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Title:
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Date:
2025-11-01

Citation:
Ervin, J., Churchill, B., Ruppanner, L. & King, T. (2025). Unpaid labour and mental health–the role of perceived fairness and satisfaction in division amongst working-age adults; a longitudinal analysis using 18 waves of panel data. Social Science and Medicine, 384, pp.118559-. https://doi.org/10.1016/j.socscimed.2025.118559.

Persistent Link:
https://hdl.handle.net/11343/363865

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Social Science & Medicine 384 (2025) 118559



Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed





Unpaid labour and mental health–the role of perceived fairness and satisfaction in division amongst working-age adults; a longitudinal analysis using 18 waves of panel data

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ARTICLE INFO

Handling editor: Social Epidemiology Office

Keywords:
Gender equality
Unpaid labor
Unpaid work
Domestic work
Mental health
Depression

ABSTRACT

Across the globe, the division of unpaid labour remains highly gendered and unequally shared. This has consequences for women's economic security and their ability to participate equally in paid work. Whilst unpaid labour time has been shown to be associated with poorer mental health, understanding how the unequal division of unpaid labour impacts mental health requires further scrutiny. Utilising 18 annual waves (2005–2022) of the HILDA survey, this study employed Mundlak modelling to examine the longitudinal association between perceptions of fairness and satisfaction in the division of key unpaid labour domains (household work and childcare) and mental health in working-age Australians (n = 8734). Mental health was assessed using the MHI-5 scale. All analyses were stratified by gender. Findings demonstrate that the mental health of both men and women is poorer when they are dissatisfied with the division of either domain of unpaid labour and when they perceive that they are doing *more* or *less* than one's fair share of both housework and childcare. Importantly, this research tells us that it is not only the objective division of unpaid labour that impacts mental health but also satisfaction and one's perceptions of fairness in that division.

1. Introduction

Unpaid labour, encompassing both caregiving and household labour, is chronically undervalued and remains largely invisible in economic modelling and policy considerations (Krol and Brouwer, 2015). Moreover, despite the ongoing shift in gender roles, from traditional family models (male breadwinner, female homemaker) to more egalitarian family structures (dual-earner couples), the division of unpaid labour remains highly gendered and unequally shared. Women and girls across the globe continue to do a disproportionate amount of unpaid household labour and remain primarily responsible for caregiving (Organisation for Economic Cooperation and Development (OECD), 2017). This has implications for women's economic security and their ability to participate equally in paid work and leadership roles, and in some cases locks women out of the workforce altogether (Charmes, 2019). In addition to these social and economic impacts, high unpaid labour loads have been shown to be associated with poorer mental health (Ervin et al., 2022). Given mental health disorders contribute substantially to the global disease burden (Arias et al., 2022), understanding how modifiable social determinants of mental health, such as unpaid labour, impact population mental health is imperative. Less clear is how men's and women's subjective feelings regarding the domestic division of labour impacts their mental health. This is important given that expectations around who does what household labour and childcare, and how much, is heavily gendered. This study addresses this gap by examining the longitudinal association between one's satisfaction with and perceived fairness of division of two key unpaid labour domains (household work and childcare) and mental health in both women and men.

Unpaid labour encompasses responsibilities and tasks done to maintain a household and/or its family members without any monetary compensation (Friedemann-Sánchez and Griffin, 2011; United Nations (UN) Women, 2018). It includes household work (such as shopping, cooking, cleaning, washing); household management; and all types of unpaid care (childcare, eldercare, care for ill or disabled household

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https://doi.org/10.1016/j.socscimed.2025.118559
Received 21 March 2025; Received in revised form 20 August 2025; Accepted 4 September 2025
Available online 6 September 2025
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members, and 'care' for non-dependent individuals) (Friedemann-Sánchez and Griffin, 2011). A 2022 systematic review, examining the mental health impact of unpaid labour time in employed adults, found high unpaid labour time to be harmful to the mental health of women, with effects less clear in men (Ervin et al., 2022). Given time is a finite resource that is important for health (Strazdins et al., 2016), this finding for women may reflect the social and gendered patterning of time poverty/scarcity that plays out strongly in the context of unpaid labour (Strazdins et al., 2011, 2016). Women are not only differentially exposed to unpaid labour but also bear a heavier burden due to the added mental load and sociocultural expectations around 'doing gender' in the home. They are often judged by household order and children's behaviour—standards not typically applied to men—while also expected to sustain careers (Milkie et al., 2021). Consistent with role strain theory, women tend to experience work and family roles as conflicting, in contrast to men who more often view them as complementary (Bird and Rieker, 2008). Furthermore, women's unpaid work remains both expected and invisible, while men continue to receive disproportionate recognition for minimal domestic contributions in dual-earner households (Dermott and Seymour, 2011). Nonetheless, although men do less unpaid labour overall, recent research shows that household work (Ervin et al., 2023) and unpaid caregiving (King et al., 2024) are also associated with poorer mental health among Australian men. This suggests a threshold beyond which unpaid work becomes burdensome for anyone - though most men may not reach it given prevailing gender norms. These dynamics likely explain why unpaid labour appears to have a more pronounced or qualitatively different impact on women's mental health.

Whilst much of the extant literature examines unpaid labour/care by calculating the gross time spent, other important yet underexplored dimensions are satisfaction with the division of labour and perceptions of fairness related to this division. These two concepts, although related, are theoretically distinct. Perceived fairness refers to evaluative judgments about equity in contributions, often informed by social norms and comparisons to one's partner (Cook et al., 2013; Hatfield et al., 1978). In contrast, satisfaction reflects a more emotional or affective response, shaped by individual preferences, expectations, and relational dynamics (Wagman et al., 2017). This distinction is important because individuals may perceive a division of labour as fair but still feel dissatisfied (or vice-versa), depending on whether their expectations or values are met. Understanding both constructs enables a more nuanced analysis of how subjective experiences of unpaid labour division influence mental health.

Based on the existing evidence, it is plausible that dissatisfaction and perceived unfairness regarding the division of unpaid labour negatively impacts mental health. Sociologists have documented that perceptions of unfairness (regarding the unequal division of unpaid labour) have negative implications for family life including relationship conflict/distress and breakdown (Maier and Priest, 2016; Newkirk et al., 2017; Ruppanner et al., 2017b). These findings are often explained by equity theory, which is derived from social exchange theory and refers to the perceived balance in each partner's contributions and outcomes (Hatfield et al., 1978). According to equity theory, individuals seek equity in interpersonal exchanges and experience emotional distress when their inputs and outcomes are misaligned (Lively et al., 2010). Equity theory has been used by sociologists to explain how perceived imbalances in contributions to household labour, whether under-benefiting or over-benefiting result in resentment, guilt or dissatisfaction (Ruppanner et al., 2017a). Ruppanner et al. (2017a) extend this by demonstrating how mismatches in housework perceptions of fairness between partners also undermine relationship satisfaction and stability. The current research builds on these insights to examine how subjective experiences of fairness and satisfaction with unpaid work affect mental health. Central social exchange and equity theories are ideas of justice and reciprocity (Hatfield et al., 2008; Ruppanner et al., 2017a; Schieman et al., 2017), and it is likely that these same mechanisms are at play regarding dissatisfaction/perceived unfairness in the division of unpaid labour and mental health. Furthermore, the limited existing research supports this. For example, a recent 2022 Korean study reported that women who were dissatisfied with their husband's participation in caregiving were 2.5 times more likely to report depressive symptoms than women who were satisfied (Park et al., 2022). A 2015 Canadian study among 1200 lawyers (66 % men) found that perceiving the division of housework as unfair to oneself or to one's partner was significantly related to poorer mental health (Polachek and Wallace, 2015). Whilst these studies provide an important backdrop for the current study, both analyses were cross-sectional in design, limiting casual inference. Moreover, neither study interrogated both key domains of unpaid labour - household tasks and care – which is an important gap given the experience of performing housework compared to childcare is likely different (Ervin et al., 2023).

In Australian households, the female caregiver/part-time worker and male full-time worker model remains the norm (Craig and Mullan, 2011; King et al., 2021; Wood, 2020). As a result, Australian women commonly juggle the lion's share of a family's unpaid work and mental load along with an average of 33 h of paid work/week (Women's Economic Equality Taskforce, 2023). Furthermore, it is commonplace for Australian women to move in and out of paid work during their prime working years to fulfil primary caregiving roles (Workplace Gender Equality Agency, 2016). These socially normative behaviours contribute to and amplify gender inequalities in career progression, renumeration and retirement savings over the life course (Coates, 2018; Stewart, 2017). Additionally, although women outside of the paid workforce due to unpaid labour responsibilities are absolved from the double burden of paid and unpaid work, the inequity or unfairness of their resultant economic situation compared to men remains. Whilst a substantive body of work has examined the gendered division of unpaid labour (and its perceived fairness) on family life, only limited research has interrogated the impact on health, with longitudinal evidence especially lacking. Furthermore, to the authors knowledge, no research using longitudinal data has examined subjective experiences of unpaid labour – notably satisfaction and perceived fairness – in relation to mental health in the Australian context.

The research questions guiding this research are.

1. How do perceptions of fairness and satisfaction with the division of unpaid labour (household work and childcare) impact mental health in working-age women and men?
2. Are there gender differences in the associations between these measures of unpaid labour division and mental health between working-age women and men?

2. Methods

2.1. Data source and sample

The Household, Income and Labour Dynamics in Australia (HILDA) survey provides nationally representative population-based longitudinal cohort data for this study. HILDA is a dynamic and rolling panel dataset that gathers comprehensive data annually on a variety of family and labour market aspects, along with economic and health metrics. Running since 2001, HILDA collects data from more than 7000 Australia households via face-to-face interviews and a self-completion questionnaire given to household members over 15 years of age (Watson and Wooden, 2021). For a panel data collection, HILDA's response rates are relatively high (>90 % for those who continued to complete the survey) (Summerfield et al., 2021). To maintain representativeness of the Australian population, a top-up sample of more than 2000 households was added to HILDA in 2011, such that more than 17,000 people have contributed to the annual HILDA waves since 2011 (Summerfield et al., 2021).

Pooled data from 18 yearly waves of HILDA (2005–2022) were used

in our analyses, as all variables of interest were available from Wave 5 onwards. The study population was limited to working-age Australian adults aged 18–70 years, with eligible participants being those in a household couple with dependent children (<15 years). Of the 40,782 participants (381,753 observations) in waves 2005–2022, there were 29,799 participants (253,741 observations) aged 18–70 years. Of these, there were 11,583 adults (71,761 observations) who were living in couple households with one or more dependent children under the age of 15 years. The resultant analytic sample across all contributing waves, after excluding participants with missing data from variables of interest, was 8734 participants (53,037 observations), 4508 women and 4226 men. Fig. 1 outlines the selection of participants into the analytical sample.

2.2. Exposure variables

2.2.1. Perceived fairness of share of unpaid labour

Perceived fairness of share of i) household work, and ii) childcare were derived from the questions: i) 'do you think you do your fair share around the house?', and ii) 'do you think you do your fair share of looking after the children?'. Responses for both questions were on a five-point Likert-scale, ranging from 'I do much more than my fair share' to 'I do much less than my fair share'. We derived a three category variable from these: 'I do my fair share' was used as the reference category (1), 'I do more than my fair share' (2) combined 'I do much more than my fair share' and 'I do a bit more than my fair share', and 'I do less than my fair share' (3) contained 'I do a bit less than my fair share' and 'I do much less than my fair share'.

2.2.2. Satisfaction with division of unpaid labour between you and your partner

Satisfaction with division of i) household work, and ii) childcare were derived from the questions: 'how satisfied are you with' i) 'the way household tasks are divided between you and your partner?', and ii) 'the way childcare tasks are divided between you and your partner?'. Responses for both questions were on an eleven-point Likert-scale from 0 (completely dissatisfied) to 10 (completely satisfied). From these, we derived a three-category variable where responses 0–4 were collapsed into 'dissatisfied', 5 was categorised as neutral, and responses 6–10 were collapsed into 'satisfied'. Variables were then reverse coded so that 'satisfied' was the reference category (1), 'neutral' (2), and 'dissatisfied' (3).

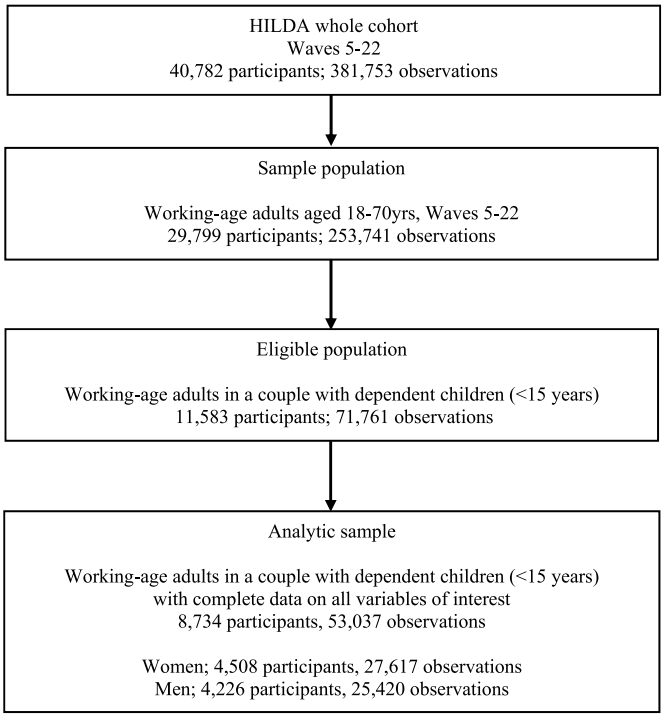


Fig. 1. Flow chart showing selection of analytic sample.

2.3. Outcome variable

2.3.1. Mental health

Mental health was assessed using the five-item Mental Health Inventory (MHI-5), a subscale of the internationally recognised Short Form (SF)-36 Health Survey with demonstrated validity within the Australian and HILDA context (Butterworth and Crosier, 2004; Summerfield et al., 2020). The MHI-5 assesses symptoms of depression and anxiety (nervousness, depressed affect) and positive markers of mental health (feeling calm, happy) in the 4-week period preceding the survey (Colleen et al., 1993; Ware, 2001). Shown to be an effective screening instrument, the MHI-5 has been validated as a measure for depression using clinical interviews as the gold standard (Cuijpers et al., 2009; Rumpf et al., 2001). The MHI-5 is expressed on a 0–100 scale, with lower scores indicating poorer mental health (Colleen et al., 1993). For the purposes of all analyses in this paper, the MHI-5 score was analysed as a continuous numerical variable.

2.4. Covariates

In our analyses, we controlled for a range of covariates considered to be plausible common causes (i.e., potential confounders) of satisfaction and perceived fairness in the division unpaid labour and mental health amongst working-age Australian women and men. These included: age, education (did not complete Year 12, Year 12, certificate/trade, diploma, bachelor's degree or higher), hours of paid work/week (including those who did zero hours), hours of unpaid household work/week, hours of unpaid childcare/week (see supplementary file for unpaid time variable derivation details), physical health (limiting health condition vs. not), equivalised household disposable income in quintiles (calculated by summing the income components for the previous financial year for all adults in the household and equivalized using the modified OECD scale) (Australian Bureau of Statistics, 2022), and place of residence (city/regional/remote). We also controlled for age-squared given age may have a non-linear relationship with our exposure variables over time as well as survey year to account for contextual factors that likely change over time. Furthermore, country of birth/indigenous status was also controlled for (derived 4 category variable) in the random-effects component of the models. Lastly, gender and household structure were accounted for in all models given all analyses were stratified by sex (those who identified as women compared to those who identified as men), and the sample was restricted to only those households comprising couples with dependent children (<15yrs).

2.5. Statistical analysis

2.5.1. Main analysis

This research was conducted in accordance with the STROBE standards (see supplementary file Table S1) given the observational nature of the study. The Stata 18.0 statistical package (StataCorp, 2023) was used for all analyses. Descriptive analysis was firstly performed to examine the sample characteristics of the population of interest. The Mundlak approach (Mundlak Y, 1978) was selected for the analytical modelling stage based on two main factors. Firstly, considering the 18 years of data being examined, Mundlak models incorporate the group-means (averages across time) of time-varying variables into regression models, which was considered pertinent to the current study. Secondly, Mundlak models include the advantages of both fixed-effects and random-effects regression techniques (Bell and Jones, 2015; Dieleman and Templin, 2016; Schunck and Reinhard, 2013). Also referred to

as hybrid models, separate estimates for "within" and "between" person effects are produced using this methodology Importantly, each individual acts as their own control in the fixed-effect (within-person) component of these models (effectively controlling for time-invariant confounding), whilst coefficients for both time-invariant and time-variant variables can be estimated using random-effects models (between-person). (Bell and Jones, 2015; Dieleman and Templin, 2016). Therefore, in addition to assessing the impact of changes in unpaid labour division status on mental health at the individual level (within--person), Mundlak models capture the relationships between our variables of interest at the group level (between-person). Four distinct Mundlak models were run for both men and women, each controlling for the covariates described above. These four models were: satisfaction with division of household work, satisfaction with division of childcare, perceived fairness of share of household work, and perceived fairness of share of childcare. Analysis was gender-stratified throughout.

2.5.2. Sensitivity analysis

Using the same methodology outlined above, a sensitivity analysis was also performed restricting our sample solely to the working population. The working population were those working-age adults (18–70 years) in a couple with dependent children (<15 years) who nominated that they were participating in paid work (using a variable from the job characteristics of the employed population in HILDA 'hours per week usually worked in all jobs').

3. Results

3.1. Descriptive results

Table 1 presents the sample characteristics stratified by gender. The mean age of women in our sample was 37.5 years and men was 40 years. Women had lower mean mental health scores than men (73 versus 75). On average, women spent more than twice as much time/week in household work (25 h versus 11 h) and childcare (29 h versus 14 h) as men. Whilst men's mean hours of paid work/week were twice that of women's (41 h vs 20 h), women spent an average of 7 additional hours/week in both paid and unpaid work than men (78 h/week compared to 71). On average, men were more satisfied with the division of unpaid labour than women (86 % vs 71 % for household work). Almost two thirds of women (63 %) reported doing more than their fair share of both household work and childcare, whilst most men reported doing their fair share (household work 56 %, childcare 66 %). Approximately, a quarter of men reported doing less than their fair share (household work 28 %, childcare 25 %). With respect to educational attainment, more women had a bachelor's degree or above (40 %) than men (32 %), while more men (42 %) than women (29 %) had a diploma/certificate. The proportion of participants with a long-term health condition, disability or impairment, regional place of residence, indigenous or ethnic minority status, and across the household income quintiles was reasonably similar overall between genders. Table S2 presents the characteristics of the sample when restricted to the working population (those examined in the sensitivity analysis).

Table 1
Sample characteristics (reported as pooled observations).

	Women	Men
Participants, n (%)	4508 (52)	4226 (48)
Observations, n (%)	27,617 (52)	25,420 (48)
Age, years (mean ± SD)	37.5 ± 7.5	40.1 ± 8.3
Mental health, MHI-5 score* (mean ± SD)	73.2 ± 16.1	75.1 ± 15.8
*The MHI-5 is expressed on a 0–100 scale, with lower scores indicating poorer mental health		
Unpaid labour, hours/week (mean ± SD)		
Total unpaid labour (inclusive of all below)	57.6 ± 31.1	29.7 ± 19.3
Household work	24.9 ± 15.0	10.7 ± 8.9
Childcare	29.3 ± 24.1	13.6 ± 12.0
Care for elders/disabled	0.9 ± 6.4	0.5 ± 4.3
Outdoor tasks	2.6 ± 3.9	5.0 ± 5.5
Satisfaction with division of unpaid labour between you and partner, n (%)		
Satisfied with household work division	19,634 (71.1)	21,914 (86.2)
Neutral	2826 (10.2)	2003 (7.9)
Dissatisfied with household work division	5157 (18.7)	1503 (5.9)
Satisfied with childcare division	21,623 (78.3)	22,500 (88.5)
Neutral	2409 (8.7)	1803 (7.1)
Dissatisfied with childcare division	3585 (13.0)	1117 (4.4)
Perceived fairness of share of unpaid labour, n (%)		
I do my fair share of household work	9120 (33.0)	14,303 (56.3)
I do less than my fair share of household work	1150 (4.2)	7185 (28.3)
I do more than my fair share of household work	17,347 (62.8)	3932 (15.5)
I do my fair share of childcare	9655 (35.0)	16,746 (65.9)
I do less than my fair share of childcare	388 (1.4)	6285 (24.7)
I do more than my fair share of childcare	17,574 (63.6)	2389 (9.4)
Paid work hours, hrs/week in all jobs (mean ± SD)	20.2 ± 17.0	41.3 ± 15.9 1.8
Education, n (%)		
School not completed	4322 (15.7)	3578 (14.1)
Year 12	4254 (15.4)	2935 (11.6)
Diploma/Certificate	8068 (29.2)	10,700 (42.1)
Bachelor's degree and above	10,973 (39.7)	8207 (32.3)
Equivalised h**ousehold disposable income,** quintiles, n (%)		
1st quintile	2075 (7.5)	1824 (7.2)
2nd quintile	5977 (21.6)	5492 (21.6)
3rd quintile	7415 (26.9)	6889 (27.1)
4th quintile	7069 (25.6)	6431 (25.3)
5th quintile	5081 (18.4)	4784 (18.8)
Long-term health condition, disability, or impairment, n (%)		
Yes	4213 (15.3)	4174 (16.4)
No	23,404 (84.7)	21,246 (83.6)
Country of birth/Indigenous status, n (%)		
Non-indigenous Australian	21,533 (78.0)	19,659 (77.3)
Indigenous/Torres Strait Islander Australian	644 (2.3)	467 (1.8)
Other English-speaking country of birth	2075 (7.5)	2539 (10.0)
Other non-English-speaking country of birth	3365 (12.2)	2755 (10.8)
Place of residence, n (%)		
Major city	17,150 (62.1)	15,987 (62.9)
Regional/rural	10,095 (36.6)	9109 (35.8)))
Remote	372 (1.4)	324 (1.3)

3.2. Analytic results

3.2.1. Relationship between perceived fairness of share of unpaid labour and mental health

Table 2 presents the adjusted coefficients from the two distinct Mundlak regression models for perceived fairness models, stratified by gender. Results show strong negative associations between perceiving to do more than one's fair share of both unpaid labour domains and mental health in both women and men, and for both within-person and between-person components of the model. Furthermore, compared to those perceiving to be doing their fair share (reference group), doing less than one's fair was also associated with poorer mental health, with larger effect sizes observed in women than when doing more than one's fair share compared to men. Between-person and within-person models produced similar results, noting that effect sizes were somewhat attenuated in the within-person models.

For women, within-persons models showed that compared to perceiving to doing one's fair share (reference group), doing less than one's fair of household work was associated with a 1.8-point reduction in mental health score (−1.8, 95 % CI -2.7, −0.9), whilst doing more was associated with a 0.9-point reduction (−0.9, 95 % CI -1.4, −0.5).

Table 2
Mundlak regression analysis examining associations between mental health & perceived fairness of share of unpaid labour in working-age adults (18–70) over 18 waves (waves 5–22) of HILDA, stratified by gender[a].

Unpaid labour variables	Women	Men
	4508 persons,	*4226 persons,*
	27,617 observations	*25,420 observations*
	MH Score b coefficient[b] (95 % CI; p-value)	**MH Score** b coefficient[b] (95 % CI; p-value)
Between-person		
I do my fair share of household work	Reference group	Reference group
I do less than my fair share of household work	−2.59 (−3.44, −1.73; p < 0.001)	−1.23 (−1.64, −0.83; p < 0.001)
I do more than my fair share of household work	−1.03 (−1.41, −0.65; p < 0.001)	−1.29 (−1.77, −0.82; p < 0.001)
I do my fair share of childcare	Reference group	Reference group
I do less than my fair share of childcare	−3.20 (−4.54, −1.86; p < 0.001)	−0.96 (−1.36, −0.55; p < 0.001)
I do more than my fair share of childcare	−1.20 (−1.56, −0.83; p < 0.001)	−1.51 (−2.07, −0.95; p < 0.001)
Within-person		
I do my fair share of household work	Reference group	Reference group
I do less than my fair share of household work	−1.76 (−2.65, −0.86; p < 0.001)	−0.76 (−1.19, −0.33; p = 0.001)
I do more than my fair share of household work	−0.94 (−1.35, −0.54; p < 0.001)	−0.96 (−1.46, −0.46; p < 0.001)
I do my fair share of childcare	Reference group	Reference group
I do less than my fair share of childcare	−2.45 (−3.83, −1.07; p = 0.001)	−0.50 (−0.93, −0.08; p = 0.019)
I do more than my fair share of childcare	−0.87 (−1.26, −0.48; p < 0.001)	−1.01 (−1.60, −0.43; p = 0.001)

[a] All models adjusted for age, age-squared, year, education, hours of paid work/week, hours of unpaid household work/week, hours of unpaid childcare/week, disposable income, long-term health condition, and remoteness/place of residence. And between person model also controlled for country of birth/Indigenous status.
[b] Estimated regression co-efficient or estimated mean difference (MH-5 trans score on a 0–100 scale).

Table 3
Mundlak regression analysis examining associations between mental health & satisfaction with division of unpaid labour between partners in working-age adults (18–70) over 18 waves (waves 5–22) of HILDA, stratified by gender[a].

Unpaid labour variables	Women	Men
	4508 persons,	*4226 persons,*
	27,617 observations	*25,420 observations*
	MH Score b coefficient[b] (95 % CI; p-value)	**MH Score** b coefficient[b] (95 % CI; p-value)
Between-person		
Satisfied with division of household work	Reference group	Reference group
Neutral	−3.10 (−3.60, −2.61; p < 0.001)	−4.02 (−4.56, −3.48; p < 0.001)
Dissatisfied with division of household work	−4.85 (−5.29, −4.40; p < 0.001)	−5.74 (−6.40, −5.08; p < 0.001)
Satisfied with division of childcare	Reference group	Reference group
Neutral	−3.47 (−4.00, −2.95; p < 0.001)	−4.30 (−4.86, −3.74; p < 0.001)
Dissatisfied with division of childcare	−5.18 (−5.67, −4.69; p < 0.001)	−5.79 (−6.52, −5.06; p < 0.001)
Within-person		
Satisfied with division of household work	Reference group	Reference group
Neutral	−2.62 (−3.13, −2.12; p < 0.001)	−3.14 (−3.69, −2.58; p < 0.001)
Dissatisfied with division of household work	−3.86 (−4.33, −3.39; p < 0.001)	−4.30 (−4.98, −3.61; p < 0.001)
Satisfied with division of childcare	Reference group	Reference group
Neutral	−2.77 (−3.31, −2.23; p < 0.001)	−3.39 (−3.97, −2.82; p < 0.001)
Dissatisfied with division of childcare	−4.08 (−4.59, −3.56; p < 0.001)	−4.42 (−5.18, −3.67; p < 0.001)

[a] All models adjusted for age, age-squared, year, education, hours of paid work/week, hours of unpaid household work/week, hours of unpaid childcare/week, disposable income, long-term health condition, and remoteness/place of residence. And between person model also controlled for country of birth/Indigenous status.
[b] Estimated regression co-efficient or estimated mean difference (MH-5 trans score on a 0–100 scale).

Similarly, perceiving to doing less than one's fair of childcare was associated with a 2.5-point reduction in mental health score in women (−2.5, 95 % CI -3.8, −1.1), while doing more was associated with a 0.9-point reduction (−0.9, 95 % CI -1.3, −0.5). For men, within-persons models showed that compared to perceiving to doing a fair share (reference group), doing less than one's fair of household work was associated with a 0.8-point reduction in mental health score (−0.8, 95 % CI -1.2, −0.3), whilst doing more was associated with a 1.0-point reduction (−1.0, 95 % CI -1.5, −0.5). Similarly, perceiving to be doing less than one's fair of childcare was associated with a 0.5-point reduction in mental health score in men (−0.5, 95 % CI -0.9, −0.1), whereas doing more was associated with a 1.0-point reduction (−1.0, 95 % CI -1.6, −0.4).

Sensitivity analysis (restricted to working population) yielded mostly similar results (see Supplementary Table S3). One notable difference was that perceiving to be doing less than one's fair share in the within person models was not significant for childcare in employed men and for housework in employed women.

3.2.2. Relationship between satisfaction with division of unpaid labour and mental health

Table 3 presents the adjusted coefficients from the two distinct Mundlak regression models for the two satisfaction models stratified by gender. Our results show a very strong association between being dissatisfied with the division of either domain of unpaid labour and poorer mental health in both women and men, for both within-person and between-person effects. Moreover, compared to those satisfied with division, a strong negative association with mental health was also observed in participants who reported being neutral in their position, but with smaller effect sizes compared to those who were dissatisfied. Between-person and within-person models produced very similar results, with effect sizes mildly attenuating in the within-person models.

In the within-persons model, changing from being satisfied to dissatisfied was associated poorer mental health, with women's mental health MHI-5 scores 3.9 points lower (−3.9, 95 % CI -4.3, −3.4), and men's 4.3 points lower (−4.30, 95 % CI -5.0, −3.6), after adjusting for confounders. Compared to being satisfied with the division of childcare, when women were dissatisfied their mental health MHI-5 scores were 4.1 points lower (−4.1, 95 % CI -4.6, −3.6), and men's 4.4 points lower (−4.4, 95 % CI -5.2, −3.7), after adjusting for confounders. The same patterns were evident for those who changed from being satisfied to neutral, albeit with smaller coefficients. Simply, the experience of becoming less satisfied with domestic work is associated with a decline in mental health for men and women alike.

Sensitivity analysis (restricted to working population) examining this association yielded very similar results (see Supplementary Table S4).

4. Discussion

Drawing on pooled data from 18 annual waves of data from the HILDA survey, this study found mental health is poorer for both men and

women who perceive they are doing *more* or *less* than their fair share of both household work and childcare. Mental health was also poorer for both genders when they were dissatisfied with the division of either domain of unpaid labour. Our findings for perceived fairness partially align with Canadian research indicating that perceiving the division of housework as unfair to either oneself or one's partner is associated with poorer mental health (Polachek and Wallace, 2015), and some earlier, but limited research suggesting a positive association between perceived unfairness in the division of housework and child rearing and depressive symptoms and psychological distress (Janzen and Kelly, 2012; Tao et al., 2010). These findings are consistent with equity theory in that perceiving to be doing more or less than is equitable in a social exchange creates a negative emotional response and engenders feelings of injustice (Ruppanner et al., 2017a; Schieman et al., 2017). Furthermore, it is theorised that perceptions of doing *less* may have a more negative impact on mental health than perceptions of doing *more* (Chibucos et al., 2005). However, we found key gendered differences in this regard: whereby perceptions of doing *less* than one's fair share appeared to be more detrimental for women's mental health than doing *more,* while the opposite was true for men: perceiving to do *more* than their fair share, especially childcare, was more impactful for men's mental health. This differs from previous literature which found that men (but not women) experience greater emotional distress when they perceive their division of domestic labour as unfair to their partner (i.e. feel that they are over-benefiting) (Lively et al., 2008). These gendered patterns are further supported by Ruppanner et al. (2017), who argue that perceptions of equity are shaped not only by the division of tasks but also by whether contributions are acknowledged or recognised. This expands the scope of equity theory by highlighting that fairness is not solely a matter of task allocation but also of symbolic validation. Our findings suggest that perceived imbalance, or the absence of such recognition, may negatively affect mental health, particularly where gender norms structure expectations of fairness within households.

Our findings are also consistent with social exchange theory, which suggests that individuals assess fairness not only in terms of objective distribution of labour but also in relation to socially constructed expectations and perceived obligations (Blau, 2017). Moreover, perceptions of fairness are shaped by broader cultural norms and expectations, for example, adherence to egalitarian compared to traditional gender norms likely influences one's perceptions of fairness regarding the division of labour. European research has shown that in more gender egalitarian countries, and in countries where women spend more time in the labour market, women and men are more likely to consider that doing a larger share of housework is unfair (Jansen et al., 2016). Perceiving to be doing *less* than one's fair share of housework and childcare implies that the other partner is doing *more* and vice-versa. Based on traditional gender norms, if women are doing *less* and men are doing *more*, this might result in more distress for both genders because it is a 'violation' of traditional gender roles or gendered expectations (Schieman et al., 2017). Research has shown that women often feel a moral obligation to contribute domestically, even when their external paid workload is substantial (Hochschild and Machung, 2012). This aligns with theories of 'gendered moral rationalities', which suggest that women evaluate fairness in domestic labour through relational and caregiving lenses rather than strict equity-based comparisons (Duncan and Edwards, 2003). In this framework, women may experience distress not necessarily because they are doing less, but because they perceive themselves as failing to fulfill their expected domestic role (Bianchi et al., 2000). This is reinforced by persistent societal narratives that equate femininity with caregiving and domesticity, leading women to feel guilt or discomfort when deviating from these norms (Ridgeway and Correll, 2004). Studies show that even in households with relatively egalitarian gender ideologies, women continue to feel responsible for managing and coordinating domestic labour, i.e., the 'mental load' (Daminger, 2019). In line with this, a 2019 Australian study postulated that some degree of gender-norm conformity about housework can positively affect women's life satisfaction (Foster and Stratton, 2019), which may reflect the persistent adherence to traditional gender norms in many households in Australia. Nonetheless, interestingly, the results from our sensitivity analysis (restricted to the working population) revealed that perceiving to be doing less than one's fair share was not significant for housework in employed women (and for childcare in employed men) in the within-person models. These weaker associations than what was observed in our main analysis may indicate that couples in the workforce balance trade-offs in terms of distribution of unpaid work. Ultimately, the metal health penalty observed for women in our main analysis when doing *less* than their fair share may be reflective of a violation of gender or a 'guilt penalty' around not 'doing gender' sufficiently in accordance with traditional gender ideology and societal expectations (Cislaghi and Heise, 2020). In contrast, an alternative explanation may be that those experiencing poorer mental health are resultantly doing less unpaid labour, indicating the relationship may be bidirectional. In a similar vein, men may feel undervalued or underrecognised when doing *more* housework and childcare because of lower societal expectations around men's domestic labour (Connell, 2005) and thus experience distress because of the mismatch between effort and perceived benefit.

In terms of our findings for satisfaction in the division of housework and childcare, the relationships are more direct. We found those who are dissatisfied with their housework and childcare contributions report worse mental health when compared to those who are satisfied (between-person), and when they themselves have become less satisfied with their arrangement (within-person). This is consistent with social exchange theory in which individuals are satisfied if their arrangements meet their own expectations. Whilst there is limited prior research to compare our findings, our results for women and childcare satisfaction align with those for Korean women who were 2.5 times more likely to be depressed if they were dissatisfied with their husband's caregiving participation (than women who were satisfied) (Park et al., 2022). Complementary Swedish research has also demonstrated that satisfaction with the division of domestic work is associated with greater odds of good life satisfaction (albeit their results were not disaggregated by gender) (Wagman et al., 2017). Overall, our findings provide strong evidence to suggest that dissatisfaction with the division of unpaid labour is associated with poor mental health, underscoring its importance in future research on this topic. We also find that those who are neutral about their division of labour also report worse mental health both in the between- and within-person models, albeit with smaller associations to those who are dissatisfied. This suggests that neutrality is not, in fact, neutral but may be a marker of movement towards dissatisfaction with one's division of unpaid labour.

Utilising Mundlak (hybrid) modelling enabled us to interpret both within-person and between-person associations. Whilst within-person effects indicate how changes in an individual's perceptions or satisfaction with the division of unpaid labour are associated with changes in their own mental health across time (whilst controlling for stable, unobserved individual characteristics such as personality or ethnicity), our between-person results capture the relationship between average level of satisfaction or perceived fairness in unpaid labour between people and average mental health, controlling for confounding variables. Between-person effects that are substantially stronger than within-person effects are suggestive of associations that are largely related to individual differences rather than being causally related. The fact that we are seeing greater associations for between effects, but still substantial associations for the within-person effects suggests dual mechanisms, that is, the between-person effects indicate that some people have traits that make them more likely to be satisfied and have better mental health, but the within-person effects also indicate that changes in a person's satisfaction may causally impact on mental health. We also note that whilst all our findings demonstrated an effect on mental health, the magnitude of that effect was mostly moderate-small - especially in the case of perceived fairness. Although the MHI-5 is widely

used, there is no universally accepted threshold for what constitutes a clinically meaningful change in the score. Nonetheless, prior research suggests that changes of 3–5 points on the MHI-5 scale indicate a clinically meaningful shift in psychological distress and increased risk of depression (Berwick et al., 1991; Butterworth and Crosier, 2004; Kelly et al., 2008); noting that all our effect sizes for dissatisfaction were >3 point change. Furthermore, whilst the effect sizes we report for fairness are smaller and may not reach clinical significance at the individual level, they can still reflect meaningful shifts in mental health risk at the population level. According to the population strategy of prevention (Rose, 2001), small increases in risk spread across a large group may generate more total cases than large risks affecting only a few individuals. In this context, even modest declines in average mental health among working-age adults may indicate an important population-level health burden.

Earlier Australian research (using the HILDA dataset) examined time spent in unpaid labour and demonstrated considerable variance and nuance in how the different domains of unpaid labour affect mental health (Ervin et al., 2023). The study found that unpaid labour time had both negative (household work in women and men, and caregiving in women) and positive (childcare in women and outdoor tasks in men) effects on mental health, noting that effect sizes were uniformly modest (Ervin et al., 2023). In contrast, the findings of the current study suggest ubiquitously negative mental health effects for perceived unfairness and dissatisfaction in the division of unpaid labour, whether that be pertaining to household work *or* childcare. Furthermore, the effect sizes seen in the current study reflect a substantive shift in the MHI-5 score, especially with respect to dissatisfaction in division of unpaid labour. Taking both studies into account, it appears that inequity in the division of unpaid labour between couples may be more important for mental health than the amount of time spent doing these tasks. This same conclusion was reached following earlier research examining depression outcomes in US adults (Bird, 1999). Thus, whilst the double burden of unpaid and paid work (or 'second shift' phenomenon (Hochschild and Machung, 2012)) creates time scarcity and role strain which can impact mental health (Friedemann-Sánchez and Griffin, 2011; Janzen and Kelly, 2012; Strazdins et al., 2016), fairness and equity in the division of unpaid labour may influence mental health as much (or more than) actual time spent in unpaid labour. Importantly, in the context of this study, the purposeful inclusion of working-age women who are not in the labour force (most likely due to care responsibilities) in our sample may tap into how such trade-offs translate into feelings of inequity/unfairness and subsequent mental health implications. Future research could compare this sub-group of women with those who are employed.

Lastly, gender differences in assessing fairness are also worthy of consideration in interpreting our results as inequality in division and perceptions of inequality are not necessarily the same. Couples often describe the way they apportion unpaid labour as fair even when women do much more than their male partners (Newkirk et al., 2017). Moreover, spouses frequently assess the division of unpaid labour differently, with men more likely than women to over-estimate their contribution (Lavee and Katz, 2002). Ultimately, disparity between the objective distribution of unpaid labour and subjective perceptions of fairness means that the two should not be conflated. In our study, we found that both fairness perceptions and satisfaction were linked to mental health, but in distinct ways - reinforcing the importance of examining perceived fairness and satisfaction as related but distinct constructs. Our results suggest that while perceived fairness may influence feelings of perceived justice or equity, satisfaction may be a stronger predictor of immediate well-being because it reflects a more personal emotional response rather than a purely comparative evaluation. This distinction illustrates why some people who perceive the division as 'fair' may nonetheless report dissatisfaction (e.g., because it doesn't align with personal preferences or relational expectations) - and why dissatisfaction, in turn, appears to have a stronger association with mental health than fairness perceptions. Future avenues for research could examine whether relationship satisfaction acts as a mediator between satisfaction and fairness in division of unpaid labour and mental health, as well as interrogating the possible bi-directional nature of the relationship between unpaid labour and mental health.

4.1. Limitations & strengths

This study has some limitations. First, a key challenge in interrogating the relationship between unpaid labour and mental health is the potential for reverse causation. For example, it is plausible that our finding for doing less than one's perceived fair share and poorer mental health may operate in the opposing direction – i.e. those who have poorer mental health may pull away from doing unpaid labour and thus do less than their fair share. Given our analysis does not control for this possible endogeneity, this is acknowledged as a key limitation. Secondly, both our exposure and outcome variables were self-reported. Although the MHI-5 in the HILDA survey is a validated measure of mental health, the self-reported nature of this instrument is still subject to self-reporting bias. Our exposure variables (perceived fairness and satisfaction in the division of unpaid labour) may also be subject to bias given participants can over-estimate their unpaid labour contributions (self-reporting and recall biases), with research indicating that there are sizable reporting gaps in the division of housework and childcare among couples (Naujoks, 2024). Moreover, we acknowledge that different domains of unpaid labour can impart different effects on mental health (Ervin et al., 2023). Our analysis somewhat accounted for this by analysing household work and childcare as separate entities. However, we concede other types of unpaid labour such as elder care or outdoor tasks were not examined in this study and may exert different effects – e.g. childcare effects likely differ from elder care effects. In addition, by restricting our analysis to those participants who were in a couple with dependent children, we acknowledge that this does not represent the diversity of Australian families nor account for separated parents and how they divide childcare. Furthermore, we acknowledge gender is not binary; however, based on data availability it was pragmatic to dichotomise gender as a binary variable (by reported sex in the HILDA survey). Lastly, our paper focuses on heterosexual couples, which while reflecting the most common cohabitation arrangement for couples in Australia, does not reflect the diversity of Australian households.

Strengths include the longitudinal nature of our study, the large, nationally representative sample, long follow up period, and utility of robust methodology in examining this association. The fixed-effects models in our Mundlak adjustments reduce potential confounding bias because unobserved time-invariant confounding factors (such as personality characteristics or upbringing that may influence behaviours pertaining to unpaid labour) are controlled for. Other strengths include our inclusion of all working-age persons with dependent children (capturing women locked out of the labour force due to care responsibilities) in our sample (rather than restricting only to employed persons) and controlling for both hours of paid work and hours of household work and hours of childcare in our models.

5. Conclusion

Utilising 18 years of nationally representative longitudinal data, this study examined the association between perceptions of fairness and satisfaction in the division of unpaid labour (household work and childcare) and mental health in working-age Australian women and men. Findings demonstrate a strong association between being dissatisfied with the division of either domain of unpaid labour and poorer mental health in both women and men, and a similarly strong association between perceiving to be doing *more* or *less* than one's fair share of both housework and childcare and poorer mental health amongst both genders. Critically, this research tells us that it is not only the objective division of unpaid labour - the time spent devoted to household tasks

and childcare between men and women in couple households - that impacts mental health but also one's perceptions of fairness and satisfaction of that division.

CRediT authorship contribution statement

Jennifer Ervin: Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Brendan Churchill:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Funding acquisition, Conceptualization. **Leah Ruppanner:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Tania King:** Writing – review & editing, Supervision, Methodology, Investigation, Conceptualization.

Ethics approval

All respondents provided informed consent to participate in the HILDA Survey. The HILDA research project was approved by the Human Research Ethics Committee at the University of Melbourne (ethics ID no. 1647030) and conformed to the principles embodied in the Declaration of Helsinki.

Data sharing

The HILDA data that support the findings of this study are not publicly available due to the conditions of data access from the data custodians (the Australian Data Archive). Interested individuals can apply to the Australian Data Archive for access at https://dataverse.ada.edu.au/dataverse.xhtml?alias=ada&q=HILDA, and once approved, can apply to the corresponding author.

Funding acknowledgement

BC is supported by the Australian Research Council (DE220100027). LR is supported by the Australian Research Council (FT220100493). TK is supported by an RMIT Vice Chancellor's Research Fellowship. This work was also supported by an Australian Research Council Linkage Project (LP180100035).

Declaration of competing interest

The authors declare no conflicts of interest.

Acknowledgments

This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the authors and should not be attributed to either DSS or the Melbourne Institute.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2025.118559.

Data availability

The authors do not have permission to share data.

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