

# Gender differences in mental health following the transition into parenthood: Longitudinal evidence from the UK

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## ABSTRACT

Previous studies have largely omitted a dynamic analysis of how the transition into parenthood shapes gender differences in mental health trajectories. This study adopts a life course approach to examine how transitioning into parenthood affects men's and women's mental health across multiple domains over time, using large-scale panel data from the 'UK Household Longitudinal Study' (2009–2020). Results from fixed effects models with discrete-time trends show that: (1) women's mental health is more largely affected by parenthood than men's; (2) women's overall mental health shows stable improvements following childbirth, while men's shows mostly insignificant changes; (3) role and social functioning are largely improved among women following childbirth, but only marginally among men; (4) emotional functioning and vitality demonstrate the counteracting effects of parenthood for both genders, with increases in feeling happy but a deterioration in feeling calm and having energy, particularly during care-intensive years; (5) women show larger variations by socioeconomic characteristics than men, with women from higher socioeconomic backgrounds and working full-time experiencing smaller mental health benefits from parenthood compared to less privileged women or having lower paid work constraints. Overall, transitioning to parenthood leads to distinct changes in mental health domains with heterogeneous effects across genders and socioeconomic groups.

## 1. Introduction

Gender inequalities persist strongly across multiple outcomes such as paid work, household labour or leisure (Bianchi et al., 2000; Budig & England, 2001; Hook, 2010; Kamp Dush et al., 2018). The effect of parenthood on gender inequalities in income and labour market outcomes has been well documented (e.g., Musick et al., 2020). Yet, how the transition to parenthood affects individuals' mental health trajectories, and particularly whether men and women are differently impacted by this life course transition, remains to be more precisely understood. The present study contributes to the health, gender, and life course literatures by providing new dynamic evidence of how the transition to parenthood shapes men's and women's mental health outcomes over time.

Understanding whether and how parenthood impacts gender gaps in mental health has important societal implications. Women tend to experience higher levels of psychological distress than men and are more likely to report internalising mental health problems such as depression or anxiety (Kuehner, 2017; Otten et al., 2021), which have been linked

to parenthood (e.g., postpartum depression). Gender disparities in mental health may partly reflect differences in gendered expectations, responsibilities and behaviours which may be amplified over the transition to parenthood, potentially leading mothers to experience greater pressures and strains than fathers (Baxter et al., 2015; Nomaguchi et al., 2005; Ruppanner et al., 2019).

To date, however, the literature has provided inconclusive evidence on how becoming a parent affects men's and women's mental well-being (Nelson et al., 2014; Nomaguchi & Milkie, 2020). Longitudinal studies generally find only short-term effects of childbirth on parental well-being (Clark et al., 2008; Mikucka & Rizzi, 2019; Myrskylä & Margolis, 2014), but mostly use unidimensional evaluative measures such as life satisfaction, which may not account for specific mental health dimensions. By contrast, multi-item mental health instruments allow to capture more precise dimensions, such as mental strains and benefits, by recording psychological functioning (e.g., ability to perform necessary tasks well) and emotional states (e.g., feeling stressed, feeling happy), which may be differentially affected by parenthood (Oyarzún-Farías et al., 2021). Studies examining specific mental health

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outcomes (e.g., stress, depression or fulfilment) suggest that parenthood has counteracting positive and negative effects, which unequally affect mothers and fathers. However, these previous studies often rely on cross-sectional data which do not capture the dynamic nature of the parenthood experience (Negraia & Augustine, 2020; Nomaguchi & Milkie, 2003; Roeters & Gracia, 2016). Only few recent studies have examined mental health longitudinally in the transition to parenthood (Clark & Georgellis, 2013; Giesselmann et al., 2018; Ruppanner et al., 2019), but without examining specific mental health areas as well as taking into account gendered and socioeconomic differences in these effects.

This study addresses gender differences in mental health trajectories of first-time parents in the UK. We combine a long-term longitudinal approach with a multidimensional measure of mental health, using the SF-12 Mental Component Summary (MCS) score. The SF-12 MCS captures relevant dimensions likely to be affected by the transition to parenthood, such as role and social functioning, stress and fatigue. Our study not only focuses on overall mental health, but also adopts a domain-based approach to mental health trajectories following the transition to parenthood using the SF-12 MCS subscales. By making novel use of multiple mental health subscales (i.e., role, social, emotional functioning, and vitality), we can identify counteracting psychological effects of parenthood which are otherwise not detectable through the computed global score (e.g., becoming a parent may increase joy, but also fatigue or conflict with social life). This allows us to compare longer-term processes in adjacent but distinct areas of individuals' mental health following childbirth. We particularly focus on gendered differences within and across these domains as well as address heterogeneity in mental health by socioeconomic characteristics among both men and women following the first parenthood transition. We use large-scale panel data from the British *Understanding Society* survey (UK Household Longitudinal Survey, UKHLS) which provides repeated annual observations on mental health measures, family context, and socioeconomic indicators collected between 2009 and 2020 from a sample of over 40,000 households.

Our study contributes to the growing literature on parenthood transitions and mental health trajectories by (1) adopting a nuanced multidimensional approach using relevant subscales of mental health, (2) examining gender differences, and (3) addressing socioeconomic heterogeneity across this life course process.

## 2. Analytical framework

### 2.1. Mental well-being in the transition to parenthood: previous findings

Previous studies on parental mental well-being have adopted various methodological approaches (cross-sectional vs. longitudinal) and examined different types of outcomes (unidimensional subjective well-being measures vs. mental health assessment scores). Studies using cross-sectional data have yielded mixed results, finding either positive or negative effects of parenthood on mental health, with some pointing out higher levels of distress and depressive moods, dependent on social and marital context, as well as age at birth and parenting stage (Evenson & Simon, 2005; Mirowsky & Ross, 2002; Simon & Caputo, 2019). However, these studies may be subject to bias due to unobserved factors affecting results (e.g., selection into parenthood). By contrast, longitudinal studies examining parental well-being, which can account for individual-level unobserved heterogeneity, show a more consistent picture. Parenthood has been mostly found to have a positive effect on individual well-being, although effect duration varies across studies. Momentary increases have been documented for German, Swiss, British, and Australian data (Clark & Georgellis, 2013; Frijters et al., 2011; Mikucka & Rizzi, 2016; Myrskylä & Margolis, 2014), while longer-lasting positive trends were found in Russia and Hungary, which suggests some variations across cultural and policy context (Mikucka, 2016; Radó, 2020).

Most previous longitudinal studies examine parental well-being through global evaluative indicators such as 1-to-10 scales of life satisfaction or happiness which reflect individuals' global perceptions of life quality (Clark et al., 2019). However, they do not necessarily reflect having good mental health or allow to describe the complex and multi-layered mental and emotional processes taking place following childbirth. Only a few studies on parenthood transitions have adopted a long-term dynamic approach to study variations in mental health. Examining Australian household panel data, Ruppanner et al. (2019) find positive effects of a first birth on maternal mental health (measured by the SF-36 MCS), supporting an older study by Clark and Georgellis (2013) finding temporary positive effects of parenthood on mental health in the UK (measured by the GHQ-12). By contrast, Giesselmann et al. (2018) find a negative evolution of German mothers' mental health (SF-12 MCS) following the transition into parenthood, while Tosi and Goisis (2021) find that (short-term) effects vary depending on whether parents had to go through medically assisted reproduction in the UK. However, these previous studies have not addressed (1) how specific mental health domains are affected by parenthood; (2) whether longer-term trajectories differ between men and women; and (3) whether trajectories show heterogeneity across socioeconomic groups. Our study contributes to filling these gaps.

### 2.2. Conceptual and theoretical approach

Mental health is conceptualised as a state which includes functioning, psychological well-being, and vitality i.e., having good mental health translates into having the ability to carry out daily work and social activities without experiencing persistent strain and being able to manage emotional distress (World Health Organization, 2022).

All mental health domains as captured by the SF-12 MCS, may be affected by parenthood. First, role and social functioning (i.e., the ability to perform well usual daily and social activities) may be negatively affected by parenthood, as the new parenting roles and responsibilities may induce performing less well due to role overload or strain, particularly for mothers (Goode, 1960; Simon, 1992). Second, emotional functioning (i.e., how emotions are experienced and expressed) may be affected by parenthood: negative emotions such as feeling stressed may increase due to feeling more pressured for time (Ruppanner et al., 2019), while positive emotions, such as feeling joyful or happy, may improve with a fulfilling family life (Nelson et al., 2013). Lastly, vitality (i.e., having energy and endurance) may deteriorate after childbirth, due to the increase in strain and fatigue linked to the lack of sleep and having to provide intensive care in the early childrearing years, which may affect mothers more than fathers (Venn et al., 2008).

The predominant approach to study parental well-being within the life course framework is the *set-point* theory. According to *set-point* theory, individuals have a stable, baseline well-being level determined by genes, personality, and early environment (Diener et al., 2009). Important life events only temporarily increase or decrease –rather than redefine– well-being levels, having a short-term effect before individuals revert to their baseline (or set-point) and adapt to their new circumstances over time. Additionally, in the case of expected life changes such as parenthood, an anticipation process is likely to be observed, raising well-being levels prior to the actual event (Frijters et al., 2011). Multiple studies find empirical evidence in support of *set-point* theory in relation to how parenthood transitions affect selected well-being outcomes (e.g., Anusic et al., 2014; Clark et al., 2008). Additionally, although *set-point* theory does not make explicit distinctions between men and women, some gendered differences are observed in effect size and adaptation periods following childbirth (Frijters et al., 2011; Mikucka & Rizzi, 2019).

Further, the *costs-rewards* approach to parenthood states that children simultaneously bring positive and negative aspects to parents' lives (Nomaguchi & Milkie, 2003). Being a parent is associated with feelings of fulfilment and happiness, as it provides psychological, emotional, and

social benefits. However, parenthood also increases feelings of stress and fatigue, due to financial and time-consuming commitments, as well as greater domestic responsibilities (Nomaguchi & Milkie, 2020). Depending on the stressors experienced by parents (e.g., work-family conflict, financial burdens), those may offset the enjoyments of parenting (Pollmann-Schult, 2014). The *cost-rewards* approach acknowledges the mixed and sometimes contradictory experience of parenthood, suggesting that transitioning into parenthood may combine both positive and negative mental health elements, particularly during the early, care-intensive childrearing years.

However, the *set-point* and *costs-rewards* theories have not been combined to examine gendered mental health dynamics over multiple years following childbirth. The *costs-rewards* theory justifies a domain-based approach to parental mental health, while *set-point* theory justifies a long-term and yearly approach to examining mental health outcomes as trends evolve rapidly around birth. We test whether the expectations drawn from *set-point* theory also apply to mental health and its specific domains, as measured by the SF-12 MCS, and examine whether parenthood's costs and rewards are reflected in mothers' and fathers' mental health outcomes.

### 2.3. Gender, parenting, and mental health

Men and women face different demands when becoming parents (Scott & Alwin, 1989). With the arrival of a child, new tasks and responsibilities need to be carried out, adding to existing obligations. As mothers and fathers are not subjected to the same societal expectations, the transition to parenthood prompts different normative, behavioural, and well-being responses from men and women.

Gendered behaviours within couples increasingly emerge following childbirth. Mothers often shoulder larger amounts of housework and childcare, which results from a shift towards more traditional gender attitudes and divisions of labour after entering parenthood (Baxter et al., 2015). Mothers continually take on a greater parenting role than fathers as the primary caretaker, which involves higher time commitments and constraints leading to increased time pressures (Offer & Schneider, 2011; Ruppanner et al., 2019). This has been accentuated by emerging 'intensive parenting' ideologies according to which parents—in particular mothers—over-invest time, energy, and resources for their children to secure them the best educational and economic outcomes, even at their own expense (Hays, 1996). This has led to an increase in child-rearing involvement and perceived parenting pressure, which may be particularly detrimental to maternal mental health (Henderson et al., 2016; Rizzo et al., 2013).

Despite this, longitudinal studies on parental subjective well-being find mostly moderate, short-term differences between mothers and fathers when having a first child (Clark et al., 2008; Clark & Georgellis, 2013; Myrskylä & Margolis, 2014). Some studies find that mothers of young children are happier (Baranowska & Matysiak, 2011; Radó, 2020), while others indicate that fathers are happier (Nelson-Coffey et al., 2019). We expand on these results by assessing gendered differences in mental health and its domains over time.

### 2.4. Socioeconomic characteristics as moderators of parental mental health

Socioeconomic characteristics are important determinants of parental well-being. The experience of parenthood can differ significantly depending on the socioeconomic context of parents (Pollmann-Schult, 2014). We consider the role of socioeconomic status (SES)—including education, occupation, and income—and paid work time constraints on mothers' and fathers' mental health trajectories.

Having children is costly, both financially and timewise. On the one hand, higher SES individuals have higher levels of education and more often work in higher paid managerial or professional occupations. Higher income provides an easier access to external childcare and

outsourcing housework, which may help relieve parental time pressures, especially for mothers. Moreover, higher SES is associated with more egalitarian family ideologies and arrangements, which are positively linked to mothers' well-being (Kulik, 2020). Higher SES is also associated with better overall health outcomes (Smith, 2007).

On the other hand, higher SES individuals may also experience greater work-family conflict due to more career-oriented occupations and demanding work responsibilities. Managerial and professional occupations typically involve longer and heavier workloads, and work-life conflict has been found to reduce well-being outcomes over the transition to parenthood (Matysiak et al., 2016). Moreover, higher SES parents are more likely to parent according to the 'concerted cultivation' approach, which involves close monitoring of children's social and educational activities to nurture and develop their abilities (Lareau, 2003). Similarly, higher SES parents adhere more strongly to intensive parenting ideologies, which further increases societal pressure on parents to be very actively involved in childcare, even when work demands are high (Gimenez-Nadal & Sevilla, 2016). A study by Nomaguchi and Brown (2011) finds evidence for the duality of the role of education for parents, which provides resources for childrearing but also increases competing parenting and career demands. As a result, it could be argued that higher SES individuals' mental health, particularly mothers', is affected disproportionately by the transition to parenthood.

Similarly, individuals who combine high work constraints with the arrival of a first child may experience more negative feelings following parenthood than those with lower work constraints, as the former have less leeway to organise and complete housework and childcare, leading to increased stress (Chandola et al., 2019). The effects of work constraints may be particularly salient for women as previous studies show that high work constraints particularly disadvantage the well-being of mothers on full-time schedules (Hewitt et al., 2006).

### 2.5. Transition into parenthood: the UK context

The early 2000s in the UK marked a shift from low state support to increased family policy interventions. Over this period, family policy was rapidly expanded by implementing new (and enlarging existing) measures to protect parental well-being and facilitate work-family life reconciliation (Lewis & Campbell, 2007). Yet, the UK remains classified as an improved breadwinner model ('male breadwinner, female part-time carer model') with persistent gendered caregiving roles (Andrew et al., 2021; Chanfreau, 2022).

The current parental leave and childcare systems reinforce gendered divisions of labour, with possible differentiated consequences on men's and women's mental health after becoming parents. Mothers are *de facto* designated as the primary caretaker due to unequal parental leave regulations. While maternity leave duration was gradually increased to 52 total weeks, paternity leave still only comprises up to 2 weeks. Although this can be changed since 2015 through the Shared Parental Leave (which allows for transfers between parents to encourage fathers' involvement in early childcare) the actual uptake is very low, placing most early care pressure on mothers (Park et al., 2013). Additionally, despite the increase in universal free childcare provided to 3–4 year olds from part-time (15 h/week) to full-time care (30 h/week) for eligible families in 2016 (Brewer et al., 2022), childcare in the UK remains among the most expensive in Europe, as it largely relies on costly private provision for non-eligible families and infants (OECD, 2022). As a result, female employment is sharply reduced post-parenthood, with a high share of British mothers opting for part-time work to look after their child (Paull & Taylor, 2002; OECD, 2021). This reduction of paid work in order to provide childcare among new mothers, while there is little change for fathers, may translate into British women experiencing greater changes in mental health, either positive (e.g., via better parent-child bonding) or negative (e.g., via reduced economic autonomy).

These institutional constraints could particularly disadvantage full-

**Table 1**  
Sample description.

|  | Young parents |      |         |      | Controls |      |         |      | Total   |      |         |      |
|--|---------------|------|---------|------|----------|------|---------|------|---------|------|---------|------|
|  | Women         |      | Men     |      | Women    |      | Men     |      | Women   |      | Men     |      |
|  | M/Prop        | SD   | M /Prop | SD   | M /Prop  | SD   | M /Prop | SD   | M /Prop | SD   | M /Prop | SD   |
| Nb. of waves observed                  | 5.4           | 2.7  | 5.4     | 2.7  | 4.9      | 2.7  | 5.2     | 2.9  | 5.2     | 2.7  | 5.3     | 2.8  |
| Age at first observation               | 29.7          | 6.5  | 32.7    | 6.9  | 25.4     | 9.0  | 28.6    | 11.9 | 27.4    | 8.2  | 30.2    | 10.4 |
| Health impairment at first observation | 0.17          |      | 0.17    |      | 0.18     |      | 0.18    |      | 0.18    |      | 0.17    |      |
| Higher education degree                | 0.43          |      | 0.38    |      | 0.44     |      | 0.36    |      | 0.44    |      | 0.37    |      |
| Managerial/professional occupation     | 0.43          |      | 0.48    |      | 0.34     |      | 0.34    |      | 0.38    |      | 0.40    |      |
| High household income                  | 0.37          |      | 0.41    |      | 0.43     |      | 0.41    |      | 0.40    |      | 0.41    |      |
| Weekly work hours                      | 25.0          | 17.0 | 40.2    | 14.8 | 28.9     | 18.8 | 30.5    | 19.7 | 27.0    | 18.1 | 34.4    | 18.6 |
| N                                      | 4,587         |      | 3,717   |      | 5,405    |      | 5,705   |      | 9,992   |      | 9,422   |      |

Note: 'Young parents' refers to the group of parents whose first child is aged 8 or younger, 'Controls' refers to the control group of childless respondents. *M* = mean, *SD* = standard deviation, Prop = proportion.

Source: UKHLS, waves 1–11, unweighted data.

time working mothers. In the UK, working part-time allows mothers to retain a 'separate sphere' from their family through work while more easily adjusting their schedules around childcare needs and keeping a manageable work-life balance (Lyonette et al., 2011; Park et al., 2013). Comparatively, full-time employed mothers –who tend to be from higher SES backgrounds (Dex et al., 2008)– are faced with equally high gendered caregiving expectations, while often having poorer work-life balance and higher childcare expenses (e.g., needing full-time day care), with possibly more adverse consequences on mental health. This may be exacerbated among higher SES mothers as higher SES parents –particularly mothers– increasingly spend more time with children than lower SES parents, following similar trends to other European countries (Gracia & Ghysels, 2017). Additionally, British parents show growing adherence to intensive forms of parenting, with demanding internalised mothering ideals (Faircloth, 2014), which may further pressure higher SES mothers who are more active in intensive care activities.

Consequently, we expect that the experience of parenthood in the UK differs across genders, paid work constraints, and SES groups given the existing policy support, gendered caregiving roles, and parenting practices.

## 2.6. Hypotheses

We formulate the following hypotheses, based on our adaptation of previous scholarship and consistent with the UK context of the study.

First, we expect a positive anticipation effect of parenthood on mental health in the pregnancy year for both men and women, followed by a positive effect at birth and in the year following birth, consistent with *set-point* theory (H1a). However, consistent with the *costs-rewards* approach, parental mental health may subsequently display a negative trend during care-intensive years (i.e., when the child is between 0 and 4 years old and hasn't yet entered formal schooling) as a result of larger strain, fatigue, and pressure associated with the high demands of early childrearing (H1b). Due to mothers' larger parental involvement, constraints, and expectations leading to greater strains than for fathers, we expect any negative trend to be more apparent for women (H1c).

Second, we expect items accounting for role burden and overload (i.e., performing tasks as well and carefully as usual) to be negatively affected by parenthood due to the multiplication of chores following parenthood, particularly during care-intensive years (H2a). Consistent with the *costs-rewards* approach predicting counteracting effects, we expect parenthood to have positive effects on mental health items that account for fulfilment (i.e., feeling happy), but negative effects on items that account for difficulties (i.e., feeling stressed, having low energy) for both men and women, with largest effects post-birth when parents emotionally adjust (H2b). Drawing on gender role models and previous evidence, we expect the effects of becoming a new parent on both positive and negative mental health items to be larger among women than among men (H2c).

Third, we anticipate socioeconomic characteristics to moderate the gendered effects of the transition to parenthood on overall mental health. We expect larger fluctuations in mental health among higher SES individuals following birth due to a higher adherence to intensive parenting ideologies (H3a), with more pronounced effects among mothers than among fathers (H3b). Similarly, we expect larger negative outcomes for mothers with high work constraints (i.e., working full-time) compared to mothers having lower paid work constraints (H3c).

## 3. Data and methods

### 3.1. Data and sample

We use the first 11 waves of the UK Longitudinal Household Survey (UKHLS), spanning every year between 2009 (wave 1) and 2020 (wave 11). The survey consists of over 40,000 British households interviewed annually, with every household member over 15 years old being interviewed separately, providing complementary data on family configurations. Questionnaires include rich modules on individual well-being and health, socioeconomic characteristics, and demographics.

We restrict the analytical sample to person-year observations in which female respondents are aged between 18 and 50 years and male respondents between 18 and 60 years to constrain it to adults in the typical age range for having younger children ( $n = 71,030$  individuals). We further drop all person-year observations having missing values on any of the model variables ( $n = 39,616$ ) along with respondents who are observed only once as they will not be used in the model estimations ( $n = 30,585$ ). In line with the analytical strategy (described in Section 3.4), we retain both the group of respondents transitioning into parenthood for the first time or experiencing aging of their first child aged 8 or younger during the survey ('young parents' sample,  $n = 8,304$ ) as well as childless respondents ('control' sample,  $n = 11,110$ ; Ludwig & Brüderl, 2021). The final sample includes 19,414 respondents, with 9,992 women ( $N = 51,479$  person-year observations) observed on average for 5.2 waves and 9,422 men ( $N = 49,860$  person-year observations) observed 5.3 times. Table 1 describes sample characteristics. All data analyses are conducted using Stata 17.0.

### 3.2. Dependent variables

We measure mental health using the SF-12 health questionnaire. We use the Mental Component Summary (MCS) score of the SF-12, a validated and reliable measure of mental health (Gill et al., 2007; Ware et al., 1996). The overall SF-12 MCS score is constructed from six items assessing the respondent's mental health out of the total twelve items in the SF-12 form. It consists of four subscales which measure the following mental health domains: limitations in *role functioning* due to emotional problems (2 items: 'accomplishing less than usual'; 'being less careful than usual'), *social functioning* (1 item: 'health or emotional problems

**Table 2**  
Description of dependent variables.

|                       |                                     | Women    |           | Men      |           | Range | Description/Item question <sup>1</sup>  | Meaning <sup>2</sup>   |
|-----------------------|-------------------------------------|----------|-----------|----------|-----------|-------|---|--|
|                       |                                     | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |       |   |  |
| SF-12 MCS             |                                     | 47.13    | 10.17     | 49.37    | 9.29      | 0–100 | Computed global score   | Higher global scores indicate better overall mental well-being and functioning   |
| Subscale              | Item                                |          |           |          |           |       |   |  |
| Role functioning      | <i>Accomplishing tasks</i>          | 4.33     | 0.95      | 4.47     | 0.87      | 1–5   | <i>During the past 4 weeks, how much of the time have you accomplished less than you would like as a result of any emotional problems?</i>                              | Lower scores indicate issues with performing work and/or other usual daily activities resulting from emotional problems; Higher scores indicate no such problems occurring in the past 4 weeks |
|                       | <i>Carrying out tasks carefully</i> | 4.43     | 0.87      | 4.54     | 0.80      | 1–5   | <i>During the past 4 weeks, how much of the time did you work or do other regular daily activities less carefully than usual as a result of any emotional problems?</i> |  |
| Social functioning    | <i>Doing social activities</i>      | 4.34     | 0.95      | 4.49     | 0.87      | 1–5   | <i>During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities?</i>                             | Lower scores indicate issues with usual social activities due to physical or emotional problems; Higher scores indicate no such problems occurring in the past 4 weeks                         |
| Emotional functioning | <i>Feeling calm*</i>                | 3.30     | 0.89      | 3.48     | 0.88      | 1–5   | <i>How much of the time during the past 4 weeks have you felt calm and peaceful?</i>  | Lower scores indicate experiencing stress and depressive emotions; Higher scores indicate feeling peaceful, calm, cheerful, and happy in the past 4 weeks                                      |
|                       | <i>Feeling happy and cheerful*</i>  | 3.94     | 0.97      | 4.08     | 0.94      | 1–5   | <i>How much of the time during the past 4 weeks have you felt downhearted and depressed?</i>  |  |
| Vitality              | <i>Having energy*</i>               | 3.24     | 0.90      | 3.44     | 0.87      | 1–5   | <i>How much of the time during the past 4 weeks did you have a lot of energy?</i>   | Lower scores indicate feeling low in energy (tired, worn out); Higher scores indicate feeling energetic in the past 4 weeks  |

Note: Pooled total sample. *M* = mean, *SD* = standard deviation. Source: UKHLS, waves 1–11, unweighted data.

<sup>1</sup>Items range from 1 = “all of the time” to 5 = “none of the time”.

<sup>2</sup>The interpretation of the SF-12 subscales included in this table is adapted from Ware & Sherbourne (1992).

\*Negatively coded (worded) items were reverse coded (rephrased) so that higher scores indicate better outcomes across all items.

interfering with social activities’), *emotional functioning* (2 items: ‘feeling calm and peaceful’; ‘feeling downhearted and depressed’), and *vitality* (1 item: ‘having a lot of energy’). The items are assessed on a scale from 1 to 5 (expressed as ‘all of the time’ to ‘none of the time’) and computed into a global score. The final score ranges continuously from 0 (very poor mental health) to 100 (very good mental health), with 50 set as a general median score and a standard deviation fixed around 10. We use both the overall SF-12 MCS score and all six items separately.<sup>1</sup> All dependent variables are treated as continuous variables. Negatively coded (or worded) items were reverse coded (or rephrased) so that higher scores indicate better outcomes across all items. Table 2 describes and summarises the distribution and meaning of all main dependent variables used.<sup>2</sup>

### 3.3. Independent, moderation, and control variables

The independent variable throughout this study is the first transition to parenthood. To model the dynamic nature of this process on individual mental health, the variable is constructed to take into account discrete-time trends surrounding the first birth event (e.g., used in Myrskylä & Margolis, 2014). We identify a first birth using the survey variable indicating if the respondent is the parent of a new entrant baby

<sup>1</sup> The SF-12 is a shortened version of the original SF-36 measure but retains the same dimensions and subscales (Ware et al., 1995). The SF-36 MCS is a multidimensional measure which evaluates all main domains of mental well-being, i.e., role, social, emotional functioning, and vitality. Each subscale was adapted from former validated and reliable instruments, permitting the use of each subscale separately as a valid measure of a specific domain (Ware & Sherbourne, 1992). The high correlation between the SF-12 and the SF-36 has been established for its UK adaptation (Jenkinson et al., 1997; Ware et al., 1995). This study makes use of both the global SF-12 MCS score and its items to explore each domain in detail.

<sup>2</sup> For comparison purposes with previous studies, we contrast results of our mental health outcome measure (SF-12 MCS) with a life satisfaction measure as an additional analysis using the same model specification (see Appendix Table A1 for details).

(i.e., a baby born between the latest and current wave). We cross this variable with a lagged variable of the number of children in the respondent’s household. We mark a first birth if (1) the (lagged) number of children increases from 0 to 1 (or 2, in case of twin births) and (2) it coincides with being a new parent. The time trend variable is then coded into a categorical variable ranging from – 3 years (or more) before birth to + 8 years after birth. This observation window is defined to include average baseline effects before birth (when estimated outcomes are considered unrelated to the parenthood transition, i.e., before any anticipation effects) and up to 8 years, to capture all early parenthood stages. For individuals becoming parents during the observation period, the variable takes the value of the number of years around the birth of the first child. For individuals already entering the panel as parents, but whose first child is 8 years or younger (i.e., left-censored observations), the time trend variable takes on the value of the first child’s age. Respondents included in the control group are coded to – 3 as a default time-invariant value (Perales, 2019). See Online Supplements (Table S1) for a fictitious illustration of the data file structure.

For moderation analyses we define four time-invariant dummy variables: obtained a degree in higher education; held a managerial or professional occupation during most years of the observed period; average personal monthly income over the observed period exceeded the average income in the sample; average working hours exceeded 30 weekly hours during care-intensive years (i.e., in years 0–4 post-birth) for young parents, or over the whole period for the control group.

Across all models, we control for: age and age squared as it is an important confounder affecting both mental health and first birth; employment status (full-time, part-time or no employment) as employment changes are linked to parenthood status and impact mental well-being (Gebel & Voßemer, 2014); relationship status (partnered, separated/widowed or single) to account for changes in household configurations; household monthly total net income to account for changes in financial security and resources; and long-term health impairment to control for the effect of changes in health status (e.g., developing a chronic condition).

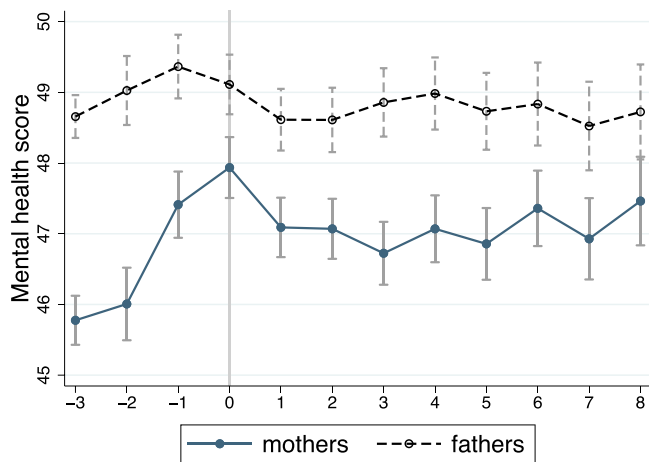


Fig. 1. Predicted mental health trajectories (in years) around first birth from fixed effects linear models. Note: Fixed effects models estimates with 95 % confidence intervals with reference category at - 3 years, separate models for men and women. Predicted effects were computed on respondents experiencing the transition to parenthood ('young parents' sample). Source: UKHLS data, waves 1–11, unweighted data.

### 3.4. Empirical strategy

We apply fixed effects models to study the trajectories around the birth of a first child, which exploit within-individual variations of time-dependent variables. The estimated parameters capture the average effect of change in the variable of interest (i.e., the arrival and aging of the first child) on a change in the outcome (i.e., mental health). Fixed effects models produce unbiased, consistent estimations by removing unobserved time-constant individual heterogeneity (Allison, 2009), which partly eliminates self-selection bias (e.g., selection into parenthood based on unobserved factors), conditional on no confounding by time-varying variables.

Fixed effects model are also less impacted by panel attrition issues such as endogenous selection bias linked to mental health levels (e.g., respondents with low overall mental health dropping out) as the within-person estimations (i.e., estimating mental health changes within the same person over time) are not affected by compositional change in the sample (Kratz & Patzina, 2020). However, fixed effects models may still be affected by endogenous selection bias if attrition occurs due to a sudden change in mental health trajectories. We conduct additional analyses to assess this possibility. First, descriptive comparisons between the 'dropout' and 'nondropout' groups in the sample show that respondents dropping out before wave 11 have slightly higher average mental health than those not dropping out. Further, logistic models predicting next-wave dropout (whether definitive or 'skipping a wave') indicate no (or very weak) associations between mental health and next-wave dropout. Lastly, including average person weights has no notable effect on mental health trajectory estimations, therefore these weights are not included in the final models. Overall, we find little evidence that selective attrition on mental health may affect model results.

We include both the group of young parents to estimate the treatment effect (i.e., experiencing the birth and/or aging of a first child until 8 years) as well as childless respondents as a control group. Respondents in the control group do not contribute to the estimations of the treatment variable (i.e., the parenthood timer) as they are assigned a time-constant default value. However, the control group contributes to the estimation of all other included covariates (e.g., disentangling and controlling for age effects on mental health), making estimations more robust and representative of the study population (Ludwig & Brüderl, 2021; Perales, 2019).

We stratify our analyses by gender and use separate models for men and women, as processes surrounding mental health and parenthood are

gender specific. We overlay graphically the separately estimated trajectories of men and women to compare magnitude, scope, and level of each examined mental health outcomes around the event, separately controlling for covariates. Additionally, we estimate fully interacted models for each outcome to include significance tests of gender differences in the parenthood transition (see Leopold, 2018 for a similar strategy). The fixed effects framework allows for interactions of time-varying variables with a time-constant variable (Gisselmann & Schmidt-Catran, 2020), although the time-constant variable will not be included in the model outside of the interaction terms.

The fixed effects regression model is specified in the following way for men and women, with clustered (robust) standard errors:

$$Y_{it} = \beta_0 + \beta_1' \cdot TP_{it} + \gamma' \cdot X_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

Where  $TP$  is the categorical discrete-time variable for first-time parenthood with values from - 3 (reference category) to + 8,  $X$  contains all time-dependent individual control variables, and  $\alpha_i$  is the individual fixed effect.

The fully interacted model is specified similarly to Eq. 1, with gender interactions on all variables:

$$Y_{it} = \beta_0 + \beta_1' \cdot TP_{it} + \beta_2' \cdot TP_{it} \times female_i + \gamma_1' \cdot X_{it} + \gamma_2' \cdot X_{it} \times female_i + \alpha_i + \varepsilon_{it} \quad (2)$$

In Eq. 2,  $\beta_2$  indicates whether and by how much the trajectory coefficient for women at time  $t$  significantly differs from the trajectory coefficient  $\beta_1$  for men at time  $t$ .

Lastly, moderation analyses add an interaction term between the independent variable and the time-invariant moderator  $M$  for men and women separately:

$$Y_{it} = \beta_0 + \beta_1' \cdot TP_{it} + \beta_2' \cdot TP_{it} \times M_i + \gamma' \cdot X_{it} + \alpha_i + \varepsilon_{it} \quad (3)$$

In Eq. 3,  $\beta_2$  indicates whether and by how much the trajectory coefficient for the second group ( $M=1$ ) at time  $t$  significantly differs from the trajectory coefficient  $\beta_1$  of the first group ( $M=0$ ) at time  $t$ .

## 4. Results

### 4.1. Mothers' and fathers' mental health trajectories

Fig. 1 presents the results of the fixed effects models for men's and women's individual mental health trajectories with full model results and coefficients presented in Appendix Table A1.

Fig. 1 shows that, on average at baseline, women becoming mothers score lower on mental health as measured by the SF-12 MCS than men becoming fathers. Women's mental health trajectory globally stays at a lower average level than men's during the complete observation frame, despite a reduction of the gap over time.

For women, we observe an anticipation effect, relative to pre-parental mental health 3 years prior birth, with a statistically significant positive effect on mental health during the year of pregnancy ( $\beta_{TP=-1} = 1.64, p < .001$ ). The trajectory reaches a peak at birth ( $\beta_{TP=0} = 2.16, p < .001$ ), before slightly reducing in the following years. However, the trajectory stays significantly positive with respect to baseline throughout all the observation windows ( $\beta_{TP=8} = 1.69, p < .001$ ). For fathers, the trajectory shows a smaller anticipation effect ( $\beta_{TP=-1} = 0.71, p < .05$ ) but no significant changes can be observed at birth or after, suggesting that men's overall mental health is on average not affected in the long-term by the first transition into parenthood.

To contextualise these results, although effect magnitude appears small in relation to the SF-12 MCS range (0–100), the SF-12 MCS within-individual standard deviation is around 6.5 points. Hence, a 2.16-point increase for women in mental health represents approximately 33 % of the average within-individual variation in mental health over the survey, which is of moderate substantive significance,

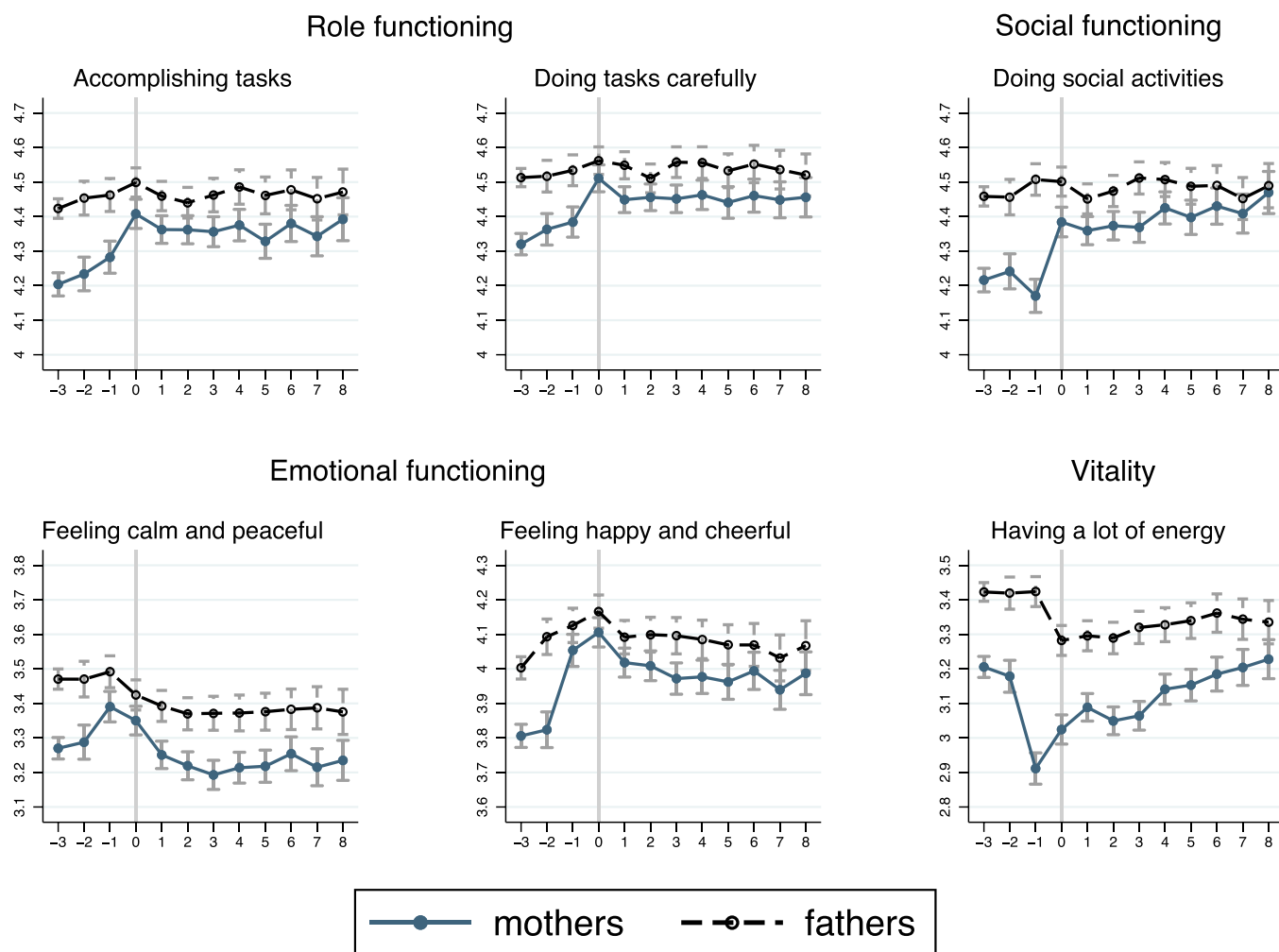


Fig. 2. Predicted mental health domains trajectories (in years) around first birth from fixed effects linear models. *Note:* Fixed effects models estimates with 95 % confidence intervals with reference category at - 3 years, separate models for men and women. Predicted effects were computed on respondents experiencing the transition to parenthood ('young parents' sample). Negatively coded (worded) items were reverse coded (rephrased) so that higher scores indicate better outcomes across all items. *Source:* UKHLS, waves 1–11, unweighted data.

while men’s anticipation coefficient of 0.71 amounts to a much smaller 11 %.

Overall, results from Fig. 1 do not fully support *set-point* theory for mental health as expected in *H1a* for men and women. Women show a positive anticipation effect followed by overall improvements in mental health after the birth of a first child without adaptation, while men are not significantly affected by the event itself. Further, we find no evidence of a negative pattern linked to the care-demanding years of raising a very young child after the positive effect of birth, as opposed to *H1b*. Lastly, contrary to *H1c*, no negative effect of parenthood is found for women’s overall mental health compared to men. Rather, women are significantly and substantively more positively impacted by parenthood during pregnancy and across all observation years than men (see Appendix Table A4 for results of the fully interacted model).

As an additional analysis, Appendix Table A1 compares results for mental health with life satisfaction to contrast both measures. Results for life satisfaction replicate findings from previous studies using a similar analytical strategy (e.g., Mikucka & Rizzi, 2019) showing distinct anticipation and adaptation effects for men and women, with a larger birth effect for women. This suggests that the multi-item SF-12 MCS measure of mental health captures additional dimensions, which drive a mostly positive longer-term effect of parenthood –for mothers– compared to life satisfaction.

#### 4.2. The transition into parenthood and specific domains of mental health

Fig. 2 shows results from the fixed effects models using all six SF-12 MCS items across its four subscales. Appendix Table A2 (for women) and Appendix Table A3 (for men) present the complete models. Appendix Table A4 presents the fully interacted model for the same measures. The main results emerging from Fig. 2 can be summarised as follows.

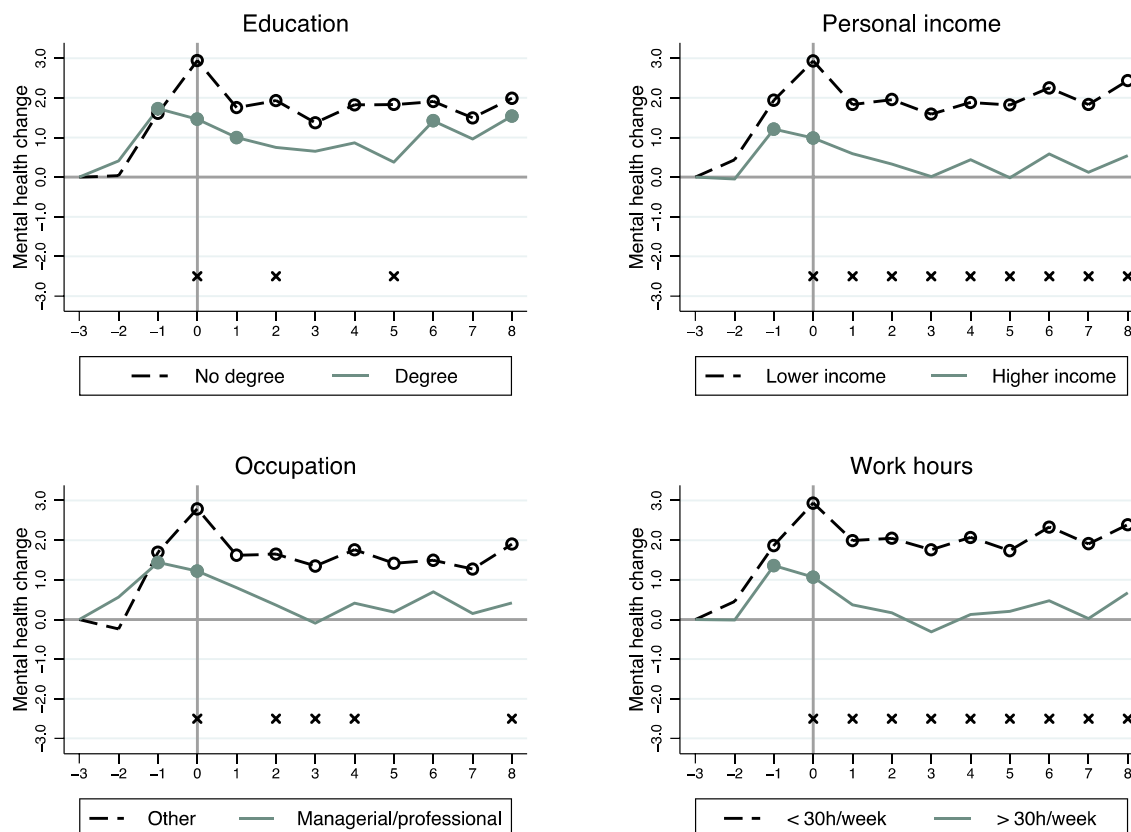
##### Role functioning

Mothers are more likely to have accomplished their usual tasks relatively to baseline starting in pregnancy, across birth ( $\beta_{TP=0} = 0.20, p < .001$ ) and the entire observation period at a stable level. By contrast, men’s changes in this item are not statistically significant, except for an increase in accomplishing tasks in the birth year ( $\beta_{TP=0} = 0.08, p < .01$ ). Similarly, women are consistently more likely to indicate being more careful than usual from pregnancy onwards across birth ( $\beta_{TP=0} = 0.19, p < .001$ ), with persistent significant effects over the observation period, while men are unaffected. This may be linked to mothers’ greater parenting responsibility and load, which requires being more efficient, careful, and attentive than usual.

##### Social functioning

Difficulties in participating in social activities are reduced post-birth (i.e., social functioning is improved) on average for women only ( $\beta_{TP=0} = 0.17, p < .001$ ), while men show no changes. The significant improvement in mothers’ social functioning lasts throughout the

## Panel A. Women



**Fig. 3.** Changes in mental health (in years) around first birth from fixed effects linear models by socioeconomic characteristics. *Note:* Fixed effects models estimates with socioeconomic characteristics interactions with reference category at  $-3$  years, separate models for men and women. Analyses are based on model results shown in [Appendix Table A5](#). Points denote a statistically significant trajectory coefficient at the 0.05 level. Crosses (x) mark a statistically significant difference between the groups' trajectory coefficients at the 0.05 level. Trajectories are obtained based on [Eq. 3](#)  $\beta_1$  coefficients for the first group ( $M=0$ ) and  $\beta_1 + \beta_2$  coefficients (with a Wald test assessing statistical significance) for the second group ( $M=1$ ). Graphs were produced similarly to [Mikucka & Rizzi \(2016\)](#). *Source:* UKHLS, waves 1–11, unweighted data.

observation period, even showing an upwards trend ( $\beta_{TP=8} = 0.25$ ,  $p < .001$ ), suggesting increasing social benefits to becoming a mother.

### Emotional functioning

We observe a statistically significant increase in feeling calm among women in the year before birth compared to baseline levels ( $\beta_{TP=-1} = 0.12$ ,  $p < .001$ ), followed by decreases (i.e., increases in feeling nervous or stressed) after birth which are however only significant in year 3 post-birth ( $\beta_{TP=3} = -0.08$ ,  $p < .05$ ). Fathers' trajectory also displays a statistically significant drop in feeling calm a year after birth ( $\beta_{TP=1} = -0.08$ ,  $p < .05$ ) which stabilises at this level throughout the observation period. Although mothers' trajectory in [Fig. 2](#) shows a more clearly defined decline pattern in feeling calm during early childrearing years (characterised by higher parenting demands) than men, the predicted change in this outcome is similar between men and women post-birth ([Appendix Table A4](#)). Conversely, mothers' happiness increases sharply over the transition to parenthood (i.e., depressive moods are significantly reduced). This process starts from the pregnancy year, with a positive anticipation effect ( $\beta_{TP=-1} = 0.25$ ,  $p < .001$ ), a peak around birth ( $\beta_{TP=0} = 0.30$ ,  $p < .001$ ) followed by long-lasting improvements over the entire observation period ( $\beta_{TP=8} = 0.18$ ,  $p < .001$ ). For men, an increase in feeling happy is also observed before and at birth ( $\beta_{TP=0} = 0.16$ ,  $p < .001$ ), however –unlike mothers– adaptation occurs five years after childbirth. Hence, we find evidence of an improvement in positive feelings following childbirth, which is larger and longer lasting for mothers than fathers ([Appendix Table A4](#)).

### Vitality

Energy levels display a statistically significant decrease for both men and women, but with a more pronounced pattern for women during care-intensive years ( $\beta_{TP=3} = -0.14$ ,  $p < .001$ ) before they regain average pre-birth levels, while men maintain a stable lower level compared to their baseline across the post-birth period ( $\beta_{TP=8} = -0.09$ ,  $p < .05$ ). A substantial and significant dip in energy levels relative to the baseline level is also observed for women in the year preceding birth ( $\beta_{TP=-1} = -0.29$ ,  $p < .001$ ), most likely due to the discomforts of pregnancy.

Overall, we find stable improvements in role and social functioning for women following birth while men mostly show no changes, which goes against *H2a* predicting dysfunction due to the multiplication of responsibilities, particularly in early childrearing years. In line with *H2b*, we observe that vitality shows important deteriorations in care intensive years while emotional functioning is differentially impacted, with increased stress (i.e., feeling less calm) countered by positive and fulfilling emotions (i.e., feeling happier) with long-lasting effects. Sub-scales show a gendered process in mental health over the parenthood transition: women display stronger changes in strain (larger fluctuations in feeling calm pre- and post-birth; lower energy levels) but overall improve their functioning compared to men. However, gender gaps in mental health emerging from the transition to parenthood are generally not very strong. Gender inequalities in mental health seem to be partly linked to pre-childbirth gender gaps in levels, although women react more strongly to parenthood in line with *H2c*.



### Panel B. Men

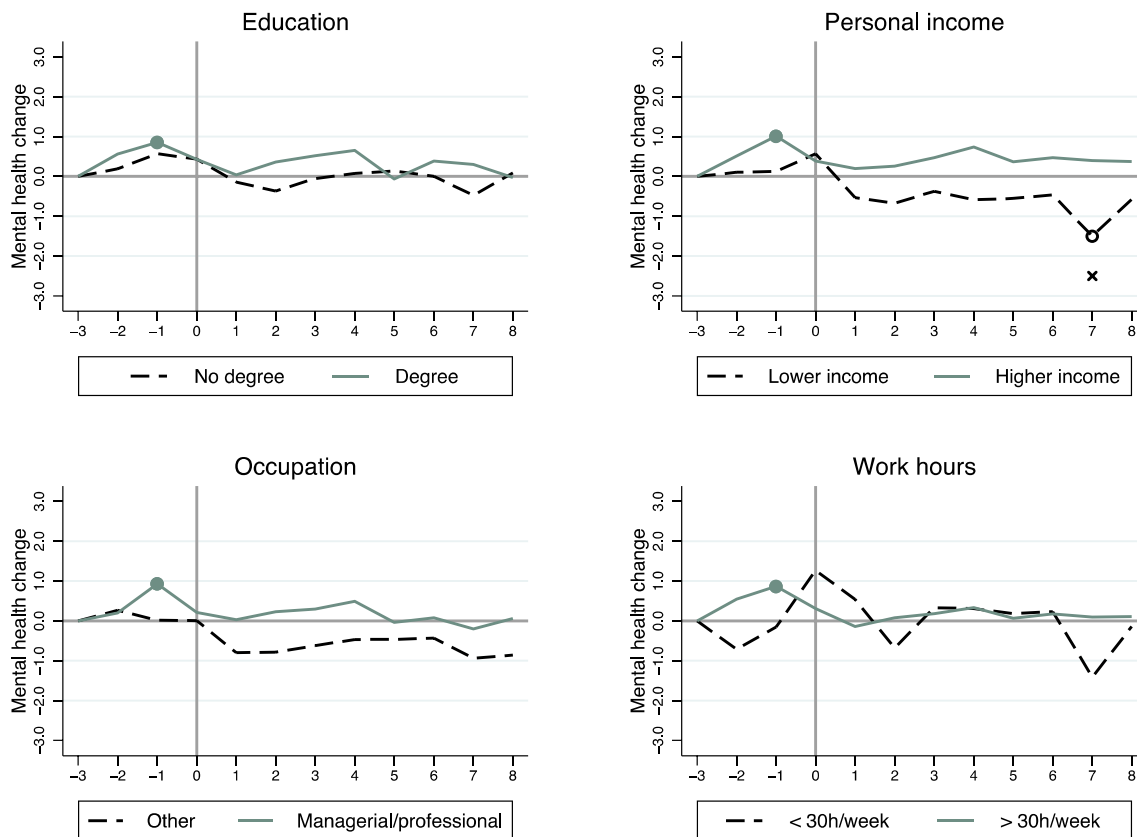


Fig. 3. (continued).

#### 4.3. The moderating role of socioeconomic characteristics

Fig. 3 presents moderation analyses to estimate the impact of socioeconomic status (SES) and work constraints on mental health trajectories in the transition to parenthood. Model coefficients are presented in Appendix Table A5.

For women, Fig. 3 (Panel A) shows a consistent pattern over all moderation analyses with higher SES groups displaying overall smaller mental health changes following parenthood. Across all SES indicators, positive anticipation effects do not significantly differ between groups. Differences in trajectories only appear and persist following birth, suggesting that the pregnancy period is overall similar between groups, but that trends start diverging during the actual experience of parenthood. Higher educated mothers experience a statistically significantly lower positive birth effect than less educated women ( $\beta_{TP,M=0} = -1.48, p < .05$ ) which continues in subsequent years (years 2 and 5 post-birth). However, the difference in effect does not translate into the parenthood transition being negative, rather higher educated mothers mostly miss out on the positive impact of having a first child during early child-rearing years but seem to recover in later stages (years 6–8 post-birth). For mothers in managerial/professional occupations, parenthood similarly translates into lower mental health levels across most years of early childrearing ( $\beta_{TP,M=4} = -1.35, p < .05$ ) after a reduced (by almost half) positive birth effect. While higher income could be associated with better outcomes due to disposing of more resources to ease the strains of parenthood, mothers with higher-than-average incomes also experience a smaller positive change in their mental health compared to lower earning mothers throughout all the post-birth period.

Further, we find that working full-time (i.e., working over 30 h per week on average during care-intensive years) was equally associated with significantly lower mental health changes across the post-birth

observation period, displaying similar trends to SES analyses which suggests a link between SES and work constraints.

For men, Fig. 3 (Panel B) shows that differences across SES and work constraints groups are small and mainly nonsignificant, except when comparing higher earning with lower earning fathers in later parenting stages ( $\beta_{TP,M=7} = 1.90, p < .05$ ). However, the trajectory pattern is reversed for men compared to women: fathers with lower earnings experience a decline in mental health which is offset for higher earning fathers.

Overall, women are found to have more heterogeneous experiences of parenthood than men depending on their socioeconomic characteristics. In line with H3a, women with higher SES experience a reduced positive experience of the arrival of the first child compared to lower SES women. By contrast, differences among fathers are mostly not significant, consistent with H3b. Lastly, we find that mothers with larger work constraints experience lower mental health outcomes, in line with H3c.

#### 5. Discussion

This study has investigated women’s and men’s mental health trajectories around the first transition into parenthood in the UK between 2009 and 2020. To widen the scope of previous parental well-being research, we examined gender differences in specific mental health areas over a long observation period. Our multidimensional approach allowed us to capture additional key components of individuals’ mental well-being, providing new empirical evidence on parenthood transitions.

The main findings of our study can be summarised as follows. First, we show that parenthood has overall significant and stable positive effects for women, but not for men. While average mental health levels are consistently lower for women than for men, we find no obvious mental

**Table A1**

Fixed effects linear regression models predicting changes in mental health and life satisfaction around first birth. Separate models for men and women.

|                            | Women             |      |                       |      | Men               |      |                       |      |
|----------------------------|-------------------|------|-----------------------|------|-------------------|------|-----------------------|------|
|                            | (1) Mental health |      | (2) Life satisfaction |      | (3) Mental health |      | (4) Life satisfaction |      |
|                            | Coef.             | SE   | Coef.                 | SE   | Coef.             | SE   | Coef.                 | SE   |
| <b>Time around birth</b>   |                   |      |                       |      |                   |      |                       |      |
| -3 years to birth          | Ref.              |      | Ref.                  |      | Ref.              |      | Ref.                  |      |
| -2 years to birth          | 0.23              | 0.29 | 0.01                  | 0.04 | 0.37              | 0.27 | -0.04                 | 0.05 |
| -1 year to birth           | 1.64 ***          | 0.30 | 0.19 ***              | 0.04 | 0.71 *            | 0.28 | 0.11 *                | 0.04 |
| Birth                      | 2.16 ***          | 0.31 | 0.31 ***              | 0.04 | 0.45              | 0.28 | 0.15 **               | 0.04 |
| 1 year after birth         | 1.31 ***          | 0.32 | 0.13 **               | 0.05 | -0.04             | 0.30 | 0.02                  | 0.05 |
| 2 years after birth        | 1.29 ***          | 0.34 | 0.06                  | 0.05 | -0.05             | 0.32 | 0.01                  | 0.05 |
| 3 years after birth        | 0.95 **           | 0.35 | -0.01                 | 0.05 | 0.20              | 0.34 | -0.02                 | 0.05 |
| 4 years after birth        | 1.29 ***          | 0.37 | -0.01                 | 0.05 | 0.33              | 0.35 | -0.00                 | 0.05 |
| 5 years after birth        | 1.08 **           | 0.39 | 0.02                  | 0.05 | 0.07              | 0.37 | -0.02                 | 0.05 |
| 6 years after birth        | 1.58 ***          | 0.41 | 0.01                  | 0.06 | 0.18              | 0.40 | -0.00                 | 0.06 |
| 7 years after birth        | 1.15 **           | 0.43 | -0.03                 | 0.06 | -0.13             | 0.41 | -0.00                 | 0.06 |
| 8 years after birth        | 1.69 ***          | 0.45 | 0.02                  | 0.06 | 0.07              | 0.43 | -0.03                 | 0.06 |
| Age                        | -0.96 ***         | 0.08 | -0.02 *               | 0.01 | -1.19 ***         | 0.07 | -0.12 ***             | 0.01 |
| Age squared                | 0.01 ***          | 0.00 | 0.00                  | 0.00 | 0.01 ***          | 0.00 | 0.00 ***              | 0.00 |
| <b>Employment status</b>   |                   |      |                       |      |                   |      |                       |      |
| Full-time                  | Ref.              |      | Ref.                  |      | Ref.              |      | Ref.                  |      |
| Not employed               | -0.97 ***         | 0.16 | -0.02                 | 0.02 | -1.18 ***         | 0.17 | -0.17 ***             | 0.03 |
| Part-time                  | -0.25             | 0.14 | -0.01                 | 0.02 | -0.17             | 0.18 | -0.07 *               | 0.03 |
| Household income           | 0.18 *            | 0.07 | 0.03 **               | 0.01 | 0.15 *            | 0.07 | 0.02                  | 0.01 |
| <b>Health status</b>       |                   |      |                       |      |                   |      |                       |      |
| No illness                 | Ref.              |      | Ref.                  |      | Ref.              |      | Ref.                  |      |
| Long-term illness          | -1.71 ***         | 0.15 | -0.19 ***             | 0.02 | -1.33 ***         | 0.14 | -0.15 ***             | 0.02 |
| <b>Relationship status</b> |                   |      |                       |      |                   |      |                       |      |
| Single                     | Ref.              |      | Ref.                  |      | Ref.              |      | Ref.                  |      |
| Partnered                  | 0.48 *            | 0.21 | 0.14 ***              | 0.03 | 0.89 ***          | 0.22 | 0.22 ***              | 0.03 |
| Separated/widowed          | -0.33             | 0.49 | -0.01                 | 0.07 | -0.67             | 0.51 | -0.13                 | 0.08 |
| Person-year observations   | 51,479            |      |                       |      | 49,860            |      |                       |      |
| Number of individuals      | 9,992             |      |                       |      | 9,422             |      |                       |      |

Note: Robust standard errors. \*\*\* p<.001, \*\* p<.01, \* p<.05. Life satisfaction is measured on a scale ranging from 1 ('completely dissatisfied') to 7 ('completely satisfied') based on the question 'How do you feel about your life overall?' (M = 5.2, SD = 1.4)

Source: UKHLS, waves 1–11, unweighted data.

**Table A2**

Fixed effects linear regression models predicting changes in mental health domains around first birth (for women).

|                            | Role functioning        |      | Social functioning |      | Emotional functioning |      | Vitality         |      |                   |      |                   |      |
|----------------------------|-------------------------|------|--------------------|------|-----------------------|------|------------------|------|-------------------|------|-------------------|------|
|                            | (1) Accomplishing tasks |      | (2) Being careful  |      | (3) Social activities |      | (4) Feeling calm |      | (5) Feeling happy |      | (6) Having energy |      |
|                            | Coef.                   | SE   | Coef.              | SE   | Coef.                 | SE   | Coef.            | SE   | Coef.             | SE   | Coef.             | SE   |
| <b>Time around birth</b>   |                         |      |                    |      |                       |      |                  |      |                   |      |                   |      |
| -3 years to birth          | Ref.                    |      | Ref.               |      | Ref.                  |      | Ref.             |      | Ref.              |      | Ref.              |      |
| -2 years to birth          | 0.03                    | 0.03 | 0.04               | 0.03 | 0.03                  | 0.03 | 0.02             | 0.03 | 0.02              | 0.03 | -0.03             | 0.03 |
| -1 year to birth           | 0.08 **                 | 0.03 | 0.06 *             | 0.03 | -0.05                 | 0.03 | 0.12 ***         | 0.03 | 0.25 ***          | 0.03 | -0.29 ***         | 0.03 |
| Birth                      | 0.20 ***                | 0.03 | 0.19 ***           | 0.03 | 0.17 ***              | 0.03 | 0.08 **          | 0.03 | 0.30 ***          | 0.03 | -0.18 ***         | 0.03 |
| 1 year after birth         | 0.16 ***                | 0.03 | 0.13 ***           | 0.03 | 0.14 ***              | 0.03 | -0.02            | 0.03 | 0.21 ***          | 0.03 | -0.12 ***         | 0.03 |
| 2 years after birth        | 0.16 ***                | 0.03 | 0.14 ***           | 0.03 | 0.16 ***              | 0.03 | -0.05            | 0.03 | 0.20 ***          | 0.03 | -0.16 ***         | 0.03 |
| 3 years after birth        | 0.15 ***                | 0.03 | 0.13 ***           | 0.03 | 0.15 ***              | 0.03 | -0.08 *          | 0.03 | 0.17 ***          | 0.04 | -0.14 ***         | 0.03 |
| 4 years after birth        | 0.17 ***                | 0.04 | 0.14 ***           | 0.03 | 0.21 ***              | 0.04 | -0.06            | 0.03 | 0.17 ***          | 0.04 | -0.06             | 0.03 |
| 5 years after birth        | 0.12 **                 | 0.04 | 0.12 ***           | 0.04 | 0.18 ***              | 0.04 | -0.05            | 0.04 | 0.16 ***          | 0.04 | -0.05             | 0.04 |
| 6 years after birth        | 0.18 ***                | 0.04 | 0.14 ***           | 0.04 | 0.21 ***              | 0.04 | -0.02            | 0.04 | 0.19 ***          | 0.04 | -0.02             | 0.04 |
| 7 years after birth        | 0.14 ***                | 0.04 | 0.13 ***           | 0.04 | 0.19 ***              | 0.04 | -0.05            | 0.04 | 0.13 **           | 0.04 | -0.00             | 0.04 |
| 8 years after birth        | 0.19 ***                | 0.04 | 0.14 ***           | 0.04 | 0.25 ***              | 0.04 | -0.04            | 0.04 | 0.18 ***          | 0.04 | 0.02              | 0.04 |
| Age                        | -0.06 ***               | 0.01 | -0.06 ***          | 0.01 | -0.06 ***             | 0.01 | -0.05 ***        | 0.01 | -0.07 ***         | 0.01 | -0.06 ***         | 0.01 |
| Age squared                | 0.00 **                 | 0.00 | 0.00 ***           | 0.00 | 0.00 *                | 0.00 | 0.00 ***         | 0.00 | 0.00 ***          | 0.00 | 0.00 ***          | 0.00 |
| <b>Employment status</b>   |                         |      |                    |      |                       |      |                  |      |                   |      |                   |      |
| Full-time                  | Ref.                    |      | Ref.               |      | Ref.                  |      | Ref.             |      | Ref.              |      | Ref.              |      |
| Unemployed                 | -0.11 ***               | 0.02 | -0.07 ***          | 0.02 | -0.09 ***             | 0.02 | -0.03 *          | 0.01 | -0.09 ***         | 0.02 | -0.01             | 0.01 |
| Part-time                  | -0.01                   | 0.01 | -0.02              | 0.01 | -0.02                 | 0.01 | 0.00             | 0.01 | -0.04 **          | 0.01 | -0.01             | 0.01 |
| Household income           | 0.01 *                  | 0.01 | 0.01 *             | 0.01 | 0.01 *                | 0.01 | 0.00             | 0.01 | 0.02 **           | 0.01 | 0.00              | 0.01 |
| <b>Health status</b>       |                         |      |                    |      |                       |      |                  |      |                   |      |                   |      |
| No illness                 | Ref.                    |      | Ref.               |      | Ref.                  |      | Ref.             |      | Ref.              |      | Ref.              |      |
| Long-term illness          | -0.21 ***               | 0.02 | -0.17 ***          | 0.01 | -0.24 ***             | 0.02 | -0.14 ***        | 0.01 | -0.15 ***         | 0.01 | -0.16 ***         | 0.01 |
| <b>Relationship status</b> |                         |      |                    |      |                       |      |                  |      |                   |      |                   |      |
| Single                     | Ref.                    |      | Ref.               |      | Ref.                  |      | Ref.             |      | Ref.              |      | Ref.              |      |
| Partnered                  | 0.04 *                  | 0.02 | 0.03               | 0.02 | 0.04 *                | 0.02 | 0.01             | 0.02 | 0.05 *            | 0.02 | -0.05 *           | 0.02 |
| Separated/widowed          | -0.05                   | 0.05 | -0.06              | 0.04 | -0.08                 | 0.05 | 0.06             | 0.04 | 0.01              | 0.05 | 0.01              | 0.04 |
| Person-year observations   | 51,479                  |      |                    |      |                       |      |                  |      |                   |      |                   |      |
| Number of individuals      | 9,992                   |      |                    |      |                       |      |                  |      |                   |      |                   |      |

Note: Robust standard errors. \*\*\* p<.001, \*\* p<.01, \* p<.05. Source: UKHLS, waves 1–11, unweighted data.

Table A3

Fixed effects linear regression models predicting changes in mental health domains around first birth (for men).

|                            | Role functioning        |      |                   |      | Social functioning    |      | Emotional functioning |      |                   |      | Vitality          |      |
|----------------------------|-------------------------|------|-------------------|------|-----------------------|------|-----------------------|------|-------------------|------|-------------------|------|
|                            | (1) Accomplishing tasks |      | (2) Being careful |      | (3) Social activities |      | (4) Feeling calm      |      | (5) Feeling happy |      | (6) Having energy |      |
|                            | Coef.                   | SE   | Coef.             | SE   | Coef.                 | SE   | Coef.                 | SE   | Coef.             | SE   | Coef.             | SE   |
| <b>Time around birth</b>   |                         |      |                   |      |                       |      |                       |      |                   |      |                   |      |
| -3 years to birth          | Ref.                    |      | Ref.              |      | Ref.                  |      | Ref.                  |      | Ref.              |      | Ref.              |      |
| -2 years to birth          | 0.03                    | 0.03 | 0.00              | 0.03 | -0.00                 | 0.03 | -0.00                 | 0.03 | 0.09 **           | 0.03 | -0.00             | 0.03 |
| -1 year to birth           | 0.04                    | 0.03 | 0.02              | 0.03 | 0.05                  | 0.03 | 0.02                  | 0.03 | 0.12 ***          | 0.03 | 0.00              | 0.03 |
| Birth                      | 0.08 **                 | 0.03 | 0.05              | 0.03 | 0.04                  | 0.03 | -0.05                 | 0.03 | 0.16 ***          | 0.03 | -0.14 ***         | 0.03 |
| 1 year after birth         | 0.04                    | 0.03 | 0.04              | 0.03 | -0.01                 | 0.03 | -0.08 *               | 0.03 | 0.09 **           | 0.03 | -0.13 ***         | 0.03 |
| 2 years after birth        | 0.02                    | 0.03 | -0.00             | 0.03 | 0.02                  | 0.03 | -0.10 **              | 0.03 | 0.10 **           | 0.04 | -0.13 ***         | 0.03 |
| 3 years after birth        | 0.04                    | 0.03 | 0.04              | 0.03 | 0.05                  | 0.03 | -0.10 **              | 0.03 | 0.09 *            | 0.04 | -0.10 **          | 0.03 |
| 4 years after birth        | 0.06                    | 0.03 | 0.04              | 0.03 | 0.05                  | 0.03 | -0.10 **              | 0.04 | 0.08 *            | 0.04 | -0.09 **          | 0.03 |
| 5 years after birth        | 0.04                    | 0.04 | 0.02              | 0.03 | 0.03                  | 0.03 | -0.09 **              | 0.04 | 0.07              | 0.04 | -0.08 *           | 0.03 |
| 6 years after birth        | 0.05                    | 0.04 | 0.04              | 0.04 | 0.03                  | 0.04 | -0.09 *               | 0.04 | 0.07              | 0.04 | -0.06             | 0.04 |
| 7 years after birth        | 0.03                    | 0.04 | 0.02              | 0.04 | -0.01                 | 0.04 | -0.08 *               | 0.04 | 0.03              | 0.04 | -0.08 *           | 0.04 |
| 8 years after birth        | 0.05                    | 0.04 | 0.01              | 0.04 | 0.03                  | 0.04 | -0.09 *               | 0.04 | 0.06              | 0.05 | -0.09 *           | 0.04 |
| Age                        | -0.08 ***               | 0.01 | -0.05 ***         | 0.01 | -0.08 ***             | 0.01 | -0.06 ***             | 0.01 | -0.10 ***         | 0.01 | -0.07 ***         | 0.01 |
| Age squared                | 0.00 ***                | 0.00 | 0.00 ***          | 0.00 | 0.00 ***              | 0.00 | 0.00 ***              | 0.00 | 0.00 ***          | 0.00 | 0.00 ***          | 0.00 |
| <b>Employment status</b>   |                         |      |                   |      |                       |      |                       |      |                   |      |                   |      |
| Full-time                  | Ref.                    |      | Ref.              |      | Ref.                  |      | Ref.                  |      | Ref.              |      | Ref.              |      |
| Unemployed                 | -0.14 ***               | 0.02 | -0.09 ***         | 0.02 | -0.13 ***             | 0.02 | -0.01                 | 0.02 | -0.14 ***         | 0.02 | -0.01             | 0.02 |
| Part-time                  | -0.03                   | 0.02 | -0.00             | 0.02 | -0.00                 | 0.02 | -0.01                 | 0.02 | -0.01             | 0.02 | -0.03             | 0.02 |
| Household income           | 0.01                    | 0.01 | 0.01              | 0.01 | 0.01                  | 0.01 | 0.01                  | 0.01 | 0.02 ***          | 0.01 | -0.00             | 0.01 |
| <b>Health status</b>       |                         |      |                   |      |                       |      |                       |      |                   |      |                   |      |
| No illness                 | Ref.                    |      | Ref.              |      | Ref.                  |      | Ref.                  |      | Ref.              |      | Ref.              |      |
| Long-term illness          | -0.16 ***               | 0.01 | -0.12 ***         | 0.01 | -0.20 ***             | 0.02 | -0.09 ***             | 0.01 | -0.11 ***         | 0.01 | -0.14 ***         | 0.01 |
| <b>Relationship status</b> |                         |      |                   |      |                       |      |                       |      |                   |      |                   |      |
| Single                     | Ref.                    |      | Ref.              |      | Ref.                  |      | Ref.                  |      | Ref.              |      | Ref.              |      |
| Partnered                  | 0.06 **                 | 0.02 | 0.05 **           | 0.02 | 0.10 ***              | 0.02 | 0.04                  | 0.02 | 0.06 **           | 0.02 | 0.01              | 0.02 |
| Separated/widowed          | -0.04                   | 0.05 | -0.07             | 0.04 | -0.00                 | 0.05 | -0.07                 | 0.06 | -0.04             | 0.06 | -0.12 *           | 0.05 |
| Person-year observations   | 49,860                  |      |                   |      |                       |      |                       |      |                   |      |                   |      |
| Number of individuals      | 9,422                   |      |                   |      |                       |      |                       |      |                   |      |                   |      |

Note: Robust standard errors. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .

Source: UKHLS, waves 1–11, unweighted data.

health disadvantage for women after the transition into parenthood, as could have been expected due to higher societal constraints and expectations surrounding motherhood. However, our findings also show important variations across different mental health domains. We find evidence of counteracting effects following birth, indicating the presence of both positive and negative aspects of parenthood, consistent with the *costs and rewards* approach to parenthood, with larger fluctuations among women than men.

Second, moderation analyses show larger heterogeneity across socioeconomic groups in mental health trajectories following parenthood among women than among men. Women from higher SES backgrounds experience reduced positive mental health effects whereas lower SES women are comparatively more positively affected by the transition into motherhood. Among men, socioeconomic characteristics are not a significant differentiator of mental health trajectories, although small trends indicate an inverse process, where higher SES men display more favourable trajectories compared to their lower SES counterparts (differences are however mostly not statistically significant).<sup>3</sup>

These results add to the literature in various directions. While

<sup>3</sup> These conclusions are based on the choice of – 3 years before birth as the reference category to document changes in mental health over the parenthood transition. While an earlier reference category could have been chosen, previous studies on parental well-being find that earlier reference points (up to –8 years before birth, see for example Frijters et al., 2011) do not alter the trajectory shape, as anticipation effects consistently set in around 2 years before birth. The choice of – 3 as the reference was made (a) following previous studies with comparable methods (e.g., Tosi & Goisis, 2021); (b) so that the reference is early enough to avoid capturing any premature positive anticipation effects, which would lead to underestimate positive or overestimate negative subsequent changes; but (c) not too early as to not capture other unrelated underlying mental health variations.

supporting previous longitudinal studies finding positive effects on mental health of a first birth in the UK (Clark & Georgellis, 2013; Tosi & Goisis, 2021), our analyses also demonstrate the importance of a multidimensional approach to capture the complex mental processes surrounding the transition into parenthood. Beyond the UK context, Ruppanner et al. (2019) similarly find positive effects of a first child on women's mental health in Australia, whereas Giesselmann et al. (2018) show negative trends in Germany. Although both studies did not examine gender differences across various mental health dimensions, our results on women's overall mental health can be compared to these findings. Germany, the UK, and Australia are similarly characterised as modified breadwinner models with large shares of mothers working part-time (OECD, 2021). However, variations in predominant mothering cultures, ideologies, and practices may result in differing effects across countries. For instance, working mothers were traditionally more strongly associated with being an uncaring parent in (West) Germany, which may have led to larger detrimental effects on maternal mental health compared to the UK where part-time working mothers have been embedded in the family policy strategy (Thévenon, 2011; Zimmermann, 2021). Moreover, the degree to which recently introduced family policies in the UK have successfully supported parents, and in particular mothers, might have differentially affected the transition into parenthood in the analysed period compared to other countries (Notten et al., 2017). The role of context-specific cultural parenting norms, expectations, institutional support, and policies in explaining country differences in the transition to parenthood should be further investigated in future comparative longitudinal studies.

Overall, our findings suggest that women react psychologically more to parenthood than men, with increases in women's mental health mostly driven by stable improvements in role and social functioning as well as happiness. This implies that women's greater parental role may have overarching positive effects in this strongly gendered life course

**Table A4**

Fixed effects linear regression models predicting changes in mental health and mental health domains around first birth. Fully interacted models for men and women.

|                                   | (1) Mental health |      | Role functioning        |      |                   |      | Social functioning    |      | Emotional functioning |      |                   |      | Vitality          |      |
|-----------------------------------|-------------------|------|-------------------------|------|-------------------|------|-----------------------|------|-----------------------|------|-------------------|------|-------------------|------|
|                                   | Coef.             | SE   | (2) Accomplishing tasks |      | (3) Being careful |      | (4) Social activities |      | (5) Feeling calm      |      | (6) Feeling happy |      | (7) Having energy |      |
|                                   | Coef.             | SE   | Coef.                   | SE   | Coef.             | SE   | Coef.                 | SE   | Coef.                 | SE   | Coef.             | SE   | Coef.             | SE   |
| <b>Time around birth</b>          |                   |      |                         |      |                   |      |                       |      |                       |      |                   |      |                   |      |
| -3 years to birth                 | Ref.              |      | Ref.                    |      | Ref.              |      | Ref.                  |      | Ref.                  |      | Ref.              |      | Ref.              |      |
| -2 years to birth                 | 0.37              | 0.27 | 0.03                    | 0.03 | 0.00              | 0.03 | -0.00                 | 0.03 | -0.00                 | 0.03 | 0.09 * *          | 0.03 | -0.00             | 0.03 |
| -1 year to birth                  | 0.71 *            | 0.28 | 0.04                    | 0.03 | 0.02              | 0.03 | 0.05                  | 0.03 | 0.02                  | 0.03 | 0.12 ***          | 0.03 | 0.00              | 0.03 |
| Birth                             | 0.45              | 0.28 | 0.08 **                 | 0.03 | 0.05              | 0.03 | 0.04                  | 0.03 | -0.05                 | 0.03 | 0.16 ***          | 0.03 | -0.14 ***         | 0.03 |
| 1 year after birth                | -0.04             | 0.30 | 0.04                    | 0.03 | 0.04              | 0.03 | -0.01                 | 0.03 | -0.08 *               | 0.03 | 0.09 **           | 0.03 | -0.13 ***         | 0.03 |
| 2 years after birth               | -0.05             | 0.32 | 0.02                    | 0.03 | -0.00             | 0.03 | 0.02                  | 0.03 | -0.10 **              | 0.03 | 0.10 **           | 0.04 | -0.13 ***         | 0.03 |
| 3 years after birth               | 0.20              | 0.34 | 0.04                    | 0.03 | 0.04              | 0.03 | 0.05                  | 0.03 | -0.10 **              | 0.03 | 0.09 *            | 0.04 | -0.10 **          | 0.03 |
| 4 years after birth               | 0.33              | 0.35 | 0.06                    | 0.03 | 0.04              | 0.03 | 0.05                  | 0.03 | -0.10 **              | 0.04 | 0.08 *            | 0.04 | -0.09 **          | 0.03 |
| 5 years after birth               | 0.07              | 0.37 | 0.04                    | 0.04 | 0.02              | 0.03 | 0.03                  | 0.03 | -0.09 **              | 0.04 | 0.07              | 0.04 | -0.08 *           | 0.03 |
| 6 years after birth               | 0.18              | 0.40 | 0.05                    | 0.04 | 0.04              | 0.04 | 0.03                  | 0.04 | -0.09 *               | 0.04 | 0.07              | 0.04 | -0.06             | 0.04 |
| 7 years after birth               | -0.13             | 0.41 | 0.03                    | 0.04 | 0.02              | 0.04 | -0.01                 | 0.04 | -0.08 *               | 0.04 | 0.03              | 0.04 | -0.08 *           | 0.04 |
| 8 years after birth               | 0.07              | 0.43 | 0.05                    | 0.04 | 0.01              | 0.04 | 0.03                  | 0.04 | -0.09 *               | 0.04 | 0.06              | 0.05 | -0.09 *           | 0.04 |
| <b>Time around birth × Female</b> |                   |      |                         |      |                   |      |                       |      |                       |      |                   |      |                   |      |
| -2 years × Female                 | -0.14             | 0.40 | -0.00                   | 0.04 | 0.04              | 0.04 | 0.03                  | 0.04 | 0.02                  | 0.04 | -0.07             | 0.04 | -0.02             | 0.04 |
| -1 years × Female                 | 0.93 *            | 0.41 | 0.04                    | 0.04 | 0.04              | 0.04 | -0.09 *               | 0.04 | 0.10 *                | 0.04 | 0.12 **           | 0.04 | -0.30 ***         | 0.04 |
| Birth × Female                    | 1.71 ***          | 0.42 | 0.13 **                 | 0.04 | 0.14 ***          | 0.04 | 0.13 **               | 0.04 | 0.13 **               | 0.04 | 0.14 **           | 0.04 | -0.04             | 0.04 |
| 1 year × Female                   | 1.36 **           | 0.44 | 0.12 **                 | 0.04 | 0.09 *            | 0.04 | 0.15 ***              | 0.04 | 0.06                  | 0.04 | 0.12 **           | 0.05 | 0.01              | 0.04 |
| 2 years × Female                  | 1.34 **           | 0.46 | 0.14 **                 | 0.04 | 0.14 ***          | 0.04 | 0.14 **               | 0.04 | 0.05                  | 0.04 | 0.11 *            | 0.05 | -0.02             | 0.04 |
| 3 years × Female                  | 0.75              | 0.49 | 0.11 *                  | 0.05 | 0.09 *            | 0.04 | 0.10 *                | 0.05 | 0.02                  | 0.05 | 0.07              | 0.05 | -0.04             | 0.05 |
| 4 years × Female                  | 0.97              | 0.52 | 0.11 *                  | 0.05 | 0.10 *            | 0.05 | 0.16 **               | 0.05 | 0.04                  | 0.05 | 0.09              | 0.05 | 0.03              | 0.05 |
| 5 years × Female                  | 1.01              | 0.54 | 0.09                    | 0.05 | 0.10 *            | 0.05 | 0.15 **               | 0.05 | 0.04                  | 0.05 | 0.09              | 0.06 | 0.03              | 0.05 |
| 6 years × Female                  | 1.41 *            | 0.57 | 0.12 *                  | 0.06 | 0.10 *            | 0.05 | 0.18 ***              | 0.06 | 0.07                  | 0.05 | 0.12 *            | 0.06 | 0.04              | 0.05 |
| 7 years × Female                  | 1.29 *            | 0.60 | 0.11                    | 0.06 | 0.11 *            | 0.05 | 0.20 ***              | 0.06 | 0.03                  | 0.06 | 0.10              | 0.06 | 0.08              | 0.05 |
| 8 years × Female                  | 1.62 **           | 0.63 | 0.14 *                  | 0.06 | 0.13 *            | 0.06 | 0.22 ***              | 0.06 | 0.06                  | 0.06 | 0.12              | 0.06 | 0.11              | 0.06 |
| <b>Controls × Female</b>          | YES               |      | YES                     |      | YES               |      | YES                   |      | YES                   |      | YES               |      | YES               |      |
| Person-year observations          | 101,339           |      |                         |      |                   |      |                       |      |                       |      |                   |      |                   |      |
| Number of individuals             | 19,414            |      |                         |      |                   |      |                       |      |                       |      |                   |      |                   |      |

Note: Robust standard errors. \*\*\* p<.001, \*\* p<.01, \* p<.05.

Source: UKHLS, waves 1–11, unweighted data.

transition, both emotionally and functionally. While parenthood comes with larger implications and demands for women, as well as fatigue and strains, it also fulfils internalised gender expectations with associated mental and social benefits. These results complement recent life course research showing that cumulating roles in early adulthood (e.g., partnership, parenthood, employment) carries life-long advantages (e.g., well-being premiums, lower late-life depressive risks; Comolli et al., 2021; Engels et al., 2021), although it does not exclude experiencing strain during childrearing years. This suggests that parenthood represents a significant mechanism with both immediate and cumulative effects on mental well-being throughout later life course stages, albeit with some variation by gender and SES groups.

Results further show larger heterogeneity among women than among men in the experience of parenthood, with higher SES women experiencing smaller mental health benefits from motherhood than lower SES women. These results may capture two complementary mechanisms. First, higher SES mothers are typically in occupations associated to greater responsibilities which can be harder to balance with added childcare responsibilities, both timewise (‘time squeeze’; Milkie et al., 2004; Ruppanner et al., 2019) and psychologically (‘mother’s guilt’; Henderson et al., 2016). While higher income is associated to better parental life satisfaction (Cetre et al., 2016; Pollmann-Schult, 2014), material benefits may not be enough to offset potential psychological or emotional difficulties experienced by higher SES mothers (e.g., higher parenting pressures, greater work-life conflict). Second, higher SES mothers are more likely to engage in intensive forms of parenting, conforming to the ‘concerted cultivation’ practice of closely monitoring child activities and development, and investing time, financial, and intellectual resources into childrearing to ensure the best outcomes for their children (Lareau, 2003). This double pressure affecting higher SES mothers stemming from both higher work and

parenting constraints may reduce the enjoyment of motherhood, suggesting that motherhood has different implications, meanings, and constraints across social contexts. Future studies should further explore the exact mechanisms surrounding childbirth across socioeconomic groups in a large-scale longitudinal framework.

Our study presents two main limitations. First, although the SF-12 MCS is an effective assessor of mental health and functioning, it may not capture all strains and issues experienced by new parents, such as sleep deprivation or parenting-specific difficulties (e.g., ‘parental burnout’; Roskam & Mikolajczak, 2020). Therefore, our conclusions on the lack of long-lasting negative effects of parenthood may be constrained by the available subscales in our measure, potentially leading to an optimistic assessment of the effects of parenthood on mental health. Thus, our findings should be complemented by other future studies addressing these parent-specific dimensions in a large-scale longitudinal framework. Second, the fixed effects models employed throughout the study exploit only within-individual change, discarding between-individual variation. While this allows to produce mostly unbiased estimations, it also means that information on individuals’ (time-constant) social context –which could contribute to inform the effect of parenthood on mental health– is lost (Bell et al., 2019). We hope future studies will further explore these questions within the gender, parenthood, and mental health literatures by considering our dynamic multidimensional approach to gendered mental health trajectories over the transition to parenthood.

To conclude, and despite some shortcomings that should be addressed in future research, our study using high-quality panel data from the UK shows how transitioning into parenthood leads to distinct mental health changes with heterogenous effects across genders and socioeconomic groups.

**Table A5**

Fixed effects linear regression models predicting changes in mental health around first birth, with socioeconomic characteristics moderation. Separate models for men and women.

|                                | Mental health × Socioeconomic characteristics (SEC) |      |         |      |                               |      |         |      |                            |      |         |      |                               |      |         |      |
|--------------------------------|---|------|---------|------|-------------------------------|------|---------|------|----------------------------|------|---------|------|-------------------------------|------|---------|------|
|                                | SEC = Higher education                              |      |         |      | SEC = Managerial/professional |      |         |      | SEC = High personal income |      |         |      | SEC = Over 30 h work per week |      |         |      |
|                                | (1) Women   |      | (2) Men |      | (3) Women                     |      | (4) Men |      | (5) Women                  |      | (6) Men |      | (7) Women                     |      | (8) Men |      |
|                                | Coef.   | SE   | Coef.   | SE   | Coef.                         | SE   | Coef.   | SE   | Coef.                      | SE   | Coef.   | SE   | Coef.                         | SE   | Coef.   | SE   |
| <b>Time around birth</b>       |   |      |         |      |                               |      |         |      |                            |      |         |      |                               |      |         |      |
| -3 years to birth              | Ref.  |      |         |      |                               |      |         |      |                            |      |         |      |                               |      |         |      |
| -2 years to birth              | 0.04  | 0.46 | 0.19    | 0.39 | -0.24                         | 0.47 | 0.27    | 0.47 | 0.44                       | 0.39 | 0.10    | 0.51 | 0.45                          | 0.39 | -0.71   | 0.72 |
| -1 year to birth               | 1.61 ***  | 0.45 | 0.57    | 0.40 | 1.70 ***                      | 0.45 | 0.02    | 0.49 | 1.94 ***                   | 0.39 | 0.13    | 0.51 | 1.87 ***                      | 0.39 | -0.15   | 0.81 |
| Birth                          | 2.95 ***  | 0.45 | 0.44    | 0.40 | 2.79 ***                      | 0.48 | 0.01    | 0.46 | 2.93 ***                   | 0.40 | 0.57    | 0.50 | 2.94 ***                      | 0.40 | 1.27    | 0.72 |
| 1 year after birth             | 1.75 ***  | 0.47 | -0.14   | 0.42 | 1.62 **                       | 0.52 | -0.80   | 0.50 | 1.83 ***                   | 0.42 | -0.53   | 0.54 | 2.00 ***                      | 0.41 | 0.54    | 0.82 |
| 2 years after birth            | 1.93 ***  | 0.48 | -0.37   | 0.44 | 1.65 **                       | 0.51 | -0.79   | 0.52 | 1.96 ***                   | 0.43 | -0.67   | 0.56 | 2.05 ***                      | 0.42 | -0.68   | 0.84 |
| 3 years after birth            | 1.37 **   | 0.51 | -0.05   | 0.46 | 1.35 *                        | 0.57 | -0.62   | 0.54 | 1.59 ***                   | 0.45 | -0.37   | 0.59 | 1.76 ***                      | 0.44 | 0.33    | 0.88 |
| 4 years after birth            | 1.83 ***  | 0.51 | 0.07    | 0.48 | 1.76 **                       | 0.56 | -0.47   | 0.55 | 1.88 ***                   | 0.47 | -0.59   | 0.63 | 2.07 ***                      | 0.46 | 0.31    | 0.90 |
| 5 years after birth            | 1.83 ***  | 0.53 | 0.13    | 0.50 | 1.42 *                        | 0.58 | -0.46   | 0.57 | 1.82 ***                   | 0.49 | -0.55   | 0.66 | 1.74 ***                      | 0.48 | 0.19    | 0.97 |
| 6 years after birth            | 1.91 ***  | 0.55 | 0.00    | 0.53 | 1.49 *                        | 0.61 | -0.43   | 0.60 | 2.25 ***                   | 0.50 | -0.46   | 0.71 | 2.33 ***                      | 0.49 | 0.23    | 1.01 |
| 7 years after birth            | 1.50 **   | 0.57 | -0.47   | 0.55 | 1.27 *                        | 0.63 | -0.93   | 0.63 | 1.83 ***                   | 0.52 | -1.50 * | 0.72 | 1.91 ***                      | 0.51 | -1.41   | 1.04 |
| 8 years after birth            | 1.99 ***  | 0.59 | 0.09    | 0.56 | 1.90 **                       | 0.65 | -0.86   | 0.64 | 2.43 ***                   | 0.55 | -0.57   | 0.74 | 2.39 ***                      | 0.53 | -0.14   | 1.07 |
| <b>Time around birth × SEC</b> |   |      |         |      |                               |      |         |      |                            |      |         |      |                               |      |         |      |
| -2 years to birth × SEC        | 0.37  | 0.58 | 0.37    | 0.54 | 0.81                          | 0.59 | -0.06   | 0.57 | -0.49                      | 0.55 | 0.41    | 0.60 | -0.47                         | 0.57 | 1.26    | 0.78 |
| -1 years to birth × SEC        | 0.11  | 0.57 | 0.28    | 0.54 | -0.26                         | 0.59 | 0.91    | 0.58 | -0.73                      | 0.57 | 0.88    | 0.59 | -0.51                         | 0.56 | 1.02    | 0.86 |
| Birth × SEC                    | -1.48 *   | 0.58 | -0.00   | 0.53 | -1.57 *                       | 0.62 | 0.20    | 0.56 | -1.95 ***                  | 0.58 | -0.18   | 0.58 | -1.87 **                      | 0.58 | -0.96   | 0.76 |
| 1 year after birth × SEC       | -0.75   | 0.58 | 0.18    | 0.55 | -0.82                         | 0.63 | 0.83    | 0.59 | -1.24 *                    | 0.57 | 0.73    | 0.61 | -1.62 **                      | 0.58 | -0.68   | 0.86 |
| 2 years after birth × SEC      | -1.18 *   | 0.59 | 0.73    | 0.57 | -1.28 *                       | 0.63 | 1.01    | 0.61 | -1.63 **                   | 0.59 | 0.93    | 0.64 | -1.88 **                      | 0.60 | 0.75    | 0.88 |
| 3 years after birth × SEC      | -0.72   | 0.61 | 0.57    | 0.59 | -1.44 *                       | 0.67 | 0.92    | 0.63 | -1.57 **                   | 0.60 | 0.85    | 0.67 | -2.07 ***                     | 0.62 | -0.15   | 0.92 |
| 4 years after birth × SEC      | -0.96   | 0.62 | 0.58    | 0.61 | -1.35 *                       | 0.67 | 0.96    | 0.64 | -1.44 *                    | 0.61 | 1.33    | 0.70 | -1.94 **                      | 0.63 | 0.03    | 0.94 |
| 5 years after birth × SEC      | -1.45 *   | 0.64 | -0.20   | 0.62 | -1.23                         | 0.68 | 0.43    | 0.65 | -1.84 **                   | 0.63 | 0.92    | 0.73 | -1.53 *                       | 0.64 | -0.12   | 1.00 |
| 6 years after birth × SEC      | -0.49   | 0.65 | 0.38    | 0.65 | -0.80                         | 0.70 | 0.51    | 0.68 | -1.67 **                   | 0.64 | 0.93    | 0.77 | -1.86 **                      | 0.65 | -0.06   | 1.05 |
| 7 years after birth × SEC      | -0.53   | 0.66 | 0.77    | 0.67 | -1.12                         | 0.72 | 0.73    | 0.70 | -1.71 **                   | 0.65 | 1.90 *  | 0.78 | -1.89 **                      | 0.67 | 1.51    | 1.07 |
| 8 years after birth × SEC      | -0.45   | 0.68 | -0.12   | 0.69 | -1.48 *                       | 0.74 | 0.92    | 0.72 | -1.89 **                   | 0.67 | 0.94    | 0.80 | -1.72 *                       | 0.69 | 0.25    | 1.10 |
| <b>Controls</b>                | YES   |      | YES     |      | YES                           |      | YES     |      | YES                        |      | YES     |      | YES                           |      | YES     |      |
| Person-year observations       | 51,479  |      | 49,860  |      | 40,770†                       |      | 42,000† |      | 51,479                     |      | 49,860  |      | 51,479                        |      | 49,860  |      |
| Number of individuals          | 9,992   |      | 9,422   |      | 9,401                         |      | 9,013   |      | 9,992                      |      | 9,422   |      | 9,992                         |      | 9,422   |      |

† Models are run only on employed person-year observations.

Note: Robust standard errors. \*\*\* p<.001, \*\* p<.01, \* p<.05. Source: UKHLS, waves 1–11, unweighted data.

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**Declaration of Competing Interest**

The authors have no competing interests to declare.

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**Appendix A**

See [Tables A1–A5](#).

**Appendix A. Supporting information**

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.alcr.2023.100550](https://doi.org/10.1016/j.alcr.2023.100550).

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