

Do Childhood Experiences of Parental Separation Lead to Homelessness?

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1 Introduction

Only a minority of the population will face homelessness in their lifetime but for those who do it is one of the most difficult (if not the most difficult) hardships they will ever endure. Homelessness is associated with significant financial and social deprivations, mental and physical health issues and socially undesirable behaviours such as substance abuse and crime (Philippot et al., 2007). For those experiencing homelessness at an early age, the consequences may be even more devastating, with long lasting effects on educational and health outcomes; employment and earnings potential; social integration and financial autonomy. Understanding how individuals, in particular children or young adults, fall into homelessness is an important first step towards developing policies that may prevent homelessness and curb the wide range of difficulties associated with homelessness, especially for those from disadvantaged backgrounds. So what leads to homelessness?

O'Flaherty (2004, 2009 & 2010) proposes a theory and presents empirical evidence of why and how shocks, i.e. "unexpected changes in circumstances", can precipitate homelessness. He finds that a negative income shock often precedes homelessness. Further, he highlights the potential role of income volatility in leading to homelessness, especially for disadvantaged groups. Parental separation, which is often sudden and implies an urgent move, can generate a financial shock analogous to an income shock and therefore lead to homelessness. In addition to this immediate effect, parental separation may also have a delayed effect on homelessness. For instance, less disadvantaged groups may be able to cope financially in the short run (by covering housing costs with their savings for example), but not in the medium run (once the savings have ran out), such that the deterioration of their financial resources may lead to homelessness some years after the separation. Parental separations can also create conflicts between parents and children, which may drive children out of their parent's home and potentially into homelessness in subsequent years.

Our paper investigates the causal effect of parental separation on homelessness using Journeys Home (JH), a unique dataset of disadvantaged Australians who are either homeless or at risk of homelessness. Specifically, we use the retrospective information provided by respondents' about their childhood experiences of parental separation and homelessness to estimate the combined immediate and delayed effect of parental separation on homelessness. In the Journeys Home sample, family breakdown appears to be an important trigger for homelessness. Of those who have experienced homelessness, 62% of respondents cite family breakdown or conflict as the main reason for becoming homeless for the first time (Scutella et al., 2012).¹ This relationship between family breakdown and homelessness is also verified beyond the onset of homelessness. Indeed, over the survey period, respondents who divorce, separate or become widows face a higher risk of homelessness (Scutella et al., 2014).

Empirical evidence on the relationship between childhood experiences of parental separation and homelessness later on in life is practically non-existent and essentially descriptive in nature. Shinn (2007) points to divorce and separations as frequently cited contributors to homelessness (Firdion & Marpsat, 2007; Hladikova & Hradecky, 2007; Okamoto, 2007; Philippot et al., 2007), together with financial difficulties, domestic violence, mental health problems, substance abuse and incarceration. Unfortunately these studies only suggest a conjunction of factors that lead people to lose their homes, rather than being able to isolate the causal effect of separation on homelessness. It is therefore unclear whether parental separation alone contributes to the onset of homelessness of children and young adults.

A small housing literature has paid some attention to the housing outcomes of families that experience divorce and/or separations, but the focus is on the broader population rather than a disadvantaged population who are at-risk of homelessness. There is indeed some

¹ This is an extremely large majority given that the next most cited answer 'Domestic and family violence or abuse' gathers only 18% of answers. Note that "family breakdown or conflict" is broader than "parental separation" given that it might include conflicts without any separation as well as the respondent's own separation from her partner.

evidence that parental separation is often associated with a downward trend in housing quality since a separation often implies an urgent move and a decrease in resources. Specifically, a separation frequently leads the separating couple to move out of home ownership; to move out of single-family housing; to sometimes move back into their parents' home or to possibly move into some form of shared accommodation. Overall, separations decrease the quality of housing and increase housing instability (Flatau et al., 2004; Feijten, 2005; Dewilde, 2008; Feijten & van Ham, 2010).

These findings of parental separation being related to housing difficulties are likely to be spurious, however, if researchers do not account for the fact that family structure is probably correlated with other determinants of a family's housing situation. Indeed, there are good reasons why parental separation may not be a random event. The factors that caused the separation may also affect the families' housing situation through other pathways, such as a parent's addiction to drugs or financial difficulties. Further, the impact of homelessness on parental separation, although less obvious, should also not be ruled out *a priori*: the stress resulting from being homeless could increase the risk of a separation.² As such, the existing literature is largely correlational and may be biased, due to the potential for omitted variables and reverse causality. We are unaware of any studies attempting to identify the causal impact of parental separation on homelessness of children later on in life.

There is an emerging literature attempting to identify the causes of homelessness more generally, but research is in its early stages and thus limited. For example, McVicar et al. (2015a) use within-individual variations, i.e. comparisons of outcomes before and after transitions into substance use, to estimate the effect of substance use on transitions into homelessness 6 months later. McVicar et al. (2015b) use trivariate duration modelling to investigate the impact of beginning to use cannabis daily and street drugs weekly on the onset

² Boyle et al. (2008) find that this is likely to be the case after moving twice or more over short distances.

of homelessness. Both these papers find smaller impacts of substance use on homelessness once they account for unobserved heterogeneity and reverse causality. This highlights the importance of using an identification strategy that deals effectively with these issues and thus avoids misleading results.

On the other side of the spectrum, the divorce literature is mainly focused on the consequences of parental separation on children's outcomes, rather than on housing outcomes (see McLanahan et al., 2013 for a review). Economists interested in identifying a causal impact of parental separation have emphasized the need to address endogeneity issues. Typically this has involved exploiting plausibly exogenous sources of variation in family structure through natural experiments or instrumental variables methods (Lang & Zagorsky, 2001; Gruber, 2004; Finlay & Neumark, 2010) and also accounting for unobserved heterogeneity through the use of individual fixed effects (Cherlin et al., 1991), sibling fixed effects (Ermisch et al., 2004; Evenhouse & Reilly, 2004) and propensity score matching (Gertler et al., 2004). Interestingly, after accounting for endogeneity issues, these studies tend to find that divorce does not deteriorate children's outcomes. Only rarely do researchers interested in family and household issues explicitly address the connections between housing on the one hand, and household formation or dissolution on the other (Mulder & Lauster, 2010).

All in all, whether parental separation increases housing difficulties is unclear and whether it increases homelessness is even more obscure. Yet, establishing the extent to which associations between parental separation and homelessness are simply correlations or are reflecting a causal relationship is crucial for the development of sound policy to prevent homelessness. A positive causal effect from parental separation to homelessness suggests that interventions designed to support families in which parents separate may efficiently reduce inflows into homelessness.

Our contribution to the literature is fourfold. First, we present original evidence which is based on a large-scale, broad-based survey of homeless individuals and others at risk of homelessness. Journeys Home has unique information on respondents' histories, including information about the respondent's age at which they were without a place to live for the first time, and the age at which their parents separated. The high frequency of homelessness and parental separation in the sample provides enough variation in the timing of these two events to address the question of a potential causal relationship between the two.

Second, we explore the degree to which the association between parental separation and homelessness might be plausibly interpreted as a causal relationship. Our paper discusses the potential for reverse causality and addresses common unobserved confounders using bivariate mixed proportional hazard models. In duration models, parental separation and the transitions into homelessness form a fully simultaneous system. In this system, parental separation can impact on homelessness and the unobserved heterogeneity terms entering each transition rate are potentially correlated. By exploiting the timing of first episodes, we can identify the direction of causal pathways linking parental separation to homelessness, and quantify the strength of these effects. This estimation strategy also deals with omitted variable bias by assuming that the unobserved heterogeneity terms determining each transition rate are jointly distributed.

Third, we distinguish between the effect of parental separation for young children and for teenagers and young adults (below 12 years old; from 12 to 30). There is indeed evidence that the timing of the parental separation matters. For instance, previous research indicates that the consequences of parents' separation on children's outcomes are worse when the separation happened earlier on in the life of the child (Hope et al., 1998 for alcohol consumption; Woodward et al. 2000 for attachment to parents). The consequences of parental separation on homelessness could also vary with the age of the children. On the one hand, younger children

have (on average) younger parents with less financial resources to deal with a separation thereby increasing the risk of homelessness for the family. On the other hand, as the children become teenagers and young adults, their risk of becoming individually homeless increases, potentially as a result of parental separation and associated conflicts. Overall, whether the consequences of parental separation on homelessness should increase or decrease with the age of the child is an unanswered but relevant empirical question. Finally, following the previous housing literature we investigate whether the impact of a separation differs between partners that were married and those that were in a de facto relationship.

We find a causal effect of parental separation on the entry into homelessness. The effect is substantial. Conditional on family and individual characteristics, if parents separate before the child reaches age 12, boys (resp. girls) have a 10-15 (resp. 15-20) percentage point greater chance of becoming homeless by age 30. However, if the parental separation occurs from the age of 12 we find a gendered result whereby the effect only persists for boys who are at greater risk of becoming homeless. These effects only occur when the parents were formally married prior to the separation. If parents were in a de facto relationship a separation does not influence their children's initiation into homelessness later on in life.

The remainder of our paper is structured as follows. In section 2 we present our data and the results from a preliminary analysis. Section 3 describes the set-up of our empirical analysis. In section 4 we present and discuss our baseline parameter estimates. We explore the robustness of our main findings by presenting a range of sensitivity analyses in Section 5, while Section 6 concludes.

2 Parental separation and homelessness

2.1 The JH data and variable definitions

JH is a longitudinal dataset with information on a sample of income support recipients (i.e. welfare payment) who are either homeless or at-risk of homelessness (Scutella et al., 2012). In our analysis we use the sample of respondents who were interviewed in September 2011 (wave 1) when retrospective information on the age of onset of homelessness was collected and respondents who were interviewed in May 2014 (wave 6) when retrospective information on the timing of parental separation was collected³. Despite the disadvantaged nature of the JH sample, both the response rate at wave 1 (61.9%) and the retention rate in the sample at wave 6 (83% of wave 1 respondents) were high.

We transfer information on parental separation from wave 6 to the situation in wave 1 and consider both parental separation and homelessness as of wave 1.⁴ Because the impact of parental separation on the children's housing situation is likely to be more relevant when children still live with their parents, we focus on those events if they happen at 30 years old at the latest. In other words, we censor the parental separation and the onset of homelessness if they occur after 30.

Parental separation can be defined in at least one of two ways: by focussing on marriages ending up in divorce only or by also considering de facto relationships ending up in separations. We define the age at parental separation by the age of the respondent when his parents (first) divorced or separated. To compare respondents whose parents separated at different ages with

³ Some respondents may make mistakes in reporting retrospective information about their childhood. However, the main parameter estimates are not very sensitive to this. What matters in particular for our estimations is not that they get the exact age absolutely right, but rather that they get the timing of events right: what happened first and with what delay. Given that parental separation and first experiences of homelessness are substantial events which happen on average 10 years apart in our sample (see Table 1), we do not think that respondents are likely to make systematic mistakes in reporting this information.

⁴ Only 3 respondents have parents separating for the first time between wave 1 and wave 6.

respondents whose parents did not separate, we have to restrict the sample further: we drop respondents whose parents were never married or never were in a de facto relationship.

Homelessness can be defined in different ways and with different thresholds. Following Johnson and Chamberlain (2008) and the Australian Bureau of Statistics, we adopt the so-called ‘cultural definition’ of homelessness used to enumerate the homeless population in Australia. This definition pertains to a broad characterization of homelessness very similar to that under the 2009 Homeless Emergency Assistance and Rapid Transition to Housing Act, and similar to that used by Link et al. (1994) and Curtis et al. (2013). Cultural homelessness is defined as sleeping rough or squatting in abandoned buildings; staying with relatives or friends temporarily with no alternative; staying in a caravan, boarding house, hotel or crisis accommodation. Using this definition, for each respondent we construct the age at which she became homeless for the first time. If the respondent has been homeless prior to JH (i.e. if she has “stayed in any [...] places because [she] did not have a place to live”), we use the retrospective information collected at wave 1 on “How old [she was] the first time that [she was] without a place to live”.

Our estimating sample consists of respondents whose parents were married or in a de facto relationship and provided complete information on parental separation and the onset of homelessness, which translates to 1,231 observations, i.e. 73% of the wave 1 sample.

2.2 *Descriptive statistics*

Table 1 shows the prevalence of parental separation and homelessness. Around 74 percent of women and 72 percent of men had experienced homelessness at wave 1 of the survey.⁵ More

⁵ Given that we restrict our attention to the wave 1 and 6 respondents, one could be concerned that this somehow reflects selection into staying in the JH study. However, the rate of homelessness at 30 years old at wave 1 is identical for the full sample of wave 1 respondents.

than half of the respondents have separated parents. Interestingly, more women have experienced parental separation than men (65 percent vs 57 percent). This is consistent with US evidence that rates of divorce are higher in families with girls than in families with boys, although this relationship is not confirmed for Australia (Bedard & Deschenes, 2005; Leigh, 2009). On average, if parental separation and homelessness both occur it is very likely that parental separation occurred first. Parental separation occurs on average at around age seven to eight while homelessness occurs at around age 17 to 18.

Table 1 around here

Figures 1 and 2 illustrate the cumulative probability distributions for parental separation and the onset of homelessness up to age 30, separately for women and men.⁶ The top graphs show that parental separation mostly occurs before the child reaches age 20. More precisely, parental separation sometimes occurs early with more than five percent of parents separating in the year following the birth of the child. Parental separation then increases sharply with about 50 percent of the sample experiencing parental separation by the age of 16. The middle graphs of Figures 1 and 2 show that the onset of homelessness usually occurs later on in life. The rate of homelessness stays relatively low with less than five percent of respondents experiencing homelessness before age 12. It then increases steeply between ages 12 and 16 to reach around a third of the sample. After that, the rate of homelessness continues to increase gradually. This suggests that there are probably two very different experiences of homelessness: early and late. Early experiences of homelessness occur at young ages, not very long before or after a parental separation. Therefore early homelessness experiences may be related to the separation. The late experience of homelessness occurs when the respondent is an adult. The late experience is

⁶ If individuals were older than 30 at the time of the survey, we ignore events after age 30. If individuals less than 30 years old and parental separation or homelessness had not occurred, we consider the process of becoming homeless or facing parental separation to be right-censored at that age.

unlikely to be related to parental separation. This descriptive evidence therefore reinforces our choice to focus on homelessness up to age 30. In addition, we will differentiate our results by the age of the child because the effect of parental separation on homelessness may have different consequences depending on whether the separation occurs in a household with young children versus teenagers and young adults.

For illustrative purposes, in the bottom graphs of Figures 1 and 2 we split up the sample in three groups: parental separation occurred before age 12, parental separation occurred after age 12, no parental separation. Men whose parents separated before they were 12 became homeless earlier than those whose parents separated between 12 and 30. Those men with parental separation occurring between ages 12 and 30 became homeless earlier than those whose parents did not separate by the time they were 30 years old. For women, the likelihood of becoming homeless is also higher if the parental separation occurred before 12. However, for women, parental separations occurring after 12 do not seem to be related to the onset of homelessness.

Figures 1 and 2 about here

If there is a causal relationship from parental separation to homelessness, then parental separation should, on average, precede the onset of homelessness. Table 2 investigates this issue, tabulating the probability associated with the possible combinations of timing of events with respect to parental separation and the onset of homelessness. For instance, 49 percent of women and 42 percent of men experienced parental separation before becoming homeless, while both happen at the same age for one percent of men (two percent of women). In contrast, two percent of men became homeless before their parents separated (three percent of women). The likelihood that parental separation occurs first is therefore very high but one cannot rule out a priori that the relationship between parental separation and homelessness is biased due to unobserved heterogeneity. In contrast, the low occurrence of parental separation after

homelessness suggests that for individuals in our sample homelessness has hardly ever led to parental separation. From this, we conclude that reverse causality is not an issue. In our analysis we focus on identifying the potential causal effect of childhood experiences with parental separation on homelessness.

Table 2 about here

Table 3 provides summary information for our sample. The JH sample grew up in a relatively disadvantaged situation with many respondents having experienced violence during childhood: on average across the sample more than half suffered from emotional abuse (58 percent) and physical violence (56 percent of girls and 63 of boys); and a significant proportion of respondents suffered from sexual violence (37 percent of boys and 15 percent of girls). By the age of 14, 14 percent were not living with their biological parents because these were deceased or because of a conflict). When disaggregating the sample by experiences of homelessness, the rates of ‘not living with parents’ and violence are much higher among respondents who experienced homelessness before 30 compared to those who did not. This emphasises the fact that respondents experiencing early homelessness, not only experience parental separation more often and earlier, but also have other disadvantages which are also likely to be driving parental separations. In order to estimate the impact of parental separation on homelessness, it will therefore be important to control for observable differences as well as unobserved differences likely to jointly determine homelessness and parental separation.

Differences in the respondents’ male and female caregiver’s education are less striking, although both men and women who experienced homelessness before age 30 less often had caregivers with post-secondary education (e.g. 11 percent of women who experienced homelessness by age 30 had a male caregiver with a Technical College or University diploma versus 18.4 percent for women who had not experienced homelessness). This background information is missing for a significant portion of our sample and this item non-response is

unlikely to be random. For instance, respondents with homeless experiences more often have missing information on their male caregiver's education. We therefore construct dummy variables for missing information on subsets of control variables: reason for not living with parents at 14, violence, male caregiver and female caregiver's education.

Table 3 about here

Tables 4 and 5 present linear probability estimates of the effect of parental separation before age 12 on the probability of homelessness occurring respectively by the ages of 15, 20, 25 and 30 years old for women and men separately. The outcome is a dummy equal to 1 if the respondent becomes homeless by age 15/20/25/30 and 0 if he becomes homeless later or never (this variable is missing for observations that are right-censored, i.e. respondents that we stop observing before the age of 15/20/25/30). Similarly, the parental separation variable is a dummy equal to 1 if the parental separation occurs before 12; 0 if it occurs later or never. In our sample, 44% of respondents have parents separating before the child reaches age 12.⁷ We control for all observable characteristics described in Table 3 (which will also be included in the bivariate duration model).

We find positive and significant effects of parental separation on homelessness. The linear probability estimates suggest that parental separation before age 12 increases women's probability of becoming homeless by age 15 by 13 percentage-points, by age 20 by 25pp, by age 25 by 25pp, and by age 30 by 22pp. Results for men are essentially similar with effects increasing until their 20s and then decreasing before age 30.⁸ Interestingly, the regression analysis confirms the descriptive evidence: childhood characteristics differ between respondents experiencing homelessness and those who don't, while caregivers' education level does not. For boys and girls, conflicts with parents and physical violence matter especially for

⁷ Note that we remove from the sample respondents who became homeless before age 12 (45 observations) to ensure that a parental separation occurred before homelessness.

⁸ Probit and logit estimates are consistent in sign and magnitude (results available upon request).

experiences of homelessness before age 15, while emotional abuse matters more for homelessness onsets after 15. These results suggest that respondents who have experienced the separation of their parents by age 12 become homeless by age 30 at a higher rate than respondents who did not, even after controlling for observable factors. However, these estimates do not take account potential unobserved heterogeneity and they deal with the timing of events in an ad hoc way by dropping respondents who were homeless before the parental separation occurred and by focusing only on parental separations which occurred before age 12. The bivariate duration modelling enables us to deal with these issues and improve upon these simple linear probability models.

Table 4 and 5 about here

3 Set-up of the analysis

The aim of this paper is to investigate whether parental separation affects the onset of homelessness. To do so, we use a bivariate mixed proportional hazard framework in which the two hazards relate to the transition to parental separation and to the (first) transition into homelessness. The model uses information about the age of the individual at which the parents separated and the age of the individual at which first homelessness occurred.

In order to establish whether there exists a causal relationship running from the parental separation to homelessness, we account for the possibility that the correlation between parental separation and homelessness reflects common confounding factors. This is achieved by modelling the two transitions as a fully simultaneous system in which the unobserved heterogeneity terms entering the transition rates are correlated. To be specific, prior parental separation enters the hazard for transitions into homelessness. Our specification accounts for endogeneity arising from common unobserved confounders because the unobserved heterogeneity terms determining each transition rate are assumed to be jointly distributed. A

major advantage of using this kind of approach is that, as shown by Abbring and van den Berg (2003), identification of the treatment effect does not rely on a conditional independence assumption and it is not necessary to have a valid instrument. Rather, identification comes from the timing of events, i.e. the order in which parental separation and first homelessness occurs.

These advantages have made bivariate duration modelling an increasingly common empirical approach in parts of the social policy literature, e.g. on the impact of benefit sanctions on welfare exit and job entry (see for example Abbring et al., 2005 and Van den Berg et al., 2004). The bivariate duration approach has also been used in several studies of drug use impacts, most commonly to investigate various impacts of cannabis use (see Van Ours & Williams, 2015 for a review). Trivariate modelling has been used by McVicar et al. (2015b) to establish whether daily cannabis use and weekly street drugs use have a causal effect on homelessness.

In our baseline bivariate model there are two transitions. The first is to parental separation, the second is to homelessness. We model transitions up to age 30 to capture early onset of parental separation and early onset of homelessness. In modelling the start of parental separation, we assume that this can happen from the birth of the child onwards. The starting rate for parental separation at time t ($t = 0$ at age 0) conditional on observed characteristics x , and unobserved characteristics u is specified as:

$$\theta_s(t|x, u) = \lambda_s(t) \exp(x'\beta_s + u) \quad (1)$$

where $\lambda_s(t)$ represents individual duration dependence. Furthermore, β_s represents vectors of parameters to be estimated. Unobserved heterogeneity accounts for differences in families' susceptibility to parental separation. We model duration (age) dependence in a flexible way using a step function $\lambda_s(t) = \exp(\sum_k \lambda_{s,k} I_k(t))$, where $k = (1, \dots, 9)$ is a subscript for age categories and $I_k(t)$ are time-varying dummy variables that are one in subsequent categories. We specify 9 age categories, 0-3, 4-5, 6-7, 8-9, 10-11, 12-13, 14-15, the penultimate one for

ages between 16 to 20 and the last interval is for ages from 21 years onwards up to 30 years.

Because we also estimate a constant term, we normalise $\lambda_{s,1} = 0$. All of our explanatory variables are defined in section 2.2 (see also Table 3).

The conditional density function for the completed durations until the parental separation occurs can be written as

$$f_s(t|x, u) = \theta_s(t|x, u) \exp\left(-\int_0^t \theta_s(s|x, u) ds\right) \quad (2)$$

Individuals for whom no parental separation occurred by the last age they are observed in the survey are assumed to have a right-censored duration of parental separation.

We model the onset of homelessness at time t conditional on observed characteristics x , prior parental separation at duration t_s and unobserved characteristics v as

$$\theta_h(t|x, t_s, v) = \lambda_h(t) \exp(x'\beta_h + \delta I(t_s < t) + v) \quad (3)$$

where $I(t_s < t)$ is an indicator function equal to one if parental separation occurred prior to time period t .⁹ Furthermore, $\lambda_h(t)$ represents individual duration dependence which is modelled using a step function $\lambda_h(t) = \exp(\sum_k \lambda_{h,k} I_k(t))$ which is specified using 12 age intervals: up to age 11, 12-13, 14, 15, 16, 17, 18, 19, 20-21, 22-23, 24-26 and 27 years or older. We normalize $\lambda_{h,1} = 0$.

The effect of previous parental separation on the onset of homelessness is measured by δ . This is the key parameter of interest as it informs us as to whether previous parental separation increases the risk of homelessness ($\delta > 0$), reduces the risk of homelessness ($\delta < 0$), or has no direct effect on the likelihood of experiencing homelessness ($\delta = 0$). The conditional density function for the completed duration until first homelessness can be written as

$$f_h(t|x, t_s, v) = \theta_h(t|x, t_s, v) \exp\left(-\int_0^t \theta_h(h|x, t_s, v) dh\right) \quad (4)$$

⁹ As we only know the age at which each event first occurs and not the actual date, we are unable to determine whether parental separation occurred first if both the onset of homelessness and parental separation occurred at the same age. It is for this reason that we allow parental separation to impact on initiation into homelessness if and only if it occurred at an earlier age.

Individuals who have not experienced homelessness by the age at which they are last observed in the data are assumed to have a right-censored duration until the onset of homelessness. The potential correlation between the unobserved components in the hazard rates for the initiation of parental separation and initiation into homelessness is taken into account by specifying the joint density function for the duration until parental separation t_s and the duration until homelessness t_h conditional on x as

$$f(t_s, t_h | x) = \int_u \int_v f_s(t|x, u) f_h(t|x, t_s, v) dG(u, v) \quad (5)$$

$G(u, v)$ is assumed to be a flexible discrete distribution with an unknown number of points of support. We will start assuming that for every transition process unobserved heterogeneity can be specified by a discrete distribution with two points of support. In combination this leads to four points of support: (u_1, v_1) , (u_1, v_2) , (u_2, v_1) , (u_2, v_2) , reflecting the finding of two types of individuals in both hazard rates for parental separation (high family susceptibility and low family susceptibility for parental separation) and two types in the hazard rate for homelessness (high susceptibility, low susceptibility). The four mass points imply that conditional on observed characteristics there are four types of individuals. The associated probabilities are denoted as follows:

$$\begin{aligned} Pr(u = u_1, v = v_1) &= p_1 & Pr(u = u_1, v = v_2) &= p_2 \\ Pr(u = u_2, v = v_1) &= p_3 & Pr(u = u_2, v = v_2) &= p_4 \end{aligned} \quad (6)$$

with $0 \leq p_c \leq 1$ for $c = 1-4$. These probabilities are modelled using a multinomial logit specification.

The parameter estimates are obtained using the method of maximum likelihood taking into account that our duration information relates to intervals rather than to exact durations. For example, an individual who indicated to have become homeless at age 16 may have become homeless on his 16th birthday or on the day before his 17th birthday. For this individual, we

model that he had not yet become homeless at age 15, but had become homeless before turning 17.

4 Parameter estimates

Tables 6 and 7 present parameter estimates of mixed proportional hazard models of the duration until parental separation and the duration until homelessness (with durations censored at 30), separately for women and men. The first two columns present estimates for separate models of parental separation and homelessness. The last two columns show results of the joint estimates. The main parameters of interest are the coefficients on parental separation before age 12 and the coefficient on parental separation from 12 to 30 in the equation for homelessness reported in the first two rows of the tables.

For women, parental separation before age 12 increases homelessness, but if the separation occurs after age 12, it has no effect on homelessness. The estimates indicate that for respondents whose parents separated before they were 12, the rate of entry into homelessness is more than double (i.e. a difference of $100(\exp(0.80)-1) = 123$ percent) the rate of otherwise similar women whose parents did not separate. The distribution of unobserved heterogeneity implies that 95 percent of females belong to the Type 1 group, having a positive starting rate for homelessness. Findings with regard to the determinants of the transition into homelessness suggest that adverse childhood circumstances (not living with parents because of death or conflict and emotional abuse) increase transitions into homelessness. In contrast caregivers' education does not affect transitions into homelessness.

Results for the case in which the unobserved components of the transition into parental separation and homelessness are correlated are contained in the last two columns of Table 6. There is no evidence of a correlation between the unobserved factors affecting parental separation and homelessness, i.e. the joint modelling does not improve on the separate

modelling. The null hypothesis of independent unobserved heterogeneity is examined using a Likelihood Ratio test. With a test statistic of 0.3, the null hypothesis is accepted at the 1% level suggesting that the unobserved heterogeneities determining the onset of parental separation and homelessness are independent.¹⁰

For men, the results differ: parental separation that occurs before and after age 12 increases transitions into homelessness. Here, with a LR-test statistic of 10.3 between the independent and joint models, we reject the null hypothesis at the 1% level of significance and conclude that the unobserved heterogeneities determining the onset of parental separation and homelessness are not independent. For men, the joint model estimates are therefore preferred and suggest that the rate at which respondents first experience homelessness is greater (than those whose parents did not separate): by 101 percent for those whose parents separated before they were 12 ($100(\exp(0.70)-1)$); and by 129 percent for those whose parents separated when they were older than 12 ($100(\exp(0.83)-1)$).

The distribution of unobserved heterogeneity implies that 39% of men belong to the Type 1 group, having a high parental separation occurrence rate and a high starting rate for homelessness (u_1, v_1); 32% belong to the Type 2 group with a low parental separation occurrence rate and a high starting rate for homelessness (u_2, v_1); while 6% are from the Type 3 group and have a high parental separation occurrence rate and a low starting rate for homelessness (u_1, v_2); finally, 23% (Type 4) have a low starting rate for both parental separation and homelessness (u_2, v_2). The identification of four types suggest that controlling for unobserved heterogeneity and taking the timing of events into consideration with the duration modelling is important. As for women, childhood adverse circumstances are found to increase men's transition rate into homelessness.

¹⁰ The LR test statistic for the null hypothesis that the unobserved heterogeneity terms are independent is distributed as a chi-squared with 1 degree of freedom.

On the basis of these findings, the sensitivity analysis that follows focuses on investigating the robustness of the estimated independent homelessness model for women, and of the estimated joint model for men.

5 Sensitivity Analysis and Extensions

In this section, we provide a number of specification tests for our modelling, as well as tests for whether the impact of parental separation differs between the end of a marriage and the end of a de-facto relationship and for a number of possible channels explaining the impact of parental separation on homelessness. Results are presented in Table 8.

First, we test our main model against alternative models with: (i) only one treatment effect for parental separation irrespective of the age at which this occurred; (ii) three treatment effects (one before age 12; one between 12 and 16; one between 17 and 30); (iii) only one treatment effect before age 12; and (iv) censoring at age 25 instead of age 30. For women, the preferred specification is test 3 and has only one treatment effect of parental separation occurring up to age 12, i.e. the effect of parental separation after age 12 is zero. Specifically, a model with only one treatment effect before age 12 performs better than a model with one treatment effect (test 1) (the log likelihood of test 3, -1373.6 is significantly larger than that of test 1, -1380.8) and better than models adding one or two treatment effects after 12 (the log likelihoods of test 2 and of the separate homelessness model in Table 6 are not better than test 3). For men, the results suggest that the best specification has only one treatment effect across all ages (test 1). The test 3 model with only one treatment effect before age 12 performs worse (the log likelihood of test 3, -3179.8 is significantly smaller than that of test 1, -3174.9); and adding one or two treatment effects after 12 does not improve the performance of the model (the log likelihoods of test 2 and of the joint model in Table 7 are not better than test 1). Finally, censoring at 25 years old instead of 30 years old only slightly increases the effects of parental

separation on homelessness. Given these results, we conduct all further robustness checks on the model used in test 3 for women and test 1 for men. These results suggest that parental separation increases the rate at which respondents first experience homelessness by 120 percent for women and 108 percent for men.

Second, we distinguish the effect of parental separation between the end of marriages and the end of de facto relationships. De facto relationships may characterise relationships that are less stable than marriages, i.e. in which partners rely less on their partner and protect themselves better against a potential break-up (by working or saving more for example or by not taking a long-term mortgage). As a result, the ending of the partnership may cause less of a financial shock for the partners helping them to avoid homelessness. At the same time, the ending of a marriage may provide more legal financial security to the less advantaged partner than the ending of a de facto relationship and therefore protect her better from homelessness. All in all, conceptually it is unclear whether endings of de facto relationships or marriages have larger impacts on initiation into homelessness. We divide the main sample into respondents whose parents were/are married (952 observations) and those whose parents were/are in a de facto relationship (279 observations). We run our preferred homelessness models on both subsamples. Essentially, for both boys and girls, the ending of a marriage is worse than that of a de facto relationship. The ending of a marriage more than doubles the transition rates into homelessness and the effects are significant at the 1% level, while the ending of a de facto relationship does not significantly increase transitions into homelessness (and the magnitude of these coefficients are half those of marriages).

Third, we test some possible mechanisms through which parental separation may increase homelessness. Results from the homelessness models in Tables 6 and 7 suggest that a number of other characteristics lead to homelessness: parents' death; conflict with parents and emotional abuse. If these characteristics result from the parental separation, they could be

channels through which parental separation affects homelessness, rather than potential confounding factors. To test this, we run our preferred models removing those characteristics one by one to see if this affects the estimation of the treatment effects. If they act as channels, the effects from parental separation to homelessness should be larger without those controls. We find this is mostly not the case suggesting that those variables are unlikely to be channels through which parental separation leads to homelessness. The only exception is the ‘conflict with parents’ variable for women: in this case we cannot rule out that the parental separation possibly led to conflicts within the household which ultimately led the youth out of their parents’ home and into homelessness.

Further, we test for other possible channels potentially resulting from the parental separation: (i) financial difficulties captured by having had utilities disconnected because of unpaid bills during childhood; (ii) family conflict leading to the placement of the respondent in State care and (iii) female caregivers’ difficulties in coping with the separation leading to substance abuse and mental health issues.¹¹ Most of these variables significantly increase the respondent’s transition rate into homelessness (except the female caregiver’s substance abuse for girls). However, they only have very little effect on the estimated treatment effect for parental separation, suggesting these are not channels. Controlling for being placed in State care and having utilities disconnected (for girls) lead to small decreases in the effect of parental separation, but the effect of parental separation on homelessness remains large and significant in all cases. This could either be because these variables are poor proxies for the underlying mechanism or because these variables actually have an independent effect on homelessness.

Finally, to illustrate the magnitude of the effects of parental separation on the entry into homelessness we perform some simulations on the basis of our preferred parameter estimates

¹¹ Male caregiver’s substance abuse and mental health issues were also investigated but those do not affect the transition rate of the respondent into homelessness. This is not surprising given that after a parental separation, most children would stay with their female caregiver rather than their male caregiver.

in combination with the characteristics of a hypothetical reference person. Our preferred estimates are those presented in Table 8 test 1 for men and test 3 for women. For the hypothetical individual we set all explanatory variables in our analysis to zero. So the hypothetical individual was not confronted during childhood with emotional abuse or physical or sexual violence and had males and female caregivers with less than primary school education. The top graph of Figure 3 shows the evolution of the cumulative probability to become homeless, by age for women. The lower line gives the evolution for women whose parents did not separate. By age 20 about 10% of these hypothetical women have become homeless, increasing to a little over 20% by age 30. The top line shows the situation in which the parents separated shortly after the birth of the hypothetical girl. Initially, parental separation has a small effect in absolute terms but by age 20 the hypothetical women already has a 20% probability to have become homeless. By age 30 this is more than 40%. In other words, the effect of parental separation doubles the probability to have become homeless by age 30. The bottom graph of Figure 3 shows both evolutions of the cumulative probability to become homeless for a different type of hypothetical women. These women were confronted with emotional abuse during childhood and were not living with their parents at age 14 because of conflict. Their cumulative probability to become homeless is much higher. Women whose parents did not separate have a 60% probability to have experienced homelessness by age 20, which increases to 80% by age 30. With an early parental separation these numbers are substantially higher; i.e. 85% by age 20 and 95% by age 30.

Figure 4 is similar to Figure 3 but now the hypothetical individual is a male. Since we find that for males it also matters whether their parents separated after age 12 we distinguish five potential situations: no parental separation; parental separations at age 1; 12; 15 and 20. The top graph shows that for men whose parents did not separate the cumulative probability to have experienced homelessness is about 25% by age 20 which increases to about 50% by age

30. There is not much difference between men whose parents separated when they were very young and men whose parents separated when they were 12 or 15 years old. For these groups, the cumulative probability to have become homeless at least once is 40% by age 20 and 65% by age 30. Parental separation occurring when the male is 20 years old increases the male's homelessness onset to the extent that by age 30 they are not so different from men whose parents separated at a very young age. The lower graph of Figure 4 shows similar differences for men who were confronted with emotional abuse and conflicts during their childhood. However, the differences between the different ages of the child at separation are not as large. Men whose parents did not separate have a probability of 80% to be homeless by age 30. This is about 90% in the case of a parental separation, irrespective of whether it occurred when the child was very young or much older.

6 Conclusions

Using a unique and detailed Australian dataset on homelessness experiences, we investigate the causal link between childhood experiences of parental separation and entry into homelessness in the short- and medium-run. In theory, parental separation and homelessness could be correlated through observable and unobservable family and individual characteristics. Unstable families or families which experience a negative financial shock may also be families that have children that are more likely to make a transition into homelessness. We utilize a bivariate hazard rate framework in which parental separation and entry into homelessness are allowed to be affected by observable and unobservable characteristics. This allows us to move beyond previous estimates of correlations and make an important contribution by investigate the causal link.

We find that even after controlling for potential observed and unobserved confounders there is a causal effect of parental separation on the first entry into homelessness. If parents

separate, their children are more likely to become homeless and the effect is substantial. Specifically, if parents separate before the child reaches age 12 the child has a 10–20 percentage point higher probability of being homeless by age 30.

Interestingly, we find effects that are not gender neutral. For girls, if their parents separate before they reach age 12, there is a clear positive effect on their entry into homelessness. However, if their parents separate after age 12, there is no effect. For boys, the effect of parental separation on their entry into homelessness persists, whereby even if the parental separation occurs after the age of 12 there is still a positive effect on their entry into homelessness. Our results suggest adolescent girls are more robust to parental separations than adolescent boys. Further, a surprising finding is that the effects of parental separations only occur when the parents were formally married. If parents were in a de facto relationship, a separation does not influence their children's chances of ending up homeless.

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Table 1: Prevalence and onset of parental separation and homelessness up to age 30

	Women	Men
<u>Homelessness</u>		
Ever (%)	73.9	71.7
Age onset	17.5	17.6
<u>Parental separation</u>		
Ever (%)	64.7	56.7
Age onset	7.3	8.3
N	564	667

Notes: Wave 1 and 6 respondents with information on parental separation and homelessness (1,231 observations). Only homeless spells and parental separations occurring before 30 are considered. The ages of onset are calculated conditional on homelessness occurring or parental separation occurring.

Table 2: Association between the timing of parental separation and homelessness (%)

	Women	Men
Parental separation before	48.8	42.3
Same age	1.2	2.3
Homelessness before	2.3	2.9
Not homeless, separation	12.4	9.3
No separation, homeless	21.6	24.3
Not homeless, no separation	13.7	19.0
N	564	667

Notes: Wave 1 and 6 respondents with information on parental separation and homelessness (1,231 observations). Only homeless spells and parental separations occurring before 30 are considered.

Table 3: Sample Characteristics (%)

	Women		Men	
	Not homeless by 30	Homeless by 30	Not homeless by 30	Homeless by 30
Do not live with parents because dead	4.1	6.7	4.2	8.4
Do not live with parents because conflict	3.4	10.8	2.1	7.5
Emotional abuse during childhood	32.0	66.9	42.3	65.3
Physical violence during childhood	33.3	64.0	48.2	68.6
Sexual violence during childhood	27.9	40.5	13.8	15.9
<i>Male caregiver's education</i>				
No schooling	2.7	0.2	2.1	1.7
Primary school	9.5	6.0	11.1	3.6
Some secondary, <=Y10	18.4	24.2	19.6	23.9
Y11 or equivalent	2.7	4.1	1.6	2.3
Y12 or equivalent	11.6	12.5	6.4	10.0
Technical College/TAFE	10.2	5.5	10.6	5.0
University	8.2	5.5	13.8	7.3
Missing	36.7	42.0	34.9	46.2
<i>Female caregiver's education</i>				
No schooling	4.1	2.2	4.8	2.3
Primary school	10.9	5.3	10.1	3.6
Some secondary, <=Y10	24.5	34.8	18.5	31.4
Y11 or equivalent	2.7	5.0	2.7	3.1
Y12 or equivalent	14.3	13.2	11.6	13.6
Technical College/TAFE	8.2	5.0	6.9	3.4
University	6.1	5.0	9.0	7.1
Missing	29.3	29.5	36.5	35.6
N	147	417	189	478

Notes: Wave 1 and 6 respondents with information on parental separation and homelessness (1,231 observations).

Table 4: Regression estimates of the effect of parental separation before age 12, women

Homeless	<=15	<=20	<=25	<=30
Separation before age 12	0.133*** (0.039)	0.251*** (0.043)	0.245*** (0.039)	0.217*** (0.035)
<i>Childhood</i>				
Parents dead	0.126 (0.083)	0.073 (0.085)	0.140* (0.075)	0.106 (0.070)
Conflict parents	0.384*** (0.066)	0.190*** (0.061)	0.104* (0.060)	0.080* (0.046)
Emotional abuse	0.086 (0.055)	0.245*** (0.070)	0.200*** (0.064)	0.177*** (0.061)
Physical violence	0.124** (0.057)	0.045 (0.071)	0.048 (0.063)	0.038 (0.061)
Sexual violence	0.057 (0.045)	-0.030 (0.046)	-0.051 (0.043)	-0.025 (0.041)
<i>Male caregiver's education</i>				
Primary school	-0.003 (0.069)	-0.118 (0.215)	0.073 (0.223)	0.307 (0.231)
Some secondary, <=Y10	0.018 (0.081)	0.046 (0.214)	0.239 (0.220)	0.339 (0.226)
Y11 or equivalent	-0.097 (0.126)	-0.085 (0.244)	0.166 (0.248)	0.357 (0.239)
Y12 or equivalent	-0.004 (0.090)	0.013 (0.219)	0.217 (0.224)	0.322 (0.229)
Technical College/TAFE	-0.032 (0.099)	-0.183 (0.224)	0.026 (0.229)	0.198 (0.233)
University	-0.039 (0.090)	-0.072 (0.222)	0.075 (0.228)	0.250 (0.232)
Missing	-0.002 (0.077)	-0.022 (0.214)	0.137 (0.219)	0.288 (0.224)
<i>Female caregiver's education</i>				
Primary school	-0.044 (0.092)	-0.032 (0.133)	-0.055 (0.135)	-0.114 (0.138)
Some secondary, <=Y10	0.053 (0.092)	0.083 (0.120)	0.088 (0.118)	0.050 (0.116)
Y11 or equivalent	0.132 (0.123)	0.246* (0.136)	0.134 (0.130)	0.071 (0.123)
Y12 or equivalent	0.133 (0.101)	0.111 (0.125)	0.017 (0.122)	-0.057 (0.121)
Technical College/TAFE	-0.109 (0.110)	0.082 (0.140)	0.053 (0.139)	-0.061 (0.138)
University	0.122 (0.115)	0.117 (0.142)	-0.018 (0.142)	-0.051 (0.140)
Missing	0.065 (0.093)	0.088 (0.122)	0.017 (0.119)	-0.041 (0.118)
<i>Missing info</i>				
Reason not living with parents	0.173 (0.151)	0.231 (0.177)	0.132 (0.178)	0.280** (0.129)
Violence	0.102* (0.055)	0.003 (0.061)	-0.008 (0.059)	0.042 (0.056)
N	547	528	522	518

Note: We remove from the sample homeless spells occurring before age 12; the number of observation decreases from one column to the next because of right censored observations due to age restrictions; absolute t-statistics in parentheses; ***/**/* indicates significance at a 1/5/10%-level.

Table 5: Regression estimates of the effect of parental separation before age 12, men

Homeless	<=15	<=20	<=25	<=30
Separation before age 12	0.115*** (0.035)	0.251*** (0.041)	0.263*** (0.036)	0.229*** (0.033)
<i>Childhood</i>				
Parents dead	0.137* (0.070)	0.201*** (0.067)	0.127* (0.066)	0.104* (0.061)
Conflict parents	0.283*** (0.088)	0.064 (0.080)	0.051 (0.074)	0.044 (0.059)
Emotional abuse	0.065 (0.041)	0.138** (0.058)	0.090* (0.055)	0.122** (0.050)
Physical violence	0.099** (0.041)	0.083 (0.058)	0.041 (0.055)	0.018 (0.050)
Sexual violence	0.001 (0.047)	-0.035 (0.055)	-0.062 (0.055)	-0.033 (0.050)
<i>Male caregiver's education</i>				
Primary school	-0.038 (0.127)	-0.072 (0.137)	-0.196 (0.152)	-0.154 (0.151)
Some secondary, <=Y10	-0.113 (0.130)	0.001 (0.126)	-0.060 (0.138)	-0.014 (0.137)
Y11 or equivalent	-0.078 (0.160)	-0.067 (0.176)	-0.065 (0.172)	-0.024 (0.164)
Y12 or equivalent	-0.037 (0.138)	0.051 (0.135)	0.004 (0.143)	0.047 (0.142)
Technical College/TAFE	-0.126 (0.134)	-0.110 (0.140)	-0.095 (0.153)	-0.101 (0.153)
University	-0.040 (0.137)	-0.096 (0.133)	-0.177 (0.144)	-0.137 (0.145)
Missing	0.004 (0.130)	0.038 (0.121)	-0.011 (0.133)	-0.022 (0.133)
<i>Female caregiver's education</i>				
Primary school	0.083 (0.082)	-0.093 (0.119)	-0.080 (0.131)	-0.044 (0.136)
Some secondary, <=Y10	0.133 (0.081)	0.240** (0.106)	0.243** (0.117)	0.197 (0.120)
Y11 or equivalent	0.128 (0.123)	0.157 (0.154)	0.234 (0.161)	0.218 (0.153)
Y12 or equivalent	0.083 (0.087)	0.176 (0.111)	0.171 (0.121)	0.159 (0.124)
Technical College/TAFE	0.055 (0.098)	0.150 (0.132)	0.034 (0.141)	-0.030 (0.145)
University	0.105 (0.097)	0.187 (0.120)	0.223* (0.128)	0.201 (0.132)
Missing	0.090 (0.081)	0.121 (0.103)	0.127 (0.116)	0.122 (0.119)
<i>Missing info</i>				
Reason not living with parents	0.191 (0.147)	-0.140 (0.149)	-0.063 (0.158)	-0.123 (0.153)
Violence	0.029 (0.063)	0.081 (0.068)	0.076 (0.062)	0.095* (0.054)
N	639	627	613	607

Note: We remove from the sample homeless spells occurring before age 12; the number of observation decreases from one column to the next because of right censored observations due to age restrictions; absolute t-statistics in parentheses; ***/**/* indicates significance at a 1/5/10%-level.

Table 6: Parameter estimates mixed proportional hazards model, parental separation and homelessness, women

	Separate		Joint	
	Parental sep.	Homelessness	Parental sep.	Homelessness
Separation before age 12		0.80*** (6.1)		0.86*** (6.5)
Separation from age 12 to 30		0.07 (0.4)		0.14 (0.7)
<i>Childhood</i>				
Parents dead		0.50** (2.5)		0.45** (2.3)
Conflict parents		1.30*** (6.5)		1.30*** (6.3)
Emotional abuse	0.21 (1.0)	0.69*** (3.7)	0.21 (1.0)	0.68*** (3.7)
Physical violence	0.17 (0.8)	0.30 (1.6)	0.17 (0.8)	0.30 (1.6)
Sexual violence	0.11 (0.7)	0.05 (0.4)	0.11 (0.7)	0.05 (0.4)
<i>Missing info</i>				
Reason not living with parents		0.84* (1.8)		0.87* (1.8)
Violence	-0.39* (1.9)	0.23 (1.3)	-0.38* (1.9)	0.24 (1.4)
<i>Male caregiver's education</i>				
Primary school	-0.12 (0.1)	0.85 (0.8)	-0.10 (0.0)	0.86 (0.1)
Some secondary, <=Y10	1.09 (0.9)	1.13 (1.1)	1.09 (0.2)	1.10 (0.2)
Y11 or equivalent	1.06 (0.8)	0.86 (0.8)	1.08 (0.2)	0.85 (0.1)
Y12 or equivalent	1.32 (1.1)	1.10 (1.0)	1.32 (0.2)	1.06 (0.2)
Technical College/TAFE	0.61 (0.5)	0.36 (0.3)	0.62 (0.1)	0.34 (0.1)
University	0.14 (0.1)	0.82 (0.8)	0.15 (0.0)	0.82 (0.1)
Missing	1.58 (1.3)	0.88 (0.8)	1.58 (0.2)	0.85 (0.1)
<i>Female caregiver's education</i>				
Primary school	0.65 (1.0)	-0.31 (0.5)	0.63 (0.9)	-0.32 (0.5)
Some secondary, <=Y10	1.07* (1.9)	0.10 (0.2)	1.06* (1.8)	0.08 (0.1)
Y11 or equivalent	1.03 (1.6)	0.47 (0.8)	1.02 (1.5)	0.45 (0.7)
Y12 or equivalent	1.77*** (3.1)	0.08 (0.1)	1.76*** (2.9)	0.07 (0.1)
Technical College/TAFE	0.75 (1.2)	-0.23 (0.4)	0.73 (1.1)	-0.25 (0.4)
University	2.23*** (3.6)	0.13 (0.2)	2.22*** (3.5)	0.13 (0.2)
Missing	1.46*** (2.6)	-0.04 (0.1)	1.44** (2.4)	-0.06 (0.1)
Constant	-4.78*** (3.6)	-8.17*** (7.0)	-4.77 (0.7)	-8.15 (1.4)
<i>Age (separation / homelessness)</i>				
4-5 / 12-13 years old	-0.28 (1.6)	2.48*** (8.2)	-0.28 (1.5)	2.47*** (7.9)
6-7 / 14 years old	-0.24 (1.3)	3.63*** (12.5)	-0.24 (1.2)	3.62*** (12.2)
8-9 / 15 years old	-0.31 (1.5)	4.16*** (14.7)	-0.30 (1.4)	4.14*** (14.3)
10-11 / 16 years old	-0.15 (0.7)	4.20*** (14.4)	-0.14 (0.6)	4.18*** (13.9)
12-13 / 17 years old	0.18 (0.8)	4.31*** (14.5)	0.19 (0.8)	4.28*** (14.3)
14-15 / 18 years old	0.47* (1.8)	4.41*** (14.6)	0.48* (1.7)	4.38*** (14.1)
16-19 / 19 years old	0.16 (0.5)	3.28*** (8.0)	0.17 (0.5)	3.25*** (7.9)
20+ / 20-21 years old	-0.53 (1.3)	3.67*** (11.2)	-0.54 (1.3)	3.63*** (10.8)
. / 22-23 years old		3.74*** (11.2)		3.70*** (10.9)
. / 24-26 years old		3.53*** (10.0)		3.48*** (9.9)
. / 27+ years old		4.11*** (12.1)		4.04*** (11.9)
Second masspoint	$-\infty$	$-\infty$	$-\infty$	$-\infty$
α_2	1.04*** (7.4)	2.91*** (8.0)		-0.98*** (6.7)
α_3				-2.91*** (7.8)
α_4				$-\infty$
Type 1 - high PS & high H (%)	73.9	94.8		70
Type 2 - low PS & high H (%)				26.2
Type 3 - high PS & low H (%)				3.8
Type 4 - low PS & low H (%)				0
-Loglikelihood	1,360.1	1,373.5		2,733.5

Notes: The age dependence structure for parental separation includes eight age intervals (indicated first) and the age dependence structure for homelessness includes 11 intervals (indicated last). Based on 564 observations; absolute t-statistics in parentheses; ***/**/* indicates significance at a 1/5/10%-level.

Table 7: Parameter estimates mixed proportional hazards model, parental separation and homelessness, men

	Separate		Joint	
	Parental sep.	Homelessness	Parental sep.	Homelessness
Separation before age 12		1.02*** (7.0)		0.70*** (4.0)
Separation from age 12 to 30		0.87*** (4.6)		0.83*** (3.7)
<i>Childhood</i>				
Parents dead		0.61** (2.6)		0.56** (2.1)
Conflict parents		1.16*** (4.6)		1.08*** (4.5)
Emotional abuse	1.08*** (4.2)	0.51*** (2.8)	1.11*** (4.2)	0.71*** (3.5)
Physical violence	-0.02 (0.1)	0.35* (1.8)	-0.03 (0.1)	0.36* (1.8)
Sexual violence	-0.14 (0.6)	0.13 (0.8)	-0.10 (0.4)	0.23 (1.2)
<i>Missing info</i>				
Reason not living with parents		0.22 (0.5)		0.12 (0.3)
Violence	0.49* (1.8)	0.23 (1.0)	0.45 (1.6)	0.26 (1.1)
<i>Male caregiver's education</i>				
Primary school	-0.63 (0.8)	-1.03* (1.9)	-0.58 (0.6)	-1.39** (2.1)
Some secondary, <=Y10	-0.36 (0.5)	-0.36 (0.7)	-0.26 (0.3)	-0.52 (0.8)
Y11 or equivalent	0.07 (0.1)	-0.49 (0.7)	0.01 (1.0)	-0.79 (1.0)
Y12 or equivalent	-0.15 (0.2)	-0.10 (0.2)	-0.14 (0.2)	-0.42 (0.6)
Technical College/TAFE	-0.98 (1.2)	-0.83 (1.4)	-0.87 (1.0)	-1.16* (1.7)
University	-0.74 (0.9)	-0.69 (1.2)	-0.65 (0.8)	-1.02 (1.5)
Missing	0.32 (0.4)	-0.18 (0.3)	0.37 (0.5)	-0.33 (0.5)
<i>Female caregiver's education</i>				
Primary school	0.51 (0.8)	-0.29 (0.6)	0.46 (0.7)	-0.30 (0.6)
Some secondary, <=Y10	1.35** (2.4)	0.74* (1.7)	1.19** (2.0)	0.97** (2.1)
Y11 or equivalent	1.44** (2.0)	0.67 (1.3)	1.42* (1.9)	0.90 (1.6)
Y12 or equivalent	0.94 (1.6)	0.37 (0.8)	0.90 (1.4)	0.65 (1.4)
Technical College/TAFE	1.05 (1.6)	0.26 (0.5)	0.90 (1.3)	0.50 (0.9)
University	0.57 (0.9)	0.53 (1.1)	0.41 (0.6)	0.62 (1.2)
Missing	0.66 (1.2)	0.53 (1.2)	0.63 (1.1)	0.89* (1.9)
Constant	-3.65*** (4.7)	-6.80*** (11.4)	-3.55*** (4.3)	-6.83*** (10.0)
<i>Age (separation / homelessness)</i>				
4-5 / 12-13 years old	-0.07 (0.4)	1.53*** (5.3)	-0.06 (0.3)	1.59*** (5.3)
6-7 / 14 years old	0.17 (0.8)	2.78*** (11.0)	0.21 (1.0)	2.85*** (11.0)
8-9 / 15 years old	0.19 (0.8)	3.35*** (13.9)	0.24 (0.9)	3.43*** (13.7)
10-11 / 16 years old	0.36 (1.3)	3.79*** (15.8)	0.40 (1.4)	3.90*** (15.7)
12-13 / 17 years old	0.67** (2.4)	4.13*** (16.9)	0.71** (2.4)	4.30*** (17.0)
14-15 / 18 years old	0.60* (1.8)	4.05*** (15.0)	0.62* (1.7)	4.28*** (15.4)
16-19 / 19 years old	0.28 (0.8)	3.96*** (13.7)	0.28 (0.8)	4.27*** (14.1)
20+ / 20-21 years old	-0.40 (1.0)	3.41*** (11.1)	-0.40 (1.0)	3.79*** (11.4)
. / 22-23 years old		3.38*** (10.3)		3.86*** (11.2)
. / 24-26 years old		3.39*** (10.3)		3.95*** (11.0)
. / 27+ years old		3.82*** (11.6)		4.46*** (12.0)
Second masspoint	-2.72*** (8.6)	-2.37*** (6.5)	-2.62*** (8.0)	-2.76*** (8.5)
α_1	-0.02 (0.1)	1.28*** (4.2)	0.53** (2.5)	
α_2			0.34 (1.4)	
α_3			-1.27*** (2.8)	
Type 1 - high PS & high H (%)	49.6	78.2	38.8	
Type 2 - low PS & high H (%)			32.1	
Type 3 - high PS & low H (%)			6.4	
Type 4 - low PS & low H (%)			22.7	
-Loglikelihood	1,550.0	1,629.9	3,174.7	

Notes: The age dependence structure for parental separation includes eight age intervals (indicated first) and the age dependence structure for homelessness includes 11 intervals (indicated last). Based on 667 observations; absolute t-statistics in parentheses; ***/**/* indicates significance at a 1/5/10%-level.

Table 8: Sensitivity analysis

	Women (Separate H model)			Men (Joint model)		
	Coeff.	s.e.	-Loglik.	Coeff.	s.e.	-Loglik.
1. With 1 treatment effect before 30	0.64***	(4.9)	1,380.8	0.73***	(4.5)	3,174.9
2. With 3 treatment effects						
Separation before 12	0.80***	(6.1)	1,373.5	0.72***	(4.2)	3,174.2
Separation from 12 to 16	0.08	(0.4)		0.99***	(4.2)	
Separation from 17 to 30	0.04	(0.1)		0.51	(1.0)	
3. With 1 treatment effect before 12	0.79***	(6.3)	1,373.6	0.58***	(3.6)	3,179.8
4. Censoring after 25	0.85***	(6.4)	1,221.5	0.76***	(4.9)	2,950.6
5. Marriages	0.84***	(5.3)	997.9	0.80***	(4.1)	2,474.6
6. De facto relationships	0.40	(1.1)	353.1	0.37	(0.8)	629.6
7. Without control for not living with parents' because dead	0.78***	(6.2)	1,375.8	0.69***	(4.3)	3,177.8
8. Without control for not living with parents because of conflict	0.85***	(7.0)	1,392.4	0.75***	(4.2)	3,183.9
9. Without emotional abuse	0.82***	(6.5)	1,380.5	0.79***	(4.9)	3,181.5
10. With control for utilities disconnected	0.74***	(5.9)	1,371.0	0.71***	(4.3)	3,167.3
11. With control for State care	0.73***	(5.9)	1,370.3	0.61***	(3.9)	3,168.8
12. With control for female caregiver's substance abuse	0.79***	(6.1)	1,373.4	0.76***	(4.4)	3,173.2
13. With control for female caregiver's mental health issues	0.77***	(6.0)	1,371.3	0.72***	(4.4)	3,170.3
14. With control for male caregiver's substance abuse	0.77***	(6.1)	1,370.0	0.74***	(4.5)	3,173.2
15. With control for male caregiver's mental health issues	0.77***	(6.2)	1,370.1	0.74***	(4.5)	3,174.8

Notes: For panels 4 onwards, the effects estimated are for separations before age 12 for women, and before age 30 for men; absolute t-statistics in parentheses; ***/**/* indicates significance at a 1/5/10%-level.

Figure 1: Cumulative starting probabilities for parental separation and the onset of homelessness, women

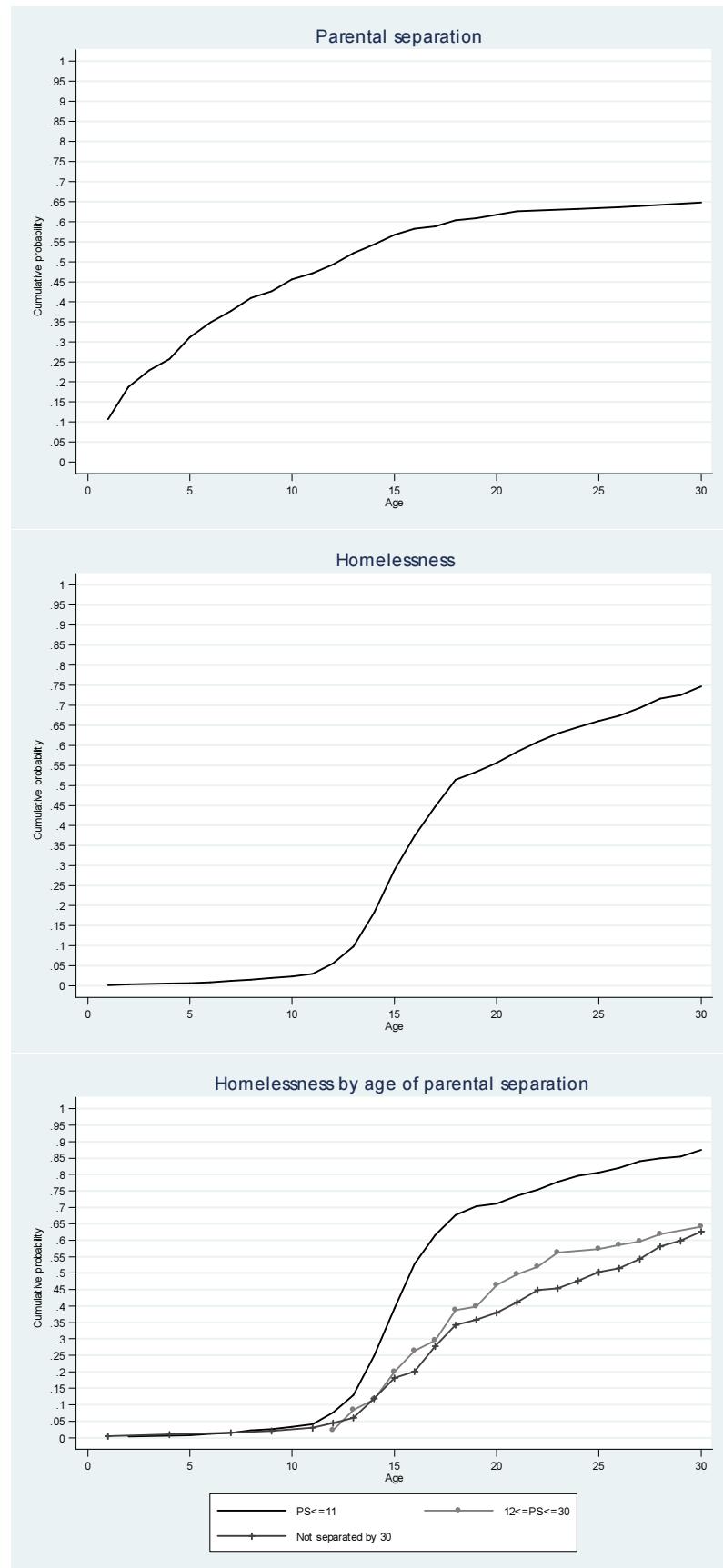


Figure 2: Cumulative starting probabilities for parental separation and the onset of homelessness, men

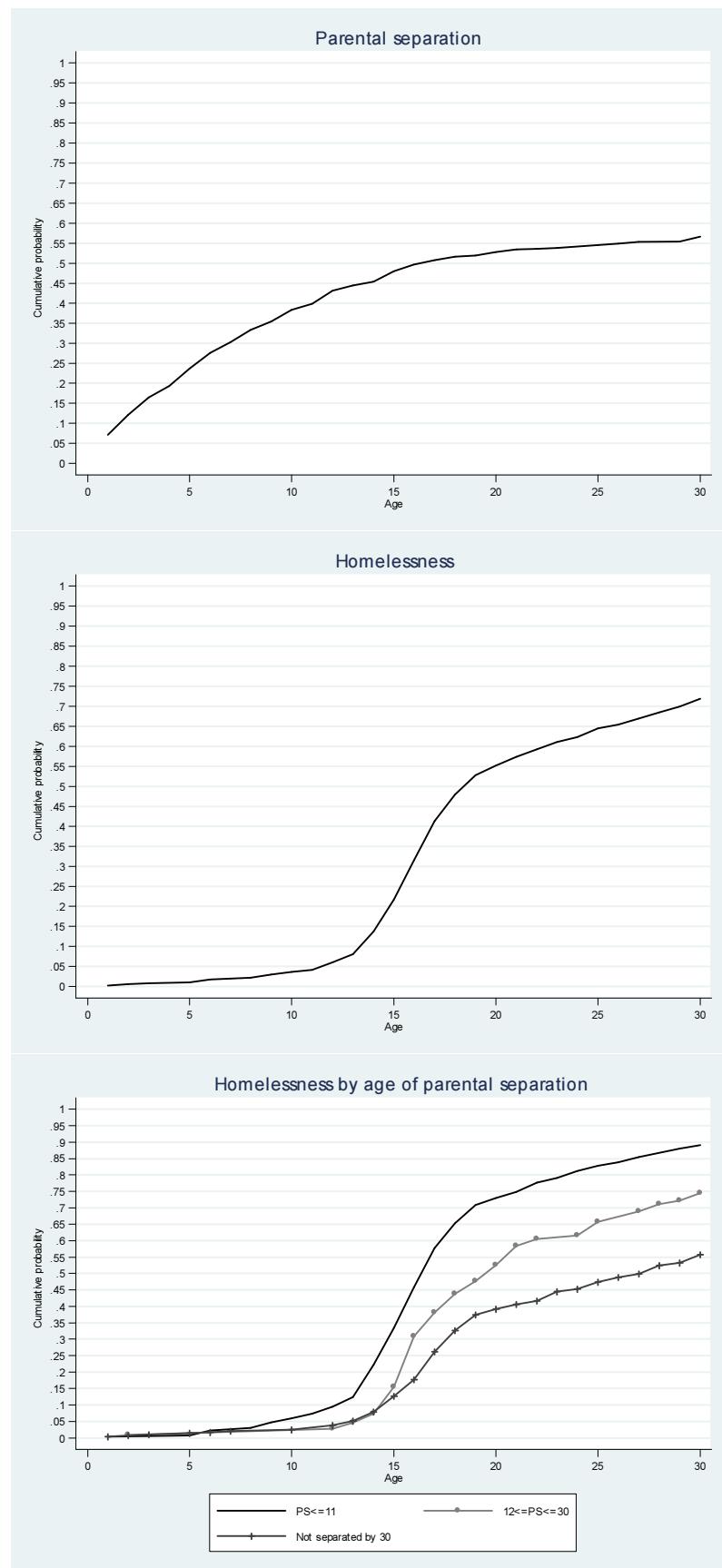


Figure 3: Simulated cumulative starting probabilities for the onset of homelessness, women

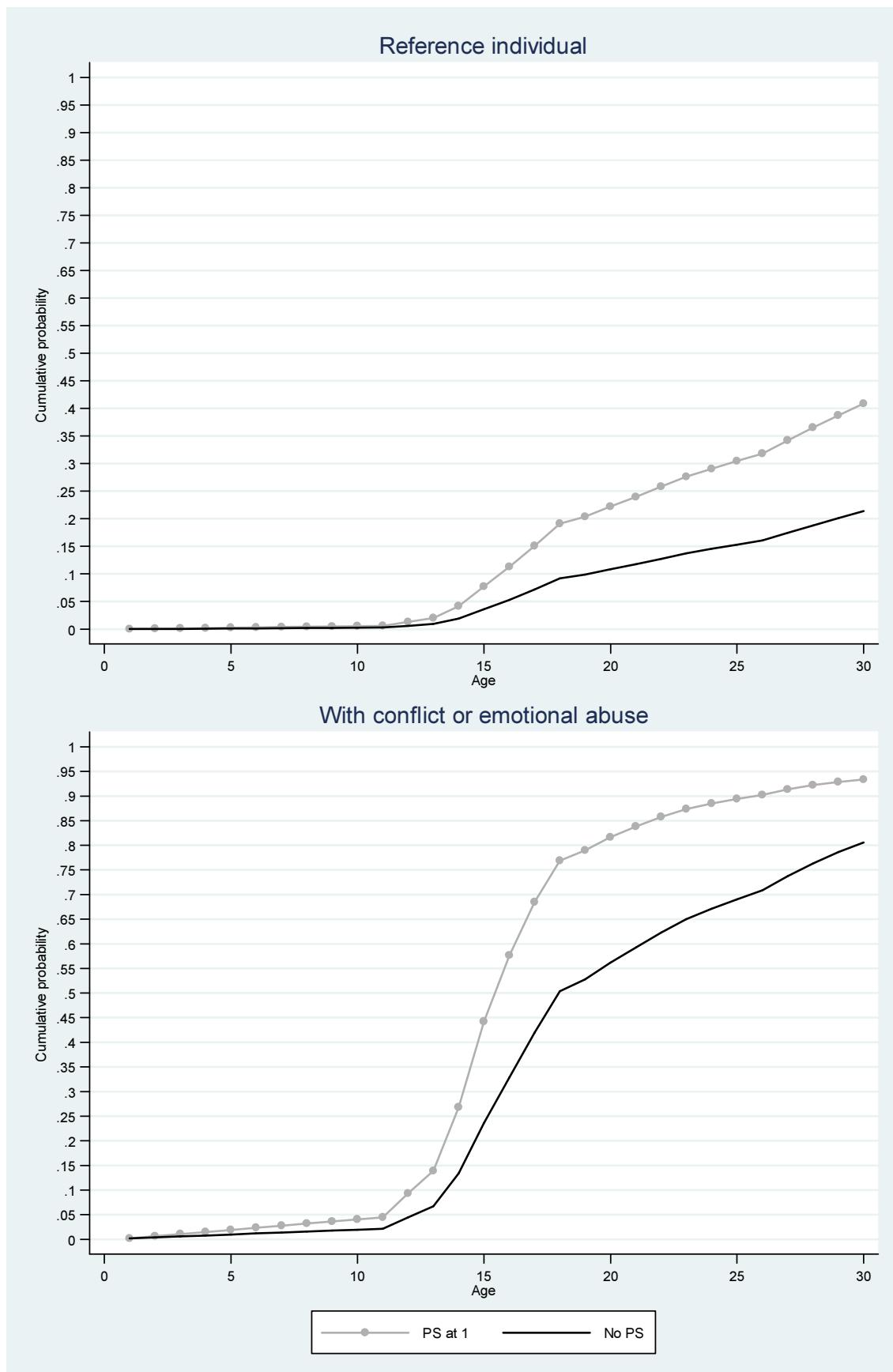


Figure 4: Simulated cumulative starting probabilities for the onset of homelessness, men

