



Parenthood and the distribution of intra-household inequalities in wellbeing

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Received: 19 October 2021 / Accepted: 26 October 2022 / Published online: 7 March 2023
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Abstract

While there is a large body of literature on the effects of parenthood on wellbeing, an intra-household perspective has, thus far, been limited. This is an important research gap given that the experience of raising children is typically associated with interdependencies between mothers and fathers. Taking an intra-household approach, this study generates new insights into the complex puzzle of the impacts of parenthood on wellbeing drawing on longitudinal data of Australian mixed-sex couple households. We identify how subjective wellbeing (SWB) changes with the number of children a couple has and the presence of a newborn child, and whether these changes in SWB are gendered. We also examine the pattern of these changes, accounting for anticipation and adaptation effects associated with parenthood. The results reveal mostly negative associations between parenthood and wellbeing, but the distribution of these effects is not always equal within households. In particular, the negative consequences of having more than one child appear to be more pronounced for women compared to men. We establish that this gendered effect is likely due to relatively large time conflicts experienced by mothers in these situations.

Keywords Intra-household Inequality · Parenthood · Gender

1 Introduction

Although there are a large number of empirical studies on the impact of having children on wellbeing, issues relating to the intra-household aspects of parenthood are currently under-researched. This is somewhat surprising since most often parenthood is a transition that both partners in a couple relationship experience together. This study aims to redress the gap in the empirical literature on the links between parenthood and wellbeing by contributing an intra-household analysis of how parenthood influences men's and women's overall life satisfaction, as well as satisfaction with their financial situation, their partner, and the free time they have.

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Drawing on a detailed household survey data from Australia, it considers how the effects of parenthood are distributed within the household, with the aim of helping to ensure adequate policies can be designed to address issues relating to the wellbeing of mothers and fathers.¹

This study contributes to the growing body of literature in economics that is concerned with intra-household allocations. Many early studies of the household have relied on a unitary model of the household which assumed that household members acted as a single decision-making unit with a joint budget constraint, and that all household resources were essentially pooled (Becker, 1991). As such, the sources of contributions of resources to the household (for example, his versus her earnings) were not considered to affect the allocation of household resources or, in turn, the intra-household distribution of wellbeing. Applied to the issue of parenthood, the unitary model implies that the impact of children on the wellbeing of household members will not be influenced by who takes up the paid and unpaid roles associated with provisioning the child's needs. In other words, according to the unitary model, the tasks associated with raising children will be distributed within the household in a way which simply ensures that total household utility will be maximised and that this parallels to the wellbeing of all members of the household.

Collective models of the household provide more useful guidance for studies of the different impacts of parenthood on men and women within the same household. These models recognise that individuals within a household will typically have different and sometimes conflicting preferences (see for example, Apps & Rees, 1988; Chiappori, 1988). As a result, the intra-household distribution of resources will be affected by the distribution of bargaining power which could lead to asymmetry in wellbeing amongst partners (Browning & Chiappori, 1998). We draw on the collective approaches to intra-household processes to explore the changes in the distribution of subjective wellbeing (SWB) that arise with parenthood. For a comprehensive view into these effects we focus on four domains of SWB, including, overall life satisfaction, financial satisfaction, partner satisfaction, and free time satisfaction.

We take account of both the positive changes in wellbeing that are experienced by many parents as well as possible negative impacts (such as time and financial pressures), and how these are distributed within the household. As such, depending on each partner's contribution towards parenting (for example paid work versus unpaid housework), their own and their partner's wellbeing may be influenced in a way which could exhibit gendered outcomes in overall life satisfaction. Since the distribution of wellbeing might be affected by a partners' participation in paid versus unpaid work (and thus their claim over financial resources within the household) there are also good reasons to expect that the financial pressures of parenthood are more prevalent for mothers than fathers. In many countries parenthood typically leads to career interruptions with many women spending less time in paid work and more time in unpaid work, due to parental leave and ongoing child rearing responsibilities, with subsequent impacts on earnings (see Breusch & Gray, 2004; Baxter et al., 2008; Angelov et al., 2016; Austen & Mavisakalyan 2018). Thus, women are more likely to experience a fall in their ability to influence expenditure decisions within their households, and the impacts of parenthood on their financial wellbeing might be especially large. One of the primary sources of conflict among couples is unmet expectations with regard to gender division of domestic labour and childcare (Mencarini and Sironi, 2012). Conflict

¹ Haddad and Kanbur (1990, p. 879) argue more generally that intra-household effects need to be considered in the policy design process – as failing to do so may lead to under- or over-estimation of poverty levels.

may be particularly pronounced for women who often have commitments to both the labour market and childrearing tasks, which can lead to work overload (Perry-Jenkins et al., 2007). Furthermore, parenthood is associated with the increased caring needs of children leading to time conflicts and resulting in less time spent with one's spouse (Pailhe & Solaz, 2009; Dew & Wilcox, 2011). This may exacerbate the conflictual elements within the household, resulting in changes to levels of partner satisfaction.

We also examine the intertemporal effects of parenthood. Accounting for anticipation effects is important given that many children are pre-planned and pregnancy might thus be associated with a higher level of wellbeing. It might also be the case that the positive change in wellbeing diminishes after the initial excitement of having a child. Furthermore, because the division of labour associated with the care of very young children tends to be highly gendered, with women typically taking on the primary care roles (Baxter et al., 2008), there is also good reason to expect that the process of adaptation following the birth of a child will differ between mothers and fathers with different implications on wellbeing.

This study is arranged as follows: Section 2 provides a literature review of studies on parenthood and wellbeing, followed by a description of the Household, Income, and Labour Dynamics in Australia (HILDA) survey and measures used within this study in Section 3. The empirical strategy is explained in Section 4. Section 5 includes results from the intra-household analysis of the effects of parenthood on wellbeing. Finally, Section 6 provides a summary discussion of the implications of the findings and some concluding remarks.

2 Background

Over the last few decades, there has been a remarkable rise in the number of economic studies attempting to measure wellbeing, with the aim of achieving a more direct evaluation of various aspects of individuals' lives than is possible from, for example, measures of income (see Clark, 2018 for a review). Most quantitative studies of wellbeing rely on survey data of people's levels of satisfaction with various elements of their lives, including their finances and relationships.

Studies of individuals' SWB typically include controls for the number of children, acknowledging how children can be a key determinant of SWB. Therefore, despite the effect of parenthood not being their main focus, a large number of studies have produced insights into the impacts of parenthood on SWB. Additionally, during the 2010s, a number of studies directly addressing the effects of children on SWB have been conducted, motivated by concern for the impacts of the global financial crisis on the costs of raising children (see for example, Cooper, 2014). A number of studies analysed the SWB of parents at this time to elucidate reasons for lower fertility rates in several countries (see for example, Aassve et al., 2015). Increased women's workforce participation and changing social norms also motivated studies of parental SWB around this time (see for example, Milkie et al., 2010). In total, the literature on the effects of parenthood and SWB is now quite substantial. However, as discussed below and summarised in Table 1, the evidence on the effects of parenthood and SWB is still quite mixed.

2.1 Parenthood and SWB

Many studies of SWB have concluded that children are associated with negative or insignificant effects. Early studies reviewed by McLanahan and Adams, (1987), for example, found that individuals with children reported lower levels of happiness and overall life

Table 1 Summary of literature on parenthood and SWB

| Author | Country | Survey | Empirical strategy | Data | Analysis by gender | Overall parenthood effect |
|-----------------------------|-----------------------|--|------------------------|-----------------|--------------------|---------------------------|
| Di Tella et al. (2003) | 12 European countries | Euro-Barometer Survey | Ordered probit with FE | Panel | No | Negative |
| Alesina et al. (2004) | 12 European countries | Euro-Barometer Survey | Ordered logit | Cross-sectional | No | Negative |
| Clark (2006) | United Kingdom | British Household Panel Survey | OLS | Cross sectional | No | Negative |
| Stanca (2012) | 94 countries | World Values Survey | OLS | Cross sectional | No | Negative |
| Stutzer and Frey (2004) | Germany | German Socio-Economic Panel Study | OLS with FE | Panel | No | Positive |
| Pollmann-Schult (2014) | Germany | German Socio-Economic Panel Study | OLS with FE | Panel | No | Positive |
| Haller and Hadler (2006) | 41 countries | World Values Survey | Multilevel regression | Cross sectional | No | Positive |
| Mikucka (2016) | Russia | Russia Longitudinal Monitoring Survey | OLS with FE | Panel | Yes | Positive |
| Radó (2020) | Hungary | Turning Points of Life Course Survey | Multivariate analysis | Panel | No | Positive |
| Nomaguchi and Milkic (2003) | United States | National Survey of Families and Household | OLS | Panel | Yes | Mixed |
| Shields and Wooden (2003) | Australia | Household, Income and Labour Dynamics in Australia | Ordered probit | Cross sectional | Yes | Negative |

Table 1 (continued)

| | | | | | | | | |
|---|----------------|--|---|------------------------|--------------------|--|---|---|
| Ambrey and Fleming (2014) | Australia | Household, Income and Labour Dynamics in Australia | Ordered Logit | Panel | No | Negative | | |
| Dockery (2010) | Australia | Household, Income and Labour Dynamics in Australia | Ordered probit | Cross sectional | Yes | Negative | | |
| Powdthavee et al. (2015) | Australia | Household, Income and Labour Dynamics in Australia | Multiple mediation analysis | Pooled cross-sectional | Yes | Insignificant | | |
| Panel B: Studies accounting for intertemporal effects of parenthood | | | | | | | | |
| Author | Country | Survey | Empirical strategy | Data | Analysis by gender | Anticipation | Year of Birth | Adaptation |
| Clark et al. (2008) | Germany | German Socio-Economic Panel Study | OLS with FE (including annual leads and lags) | Panel | Yes | One year positive and significant anticipation effects for both men and women. | Positive and significant effects for women but not for men. | Negative and significant lag effects for both men and women although back to baseline SWB in year 5+. |
| Clark and Georgellis (2013) | United Kingdom | British Household Panel Survey | OLS with FE (including annual leads and lags) | Panel | Yes | No anticipation effects for men. Positive and significant anticipation effect for women starting two years prior to birth. | Positive and significant effects for women but not for men. | Women back to baseline SWB within the year of birth. |

Table 1 (continued)

| | | | | | | | | |
|------------------------|---------------------------------|---|--|-------|-----|--|--|---|
| Frijters et al. (2011) | Australia | Household, Income and Labour Dynamics in Australia | OLS with FE (including quarterly leads and lags) | Panel | No | Positive and significant anticipation effects two quarters prior to birth. | Positive and significant effects. | Back to baseline SWB five quarters (a year) after the birth. |
| Matysiak et al. (2016) | Australia | Household, Income and Labour Dynamics in Australia | OLS with FE (including annual lags) | Panel | No | Positive and significant anticipation the year prior to birth. | Positive and significant effects. | Back to baseline SWB within the year of birth. |
| Rudolf and Kang (2015) | Korea | Korean Labor and Income Panel Study | OLS with FE (including annual leads and lags) | Panel | Yes | No anticipation effects for women. Positive and significant anticipation effect for men starting three years prior to birth. | No significant effects for both men and women. | Men back to baseline SWB within the year of birth. Women negative and significant long-term effect (no adaptation). |
| Clark et al. (2018) | Britain Germany Australia | British Household Panel Survey German Socio-Economic Panel Study Household, Income and Labour Dynamics in Australia | OLS with FE (including annual leads and lags) | Panel | Yes | Positive and significant anticipation for men and women in German and Australian samples within two years prior to birth and one year prior to birth for the British sample. | Positive and significant effects for men and women in all country samples. | Men and women in all country samples generally completely adapt to baseline SWB within two years of birth. |

satisfaction compared to childless individuals. They explained that despite children often being a great source of joy, the rewards of parenting were often offset by negative aspects of parenthood, such as increased financial and time constraints. More recently, Di Tella et al., (2003) and Alesina et al., (2004), used Euro-Barometer Survey series data, and concluded that SWB reduced significantly as the number of children present in the household rose and that children contributed to higher levels of stress. An analysis of data from the British Household Panel Survey (BHPS) by Clark, (2006) also established significant negative effects on individual SWB with the presence of one or two children (although the effect of three children on SWB was found to be statistically insignificant). Using data from the World Values Survey (WVS), including a sample of individuals from 94 countries, Stanca, (2012) found a direct negative relationship between parenthood and SWB. However, he also found that the negative relationship was mediated by the individual's socio-demographic characteristics, their financial situation, and their nationality—suggesting the influence of cultural norms on the effects of parenthood and wellbeing.

A small number of studies found, in contrast, a positive relationship between parenthood and SWB. Stutzer and Frey, (2004) and Pollmann-Schult, (2014) used data from the German Socio-Economic Panel Study (GSOEP) and their estimates demonstrated a significant positive relationship between having children and life satisfaction. Haller and Hadler, (2006) generated similar results using data from the WVS, comprised of 41 countries, while a more recent study by Mikucka, (2016) on parenthood and SWB in Russia concluded that life satisfaction increased on the arrival of a first child but the effect was even stronger on the birth of a second child, and highly significant for women. The positive relationship of parenthood on SWB was similarly established within the Hungarian context, where using data from the Turning Points of Life Course Survey, Radó, (2020) found that first and second children increased SWB.

Other studies produced mixed results. For example, using U.S. data from the National Survey of Families and Household, Nomaguchi and Milkie, (2003) found that having children could be both disadvantageous and fulfilling. Married mothers were found to spend more time on housework and faced higher levels of marital conflict, yet were less depressed than childless women. However, unmarried parents were reported to be more depressed than their childless counterparts. Interestingly, their study established that parenthood had little effect on the lives of married men.

Most Australian studies on the effects of parenthood use data from the Household, Income and Labour Dynamics in Australia (HILDA) survey. The majority fall into the subset of empirical literature that has found negative or statistically insignificant effects of parenthood on SWB. Shields and Wooden, (2003) concluded that SWB declines with the presence of children within the household. In a review of the patterns of life satisfaction in Australia, Ambrey and Fleming, (2014) also found that dependent children reduce individuals' SWB. Dockery, (2010) provided more evidence that SWB is negatively associated with parenthood, however, when splitting the sample by gender he found that the negative effects of children on SWB are significant for both men and women. In comparison, Powdthavee et al., (2015) found no significant effects associated with number of children on SWB for men or women. Differences in these results based on the same dataset are likely due to different model specifications and empirical strategies employed – these are presented in Table 1.

2.2 Studies with anticipation and adaptation effects

A recent and important alternate set of studies has provided a new perspective on the impacts of parenthood on SWB by finding that major life events such as having a child have transient effects on individuals (Nomaguchi & Milkie, 2020). This empirical literature was first advanced

by Clark et al., (2008), who studied the anticipation and adaptation effects of five major life events, including the birth of a child. Using GSOEP data, they found that a newborn has a positive and significant effect on SWB for women but not for men; however, these effects become negative once the child is between 2 to 3 years old. Clark and Georgellis, (2013) later found very similar results, demonstrating complete adaptation of SWB for a sample of parents included in the BHPS. Another relevant study by Rudolf and Kang, (2015), using data from the Korean Labor and Income Panel Study, established gendered effects on SWB. Men show positive anticipation effects related to the birth of a child, however, Korean women experience long-term significant negative effects on SWB, which become apparent two years after birth.

Following the same methodology, although focusing on quarterly life-event data, Frijters et al., (2011) used data from the HILDA survey and found positive effects of a newborn on SWB; however, they also found that complete adaptation is reached very quickly: within five quarters of the child's birth. Using the same dataset, Matysiak et al., (2016) found very similar results. A more recent analysis by Clark et al., (2018) included samples from GSOEP, BHPS, and HILDA. Their findings indicated that in all three countries there were positive anticipation effects although, complete adaptation occurred within two years of the child's birth.

Many of the above results on the transient effects of parenthood on SWB are consistent with the baseline hypothesis theory established by Brickman and Campbell, (1971). This suggests individuals go through life on a so-called "hedonic treadmill," where certain events (such as having children) have anticipation and adaptation effects on wellbeing, but the effects of such events ultimately diminish over time, with individuals reverting to their baseline level of wellbeing.

2.3 Gaps in knowledge

While some of the reviewed studies incorporate analysis by gender, they still do not account for intra-household aspects. The study by Matysiak et al., (2016) did include some intra-household elements in terms of work-family conflict. However, apart from including partner's labour force status, no other partner characteristics were taken into account. Many studies on parenthood and wellbeing (including Matysiak et al., 2016), have included single, coupled, and divorced men and women in their samples. As such, the focus has been on how parenthood affects men and women separately – hence, neglecting interdependencies between parents. Couples often make decisions regarding parenting contributions based on their shared circumstances rather than individual circumstances. For example, adjustments in paid and unpaid work from parenthood may have implications not only on an individual's wellbeing but also on their partner's wellbeing –further emphasising the need for an intra-household analysis.

Furthermore, most prior studies have only provided insights on the impact of parenthood on overall wellbeing. Thus they have neglected the way in which the net overall impact of parenthood is produced by potentially different impacts on various domains of SWB, and how the pattern of these impacts might be gendered.

This study helps fill these gaps in knowledge by contributing an intra-household analysis of how men's and women's overall life satisfaction, financial satisfaction, partner satisfaction, and their free time satisfaction changes with parenthood.

3 Data and measures

This study is based on the HILDA survey, a nationally representative longitudinal panel that is comparable to the GSOEP and the BHPS. Commencing in 2001, HILDA provides information on the lives of Australians including topics such as employment, childcare,

family relationships, health and wellbeing, income, and expenditure. The survey consists of 18 waves conducted between 2001 and 2018, with information on 9,639 households and 18,324 responding individuals in the most recent wave (Summerfield et al., 2019). The survey collects data at the household level, and for couple households it includes interviews with each of the partners. It is thus well-suited to a study of the intra-household effects of parenthood on wellbeing.

This study uses HILDA data for the period from 2002 to 2018 (that is, from wave 2 onwards) because relevant information on the birth of a newborn child is not available in wave 1.² The sample comprises men and women in mixed-sex couples for whom relevant partner information is also available, and includes those who were either formally married or in a de-facto relationship, and with or without children. The sample is limited to individuals aged between 20 and 50 years old, as these are the key years of child-raising. As the study attempts to examine both the lead and lag effects of parenthood on wellbeing, there is inevitably some missing data for some couples, and this reduces the sample size. Furthermore, to best avoid capturing effects of multiple births such that one child's anticipation effects coincide with another child's adaptation effects, the sample is also limited to men and women in couple relationships where no more than one child was born across the years in which they were interviewed. These restrictions were applied to all models (even those without lead and lag intertemporal effects).³ The study still achieves an unbalanced panel consisting of 12,842 female-year observations and 12,527 male-year observations from 3,181 couple households.⁴

The key dependent variables of interest are those that proxy wellbeing. HILDA includes a comprehensive range of measures for over twenty domains of SWB. For this study we focus on four measures which are most relevant to parenthood. These are constructed from a set of HILDA survey questions which asked each year about the respondent's life, financial, partner and free time satisfaction: (i) "All things considered, how satisfied are you with your life?" (ii) "How satisfied are you with your financial situation?" (iii) "How satisfied are you with your partner?" and (iv) "How satisfied are you with the amount of free time you have?" For each of these questions, the survey allowed responses on a scale from 0 to 10, with a response of 0 indicating that the individual is completely dissatisfied and a response of 10 indicating complete satisfaction. The correlation matrix across the four measures is displayed in Table 2. Overall life satisfaction is strongly correlated with all specific domains of satisfaction. We observe the highest correlation with financial satisfaction for both men and women.

The main explanatory variables are measures capturing parental status as categorised by the number of children and the presence of a newborn child. Number of children is a categorical variable that varies over time. The newborn variable captures the presence of a child below the age of one within the household. As shown in Table 3, men and women who are parents generally report lower scores across each of the four SWB domains compared to men and women with no children. However, women with a newborn report on

² The presence of a newborn child within a family is measured through changes in the number of children reported between consecutive waves. As such, the presence of a newborn in wave 1 cannot be identified due to missing lagged data. Alternatively, HILDA includes data on questions regarding important life events, one of which includes the birth of a child. However, this question is also not available in wave 1.

³ The purpose of imposing restrictions on all models is so that the intertemporal and contemporaneous effects of a newborn can be compared.

⁴ The number of couple observations in different parts of the analysis varies, since in some parts observations with missing data on key dependent variables of interest are dropped.

Table 2 Correlation matrix for domains of satisfaction by gender

| | Men | | | |
|-----------------------------|---------------------------|------------------------|---------------------------|-----------------------------|
| | Overall life Satisfaction | Financial satisfaction | Satisfaction with partner | Satisfaction with free time |
| Overall Life Satisfaction | 1 | - | - | - |
| Financial Satisfaction | 0.441*** | 1 | - | - |
| Satisfaction with Partner | 0.377*** | 0.174*** | 1 | - |
| Satisfaction with Free Time | 0.336*** | 0.221*** | 0.153*** | 1 |
| | Women | | | |
| | Overall life Satisfaction | Financial satisfaction | Satisfaction with partner | Satisfaction with free time |
| Overall Life Satisfaction | 1 | - | - | - |
| Financial Satisfaction | 0.398*** | 1 | - | - |
| Satisfaction with Partner | 0.388*** | 0.190*** | 1 | - |
| Satisfaction with Free Time | 0.351*** | 0.229*** | 0.173*** | 1 |

average similar overall life satisfaction scores (of 8.12 points as seen in Column 1) as women with no children. In households with one, two, and three or more children, women report marginally higher average overall life satisfaction scores than men. Comparing data between men and women on financial satisfaction scores (Column 2), men with a newborn child record on average, the lowest scores. Both mothers and fathers of two children report higher financial satisfaction scores compared to mothers and fathers with one or three or more children. Moreover, for both men and women having a child is associated with lower partner satisfaction (as seen in Column 3), although the negative impact of parenthood is less when a newborn is present. On the other hand, both men and women, on average, report the lowest free time satisfaction scores with the presence of a newborn. It is possible that patterns described above are confounded by the U-shape in age. It is therefore important to go beyond the evidently descriptive cross-sectional findings.

Appendix Table A1 provides summary statistics for other important measures used in this study. Previous studies have established that changes in hours spent in paid and unpaid work are important mediators between parenthood and wellbeing (Nomaguchi and Milkie, 2003; Craig & Bittman, 2008). Thus, this analysis includes measures to control for different levels of paid and unpaid work across the sample. Other control variables used in this study include measures of income (in 2018 Australian dollars), marital status, and a range of demographic factors. The demographic controls include measures of each partner's age in five-year bands, the presence of a health condition, and years in education.⁵ Age and health status have also been controlled for since studies have demonstrated their significant effects on wellbeing. At the same time, age and health status are likely to be correlated with fertility choices (Dolan et al. 2008; Pollmann-Schult 2014). A number of studies have also indicated that the positive effects of parenthood are, on average, larger for individuals with higher levels of education (Myrskylä and Margolis, 2014; Roeters et al., 2016).

⁵ During the observation period thirteen per cent of individuals had a variation in education years.

Table 3 Number of children and men's and women's SWB: Descriptive statistics

| | 1 | | 2 | | 3 | | 4 | |
|------------------------------|-------------------|--------------------|------------------------|--------------------|----------------------|--------------------|------------------------|--------------------|
| | Life satisfaction | Standard deviation | Financial satisfaction | Standard deviation | Partner satisfaction | Standard deviation | Free time satisfaction | Standard deviation |
| No children | 8.01 | 1.19 | 6.79 | 1.88 | 8.95 | 1.25 | 8.95 | 1.25 |
| One child | 7.83 | 1.28 | 6.33 | 1.98 | 8.32 | 1.70 | 8.32 | 1.70 |
| Two children | 7.85 | 1.25 | 6.58 | 1.93 | 8.26 | 1.74 | 8.26 | 1.75 |
| Three or more children | 7.78 | 1.39 | 6.32 | 2.04 | 8.33 | 1.77 | 8.33 | 1.77 |
| Newborn | 7.90 | 1.35 | 6.18 | 2.17 | 8.52 | 1.51 | 8.52 | 1.51 |
| N (person-year observations) | 12,527.00 | | 12,526.00 | | 11,457.00 | | 12,525.00 | |
| | Women | | | | | | | |
| No children | 8.13 | 1.14 | 6.82 | 1.88 | 8.91 | 1.37 | 8.91 | 1.37 |
| One child | 7.98 | 1.23 | 6.39 | 2.07 | 8.29 | 1.72 | 8.28 | 1.72 |
| Two children | 7.99 | 1.25 | 6.53 | 1.91 | 8.15 | 1.82 | 8.15 | 1.82 |
| Three or more children | 7.99 | 1.25 | 6.37 | 2.05 | 8.06 | 1.94 | 8.06 | 1.95 |
| Newborn | 8.12 | 1.21 | 6.30 | 2.00 | 8.37 | 1.74 | 8.37 | 1.74 |
| N (person-year observations) | 12,842.00 | | 12,840.00 | | 11,948.00 | | 12,838.00 | |

Note. The sample consists of men and women in mixed-sex couples, between the ages of 20–50 years old who were interviewed in the HILDA survey, waves 2–18

4 Empirical strategy

The basic approach to modelling the relationship between parenthood and SWB is to describe an individual's life satisfaction, financial satisfaction, partner satisfaction and time satisfaction as a linear function of a set of independent variables, including the presence of children. As the focus of this study is on how these effects play out within households, a key feature of the models used in this study is to control for partner characteristics in the estimation of SWB. The study deploys a fixed effects regression modelling approach. It is acknowledged that some debate exists on the application of a linear fixed effects model to a categorical dependent variable (see Kristoffersen, 2010). However, recent studies of subjective wellbeing which have used both linear and non-linear regressions have produced similar estimates. That is, ordered probit or logit models and OLS models have been found to produce estimates with similar signs and levels of statistical significance (see Gardner & Oswald, 2007; Ferrer-i-Carbonell & Frijters, 2004; Headey & Wooden, 2004; Blanchflower & Oswald, 2004, 2005). As such, and due to the easier interpretation of estimates, this study uses linear fixed effects models.⁶

Using a linear fixed effects model allows for within-individual comparisons, such that the same individual's wellbeing is analysed at different points in time and thus, time invariant unobserved heterogeneity can be eliminated. Sources of time invariant unobserved heterogeneity may include factors such as cultural norms which may shape an individual's wellbeing in certain ways, as well as affect choices of having children.⁷ This identification strategy adds a more rigorous test for the association between parenthood and wellbeing compared to studies which make more generalised between-individual comparisons, while not controlling for individual fixed effects (for example Shields & Wooden, 2003; Alesina et al., 2004; Stanca, 2012). Employing this approach, each partner's SWB is estimated as follows:

$$s_{jt}^m = \beta_{1m}K_{jt} + \beta_{2m}N_{jt} + \gamma_{1m}C_{jt}^O + \gamma_{2m}C_{jt}^P + t_1 + \mu_j^m + \varepsilon_{1jt} \quad (1)$$

$$s_{jt}^w = \beta_{1w}K_{jt} + \beta_{2w}N_{jt} + \gamma_{1w}C_{jt}^O + \gamma_{2w}C_{jt}^P + t_2 + \mu_j^w + \varepsilon_{2jt} \quad (2)$$

The variables s_{jt}^m and s_{jt}^w denote the SWB of the man and the woman in the j th household at time t , respectively. The vector K_{jt} captures the presence of one child, two children, and three or more children in the j th household, with no children as the reference category. Given a fixed effects approach, the coefficient on the one child variable represents the difference in average SWB of, for example, a woman in the years when she had no children compared to her average level of SWB in the years when she has one child. The difference in magnitude of the coefficients on the one child and two children variables show, in the case of women, the difference in her average SWB in the years when she had one child, and in the years when she had two children, and so on. These variables, however, do not capture how the effects of parenthood on SWB might vary with the age of the (existing) children in the household. It could be expected that the immediate effects of an extra child within the household will be different from the effects of the child as measured across all of the years following its birth. To account for this, a second variable N_{jt} , captures the birth of a child within the last year in the j th household with no newborn as the reference category.

⁶ As a robustness check, regressions were run using ordered logit models, yielding similar results to our OLS models. These are available on request.

⁷ Although HILDA contains specific questions relating to norms, the data are not consistently available in all waves.

The vector C_{jt}^O includes a set of controls which capture the individual’s own characteristics that may have independent impacts on levels of SWB, including, as noted, marital status (formally married or de facto), age, individual income (in logs), presence of a long-term health condition, years in education, average hours of paid work per week, and average hours of housework per week.⁸ The vector C_{jt}^P captures characteristics of the individual’s partner, including his/her age, individual income (in logs), presence of a long-term health condition, years in education, average hours in paid work per week, and average hours of housework per week. Both own and partner’s age controls include squared terms to capture possible non-linear effects. Own and partner’s average hours in paid work and housework per week controls are treated as continuous variables and top coded at 84 h per week to account for implausible values in the data such as individuals reporting spending 24 h on paid work per day. Variables t_1 and t_2 present the year fixed effects, while the vector of variables μ_j^m and μ_j^w denote individual fixed effects that control for time invariant characteristics of the man and woman respectively. Variables ε_{1jt} and ε_{2jt} are randomly distributed error terms with a mean of zero.

The inclusion of an extensive list of partner characteristics serves to capture potential intra-household effects in the analysis of the wellbeing implications of parenthood, and thus helps capture possible intra-household interdependencies. They also enable an assessment of whether changes in SWB associated with parenthood are differently affected by adjustments in the person’s time spent in paid work and unpaid work, as compared to their partner’s time spent in paid work and unpaid work. Successively, variables for own income and work hours and partner’s income and work hours are added to the modelling. The goal of this step-wise approach is to determine how the relationship between SWB and parenthood may be altered by factors relating to adjustments in average time spent in paid work and housework for both genders.

Using this strategy, the study is able to measure how parenthood affects SWB (across four domains, including overall life satisfaction, financial satisfaction, partner satisfaction, and free time satisfaction) of men and women in mixed-sex couple households by comparing, in particular, the coefficients on K_{jt} and N_{jt} across models (1) and (2). For a closer look into the intra-household dynamics, we also analyse the difference in the man’s and the woman’s SWB, that is whether the estimated coefficients on the children variables are significantly different across the men and women samples, this can be interpreted as evidence of the gendered effects of parenthood, whereby the perceived costs and benefits of parenthood are not evenly distributed. This exercise is equivalent to estimating a model whose dependent variable is the difference between the woman’s and the man’s SWB, $s_{jt}^w - s_{jt}^m$.

To measure the anticipation and adaptation effects of a newborn, the modelling is altered to include measures of SWB in the time prior and subsequent to the arrival of a new child in the family. Following Clark and Georgellis, (2013), each partner’s SWB is modelled as a linear function of an extended set of independent variables:

$$s_{jt}^m = \sum_{i=1}^4 \beta_{1m,T-i} N_{jt,T-i}^m + \sum_{i=0}^5 \beta_{1m,T+i} N_{jt,T+i}^m + \alpha_{1m} C_{jt}^O + \alpha_{2m} C_{jt}^P + t_2 + \mu_j^m + \varepsilon_{2jt} \quad (3)$$

$$s_{jt}^w = \sum_{i=1}^4 \beta_{1w,T-i} N_{jt,T-i}^w + \sum_{i=0}^5 \beta_{1w,T+i} N_{jt,T+i}^w + \alpha_{1w} C_{jt}^O + \alpha_{2w} C_{jt}^P + t_2 + \mu_j^w + \varepsilon_{2jt} \quad (4)$$

⁸ A long-term health condition refers to any impairment or disability that restricts day to day activity and has lasted or is likely to last for 6 months or more.

In contrast to entering a simple newborn dummy that will pick up the average wellbeing effect of all the individuals with a newborn, individuals with a newborn are split into six groups, those who had a newborn 0–1 years ago, 2–3 years ago, and so on. Thus, for example, for lead effects, if the individual is observed in the year preceding the birth of a child, N_{T-1} is coded as 1. Similarly, for lag effects, if the individual is observed two years after the birth of their child, N_{T+2} is coded as 1. With no anticipation effects, all the coefficients on the lead variables will be roughly the same. If there are adaptation effects, the lag coefficients will be less positive than the base coefficients, or even statistically insignificant – and this would imply that individuals, on average, revert to a baseline level of SWB in the years following the birth of a child. The omitted category includes individuals who do not have a newborn within the four-year timeframe. Again, to provide a closer analysis into the intra-household dynamics, we estimate a model where the dependent variable is the difference between the woman's and the man's SWB ($s_{jt}^w - s_{jt}^m$), allowing us to compare the coefficients on the newborn lead and lag variables for any significant intra-household differences between the man and the woman.

It should be noted that this stage of the analysis does not separately compare the effects of a first newborn child for example, with the effects of a newborn in households where other children are already present. Rather, this factor is controlled for by including a variable for the number of children present within the household.⁹ The implicit assumption is thus that the effects of a first-born child on SWB are similar to those of a subsequent child. This is an acknowledged limitation of the analysis, but it is a constraint imposed by the sample size. Other variables in Eqs. (3) and (4) are as defined in Eqs. (1) and (2).

5 Results

5.1 Baseline results

The results from the estimations of overall life satisfaction, financial satisfaction, partner satisfaction, and free time satisfaction for men and women are presented in Tables 4, 5, 6 and 7 respectively. For all four domains of SWB, three models are specified. Model A does not include any controls for income or paid work and unpaid housework hours. In Model B, controls for own income and own hours in paid work and housework per week are added. Finally, Model C contains the full set of controls including both partners' income and hours in paid work and housework per week.

5.1.1 Overall life satisfaction

Table 4 provides results demonstrating changes in overall life satisfaction in the presence of children for men and women respectively. Comparing results (for models with no income or hours of paid work and housework controls) in Columns 1 and 4 at mean values, for men, having one child is estimated to reduce life satisfaction by 0.137 points compared to when having no children. This negative impact increases in magnitude and significance with two children and three or more children. At mean values, partnered women who have

⁹ One option for measuring the differences in SWB for first, second, and third newborns could be to include an interaction term between the newborn variables and number of children categorical variables. However, despite the fairly large sample size, the number of specific cases of such combinations were too small to produce robust results.

Table 4 Parenthood on overall life satisfaction: Fixed effects regression results

| | Man's SWB | | | Woman's SWB | | | Woman's SWB - Man's SWB |
|--|---------------------|---------------------|--------------------|----------------------|----------------------|----------------------|-------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| One child | -0.137 (0.089) | -0.139 (0.088) | -0.122 (0.089) | -0.115 (0.079) | -0.164** (0.082) | -0.163** (0.082) | -0.100 (0.101) |
| Two children | -0.208* (0.126) | -0.210* (0.126) | -0.185 (0.127) | -0.370*** (0.120) | -0.439*** (0.123) | -0.434*** (0.123) | -0.280* (0.148) |
| Three or more children | -0.360** (0.180) | -0.363** (0.179) | -0.330* (0.182) | -0.625*** (0.164) | -0.707*** (0.167) | -0.698*** (0.167) | -0.437** (0.212) |
| Newborn | 0.090 (0.059) | 0.091 (0.059) | 0.097* (0.058) | 0.260*** (0.056) | 0.250*** (0.056) | 0.253*** (0.056) | 0.150** (0.075) |
| Woman's log (individual income +1) | | | 0.003 (0.012) | | -0.021 (0.013) | -0.022* (0.013) | -0.013 (0.014) |
| Woman's average work hours per week | | | 0.002* (0.001) | | -0.002* (0.001) | -0.001 (0.001) | 0.022 (0.019) |
| Woman's average housework hours per week | | | 0.000 (0.001) | | 0.001** (0.001) | 0.002** (0.001) | -0.004*** (0.001) |
| Man's log (individual income +1) | 0.009 (0.017) | 0.009 (0.017) | 0.010 (0.018) | | | 0.030** (0.013) | 0.001 (0.001) |
| Man's average work hours per week | -0.001 (0.001) | -0.001 (0.001) | -0.001 (0.001) | | | 0.000 (0.001) | 0.001 (0.001) |
| Man's average housework hours per week | -0.000 (0.000) | -0.000 (0.000) | -0.001 (0.001) | | | -0.001 (0.001) | 0.000 (0.001) |

Table 4 (continued)

| | Man's SWB | | | Woman's SWB | | | Woman's SWB - Man's SWB |
|-------------------------|-----------|--------|--------|-------------|--------|--------|-------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| Baseline controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Couple fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>N</i> (observations) | 12,527 | 12,527 | 12,527 | 12,842 | 12,842 | 12,842 | 12,841 |
| Couples | 3,147 | 3,147 | 3,147 | 3,181 | 3,181 | 3,181 | 3,181 |

Note. The bracketed terms are robust standard errors (clustered by couples). The sample consists of men and women in mixed-sex couples, between the ages of 20–50 years old who were interviewed in the HILDA survey, waves 2–18. Baseline controls include a dummy for marriage, both partner's age in five-year bands, both partner's years in education, and both partner's presence of a health condition

* Denotes significance at 10%; ** at 5%; *** at 1% levels

Table 5 Parenthood and financial satisfaction: Fixed effects regression results

| | Man's SWB | | | Woman's SWB | | | Woman's SWB - Man's SWB |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| One child | -0.434*** (0.144) | -0.405*** (0.140) | -0.348** (0.141) | -0.664*** (0.118) | -0.376*** (0.121) | -0.390*** (0.121) | -0.012 (0.145) |
| Two children | -0.652*** (0.197) | -0.599*** (0.191) | -0.521*** (0.192) | -1.004*** (0.212) | -0.612*** (0.215) | -0.621*** (0.214) | 0.118 (0.221) |
| Three or more children | -0.965*** (0.264) | -0.892*** (0.260) | -0.792*** (0.261) | -1.530*** (0.304) | -1.049*** (0.306) | -1.092*** (0.303) | -0.033 (0.306) |
| Newborn | -0.028 (0.092) | -0.045 (0.090) | -0.023 (0.090) | 0.139 (0.098) | 0.224** (0.097) | 0.213** (0.096) | 0.198** (0.099) |
| Woman's log (individual income +1) | | | -0.001 (0.016) | | 0.030 (0.021) | 0.032 (0.021) | 0.042* (0.022) |
| Woman's average work hours per week | | | 0.005*** (0.002) | | 0.018*** (0.002) | 0.017*** (0.002) | -0.010 (0.032) |
| Woman's average housework hours per week | | | -0.000 (0.001) | | 0.001 (0.001) | 0.001 (0.001) | 0.011*** (0.002) |
| Man's log (individual income +1) | | 0.095*** (0.029) | 0.097*** (0.030) | | | 0.086*** (0.031) | -0.009*** (0.002) |
| Man's average work hours per week | | 0.021*** (0.002) | 0.020*** (0.002) | | | 0.010*** (0.002) | 0.000 (0.001) |
| Man's average housework hours per week | | 0.001 (0.001) | 0.000 (0.001) | | | 0.000 (0.001) | -0.000 (0.001) |

Table 5 (continued)

| | Man's SWB | | | Woman's SWB | | | Woman's SWB - Man's SWB |
|-------------------------|-----------|--------|--------|-------------|--------|--------|-------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| Baseline controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Couple fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>N</i> (observations) | 12,526 | 12,526 | 12,526 | 12,840 | 12,840 | 12,840 | 12,839 |
| Couples | 3,147 | 3,147 | 3,147 | 3,180 | 3,180 | 3,180 | 3,180 |

Note. The bracketed terms are robust standard errors (clustered by couples). The sample consists of men and women in mixed-sex couples, between the ages of 20–50 years old who were interviewed in the HILDA survey, waves 2–18. Baseline controls include a dummy for marriage, both partner's age in five-year bands, both partner's years in education, and both partner's presence of a health condition

* Denotes significance at 10%; ** at 5%; *** at 1% levels

Table 6 Parenthood and partner satisfaction: Fixed effects regression results

| | Man's SWB | | | Woman's SWB | | | Woman's SWB - Man's SWB |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| One child | -0.599*** (0.113) | -0.603*** (0.113) | -0.602*** (0.114) | -0.514*** (0.125) | -0.523*** (0.128) | -0.522*** (0.129) | -0.038 (0.122) |
| Two children | -1.069*** (0.176) | -1.074*** (0.176) | -1.074*** (0.176) | -0.938*** (0.197) | -0.951*** (0.199) | -0.949*** (0.199) | -0.095 (0.195) |
| Three or more children | -1.046*** (0.242) | -1.050*** (0.242) | -1.052*** (0.244) | -1.130*** (0.258) | -1.146*** (0.263) | -1.146*** (0.263) | -0.169 (0.313) |
| Newborn | 0.323*** (0.077) | 0.324*** (0.077) | 0.325*** (0.078) | 0.266*** (0.087) | 0.266*** (0.087) | -0.264*** (0.087) | -0.014 (0.091) |
| Woman's log (individual income +1) | | | -0.006 (0.015) | | -0.009 (0.015) | -0.009 (0.015) | -0.003 (0.016) |
| Woman's average work hours per week | | | 0.001 (0.001) | | -0.000 (0.002) | -0.001 (0.002) | 0.005 (0.021) |
| Woman's average housework hours per week | | | 0.001 (0.001) | | -0.000 (0.001) | -0.000 (0.001) | -0.001 (0.002) |
| Man's log (individual income +1) | | 0.008 (0.015) | 0.008 (0.015) | | | 0.014 (0.021) | 0.004** (0.002) |
| Man's average work hours per week | | -0.001 (0.001) | -0.001 (0.001) | | | 0.003* (0.002) | -0.003* (0.002) |

Table 6 (continued)

| | Man's SWB | | | Woman's SWB | | | Woman's SWB - Man's SWB |
|--|-----------|-------------------|-------------------|-------------|--------|------------------|-------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| Man's average housework hours per week | | -0.001 (0.002) | -0.002 (0.002) | | | 0.000 (0.001) | 0.001 (0.002) |
| Baseline controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Couple fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N (observations) | 11,457 | 11,457 | 11,457 | 11,948 | 11,948 | 11,948 | 11,528 |
| Couples | 3,004 | 3,004 | 3,004 | 3,083 | 3,083 | 3,083 | 3,017 |

Note. The bracketed terms are robust standard errors (clustered by couples). The sample consists of men and women in mixed-sex couples, between the ages of 20–50 years old who were interviewed in the HILDA survey, waves 2–18. Baseline controls include a dummy for marriage, both partner's age in five-year bands, both partner's years in education, and both partner's presence of a health condition

* Denotes significance at 10%; ** at 5%; *** at 1% levels

Table 7 Parenthood and free time satisfaction: Fixed effects regression results

| | Man's SWB | | | Woman's SWB | | | Woman's SWB - Man's SWB |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| One child | -0.828*** (0.230) | -0.934*** (0.225) | -0.961*** (0.227) | -1.423*** (0.198) | -2.070*** (0.201) | -2.031*** (0.202) | -1.078*** (0.253) |
| Two children | -1.030*** (0.317) | -1.191*** (0.297) | -1.225*** (0.299) | -2.144*** (0.313) | -3.022*** (0.324) | -2.966*** (0.325) | -1.662*** (0.346) |
| Three or more children | -1.092*** (0.375) | -1.352*** (0.357) | -1.374*** (0.360) | -2.852*** (0.415) | -3.923*** (0.425) | -3.797*** (0.426) | -2.355*** (0.455) |
| Newborn | 0.046 (0.115) | 0.092 (0.112) | 0.077 (0.112) | -0.190 (0.124) | -0.392*** (0.125) | -0.368*** (0.125) | -0.427*** (0.160) |
| Woman's log (individual income +1) | | | 0.016 (0.020) | | -0.013 (0.021) | -0.022 (0.021) | -0.033 (0.027) |
| Woman's average work hours per week | | | -0.002 (0.002) | | -0.040*** (0.003) | -0.037*** (0.003) | 0.021 (0.037) |
| Woman's average housework hours per week | | | 0.000 (0.001) | | -0.001 (0.001) | -0.001 (0.001) | -0.035*** (0.003) |
| Man's log (individual income +1) | | 0.043 (0.033) | 0.041 (0.033) | | | 0.074*** (0.024) | 0.043*** (0.003) |
| Man's average work hours per week | | -0.045*** (0.003) | -0.045*** (0.003) | | | -0.001 (0.002) | -0.002 (0.002) |
| Man's average housework hours per week | | -0.001 (0.001) | -0.001 (0.001) | | | 0.000 (0.001) | 0.001 (0.001) |

Table 7 (continued)

| | Man's SWB | | | Woman's SWB | | | Woman's SWB - Man's SWB |
|----------------------|-----------|--------|--------|-------------|--------|--------|----------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Baseline controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Couple fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N (observations) | 12,525 | 12,525 | 12,525 | 12,838 | 12,838 | 12,838 | 12,835 |
| Couples | 3,147 | 3,147 | 3,147 | 3,179 | 3,179 | 3,179 | 3,179 |

Note. The bracketed terms are robust standard errors (clustered by couples). The sample consists of men and women in mixed-sex couples, between the ages of 20–50 years old who were interviewed in the HILDA survey, waves 2–18. Baseline controls include a dummy for marriage, both partner's age in five-year bands, both partner's years in education, and both partner's presence of a health condition

* Denotes significance at 10%, ** at 5%; *** at 1% levels

one child experience a drop in life satisfaction of 0.115 points compared to when they had no children. The negative impact of parenthood increases in magnitude for women with two children and three or more children. In relation to the effects of the presence of a newborn child within the family, men with a newborn child do not record a significant change in their level of overall life satisfaction; however, for women, in the initial period following the birth of a child, their life satisfaction increases by 0.260 points.

As mentioned above, comparing coefficients between models with and without own and partner's income and time spent in paid and unpaid housework enables an assessment of whether changes in work patterns may be responsible for changes in SWB associated with parenthood. For men, comparing results in Table 4 (Columns 2 and 3), adding controls for income and own hours of paid work and housework has little impact on the measured effect of parenthood on life satisfaction. However, in the presence of controls for their partner's income and average hours of work, the measured negative impact of three or more children falls slightly, from -0.363 to -0.330 points. These results suggest that when women's income and work hours remain constant in households following parenthood, the negative pressures of parenthood for men are less significant. For women, comparing results in Columns 5 and 6 reveals an opposite pattern. In the presence of controls for her own income and hours in paid and unpaid housework, the negative coefficients on each of the parenthood variables increase. Controlling for women's partner's income and work hours has negligible effects on the relationship between women's overall life satisfaction and parenthood. These results may imply that when women's work hours remain constant following parenthood, the negative pressures on themselves increases.

Column 7 of Table 4 provides details on the gender distribution of the impacts of parenthood on overall life satisfaction. There are statistically significant gender gaps relating to the presence of a newborn, and the second and third child. Women with a newborn report a higher increase in life satisfaction by 0.150 points compared to men. The presence of two children in a household is not associated with statistically significant changes in life satisfaction for men (see Column 3 in Table 4), but for women there is a large and statistically significant drop in life satisfaction by 0.280 points. The presence of three or more children is linked to life satisfaction that is 0.437 points lower for women compared to men. This analysis of the changes in overall life satisfaction associated with parenthood suggests important gender differences. While women appear on average to experience a larger increase in their overall life satisfaction on the arrival of a newborn than men, they also appear to typically experience larger long-term (and negative) effects, specifically when they have more than one child.

5.1.2 Financial satisfaction

As before, the results in Columns 1 and 4 of Table 5 report the coefficients for baseline models of financial satisfaction (without additional income and work controls) for men and women respectively. Partnered men who had one child, at mean values, experienced a reduced level of financial satisfaction by 0.434 points; this negative correlation increased with the number of children in the household. Similarly, at mean values, partnered women who had one child became less satisfied with their financial situation by 0.664 points, and this negative effect also increased with the number of children. It is worth noting that the drop in financial satisfaction for women as the number of children increased is relatively steep. For example, women whose family size increased to three or more children experienced an average decline in their level of financial satisfaction of 1.530 points. In contrast,

their overall life satisfaction fell by 0.625 points, suggesting that the changes in financial satisfaction is a possible driver of the change in life satisfaction in this group. In contrast, the results in Columns 1 and 4 of Table 5 show that the arrival of a newborn was not significantly associated with financial satisfaction for men and women.

A comparison of the above results to those in Column 2 of Table 5 (where men's income and own paid work and housework hours per week are controlled for) and those in Column 3 (where their partner's income and paid work and housework hours per week are controlled for) provides further insights into the effects of parenthood on financial wellbeing. When men's own and partner's income and work hours are held constant, the negative effects of parenthood become smaller, but only by a small margin. In contrast, the results for women in Columns 4, 5 and 6 of Table 5 show that when their own income and work hours are held constant, the measured negative impact of parenthood on their financial satisfaction become much smaller. For example, the impact of a newborn becomes positive and statistically significant, and the negative effect of one child on financial satisfaction scores almost halved, from -0.664 points to -0.376 points. These results indicate that an important driver of the negative impact of parenthood on women's financial satisfaction is their own changes in work hours and income. That is, if women's hours in work were not affected by parenthood, the financial impacts would lessen. The results also point to the importance of women's paid work to their financial satisfaction.

It is also worth noting the different pattern of change across the models with and without work hours controls in Tables 4 and 5. In Table 2 – overall life satisfaction models – the inclusion of controls saw an increase in the negative effects of parenthood for women and an opposite effect for men. In Table 5 – financial satisfaction models – the controls pushed the results in the opposite direction. That is, the measured negative effects fell for women. Thus, while paid work appears to support the financial wellbeing of mothers, it must generate other costs, including time pressures, and these contribute to a reduction in overall life satisfaction for women whose work hours do not change with parenthood.

Column 7 in Table 5 includes the results of the observed gender gap in the effect of parenthood on financial satisfaction. It shows that there are no differences in the estimated effects of one child, two children, and three or more children on men's and women's financial satisfaction. In contrast, a newborn has no significant effect on men's satisfaction with their financial situation, while, for women, a newborn is associated with higher financial satisfaction by 0.198 points in situations where income and work hours remain constant. A possible explanation for this is that for women, a higher financial position is a prerequisite in the decision to have a child, given the "motherhood penalty." This, however, is not the case for men who often benefit from "fatherhood premiums"—this idea is further elaborated on later in this study. Overall, there is some evidence that the perceived financial costs associated with parenthood are not equally distributed between men and women in couple relationships, particularly in relation to a newborn child.

5.1.3 Partner satisfaction

The estimations from the models of partner satisfaction are presented in Table 6. Results from the initial models (without own and partner's income and paid work and housework hours per week controls) in Columns 1 and 4 show that when there is one child, partner satisfaction is on average lower by 0.599 points for men and 0.514 points for women than it was when no child was present. Interestingly, for men, moving from having two children to

three or more children increases partner satisfaction slightly by 0.023 points (1.069–1.046), yet for women, moving from having two children to three or more children further reduces partner satisfaction by 0.192 points (1.130–0.938). For both men and women, having three or more children is still associated with a drop in partner satisfaction of 1.046 points and 1.130 points respectively, compared to when having no children. Men's and women's satisfaction with their partner typically increases when they have a newborn child: by 0.323 points for men and 0.266 points for women.

Moreover, the findings in Table 6 show that own and partner income and work hours do not moderate the influence of parenthood on partner satisfaction. The evidence in Columns 2 and 3 (for men), and 5 and 6 (for women), is similar to the results of the “baseline” regressions. It would seem then that changes in income and work hours are not a key source of the relationship stressors associated with parenthood.

The size of these negative impacts of parenthood on partner satisfaction are similar in magnitude to the effects of parenthood on financial satisfaction. Given the correlation amongst SWB domains (see Table 2), it is possible that heightened conflict within households once children are present contributes, alongside larger financial pressures, to lower overall levels of SWB. As seen in Column 7 of Table 6, within the sample, there are no significant gendered effects in relation to parenthood and partner satisfaction.

5.1.4 Free time satisfaction

Table 7 provides results demonstrating changes in free time satisfaction in the presence of children for men and women respectively. The results in Columns 1 and 4 (for models with no income and hours of paid work or housework controls) demonstrate that for men, at mean values having one child reduces free time satisfaction by 0.828 points compared to when having no children. For women, at mean values, having one child reduces free time satisfaction by 1.423 points compared to when having no children. Like other domains of SWB, for both men and women, the negative impact on free time satisfaction increases in magnitude when more children are present.

When comparing results for men and women in Columns 2 and 5 where the controls for own income and hours in paid work and housework are included, the negative implications of having children increase. These results suggest that when own work hours remain constant parenthood is associated with higher time pressures. These pressures appear to be more prevalent for women than for men. For example, for men, at mean values, having three or more children reduces free time satisfaction by 1.092 if income and work hours are not held constant compared to a reduction of 1.332 points if income and work hours are held constant. On the other hand, for women, when income and work hours are not held constant, the negative implications of having three or more children is 2.852 points compared to 3.923 points with the additional controls. In addition, for women, the presence of a newborn reduces free time satisfaction by 0.392 points. However, for men, the implications of the presence of a newborn are still not significant. As seen in Columns 3 and 6 for both men and women controlling for partner's income and hours in work does not alter the results much.

The observed gender gaps are presented in Column 7 of Table 7. There are large and statistically significant gender gaps relating to the one child, two children, three or more children, and the newborn coefficients confirm that the time pressures associated with parenthood are higher for women than for men.

5.1.5 Alternative specifications

Noting that there may be a certain degree of heterogeneity within the sample, we present the results on the difference between partner's SWB in subsamples defined by income and work hours. In the top panel of Table 8, results are presented for high and low income groups.¹⁰ In the bottom panel of Table 8, we present results for individuals who work above average and below average hours per week.¹¹ Similar to the results presented in Tables 4, 5, 6, and 7 majority of the significant wellbeing gaps between partners relates to the domain of free time satisfaction. These results confirm that within the sample, amongst different demographic groups time pressures associated with parenthood are still significantly higher for women than for men. However, women with lower work hours per week report a higher increase in life satisfaction compared to men when there is a newborn present.

As an alternate specification to determine how important changes in partner's work are, we analyse the subjective wellbeing of men whose partner did not work in the year prior to the birth of a child.¹² Within the sample there are 413 couples that fit the latter description.¹³ As seen in Table 9 (Columns 5 and 6), when the woman does not work in the year prior to birth there are no significant changes to men's life satisfaction and financial satisfaction on all the children and newborn variables. In addition, the positive impact of a newborn for men where the woman does not work pre-birth is more than double compared to men where the woman works pre-birth in the domain of partner satisfaction. Interestingly, the negative implications of children on free time satisfaction are not significant for the two, three or more, and newborn variables for men where the woman does not work pre-birth. Possible explanations for these findings could be that the birth of a child does not bring significant changes in the reallocation of work contributions for couples where the woman is already not in paid work prior to the birth.

5.1.6 Anticipation and adaptation effects of a newborn

The final set of results presented in this study addresses patterns of anticipation and adaptation of parenthood on overall life satisfaction, financial satisfaction, partner satisfaction, and free time satisfaction. As noted in the introduction, this stage of the analysis is important because it addresses the implicit assumption in previous stages that the effects of parenthood on SWB are contemporaneous. To analyse changes in wellbeing in the years prior to having a child and the adaptation effects following the birth of a child, this stage of the analysis estimates lead and lag relationships between the arrival of a child and each of the four domains of satisfaction, while still controlling for couple interdependencies as before. For ease of reading and comparison of gendered effects, a visual representation of the results are summarised graphically in Fig. 1.

¹⁰ High and low income individuals are classified as those who have a personal income above and below the sample average of \$52,046.

¹¹ Within the sample, the average hours worked is 34.7 h per week.

¹² Note that we also ran regressions for an alternate specification with interaction terms between the children variables and each partner's work hours. However, many of the interaction terms were small and not significant, we therefore do not report these results.

¹³ We do not conduct the same analysis for women given the low incidence of men not working pre-birth within the sample.

Table 8 Parenthood and life satisfaction, financial satisfaction, partner satisfaction and free time satisfaction by income and work hours: Fixed effects regression results

| | Woman's SWB - Man's SWB | | | | | | | | | |
|------------------------|-------------------------|------------------------|----------------------|------------------------|-------------------|------------------------|----------------------|------------------------|--|--|
| | High income | | | | | Low income | | | | |
| | Life satisfaction | Financial satisfaction | Partner satisfaction | Free time satisfaction | Life satisfaction | Financial satisfaction | Partner satisfaction | Free time satisfaction | | |
| One child | -0.041 (0.135) | 0.106 (0.187) | -0.163 (0.148) | -1.193*** (0.324) | -0.084 (0.208) | -0.267 (0.281) | 0.272 (0.271) | -0.847 (0.540) | | |
| Two children | -0.236 (0.208) | -0.068 (0.260) | -0.022 (0.225) | -1.574*** (0.448) | 0.057 (0.279) | -0.406 (0.405) | 0.222 (0.383) | -2.002*** (0.687) | | |
| Three or more children | -0.280 (0.305) | -0.190 (0.406) | -0.355 (0.308) | -2.321*** (0.612) | -0.158 (0.392) | -0.346 (0.616) | 0.252 (0.504) | -3.141*** (0.947) | | |
| Newborn | 0.134 (0.082) | 0.196 (0.119) | 0.038 (0.111) | -0.365* (0.198) | 0.210 (0.158) | 0.342* (0.189) | -0.093 (0.156) | -0.451 (0.331) | | |
| Baseline controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | |
| Couple fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | |
| N (observations) | 7,738 | 7,738 | 7,116 | 7,738 | 4,789 | 4,788 | 4,341 | 4,787 | | |
| Couples | 2,138 | 2,196 | 2,097 | 2,196 | 1,802 | 1,802 | 1,679 | 1,802 | | |

Table 8 (continued)

| | Woman's SWB - Man's SWB | | | | | | | |
|------------------------|-------------------------|------------------------|----------------------|------------------------|-------------------|------------------------|----------------------|------------------------|
| | Life satisfaction | Financial satisfaction | Partner satisfaction | Free time satisfaction | Life satisfaction | Financial satisfaction | Partner satisfaction | Free time satisfaction |
| One child | -0.057 (0.108) | -0.047 (0.146) | -0.084 (0.130) | -1.271*** (0.249) | -0.778 (0.484) | -0.270 (0.669) | 0.376 (0.433) | -1.480* (0.875) |
| Two children | -0.204 (0.158) | -0.210 (0.203) | -0.066 (0.190) | -1.977*** (0.346) | -0.303 (0.566) | 0.915 (0.861) | 1.138 (0.699) | -1.544 (1.110) |
| Three or more children | -0.239 (0.218) | -0.232 (0.323) | -0.384 (0.267) | -2.720*** (0.456) | -0.744 (0.728) | 1.384 (1.075) | 0.029 (0.904) | -3.366*** (1.454) |
| Newborn | 0.090 (0.073) | 0.118 (0.107) | 0.022 (0.091) | -0.410** (0.168) | 0.612* (0.351) | 0.584 (0.546) | -0.168 (0.312) | -0.020 (0.769) |
| Baseline controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Couple fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N (observations) | 11,044 | 11,045 | 9,939 | 11,041 | 1,480 | 1,477 | 1,325 | 1,478 |
| Couples | 2,888 | 2,888 | 2,728 | 2,888 | 736 | 735 | 677 | 734 |

Note. The bracketed terms are robust standard errors (clustered by couples). The sample consists of men and women in mixed-sex couples, between the ages of 20–50 years old who were interviewed in the HILDA survey, waves 2–18. Baseline controls include a dummy for marriage, both partner's age in five-year bands, both partner's years in education, and both partner's presence of a health condition

* Denotes significance at 10%, ** at 5%, *** at 1% levels

Table 9 Parenthood and men's life satisfaction, financial satisfaction, partner satisfaction, and free time satisfaction by woman's work status pre-birth: Fixed effects regression results

| | Woman works pre-birth | | | Woman does not work pre-birth | | | | |
|------------------------|-----------------------|------------------------|----------------------|-------------------------------|-------------------|------------------------|----------------------|------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Life satisfaction | Financial satisfaction | Partner satisfaction | Free time satisfaction | Life satisfaction | Financial satisfaction | Partner satisfaction | Free time satisfaction |
| One child | -0.189** (0.096) | -0.339** (0.154) | -0.521*** (0.117) | -0.862*** (0.204) | 0.082 (0.199) | -0.223 (0.300) | -0.932*** (0.320) | -1.264** (0.525) |
| Two children | -0.333** (0.138) | -0.667*** (0.225) | -0.896*** (0.204) | -1.292*** (0.325) | 0.162 (0.288) | -0.045 (0.387) | -1.682*** (0.434) | -1.030 (0.662) |
| Three or more children | -0.620*** (0.211) | -0.994*** (0.318) | -0.833*** (0.287) | -1.422*** (0.403) | 0.326 (0.412) | -0.096 (0.521) | -1.779*** (0.584) | -0.865 (0.811) |
| Newborn | 0.124* (0.064) | 0.031 (0.108) | 0.243*** (0.086) | 0.047 (0.128) | -0.010 (0.166) | -0.294 (0.185) | 0.559*** (0.180) | -0.053 (0.247) |
| Baseline controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Couple fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N (observations) | 11,234 | 11,232 | 10,315 | 11,231 | 1,293 | 1,294 | 1,142 | 1,294 |
| Couples | 2,737 | 2,737 | 2,634 | 2,737 | 413 | 413 | 372 | 413 |

Note. The bracketed terms are robust standard errors (clustered by couples). The sample consists of men and women in mixed-sex couples, between the ages of 20–50 years old who were interviewed in the HILDA survey, waves 2–18. Baseline controls include a dummy for marriage, both partner's age in five-year bands, both partner's years in education, and both partner's presence of a health condition

* Denotes significance at 10%; ** at 5%; *** at 1% levels

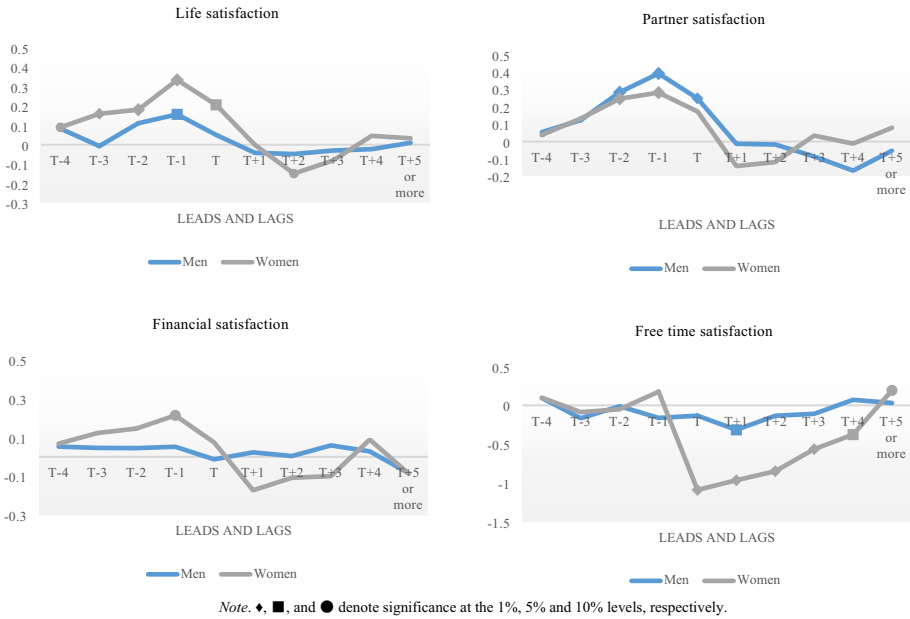


Fig. 1 Dynamic effects of a newborn by SWB domain

As seen in Fig. 1, for overall life satisfaction, there are strong positive “anticipation” effects of a newborn. For both men and women, these are highest in the year prior to the child’s birth (T-1). However, for women, positive anticipation effects are present in each of the four years prior to the birth of a child.

In the birth year (T), women’s life satisfaction stays high but men’s falls to become insignificantly different from the level recorded four years prior to the birth. However, reflecting on the pattern of the results in Fig. 1, the pattern changes in subsequent years. Statistically significant negative impacts on life satisfaction emerge for women when the child is around two years old, while men’s life satisfaction stabilises at that time. For women, adaptation back to a baseline level of overall life satisfaction occurs, on average, when the child is three years old, much later than is the case for men. The results for women align with those found in Clark et al., (2018).

The results presented in Fig. 1 on financial satisfaction reveal fairly large significant positive anticipation effects a year prior to birth for women. However, in the year of birth, financial satisfaction reverts to a level that is not statistically different from the level prevailing four years prior, and it remains at this relatively low level for three years after the child’s birth. For men, the birth of a child does not cause large changes in financial satisfaction. These patterns suggest that financial satisfaction is important to women’s decision to have a child, but having a child pushes them back to a lower financial position. It also implies that the financial impacts of parenthood may not be equally shared between mothers and fathers.

For both men and women, partner satisfaction increases in the two years leading up to having a child, and these effects are highest in the year prior to birth. Exhibiting similar adaptation effects for both genders, the positive effects of a newborn on partner satisfaction diminish in the year of birth with negative (although insignificant) lag effects when the child is around one year old.

The results for free time satisfaction presented in Fig. 1 demonstrate that there are no significant anticipation effects for both men and women. However, for women, in the birth year (T), there is a steep drop in free time satisfaction; negative adaptation effects are significant until five or more years after the birth of a child. For men, negative adaptation effects are present in the year after the birth of a child.

The results highlight the importance of taking account of newborn lead and lag effects, as they show how the positive effect of newborns on SWB is, in large part, due to changes occurring prior to the child's birth especially for women. This is suggestive of a selection into parenthood effect. The measured negative effects of parenthood evident in these results suggest that, for women, the positive changes in financial and other forms of SWB that encouraged them to have a child do not survive the early years of parenthood, and it takes four or more years to regain this lost ground.

In order to delve further into the intra-household gender gaps, Table 10 provides a comparison of the difference between the woman's and the man's SWB across the newborn lead and lag coefficients. There are some gender differences within life satisfaction and free time satisfaction domains. Women report higher levels of overall life satisfaction in the year before the birth of a child by 0.164 points. In addition, the negative lag effects on free time satisfaction followed by the birth of a child appear to be statistically significant and much larger for women than men. For example, in the year of birth, women's free time satisfaction is on average 1.014 points lower than men's free time satisfaction.

6 Conclusion

The findings of the analyses presented in this study are broadly consistent with those produced in a range of other Australian studies as they show that, in general, parenthood is associated with lower levels of SWB. The findings of this study, however, reveal some additional gender patterns and suggest that the financial vulnerability and time pressures of parenthood are more strongly experienced by women than men. This can be linked to the gendered roles associated with parenting. A range of studies have documented the increase in women's time spent on domestic roles when they become mothers, and of a fall in their ability to participate in paid work (see for example, Craig & Mullan, 2010). However, some have suggested that this may be a voluntary arrangement, agreed to by women in an implicit contract with their partner (Becker, 1991). The findings of this study appear to go against that possibility. Rather than showing similar changes in life satisfaction for both partners, this study finds substantial gender differences in the effects of parenthood specifically in the presence of two or more children. This evidence is not supportive of the assumptions of the unitary model of the household, but rather, the divergence in the effects of parenthood on SWB within households are more consistent with the implications of collective models of the household.

These results add to the emerging literature on the intra-household allocation of resources and how this affects the distribution of wellbeing. Women who are able to maintain their work appear to suffer a smaller drop in financial wellbeing with parenthood. However, maintaining paid work hours is also associated with lower overall satisfaction, perhaps because with weak institutional support, juggling work and care duties tends to be a difficult task – and one that falls on women. Moreover, our results suggest that while own work hours are an important mechanism in determining changes in wellbeing relating to parenthood, the same is not always the case for partner's work hours.

The results on adaptation and anticipation effects of parenthood are another important contribution of this study. They show, first, some of the limitations of models that do not account

Table 10 Newborn lead and lag effects on women's and men's differences in life satisfaction, financial satisfaction, partner satisfaction, and free time satisfaction: Fixed effects regression results

| | Woman's SWB - Man's SWB | | | |
|-----------------|-------------------------|------------------------|----------------------|------------------------|
| | 1 | 2 | 3 | 4 |
| | Life satisfaction | Financial satisfaction | Partner satisfaction | Free time satisfaction |
| T-4 | -0.030 (0.065) | 0.000 (0.102) | -0.019 (0.082) | 0.038 (0.138) |
| T-3 | 0.139** (0.069) | 0.027 (0.102) | 0.085 (0.096) | 0.147 (0.152) |
| T-2 | 0.058 (0.075) | 0.030 (0.114) | 0.049 (0.103) | 0.015 (0.161) |
| T-1 | 0.164** (0.083) | 0.110 (0.126) | 0.020 (0.118) | 0.393** (0.175) |
| T | 0.136 (0.107) | 0.078 (0.160) | -0.192 (0.157) | -1.014*** (0.233) |
| T+1 | 0.021 (0.107) | -0.208 (0.154) | -0.252 (0.156) | -0.712*** (0.230) |
| T+2 | -0.090 (0.105) | -0.111 (0.156) | -0.145 (0.163) | -0.780*** (0.214) |
| T+3 | -0.059 (0.111) | -0.147 (0.182) | -0.147 (0.149) | -0.503** (0.243) |
| T+4 | 0.069 (0.132) | 0.075 (0.180) | -0.065 (0.192) | -0.510** (0.233) |
| T+5 or more | 0.020 (0.064) | -0.046 (0.094) | 0.029 (0.086) | 0.099 (0.136) |
| <i>N</i> (obs.) | 12,841 | 12,839 | 11,528 | 12,835 |
| Couples | 3,181 | 3,180 | 3,017 | 3,179 |

Note. The bracketed terms are robust standard errors (clustered by couples). The sample consists of men and women in mixed-sex couples, between the ages of 20–50 years old who were interviewed in the HILDA survey, waves 2–18. Controls are: number of children, marriage, both partner's individual income (in logs), both partner's hours of paid work and housework, both partner's presence of a health condition, both partner's years in education, both partner's age in five-year bands, year dummies, and individual fixed effects

* Denotes significance at 10%; ** at 5%; *** at 1% levels

for the process of changes in SWB. When controlling for anticipation and adaptation effects, while still accounting for partner interdependencies, the results are also very much consistent with the idea of the hedonic treadmill model – providing evidence that the impact of certain life events such as the birth of a child on wellbeing are better understood as a process occurring not only in the year of the event, but also in the years proceeding and following it.

Positive anticipation effects are present on some domains of wellbeing for both men and women. For example, the positive effects on overall life satisfaction quickly diminish in the year of birth and one year after birth for men and women respectively. However, these positive effects are larger for women than men. In other words, if men are less satisfied than women in general, then from the lags and leads analysis

a newborn is likely to make households less equal in the lead up to the birth and one year after (from Fig. 1), with a return back to the initial level of satisfaction inequality afterwards. While there appear to be no anticipation effects for men's financial satisfaction, there are positive anticipation effects on financial satisfaction for women the year before the birth of a child. These findings support results in Danish (Andersson et al., 2014), Norwegian (Hart, 2015) and Finnish (Vikat, 2004) samples which demonstrated that higher financial positions for women are an important factor in fertility decisions. Given that parenthood is often associated with the "motherhood penalty," women may opt to only have children once a certain level of career maturity (and financial security) is reached (Andersson et al., 2014). Using Australian data, the results in this study indicate some possible cross-country similarities.

The results in this study are subject to some limitations. Regardless of the comprehensive list of controls and the use of fixed effects estimation strategies which control for unobserved time invariant heterogeneity, issues of unobserved time variant heterogeneity and reverse causality may still be present. For example, "(un)happy" individuals' self-selection into parenthood cannot be ruled out. Moreover, Kravdal, (2014) argues that estimations in previous studies about the effect of parenthood are biased since none of them controlled for expectations about the effect of parenthood. In that case, however, it could be assumed that the use of models which account for the anticipation effects of a newborn would capture an individual's wellbeing in the years prior to the event mitigating this bias. Nonetheless, to avoid any unwarranted claims on this issue, the results presented in this study simply point out how parenthood and wellbeing are correlated.

The results provide some insight on policy implications, demonstrating the importance of advocating for supportive childcare and promotion of flexible work practices. The results in this study are obtained using Australian data, however they are also likely to be relevant in other countries (for example the US) which have similar parental public policies with minimal support for parents who juggle full-time work and family obligations. Previous empirical work on parental wellbeing has demonstrated that parents in countries (such as Germany (see Stutzer and Frey, (2004) and Pollmann-Schult, (2014))) in which progressive policies such as childcare and parental leave support gender-egalitarian patterns, in contrast to countries where institutional support promotes traditional division of gender roles, parents report higher wellbeing compared to non-parents.

In particular, within the Australian context, the relatively low access to childcare services provides greater support to traditional households where women take up childcare responsibilities while men provide financial support (Baxter et al., 2015). This arrangement reduces time conflicts arising from trying to balance both work and childcare for mothers. Yet as the results of this study show, such a reduction in women's participation in paid work has consequences on their financial wellbeing.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10888-022-09553-7>.

Funding Open Access funding enabled and organized by CAUL and its Member Institutions

Data availability The data that support the findings of this study are available from the HILDA survey but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available.

The HILDA Survey Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the authors and should not be attributed to the DSS or the Melbourne Institute.

Declarations

Conflict of interest None.

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