are a variety of similarities and differences observed. Many factors such as having twins (positive effect), relationship quality (positive effect) and factors related to workload such as self-employment, full-time employment and overtime (negative effect) have similar effects on paternal childcare involvement as on paternal leave taking. All other factors with significant associations are either new or have reversed signs.

We can, for example, see that cohabitation, which has an insignificant effect on taking more than two-weeks leave, has a negative association with paternal childcare involvement at both the 9 months and 2 years stage. This may be potentially driven by shared custody arrangements in cases where the mother is not cohabiting with partner, and therefore those fathers have to take over the direct responsibility when the child is in their household.

Table 5 also shows that the income difference between fathers and mothers plays a crucial role in explaining fathers' involvement in the day-to-day care, i.e. the division of unpaid labour in the household, even if other work- and education-related factors are controlled for. The higher the income difference (i.e. in terms of the father out-earning the mother) the lower the probability of the father undertaking high childcare involvement, at both 9 months and 2 years.

With respect to the father's ethnicity, we see an interesting pattern. While fathers in Māori and Pasifika households are less likely to participate in GUiNZ,[14] and ethnicity had no effect on leave taking behaviour, we also observe fathers with prioritised Māori and Pasifika ethnicity to be more likely, on average, to undertake high childcare involvement, relative to their NZ European counterparts. The lower probability of GUiNZ participation might thus indicate a stronger hesitation towards the survey per se, rather than being a proxy indicator for paternal involvement with the child.

[14] Note that, as mentioned in section 6.2.1, we cannot directly observe the ethnicity of fathers who did not participate in GUiNZ, therefore, we use the mother's ethnicity.

Another interesting observation can be made with respect to conscientiousness. While it was negatively related to taking more than two weeks leave, the association between conscientiousness and high childcare involvement is positive (at age 9 months). Conscientious fathers might face a strong two-edged sense of obligation towards their workplace and their children causing them to simultaneously take over relatively more paid and unpaid work.

6.2.4 Quality of care

The last outcome of interest in Table 5 is the binary indicator of high quality care. Estimation results for the full model are shown in column 5 and the outcome variable is defined as more-than-median amount of activities based on the sum of all activity categories (playing games, playing with toys, talking, telling stories in DCW 1 and DCW 2 and reading books in DCW 1 and DCW 2). Many of the findings follow a similar pattern to those discussed above with respect to other outcome variables related to paternal involvement. For example, in line with the likelihood of participating in GUiNZ, as well as the likelihood of taking more than two-weeks leave, the probability of high quality care by the father suffers the higher the number of siblings in the household. Closely related to this, the helpfulness rating of the family (as rated by the father) is on average positively related to fathers' quality care, which potentially indicates more time for childcare activities when other domestic duties are taken care of by others in the household.

Also, in line with earlier findings, the relationship quality between the mother and the father has an on average positive association with high quality care of fathers. Again, the data does not enable us to disentangle the direction of causation between these variables, but there are likely effects in both directions. The results also show that in general a higher educational attainment level for the father is more positively associated with their quality care level. For example, fathers with higher than a bachelor's degree are on average 12.7 percentage points more likely to provide more-than-median quality care.

Very much in line with the finding on ethnicity discussed in Section 6.2.3, Pasifika fathers are not only more likely to be involved in the day-to-day care of the child but also more likely to provide more quality care.

Lastly, while conscientiousness was an important determinant of the quantity of childcare (column 2 of Table 5), extraversion and openness of the father are the personality traits that are positively associated with high quality care provision.

6.2.5 Psycho-social characteristics as mechanisms

In further results (detailed in the Appendix), we add to our estimation model the father's psycho-social characteristics. Additional input variables include perceived influence, parental identity, parental confidence, perception of being a good parent, parental satisfaction, and perceived importance of a work-life balance. These variables are likely to be important mechanisms of the relationship between other exogenous factors and the outcomes of interest. Results of these inclusions are provided in columns 4 and 8 of Table A.5 (for the high childcare involvement indicator at 9 months and 2 years respectively); column 4 of Table A.6 (for the outcome variable for taking more than two weeks leave); and column 4 of Table A.7 (for the outcome variable of high quality care).

Results show that perceived influence, parental confidence, perception of being a good parent and parental satisfaction have a strong positive association with the high childcare involvement (Table A.5)

and high quality care (Table A.7) but is not statistically significant with respect to taking more than two weeks leave (Table A.6).

It is also apparent that after controlling for these psycho-social characteristics in our estimation models, the magnitudes of several other determinants of paternal involvement reduce. This suggests a potential mediating role of these characteristics. This is the case, for example, for fathers' rating of helpfulness of family and relationship quality between mother and father with respect to the outcome variables of high childcare involvement and high quality care.

Also, ethnicity (i.e. being Māori or Pasifika) has a smaller or no significant effect on paternal involvement and / or quality of care if these psycho-social characteristics are controlled for, suggesting an important difference in paternal confidence and satisfaction between Māori and Pasifika fathers and their NZ European counterparts, which positively affects their involvement.

6.2.6 Heterogeneity analysis by ethnicity

Given the interesting findings with respect to differences in paternal involvement among ethnic groups, we took a closer look into the heterogeneity of all other factors by ethnicity. However, due to the very small samples in all ethnic groups except NZ European, the estimation of the models above in stratified samples by ethnic groups is not feasible. Therefore, in order to check the association of the different characteristics and paternal involvement for heterogeneity with respect to the father's ethnicity, we conduct a mean equality test separately for NZ Europeans, Māori and Pasifika. The results of this descriptive analysis and the t-tests are reported in Table A.8 (paternal involvement at 9 months), Table A.9 (quality of care) and Table A.10 (parental leave taking) in the Appendix. Note that due to the small sample sizes even these descriptive results have to be interpreted with care.

With respect to paternal involvement we can, for example, see that the negative association between already having children and paternal involvement is mainly driven by NZ European fathers whereas the association seems to be much less clear for Māori and Pasifika fathers. In contrast, having additional children in the household has a negative association with quality of care provided by the father for all three ethnicity groups portrayed in Table A.9.

We can also see that although having multiple adults in the household had no significant effect on paternal involvement on average, having additional adults in the household is positively associated with the involvement of Māori fathers and children's health seems to be positively associated with the involvement of Pasifika fathers. Also, while marriage negatively affects involvement of NZ European and Māori fathers, this isn't the case for Pasifika fathers, where the association is positive. Additionally, the positive association of relationship quality and paternal involvement can only be observed for NZ European fathers while the association between relationship quality and high quality of care is similar for all ethnic groups.

In terms of the role of financial and occupational factors, variables such as income difference and being employed fulltime are positively associated with high paternal involvement at 9 months, regardless of the father's ethnicity. If the mother is not employed, there is lower involvement from the father – but this is only true for NZ European fathers. Further, higher education level is associated with a higher quality of care, again only for NZ European fathers.

As opposed to the differences in factors associated with paternal involvement and quality of care between ethnic groups, the variables associated with paternal leave taking are quite homogenous between NZ European, Māori and Pasifika fathers. Only the question of internal substitution ability (i.e. the lower likelihood of leave taking for self-employed fathers and fathers in managerial positions) seems to be less pronounced for Māori and Pasifika fathers. This, again, underlines the important differences between determinants of involvement on the one hand and determinants of leave taking on the other.

7. RESEARCH AIM 3

The first two research aims of this study helped us get a picture of the involvement of NZ fathers as well as determinants of this involvement. To fully assess the relevance of these findings, the consequences of different levels of fathers' involvement on children's outcomes have to be analysed in detail. The importance of parent's quantity and quality of time for children's cognitive and psychological development has been the key justification for the political and academic interest in increased paternal involvement (see for example Cools, Fiva, and Kirkebøen 2015; Mangiavacchi, Piccoli, and Pieroni 2021; El Nokali, Bachman, and Votruba-Drzal 2010).

In this section, we present a descriptive analysis of the association between paternal involvement and different measures of children's cognitive, physical, and psychological development at later time points. This analysis should be seen as exploratory evidence on this topic, giving an indication for the importance of further research in this area.

7.1 Variables and empirical approach

The information on children's cognitive, physical and psychological development is observed in DCW3 (31-month interview), DCW4 (45-month interview) and DCW5 (54-month interview). Table 6 gives an overview of the variables we are using as well as a description of the variable construction and the DCW it was measured in. First, cognitive development is measured using information on language development based on the number of words used by the child (on feelings, shapes, colours) reported by the mother at ages 31 and 45 months. Secondly, physical development is based on motor skills, such as bending over and walking straight lines, reported by the mother at 54 months.

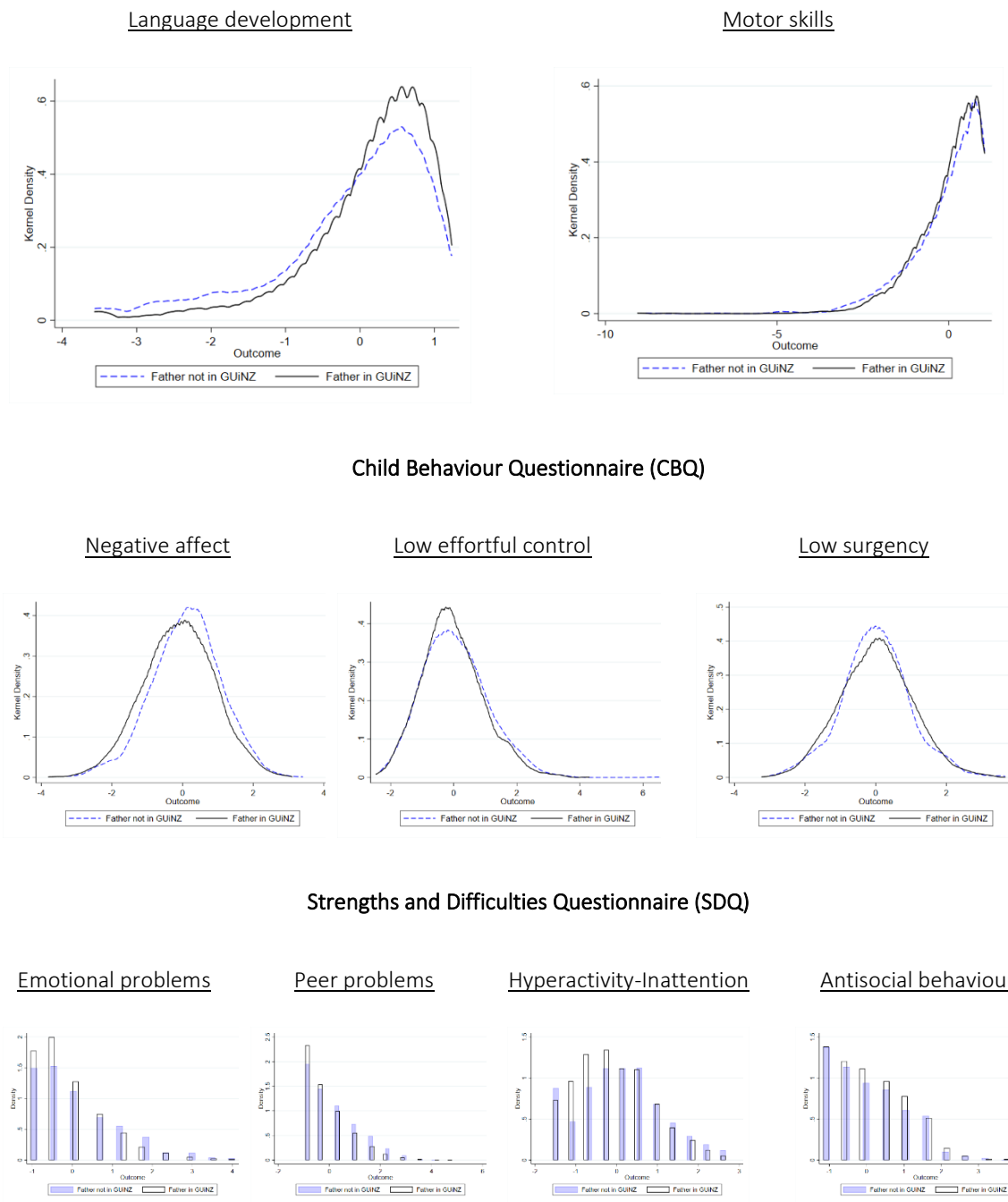
The third domain of interest is psychological development. It is evaluated using two established questionnaires: the Strengths and Difficulties Questionnaire (SDQ) based on the work of Goodman (1997) and the Temperament / Child Behaviour Questionnaire (CBQ) based on Putnam and Rothbart (2006). The SDQ is an internationally used 25-item scale that usually measures five aspects of child behaviour: emotional symptoms, peer relationship problems, hyperactivity/inattention, conduct problems and prosocial behaviour. In line with the guidelines given in the data user guide (Growing Up in New Zealand, 2018), we drop 'conduct problems' from the list due to a missing item in the questionnaire, and thus concentrate on the four remaining aspects of behaviour. Additionally, to make signs comparable between concepts, we reverse all items referring to prosocial behaviour and thus discuss antisocial behaviour instead. The CBQ is a similarly widely used scale which measures three aspects of children's temperament: negative affect, effortful control, surgency. Although research described in the data user guide (Growing Up in New Zealand 2018) suggests that a six factor structure potentially is a better fit for the data, we concentrate on the original three factors for reasons of simplicity. In line with the rescaling done for the SDQ items, we rescale all items corresponding to effortful control and surgency such that high values correspond to 'negative' psychological development (i.e. low surgency and low effortful control). All outcome variables are used in a standardised from in order to simplify coefficient interpretation and comparability. A list of all items corresponding to the SDQ and CBQ factors can be found in Tables A.11 and A.12 in the Appendix.

Table 6 - Children's outcome variables

Variable		Descriptions	DCW
Cognitive development			
Language development		Continuous variable: Total number of words out of a list of 32 the child is using in English or any other language (reported by mother). • 12 words from month 31 (DCW3) questionnaire (e.g. happy, sad, angry, wish etc.) • 20 words (colours, shapes, own name) from the month 45 (DCW4) questionnaire	3 4
Physical development			
Motor skills		Continuous variable: Average frequency of whether child is able to perform a list of 11 actions rated from 1 (Never) to 4 (Always) • Actions: bend over, walk straight line, walk backwards etc.	5
Psychological development			
Strengths and Difficulties Questionnaire (SDQ)	**Emotional problems**	Ordinal variable ranging from 0 to 10: Sum of corresponding 5 items of the SDQ rated on the scale 0 (Normal), 1 (Borderline) and 2 (Abnormal) • Items: e.g. worried, unhappy, nervous, scared	5
	Peer problems	Ordinal variable from 0 to 10: Sum of corresponding 5 items of the SDQ rated on the scale 0 (Normal), 1 (Borderline) and 2 (Abnormal) • Items: e.g. solitary, good friends, liked, bullied	5
	Hyperactivity-Inattention	Ordinal variable from 0 to 10: Sum of corresponding 5 items of the SDQ rated on the scale 0 (Normal), 1 (Borderline) and 2 (Abnormal) • Items: e.g. restless, squirming, easily distracted	5
	Antisocial behaviour	Ordinal variable from 0 to 10: Sum of corresponding 5 items of the SDQ rated on the scale 0 (Normal), 1 (Borderline) and 2 (Abnormal), with all items being reversed as 'abnormal' here refers to high levels of prosociality • Items: e.g. considerate, shares, helpful, kind	5
Temperament / Child Behaviour Questionnaire (CBQ)	**Negative affect**	Continuous variable: Average rating of corresponding 12 items of the CBQ rated on a scale from 1 (Extremely untrue) to 7 (Extremely true), with items corresponding to a low negative affect being reversed (e.g. hardly ever complains) • Items: e.g. upset, angry, difficult to sooth, afraid, frustrated	5
	Low effortful control	Continuous variable: Average rating of corresponding 12 items of the CBQ rated on a scale from 1 (Extremely untrue) to 7 (Extremely true), with items corresponding to a high effortful control being reversed (e.g. follow instructions) • Items: e.g. follow instructions, becoming involved, prepares	5
	Low surgency	Continuous variable: Average rating of corresponding 12 items of the CBQ rated on a scale from 1 (Extremely untrue) to 7 (Extremely true) with items corresponding to a high surgency being reversed (e.g. adventurous) • Items: e.g. shy, rush into new situations, rough and rowdy, adventurous	5

Figure 11 gives an overview of the distributions of the standardised versions of the outcome variables. The graphs show the kernel densities of the continuous outcome variables and histograms for the categorial outcome variables separately by whether the father participated in GUiNZ. It can be seen that in the absence of controlling for other factors, we observe a better language development as well as lower levels of negative affect, effortful control, and emotional problems for children in families in which the father participates in GUiNZ, relative to the sample where the father did not participate.

Figure 11 - Distribution of children's developmental outcomes by sample



Source: GUiNZ DCW3, DCW4, DCW5, own calculations and illustrations.

Next, we employ multivariate linear analysis to explore the association between the developmental outcomes D_i of child i with respect to the paternal involvement variables Y_i:

1. Father participates in GUiNZ (binary)
2. Involvement in day-to-day care at 9 months (ordinal)[15]
3. Paternal leave taking (ordinal)[16]
4. Quality care (continuous in points on the constructed quality of care scale)[17]

All outcome variables are assumed to be continuous for the multivariate linear analysis. We thus estimate the following estimation equation:

$$D_i = P(\alpha_i + \beta_1 Y_i + \beta_2 C_i + \beta_3 HH_i + \beta_4 M_i + \beta_5 F_i + \varepsilon_i) \quad (2)$$

With the groups of control variables referring to the following list:

- **Child's characteristics (C_i)**: twin birth; gender; planned pregnancy; number of siblings; indicators for young siblings (under 5 and under 2); subjective health, developmental problems.
- **Household characteristics (HH_i)**: household type; household income.
- **Mother's socio-economic characteristics (M_i)**: marital status; age, migration status; education (ethnicity; employment status / occupation). [18]
- **Father's socio-economic characteristics (F_i):** biological father; age; criminal history (DCW1); migration status; ethnicity; education; employment status / occupation; income differences; shiftwork (DCW1); self-employment (DCW2); working hours (DCW1).

7.2 Results

Table 7 summarises the estimation results of equation (2) for all nine developmental outcome variables. For the sake of brevity, the table is restricted to the key coefficients of interest, i.e. the paternal involvement variables Y_i (the full estimation details can be obtained from the authors upon request). At first glance, it is apparent that there are just a few involvement variables that seem to have a significant effect on some of the developmental outcome variables. We can see, for example, that in households where the father participates in GUiNZ, the child is observed to have a slightly better language development (speaking on average, ceteris paribus, 0.076 more words) as well as higher levels of effortful control.

[15] Ordinal categories of involvement in day-to-day care are: 1 = Not much of the time; 2 = Some of the time; 3 = Most of the time; 4 = All the time.

[16] Ordinal categories of paternal leave taking are: 0 = No Leave; 1 = 1 week; 2 = 2 weeks; 3 = between 2 weeks and 1 month; 4 = between 1 month and 2 months; 5 = between 2 months and 3 months; 6 = more than 3 months (incl. still on leave at 9 months).

[17] The quality care scale corresponds to the variable constructed for the analysis in research aim 2 (Section 6), i.e. the sum of all activity categories (playing games, playing with toys, talking, telling stories in DCW 1 and DCW 2 and reading books in DCW 1 and DCW 2).

[18] Employment status/occupation and ethnicity of the mother are only used as control variables in the estimation of father's participation in GUiNZ, where father's characteristics are not available.

With respect to the involvement in the day-to-day care we see a strong positive association of very frequent involvement (all the time) with motor skills and temperament (negative affect and low effortful control) as well as a positive association of involvement in general (some, most or all of the time) with lower levels of behavioural problems (especially peer problems and antisocial behaviour). Although some coefficients for different levels of paternal leave are significant, no clear pattern can be observed.

The clearest pattern evident in Table 7 is in terms of the quality of care scale indicator. We find that higher quality of care positively affects language development and motor skills as well as being associated with a lower risk of emotional problems, peer problems, hyperactivity, antisocial behaviour, and low effortful control. Thus, we can conclude that besides the quantity of care (measured by involvement in day-to-day care) the quality of involvement is highly important for developmental outcomes.

Table 7 - Estimation results – outcome: child's development

			Strengths and Difficulties Questionnaire (SDQ)				Child Behaviour Questionnaire (CBQ)		
	Language dev.	Motor skills	Emotional	Peer	Hyperact.	Antisoc.	Neg. affect	Low effort. control	Low surgency
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Father in GUiNZ	0.076**	0.000	-0.026	-0.004	-0.043	-0.006	-0.055	-0.092***	0.006
	(0.032)	(0.036)	(0.033)	(0.032)	(0.034)	(0.035)	(0.036)	(0.035)	(0.037)
Observations	4,443	4,253	4,443	4,443	4,443	4,443	4,253	4,253	4,252
Paternal leave (Ref: None)									
1 week	0.051	-0.054	-0.042	0.005	-0.001	0.165***	-0.160**	0.052	0.027
	(0.054)	(0.063)	(0.059)	(0.058)	(0.060)	(0.064)	(0.066)	(0.063)	(0.068)
2 weeks	0.029	-0.090	-0.016	0.045	-0.057	0.166**	-0.127*	0.047	0.068
	(0.055)	(0.064)	(0.060)	(0.059)	(0.062)	(0.066)	(0.068)	(0.064)	(0.069)
> 2 weeks – 1 month	-0.054	-0.145*	-0.059	-0.031	-0.101	0.116	-0.111	0.075	0.101
	(0.063)	(0.074)	(0.069)	(0.068)	(0.071)	(0.075)	(0.078)	(0.074)	(0.080)
> 1 month – 2 months	0.026	0.088	0.040	0.055	-0.073	0.055	-0.080	0.071	0.169
	(0.091)	(0.105)	(0.099)	(0.097)	(0.102)	(0.108)	(0.111)	(0.105)	(0.113)
> 2 months – 3 months	-0.003	-0.348**	-0.125	0.152	-0.080	0.310*	-0.256	0.517***	0.054
	(0.146)	(0.171)	(0.160)	(0.157)	(0.164)	(0.174)	(0.181)	(0.170)	(0.184)
> 3 months	0.060	0.058	-0.077	-0.030	-0.100	-0.025	-0.337**	0.048	0.052
	(0.136)	(0.159)	(0.149)	(0.145)	(0.152)	(0.162)	(0.167)	(0.158)	(0.170)
Observations	2,539	2,479	2,539	2,539	2,539	2,539	2,480	2,480	2,479
Involvement in day-to-day care at DCW1 (Ref: Not much)									
Some of the time	-0.022	0.063	-0.088	-0.160**	-0.063	-0.142*	-0.111	-0.124*	-0.059
	(0.063)	(0.071)	(0.068)	(0.067)	(0.070)	(0.073)	(0.076)	(0.071)	(0.077)
Most of the time	0.005	0.102	-0.049	-0.148**	-0.139*	-0.229***	-0.127	-0.114	-0.024
	(0.067)	(0.076)	(0.072)	(0.072)	(0.075)	(0.078)	(0.081)	(0.076)	(0.082)
All the time	-0.098	0.230**	-0.188**	-0.215**	-0.074	-0.234**	-0.251**	-0.233**	-0.072
	(0.083)	(0.095)	(0.090)	(0.089)	(0.093)	(0.097)	(0.101)	(0.094)	(0.102)
Observations	3,098	3,013	3,098	3,098	3,098	3,098	3,014	3,014	3,013
Father's quality care	0.168***	0.071**	-0.057*	-0.103***	-0.121***	-0.065*	-0.047	-0.131***	0.001
	(0.031)	(0.035)	(0.033)	(0.033)	(0.034)	(0.036)	(0.037)	(0.035)	(0.038)
Observations	3,098	3,013	3,098	3,098	3,098	3,098	3,014	3,014	3,013

Source: GUiNZ DCW0, DCW1, DCW2, DCW3, DCW4 and DCW5, own calculations and illustrations.
Notes: *** for p<0.01, ** for p<0.05 and * for p<0.1.

As with all the regressions presented, these results show correlation rather than causation. It is, therefore, possible that the positive link between paternal involvement and children's outcomes could be driven by other factors. For example, it may be the case that the level of involvement of mothers and fathers within families is positively correlated (that is, a child with a highly involved father is more likely to also have a highly involved mother). If this is the case, then the measures of paternal involvement may also be indirectly capturing the degree of the mother's involvement, and thus contributing to the positive observed association. Another possibility is that a child who has more carers has better outcomes. This could be due to greater socialisation or simply because these children have a higher total amount of time when an adult is engaged with them. In summary, we cannot rule out the possibility that higher paternal involvement could be proxying for overall higher quantity and quality involvement from other sources.

8. LIMITATIONS

Given the breadth of results presented in Sections 5 through to 7, it is important to acknowledge any relevant limitations that must be taken into account, before concluding with key findings in the following section.

First, the findings presented are based on a survey of a selected sample of fathers whose socio-economic characteristics may not be representative of the whole of NZ, for example , GUiNZ mothers are on average older than the NZ population and non-European mothers are oversampled (Morton et al., 2013).

Second, and very much in line with the first point, is the possibility that survey data contains measurement errors driven, for example, by conscious and unconscious misreporting. The findings about the fairness of the division of tasks presented in Section 5, for example, show that especially reported levels of involvement are at risk of being biased by overestimation due to the subjective nature of the rating.

Third, as mentioned earlier, the sub-group analysis comparing characteristics of determinants associated with varying levels of paternal involvement and engagement with their children is hampered by small sample size for Māori and Pasifika. This small sample size is partly due to a reasonable share of GUiNZ households who did not have a father who participated in GUiNZ, with the share of non-participating fathers being higher among Māori, Pasifika and Asian households than NZ European ones. As discussed in Section 6.2.6, this small sample means that our more detailed investigation into ethnic differences is limited to descriptive results, and that even these descriptive results should be interpreted with caution. Moreover, it should be kept in mind that the results on paternal involvement, engagement and children's outcomes relate to fathers who participated in GUiNZ rather than being representative of the overall population of NZ families.

The final and most important limitation concerns the causal nature of the estimated associations. Due to a lack of clear exogenous variation in the factors influencing involvement in research aim 2 as well as development outcomes in research aim 3, these results ***do not*** represent causal relationships. Rather, these findings represent the relationship between 1) family and father characteristics and paternal involvement and 2) paternal involvement and developmental outcomes. Nevertheless, our findings do hopefully pave the way for future research to exploit exogenous variation in involvement in order to identify causal relationships.

9. CONCLUSIONS

This study used rich data from the Growing Up in New Zealand study to draw a very detailed picture of the involvement of NZ fathers in their children's upbringing in the first years after birth. The information available allowed us to get an overview of different levels and forms of engagement observed with respect to parental leave taking, direct involvement in day-to-day care and activity indicators that proxied for quality of care. We then explored the internal and external factors driving differences between paternal engagement based on these measures; and by virtue of the longitudinal nature of the data, assessed how different levels of engagement were associated with children's developmental outcomes at later time points.

Prior to undertaking the empirical analysis in this study, we summarised the relevant policy background and current evidence on the gender care gap in NZ. For example, we know that while parental leave entitlements sit with the mother, she can transfer all or part of her entitlements to her spouse or de facto partner – however the uptake of paid parental leave (PPL) by fathers in NZ is less than 1%. Further, while a number of OECD countries have begun to try and incentivise paternal leave taking with the introduction of earmarked leave for fathers (daddy months), NZ is one of just six OECD countries with PPL that has not moved in this direction. Available data on time spent in paid and unpaid work also illustrated that NZ has a negative gender work gap, driven largely by fathers spending more time in paid work. This may be a signal of unequal labour market patterns driving the gender care gap, more so than underlying intra-household gender norms.

To gain a snapshot of fathers' engagement during the early years of their children's lives we first compared indicators of direct involvement relative to the mothers in the sample. Fathers were distinctly less involved than mothers, although involvement levels did increase when the child was aged between 9 months and 2 years. Interestingly, fathers strongly overestimate their anticipated involvement and direct responsibility in childcare based on antenatal interviews. A similar pattern between fathers, mothers and over time is evident for a range of activities intended to capture quality of care (e.g. playing games, reading books, etc). In terms of leave taking we find that for more than half of the employed sample, anticipated leave is shorter than the preferred amount; and the actual leave taken is less than the anticipated level. The most common reason for taking no / shorter leave was professional or work commitments, followed by financial reasons. Additionally, we find that parental leave taking has no significant link to direct involvement within the household and is only weakly linked to quality of care, indicating an important difference between parental leave taking and quantity and quality of direct involvement.

In our second research aim we analysed the internal and external determinants of the above-discussed levels of paternal involvement. Unsurprisingly, high childcare involvement (defined as father being involved at least most of the time in day-to-day care of the child) is negatively associated with several work-related factors reflecting more time spent in paid employment such as self-employment; full-time employment; and overtime work. Further, the likelihood of high childcare involvement is reduced the higher the income difference between the father and mother. This is a potential indication of differences in the distribution of bargaining power in driving the division in unpaid labour, even when work and education related factors are controlled for.

We capture quality of care with a binary indicator defined as above-median amount of activities with the child, and find a range of factors are associated with this outcome. For example, more siblings means a lower likelihood of high quality of care; while the helpfulness rating of the family and relationship quality between father and mother are associated with a greater likelihood of fathers interacting with their children in ways that reflect high quality of care.

A novel contribution of this research is to delve into the psycho-social characteristics and personality traits as mechanisms behind NZ fathers' involvement with their children. We find that conscientiousness is an important determinant of day-to-day care; while extraversion and openness of the father is associated with a greater likelihood of high quality of care. Perceived influence, parental confidence and parental satisfaction are also strongly positively associated with high childcare involvement in general

There are clear ethnic differences apparent in this research. Māori and Pasifika fathers in general undertake higher childcare involvement and Pasifika fathers are found to be more likely to undertake high quality of care activities, all relative to their NZ European counterparts.

Previous studies often do not have good data on paternal involvement and often have to proxy this with the amount of leave taken. Importantly, we find that paternal leave taking is far from being a good proxy for actual involvement of fathers especially if one is interested in determinants driving the behaviour. Paternal leave taking is strongly driven by occupational factors such as internal substitutionability in the firm (e.g. managers and self-employed fathers) as well as negatively associated with existing children in the household. While there are no ethnic differences in leave taking, there were clear differences by ethnicity in day-to-day care and involvement in general.

In the final research aim of this study we undertook exploratory analysis of the association between paternal involvement in the child's early years and children's cognitive, physical and psychological development at later time points. The findings show that no clear associations between paternal leave taking and developmental outcomes can be found. As opposed to this, we do see an important positive relationship between involvement in day-to-day care and especially psychological outcomes such as lower levels of peer and emotional problems and antisocial behaviour as well as higher levels of effortful control. Nevertheless, the clearest pattern evident in Section 7 is in terms of the quality of care scale indicator. We find that higher quality of care positively affects language development, motor skills and most psychological outcomes (e.g. lower risk of emotional problems, peer problems, hyperactivity / inattention, antisocial behaviour, and low effortful control). Thus, we concluded that besides the quantity of direct involvement, the quality of involvement is highly important for developmental outcomes.

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APPENDIX

Table A.1 - Descriptive statistics by father availability

	Father in GUiNZ		
	No	Yes	
Observations	1,345	3,098	
CHILDREN AND PREGNANCY CHARACTERISTICS			
Is twin	0.02	0.03	
Is girl	0.49	0.49	
Pregnancy planned	0.52	0.75	***
Number of siblings			
None	0.31	0.40	***
One	0.35	0.37	
Two	0.17	0.15	**
Three	0.09	0.05	***
Four or more	0.08	0.03	***
Youngest sibling under 5	0.51	0.45	***
Youngest sibling under 2	0.15	0.12	***
Child's subjective health			
Excellent	0.57	0.62	***
Very good	0.30	0.27	**
Good	0.11	0.08	***
Fair or Poor	0.03	0.03	
Child has developmental problem	0.09	0.10	
External care (at age 2)			
None	0.52	0.41	***
ECE (incl. Kindergarten Kohanga Reo and PI ECE)	0.32	0.38	***
Home-base care	0.04	0.07	***
Nanny	0.02	0.04	***
Grandparents or other relatives	0.09	0.08	
Other (friends, neighbours, community center)	0.02	0.02	
HOUSEHOLD CHARACTERISTICS			
HH type – Extended family	0.37	0.19	***
Household income			
Less than 20K	0.06	0.01	***
20-30K	0.08	0.03	***
30-50K	0.18	0.10	***
50-70K	0.19	0.15	***
70-100K	0.23	0.25	
100-150K	0.17	0.27	***
More than 150K	0.10	0.19	***
MOTHER CHARACTERISTICS			
Mother is married	0.57	0.75	***

Mother is cohabiting	0.94	0.99	***
Mother's age			
<25 years	0.24	0.09	***
25-29 years	0.25	0.24	
30-34 years	0.29	0.37	***
35-39 years	0.18	0.25	***
40+ years	0.04	0.04	
Mother born in NZ	0.65	0.68	**
Mother's prioritised ethnicity			
NZ European	0.41	0.66	***
Māori	0.22	0.12	***
Pasifika	0.20	0.07	***
Asian	0.16	0.13	**
MELAA or Other	0.02	0.03	
Mother's education			
No sec school qualification	0.08	0.03	***
Secondary school/NCEA 1-4	0.25	0.19	***
Diploma/Trade cert/NCEA 5-6	0.37	0.27	***
Bachelors degree	0.18	0.29	***
Higher degree	0.11	0.22	***
Mother's occupation			
Does not apply (not employed)	0.51	0.34	***
Managers	0.05	0.08	***
Professionals	0.19	0.34	***
Clerical and administrative workers	0.03	0.02	
Technicians and trades workers	0.05	0.04	*
Machinery operators and drivers	0.10	0.12	*
Community and personal service workers	0.04	0.04	
Sales workers	0.01	0.00	***
Labourers	0.03	0.02	*

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Notes: Significant stats in column 3 refer to the significance levels of a t-test for mean equality between columns 2 and 3 with *** for p<0.01, ** for p<0.05 and * for p<0.1.

Table A.2 - Variable overview and summary statistics – children, household and mothers (all observations)

Variable	Description	Categories	Mean
CHILDREN AND PREGNANCY CHARACTERISTICS			
Is twin	Dummy variable: 1 if child is a twin, 0 if not		0.02
Is girl	Dummy variable: 1 if child is a girl, 0 if a boy		0.49
Pregnancy planned	Dummy variable: 1 if pregnancy was planned, 0 if not.		0.68
Number of siblings	Categorial variable: Calculated number of siblings at birth based on the reported years of birth in the phone interview at 16 months, i.e. reported number of siblings minus number of siblings born after the child.	Non	0.37
		One	0.36
		Two	0.16
		Three	0.06
		Four or more	0.05
Youngest sibling under 5	Dummy variable: 1 if child had a sibling under 5 at time of birth, 0 if not.		0.47
Youngest sibling under 2	Dummy variable: 1 if child had a sibling under 2 at time of birth, 0 if not.		0.13
Developmental problems (DCW1)	Dummy variable: 1 if child has any reported developmental problems, 0 if not		0.10
Childs subjective health (DCW1)	Categorial variable: Parental report about their child health. 1 if child is in excellent health, 2 if child is in very good health, 3 if child is in good health, 4 if child is in fair or poor health.	Excellent	0.60
		Very Good	0.28
		Good	0.09
		Fair or Poor	0.03
HOUSEHOLD CHARACTERISTICS			
HH type – Extended family	Dummy variable: 1 if reported household included other adults other than parents, 0 if not.		0.25
Household income	Categorial variable: Reported household income in bands.	Less than 20K	0.03
		20-30K	0.04
		30-50K	0.12
		50-70K	0.16
		70-100K	0.24
		100-150K	0.24
		More than 150K	0.16
Partnership quality[a]	Latent continuous variable (standardised): Quality of the relationship based on factor analysis of a list of 15 situations in the partnership rated on a scale from 1 (All the time) to 6 (Almost never). Examples: Get angry with each other, Let each other know you really care about each other (reversed).		0.03
Family helpfulness[a]	Continuous variable (standardised): Average rating of the helpfulness of own parents, partner's parents		0.01

	as well as own and partners extended family on a scale from 1 (Not available) to 6 (Extremely helpful).		
MOTHER'S CHARACTERISTICS			
Mother is married	Dummy variable: 1 if mother is married or in a civil union, 0 if not (missing if no partner)		0.70
Mother is cohabiting with partner	Dummy variable: 1 if mother reports cohabiting with her partner, 0 if not (missing if no partner)		0.98
Mother's age	Categorial variable: Reported age grouped into 5-year bands.	<25 years	0.14
		25-29 years	0.24
		30-34 years	0.35
		35-39 years	0.23
		40+ years	0.04
Mother born in NZ	Dummy variable: 1 if mother reports being born in New Zealand, 0 if not.		0.67
Mother's prioritised ethnicity	Categorial variable: - Respondents are allocated a single ethnicity where the order of priority is Māori, Pacific Peoples, Asian, MELAA and Other, NZ European.	NZ European	0.58
		Māori	0.15
		Pasifika	0.10
		Asian	0.14
		MELAA	0.02
Mother's education	Categorial variable: Reported highest level of education of the mother.	No sec school qualification	0.04
		Sec school/NCEA 1-4	0.21
		Diploma/Trade cert/NCEA 5-6	0.30
		Bachelor's degree	0.26
		Higher degree	0.19
Mother's occupation	Categorial variable: Reported occupation of the mother if she reports to be employed.	Does not apply (not employed)	0.39
		Managers	0.07
		Professionals	0.30
		Clerical and administrative Workers	0.02
		Technicians and trades workers	0.04
		Machinery operators and drivers	0.12
		Community and personal service Workers	0.04
		Sales workers	0.00
		Labourers	0.02

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Notes: [a] Variables on partnership quality and helpfulness of family come from partner questionnaire and are thus only available for the sample of permanent fathers.

Table A.3 - Variable overview and summary statistics - fathers (sample: permanent fathers)

Variable	Description	Categories	Mean
SOCIO-ECONOMIC CHARACTERISTICS			
Partner is biological father	Dummy variable: 1 if fathers reports to be the biological father of the baby, 0 if not.		0.99
Father's age	Categorial variable: Reported age grouped into 5-year bands.	<25 years	0.05
		25-29 years	0.19
		30-34 years	0.33
		35-39 years	0.28
		40+ years	0.15
Father has criminal history (DCW1)	Dummy variable: 1 if father reports having a criminal history, 0 if not.		0.02
Father born in NZ	Dummy variable: 1 if father reports being born in New Zealand, 0 if not.		0.69
Father migrated as a kid (if migrant)	Dummy variable: 1 if migration year < birth year + 18, 0 if not, missing if father born in NZ.		0.02
Father's prioritised ethnicity	Categorial variable: Respondents are allocated a single ethnicity where the order of priority is Māori, Pacific Peoples, Asian, MELAA, Other, NZ European.	NZ European	0.65
		Māori	0.13
		Pasifika	0.08
		Asian	0.11
		MELAA	0.02
		Other	0.65
Father's education	Categorial variable: Reported highest level of education of the father.	No sec school qualification	0.05
		Sec school/NCEA 1-4	0.18
		Diploma/Trade cert/NCEA 5-6	0.37
		Bachelors degree	0.21
		Higher degree	0.19
Father's occupation	Categorial variable: Reported occupation of the father if he reports to be employed.	Does not apply / not employed	0.17
		Managers	0.18
		Professionals	0.29
		Clerical and administrative Workers	0.16
		Technicians and trades workers	0.03
		Machinery operators and drivers	0.04
		Community and personal service workers	0.04
		Sales workers	0.05
		Labourers	0.05
Income difference in $1000	Continuous variable: Difference between father's income and mother's income in $1000. Calculated by setting income equal to the average income within an income band, e.g. 10K for <20K, 25K for		2.96

	20-30K, 40K for 30-50K, 60K for 50-70K, 85K for 70-100K, 125K for 100-150K and 175K for >150K.		
Shiftwork (DCW1)	Dummy variable: 0 if father reports working a regular daily schedule, 1 if not.		0.20
Self-employed (DCW2)	Dummy variable: 1 if father reports being self-employed, 0 if not.		0.20
Fulltime (DCW1)	Dummy variable: 1 if father reports weekly actual working hours of 40 hours or more, 0 if not.		0.84
Overtime (DCW1)	Dummy variable: 1 if father reports weekly working hours of more than 40 hours, 0 if not.		0.60
HEALTH			
Mental health	Dummy variable: 1 if father reports having depression and/or anxiety/panic attacks diagnosed ever at any time in his life, 0 if not.		0.11
Physical health	Dummy variable: 1 if father reports having a disability, asthma, a heart disease/high blood pressure or diabetes diagnosed ever at any time in his life, 0 if not.		0.32
Subjective health	Dummy variable: 1 if father reports having a good, very good or excellent health, 0 if not.		0.88
PERSONALITY			
Big Five personality inventory	Five continuous variables: Average rating of a number of 8 statements/items per variable on a scale from 1 (Disagree strongly) to 5 (Agree strongly). Example: I see myself as someone who 1. Is talkative (E) 2. Tends to find fault with others (A) 3. Does things carefully and completely (C) 4. Is depressed, down (N) 5. Is original, comes up with new ideas (O)	Extraversion (E) Agreeableness (A) Conscientiousness (C) Neuroticism (N) Openness (O)	3.54 4.00 3.99 2.21 3.98
Perceived stress scale	Latent continuous variable: Predicted from factor analysis based on the father's evaluation of a list of 10 situations on a scale from 1 (Never) to 5 (Very often). Example: In the last four weeks, how often have you been upset because of something that happened unexpectedly?		-0.05
PSYCHO-SOCIAL CHARACTERISTICS (PARENTAL IDENTITY)			
Work-life balance (DCW1)	Dummy variable: 1 if father has a higher than mean self-assessed importance of a work-life balance (as a latent continuous measure predicted from factor analysis based on father's evaluation of		0.49

	8 statements on a scale from 1 (Strongly disagree) to 7 (Strongly agree). Example: Having both work and family responsibilities makes me a more well-rounded person.	
Perceived influence (DCW1)	Dummy variable: 1 if father thinks he positively affects the baby's development based a reported 5 or 6 on a scale from 1 (Not at all) to 6 (A great deal), 0 if not.	0.84
Parental identity (DCW2)	Dummy variable: 1 if father reports "being a parent" is an important part of who he is, 0 if not.	0.98
Parental confidence (DCW1)	Dummy variable: 1 if father reports he is confident when caring for his baby based a reported 5 or 6 on a scale from 1 (Not at all confident) to 6 (Completely confident), 0 if not.	0.86
Good parent (DCW2)	Dummy variable: 1 if father reports he is a better than average or very good parent, 0 if not.	0.81
Parental satisfaction (DCW1)	Continuous variable: Average rating of 3 statements on a scale from 1 (Strongly disagree) to 5 (Strongly agree). Statements: On the whole, I enjoy being a parent, Being a parent is very satisfying, On the whole, it's good to be a parent.	5.22

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Table A.4 - Full estimation results - outcome: GUiNZ participation

	(1)	(2)
	b/se	b/se
Is twin	0.045	0.015
	(0.044)	(0.042)
Is girl	-0.009	-0.006
	(0.013)	(0.013)
Pregnancy planned	0.113***	0.048***
	(0.016)	(0.016)
Number of siblings (Ref: None)		
One	-0.057***	-0.062***
	(0.020)	(0.020)
Two	-0.067***	-0.081***
	(0.024)	(0.024)
Three	-0.128***	-0.123***
	(0.032)	(0.033)
Four or more	-0.162***	-0.141***
	(0.037)	(0.039)
Youngest sibling under 5	0.014	-0.005
	(0.019)	(0.019)
Youngest sibling under 2	0.009	0.014
	(0.021)	(0.021)
Child's subjective health (Ref: Excellent)		
Very good	-0.024	-0.018
	(0.015)	(0.015)
Good	-0.033	-0.022
	(0.024)	(0.023)
Fair	0.022	0.038
	(0.037)	(0.035)
Child has developmental problems	0.000	-0.013
	(0.023)	(0.022)
HH type = Extended family	-0.119***	-0.040**
	(0.014)	(0.016)
Household income (Ref: Less than 20K)		
20-30K	0.077	0.046
	(0.057)	(0.055)
30-50K	0.180***	0.111**
	(0.049)	(0.048)
50-70K	0.229***	0.136***
	(0.048)	(0.047)
70-100K	0.278***	0.143***
	(0.047)	(0.047)
100-150K	0.329***	0.173***

	(0.047)	(0.048)
More than 150K	0.350***	0.180***
	(0.048)	(0.050)
Mother is married		0.085***
		(0.015)
Mother is cohabiting with partner		0.222***
		(0.047)
Mother's age (Ref: <25 years)		ref.
25-29 years		0.070***
		(0.024)
30-34 years		0.068***
		(0.025)
35-39 years		0.094***
		(0.027)
40+ years		0.089**
		(0.039)
Mother born in NZ		0.013
		(0.018)
Mother's prioritised ethnicity (Ref: NZ European)		
Māori		-0.067***
		(0.021)
Pasifika		-0.173***
		(0.027)
Asian		-0.101***
		(0.026)
MELAA or other		-0.004
		(0.043)
Mother's education (Ref: No sec qualification)		
Sec school/NCEA 1-4		0.064*
		(0.035)
Diploma/Trade cert/NCEA 5-6		0.031
		(0.035)
Bachelors degree		0.085**
		(0.037)
Higher degree		0.099**
		(0.039)
Mother's occupation (Ref: Professional or admin. worker)		
Not employed		-0.036**
		(0.016)
Managers		-0.027
		(0.029)
Technicians/ trades workers/ machinery operators		-0.097**
		(0.042)

Other		-0.002
		(0.022)
Observations	4,443	4,443
Pseudo R-squared	0.089	0.126

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Notes: *** for p<0.01, ** for p<0.05 and * for p<0.1.

Table A.5 - Full estimation results - outcome: involvement in day-to-day care

	DCW1				DCW2			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Is twin	-0.029	-0.015	-0.019	-0.009	0.156***	0.179***	0.179***	0.186***
	(0.054)	(0.053)	(0.053)	(0.053)	(0.056)	(0.056)	(0.056)	(0.055)
Is girl	-0.013	-0.016	-0.013	-0.013	-0.001	-0.000	0.003	0.003
	(0.017)	(0.016)	(0.016)	(0.016)	(0.018)	(0.017)	(0.017)	(0.017)
Pregnancy planned	-0.048**	-0.027	-0.027	-0.036*	-0.028	-0.009	-0.007	-0.015
	(0.022)	(0.021)	(0.021)	(0.021)	(0.022)	(0.022)	(0.022)	(0.022)
Number of siblings (Ref: None)								
One	0.001	-0.005	-0.001	-0.001	-0.004	0.001	0.010	0.011
	(0.028)	(0.027)	(0.027)	(0.027)	(0.030)	(0.029)	(0.029)	(0.029)
Two	-0.034	-0.031	-0.024	-0.025	-0.031	-0.019	-0.004	-0.003
	(0.033)	(0.033)	(0.033)	(0.032)	(0.035)	(0.035)	(0.035)	(0.035)
Three	0.098**	0.050	0.051	0.028	-0.021	-0.047	-0.038	-0.048
	(0.047)	(0.046)	(0.046)	(0.044)	(0.048)	(0.048)	(0.048)	(0.047)
Four or more	-0.000	-0.067	-0.052	-0.069	0.084	0.046	0.065	0.051
	(0.056)	(0.052)	(0.053)	(0.051)	(0.059)	(0.061)	(0.061)	(0.061)
Youngest sibling under 5	-0.093***	-0.036	-0.030	-0.016	-0.084***	-0.029	-0.026	-0.020
	(0.027)	(0.027)	(0.026)	(0.026)	(0.028)	(0.028)	(0.028)	(0.028)
Youngest sibling under 2	0.018	0.005	0.009	0.014	0.004	0.004	0.008	0.011
	(0.029)	(0.029)	(0.029)	(0.028)	(0.030)	(0.030)	(0.030)	(0.030)
Child's subjective health (Ref: Excellent)								
Very good	0.008	0.002	0.009	0.014	-0.023	-0.028	-0.026	-0.023
	(0.020)	(0.019)	(0.019)	(0.019)	(0.021)	(0.020)	(0.020)	(0.020)
Good	-0.027	-0.026	-0.017	-0.014	0.023	0.024	0.034	0.036
	(0.032)	(0.031)	(0.031)	(0.031)	(0.034)	(0.033)	(0.033)	(0.033)
Fair	0.032	0.024	0.025	0.023	-0.017	-0.012	-0.011	-0.012
	(0.052)	(0.050)	(0.050)	(0.049)	(0.053)	(0.052)	(0.052)	(0.052)
Develpmental problems	-0.000	-0.002	0.004	0.008	-0.024	-0.025	-0.021	-0.019
	(0.029)	(0.028)	(0.028)	(0.028)	(0.031)	(0.030)	(0.030)	(0.030)
HH type = Extended family	0.033	-0.009	-0.017	-0.024	0.034	0.001	-0.006	-0.009
	(0.022)	(0.022)	(0.022)	(0.022)	(0.024)	(0.024)	(0.024)	(0.024)
Household income (Ref: Less than 20K)								
20-30K	-0.002	0.031	0.011	0.019	-0.077	-0.031	-0.049	-0.047
	(0.092)	(0.078)	(0.080)	(0.077)	(0.093)	(0.094)	(0.093)	(0.093)

30-50K	-0.050	0.024	0.000	0.013	-0.134*	-0.079	-0.095	-0.089
	(0.079)	(0.066)	(0.068)	(0.066)	(0.079)	(0.081)	(0.081)	(0.080)
50-70K	-0.098	0.021	-0.000	0.019	-0.194**	-0.109	-0.123	-0.112
	(0.077)	(0.066)	(0.068)	(0.065)	(0.078)	(0.080)	(0.080)	(0.079)
70-100K	-0.095	0.035	0.016	0.029	-0.126	-0.035	-0.045	-0.040
	(0.077)	(0.065)	(0.067)	(0.065)	(0.077)	(0.079)	(0.079)	(0.079)
100-150K	-0.106	0.052	0.031	0.045	-0.160**	-0.049	-0.062	-0.057
	(0.077)	(0.066)	(0.068)	(0.066)	(0.077)	(0.080)	(0.080)	(0.080)
More than 150K	-0.112	0.072	0.055	0.064	-0.177**	-0.047	-0.059	-0.057
	(0.078)	(0.068)	(0.070)	(0.067)	(0.078)	(0.082)	(0.082)	(0.081)
Married	-0.043**	-0.015	-0.020	-0.019	-0.024	-0.009	-0.012	-0.011
	(0.021)	(0.020)	(0.020)	(0.020)	(0.022)	(0.022)	(0.022)	(0.022)
Cohabiting	-0.186*	-0.172*	-0.163*	-0.176*	-0.190	-0.210*	-0.200*	-0.205*
	(0.101)	(0.097)	(0.096)	(0.095)	(0.119)	(0.117)	(0.117)	(0.117)
Mother's age (Ref: <25 years)								
25-29 years	0.000	-0.003	0.006	0.013	-0.038	-0.073*	-0.072*	-0.069*
	(0.033)	(0.035)	(0.034)	(0.034)	(0.036)	(0.038)	(0.038)	(0.038)
30-34 years	0.021	0.021	0.029	0.032	-0.011	-0.057	-0.052	-0.054
	(0.034)	(0.038)	(0.038)	(0.037)	(0.037)	(0.042)	(0.042)	(0.041)
35-39 years	0.029	0.023	0.033	0.034	-0.001	-0.054	-0.050	-0.051
	(0.036)	(0.041)	(0.041)	(0.040)	(0.039)	(0.045)	(0.045)	(0.045)
40+ years	0.036	0.002	0.015	0.009	-0.038	-0.109*	-0.100*	-0.107*
	(0.052)	(0.055)	(0.054)	(0.053)	(0.055)	(0.059)	(0.059)	(0.059)
Mother born in NZ	-0.013	-0.018	-0.033	-0.025	-0.067***	-0.063***	-0.073***	-0.070***
	(0.019)	(0.021)	(0.021)	(0.021)	(0.020)	(0.022)	(0.022)	(0.022)
Mother's education (Ref: No sec qualification)								
Sec school/ NCEA 1-4	0.039	0.060	0.060	0.062	0.119**	0.135**	0.134**	0.131**
	(0.056)	(0.052)	(0.051)	(0.050)	(0.058)	(0.056)	(0.056)	(0.056)
Diploma/Trade cert/NCEA 5-6	0.012	0.038	0.041	0.045	0.097*	0.119**	0.119**	0.117**
	(0.055)	(0.051)	(0.050)	(0.050)	(0.057)	(0.055)	(0.055)	(0.055)
Bachelors degree	-0.019	0.027	0.024	0.031	0.072	0.096*	0.094*	0.094*
	(0.056)	(0.052)	(0.052)	(0.051)	(0.058)	(0.057)	(0.056)	(0.056)
Higher degree	0.009	0.043	0.048	0.058	0.085	0.087	0.089	0.090
	(0.057)	(0.054)	(0.053)	(0.052)	(0.059)	(0.058)	(0.058)	(0.058)
Partner is biological father		-0.080	-0.062	-0.040		0.114	0.132	0.141
		(0.096)	(0.095)	(0.092)		(0.108)	(0.107)	(0.106)
Father's age (Ref: <25 years)								
25-29 years		0.005	0.001	0.020		0.071	0.062	0.072
		(0.044)	(0.045)	(0.043)		(0.047)	(0.047)	(0.047)
30-34 years		-0.000	-0.009	0.010		0.076	0.062	0.073
		(0.046)	(0.047)	(0.045)		(0.049)	(0.050)	(0.049)
35-39 years		-0.007	-0.017	-0.001		0.098*	0.084	0.096*

	(0.049)	(0.049)	(0.047)	(0.051)	(0.052)	(0.051)
40+ years	0.070	0.066	0.084	0.141***	0.131**	0.145***
	(0.052)	(0.053)	(0.051)	(0.054)	(0.055)	(0.054)
Father criminal history	-0.022	-0.029	-0.013	0.009	0.005	0.015
	(0.065)	(0.064)	(0.063)	(0.072)	(0.072)	(0.071)
Father born in NZ	-0.056**	-0.062***	-0.049**	-0.016	-0.017	-0.009
	(0.022)	(0.022)	(0.022)	(0.024)	(0.024)	(0.024)
Father's prioritised ethnicity (Ref: NZ European)						
Māori	0.093***	0.087***	0.074***	0.043	0.040	0.035
	(0.027)	(0.027)	(0.027)	(0.028)	(0.028)	(0.028)
Pasifika	0.112***	0.081**	0.057	0.118***	0.106***	0.093**
	(0.035)	(0.036)	(0.035)	(0.037)	(0.038)	(0.038)
Asian	-0.032	-0.050	-0.052*	0.009	-0.006	-0.007
	(0.032)	(0.031)	(0.031)	(0.036)	(0.036)	(0.036)
MELAA and Other	0.044	0.037	0.016	0.068	0.058	0.044
	(0.059)	(0.058)	(0.056)	(0.064)	(0.063)	(0.063)
Father's education (Ref: No sec qualification)						
Sec school/NCEA 1-4	-0.036	-0.040	-0.046	-0.006	-0.011	-0.014
	(0.043)	(0.043)	(0.042)	(0.045)	(0.045)	(0.045)
Diploma/Trade cert/NCEA 5-6	-0.026	-0.037	-0.043	-0.016	-0.027	-0.030
	(0.041)	(0.041)	(0.040)	(0.043)	(0.043)	(0.043)
Bachelors degree	-0.081*	-0.091**	-0.087*	-0.030	-0.038	-0.037
	(0.045)	(0.045)	(0.045)	(0.048)	(0.048)	(0.047)
Higher degree	-0.035	-0.052	-0.047	0.023	0.012	0.012
	(0.047)	(0.047)	(0.047)	(0.049)	(0.049)	(0.049)
Father's occupation (Ref: Professionals and admin. workers)						
Not employed	0.028	0.025	0.022	-0.005	-0.011	-0.013
	(0.027)	(0.026)	(0.026)	(0.028)	(0.028)	(0.028)
Managers	-0.022	-0.025	-0.029	-0.023	-0.031	-0.034
	(0.025)	(0.025)	(0.025)	(0.027)	(0.027)	(0.026)
Technicians/ Trades workers/ machinery operators	0.069**	0.065**	0.056**	0.010	0.006	0.002
	(0.027)	(0.027)	(0.026)	(0.028)	(0.028)	(0.028)
Other	0.056*	0.057*	0.047	0.037	0.037	0.032
	(0.030)	(0.030)	(0.030)	(0.032)	(0.032)	(0.032)
Income difference in K$	-0.010***	-0.009***	-0.008***	-0.016***	-0.016***	-0.015***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Father shiftwork (DCW1)	0.042**	0.040*	0.034*	0.013	0.006	0.003
	(0.020)	(0.020)	(0.020)	(0.022)	(0.022)	(0.022)
Father self-employed (DCW2)	-0.021	-0.028	-0.029	-0.050**	-0.058**	-0.060***
	(0.022)	(0.022)	(0.021)	(0.023)	(0.023)	(0.023)
Father fulltime (DCW1)	-0.121***	-0.131***	-0.128***	-0.023	-0.032	-0.030
	(0.026)	(0.026)	(0.026)	(0.029)	(0.029)	(0.029)

Father overtime (DCW1)		-0.076***	-0.079***	-0.075***		-0.078***	-0.083***	-0.078***
		(0.020)	(0.020)	(0.019)		(0.021)	(0.021)	(0.021)
Mental health			-0.023	-0.012			-0.070**	-0.065**
			(0.028)	(0.027)			(0.029)	(0.029)
Physical health			-0.017	-0.015			0.004	0.005
			(0.018)	(0.018)			(0.019)	(0.019)
Subjective health			0.009	-0.006			0.012	0.001
			(0.026)	(0.026)			(0.028)	(0.028)
Extraversion			-0.016	-0.029**			0.026*	0.018
			(0.013)	(0.012)			(0.013)	(0.013)
Agreeableness			0.024	0.006			0.005	-0.005
			(0.017)	(0.016)			(0.018)	(0.018)
Conscientiousness			0.041***	0.029**			0.024	0.016
			(0.015)	(0.015)			(0.016)	(0.016)
Neuroticism			0.008	0.007			0.035**	0.036**
			(0.016)	(0.016)			(0.017)	(0.017)
Openness			0.026*	0.014			0.021	0.014
			(0.016)	(0.016)			(0.017)	(0.017)
Perceived stress scale			0.009	0.014			0.008	0.011
			(0.011)	(0.011)			(0.012)	(0.012)
Relationship quality			0.018*	0.009			0.031***	0.026**
			(0.010)	(0.010)			(0.010)	(0.010)
Average helpfulness of family			0.039***	0.027***			0.022**	0.014
			(0.009)	(0.009)			(0.009)	(0.010)
Perceived influence (DCW1)				0.123***				0.055**
				(0.026)				(0.026)
Parental identity (DCW2)				-0.012				-0.052
				(0.056)				(0.060)
Parental confidence (DCW1)				0.108***				0.052*
				(0.027)				(0.027)
Good parent (DCW2)				0.038*				0.055**
				(0.022)				(0.023)
Parental satisfaction (DCW1)				0.069***				0.036**
				(0.014)				(0.014)
Work-life balance				-0.016				-0.013
				(0.017)				(0.018)
Observations	3,098	3,098	3,098	3,098	3,098	3,098	3,098	3,098
Pseudo R-squared	0.022	0.076	0.088	0.114	0.022	0.057	0.066	0.074

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Notes: *** for p<0.01, ** for p<0.05 and * for p<0.1.

Table A.6 - Full estimation results - outcome: leave taking

	Marginal effects of logit estimation – Dependent variable: Father took more than 2 weeks of leave				Linear estimation – Dependent variable: Weeks of leave			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Is twin	0.170***	0.184***	0.174***	0.175***	0.686*	0.804**	0.686*	0.694*
	(0.043)	(0.043)	(0.044)	(0.044)	(0.399)	(0.400)	(0.405)	(0.406)
Is girl	-0.002	-0.007	-0.009	-0.008	0.083	0.053	0.054	0.060
	(0.016)	(0.016)	(0.016)	(0.016)	(0.126)	(0.126)	(0.126)	(0.127)
Pregnancy planned	0.006	0.008	0.005	0.004	-0.206	-0.182	-0.188	-0.180
	(0.021)	(0.021)	(0.021)	(0.021)	(0.160)	(0.161)	(0.161)	(0.162)
Number of siblings (Ref: None)								
One	-0.067**	-0.066**	-0.066**	-0.067**	-0.610***	-0.580***	-0.543**	-0.553***
	(0.030)	(0.029)	(0.030)	(0.030)	(0.211)	(0.213)	(0.214)	(0.214)
Two	-0.115***	-0.104***	-0.107***	-0.109***	-0.897***	-0.810***	-0.784***	-0.793***
	(0.031)	(0.032)	(0.032)	(0.032)	(0.249)	(0.254)	(0.255)	(0.257)
Three	-0.086*	-0.092**	-0.094**	-0.098**	-0.816**	-0.831**	-0.814**	-0.853**
	(0.044)	(0.043)	(0.043)	(0.043)	(0.353)	(0.359)	(0.360)	(0.361)
Four or more	-0.142***	-0.131***	-0.133***	-0.137***	-1.205***	-1.165***	-1.176***	-1.186***
	(0.047)	(0.049)	(0.049)	(0.048)	(0.429)	(0.443)	(0.444)	(0.445)
Youngest sibling under 5	0.022	0.028	0.032	0.033	0.380*	0.483**	0.503**	0.519**
	(0.028)	(0.028)	(0.028)	(0.028)	(0.203)	(0.207)	(0.207)	(0.207)
Youngest sibling under 2	0.028	0.020	0.020	0.019	-0.084	-0.096	-0.113	-0.112
	(0.028)	(0.028)	(0.028)	(0.028)	(0.216)	(0.216)	(0.216)	(0.217)
Child's subjective health (Ref: Excellent)								
Very good	0.021	0.015	0.010	0.011	0.047	0.015	-0.003	0.009
	(0.019)	(0.019)	(0.019)	(0.019)	(0.148)	(0.148)	(0.148)	(0.148)
Good	0.009	0.005	-0.005	-0.005	-0.077	-0.082	-0.138	-0.130
	(0.032)	(0.031)	(0.031)	(0.031)	(0.241)	(0.241)	(0.242)	(0.242)
Fair	-0.110***	-0.110***	-0.114***	-0.113***	-0.448	-0.504	-0.527	-0.505
	(0.037)	(0.037)	(0.037)	(0.037)	(0.376)	(0.376)	(0.376)	(0.377)
Develpmental problems	0.025	0.024	0.026	0.027	0.017	0.006	0.010	0.022
	(0.027)	(0.027)	(0.027)	(0.027)	(0.216)	(0.216)	(0.216)	(0.216)
HH type = Extended family	-0.010	-0.019	-0.015	-0.016	0.066	0.022	0.044	0.046
	(0.023)	(0.023)	(0.023)	(0.023)	(0.173)	(0.181)	(0.182)	(0.182)
Household Income (Ref: Less than 20K)								
20-30K	0.044	0.032	0.016	0.020	0.053	0.099	-0.074	0.005
	(0.099)	(0.091)	(0.090)	(0.089)	(0.818)	(0.818)	(0.817)	(0.817)
30-50K	0.018	0.015	0.016	0.019	0.311	0.458	0.388	0.444
	(0.085)	(0.078)	(0.079)	(0.078)	(0.711)	(0.710)	(0.710)	(0.710)
50-70K	0.069	0.075	0.073	0.078	0.885	1.119	1.035	1.095
	(0.083)	(0.077)	(0.079)	(0.077)	(0.700)	(0.702)	(0.702)	(0.702)
70-100K	0.059	0.070	0.065	0.068	0.751	1.032	0.914	0.977
	(0.083)	(0.076)	(0.078)	(0.077)	(0.696)	(0.699)	(0.699)	(0.699)

100-150K	0.094	0.109	0.106	0.110	0.830	1.172*	1.099	1.168*
	(0.083)	(0.077)	(0.078)	(0.077)	(0.698)	(0.703)	(0.703)	(0.704)
More than 150K	0.046	0.071	0.066	0.067	0.709	1.142	1.081	1.135
	(0.083)	(0.078)	(0.079)	(0.078)	(0.705)	(0.712)	(0.712)	(0.713)
Married	-0.027	-0.033	-0.027	-0.027	-0.302*	-0.272*	-0.222	-0.211
	(0.020)	(0.020)	(0.020)	(0.020)	(0.157)	(0.160)	(0.161)	(0.161)
Cohabiting	-0.009	0.014	0.018	0.017	0.357	0.482	0.525	0.512
	(0.100)	(0.098)	(0.097)	(0.097)	(0.768)	(0.779)	(0.779)	(0.779)
Mother's age (Ref: <25 years)								
25-29 years	-0.011	-0.015	-0.020	-0.018	-0.107	-0.142	-0.152	-0.145
	(0.034)	(0.036)	(0.036)	(0.036)	(0.274)	(0.289)	(0.289)	(0.289)
30-34 years	0.019	0.009	0.006	0.007	0.241	0.188	0.176	0.183
	(0.034)	(0.039)	(0.040)	(0.039)	(0.277)	(0.313)	(0.312)	(0.313)
35-39 years	0.058	0.048	0.044	0.046	0.527*	0.448	0.423	0.431
	(0.037)	(0.043)	(0.043)	(0.043)	(0.292)	(0.336)	(0.335)	(0.335)
40+ years	0.114**	0.082	0.081	0.082	0.654	0.452	0.460	0.471
	(0.055)	(0.059)	(0.060)	(0.060)	(0.398)	(0.440)	(0.439)	(0.440)
Mother born in NZ	-0.021	-0.012	-0.001	-0.001	-0.144	-0.104	-0.045	-0.031
	(0.018)	(0.020)	(0.020)	(0.020)	(0.141)	(0.158)	(0.160)	(0.160)
Mother's education (Ref: No sec qualification)								
Sec school/ NCEA 1-4	0.058	0.060	0.058	0.059	0.435	0.470	0.427	0.432
	(0.056)	(0.057)	(0.058)	(0.058)	(0.452)	(0.453)	(0.452)	(0.452)
Diploma/Trade cert/NCEA 5-6	0.046	0.041	0.038	0.039	0.370	0.369	0.303	0.311
	(0.055)	(0.056)	(0.057)	(0.057)	(0.445)	(0.446)	(0.446)	(0.446)
Bachelors degree	0.059	0.054	0.055	0.056	0.329	0.346	0.297	0.299
	(0.055)	(0.057)	(0.057)	(0.057)	(0.450)	(0.454)	(0.454)	(0.454)
Higher degree	0.048	0.035	0.029	0.030	0.346	0.316	0.208	0.216
	(0.056)	(0.058)	(0.058)	(0.058)	(0.459)	(0.465)	(0.466)	(0.466)
Partner is biological father		-0.171*	-0.188**	-0.185**		-1.141	-1.216	-1.223
		(0.089)	(0.088)	(0.088)		(0.807)	(0.806)	(0.806)
Father's age (Ref: <25 years)								
25-29 years		0.013	0.013	0.015		0.208	0.197	0.260
		(0.048)	(0.048)	(0.048)		(0.387)	(0.387)	(0.388)
30-34 years		0.025	0.029	0.031		0.181	0.185	0.236
		(0.050)	(0.049)	(0.049)		(0.399)	(0.399)	(0.400)
35-39 years		0.022	0.022	0.023		0.279	0.252	0.282
		(0.051)	(0.051)	(0.051)		(0.413)	(0.414)	(0.414)
40+ years		0.047	0.044	0.046		0.414	0.376	0.406
		(0.055)	(0.054)	(0.054)		(0.433)	(0.435)	(0.435)
Father criminal history		-0.154	-0.163	-0.162		-0.165	-0.164	-0.180
		(0.101)	(0.101)	(0.101)		(0.566)	(0.565)	(0.565)
Father born in NZ		0.018	0.021	0.024		-0.190	-0.158	-0.137

	(0.021)	(0.022)	(0.022)	(0.170)	(0.173)	(0.173)
Father's prioritised ethnicity (Ref: NZ European)						
Māori	0.006	0.006	0.006	0.241	0.237	0.226
	(0.027)	(0.026)	(0.026)	(0.207)	(0.208)	(0.209)
Pasifika	0.004	0.019	0.017	-0.145	-0.080	-0.087
	(0.035)	(0.037)	(0.037)	(0.269)	(0.277)	(0.278)
Asian	0.047	0.060*	0.064*	-0.018	0.053	0.092
	(0.034)	(0.035)	(0.036)	(0.255)	(0.257)	(0.258)
MELAA and other	0.007	0.007	0.005	-0.314	-0.317	-0.315
	(0.064)	(0.063)	(0.063)	(0.493)	(0.493)	(0.493)
Father's education (Ref: No sec qualification)						
Sec school/NCEA 1-4	0.032	0.026	0.027	0.242	0.191	0.175
	(0.040)	(0.040)	(0.041)	(0.344)	(0.344)	(0.344)
Diploma/Trade cert/NCEA 5-6	0.076**	0.077**	0.076*	0.545*	0.527	0.496
	(0.038)	(0.039)	(0.039)	(0.328)	(0.328)	(0.328)
Bachelors degree	0.058	0.055	0.056	0.543	0.497	0.489
	(0.042)	(0.042)	(0.042)	(0.360)	(0.362)	(0.362)
Higher degree	0.099**	0.098**	0.099**	0.616*	0.588	0.585
	(0.045)	(0.045)	(0.045)	(0.374)	(0.375)	(0.376)
Father's occupation (Ref: Professionals and admin. workers)						
Managers	-0.080***	-0.071***	-0.072***	-0.311*	-0.223	-0.228
	(0.021)	(0.021)	(0.021)	(0.175)	(0.176)	(0.176)
Technicians/ trades workers/ machinery operators	-0.009	0.002	0.000	0.263	0.333*	0.322*
	(0.026)	(0.026)	(0.026)	(0.191)	(0.192)	(0.192)
Other	0.005	0.013	0.012	0.222	0.305	0.300
	(0.029)	(0.029)	(0.029)	(0.216)	(0.216)	(0.216)
Income difference in K$	0.001	0.001	0.002	-0.010	-0.010	-0.008
	(0.002)	(0.002)	(0.002)	(0.015)	(0.015)	(0.015)
Father shiftwork (DCW1)	0.092***	0.091***	0.090***	0.211	0.203	0.191
	(0.020)	(0.020)	(0.020)	(0.163)	(0.163)	(0.163)
Father self-employed (DCW2)	-0.081***	-0.077***	-0.079***	-0.498***	-0.488***	-0.491***
	(0.022)	(0.022)	(0.022)	(0.162)	(0.162)	(0.162)
Father fulltime (DCW1)	-0.090***	-0.083***	-0.083***	-0.564**	-0.519**	-0.506**
	(0.027)	(0.027)	(0.027)	(0.224)	(0.224)	(0.225)
Father overtime (DCW1)	0.007	0.013	0.014	-0.175	-0.143	-0.136
	(0.020)	(0.020)	(0.020)	(0.153)	(0.153)	(0.154)
Mental health		0.024	0.024		0.012	0.027
		(0.027)	(0.027)		(0.218)	(0.218)
Physical health		0.011	0.011		0.120	0.123
		(0.017)	(0.018)		(0.137)	(0.138)
Subjective health		-0.061**	-0.063**		-0.324	-0.318
		(0.025)	(0.025)		(0.209)	(0.210)

Extraversion			-0.011	-0.012			-0.141	-0.148
			(0.012)	(0.012)			(0.095)	(0.096)
Agreeableness			-0.014	-0.015			-0.189	-0.206
			(0.016)	(0.016)			(0.128)	(0.129)
Conscientiousness			-0.040***	-0.042***			-0.237**	-0.248**
			(0.014)	(0.014)			(0.114)	(0.114)
Neuroticism			-0.020	-0.020			-0.087	-0.095
			(0.016)	(0.016)			(0.123)	(0.123)
Openness			0.014	0.012			0.228*	0.207*
			(0.016)	(0.016)			(0.122)	(0.123)
Perceived stress scale			-0.011	-0.010			0.045	0.052
			(0.011)	(0.011)			(0.086)	(0.086)
Relationship quality			0.019**	0.019*			0.160**	0.164**
			(0.010)	(0.010)			(0.076)	(0.077)
Average helpfulness of family			-0.020**	-0.022**			-0.133*	-0.147**
			(0.009)	(0.009)			(0.069)	(0.070)
Perceived influence (DCW1)				0.008				0.245
				(0.024)				(0.182)
Parental identity (DCW2)				-0.008				0.184
				(0.053)				(0.427)
Parental confidence (DCW1)				0.033				0.312
				(0.025)				(0.194)
Good parent (DCW2)				0.000				-0.352**
				(0.021)				(0.167)
Parental satisfaction (DCW1)				0.006				0.035
				(0.013)				(0.100)
Work-life balance				-0.005				-0.064
				(0.016)				(0.129)
Constant					1.137	1.854	3.594**	3.159*
					(1.065)	(1.347)	(1.627)	(1.710)
Observations	2,539	2,539	2,539	2,539	2,539	2,539	2,539	2,539
Pseudo R-squared	0.026	0.059	0.070	0.071	0.019	0.039	0.048	0.052

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Notes: *** for p<0.01, ** for p<0.05 and * for p<0.1.

Table A.7 - Full estimation results - outcome: quality of care

	Marginal effects of logit estimation – Dependent variable: Father provides better than average quality care				Linear estimation – Dependent variable: Points on quality (std)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Is twin	-0.013	-0.018	-0.031	-0.017	0.042	0.039	0.028	0.044
	(0.054)	(0.054)	(0.053)	(0.052)	(0.056)	(0.056)	(0.055)	(0.054)
Is girl	-0.018	-0.019	-0.017	-0.018	-0.016	-0.016	-0.013	-0.015
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.017)	(0.017)
Pregnancy planned	0.015	0.023	0.028	0.019	0.020	0.027	0.031	0.018
	(0.022)	(0.022)	(0.022)	(0.021)	(0.023)	(0.023)	(0.022)	(0.022)
Number of siblings (Ref: None)								
One	-0.134***	-0.124***	-0.112***	-0.114***	-0.149***	-0.141***	-0.126***	-0.127***
	(0.029)	(0.030)	(0.029)	(0.029)	(0.030)	(0.030)	(0.029)	(0.029)
Two	-0.228***	-0.218***	-0.193***	-0.195***	-0.237***	-0.228***	-0.199***	-0.200***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.036)	(0.036)	(0.035)	(0.035)
Three	-0.196***	-0.195***	-0.190***	-0.209***	-0.207***	-0.213***	-0.205***	-0.229***
	(0.048)	(0.049)	(0.048)	(0.047)	(0.049)	(0.049)	(0.048)	(0.047)
Four or more	-0.184***	-0.184***	-0.153**	-0.171***	-0.247***	-0.252***	-0.212***	-0.232***
	(0.060)	(0.061)	(0.061)	(0.060)	(0.060)	(0.062)	(0.060)	(0.059)
Youngest sibling under 5	-0.088***	-0.070**	-0.060**	-0.046*	-0.133***	-0.110***	-0.097***	-0.080***
	(0.027)	(0.027)	(0.027)	(0.027)	(0.029)	(0.029)	(0.029)	(0.028)
Youngest sibling under 2	0.001	-0.005	0.003	0.013	0.045	0.035	0.045	0.055*
	(0.029)	(0.029)	(0.028)	(0.028)	(0.031)	(0.030)	(0.030)	(0.029)
Child's subjective health (Ref: Excellent)								
Very good	-0.016	-0.017	-0.013	-0.008	-0.010	-0.011	-0.005	0.001
	(0.020)	(0.020)	(0.020)	(0.020)	(0.021)	(0.021)	(0.020)	(0.020)
Good	-0.106***	-0.102***	-0.090***	-0.087***	-0.154***	-0.149***	-0.134***	-0.128***
	(0.033)	(0.032)	(0.032)	(0.032)	(0.034)	(0.034)	(0.033)	(0.033)
Fair	-0.016	-0.009	0.003	0.009	-0.080	-0.071	-0.059	-0.053
	(0.051)	(0.051)	(0.050)	(0.050)	(0.054)	(0.053)	(0.052)	(0.051)
Develpmental problems	-0.011	-0.015	-0.007	-0.002	-0.007	-0.013	-0.002	0.004
	(0.030)	(0.030)	(0.029)	(0.029)	(0.031)	(0.031)	(0.030)	(0.030)
HH type = Extended family	-0.018	-0.032	-0.040*	-0.044*	-0.020	-0.033	-0.045*	-0.052**
	(0.023)	(0.024)	(0.024)	(0.023)	(0.024)	(0.025)	(0.024)	(0.024)
Household income (Ref: Less than 20K)								
20-30K	-0.008	0.007	-0.017	-0.007	0.060	0.085	0.050	0.060
	(0.090)	(0.089)	(0.088)	(0.086)	(0.094)	(0.093)	(0.091)	(0.089)
30-50K	-0.010	0.029	0.017	0.029	0.001	0.062	0.042	0.054
	(0.077)	(0.076)	(0.075)	(0.074)	(0.080)	(0.080)	(0.078)	(0.077)
50-70K	-0.019	0.040	0.028	0.044	-0.001	0.081	0.060	0.080
	(0.075)	(0.075)	(0.074)	(0.073)	(0.079)	(0.079)	(0.077)	(0.076)
70-100K	-0.008	0.048	0.043	0.052	-0.011	0.064	0.052	0.064

	(0.074)	(0.074)	(0.073)	(0.072)	(0.078)	(0.078)	(0.076)	(0.075)
100-150K	0.009	0.069	0.065	0.076	0.015	0.090	0.078	0.092
	(0.075)	(0.075)	(0.074)	(0.073)	(0.078)	(0.079)	(0.077)	(0.076)
More than 150K	0.015	0.074	0.069	0.076	0.039	0.104	0.088	0.096
	(0.076)	(0.077)	(0.076)	(0.075)	(0.080)	(0.080)	(0.079)	(0.077)
Married	0.017	0.026	0.029	0.031	0.033	0.044*	0.046**	0.049**
	(0.021)	(0.022)	(0.022)	(0.021)	(0.022)	(0.023)	(0.022)	(0.022)
Cohabiting	-0.056	-0.045	-0.029	-0.042	-0.014	0.010	0.025	0.008
	(0.104)	(0.104)	(0.102)	(0.100)	(0.108)	(0.108)	(0.105)	(0.103)
Mother's age (Ref: <25 years)								
25-29 years	0.043	0.034	0.040	0.046	0.062*	0.047	0.058	0.064*
	(0.035)	(0.038)	(0.037)	(0.037)	(0.037)	(0.040)	(0.039)	(0.038)
30-34 years	0.052	0.051	0.059	0.061	0.062*	0.039	0.053	0.053
	(0.036)	(0.041)	(0.040)	(0.040)	(0.037)	(0.043)	(0.042)	(0.041)
35-39 years	0.002	0.004	0.008	0.008	0.042	0.019	0.026	0.025
	(0.038)	(0.044)	(0.044)	(0.043)	(0.039)	(0.046)	(0.045)	(0.044)
40+ years	0.026	0.015	0.031	0.022	0.009	-0.036	-0.010	-0.023
	(0.053)	(0.059)	(0.058)	(0.057)	(0.055)	(0.061)	(0.060)	(0.059)
Mother born in NZ	0.103***	0.078***	0.067***	0.071***	0.110***	0.083***	0.066***	0.071***
	(0.019)	(0.022)	(0.022)	(0.021)	(0.020)	(0.023)	(0.022)	(0.022)
Mother's education (Ref: No sec qualification)								
Sec school/ NCEA 1-4	0.109*	0.102*	0.093	0.095*	0.149**	0.135**	0.123**	0.124**
	(0.058)	(0.058)	(0.057)	(0.056)	(0.060)	(0.059)	(0.058)	(0.057)
Diploma/Trade cert/NCEA 5-6	0.091	0.087	0.081	0.086	0.149**	0.139**	0.132**	0.134**
	(0.057)	(0.057)	(0.056)	(0.056)	(0.059)	(0.059)	(0.057)	(0.056)
Bachelors degree	0.092	0.074	0.061	0.068	0.168***	0.138**	0.122**	0.128**
	(0.058)	(0.058)	(0.058)	(0.057)	(0.060)	(0.060)	(0.059)	(0.058)
Higher degree	0.179***	0.146**	0.139**	0.150**	0.241***	0.187***	0.179***	0.190***
	(0.059)	(0.060)	(0.059)	(0.059)	(0.061)	(0.062)	(0.060)	(0.059)
Partner is biological father		-0.030	0.014	0.033		-0.187*	-0.126	-0.105
		(0.108)	(0.108)	(0.105)		(0.109)	(0.107)	(0.105)
Father's age (Ref: <25 years)								
25-29 years		0.042	0.021	0.042		0.055	0.024	0.048
		(0.048)	(0.048)	(0.047)		(0.050)	(0.049)	(0.048)
30-34 years		0.022	-0.006	0.015		0.058	0.019	0.043
		(0.050)	(0.050)	(0.049)		(0.053)	(0.052)	(0.051)
35-39 years		-0.000	-0.030	-0.011		0.028	-0.013	0.012
		(0.053)	(0.052)	(0.051)		(0.055)	(0.054)	(0.053)
40+ years		0.020	-0.008	0.014		0.062	0.025	0.054
		(0.056)	(0.055)	(0.054)		(0.058)	(0.057)	(0.056)
Father criminal history		-0.079	-0.096	-0.084		-0.127*	-0.148**	-0.132*
		(0.071)	(0.070)	(0.069)		(0.074)	(0.072)	(0.071)

Father born in NZ	0.003	0.004	0.016	-0.002	-0.004	0.013
	(0.023)	(0.023)	(0.023)	(0.024)	(0.024)	(0.024)
Father's prioritised ethnicity (Ref: NZ European)						
Māori	0.046*	0.041	0.026	0.036	0.026	0.010
	(0.027)	(0.027)	(0.027)	(0.028)	(0.028)	(0.028)
Pasifika	0.074**	0.071**	0.045	0.079**	0.068*	0.038
	(0.035)	(0.035)	(0.035)	(0.037)	(0.037)	(0.037)
Asian	-0.048	-0.047	-0.057*	-0.086**	-0.088**	-0.098***
	(0.035)	(0.035)	(0.034)	(0.037)	(0.036)	(0.036)
MELAA and other	-0.102*	-0.111*	-0.133**	-0.097	-0.114*	-0.143**
	(0.060)	(0.059)	(0.057)	(0.064)	(0.063)	(0.061)
Father's education (Ref: No sec qualification)						
Sec school/NCEA 1-4	0.123***	0.106**	0.104**	0.132***	0.105**	0.100**
	(0.044)	(0.044)	(0.043)	(0.046)	(0.045)	(0.044)
Diploma/Trade cert/NCEA 5-6	0.106**	0.080*	0.078*	0.085*	0.047	0.044
	(0.042)	(0.041)	(0.041)	(0.044)	(0.043)	(0.042)
Bachelors degree	0.123***	0.096**	0.100**	0.127***	0.086*	0.090*
	(0.046)	(0.046)	(0.045)	(0.048)	(0.048)	(0.047)
Higher degree	0.156***	0.127***	0.130***	0.167***	0.124**	0.125**
	(0.048)	(0.048)	(0.047)	(0.050)	(0.049)	(0.049)
Father's occupation (Ref: Professionals and admin. workers)						
	0.005	-0.002	-0.007	0.009	0.002	-0.003
	(0.028)	(0.028)	(0.027)	(0.029)	(0.028)	(0.028)
Managers	-0.035	-0.037	-0.040	-0.027	-0.031	-0.037
	(0.026)	(0.026)	(0.025)	(0.027)	(0.026)	(0.026)
Technicians/ trades workers/ machinery operators	-0.034	-0.029	-0.037	-0.084***	-0.076***	-0.084***
	(0.028)	(0.027)	(0.027)	(0.029)	(0.028)	(0.028)
Other	0.020	0.026	0.016	-0.001	0.010	-0.002
	(0.031)	(0.031)	(0.031)	(0.033)	(0.032)	(0.031)
Income difference in K$	-0.007***	-0.006***	-0.006***	-0.009***	-0.008***	-0.007***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Father shiftwork (DCW1)	-0.011	-0.018	-0.021	0.013	0.002	-0.002
	(0.022)	(0.022)	(0.021)	(0.023)	(0.022)	(0.022)
Father self-employed (DCW2)	0.030	0.017	0.014	0.018	-0.001	-0.005
	(0.022)	(0.022)	(0.022)	(0.023)	(0.023)	(0.022)
Father fulltime (DCW1)	-0.121***	-0.131***	-0.131***	-0.144***	-0.158***	-0.159***
	(0.029)	(0.029)	(0.028)	(0.030)	(0.029)	(0.029)
Father overtime (DCW1)	0.004	0.005	0.009	-0.007	-0.006	0.001
	(0.021)	(0.021)	(0.021)	(0.022)	(0.022)	(0.021)
Mental health		0.027	0.035		-0.003	0.007
		(0.029)	(0.028)		(0.029)	(0.029)
Physical health		0.011	0.013		0.008	0.011

			(0.018)	(0.018)			(0.019)	(0.019)
Subjective health			0.045*	0.034			0.047*	0.030
			(0.027)	(0.027)			(0.028)	(0.027)
Extraversion			0.036***	0.021			0.039***	0.021
			(0.013)	(0.013)			(0.013)	(0.013)
Agreeableness			0.028	0.010			0.029*	0.007
			(0.017)	(0.017)			(0.018)	(0.017)
Conscientiousness			0.007	-0.001			0.010	-0.002
			(0.015)	(0.015)			(0.016)	(0.015)
Neuroticism			0.020	0.017			0.017	0.015
			(0.016)	(0.016)			(0.017)	(0.017)
Openness			0.072***	0.062***			0.107***	0.095***
			(0.016)	(0.016)			(0.017)	(0.017)
Perceived stress scale			0.018	0.022*			0.012	0.017
			(0.011)	(0.011)			(0.012)	(0.012)
Relationship quality			0.045***	0.035***			0.055***	0.044***
			(0.010)	(0.010)			(0.010)	(0.010)
Average helpfulness of family			0.025***	0.013			0.039***	0.024**
			(0.009)	(0.009)			(0.010)	(0.009)
Perceived influence (DCW1)				0.085***				0.100***
				(0.024)				(0.025)
Parental identity (DCW2)				0.104*				0.095
				(0.060)				(0.059)
Parental confidence (DCW1)				0.044*				0.051*
				(0.026)				(0.026)
Good parent (DCW2)				0.044**				0.088***
				(0.022)				(0.023)
Parental satisfaction (DCW1)				0.073***				0.089***
				(0.013)				(0.014)
Work-life balance				-0.014				-0.024
				(0.017)				(0.017)
Constant					0.559***	0.700***	-0.091	-0.618***
					(0.134)	(0.174)	(0.211)	(0.220)
Observations	3,098	3,098	3,098	3,098	3,098	3,098	3,098	3,098
Pseudo R-squared	0.065	0.083	0.105	0.124	0.111	0.146	0.188	0.221

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Notes: *** for p<0.01, ** for p<0.05 and * for p<0.1.

Table A.8 - Heterogeneity analysis by ethnicity - outcome: high involvement (9m)

	NZ European		Māori		Pasifika	
	Involvement at 9m		Involvement at 9m		Involvement at 9m	
	Not much or Some of the time	Most or All of the time	Not much or Some of the time	Most or All of the time	Not much or Some of the time	Most or All of the time
Observations	1,390	622	237	180	118	128
	69.09%	30.91%	56.83%	43.17%	47.97%	52.03%
Is twin	0.03	0.03	0.03	0.03	0.03	0.00**
Is girl	0.50	0.48	0.52	0.50	0.51	0.41
Pregnancy planned	0.83	0.80	0.65	0.58	0.53	0.47
Number of siblings						
None	0.38	0.46***	0.32	0.38	0.31	0.34
One	0.40	0.35**	0.33	0.29	0.29	0.29
Two	0.16	0.14	0.23	0.13***	0.21	0.17
Three	0.04	0.04	0.05	0.12***	0.08	0.11
Four or more	0.02	0.01	0.07	0.08	0.11	0.09
Youngest sibling under 5	0.51	0.40***	0.49	0.38***	0.47	0.48
Youngest sibling under 2	0.13	0.11	0.14	0.13	0.16	0.17
Child's subjective health						
Excellent	0.64	0.65	0.60	0.53	0.52	0.64**
Very good	0.25	0.25	0.25	0.32	0.33	0.26
Good	0.08	0.07	0.10	0.11	0.15	0.07**
Fair or poor	0.03	0.03	0.05	0.04	0.00	0.03*
Child has developmental problem	0.12	0.12	0.09	0.11	0.09	0.09
HH type = Extended family	0.10	0.12	0.21	0.32**	0.50	0.50
Household income						
Less than 20K	0.00	0.01	0.03	0.02	0.02	0.05
20-30K	0.02	0.02	0.02	0.03	0.05	0.05
30-50K	0.06	0.06	0.13	0.16	0.14	0.20
50-70K	0.13	0.11	0.21	0.18	0.17	0.23
70-100K	0.24	0.25	0.27	0.29	0.31	0.16**
100-150K	0.31	0.29	0.26	0.24	0.19	0.22
More than 150K	0.24	0.25	0.09	0.08	0.11	0.09
Mother is married	0.78	0.71***	0.62	0.51**	0.63	0.73*
Mother is cohabiting	1.00	0.99*	0.98	0.97	0.99	0.97
Mother's age						
<25 years	0.07	0.08	0.18	0.19	0.13	0.19
25-29 years	0.19	0.19	0.28	0.32	0.40	0.25**
30-34 years	0.39	0.37	0.36	0.28	0.27	0.35
35-39 years	0.30	0.30	0.16	0.17	0.17	0.19
40+ years	0.05	0.06	0.02	0.04	0.03	0.02

Mother born in NZ	0.76	0.75	0.88	0.89	0.59	0.55
Mother's prioritised ethnicity						
NZ European	0.86	0.83**	0.57	0.46**	0.24	0.16
Māori	0.07	0.09	0.37	0.46*	0.17	0.16
Pasifika	0.02	0.02	0.04	0.06	0.55	0.64
Asian	0.04	0.04	0.02	0.02	0.03	0.03
MELAA	0.01	0.03***	0.00	0.00	0.01	0.01
Mother's education						
Sec school/NCEA 1-4	0.15	0.18	0.24	0.24	0.32	0.33
Diploma/Trade cert/NCEA 5-6	0.26	0.23	0.28	0.32	0.28	0.36
Bachelors degree	0.31	0.30	0.26	0.26	0.21	0.12**
Higher degree	0.26	0.27	0.14	0.14	0.12	0.13
Mother's occupation						
Does not apply / not employed	0.33	0.22***	0.41	0.40	0.40	0.48
Managers	0.08	0.13***	0.04	0.08**	0.07	0.05
Professionals	0.38	0.41	0.30	0.27	0.20	0.21
Technicians and trades workers	0.03	0.02	0.02	0.01	0.01	0.02
Community and personal service workers	0.03	0.04	0.05	0.05	0.05	0.07
Clerical and administrative workers	0.12	0.12	0.12	0.13	0.16	0.10
Sales workers	0.03	0.04	0.02	0.04	0.06	0.03
Labourers	0.01	0.01	0.04	0.02	0.03	0.04
Partner is biological father	0.99	0.99*	1.00	0.99	1.00	0.99
Father’s age						
<25 years	0.04	0.05	0.09	0.12	0.09	0.15
25-29 years	0.15	0.16	0.26	0.28	0.31	0.23
30-34 years	0.33	0.32	0.36	0.31	0.28	0.23
35-39 years	0.32	0.28**	0.24	0.16*	0.20	0.26
40+ years	0.16	0.20**	0.05	0.13***	0.12	0.14
Father has criminal history	0.01	0.01	0.05	0.04	0.01	0.04
Father born in NZ	0.81	0.75***	0.96	0.96	0.53	0.47
Father’s education						
No sec school qualification	0.03	0.04	0.09	0.16*	0.09	0.15
Sec school/NCEA 1-4	0.15	0.18**	0.21	0.24	0.33	0.36
Diploma/Trade cert/NCEA 5-6	0.37	0.38	0.43	0.43	0.38	0.37
Bachelors degree	0.24	0.18***	0.16	0.12	0.09	0.08
Higher degree	0.22	0.23	0.11	0.06	0.10	0.05
Father’s occupation						
Does not apply / not employed	0.14	0.16	0.22	0.26	0.19	0.25
Managers	0.24	0.17***	0.14	0.10	0.08	0.05
Professionals	0.33	0.32	0.22	0.16	0.20	0.08***
Technicians and trades workers	0.14	0.18**	0.17	0.16	0.11	0.17
Community and personal service workers	0.02	0.04***	0.04	0.04	0.03	0.05
Clerical and administrative workers	0.04	0.03	0.06	0.04	0.10	0.03**

Sales workers	0.04	0.04	0.02	0.06**	0.04	0.05
Machinery operators anddrivers	0.02	0.03	0.06	0.08	0.14	0.20
Labourers	0.04	0.03	0.08	0.09	0.10	0.13
Income difference in K$	4.02	2.05***	2.67	1.23***	1.65	0.89**
Father works in shifts	0.17	0.21**	0.24	0.23	0.26	0.29
Father is self-employed	0.23	0.23	0.15	0.12	0.10	0.08
Farther is fulltime employed	0.92	0.77***	0.86	0.68***	0.85	0.73**
Father works more than 40 hours per week	0.70	0.52***	0.67	0.48***	0.51	0.44
Father has any mental health diagnosis	0.13	0.14	0.10	0.12	0.06	0.03
Father has any physical health diagnosis	0.33	0.32	0.40	0.43	0.25	0.30
In good (subjective) health	0.91	0.91	0.84	0.78	0.73	0.83*
Big five personality traits						
Extraversion	3.55	3.51	3.60	3.54	3.49	3.44
Agreeableness	3.93	4.01***	4.01	4.00	4.14	4.15
Conscientiousness	3.98	4.00	3.93	3.91	3.92	4.00
Neuroticism	2.21	2.20	2.17	2.23	2.13	2.28*
Openness	3.97	4.02*	4.05	4.00	3.92	3.87
Perceived stress scale	-0.12	-0.16	-0.08	0.13**	0.28	0.44
High importance of work-life balance (> median) (9m)	0.47	0.42*	0.55	0.52	0.60	0.55
Thinks he has influence on his child's development (9m)	0.78	0.91***	0.80	0.91***	0.84	0.94**
Being a parent is important part of identity (2y)	0.97	0.97	0.99	0.98	0.99	1.00
Feels confident parenting (9m)	0.84	0.91***	0.82	0.95***	0.88	0.97***
Thinks he is a better-than-average parent (2y)	0.78	0.84***	0.76	0.80	0.81	0.86
Satisfaction with being parent (9m)	5.04	5.30***	5.22	5.48***	5.39	5.64***
Relationship quality	0.01	0.17***	-0.18	-0.16	-0.22	-0.18
Average helpfulness of family	-0.08	0.05***	0.21	0.31	0.36	0.43

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Notes: Significant starts in columns 2,4 and 6 refer to the significance levels of a t-test for mean equality between fathers with low and high involvement with *** for p<0.01, ** for p<0.05 and * for p<0.1.

Table A.9 – Heterogeneity analysis by ethnicity - outcome: quality of care

	NZ European		Māori		Pasifika	
	Quality care		Quality care		Quality care	
	< Mean	>Mean	< Mean	>Mean	< Mean	>Mean
Observations	961	1,051	194	223	117	129
	47.76%	52.24%	46.52%	53.48%	47.56%	52.44%
Is twin	0.04	0.02	0.03	0.04	0.00	0.03*
Is girl	0.50	0.49	0.56	0.47*	0.50	0.43
Pregnancy planned	0.78	0.85***	0.57	0.66*	0.46	0.53
Number of siblings						
None	0.27	0.53***	0.23	0.45*	0.21	0.42***
One	0.45	0.33***	0.33	0.30	0.29	0.29
Two	0.21	0.10***	0.24	0.14**	0.28	0.11***
Three	0.05	0.03**	0.10	0.05*	0.10	0.09
Four or more	0.03	0.01***	0.10	0.04**	0.11	0.09
Youngest sibling under 5	0.61	0.36***	0.56	0.34***	0.56	0.40**
Youngest sibling under 2	0.16	0.09***	0.17	0.10**	0.21	0.13
Child's subjective health						
Excellent	0.61	0.68***	0.57	0.58	0.55	0.61
Very good	0.26	0.24	0.28	0.27	0.28	0.30
Good	0.09	0.06***	0.12	0.09	0.16	0.06**
Fair or poor	0.04	0.02***	0.03	0.06	0.01	0.02
Child has developmental problem	0.12	0.11	0.10	0.10	0.10	0.08
HH type = Extended family	0.11	0.10	0.26	0.26	0.53	0.47
Household income						
Less than 20K	0.01	0.00	0.03	0.02	0.06	0.02*
20-30K	0.02	0.01	0.03	0.02	0.06	0.04
30-50K	0.07	0.06*	0.13	0.14	0.21	0.14
50-70K	0.15	0.11***	0.23	0.17	0.24	0.17
70-100K	0.26	0.22*	0.28	0.28	0.21	0.26
100-150K	0.28	0.32**	0.24	0.26	0.16	0.25*
More than 150K	0.21	0.27***	0.07	0.10	0.07	0.13
Mother is married	0.75	0.77	0.55	0.59	0.69	0.67
Mother is cohabiting	1.00	1.00	0.99	0.96*	0.97	0.99
Mother's age						
<25 years	0.07	0.07	0.17	0.19	0.21	0.12*
25-29 years	0.18	0.20	0.27	0.32	0.35	0.29
30-34 years	0.35	0.42***	0.35	0.30	0.27	0.35
35-39 years	0.34	0.26***	0.18	0.16	0.15	0.20
40+ years	0.06	0.05	0.03	0.03	0.02	0.04
Mother born in NZ	0.75	0.77	0.89	0.89	0.47	0.67***
Mother's prioritised ethnicity						
NZ European	0.83	0.87**	0.51	0.53	0.13	0.26*

Māori	0.09	0.06***	0.42	0.40	0.10	0.22*
Pasifika	0.01	0.02	0.05	0.05	0.72	0.49***
Asian	0.04	0.04	0.02	0.02	0.05	0.02
MELAA	0.02	0.01*	0.00	0.00	0.00	0.02
Mother's education						
Sec school/NCEA 1-4	0.17	0.15	0.22	0.26	0.37	0.29
Diploma/Trade cert/NCEA 5-6	0.28	0.22***	0.34	0.26	0.32	0.32
Bachelors degree	0.30	0.31	0.26	0.26	0.12	0.20*
Higher degree	0.22	0.30***	0.11	0.17*	0.09	0.16
Mother's occupation						
Does not apply / not employed	0.35	0.24***	0.44	0.38	0.49	0.40
Managers	0.06	0.12***	0.04	0.07	0.03	0.08
Professionals	0.34	0.43***	0.28	0.29	0.21	0.21
Technicians and trades workers	0.03	0.03	0.02	0.01	0.01	0.02
Community and personal service workers	0.04	0.03	0.06	0.04	0.08	0.05
Clerical and administrative workers	0.13	0.10**	0.11	0.13	0.08	0.18**
Sales workers	0.03	0.03	0.01	0.04**	0.04	0.05
Machinery operators and drivers	0.00	0.00	0.00	0.00	0.02	0.00
Labourers	0.01	0.01	0.03	0.03	0.05	0.02
Partner is biological father	1.00	0.99	0.99	1.00	1.00	0.99
Father’s age						
<25 years	0.04	0.04	0.08	0.13	0.15	0.10
25-29 years	0.14	0.17**	0.27	0.26	0.26	0.26
30-34 years	0.29	0.36***	0.35	0.34	0.25	0.26
35-39 years	0.34	0.28***	0.21	0.20	0.22	0.24
40+ years	0.19	0.15**	0.10	0.08	0.12	0.14
Father has criminal history	0.01	0.01*	0.07	0.02**	0.01	0.04
Father born in NZ	0.80	0.78	0.97	0.95	0.43	0.57**
Father’s education						
No sec school qualification	0.05	0.02***	0.16	0.09**	0.10	0.14
Sec school/NCEA 1-4	0.15	0.17	0.21	0.24	0.40	0.29*
Diploma/Trade cert/NCEA 5-6	0.40	0.34***	0.44	0.43	0.40	0.35
Bachelors degree	0.21	0.23	0.11	0.16	0.04	0.12**
Higher degree	0.19	0.24***	0.08	0.09	0.05	0.09
Father’s occupation						
Does not apply / not employed	0.13	0.15	0.23	0.25	0.21	0.23
Managers	0.26	0.18***	0.10	0.14	0.03	0.09*
Professionals	0.29	0.36***	0.18	0.21	0.15	0.12
Technicians and trades workers	0.15	0.15	0.18	0.15	0.18	0.11
Community and personal service workers	0.02	0.03**	0.03	0.05	0.02	0.07**
Clerical and administrative workers	0.04	0.03	0.07	0.03*	0.04	0.09*
Sales workers	0.04	0.04	0.04	0.03	0.04	0.05
Machinery operators and drivers	0.03	0.02***	0.10	0.05*	0.16	0.17

Labourers	0.04	0.03	0.08	0.09	0.15	0.08*
Income difference in K$	4.34	2.56***	2.35	1.79	1.90	0.67***
Father works in shifts	0.19	0.18	0.24	0.24	0.28	0.27
Father is self-employed	0.22	0.24	0.15	0.12	0.05	0.12**
Farther is fulltime employed	0.91	0.84***	0.78	0.78	0.81	0.77
Father works more than 40 hours per week	0.69	0.60***	0.56	0.61	0.46	0.48
Father has any mental health diagnosis	0.12	0.14	0.09	0.13	0.03	0.06
Father has any physical health diagnosis	0.32	0.34	0.40	0.43	0.30	0.26
In good (subjective) health	0.90	0.92**	0.78	0.83	0.76	0.80
Big five personality traits						
Extraversion	3.48	3.59***	3.52	3.63*	3.40	3.53*
Agreeableness	3.92	3.99***	3.97	4.04	4.10	4.19
Conscientiousness	3.99	3.99	3.88	3.96	3.90	4.02
Neuroticism	2.21	2.21	2.23	2.17	2.25	2.16
Openness	3.90	4.06***	3.98	4.07	3.82	3.96**
Perceived stress scale	-0.11	-0.15	0.03	-0.00	0.42	0.31
High importance of work-life balance (> median) (9m)	0.48	0.43**	0.56	0.51	0.63	0.53*
Thinks he has influence on his child's development (9m)	0.76	0.88***	0.79	0.90***	0.84	0.94**
Being a parent is important part of identity (2y)	0.96	0.98**	0.99	0.98	0.99	1.00
Feels confident parenting (9m)	0.84	0.87*	0.85	0.90*	0.91	0.95
Thinks he is a better-than-average parent (2y)	0.75	0.84***	0.78	0.78	0.79	0.88*
Satisfaction with being parent (9m)	4.97	5.26***	5.23	5.41***	5.46	5.57
Relationship quality	-0.08	0.19***	-0.32	-0.05***	-0.49	0.06***
Average helpfulness of family	-0.11	0.02***	0.10	0.39***	0.35	0.45

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Notes: Significant starts in columns 2,4 and 6 refer to the significance levels of a t-test for mean equality between fathers with low and high involvement with *** for p<0.01, ** for p<0.05 and * for p<0.1.

Table A.10 - Heterogeneity analysis by ethnicity - outcome: leave taking

	NZ European		Māori		Pasifika	
	Parental leave		Parental leave		Parental leave	
	≤ 2 weeks	> 2 weeks	≤ 2 weeks	> 2 weeks	≤ 2 weeks	> 2 weeks
Observations	961	1,051	194	223	117	129
	47.76%	52.24%	46.52%	53.48%	47.56%	52.44%
Is twin	0.02	0.05***	0.02	0.09**	0.01	0.06
Is girl	0.49	0.48	0.54	0.49	0.41	0.54
Pregnancy planned	0.82	0.85	0.64	0.74	0.53	0.57
Number of siblings						
None	0.38	0.44**	0.32	0.46**	0.32	0.29
One	0.39	0.40	0.34	0.32	0.26	0.29
Two	0.17	0.11***	0.20	0.15	0.20	0.26
Three	0.04	0.04	0.07	0.03	0.09	0.09
Four or more	0.02	0.01	0.07	0.03	0.13	0.09
Youngest sibling under 5	0.50	0.46	0.45	0.35	0.49	0.43
Youngest sibling under 2	0.12	0.13	0.13	0.09	0.16	0.17
Child's subjective health						
Excellent	0.65	0.63	0.57	0.57	0.55	0.60
Very good	0.24	0.27	0.27	0.34	0.32	0.29
Good	0.07	0.09	0.11	0.06	0.12	0.11
Fair or poor	0.04	0.02*	0.06	0.03	0.01	0.00
Child has developmental problem	0.11	0.13	0.11	0.06	0.07	0.14
HH type = Extended family	0.10	0.10	0.26	0.17	0.51	0.43
Household income						
Less than 20K	0.00	0.00	0.02	0.00	0.03	0.00
20-30K	0.02	0.01	0.01	0.00	0.05	0.06
30-50K	0.06	0.03**	0.11	0.05	0.16	0.11
50-70K	0.12	0.13	0.22	0.15	0.22	0.14
70-100K	0.24	0.21	0.29	0.25	0.18	0.37**
100-150K	0.30	0.36**	0.26	0.43***	0.26	0.17
More than 150K	0.26	0.26	0.10	0.12	0.10	0.14
Mother is married	0.78	0.74	0.58	0.65	0.72	0.66
Mother is cohabiting	1.00	0.99	0.97	1.00	0.99	0.94**
Mother's age						
<25 years	0.06	0.05	0.14	0.17	0.12	0.11
25-29 years	0.20	0.17	0.32	0.20*	0.35	0.26
30-34 years	0.40	0.36	0.33	0.40	0.29	0.43
35-39 years	0.29	0.35*	0.18	0.18	0.22	0.11
40+ years	0.05	0.07*	0.02	0.05	0.02	0.09**
Mother born in NZ	0.75	0.73	0.88	0.88	0.54	0.66
Mother's prioritised ethnicity						

NZ European	0.85	0.87	0.54	0.69**	0.17	0.29
Māori	0.08	0.05**	0.38	0.29	0.18	0.20
Pasifika	0.02	0.02	0.06	0.00**	0.62	0.49
Asian	0.03	0.05*	0.02	0.02	0.03	0.03
MELAA	0.02	0.01	0.00	0.00	0.00	0.00
Mother's education						
Sec school/NCEA 1-4	0.16	0.15	0.23	0.26	0.33	0.29
Diploma/Trade cert/NCEA 5-6	0.26	0.24	0.30	0.22	0.33	0.29
Bachelors degree	0.30	0.32	0.28	0.31	0.16	0.26
Higher degree	0.26	0.28	0.14	0.15	0.12	0.14
Mother's occupation						
Does not apply / not employed	0.30	0.28	0.36	0.31	0.46	0.34
Managers	0.10	0.10	0.07	0.08	0.05	0.11
Professionals	0.38	0.42	0.30	0.40	0.22	0.20
Technicians and trades workers	0.03	0.02	0.02	0.00	0.01	0.00
Community and personal service workers	0.03	0.04	0.07	0.00**	0.05	0.06
Clerical and administrative workers	0.12	0.10	0.12	0.14	0.10	0.26**
Sales workers	0.03	0.03	0.02	0.05	0.05	0.03
Machinery operators and drivers	0.00	0.00	0.00	0.00	0.01	0.00
Labourers	0.01	0.01	0.04	0.03	0.04	0.00
Partner is biological father	1.00	0.98***	1.00	1.00	1.00	1.00
Father’s age						
<25 years	0.03	0.03	0.07	0.03	0.10	0.09
25-29 years	0.15	0.13	0.26	0.23	0.28	0.26
30-34 years	0.33	0.32	0.32	0.46**	0.25	0.29
35-39 years	0.32	0.31	0.25	0.22	0.26	0.20
40+ years	0.17	0.20*	0.11	0.06	0.12	0.17
Father has criminal history	0.01	0.00	0.05	0.00*	0.02	0.03
Father born in NZ	0.79	0.78	0.97	0.91**	0.47	0.69**
Father’s education						
No sec school qualification	0.04	0.01**	0.10	0.09	0.16	0.03**
Sec school/NCEA 1-4	0.17	0.12**	0.25	0.17	0.34	0.31
Diploma/Trade cert/NCEA 5-6	0.36	0.39	0.42	0.46	0.36	0.40
Bachelors degree	0.23	0.20	0.15	0.18	0.06	0.20***
Higher degree	0.21	0.27**	0.08	0.09	0.08	0.06
Father’s occupation						
Managers	0.28	0.16***	0.16	0.18	0.08	0.09
Professionals	0.36	0.44***	0.25	0.26	0.17	0.23
Technicians and trades workers	0.18	0.16	0.21	0.22	0.18	0.17
Community and personal service workers	0.02	0.08***	0.06	0.05	0.05	0.09
Clerical and administrative workers	0.04	0.05	0.06	0.11	0.08	0.11
Sales workers	0.05	0.05	0.05	0.02	0.06	0.06
Machinery operators and drivers	0.03	0.03	0.09	0.11	0.21	0.17

Labourers	0.04	0.03	0.12	0.06	0.16	0.09
Income difference in K$	3.71	3.51	2.51	2.94	1.55	1.83
Father works in shifts	0.15	0.26***	0.25	0.34	0.27	0.20
Father is self-employed	0.25	0.18**	0.16	0.12	0.08	0.11
Farther is fulltime employed	0.90	0.83***	0.86	0.88	0.85	0.86
Father works more than 40 hours per week	0.68	0.61**	0.64	0.68	0.55	0.46
Father has any mental health diagnosis	0.12	0.13	0.10	0.09	0.04	0.11*
Father has any physical health diagnosis	0.33	0.31	0.38	0.43	0.28	0.34
In good (subjective) health	0.92	0.90	0.84	0.85	0.80	0.60**
Big five personality traits						
Extraversion	3.55	3.51	3.57	3.54	3.43	3.46
Agreeableness	3.97	3.97	4.04	3.89*	4.15	4.12
Conscientiousness	4.02	3.94**	3.95	3.86	3.99	3.88
Neuroticism	2.21	2.13*	2.19	2.17	2.20	2.28
Openness	3.96	4.00	4.00	4.09	3.84	4.01
Perceived stress scale	-0.15	-0.22	-0.01	-0.09	0.34	0.58
High importance of work-life balance (> median) (9m)	0.46	0.44	0.55	0.49	0.58	0.54
Thinks he has influence on his child's development (9m)	0.81	0.83	0.84	0.88	0.89	0.89
Being a parent is important part of identity (2y)	0.97	0.98	0.99	0.97	0.99	1.00
Feels confident parenting (9m)	0.86	0.88	0.88	0.86	0.93	0.89
Thinks he is a better-than-average parent (2y)	0.80	0.80	0.78	0.82	0.84	0.80
Satisfaction with being parent (9m)	5.12	5.16	5.32	5.22	5.53	5.33*
Relationship quality	0.04	0.15**	-0.16	0.09*	-0.26	0.10
Average helpfulness of family	-0.02	-0.13**	0.29	0.17	0.32	0.40

Source: GUiNZ DCW0, DCW1 and DCW2, own calculations and illustrations.

Notes: Significant starts in columns 2,4 and 6 refer to the significance levels of a t-test for mean equality between fathers with low and high involvement with *** for p<0.01, ** for p<0.05 and * for p<0.1.

Table A.11 – Items list for CBQ variables

		Negative effect	Low effortful control	Low surgency
1	{name} seems always in a big hurry to get from one place to another			x(r)
2	{name} gets quite frustrated when prevented from doing something {he/she} wants	x		
3	When drawing or colouring in a book, {name} shows strong concentration		x(r)	
4	{name} likes going down high slides or other adventurous activities			x(r)
5	{name} is quite upset by a little cut or bruise	x		
6	{name} prepares for trips and outings by planning things {he/she} will need		x(r)	
7	{name} often rushes into new situations			x(r)
8	{name} tends to become sad if the family's plans don't work out	x		
9	{name} likes being sung to		x(r)	
10	{name} seems to be at ease with almost any person			x(r)
11	{name} is afraid of burglars or the "boogie man"	x		
12	{name} notices it when parents are wearing new clothing		x(r)	
13	{name} prefers quiet activities to active games			x
14	When angry about something, {name} tends to stay upset for ten minutes or longer	x		
15	When building or putting something together, becomes very involved in what {name} is doing		x(r)	
16	{name} likes to go high and fast when pushed on a swing			x(r)
17	{name} seems to feel depressed when unable to accomplish some tasks	x		
18	{name} is good at following instructions		x(r)	
19	{name} takes a long time in approaching new situations			x
20	{name} hardly ever complains when ill with a cold	x(r)		
21	{name} likes the sound of words, such as nursery rhymes		x(r)	
22	{name} is sometimes shy even around people {he/she} has known for a long time			x
23	{name} is very difficult to soothe when {he/she} has become upset	x		
24	{name} is quickly aware of some new item in the living room		x(r)	
25	{name} is full of energy, even in the evening			x(r)
26	{name} is not afraid of the dark	x(r)		
27	{name} sometimes becomes absorbed in a picture book and looks at it for a long time		x(r)	
28	{name} likes rough and rowdy games			x(r)
29	{name} is not very upset at minor cuts or bruises	x(r)		
30	{name} approaches places {he/she} has been told are dangerous slowly or cautiously		x(r)	
31	{name} is slow and unhurried in deciding what to do next			x
32	{name} gets angry when {he/she} can't find something {he/she} wants to play with	x		
33	{name} enjoys gentle rhythmic activities such as rocking or swaying		x(r)	
34	{name} sometimes turns away shyly from new acquaintances			x
35	{name} becomes upset when loved relatives or friends are getting ready to leave	x		
36	{name} comments when a parent has changed his/her appearance		x(r)	

Source: GUiNZ DCW5, own calculations and illustrations.

Notes: Items marked with a (r) are reversed.

Table A.12 – Items list for SDQ variables

		Emotional problems	Peer problems	Hyper-activity	Antisocial behaviour
1	{name} Considerate of other people's feelings at 54 months				X(r)
2	{name} is restless, overactive, cannot stay still for long at 54 month			x	
3	{name} often complains of headaches, stomach-aches, or sickness at 54 months	x			
4	{name} shares readily with other children (treats, toys, pencils, etc.) at 54 months				X(r)
6	{name} rather solitary, prefers to play alone at 54 months		x		
8	{name} worries or often seems worried at 54 months	x			
9	{name} helpful if someone is hurt, upset or feeling ill at 54 months				X(r)
10	{name} is constantly fidgeting or squirming at 54 months			x	
11	{name} has at least one good friend at 54 months		x		
13	{name} is often unhappy, down-hearted or tearful at 54 months	x			
14	{name} is generally liked by other children at 54 months		x		
15	{name} is easily distracted, concentration wanders at 54 months			x	
16	{name} is nervous or clingy in new situations, easily loses confidence at 54 months	x			
17	{name} is kind to younger children				X(r)
19	{name} is picked on or bullied by other children at 54 months		x		
20	{name} often volunteers to help others (parents, teachers, other children) at 54 months				X(r)
23	{name} gets on better with adults than with other children at 54 months		x		
24	{name} has many fears, is easily scared at 54 months	x			
29	{name} thinks things out before acting at 54 months			x	
31	{name} has good attention span, sees chores or work through to the end at 54months			x	

Source: GUiNZ DCW5, own calculations and illustrations.

Notes: Items marked with a (r) are reversed

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