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Parenthood and Gendered Mental Health: The Role of Paid Work and Housework Time

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ABSTRACT

Objective: This study examines the role of changes in paid work and housework time on first-time mothers' and fathers' mental health trajectories.

Background: The transition into parenthood is a key life course event with important consequences for individuals' activity patterns and couples' division of labor. Yet, whether gendered shifts in paid and domestic work time are linked to men's and women's mental health during the transition to parenthood remains unclear.

Method: Using large-scale panel data from the Australian HILDA survey for men and women in different-sex couples (2002–2022; $N = 5932$), we apply a longitudinal mediation framework with fixed effects models to determine the extent to which mental health trajectories are affected by changes in paid work and housework hours across the first transition into parenthood, considering both *individual* and *partner-relative* contributions.

Results: Individual and partner-relative paid work hours are positively associated with mental health for both men and women, while individual housework hours negatively impact only women. Following parenthood, women experience substantial reductions in paid work and increases in housework hours, but men's time use stays unchanged. Accordingly, despite overall improvements in women's mental health trajectories, findings show that these parenthood-related changes in time allocations suppress some of the positive effects of childbearing for women, whereas men remain unaffected.

Conclusion: The transition to parenthood markedly reinforces gendered time use patterns in paid work and housework within couples, with disadvantageous shifts for women that result in small reductions in first-time mothers' mental health trajectories. The potential factors underlying these findings are discussed.

1 | Introduction

Studies on individual mental health and well-being find persistent and systematic gender differences: women are shown to have higher levels of psychological distress and affective disorders than men (Otten et al. 2021). This finding holds across various national contexts (Van de Velde et al. 2010) and is typically attributed to the societal expectations and gender roles imposed on women (Bird and Fremont 1991; Cabezas-Rodríguez et al. 2021). Recent scholarship has been particularly interested in the way gendered well-being is impacted by and evolves following the transition into parenthood as it pushes couples into more gender-typical roles, often with an uneven distribution of responsibilities between mothers and fathers, which may

exacerbate pre-existing disparities (Gjerdingen and Center 2005; Grunow et al. 2012; Yavorsky et al. 2015). Our study contributes to this growing literature by disentangling the extent to which time allocations play a role in shaping mental health across the transition to parenthood, with a focus on gender differences.

Previous research identifies parenthood as a defining life course event that carries substantial implications for individuals' well-being (Myrskylä and Margolis 2014). Yet, its clear-cut effects are not well understood due to the complexity of the parenthood experience (Nomaguchi and Milkie 2020). Longitudinal studies find that parenthood generally enhances mental well-being around the time of birth through increases in feeling happy and fulfilled, but equally point out adverse implications such as heightened stress and fatigue (Aassve et al. 2021; Metzger and Gracia 2023; Mikucka and Rizzi 2019; Ruppanner et al. 2019). This heterogeneity is particularly pronounced for women who tend to experience both larger benefits and greater strains from parenthood (Nomaguchi and Milkie 2003). A hypothesized mechanism behind gendered dissimilarities in well-being following parenthood is the unequal shift in time allocations between paid and domestic work after having a child (Boye 2009; Craig and Brown 2017). New mothers typically make more time for domestic responsibilities by reducing their employment hours and have to accommodate a greater set of work, household, and family obligations than fathers (Bianchi et al. 2012). These changes in time use following parenthood could particularly influence gender gaps in mental health, as the new time constraints may disproportionately burden mothers, potentially impacting the types of mental health conditions women are already more likely to experience (such as stress or anxiety disorders) as well as reducing their enjoyment of this event.

However, the exact ways in which changes in paid work and housework time affect mothers' and fathers' well-being—and particularly, mental health—trajectories following parenthood transitions remain unclear. Most research on the link between time use and parental well-being was carried out cross-sectionally, making use of time diary surveys (e.g., Meier et al. 2018; Musick et al. 2016). Although this provides important insights into how mothers and fathers differently experience daily activities, the cross-sectional design does not allow for identifying patterns of change in time use nor the consequences of those changes over critical life events, such as childbirth, on well-being trajectories. Further, there is a lack of studies focusing specifically on mental health outcomes in relation to time use, particularly around parenthood. Yet mental health encompasses not only individuals' state of mental well-being but also their ability to cope with life stressors, function normally at work and home, and maintain social connections (WHO 2022). Examining mental health measures may therefore more extensively capture the variations in individuals' well-being linked to the professional, domestic, and interpersonal adjustments following childbirth. One recent longitudinal study by Ruppanner et al. (2019) finds that parenthood increases the subjective perception of time pressure, which is associated with diminished mental health following birth. However, experiencing time pressure is not necessarily equivalent to actual involvement in specific tasks. Actual time use may have distinct implications for mental health as it indicates the tangible allocation of time linked to external factors, such as work obligations and daily routines, and effectively reflects the demands that new parents face. Despite this, no study to date has dynamically analyzed the direct link between changes in time use and gendered mental health following childbirth.

This study addresses these gaps by investigating the relationship between changing dynamics in paid work and housework time use (i.e., how the number of hours spent in each activity changes after parenthood) and men's and women's mental health trajectories (measured by the SF-36 Mental Component Summary score) across the transition to parenthood. Using large-scale contemporary Australian household panel data with yearly recorded time use information from both partners, we examine whether gendered changes in paid and domestic work time allocations operate as a mechanism linking the transition to parenthood with men's and women's mental health outcomes. We adopt a longitudinal framework that focuses on the years surrounding the first transition into parenthood, as this period marks one of the most important shifts in gendered time use over individuals' life courses, providing an ideal context for examining how major changes in paid work and housework time impact gender-specific mental health trajectories (Baxter et al. 2008). In addition to *individual* time use changes, we also include a *partner-relative* dimension to take into account the reallocation of time between partners as a potentially distinct mechanism shaping mental health trajectories. This dynamic couple-level approach allows us to document whether the gendered (re)distribution of labor within couples (i.e., how paid and domestic responsibilities are shared) affects men's and women's mental health trajectories over the transition into parenthood, which has been omitted so far from prior studies.

In doing so, the study combines and contributes to three different strands of the Family Sociology literature that examine: (1) the impact of the transition to parenthood on mental health and well-being trajectories (e.g., Giesselmann et al. 2018; Myrskylä and Margolis 2014; Pollmann-Schult 2014; Tosi and Goisis 2021), (2) the changes in the division of paid and unpaid domestic work within different-sex couples following parenthood (e.g., Baxter et al. 2008; Grunow et al. 2012; Nomaguchi and Milkie 2003), and (3) the relationship between paid and domestic work and (parental) mental health (e.g., Bird and Fremont 1991; Foster and Stratton 2019; Glass and Fujimoto 1994).

2 | Background

2.1 | Gendered Division of Labor and Parenthood in the Australian Context

Australia provides a relevant context for studying the links between paid and domestic work time, parenthood, and mental health, as it combines a relatively high total fertility rate with an important gender-based variation in time use following the transition into parenthood (OECD 2023b). Despite improvements in recent decades, Australia remains characterized as a liberal welfare regime with comparatively limited family policies that primarily support families through financial transfers (e.g., income-tested tax benefits, one-off maternity payments) over in-kind services (e.g., formal childcare services; Luci-Greulich and Thévenon 2013). This encourages seeking private and

individualized rather than state-provided solutions to balance work and care responsibilities (McDonald and Moyle 2010). Additionally, as female labor force participation expanded, norms shifted toward women increasingly combining parenthood and employment (55% of Australian mothers were employed in 1998 vs. 69% in 2019; OECD 2023a). Yet, traditional family and gender attitudes anticipating women to take on the greater domestic and parenting role following birth persist. As a result, new mothers tend to adapt their work schedules to family obligations, often switching to part-time hours to meet both these expectations, while new fathers' employment patterns remain unchanged, reinforcing the prevailing 1.5-earner model ('male full-time, female part-time') among Australian families (Craig et al. 2010; Hill 2007; OECD 2023b).

Yet, the 1.5-earner arrangement does not necessarily equate to Australian women experiencing less stress or pressure by allowing them to better combine work and family duties. In fact, studies on Australian women's part-time employment find that it does not significantly reduce the experience of time pressure, as reduced work hours mostly translate into an increased domestic load (Rose et al. 2013). Additionally, scaling back on work and going part-time often means (temporarily) limiting career progression or accepting uncertain employment while replacing it with more tedious domestic work, with uncertain consequences for Australian mothers' mental health. Consequently, it remains unclear—in Australia and elsewhere—in which ways long-term changes surrounding parenthood, such as variations in time spent in paid employment and doing domestic work, relate to gendered mental health outcomes.

2.2 | Parenthood and Well-Being: Previous Research

Previous research has extensively examined the impact of becoming a parent on well-being using different approaches (Nomaguchi and Milkie 2020). First, studies have varied in their empirical strategy depending on the employed datasets (i.e., cross-sectional vs. longitudinal data). Studies using (repeated) cross-sectional data generally contrast parents with nonparents to assess differences in well-being *levels*, whereas longitudinal studies exploit within-individual *changes* in well-being over time, with differing results. Second, studies have operationalized well-being through different measures. The often-used unidimensional *subjective well-being* measures (e.g., life satisfaction or happiness scales) have been complemented by more comprehensive multidimensional *mental health* scores. Although measures such as life satisfaction and happiness respectively reflect an evaluative dimension of well-being and the frequency of positive emotion, multidimensional mental health scores allow capturing the complex—and sometimes conflicting—mental processes arising during the parenthood experience (e.g., feeling both stressed and joyful) and the extent to which they impact good daily functioning.

Cross-sectional studies have overall reached mixed conclusions on whether the association between parenthood and well-being is positive or negative, pointing out notable cross-national and period-based variations, both for subjective well-being (e.g., Aassve et al. 2012; Blanchflower and Clark 2021; Glass et al. 2016; Herbst and Ifcher 2016) and mental health (e.g., Nordenmark 2021; Somogyi et al. 2021). In a recent study, Nomaguchi and Milkie (2023) demonstrate that results depend on the considered outcome: although parenthood decreases happiness levels among US women, it also offers protective benefits against depression, highlighting the complexity and ambiguity of the parenthood experience. By contrast, longitudinal studies find more consistent results. Myrskylä and Margolis (2014) identify an increase in within-individual happiness around the transition to parenthood in the United Kingdom and Germany in the 1990s and early 2000s. This result has since been compounded by subsequent studies examining both types of well-being outcomes (Baetschmann et al. 2016; Baranowska and Matysiak 2011; Mikucka and Rizzi 2019; Ruppanner et al. 2019; Tosi and Goisis 2021), which find similarly positive trajectories around birth across different national contexts (including Australia), but equally point out contradictory effects on well-being (e.g., increased positive affect but also increased fatigue and diminished leisure or relationship satisfaction following parenthood; Aassve et al. 2021; Metzger and Gracia 2023).

Further, previous studies identify clear gender-based differences in the consequences of parenthood on well-being. In particular, findings show that parenthood transitions come with both greater strains and greater benefits for women (Nomaguchi and Milkie 2003). This gendered duality of parenthood (in which its *costs* and *benefits* offset their respective impacts on well-being) is attributed to the restrictive effects of parenthood demands, including new time demands, which reduce the rewarding consequences of children on well-being in different ways for men and women (Pollmann-Schult 2014). Specifically, women's schedules are much more extensively affected by children than men's, with greater implications for their well-being. Yet, the mechanisms that shape mental health over parenthood transitions still need to be better understood. This motivates a study focusing on the time-related costs linked to parenthood and its association with gendered well-being outcomes.

2.3 | Changes in Paid Work and Housework Time Following the Transition Into Parenthood

Following the arrival of a child, individuals' time use patterns are significantly affected as additional household tasks need to be completed and redistributed within couples alongside pre-existing employment obligations. Although different theoretical approaches predict how cohabiting couples allocate their time, studies indicate that normative explanations most accurately describe gendered divisions of time and labor once couples become parents (Grunow et al. 2012; Kühhirt 2012; Yavorsky et al. 2015). Specifically, partners tend to organize their time and tasks mostly according to specialized gender roles, as hypothesized by the *doing gender theory* (West and Zimmerman 1987), rather than strictly following economic rationales or time availability considerations (Killewald and García-Manglano 2016; Nitsche and Grunow 2016). This translates into mothers being considered primarily responsible for the organizational and managerial duties in the home and performing the most time-consuming housework tasks, while fathers should specialize in paid work to secure the household's financial stability (Umberson and Gove 1989).

Empirical research on different-sex couples documents these persistent gendered trends in time allocations in paid and domestic work following the transition to parenthood. New mothers generally reduce working hours, either temporarily by taking up longer parental leave, or more permanently by (a) transitioning to part-time work hours or (b) withdrawing from the labor market during early childrearing years or indefinitely, with long-term negative consequences on their labor market outcomes (Kleven et al. 2019). By contrast, fathers' work hours and employment outcomes are generally unaffected by the birth of a (first) child. Simultaneously, women disproportionately increase their unpaid housework hours following parenthood in response to their new role and the increased domestic demands (Baxter et al. 2008; Craig and Mullan 2010). It follows that partners' contributions shift according to these individual-level changes, with a larger share in domestic work time along with a decreased share in paid work of the female partner after parenthood, generally leading to increasingly imbalanced divisions of labor within couples (Grunow et al. 2012). Overall, previous literature on the impact of the transition to parenthood on time use patterns suggests that men's and women's time allocations follow a highly gendered logic with greater implications for women than for men.

2.4 | The Role of Changes in Paid Work and Housework Time in Parental Mental Health Trajectories

2.4.1 | Individual-Level Changes

We expect that the anticipated changes in paid and unpaid work time will play a role in shaping mental health trajectories over the transition to parenthood, given the existing associations between time use and well-being. First, each time use activity is distinctly related to individual mental health and well-being. Although the relationship between paid work and well-being is complex, and may be moderated by a number of factors such as employment stability, job quality or satisfaction (Pereira and Coelho 2013), studies find paid work to be overall associated with positive mental health and well-being outcomes for men and women. This positive association is attributed to the economic, social, and psychological benefits linked to increased autonomy, resources, and social status gained from employment (see Modini et al. 2016 for a review). However, this relationship is further argued to be curvilinear, with a threshold of hours (found to be lower for women than for men) beyond which negative effects for both mental and physical health can be observed (e.g., depression, sleep disruption, or cardiovascular diseases), which are attributed to the adverse consequences of overly prolonged exposures to work-related stressors (Glass and Fujimoto 1994; Virtanen et al. 2011; Virtanen and Kivimäki 2018). By contrast, time spent on domestic work is consistently associated with negative mental health outcomes (see Ervin et al. 2022 for a review), as it is mostly constituted of repetitive, unpleasant tasks with little gratification (Foster and Stratton 2019; Glass and Fujimoto 1994).

Second, the effects of paid work and housework on well-being may extend beyond the type and duration of each activity and their direct association with well-being; they may also depend on how these activities combine and interact. Following *role strain* theory, time-based strains may emerge when employment obligations compete with domestic demands, such that meeting responsibilities in one domain comes at the expense of the other, resulting in mentally taxing work-life conflict (Goode 1960; Greenhaus and Beutell 1985). Such strains are likely to be more pronounced for first-time mothers, who typically take on greater domestic responsibilities often in addition to paid work, than first-time fathers (Craig and Brown 2017; Matysiak et al. 2016), potentially amplifying the negative mental health implications of their adjustments in paid and domestic work time (Nomaguchi et al. 2005; Ruppanner et al. 2019).

In general, we expect individual paid work hours to have a mostly positive relationship with mental health, whereas housework hours are anticipated to have a negative association (H1a). Given the previous findings on paid and domestic work hours changes across the transition to parenthood, women are therefore more likely than men to adjust their schedules in ways that may negatively impact their mental health. Specifically, women are expected to reduce their paid working hours while simultaneously increasing their domestic workload after childbirth, whereas men are expected to maintain their existing work schedules and only marginally increase their domestic time (H1b). For women, these adjustments may result in missing out on the benefits of full-time employment, career prospects, and sufficient personal income, potentially leading to frustration and greater economic dependence. This may be compounded when reduced paid work is replaced by strenuous and less rewarding domestic responsibilities when switching to part-time or no employment. Alternatively, women who keep working full-time, although still benefiting from employment, may become more likely to experience strains from increased work-life conflict. Consequently, changes in paid and domestic work hours are expected to reduce the overall positive association between parenthood and women's mental health but should not be relevant for men as they only experience minimal changes with negligible mental health consequences (H1c).

2.4.2 | Couple-Level Changes

The impact of parenthood on mental health may not solely be contingent upon individual-level changes in paid work and housework time. It may also be crucial to consider how individuals' changes in time allocation compare to their partner's, particularly in the transition to parenthood, when gendered relationship expectations get redefined (Hiekel and Ivanova 2022; Keizer and Schenk 2012). Partner-relative contributions may have different mental health implications than individual time allocations through distinctly operating mechanisms. For instance, an unequal division of labor between partners may be harmful when contributions are perceived as unfair or lead to a sustained imbalance that disadvantages one partner (Glass and Fujimoto 1994; Kalmijn and Monden 2012). Specifically, a decreased share in paid work may undermine mental health through losses in financial autonomy and bargaining power within the household, while a disproportionate increase in the share of domestic work may intensify feelings of unfairness, leading to diminished mental health (H2a).

TABLE 1 | Sample description.

	Women ($N = 2975$)		Men ($N = 2957$)	
	Mean/Prop. (SD)	Range	Mean/Prop. (SD)	Range
Age at first wave observed	26.78 (6.39)	18–50	28.96 (7.70)	18–60
No. of waves observed	6.16 (3.48)	2–20	6.33 (3.67)	2–20
SF-36 MCS	47.16 (10.07)	0–100	49.48 (8.89)	0–100
Individual hours				
Paid work	27.05 (17.86)	0–100[a]	41.49 (13.71)	0–100[a]
Housework	16.79 (12.70)	0–100[a]	9.20 (7.12)	0–100[a]
Partner-relative contribution				
Paid work	0.37 (0.24)	0–1	0.64 (0.24)	0–1
Housework	0.62 (0.20)	0–1	0.38 (0.20)	0–1
Log-household income	11.43 (0.62)	0–14	11.43 (0.62)	0–14
Long-term health impairment	0.14	0–1	0.13	0–1
Relationship dissolution	0.03	0–1	0.03	0–1

Abbreviations: MCS = mental component summary score; SD = standard deviation.
[a]Values are top-coded.
Source: HILDA, waves 2–21.

Partners' contributions to paid and domestic work are expected to become more unequal following the transition to parenthood, reflecting the reinforced gendered division of labor (H2b). That is, women are expected to reduce their paid work hours, whereas men's should remain unchanged, resulting in a relative decline in women's contribution to paid work between partners. At the same time, women are expected to increase their domestic load, while men's housework contributions only marginally increase, leading women to perform a larger share of housework (Killewald and García-Manglano 2016). As the gender imbalance in partners' paid work and housework contributions widens following parenthood, this reinforced gendered division of labor within couples is expected to weaken the positive association between parenthood and women's mental health, but not men's, as only women should be disproportionately penalized by these couple-level shifts (H2c).

3 | Methods

3.1 | Data and Sample

We use data from the Household, Income and Labour Dynamics in Australia (HILDA) panel survey, covering every year from 2002 (wave 2) to 2022 (wave 21). We exclude wave 1 as it does not yet include time use. The HILDA annually surveys a sample of over 9000 Australian households (including a sample top-up in 2011), constituting a large and long-running panel. The survey includes every household member over 15 years old and provides rich information on cohabiting partners. The questionnaire includes detailed time use indicators (e.g., time spent in paid employment, doing housework, or household errands) and mental health measures, along with precise sociodemographic variables at the individual- and household-level.

Our sample is restricted to respondents aged 18 to 50 years for women and up to 60 for men (i.e., the typical age range for having a first child and the subsequent years associated with early childrearing, restricting the initial sample from $N = 45{,}570$ respondents to $N = 29{,}111$). We further restrict the sample to individuals who have (a) complete information on all model variables ($N = 23{,}188$), (b) a different-sex cohabitating partner ($N = 16{,}123$) with (c) available partner time use information ($N = 14{,}493$), and who are observed at least twice over the survey ($N = 11{,}746$). In line with the employed modeling strategy, we only keep respondents who transition into parenthood ($N = 3378$ first-time parents) and respondents who remain childless over the observation window ($N = 2554$ right-censored observations; see empirical strategy section for details) in the final sample ($N = 5932$; 2975 women and 2957 men). Table 1 describes sample characteristics. Figures showing employment status changes for men and women across the transition to parenthood are presented in the Supporting Information (Figure A1 and Figure A2).

3.2 | Variables

3.2.1 | Dependent Variable

We use the SF-36 Mental Component Summary score (SF-36 MCS) to measure (positive) mental health, a reliable and valid instrument suited for the Australian population (Jenkinson et al. 1994; McCallum 1995; OECD 2023c). The SF-36 MCS assesses various aspects of mental health across four subscales, each based on multiple items: social functioning, role functioning, emotional functioning, and vitality (see Supporting Information for a summary of the questions and items included in the SF-36). The overall score ranges from 0 to 100 points, with higher scores indicative of better overall mental health, and is derived from a standardized, weighted combination of these

items. These construction weights are predefined and country-specific to adjust the scores relatively to national characteristics and facilitate their interpretation with respect to the general population (Ware et al. 1994). Although the HILDA survey includes the complete SF-36 questionnaire, it does not include the fully computed SF-36 MCS. We therefore derive it based on the individual responses to questionnaire items using the Stata module "sf36" (Ryan 1999), which follows the computational steps in accordance with the SF-36 construction manual by Ware et al. (1994) and allows setting Australia-specific weights (Australian Bureau of Statistics 1995) to obtain the standardized SF-36 MCS for the full survey sample. The advantage of using the SF-36 MCS is that it captures both emotional states and daily functioning by taking into consideration the experience of specific symptoms (e.g., feeling nervous or happy), as well as whether they impact and restrict day-to-day life (i.e., the ability to perform usual routine or social tasks effectively).

3.2.2 | Independent Variable

The main variable of interest is the first transition to parenthood. To capture the dynamic, nonlinear nature of this process and obtain the distributed effects of becoming a parent over time, we define a discrete-time trend variable around the event of the first childbirth ranging from −3 (baseline category, when the outcome is considered unrelated to the parenthood transition, i.e., prior to any anticipation effects) to +6 years post-birth, to model the adaptation period to parenthood and early childrearing years. For respondents becoming parents during the survey, the variable takes on the value of the number of years around the birth of their first child. For respondents who do not experience this transition (i.e., who remain childless during the survey), the variable takes on a default time-invariant value (set to −3).

3.2.3 | Mediating Variables

Time use variables are used as mediators between the transition to parenthood and mental health. We define two time use variables for paid and domestic work, described in Table 2. Time spent in paid work is defined as the weekly hours the respondent spends in formal paid employment. Time spent in domestic work is defined as the weekly hours spent doing housework and running household errands. The time use measures are defined both *individually* in absolute terms as well as at the *couple level* in relative terms, that is, as the proportion of hours the respondent does relative to the total combined hours with their partner, to capture the division of paid and domestic labor within couples.

TABLE 2 | Description of time use variables.

Activity	Description (based on survey questions)
Paid work	Weekly time spent in paid employment in a typical week
Housework	Weekly time spent doing housework (preparing meals, washing dishes, cleaning house, washing clothes, ironing, and sewing) combined with weekly time spent running errands (shopping, banking, paying bills, and keeping financial records) in a typical week

Although self-reported time use measures are less precise than measures collected through time diaries (Kan 2008), previous studies making use of the HILDA time use measures have examined their accuracy by comparing the averages with those from the 2006 Australian Time Use Survey and found reasonable similarity permitting the use of these measures as accurate representations of individuals' time use (see Foster and Stratton 2018, 2019). The time use variables described in this section are also used as dependent variables to model associations between time use and mental health.

3.2.4 | Control Variables

We use the following time-variant covariates as controls in the fixed effects models: age (linear and squared) to account for the confounding effect of aging on both the parenthood transition and mental health variations; (log) household income to account for changes in household resources; and a health impairment indicator to account for adverse effects of physical health deteriorations on mental health. We also include a dummy variable that indicates the year before a relationship dissolution occurs within the survey (as respondents are dropped when they are not partnered anymore) to account for the negative effect of separation on mental health. We do not control for subsequent births, as doing so could introduce endogenous selection bias by adjusting for a collider variable that is influenced by both the main independent variable and the outcome (i.e., having a second child is both the consequence of the first transition to parenthood and more likely with increased mental well-being and a positive experience after the first birth; Elwert and Winship 2014; Luppi and Mencarini 2018).

3.3 | Analytical Strategy

We apply fixed effects linear regressions to model the dynamic associations between time use, parenthood, and mental health. Fixed effects models exploit the within-individual change in time-varying variables, eliminating time-constant individual effects and unobserved heterogeneity, which produces mostly unbiased estimations (conditionally on no confounding by unobserved time-varying variables) in a modeling framework that requires few assumptions (Allison 2009). The estimated parameters reflect the average effect of a within-individual change in the variable of interest on the outcome, that is, the parenthood variable reflects the effect of the transition into parenthood and the progression into subsequent years on individuals' mental health, relative to their baseline level before becoming parents (i.e., −3 years before), everything else equal. Fixed effects models are also well suited to unbalanced panels, allowing us to include all first-time parents with at least two valid observations within the −3 to +6 year window around birth.

We run models separately for men and women, as the processes surrounding parenthood and mental health are highly gendered. We include both respondents who become parents during the observation period and a control sample of childless

respondents, consistent with the empirical approach taken in related studies (e.g., Giesselmann et al. 2018; Mikucka and Rizzi 2019; Ruppanner et al. 2019). Although control observations do not contribute to estimating parenthood effects on mental health (as they take on a time-invariant default value for the parenthood transition variable), they do contribute to a more robust estimation of all other time-variant covariates. This is particularly important for age-related effects. Age effects (i.e., the impact of aging on mental health) may be inaccurately estimated when leaving out the control group, which may then be erroneously reflected in the parenthood transition coefficients (Brüderl and Ludwig 2015; Ludwig and Brüderl 2021; Perales 2019).

3.3.1 | Modeling the General Association Between Time Use and Mental Health

We first quantify the overall associations between the different time use variables and mental health. This allows us to establish the general relationship between changes in individual and partner-relative contributions in paid and domestic work time and mental health:

$$MH_{it} = \beta_0 + \beta_1 \bullet TU_{it} + \boldsymbol{\gamma}' \bullet \boldsymbol{X}_{it} + \alpha_i + \varepsilon_{it}$$

Where *MH* represents the mental health score of individual i at time t, *TU* represents individual- or couple-level time use, that is, the number of weekly hours or the share of hours spent on paid or domestic work, $\boldsymbol{X}$ contains all time-dependent individual control variables, and α_i is the individual fixed effect. This model allows testing hypotheses H1a and H2a.

3.3.2 | Modeling the Mediating Role of Changes in Time Use on Parental Mental Health

To identify whether time use plays a role in the mental health trajectories of men and women during the transition to parenthood, we conduct a longitudinal mediation analysis (without causal interpretation). This follows the principles of standard mediation analysis but applies fixed effects linear regressions that model within-individual variations. The effect estimates are thus interpreted in terms of within-individual changes. The specific steps of the mediation analysis are outlined below (see also Table 3 for a graphical summary).

Step 1. Assess the association between the transition to parenthood and time use:

$$TU_{it} = a_0 + a_1 \bullet TP_{it} + \boldsymbol{\gamma}' \bullet \boldsymbol{X}_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

Where *TP* is the categorical discrete-time variable for the transition into parenthood with values from −3 (reference category) to +6, and a_1 is the estimated effect of the transition to parenthood on changes in time use that tests hypotheses H1b and H2b.

Step 2. Estimate the base model to assess the total effect of the transition to parenthood on mental health (i.e., without accounting for time use changes):

$$MH_{it} = c_0 + c_1 \bullet TP_{it} + \boldsymbol{\gamma}' \bullet \boldsymbol{X}_{it} + \alpha_i + \varepsilon_{it} \quad (2)$$

Where c_1 estimates the *total effect* of the parenthood transition on changes in mental health.

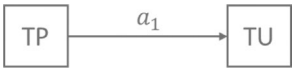
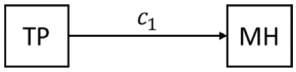
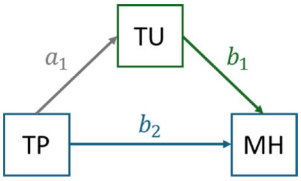
Step 3. Estimate the mediated model to examine the role of time use in shaping parental mental health by adding time use into Equation (2):

$$MH_{it} = b_0 + b_1 \bullet TU_{it} + b_2 \bullet TP_{it} + \boldsymbol{\gamma}' \bullet \boldsymbol{X}_{it} + \alpha_i + \varepsilon_{it} \quad (3)$$

Where b_1 is the effect of time use changes on mental health variations net of the parenthood transition, and b_2 is the *direct effect* of the transition to parenthood on mental health. The *indirect effect*—representing the part of the effect of parenthood on mental health that operates only through time use—is given by $a_1.b_1$ (with a_1 as estimated in Equation 1), which allows testing hypotheses H1c and H2c. The total effect c_1 from Equation (2) is the sum of the direct (b_2) and indirect ($a_1.b_1$) effects in Equation (3), that is, $c_1 = b_2 + a_1.b_1$. Consequently, the indirect effect can also be obtained by computing the difference between the total and direct effects of parenthood, that is, $a_1.b_1 = c_1 - b_2$ from Equations (2) and (3).

Practically, we first estimate Equation (1) to examine the effect of becoming a parent on changes in individual and

TABLE 3 | Conceptual summary of the mediation analysis.

Step 1	Step 2	Step 3
		
a_1: effect of the transition to parenthood on time use changes	c_1: total effect = effect of the transition to parenthood on mental health changes	b_2: direct effect $a_1.b_1$: indirect (= mediated) effect $b_2 + a_1.b_1$: total effect (= c_1)

Abbreviations: MH = mental health; TP = transition to parenthood; TU = time use.

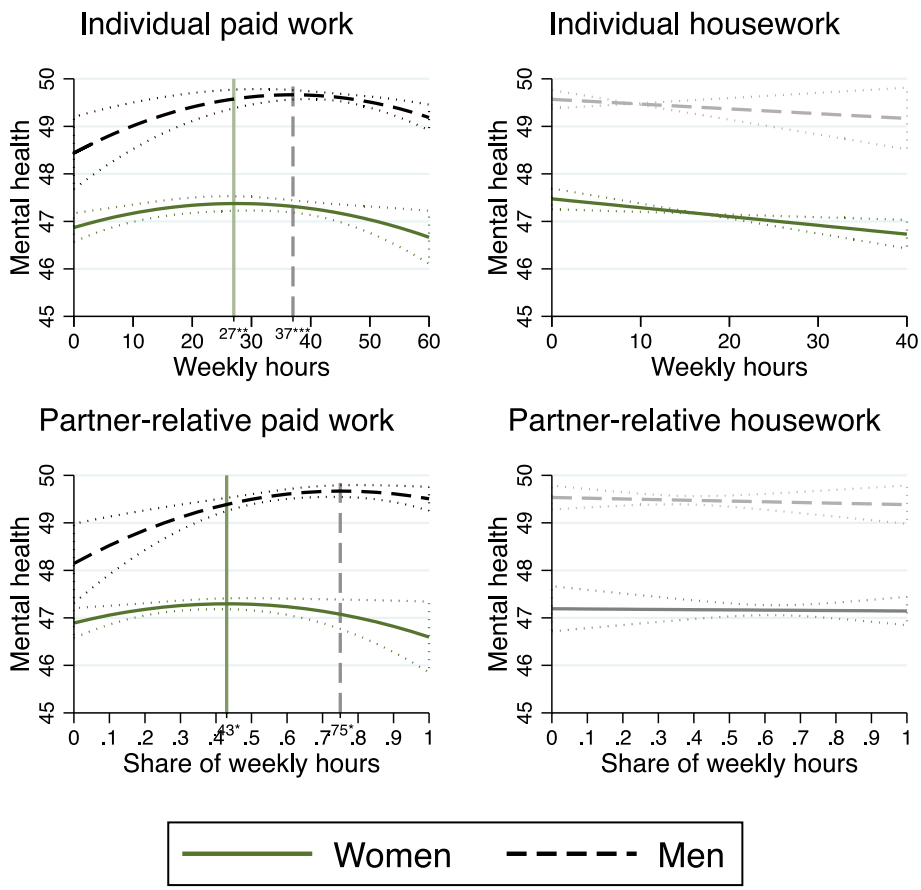


FIGURE 1 | Predicted change in mental health by time use (individual weekly hours and partner-relative contributions) from fixed effects linear models. Separate models for men and women. Fixed effects model estimates with 95% confidence intervals. Controls include age, age squared, household income, long-term health impairment, and relationship dissolution. Vertical lines indicate a statistically significant U-point in a quadratic association; the value and level of statistical significance of the U-point are indicated on the x-axis. Light gray confidence intervals and lines signify a statistically non-significant association at the 5% level. [Color figure can be viewed at wileyonlinelibrary.com]
Source: HILDA, waves 2–21.

partner-relative paid and domestic work. Second, we estimate Equation (2) as the baseline model (M0), followed by multiple specifications of Equation (3) that incorporate the different time use variables (models M1–M4) to assess their potential mediating effect on parental mental health changes. To determine mediation, we compare the *TP* coefficient differences between M0 and M1–M4 (i.e., $c_1 - b_2$) to determine the indirect effects. We then test whether these indirect effects are statistically significant by applying bootstrapping ($n = 1500$ resamples and analysis replications using the Stata 18.5 MP "bootstrap" command) to establish an empirical sampling distribution for the difference terms and obtain 95% confidence intervals and appropriate *p*-values. Full results tables are shown in the Supporting Information.

Based on the hypotheses, we expect to find evidence of *competitive mediation* through time use changes for women only (Zhao et al. 2010). That is, we anticipate both indirect (or mediated) and direct effects to be present, but to point in opposite directions. Specifically, we expect the direct effect of the transition to parenthood on mental health to be positive, but the mediated effects through time use to be negative—reflecting the disadvantageous shifts in both paid and domestic work linked to parenthood for women.

4 | Results

4.1 | Paid Work, Housework, and Mental Health: General Associations

Figure 1 shows the overall associations of individual- and couple-level time use variations with mental health from separate fixed effects models for men and women. We find that individual paid work hours have a statistically significant nonlinear association with mental health for both men and women, although the relationship is steeper for men. This translates into an inverse U-shape relationship, which we formally test through a *t*-test with a quadratic specification between the work hours variable and the outcome (Lind and Mehlum 2010), which is significant for women ($p < 0.01$) and men ($p < 0.001$). The computed extreme points (i.e., the highest point of the inverse U) are plotted (vertical lines) at 37 h for men and 27 h for women. To contextualize results, the average within-individual

mental health variation over the survey (which encompasses up to 20 years) is only about 6.1 points out of the 0 to 100 SF-36 MCS scale. The effects of changes in paid work hours on mental health are ~0.04 for women and 0.07 for men, that is, a change of 1 h in paid work is associated with a 0.04 (or 0.07) SF-36 MCS point change. Although these effects are small given the full scale, they should be interpreted considering (a) the limited range of within-individual variation in mental health over time and (b) that major time use shifts still substantially affect individual mental health. For women, switching from 27 weekly work hours (peak value from Figure 2) to no employment would lead to a $-27 * 0.037 - 0.001 * 27^2 \approx -0.3$ point reduction in mental health. Similarly, for men, a change from 37 weekly hours to none would result in a $-37 * 0.066 - 0.001 * 37^2 \approx -1.1$ point decrease. Therefore, relative to the average within-individual variation, large shifts in time use can represent sizeable changes in mental health, thereby supporting H1a.

Partners' paid work contributions show similar trends and shapes to individual hours, with a much higher peak for men. The positive association between his paid work contribution and his mental health peaks at 75% ($p < 0.05$), whereas it peaks at 43% ($p < 0.05$) for her. Overall, these associations suggest that, on average, men derive most mental health benefits from full-time employment and being in 1.5-earner configurations (i.e., a 75% share of total work hours relative to their partner). Comparatively, women favor a lower workload and a more equal distribution of paid work (i.e., around 50% each).

For individual housework hours, we find a statistically significant linear negative association with mental health for women only. Effect sizes are of a similar range—but slightly smaller—than for paid work (i.e., an increase of 1 h in housework is linked to a 0.02 SF-36 MCS point decrease for women). By contrast, changes in the partner's housework contribution have no significant effect on men's or women's mental health, suggesting that the division of housework may not be as important for mental health as the actual number of individual hours. Overall, these findings support H2a for paid work contributions, but not for housework.

4.2 | Longitudinal Mediation: Do Changes in Paid Work and Housework Time Mediate the Association Between the Transition to Parenthood and Mental Health Trajectories?

4.2.1 | Effects of the Transition to Parenthood on Time Allocations

We first model the effect of the transition into parenthood on changes in time use (Step 1), both for absolute individual hours (Figure 2a) and partner-relative contributions (Figure 2b).

Results show that, on average, becoming a mother is associated with a decrease in weekly paid work hours of 18 to 27 h post-birth (reflecting both large reductions in working hours and full exits from the labor force) and an increase in housework between 8 and 11 h per week, relative to individual pre-birth levels (Figure 2a). Consistent with these individual-level shifts, the average partner-relative share of paid work decreases, with a 20% reduction in her paid work contribution compared to her partner, against a 10% increase in her housework contributions (Figure 2b). For fathers, there is no significant decrease in work hours compared to baseline and only a small increase in housework hours of about 1 h (Figure 2a). The increase and decrease in the contributions compared to their partner mirrors the women's changes. Both perspectives highlight the shift to specialized gender roles following the first transition to parenthood, supporting H1b and H2b.

4.2.2 | Parenthood and Mental Health: Accounting for Changes in Paid Work and Housework Time

Results assessing whether time use mediates the relationship between the first transition into parenthood and mental health (Steps 2 and 3) are presented in Table 4a for women and Table 4b for men. The base model M0 shows the total effect of the transition to parenthood on mental health trajectories (i.e., without time use), which we find to be consistent with previous

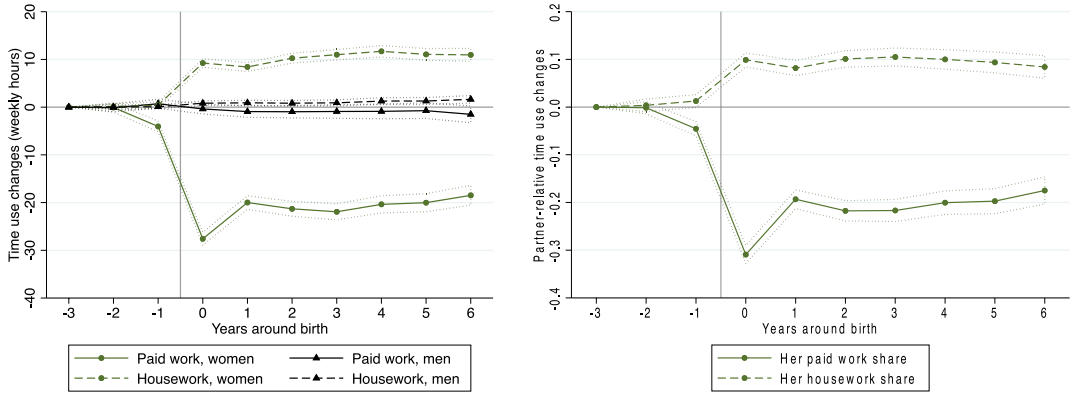


FIGURE 2 | (a) Predicted change in time use (individual weekly hours) around the first birth. Separate models for men and women. Fixed effects model estimates with 95% confidence intervals with reference category at-3 years. Controls include age, age squared, household income, long-term health impairment, and relationship dissolution. (b) Predicted change in partners' time use share (*her* share) around the first birth. Fixed effects model estimates with 95% confidence intervals with reference category at −3 years. Controls include age, age squared, household income, long-term health impairment, and relationship dissolution. Only *her* share is displayed as *his* share mirrors *her* share (*his* share ≈ 1—*her* share). *Source:* HILDA, waves 2–21. [Color figure can be viewed at wileyonlinelibrary.com]

TABLE 4a | Fixed effects linear regression models predicting changes in mental health, accounting for time use (women).

	Mental health (SF-36 MCS)								
	M0	**M1**	***M0–M1***[a]	**M2**	***M0–M2***[a]	**M3**	***M0–M3***[a]	**M4**	***M0–M4***[a]
Years (*Reference*: −3)									
−2	0.78*	0.77*	*0.01*	0.78*	*0*	0.78*	*0*	0.77*	*0.01*
−1	2.62***	2.63***	*−0.01*	2.63***	*−0.01*	2.62***	*0*	2.64***	*−0.02*
0	1.25***	1.48***	*−0.23*	1.40***	*−0.15*[b]	1.52***	*−0.27*	1.54***	*−0.29*[a]
1	1.39***	1.46***	*−0.07*	1.53***	*−0.14*[b]	1.52***	*−0.13*	1.54***	*−0.15*
2	0.68	0.77	*−0.09*	0.85*	*−0.17*[b]	0.85	*−0.17*	0.85*	*−0.17*
3	0.94*	1.03*	*−0.09*	1.12*	*−0.18*[b]	1.12*	*−0.18*	1.11*	*−0.17*
4	0.95	1.02*	*−0.07*	1.14*	*−0.19*[b]	1.12*	*−0.17*	1.10*	*−0.15*
5	1.12*	1.18*	*−0.06*	1.30*	*−0.18*[b]	1.28*	*−0.16*	1.26*	*−0.14*
6	0.94	0.99	*−0.05*	1.13*	*−0.19*[b]	1.08	*−0.14*	1.06	*−0.12*
Individual hours									
Paid work		0.04**				0.04*			
Paid work (sq)		−0.00**				−0.00**			
Housework				−0.02*		−0.01			
Partner-relative									
Paid work								2.34*	
Paid work (sq)								−2.44*	
Housework								0.13	
Controls	Yes	Yes		Yes		Yes		Yes	
No. observations	18,332	18,332		18,332		18,332		18,332	
No. individuals	2975	2975		2975		2975		2975	

Note: Results from fixed effects models with robust standard errors. ***$p<0.001$, **$p<0.01$, *$p<0.05$. Controls include age, age squared, household income, long-term health impairment, and relationship dissolution.
Abbreviation: sq. = squared.
[a]Indirect (mediated) effects.
[b]$p<0.05$ based on bootstrapped standard errors.
Source: HILDA, waves 2–21.

research: women show statistically significant positive anticipation effects in the years leading up to birth ($b_{TP=-2}=0.78$, $p<0.05$; $b_{TP=-1}=2.62$, $p<0.001$), followed by a positive birth effect ($b_{TP=0}=1.25$, $p<0.001$). To situate these effect sizes, a 2.62 points anticipation effect represents around 43% of the total average intra-individual mental health variation, which denotes a substantial life course effect. The effects then reduce both in terms of magnitude and significance level, suggesting a partial adaptation effect to parenthood. Men's mental health, on the other hand, is not significantly affected by the transition to parenthood.

Models M1–M4 include the different time use mediators at the individual- and couple-level, estimating the direct and indirect effects of the transition to parenthood on mental health trajectories. M1 examines the mediating role of changes in individual paid work hours. For men, including paid work hours has no impact on results. For women, accounting for changes in paid work time does not change the anticipation effect coefficients (i.e., years −2 and −1), but increases all subsequent coefficients from birth onwards compared to M0 (e.g., from $b_{TP=0}=1.25$, $p<0.001$ to $b_{TP=0}=1.48$, $p<0.001$). This indicates that the indirect effect, that is, the effect of parenthood mediated by changes in paid work

TABLE 4b | Fixed effects linear regression models predicting changes in mental health, accounting for time use (men).

	Mental health (SF-36 MCS)								
	M0	**M1**	***M0-M1*[a]**	**M2**	***M0-M2*[a]**	**M3**	***M0-M3*[a]**	**M4**	***M0-M4*[a]**
Years (*Reference*: −3)									
−2	0.23	0.23	*0*	0.23	*0*	0.24	*−0.01*	0.23	0
−1	0.31	0.33	*−0.02*	0.31	*0*	0.33	*−0.02*	0.29	0.02
0	0.19	0.19	*0*	0.20	*−0.01*	0.20	*−0.01*	0.14	0.05
1	−0.25	−0.24	*−0.01*	−0.24	*−0.01*	−0.24	*−0.01*	−0.32	0.07
2	−0.26	−0.27	*0.01*	−0.26	*0*	−0.26	*0*	−0.32	0.06
3	−0.38	−0.37	*−0.01*	−0.37	*−0.01*	−0.36	*−0.02*	−0.43	0.05
4	−0.70	−0.68	*−0.02*	−0.69	*−0.01*	−0.67	*−0.03*	−0.75	0.05
5	−0.42	−0.43	*0.01*	−0.41	*−0.01*	−0.42	*0*	−0.49	0.07
6	−0.61	−0.62	*0.01*	−0.60	*−0.01*	−0.61	*0*	−0.68	0.07
Individual hours									
Paid work		0.07***				0.06***			
Paid work (sq)		−0.00***				−0.00***			
Housework				−0.01		−0.01			
Partner-relative									
Paid work								4.10**	
Paid work (sq)								−2.71**	
Housework								−0.05	
Controls	Yes	Yes		Yes		Yes		Yes	Yes
No. observations	18,712	18,712		18,712		18,712		18,712	18,712
No. individuals	2957	2957		2957		2957		2957	2957

Note: For details, see Table 4a.
[a]Indirect (mediated) effects.
Source: HILDA, waves 2–21.

hours, suppresses some of the positive direct effects of becoming a mother on mental health. However, these mediated effects (given by M0-M1) are small (ranging between −0.05 and −0.23) and not statistically significant. Therefore, although this goes in the direction hypothesized by H1c, the lack of statistical significance does not fully support it for changes in paid work time.

M2 examines the mediating role of individual housework hours. Similarly to M1, women's post-birth coefficients are increased compared to M0 (e.g., from $b_{TP=0} = 1.25$, $p < 0.001$ to $b_{TP=0} = 1.40$, $p < 0.001$) while anticipation effects stay the same. The indirect effects of parenthood on mental health through changes in housework hours range from −0.14 to −0.19 (given by M0–M2) and are statistically significant starting from the birth year for women. Results remain unchanged for men. This finding aligns with H1c, which predicts the post-birth increase in housework hours to diminish the positive direct effect of becoming a parent for women only.

M3 examines the mediating roles of both domestic and paid work hours changes. For men, the parenthood coefficients remain insignificant in this specification, indicating no evidence of mediation. For women, the pre-birth effects are again unchanged, whereas all post-birth coefficients increase compared to M0, with mediating effects ranging from −0.13 to −0.27 (M0–M3), as well as to M2 and M3. Although this pattern could suggest a potential combined mediating effect of changes in paid and domestic work hours on mental health after the transition to parenthood, the effects are not statistically significant, preventing a definite conclusion.

M4 assesses the mediation operating through changes in partner-relative contributions following parenthood. We do not examine housework contributions separately, given that it has no statistically significant association with mental health for men or women and shows no mediation effects for parental mental health around birth (results not shown but available upon request). Consequently, including only paid work or both paid and domestic work contributions yields near-identical results. Similar to the previous models, the mediation effects in M4 occur only following birth and range from −0.12 to −0.29 (M0–M4). The birth and first year are most affected, with a statistically significant negative mediation effect in year 0, which indicates a significant short-term suppressive effect from the changes in partner contributions on mental health trajectories for first-time mothers (−0.29 reduction of the positive direct effect, $p < 0.05$). No changes or mediation effects are observed for men. This result supports H2c, expecting changes in the contribution of paid work hours to reduce the positive association between parenthood and mental health for women only. By contrast, the lack of an effect from housework contributions suggests that the redistribution of domestic tasks following childbirth is not a co-determinant of parental (and specifically, maternal) mental health trajectories, thereby invalidating H2c for housework contributions.

Overall, we find evidence of competing effects being at work when it comes to parenthood transition, particularly for women: while becoming a parent generally enhances mental health, it also increases housework and leads to shifts in partners' paid and domestic work contributions which exert a counteracting (i.e., negative) effect on mothers' positive mental health trajectories. These findings follow the hypothesized directions both at the individual- and the couple-level and align with the *costs and rewards* approach to parenthood, whereby parents simultaneously experience rewarding and challenging changes following birth. Despite this, the obtained effect sizes require cautious interpretations. The trajectory improvements found from accounting for the changes linked to parenthood-related time costs (i.e., women reducing rewarding paid work and increasing unpleasant housework) are modest when considered relative to the range of within-individual mental health variation and are only significant for changes in housework hours (M2) and partners' paid work contributions (M4). This could indicate that time use shifts are only minor determinants of mental health changes over the transition to parenthood.

4.3 | Additional Analyses: Considering Childcare Hours

Our main analyses focus on changes in time use before and after parenthood in paid work and housework, excluding childcare. Although childcare represents a substantial increase in unpaid workload –increasing from 0 h (the default pre-birth value) to about 50 h per week for women and 20 h for men (see Supporting Information Figure A3)—additional analyses indicate no significant association between childcare hours and mental health, either at the individual level or relative to the partner (see Supporting Information Figure A4). This may be due to the complex emotional implications of childcare time, which can differ depending on the type, frequency, and duration of care activities and whether they involve enjoyable interactions (e.g., playtime) or more demanding routine tasks (e.g., physical care). However, the HILDA questionnaire does not differentiate between leisure- and routine-oriented childcare, preventing a differentiated analysis of the heterogeneous impacts of childcare. Robustness checks (not shown, but available upon request) show that including childcare (either as a separate variable or combined with housework) does not alter the main findings, consistent with the absence of a direct empirical association with the outcome.

5 | Discussion

This study investigates the role played by individual and partner-relative changes in paid and domestic work in women's and men's mental health trajectories around the first transition to parenthood using high-quality yearly panel data from Australian couples (2002–2022). Although prior studies have separately examined the consequences of parenthood on time use allocations and individual well-being, none have explored the joint relationships between time use, mental health, and parenthood. We extend the scope of previous research by adopting a dynamic life course approach to examine whether and to what extent time use allocations in paid and domestic work act as a mechanism linking parenthood to mental health, combining an individual- and couple-level perspective.

Our findings can be summarized at three key levels. First, results show that individual and couple-level time allocations greatly change over the first parenthood transition. This change is almost exclusively driven by variations in women's time use, with a large decrease in paid work and an increase in unpaid housework, which is reflected in partners' time contribution patterns. We further confirm a direct and gendered association between time use and mental health: paid work hours are overall positively associated with mental health for both men and women, whereas housework hours have a consistently negative association for women only. These effects may become more substantial in the case of larger time shifts, such as switching between full-time, part-time, or no employment, and doubling the domestic workload, which are likely to occur around parenthood transitions.

Second, we accordingly derive that individual time allocations shift in an unfavorable direction for women as they miss out on the mental health benefits of employment while concurrently increasing their more strenuous domestic load over the transition to parenthood. This asymmetrical shift supports previous research on the gendered *costs and rewards* of parenthood, which argues that it is a heterogeneous experience that implies fundamental benefits such as increased purpose, meaning, and joy but also carries considerable costs and strains, particularly for women (Nomaguchi and Milkie 2003; Pollmann-Schult 2014). We assume these disadvantageous shifts in time allocations to be linked to the time-related costs of parenthood, which lead to a reduction of the enjoyment of this event through diminished mental health for new mothers. We find evidence for this from longitudinal mediation analyses, which suggest that changes in housework time associated with parenthood exert small compensatory effects that slightly offset the otherwise positive impact of parenthood on women's mental health trajectories. The

fact that we find no such mediation effects of time use before birth (i.e., in years −2 and −1) further suggests that this mechanism only begins to operate after the child's arrival. This pattern is consistent with *role strain* theory, which predicts negative effects resulting from the multiplication of responsibilities when becoming a parent (Goode 1960).

Third, we provide new evidence on how couple-level time allocations may influence the link between transitioning to parenthood and mental health. We observe that the changes in paid work contributions are linked to reductions in maternal mental health around birth. As these changes reflect women's decreased contribution to paid labor within the household, they may capture growing intra-couple inequality following parenthood and shifting (economic) power dynamics between partners, both of which may be negatively associated with mothers' mental health. This interpretation is supported by related studies such as Keizer et al. (2010), which show that mothers' labor market withdrawal following childbirth most strongly predicts declines in relationship satisfaction, suggesting that substantial drops in paid work participation reshuffle partnership dynamics in ways that can be detrimental to relationship quality and, by extension, to parental—specifically, maternal—mental health.

By contrast, we find no clear impact of partners' division of housework on mental health. This could suggest that, unlike paid work, the distribution of housework does not relate to mental health as directly as anticipated, potentially due to carrying more ambiguous effects linked to gender role ideology. That is, an unequal contribution to housework may be a source of strain and disagreement for women within some couples, whereas it may conform to gender norms and be perceived as appropriate in others (Tai and Baxter 2018). This distinction may be especially relevant in the Australian context, where specialized gender and family norms remain common (e.g., highly prevalent male breadwinner or 1.5-earner models), and where such unequal divisions of domestic labor may therefore not always be viewed as unfair or problematic (Baxter and Hewitt 2013). Subsequent studies should explore in more detail whether gender ideology impacts the role of partners' time allocations in shaping parental mental health, possibly making use of the extensive 'Attitudes and Values' module included in the HILDA survey.

Overall, our findings contribute to the existing literature by establishing a direct link between changes in time use and mental health. We offer empirical evidence on the association between "objective" measures of time use and parental mental health, which suggests that changes in actual time use may undercut some of the positive relationship between childbearing and overall mental well-being for women. This complements prior research linking increased "subjective" perceptions of time pressures to lowered parental mental health outcomes and higher risks of depression (Hewitt et al. 2022; Roxburgh 2012; Ruppanner et al. 2019). Our findings further align with previous studies indicating that women are overall more impacted by parenthood than men in terms of lifestyle changes and emotional responses (e.g., Baxter et al. 2008; Mikucka and Rizzi 2019).

However, the small effect sizes obtained may indicate that changes in individual time allocations only play a minor role in shaping parental mental health, particularly when compared to recent findings examining time pressure (e.g., Hewitt et al. 2022; Ruppanner et al. 2019). This could suggest that actual time use matters less than subjectively perceived time pressures in shaping parental mental health trajectories. Similarly, the shift in the division of labor within couples may carry ambivalent implications depending on the subjective perception of inequity rather than the actual contribution, particularly for housework. Therefore, equity perception changes over the transition to parenthood may more strongly mediate the association between parenthood and mental health. This mechanism could be investigated as an extension of this study in future research.

Alternatively, the small effect sizes may result from data-related limitations, which resulted in the exclusion of other important interdependent time use domains that are closely linked to mental health and considerably impacted by parenthood, such as sleep and leisure time (Claxton and Perry-Jenkins 2008; Plage et al. 2016). However, sleep hours are only recorded in waves 13 and 17 of the HILDA survey, and leisure hours (e.g., hobbies, socializing) are not included, thus not allowing for their use in the current study. In addition, childcare hours had to be omitted due to their indeterminate link to mental health, which potentially reflects the conflation of various dissimilar childcare activities into a single variable in the survey questionnaire. Yet, adding routine childcare to the domestic load and recreational time with children to leisure time could offer a more complete picture of parenthood-related time use changes and how these link to parental mental health adjustments. Future research with more comprehensive longitudinal time use data should further investigate these questions, either to confirm the weak mediation link between time use and parental mental health or to uncover more nuanced associations and provide empirical contextualization to our findings.

Lastly, our study presents the following shortcomings related to the analytical strategy. Although employing fixed effects models has important advantages, there are some drawbacks to this modeling framework. First, we cannot conclude regarding the effect of the level of time use (i.e., the number of hours) in relation to parental mental health as fixed effects models only exploit change (i.e., the change in the number of hours), discarding initial starting levels for estimations which might restrict capturing the full effect of time use on mental health. Second, by only exploiting within-individual variations in time use to predict within-individual changes in mental health, we largely reduce available model variance, leading to small effect sizes. Our estimates on the role of time use in mental health trajectories over the transition to parenthood may therefore be more conservative. Third, due to including a couple-level approach and restricting our sample accordingly, our results pertain to individuals in different-sex cohabiting couples. Future studies should expand on the links between time use and mental health for other demographic groups.

Despite these limitations, our study is the first to provide evidence on the role of both individual- and couple-level time in paid and domestic work in determining mental health trajectories over the transition to parenthood within a large-scale longitudinal framework. In doing so, we contribute to gaining new insights into a hypothesized mechanism affecting parental well-being. Findings indicate that large shifts in employment and domestic work time can have substantial effects on mental health

and that such disadvantageous changes take place for first-time mothers, but with only moderate adverse consequences on their mental health. Nevertheless, these findings contribute to supporting family policy designs that promote a more balanced division of paid and unpaid work between partners, especially in the short term. In particular, although current leave policies after childbirth aim to alleviate time and financial constraints for new parents, they may also reinforce gender specialization models within couples if they are predominantly taken by mothers only, potentially offsetting some of their intended mental health benefits. Fully equal leave for both parents, allowing for a more equal division of labor from the outset, could therefore help to better counteract these dynamics.

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