# Relationship Transitions and Women's Time on Domestic Labour in Australia: A Multiprocess, Multilevel Approach

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**Abstract**

In this paper we examine data from 8 waves of the Households, Income and Labour Dynamics in Australia (HILDA) survey to investigate the impact of relationship transitions on domestic labour time. Although there is a growing body of literature on this topic, previous research has failed to adequately address selection issues or the role of unobserved factors in determining transitions in marital status and time on housework. Neglecting these factors potentially becomes more consequential with declining rates of marriage, increased rates of cohabitation, remarriage and non-partnering. Specifically, the unobserved factors influencing the transition into or out of relationship types may be the same as those influencing time spent on housework. The new multiprocess multilevel models presented here enable examination of these issues. Our aim is to first use HILDA data (Waves 1-8) to identify the joint influence of unobserved factors on relationship transitions and women's time on domestic labour and second, to determine whether there is a selection effect into and out of cohabitation and marriage for women who do varying amounts of domestic work. A simultaneous-equations model is used to jointly examine the relationships between time on domestic labour and marital status transitions to allow for correlation between unobserved partner and person characteristics that impact on each process. Our results show that women who spend more time on housework when single, suggesting higher levels of domesticity, spend more time on housework after cohabitation or marriage. But there is no evidence of selection of these women into marriage rather than cohabitation. We also found no evidence to support the hypothesis that women who do varying amounts of housework are more likely to separate from cohabitation or marriage. Overall we conclude that the unobserved factors influencing time spent on housework are not related to the unobserved factors influencing relationship transitions.

## Introduction

Previous research has shown that life course events, such as transitions into and out of relationships, lead to large variations in women's time on domestic labour (Gupta, 1999; Baxter, Hewitt and Haynes 2008). What has not been examined however, is whether these processes are interrelated or whether the factors that lead to variations in housework hours are the same as those that influence the likelihood of making certain relationship transitions. Some research has shown that women who cohabit spend less time on domestic labour than women who are married, (Shelton and John 1993; South and Spitze 1994; Baxter 2005), but we do not know if this is because of the experience of cohabitation or whether some women are more likely to select into cohabitation rather than marriage. Women who cohabit may differ in observed or unobserved characteristics that influence both the amount of time they spend on housework and their decisions about union type. Similarly we know that women who separate from a union experience a decrease in the amount of time spent on housework (Gupta 1999; Baxter, Hewitt and Haynes 2008). But is this decrease a result of the separation from a relationship union or are the factors that lead to separation the same as those that lead to less time on housework? In other words, are women who do less housework when married or cohabiting more likely to separate?

To address these questions we examine the selection of women into and out of partnerships with regards to their housework hours. We know that the processes influencing women's time on housework will be linked to decisions about union formation and dissolution. But to date there have been no attempts to jointly model these processes. In this paper we go beyond the single process model to jointly model the processes of union formation and dissolution and housework hours using new multiprocess, multilevel models (for examples of the application of these models to other life events see Steele, Kallis, Goldstein and Joshi 2005 and Steele 2011). This new modelling approach allows us to examine the extent to which relationship transitions and housework hours are linked and jointly determined by both observed and unobserved factors.

We examine data from the Households, Income and Labour Dynamics in Australia (HILDA) survey to investigate these questions. Our earlier work has shown that lifecourse events have a much

greater affect on women's housework hours than men's (Baxter, Hewitt and Haynes, 2008). Women's housework hours vary considerably in relation to marital, parental and employment status with women generally increasing their hours in response to the formation of partnerships and the arrival of children, typically in combination with a reduction in paid work hours outside the home. Men on the other hand perform much the same number of housework hours regardless of marital, parental or employment status. For this reason, in the current paper we focus on women of child-bearing age from 18-45 years, examining changes in women's housework hours in relation to union transitions.

Our aim is to first identify the joint influence of observed and unobserved factors on relationship transitions and housework time. Second to determine whether there is a selection effect from single into a marital or cohabiting union for women who spend more time on domestic work, or a selection effect from cohabiting or married to single for women who spend less time on housework. We analyse prospective data from Australia with a multiprocess multilevel modelling approach. A simultaneous-equations model is used to jointly examine the relationships between time on domestic labour and marital status transitions. The observed factors are incorporated as independent variables in the equation for each process simultaneously, while unobserved person characteristics that impact on each process are permitted to co-vary. A significant non-zero covariance term indicates that the unobserved characteristics associated with each process are correlated and that a selection effect may be present.

**Time on Housework and Relationship Transitions**

Research shows that women in cohabiting or marital partnerships spend much longer amounts of time on domestic labour than unpartnered women (Gupta 1999; Baxter, Hewitt and Haynes 2008; Baxter Haynes and Hewitt 2010). The reason for this difference in housework time between partnered and unpartnered women has been assumed rather than explicitly investigated. One possibility according to a gender display approach is that women in partnerships create and affirm their gender identity as partnered women by spending more time on certain female-defined housework tasks compared to single women. Typically female-defined housework tasks are those that require considerable investments of time and

energy on a regular basis, such as cooking, cleaning and laundry, compared to male-defined housework tasks such as lawn mowing or home repairs which may be seasonal or irregular. Researchers have argued that women are more likely to display gender by spending time on housework when married than in other relationship states (South and Spitze 1994). The gender display approach has been recently subject to critique and re-evaluation (Sullivan 2011), but nevertheless has been an extremely influential approach for explaining why gender divisions of labour in households have proved so intractable.

Other well-known approaches to explaining women's time on housework have focused on household specialisation or bargaining often using measures of relative earnings to assess how couples make decisions about who should spend most time on unpaid housework tasks and who should specialise in paid work (Brines 1994). Since women typically earn less than men it is usually women who devote a greater proportion of their time to unpaid work, either because they have less bargaining power or because of the perceived household utility of gender specialisation. Gupta's recent work (2006, 2007) has taken debates about earnings and housework time in a new direction by arguing that women's time on housework is related to their absolute rather than their relative earnings. This work has led to a rethinking about the links between earnings and housework time. One possibility is that women use their earnings to purchase household help, thereby reducing their time on housework. Alternatively, higher earning women may have different orientations toward housework than women with lower earnings, with higher earning women having less interest in doing housework, or holding different preferences and beliefs about appropriate standards of tidiness and cleanliness.

Most of this previous research has been focused on understanding why women spend more time on housework compared to men rather than why partnered women spend more time on housework compared to single or separated women. One possibility is that the transition to a partnership is associated with other important changes in the life course that occur at the same time that are also related to women's time spent on housework. For example, the decision to cohabit or marry may be closely linked to decisions about having a child, buying a house or reducing time spent in employment. Research has shown that fertility decisions are linked to transitions between cohabitation and marriage (Steele, Kallis,

Goldstein and Joshi 2005) and we know that the birth of a child, particularly a first child, leads to large increases in women's time on housework (Baxter, Hewitt and Haynes 2008). These co-occurring events, perhaps reciprocally related to decisions about partnership transitions, may also lead to women spending longer amounts of time on housework.

At the same time, the characteristics that select some women into cohabiting relationships rather than marital relationships may also determine how much time they spend on housework. Considerable research has examined the observable characteristics that lead to women's likelihood of marriage, such as education, earnings, employment characteristics and ethnicity (Oppenheimer 1997), but there may also be unmeasured or unobservable characteristics that lead to marital status transitions. One possibility is that the amount of housework that a woman performs when unmarried may be influenced by domestic standards or orientations. These same unmeasured standards or orientations may mean that these women will be more likely to partner than those who do not have these same domestic standards or orientations. Similarly women who are less domestically inclined may be more likely to separate from a partnership than their counterparts. In other words, the formation and dissolution of partnerships, and decisions about whether to cohabit or marry, may be influenced by measured covariates such as age, education, earnings and attitudes, as well as unobserved factors such as a woman's propensity to spend time on housework, or what might be termed her level of domesticity.

Another way of thinking about these processes is in relation to issues of selection. Issues of cause and selection have plagued much sociological research on a range of topics. In the current paper our concern is whether women with certain unmeasured characteristics are more likely to select into, or out of relationships than others and to spend greater or lesser amounts of time on housework. Do some women select into or out of cohabitation or marriage? If women do have varying levels of domesticity or unmeasured orientations to marriage, then it may be that these orientations manifest in terms of increased amounts of time on housework as well as a greater likelihood of marrying compared to cohabiting. Similarly unmeasured characteristics driving women's time on housework may also lead to women's decisions to separate from a relationship.

We consider time spent on housework as a process that is influenced by both observed and unobserved factors related to a woman's characteristics or circumstances, and in varying degrees by the same factors that influence marital status transitions. Marital status transitions and fertility have been analysed as two related multistate processes by Steele et al. (2005, 2006) and others (e.g. Upchurch et al. 2002) using event-history data. They jointly model these processes using a system of simultaneous equations with co-varying random effects. In this paper we consider time spent on housework and relationship transitions as two related processes and analyse eight waves of data from the HILDA survey. We address three key questions:

1. What is the effect of a relationship transition on women's time on housework?
2. Is there a selection effect of women who spend more time on domestic labour into partnerships compared to women who spend less time on domestic labour, and specifically into cohabitation rather than marriage?
3. Is there a selection effect of women who do less domestic labour out of partnerships?

**Methods**

*Data and sample*

Our Australian data come from the first 8 waves of The Households, Income and Labour Dynamics in Australia (HILDA) survey collected between 2001 and 2008. Wave 1 comprised 7,682 households and 13,969 individuals (Watson and Wooden 2002a and b). To control for housework hours in the previous wave, the model that we use includes a term for lagged housework hours. Women who were widowed before and during the survey, and observations for which housework hours, marital status and other transitional variables were unknown, were excluded from the sample. The final HILDA sample retained for analysis included 3,392 women who completed the survey and gave responses for the housework hours variable at least once in Waves 2 to 8 (excluding Wave 1 due to inclusion of lagged housework hours). The final number of observations or person-years in the data sample was 18,376 .

*Measures*

HILDA collects a range of measures to do with time use. The main outcome measure in this study is hours spent doing housework each week. In the survey, respondents were asked questions about the hours they would spend in a typical week on housework (preparing meals, washing dishes, cleaning house, washing clothes).

Respondents were asked their current marital status at each wave, including married, cohabiting (living together but not legally married), separated, divorced, widowed and never married. We collapse marital status at each wave to three relationship states: Married, cohabiting, and single (including never married, separated and divorced) and identify 8 transitions of interest between these relationship states: married – married; married – single; cohabiting – cohabiting; cohabiting – single; cohabiting – married; single – single; single – married; and single – cohabiting.

We include two measures for children. The first is a categorical measure for the number of dependent children (defined as 18 and under), including 1 = no children, 2 = 1 child, 3 = 2 children, and 4 = 3 or more children. The second measure indicates whether the respondent had a birth between waves with 1 = no birth, and 2 = birth.

We also include a range of controls that have been found to be associated with housework and relationship transitions including age of respondent and age squared, earnings, education, employment status, gender role attitudes and duration in marital status. All of these measures are time varying with descriptive statistics for each shown in Table 1.

*Models*

In previous research we have modelled time spent on housework as a single process across the different forms of marital status of single, cohabiting and married and have used linear mixed models with random intercepts to analyse the change in time on housework with transitions into and out of these partnerships for both men and women (Baxter et al. 2005, 2008). This also takes the form of a multilevel model with a two-level hierarchical structure where repeated observations are considered to be clustered within

individuals. The random intercept allows us to capture time-constant between-individual variation. We included both the current marital status and the marital status in the previous wave using a lagged variable while controlling for important demographic and socio-economic characteristics.

This previous work is extended here by analysing time spent on housework as a process that is influenced by both observed and unobserved factors relating to individual characteristics and circumstance and allowing the process to vary according to marital status. The formation and dissolution of partnerships is also analysed as a multistate process that may be influenced by measured covariates and unobserved factors that measure a woman's propensity to spend time on housework, or in other words, her degree of domesticity. For each woman in the sample data, we observe measures for housework hours and marital status on up to eight occasions and we also observe when a marital transition representing a partnership formation or dissolution occurs. Because we have repeated observations on each woman, and a transition can occur more than once for a woman, then housework hours and transitions are nested within individuals and an approach using a multilevel model specification is appropriate. In our sample data from HILDA, 1,349 marital transitions are observed.

In an approach similar to that taken by Steele et al. (2005, 2006) among others, we use a multiprocess multilevel model where a system of regression equations with random coefficients is estimated simultaneously. The data analysed by these authors contain complete event histories for the formation and dissolution of adult defacto and marital partnerships as well as for other outcomes of interest such as the birth of a child which allows the specification of a multilevel multistate event history model to analyse duration until an event occurs. The HILDA survey does not collect a complete event history for defacto relationships and it is not possible to collect retrospective data on housework hours, however, we can compute the duration of the marital status at wave one and the duration of subsequent marital status events. With just eight waves of data, we therefore analyse the likelihood of a marital transition from wave one using multinomial models and including marital status duration as an independent variable in the model. Our multiprocess model includes a linear mixed model for logged housework hours and several multinomial logit models with random intercepts for transitions into and out

of partnerships (Pettitt et al. 2006). The model component for logged housework hours (Model 1) includes an indicator variable for each marital status and the indicator variables are interacted with each covariate in the model. Random coefficients are specified for the indicator variables. Three additional models are specified separately for transitions into a partnership (Model 2: from the single state to cohabiting or married), for transitions out of a cohabiting partnership (Model 3: from the cohabiting state to married or single) and for transitions from the married state to single (Model 4). We analyse the likelihood of a transition occurring at any point in time and hence Models 2 and 3 are multinomial logit models with random intercepts and Model 4 is a binary logit model with a random intercept. For Models 2-4 the reference outcome is no transition. The model specification is formulated below.

**Model 1**: A linear mixed model for housework hours with random coefficients on indicator variables for single, cohabiting and marriage statuses. All covariates are interacted with the state indicator variables, $I_k$.

$$\ln(y_{ti}) = b_0^k + b_1^k Age_{ti} + b_3^k Earnings_{ti} + b_4^k Attitude_{ti} + b_5^k Birth_{ti} + b_6^k One\_child_{ti} + b_7^k Two\_children_{ti} + b_8^k More\_children_{ti} + b_9^k FTemp_{ti} + b_{10}^k PTemp_{ti} + b_{11}^k Duration_{ti} + b_{12}^k Trans1_{ti} + b_{13}^k Trans2_{ti} + \alpha_{1ki}$$

The variable Y with response $y_{ti}$ is used to denote housework hours for woman *i* at wave number $t = 2,\ldots,8$ . All covariates are interacted with the state indicator variables $I_k$. The fixed regression constants and coefficients are denoted $b_l^k$ where the superscript *k* denotes the marital status: s = single, c = cohabiting, m = married and $l = 0, 1, \ldots, 13$ is a variable specific number corresponding to each of the explanatory variables in the model. The superscript *k* for each of the variable coefficients indicates that the variable has been interacted with the indicator variable $I_k$ for the corresponding marital status producing an estimated regression coefficient for each marital status. For the single status (k=1) the variable Trans1 represents the transition to the cohabiting status, and Trans2 represents the transition to the married status. For the cohabiting status (k=2) the variable Trans1 represents the transition to the single status and Trans2 represents the transition to the married status. For the married status (k=3) the

variable Trans1 represents the transition to single status or separation and the coefficient $b_{13}^{3} = 0$. The term $\alpha_{1ki}$ represents the individual-specific random intercept term associated with marital status *k* in Model 1 and is specified to have a normal distribution with mean zero and variance $\sigma_{1k}^{2}$.

**Model 2:** A multinomial logit model for transitions out of the single state with no transition as the reference category and a random intercept for each transition. The variable $Z_1$ denotes the marital status *p =0, 1, 2* into which a transition is being made, where 0 = no transition, 1 = cohabiting, 2 = married.

$$\ln\left(\frac{\Pr(Z_{1ti} = p)}{\Pr(Z_{1ti} = 0)}\right) =$$

$$g_0^p + g_1^p Age_{pti} + g_2^p Age_{pti}^2 + g_3^p Lag\_earnings_{pti} + g_4^p Degree_{pti} + g_5^p One\_child_{pti} +$$
$$g_6^p Two\_children_{pti} + g_7^p More\_children_{pti} + g_8^p Birth_{pti} + g_9^p Duration_{pti} +$$
$$g_{10}^p Lag\_HWHours_{pti} + \alpha_{2pi}$$

The fixed regression constants and coefficients are denoted $g_l^p$ where p = 1, 2 and *l =0, 1,…, 10* is a variable specific number corresponding to each of the explanatory variables in the model. The explanatory variables in Model 2 are a subset of those included in Model 1. The term $\alpha_{2pi}$ represents the random intercept term associated with Model 2 and the transition to marital status p and is specified to have a normal distribution with mean zero and variance $\sigma_{2p}^{2}$. Models 3 and 4 are specified similarly to Model 2. Model 3 is a multinomial logit model for transitions out of the cohabiting state and Model 4 is a binary logit model for transition out of marriage to separation with no transition as the reference category.

*Model Estimation*

For the multinomial logit models we allow the random effects across the two transition states for each of these models to co-vary. Non-zero correlations among random effects across the models may occur if the unobserved characteristics that influence a woman to do more housework in any of the marital states also influence the decision to form or dissolve a partnership. Also, if a woman experiences several transitions across the eight waves it is possible that the propensity to undergo one type of transition may also

influence the likelihood of her undergoing another transition. Therefore, all eight random effects from Models 1 to 4 are specified to arise from a multivariate normal distribution with mean zero and variance-covariance matrix $\Sigma$. The system of equations specified in Models 1-4 form the multilevel multiprocess model. The parameters in each of the equations are estimated simultaneously using Markov chain Monte Carlo (MCMC) simulation (Gelman et al. 2005) which is implemented using the freely available WinBUGS software (Spiegelhalter et al. 1998). Non-informative normal prior distributions were specified for each of the regression parameters. A Wishart prior distribution (dimension eight) was specified for inverse $\Sigma$.Similar methods have been used to estimate multinomial logit models with random effects for estimating the probability of employment for immigrants to Australia with time since arrival (Pettitt et al. 2006) and the probability of employment for Australian women (Haynes et al. 2008).

**Results**

The results from the estimation of the multiprocess model defined by Models 1-4 are shown in Tables 2-5. All results are means of posterior distributions obtained from 46,000 MCMC simulations following a burn-in length of 4,000 simulations. Table 2 shows the estimated regression coefficients for logged housework hours from Model 1. Table 3 shows the estimated regression effects for the log odds of partnership formation and Table 4 shows the estimated regression effects for the log odds of partnership dissolution. Table 5 shows the estimated variance-covariance matrix for the eight random effects from Models 1-4 and these estimates are interpreted below. We discuss the results for each of our research questions in turn.

*What is the effect of a marital status transition on women's time on housework?*

Model 1 has addressed this question in two ways. First, the positive correlations ( $\rho > 0.60$ ) among the random effects for time spent on housework in each marital status (shown in the top left 3 rows and columns of Table 5) suggest that women with a propensity to high levels of housework or domesticity

when single also have a propensity to spend more time on housework relative to other women, when in a partnership. The random effects specified in Model 1 represent the pooled unobserved characteristics of a woman and their association with time spent on housework in each marital status. Women who experience at least one marital transition during the time spanned by the HILDA survey will have more than one estimated random effect corresponding to each observed marital status and therefore a positive correlation indicates that a woman who does a higher than average amount of housework in one marital status will tend to do more than an average amount of housework when in another marital status, after controlling for the same observed factors. Second, the regression coefficients for estimating the effect of a marital transition on housework time (Table 2) show that the formation of a relationship is associated with a significant increase in housework hours and that the effect of a transition into marriage (b=0.333, SE=0.064) is twice as high as the effect of a transition into a cohabiting relationship (b=0.169, SE=0.033). Thus women who enter a marital union spend longer on housework than women who enter a cohabiting union. Table 2 also shows that separation from a cohabiting relationship is associated with a significant reduction in housework hours (b=-0.104, SE=0.047).

Together, these findings suggest that women's housework hours increase with the transition into a relationship and also that if a woman spends more than average time on housework hours when she is single then she will also tend to spend more than average time on housework when she is in a cohabiting or married relationship. This result infers that some marital transitions do influence the change in time spent on housework but that the total amount of housework undertaken following a transition is to an extent influenced by the propensity of a woman to spend more or less than average time on housework before the transition takes place.

*Is there a selection effect of women who spend more time on domestic labour into cohabiting rather than marital partnerships?*

A selection effect of this type can be assessed by examining the correlations between the random effects in Model 1 and the random effects in Models 2-4. The random effects specified in Models 2-4 represent

the effects of a woman's unobserved characteristics on her likelihood to undergo a certain marital transition. If a woman's unobserved characteristics were associated with a higher than average time spent on housework when single and these characteristics were also associated with a high likelihood of entering a marital partnership compared to a cohabiting union, then the random effects from Model 1 and the Models representing partnership formation would be positively correlated and this would signify the detection of a selection effect. However, Table 5 shows that the correlations among these random effects are not significantly different from zero. Therefore there is no evidence of a selection effect of this type.

*Is there a selection effect of women who do less domestic labour out of partnerships?*

The correlations of random effects presented in Table 5 show that there are no significant associations among the random effects for time spent on housework and transitions out of partnerships. Therefore there is no evidence of a selection effect of this type in our sample. Thus women who spend less time on housework in a relationship are not more likely to separate than women who spend more time on housework.

However, significant correlations occur among the random effects for the transition from single into a cohabiting partnership and the transition from a cohabiting to married partnership, the transition from cohabitation to separation and the transition from marriage to separation. It is not surprising that women who form a cohabiting relationship will either separate or go on to marry, but it is interesting that the unobserved characteristics of women who cohabit are positively correlated with the unobserved characteristics of women who separate from marriage ($\rho > 0.60$). This suggests that women with unobserved characteristics that are more likely to encourage them to enter a cohabiting relationship before marriage, are also more likely to encourage them to separate from marriage compared to those who marry directly.

Other statistically significant results arising from the interpretation of regression coefficients, as shown in Tables 2, 3 and 4, are:

- Time spent on housework increases with earnings for single women, and decreases with earnings for married women.
- Time spent on housework hours increases with more traditional attitudes in support of the view that men should be the household breadwinner, for both single and married women but not for cohabiting women.
- Time spent on housework is much lower for women who are in employment, and is lowest for women who are in full-time employment.
- There is no evidence of a significant fixed effect on housework hours when cohabiting women marry.
- Single women are more likely to cohabit following a birth.

**Discussion**

Most previous research on women's housework time has focused on explaining why women spend more time doing housework than men. While this is an important research question, the results reported here shift this focus by concentrating on why relationship transitions affect women's time on housework. We ask whether there are observed and unobserved characteristics that influence both women's decisions about whether to cohabit, marry or separate, and their time spent on housework. We present new multilevel multiprocess models that enable examination of the selection of women into and out of relationships according to their housework hours. Social life is complex with many life course events interrelated with other co-occurring events and processes. Understanding the observed and unobserved drivers of these co-occurring events is important if we are to fully understand the causes and consequences of life course transitions.

Overall our results suggest that movement into a relationship increases women's time on domestic labour. This is consistent with findings from previous research (Baxter, Hewitt and Haynes, 2008; Gupta, 1999; Sanchez and Thomson, 1997). Our main contribution in this paper is to take these

models one step further to examine whether this increase in housework hours is due to the characteristics of the kinds of women who partner or is the result of circumstances arising afterpartnership. This enables us to address questions of selection and effect that have not been adequately addressed in previous studies. Moreover we are also able to address whether unobserved characteristics relating to women's time on housework determine what kind of partnership, cohabiting or married, they enter, and also whether these unobserved characteristics are related to women's decisions to leave a partnership.

Our results show that women who spend more time on housework when single, suggesting higher levels of domesticity, spend more time on housework after cohabitation or marriage. But there is no evidence of selection of these women into marriage. Women who do more housework when single are no more likely to form a partnership, and no more likely to choose to marry rather than cohabit, compared to women who do less housework when single. We also found no evidence to support the hypothesis that women who do varying amounts of housework are more likely to separate from cohabitation or marriage. Overall we conclude that the unobserved factors influencing time spent on housework are not related to the unobserved factors influencing marital status transitions.

Interestingly though we do find that the unobserved characteristics influencing women to cohabit prior to marriage also influence their likelihood of separation from marriage. Previous research has shown that couples are more likely to separate if they have cohabited prior to marriage compared to those who have married directly (Dush, Cohan and Amato 2003) . Our results support this previous research by showing that women who select into cohabitation prior to marrying are also more likely to select out of marriage.

Part of the aim here has also been to highlight the potential of these new multiprocess multilevel models for jointly examining co-occurring social events. Disentangling selection effects from experiential outcomes is a problem that plagues much social science research across numerous topics. The increased availability of large scale panel data spanning the life course on large samples of individuals, in addition to the use of these new modelling techniques, provides social researchers with a means of more rigorously testing complex interrelated social processes.

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**Table 1: Means, Standard Deviations, Proportions of Housework Hours and Model Covariates for Pooled Sample of Women aged 18-45 years, HILDA Waves 2-8.**

| | HILDA (2 – 8) | |
|---|---|---|
| | Mean | SD |
| Housework hours | 17.81 | 13.3 |
| Housework hours (logged) | 2.60 | 0.8 |
| Age | 36.93 | 7.9 |
| Earnings (10,000) | $2.80 | $2.10 |
| Bachelor Degree or higher (1=yes) | 30% | |
| Number of children <18 | | |
| None | 38% | |
| 1 child | 12% | |
| 2 children | 27% | |
| 3 + children | 23% | |
| Birth | 5% | |
| Employment status: | | |
| Not employed | 25% | |
| Employed Full time | 39% | |
| Employed Part time | 36% | |
| Duration by Marital Status (Months) | | |
| Married | 159 | 97 |
| Cohabiting | 34 | 24 |
| Single | 46 | 26 |
| Woman-years | 18,376 | |
| Number of women | 3,393 | |

**Table 2: Estimated Coefficients and Standard Errors from Models of Change in Log Housework Hours for Single, Cohabiting and Married Women aged 18-45 years, HILDA Waves 1-8.[a]**

| Variable | Single State Model for Log Housework Hours | | Cohabit State Model for Log Housework Hours | | Married State Model for Log Housework Hours | |
|---|---|---|---|---|---|---|
| | Coeff | SE | Coeff | SE | Coeff | SE |
| Constant | 2.198* | 0.040 | 2.498* | 0.065 | 2.749* | 0.031 |
| Age | 0.014* | 0.002 | 0.008* | 0.003 | 0.005* | 0.002 |
| Age_squared | -0.001* | 0.0002 | -0.0005 | 0.0003 | -0.0003 | 0.0002 |
| Earnings (log '0,000s) | 0.105* | 0.030 | -0.024 | 0.037 | -0.107* | 0.017 |
| Male breadwinner attitudes | 0.012* | 0.002 | 0.001 | 0.005 | 0.007* | 0.002 |
| Bachelor degree (1=yes) | 0.055 | 0.032 | -0.005 | 0.044 | 0.016 | 0.025 |
| Birth of child | | | | | | |
| No birth | | | | | | |
| Birth | 0.105 | 0.058 | 0.023 | 0.050 | 0.094* | 0.024 |
| Number of children<18 | | | | | | |
| None | | | | | | |
| 1 child | 0.492* | 0.044 | 0.335* | 0.050 | 0.173* | 0.028 |
| 2 children | 0.465* | 0.043 | 0.516* | 0.050 | 0.300* | 0.025 |
| 3+ children | 0.535* | 0.046 | 0.529* | 0.061 | 0.363* | 0.027 |
| Employment | | | | | | |
| Not employed | | | | | | |
| Employed Full-time | -0.304* | 0.031 | -0.373* | 0.044 | -0.406* | 0.022 |
| Employed Part-time | -0.193* | 0.028 | -0.195* | 0.039 | -0.177* | 0.018 |
| Duration in current marital status | -0.0002 | 0.0003 | -0.0004 | 0.0005 | 0.00009 | 0.0002 |
| Trans S-C | 0.169* | 0.033 | | | | |
| Trans S-M | 0.333* | 0.064 | | | | |
| Trans C-S | | | -0.104* | 0.047 | | |
| Trans C-M | | | 0.033 | 0.045 | | |
| Trans M-S | | | | | -0.068 | 0.044 |

**a.** Estimated values are means of posterior distributions obtained from 46,000 MCMC simulations, following a burn-in of 4,000.
**b.** * indicates that the 95% credible interval for the estimated regression coefficient does not contain zero.

**Table 3: Estimated Coefficients and SEs from Models of Log Odds of Partnership Formation for Women aged 18-45 years, HILDA Waves 1-8.[a]**

| Variable | Model for Transition Single-Married | | Model for Transition Single-Cohabiting | | Model for Transition Cohabiting-Married | |
|---|---|---|---|---|---|---|
| | Coeff | SE | Coeff | SE | Coeff | SE |
| Constant | -5.215* | 0.831 | -2.390* | 0.169 | -1.711* | 0.353 |
| Age | -0.064* | 0.022 | -0.068* | 0.009 | -0.057* | 0.015 |
| Age_squared | -0.006* | 0.002 | -0.004* | 0.0009 | -0.006* | 0.002 |
| Lag earnings (log '0,000s) | 0.018 | 0.062 | 0.064* | 0.022 | 0.081 | 0.071 |
| Bachelor degree (1=yes) | 0.703* | 0.365 | 0.114 | 0.133 | 0.475* | 0.221 |
| Birth of child | | | | | | |
| No birth | | | | | | |
| First birth | 0.237 | 0.767 | 1.793* | 0.273 | 0.036 | 0.316 |
| Number of children <18 | | | | | | |
| None | | | | | | |
| 1 child | -0.039 | 0.476 | -0.232 | 0.199 | -0.014 | 0.270 |
| 2 children | 0.281 | 0.441 | -0.533* | 0.206 | -0.827* | 0.302 |
| 3+ children | 0.346 | 0.473 | -0.663* | 0.238 | -0.349 | 0.315 |
| Duration in previous marital status | 0.008* | 0.005 | 0.002 | 0.002 | 0.006 | 0.005 |
| Lag housework hours (log) | 0.006 | 0.018 | 0.004 | 0.023 | 0.006 | 0.018 |

a. Estimated values are means of posterior distributions obtained from 46,000 MCMC simulations, following a burn-in of 4,000.
b. * indicates that the 95% credible interval for the estimated regression coefficient does not contain zero.

**Table 4: Estimated Coefficients and Standard Errors from Models of Log Odds of Partnership Dissolution for Women aged 18-45 years, HILDA Waves 1-8.[a]**

| Variable | Model for Transition Cohabiting-Single | | Model for Transition Married-Single | |
|---|---|---|---|---|
| | Coeff | SE | Coeff | SE |
| Constant | -3.990* | 0.407 | -3.943* | 0.258 |
| Age | -0.010 | 0.014 | -0.009 | 0.016 |
| Age_squared | -0.002* | 0.002 | -0.001 | 0.002 |
| Lag earnings (log '0,000s) | -0.206* | 0.061 | -0.047 | 0.076 |
| Bachelor degree (1=yes) | -0.410 | 0.226 | -0.581* | 0.197 |
| Birth of child | | | | |
| No birth | | | | |
| Birth | -0.993* | 0.433 | -1.157* | 0.460 |
| Number of children <18 | | | | |
| None | | | | |
| 1 child | 0.503 | 0.255 | -0.446 | 0.282 |
| 2 children | -0.342 | 0.279 | -0.206 | 0.220 |
| 3+ children | -0.221 | 0.295 | -0.347 | 0.239 |
| Duration in previous marital status | -0.016* | 0.005 | -0.002* | 0.001 |
| Lag housework hours (log) | 0.004 | 0.023 | -0.006 | 0.030 |

a. Estimated values are means of posterior distributions obtained from 46,000 MCMC simulations, following a burn-in of 4,000.
b. * indicates that the 95% credible interval for the estimated regression coefficient does not contain zero.

**Table 5: Estimated random-effects covariance matrix from the multi-process model, HILDA Waves 1-8 (Includes estimates of correlation in [ ]).**

| | Housework hours for single state | Housework hours for married | Housework hours for cohabiting | Likelihood of S-M transition | Likelihood of S-C transition | Likelihood of C-M transition | Likelihood of C-S transition | Likelihood of M-S transition |
|---|---|---|---|---|---|---|---|---|
| Housework hours for single state | 0.263* | | | | | | | |
| Housework hours for married | 0.135*<br>[0.605] | 0.189* | | | | | | |
| Housework hours for cohabiting | 0.172*<br>[0.696] | 0.126*<br>[0.601] | 0.232* | | | | | |
| Likelihood of S-M transition | 0.027<br>[0.021] | -0.096<br>[-0.089] | 0.096<br>[0.081] | 6.119* | | | | |
| Likelihood of S-C transition | 0.069<br>[0.133] | -0.008<br>[-0.018] | 0.023<br>[0.047] | 0.654<br>[0.262] | 1.019* | | | |
| Likelihood of C-M transition | 0.018<br>[0.025] | -0.031<br>[-0.051] | 0.046<br>[0.068] | 2.110<br>[0.610] | 0.339*<br>[0.240] | 1.954 | | |
| Likelihood of C-S transition | 0.027<br>[0.047] | 0.018<br>[0.037] | -0.031<br>[0.057] | -0.085<br>[-0.031] | 0.479*<br>[0.424] | -0.266<br>[0.170] | 1.253 | |
| Likelihood of M-S transition | 0.077<br>[0.122] | -0.011<br>[0.020] | 0.044<br>[0.074] | 0.952*<br>[0.312] | 0.762*<br>[0.612] | 0.325<br>[0.188] | 0.426<br>[0.309] | 1.522* |