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Family Structure, Housing and Child Health

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Abstract:

Why is it that children who live with a single mother two cohabiting parents have poorer heath and developmental outcomes than children who live with two biological parents? Differential access to high quality and stable housing circumstances by family structure may be one important factor, especially in countries like the United States where housing costs are high and housing assistance is difficult to obtain. Because family structure is strongly linked to income, married, two parent families are likely to be in a better position to be able to afford adequate housing. Dissolution, more likely amongst unmarried parents, is likely to be linked to housing instability and moves into lower quality housing or public housing projects, both of which have been shown to be negatively associated with child outcomes. Using data from the Fragile Families and Child Wellbeing Study, this paper aims to identify whether and how housing and family circumstances are associated with and inter-related in the production of child health. Findings suggest strong links between family structure and housing tenure, but the nature of the relationships with one another and with child health vary according to the health outcome considered. For childhood asthma, non-marital family structures are persistently associated with poor health. Nonetheless, housing tenure appears to be an important explanatory pathway, and children of social housing tenants appear particularly at heightened risk. In contrast, when a general health assessment measure is examined, initial differentials by non-marital family structure are narrow and appear to be mediated by housing tenure. Moves out of owner-occupation and into rented accommodation is, for both outcomes, associated with poor health.

Introduction

It is well established that, for a wide range of outcomes and across a wide range of industrialized countries, children who grow up living with married biological parents have, on average, better outcomes than children who experience other family structures (for reviews see Amato and Keith 1991a; Amato and Keith 1991b; Amato 2000; McLanahan and Sandefur 1994; Sigle-Rushton and McLanahan 2004). However, it is less clear what this association means and how it should be interpreted. A good deal of debate has centred on whether the association represents something "real" or merely spurious, and a wide range of statistical methods – each with their own strengths and limitations -- have been deployed in an attempt to remove selection bias and identify the direct or "causal" effect of family structure on child outcomes (see Sigle-Rushton and McLanahan 2004 or Steele, Sigle-Rushton and Kravdal 2008 for a discussion). In much of this work, researchers have focused predominantly on whether and how parameter estimates linking family structure and child outcomes change before and after some sources of bias are controlled or expunged. The predominant concern is whether the parameters remain significantly different from zero after techniques to control for self-selection or to remove unobserved heterogeneity bias are applied.

Although the potential for unobserved heterogeneity and selection bias raises important and vexing questions about how to interpret evidence, concerted efforts to identify the "causal" effects of family structure may have diverted attention from other equally relevant questions about the sources of differentials in child outcomes by family structure. Whether or not significant associations are biased, it is both theoretically and policy relevant to devote careful attention to understanding what the underlying processes are: why it is that children who live with a single mother have poorer heath and developmental outcomes than children who live with two biological parents. Reviews of the literature often outline plausible explanatory processes, but studies seeking to adjudicate between differing hypotheses or to develop a greater understanding of the processes that lead to poorer outcomes are far less common than studies seeking simply to determine whether any statistically significant association can be "written off" as a spurious relationship by applying more advanced statistical techniques and/or including a range of more or less exogenous controls in (what economists refer to as) reduced form rather than structural models. This stripped down approach means that researchers have devoted relatively less attention to identifying links between family structure and the more proximate factors that produce particular outcomes, many of which might also be endogenous themselves. A better understanding of the factors and processes the might plausibly underlie or contribute to the link between family structure and child outcomes is both theoretically relevant and could usefully inform the development of effective policy interventions (Sigle-Rushton and McLanahan 2004).

Focusing on the association between family structure and child health, this paper examines brings together several different literatures to motivate an examination of the role of housing as a potential explanatory link. Both housing quality and housing stability have been shown to be strongly linked to child well-being (Ziol-Guest and McKenna 2009; Fertig and Reingold 2007). A cramped and crowded home environment, which facilitates the transmission of disease, has been shown to be associated with a range of respiratory and gastrointestinal problems in children (Leventhal and Newman 2010). A somewhat separate literature has established links between family structure or family transitions and housing circumstances (Feijten and Van Ham 2010; Grinstein-Weiss et al 2011; Kalil and Ryan 2010). Because of their higher socio-economic status (Sigle-Rushton and McLanahan 2002), married couples are better able to afford good quality housing for themselves and their children. Although they benefit from shared resources and economies of scale, unmarried

cohabiting couples in the United States tend to be more disadvantaged than their married counterparts, and they are thus likely to struggle to find affordable housing. In addition to any direct effects on child health outcomes, insalubrious housing conditions might also indirectly influence child health if the stress of coping with substandard or unaffordable housing impairs parenting (Evans 2001; Sandel and Wright 2007). Furthermore, efforts to cope adequate space and/or amenities couple put a strain on parental relationships. Whether or not the stress of living in poor housing conditions leads to a divorce or dissolution, conflict between parents has also been shown to be detrimental for child outcomes. Dissolution, more likely amongst unmarried couples, is also likely to generate disruptive residential moves into lower quality housing (which is likely to be located in deprived neighborhoods) or into public housing projects. Again, the latter have been shown to be associated with poor adult and child health outcomes. Residential moves could also deprive families of social capital and disrupt continuity of the provision of health care and other services.

A small number of studies have considered the implications of some of these processes for child well-being. Previous studies have tended to utilize samples of adolescents, focusing predominantly on the association between residential instability and measures of psychological adjustment and/or academic achievement (see, for example, Astone and McLahanan 1994; Adam 2004). To date, we know little about the implications for physical health outcomes or how younger children are affected.

Data

This study uses data from the Fragile Families and Child Wellbeing Study, a joint effort by researchers at Princeton and Columbia Universities. The study, funded by a host of government organizations and private foundations in the United States, was designed to provide new information on the capabilities and relationships of new, unwed parents (particularly unwed fathers), as well as the effects of policies on family formation and child well-being. The mothers' first interview took place in the hospital, within 48 hours of the delivery. Fathers were also interviewed, often in the hospital, a short time later. The baseline data, collected between 1998 and 2000, contains information on 3,712 deliveries to unmarried parents in 20 large US cities, and is representative of all non-marital deliveries in US cities with populations of 200,000 or more. In each city, a comparison group of married parents was interviewed, providing a sample of 1,188 deliveries to married parents, and so these data contain the information needed to compare the family and housing circumstances of married and unmarried parents.[1] Follow-up interviews took place when the children were about 1 (wave 2), 3 (wave 3), 5,and 9 years old.

This analysis is carried out using only the first three waves of data. The first three years of life are critical for child development. In addition, during the preschool years, many children will spend large amounts of time exposed to the home environment. To construct the analytic sample, we first select all mothers who were interviewed at wave 3 and completed an additional in-home interview. Those who were not living with the child at the wave 3 interview and those who report an ethnicity other than black, white or Hispanic were excluded. With only a few exceptions which are explained below, we further excluded families with missing information on any of the variables of interest, and so our final analytic sample includes left with 2,294 unmarried couples and 727 married couples.

We consider two indicators of child health: asthma and a general assessment of the child's health. Asthma is common childhood illness in the United States. It has been linked in a vast

[1] Because women who are unmarried at birth are over-sampled, summary statistics are presented separately for each group. In addition, controls for family structure are included in all multivariate models.

literature to housing circumstances (Leventhal and Newman 2010) and, in a more limited literature, to family structure (Harknett 2009; Liu and Heiland 2009) and to parental stress (Sandel and Wright 2007). During the in-home interview, mothers were asked whether a doctor or health professional had told her that the child has asthma. Information from a similar question asked at wave 2 was used to fill in missing information for one additional case. The second dependent variable is constructed using information provided by the mother about her child's health. At the wave 3 interview, the mother is asked the describe her child's health as excellent, very good, good, fair, or poor, and, following previous research, our dependent variable identifies children whose health is reported as anything other than excellent or very good. Responses to the (exact) same question during the in-home interview are used to fill in missing information for 731 cases which are flagged with an additional dummy variable. The results presented below are robust to the exclusion of these cases. Table 1 presents means for each of the variables according by marital and relationship status at baseline. For both measures, the children born to married mothers tend to fare best. Only 13 percent of married mothers report having been told that their child has asthma, compared to 24 percent of unmarried mothers. Differences in reported health are less marked. About 9 percent of mothers who were married at birth report that their child's health is good, fair or poor. Amongst unmarried mothers the figure is 13 percent. Unmarried mothers who were cohabiting with the father at the time of birth report less asthma than unmarried mothers who were not (20 percent versus 28 percent). In contrast, the general health assessments are relatively similar.

The Fragile Families data contain rich and detailed information about family structure and family structure transitions at the baseline and each of the follow-up waves. Using information provided at birth and the first follow-up, we distinguish a range of different structures and transitions. We first identify those mothers that, in the first year of their child's life, were continuously married to the father of their child. Next we distinguish those who continuously cohabited with the father, transitioned into marriage, transitioned into cohabitation with the father, lived apart from the father at birth and at the first wave, dissolved their relationship with the father, and, finally, those who report having married someone who is not the father of their child. When a woman reports that she is cohabiting with but not married to a new partner, this relationship is ignored and she is coded based on her relationship with the father. As cohabiting unions are often unstable and as we rely only on snapshot measures of family structure at the time of the interview, it is possible that some women who are living alone at wave 2 formed and dissolved cohabiting unions with a new partner prior to the interview. It is far less likely that someone will have married and divorced in the first year of their child's life. Summary statistics of the family status variables are presented, by relationship status at baseline, in the first rows of Table 2. Here we see that marriages are far more stable than cohabiting partnerships. About 30 percent of mothers who were cohabiting at birth are no longer living with the father at the time of the age 1 interview. In contrast, only around 6 percent of married partnerships have dissolved. Given the short time span between the first and second interviews, it is not surprising that transitions to (married) step-families are rare, regardless of relationship status at birth. But because it is such a unique status, it was difficult to see how to incorporate it into one of the other categories.

Two additional variables capture changes between waves 2 and 3. The first is set equal to one for those mothers who either transition from cohabitation into marriage or from living apart to a co-residential relationship with the father (cohabitation or marriage). The second is set equal to one for those women who either dissolve a co-residential relationship with the father or form a step-family by marrying someone other than the father. Means for these additional variables are also presented in Table 2. Although another 18 percent of mothers who were cohabiting with the father at birth separate before their child is three years old,

around 30 percent have transitioned to marriage by the time of the age 3 interview. Only around 9 percent of women who were not cohabiting at birth move in with or marry the father of their child after the first year.

Compared to the later waves, information on housing tenure at baseline is somewhat limited. For this reason, our analysis of child health at wave 3 includes measures of housing tenure at wave 2 and accounts for transitions between waves 2 and 3. At wave 2, we distinguish mothers who are owner-occupiers, those who rent independently, those who receive government support (rent support or a public housing unit) and those in other housing situations. The vast majority of those in the final category -- well over 90 percent -- are doubling up in some way with family or friends. Information on the distribution of housing tenure and subsequent transitions by relationship status at birth is presented in the bottom rows of Table 2. Married mothers are far more likely than unmarried mothers to be owner-occupiers by the time their child reaches one year of age and they are both relatively and absolutely more likely than other women to make the transition to owner-occupation between waves 2 and 3. Unmarried mothers are more reliant on some form of government assistance, and, amongst unmarried mothers, those who were not cohabiting with the father at birth tend are least likely to rent independently. Even though more than half of unmarried mothers report having changed residence at least once between the second and third wave of data collection (compared to about a third of married mothers), only about 30 percent report a change of tenure. Cohabiting mothers are more likely to move into owner-occupation, but the rates are low. For both groups of unmarried mothers, there appears to be some churning in and out of doubling up arrangements, although with more moving out than in, the direction does seem to be towards more independent circumstances (perhaps as people move up waiting lists for housing assistance).

To help understand any observed differentials in child health by housing tenure, we also include, in some model specifications, controls for the quality of the home environment. Although the home observation data at wave 3 provide rich information on health hazards (both within and around the home) and noise, a substantial portion of our sample are missing information on these variables and including them in the analysis would mean a far smaller and potentially more select (based on preliminary analyses of the data) sample. To preserve sample size, we rely on information provided in either the core or in-home surveys at wave 3. For the majority of mothers, the in-home survey collected information on household size and number of rooms. We use this information to construct a measure of over-crowding: an indicator set equal to one if the woman lives in a household with more than one person per room. For women living in one of the two cities where the in-home survey was piloted, information on household size is missing. Because information on over-crowding is arguably missing at random for these women, we impute a measure of crowding for them and include an imputation flag in the models. Additional measures of the quality of the home environment include whether there are smokers in the household (perhaps difficult to control when doubling up with others) and whether the mother reports that, in the past year, her home was uncomfortably cold for 48 hours or more. Means by family structure at birth, presented in Table 2, indicate that unmarried mothers bring their child up in more crowded homes and are more likely to raise their child in a house with someone who smokes. Although it is a relatively rare experience, unmarried mothers about twice as likely as married mothers to report that their home was uncomfortably cold in the past year. The descriptive statistics suggest a close relationship between family status and housing: women who are married at birth appear best able to maintain secure and appropriate housing in the first years of their children's lives which might contribute towards the production of better child health outcomes.

Additional control variables include mothers' age at birth, her ethnicity, and education level as well as the child's sex and birth order. Means for these variables are presented in Table 3. As previous research has shown (see, for example, Sigle-Rushton and McLanahan 2002), married mothers are older and better educated than unmarried mothers which may explain part of the health advantages we see in their children.

Methods

Our aim in this paper is to assess whether and to what extent access to housing explains advantages in children's health at age 3 by family structure. To answer this question we estimate, for each health outcome, a series of nested models. In the first specification (m1) we include the summary measures of family structure in the first year of the child's life as controls. With model m2, we introduce measures of housing tenure at wave 2. The third specification adds transitions in family and housing in waves 2 and 3. Because married women appear to have greater access to resources they may be more buffered from the consequences of (apparently) downward moves, and they may be particularly advantaged by transitions into home ownership. Similarly, owner-occupiers may be better placed to cope with the loss of economies of scale that accompanies a relationship breakdown. To test inter-relations of this sort, a fourth specification (m4) interacts marital status at wave 2 with housing transitions between waves 2 and 3. In the same specification, housing tenure at wave 2 (owner occupation and shared/other) is interacted with the wave 2-3 family transition variables. In the final specification, m5, we add the additional housing measures and the socio-economic controls. We are interested in assess whether and how much family structure differentials narrow when differences in access to housing are introduced, but our focus is not whether they narrow but what explains any narrowing that we observe.

Results

Table 4 presents the parameter estimates, in the form of odds ratios, for each of the 5 model specifications with childhood asthma at age 3 as the outcome variable. In the first specification which controls only for the mothers' family and relationship status in the first year of the child's life, most of the odds ratios are large and significant. The results indicate that children born to mothers who were not cohabiting with the father at birth, regardless of whether they later cohabit with him, are significantly more likely to develop asthma by age 3, with odds that exceed three to one. The odds ratio for children in families that dissolve are only slightly smaller at 2.82:1. Although children born to mothers that continuously cohabit with the father and those who marry him in the first year also fare worse than children born to continuously married mothers, the differences are more moderate than what we observe for the other categories (with the exception of the step-family category which is supported by only a small number of cases).

Differences between children of continuously married and continuously cohabiting mothers are only borderline significant in m2, when controls for wave 2 housing tenure are added. Although they remain significant, the other (previously significant) odds ratios are smaller in this specification, even though only one of the wave 2 housing tenure variables – receipt of government housing assistance -- is significantly associated with asthma (odds: 1.75:1). When additional controls for housing and family transitions are added in the third specification, the odds ratio associated with continuous cohabitation is no longer significant at conventional levels. In the final model, the odds ratio for a transition into marriage becomes insignificant as well. Consistent with the extant literature, over-crowding is a significant predictor of asthma in m5, but living in a household with adults who smoke does is not. The odds ratios associated with solo motherhood, either at birth or as a consequence of dissolution, which were relatively large to begin with, are reduced in size but remain significant in the final model. To summarise, the results in Table 4 suggest that housing

circumstances, at least as we have measured them, only partially explain the increased risk of asthma amongst children living with unmarried or single mothers.

Results from similar model specifications, this time estimated for a general measure of child health at age 3 as the dependent variable, are presented in Table 5. For model m1, the odds ratios are notably smaller than what we observed in the previous table for asthma and they are only significant for of the family summary variables. When housing tenure is added in the second model specification, none the family status groups differ significantly from the continuously married. Similar to what we saw with asthma, children whose mothers receive some form of government housing assistance have the worst reported health, however the housing controls are also significant and the odds ratios for all three are well in excess of 2:1. We see little evidence of substantial interaction effects in m4, but similar to the results for asthma, downward moves from owner-occupation are associated with poorer children health outcomes. In contrast to what we saw with asthma, it is cold housing as opposed to crowded housing which appears to explain some of the residual housing differentials in model m5.

Conclusion

In this paper, we set out to explore whether and how housing circumstances might explain differences in child health by family structure. We suggested that because of their higher socio-economic status (Sigle-Rushton and McLanahan 2002), married couples should be better able to afford good quality housing for themselves and their children. Although they would benefit from shared resources and economies of scale, and so perhaps fare better than single mothers, we posited that cohabiting couples might, nonetheless, find it more difficult than married couples to secure adequate, affordable housing. If this was the case, differences in their housing circumstances might go so some way towards explaining why their children tend to have relatively worse health outcomes. Our findings provide some limited support for these ideas.

Examining two different measures of child health, we find that family structure is more strongly and more persistently linked to asthma than to a general measure of health. In models of childhood asthma we found large family gaps and some evidence that housing, particularly social housing, may play a partial explanatory role. It appears most relevant to comparisons across various kinds of (more stable) two parent families. However gaps between married and single mothers at birth are only partially mediated by the controls for housing and housing quality that we introduce. Although the findings suggest that it would behove researchers to play closer attention to the role of housing, at the same time good deal of variation across these groups remains to be explained. Other processes need to be considered as well.

When the outcome was a general health measure, we found stronger evidence of links with housing but as family gaps were more moderate, the explanatory role of housing was, for a different reason, somewhat limited. Although married mothers, on average, report that their children enjoy better overall health, differentials by family status are far narrower and differentials by housing status are far more pronounced than what we observe for childhood asthma. Moreover, when we examine a broad measure of child health, it is housing circumstances that persist and appear to require further exploration and consideration.

Although in both models, there are some significant family and housing interactions, for the outcomes we consider, the results provide preliminary evidence for a small set of potential interactions. The children of owner-occupiers might be somewhat buffered from some of the negative effects of dissolution, and for asthma, there is some evidence that transitions to owner-occupation are particularly effective.

Despite some similarities, the results indicate that findings may be sensitive to the choice of outcome measure. Future research should seek not only to incorporate additional competing processes and but to understand whether and why their contribution differs.

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TABLE 1: MEANS OF OUTCOME VARIABLES BY MARITAL AND RELATIONSHIP STATUS AT BIRTH

	sample size	asthma at age 3	good, fair, or poor health
married	727	0.13	0.09
unmarried (all)	2,294	0.24	0.13
cohabiting	1,105	0.20	0.13
not cohabiting	1,189	0.28	0.14

TABLE 2: MEANS OF FOCAL CONTROL VARIABLES BY MARITAL AND RELATIONSHIP STATUS AT BIRTH

	married	cohabiting	not cohabiting
Relationship/family structure, wave 1-2			
continuoulsy married	0.95	--	--
continuously cohabit	--	0.56	--
transition to marriage	--	0.15	0.04
transition to cohabitation	--	--	0.17
live apart from father, both waves	--	--	0.78
dissolved relationship	0.05	0.29	--
married new partner	0.01	0.01	0.01
Family transitions, waves 2-3			
into marriage or cohabition with father	--	0.15	0.09
dissolve relationship/ form step-family	0.07	0.18	0.12
Housing at wave 2			
Owner-occupier	0.50	0.11	0.05
rent independently	0.35	0.46	0.30
housing assistance/project	0.06	0.17	0.22
Other	0.09	0.26	0.43
Housing transitions, waves 2-3			
no change	0.78	0.71	0.69
to owner-occupation	0.11	0.05	0.03
from own to (any) rent	0.04	0.01	0.01
to other (doubling up)	0.03	0.08	0.08
from doubling up	0.04	0.15	0.20
Housing quality			
overcrowded at wave 3	0.11	0.21	0.19
uncomfortably cold house	0.05	0.09	0.10
smokers in household at wave 3	0.19	0.45	0.42

TABLE 3: MEANS OF ADDITIONAL CONTROL VARIABLES, BY MOTHER' RELATIONSHIP STATUS AT BIRTH

	married	cohabiting	not cohabiting
Child's characteristics			
first birth	0.34	0.35	0.43
female birth	0.48	0.49	0.46
Mother's age			
mother aged less than 22	0.09	0.41	0.46
mother aged 22-27	0.29	0.36	0.33
mother aged 28+ (ref)	0.62	0.23	0.21
Mother's ethnicity			
non-Hispanic White (ref)	0.50	0.19	0.11
non-Hispanic Black	0.24	0.47	0.69
Hispanic	0.26	0.34	0.20
Mother's education level			
less than high school	0.17	0.38	0.40
high school (ref)	0.19	0.35	0.34
more than high school	0.64	0.27	0.26

TABLE 4: ODDS RATIOS FROM LOGISTIC MODELS OF CHILD ASTHMA AT AGE 3

	m1		m2		m3		m4		m5[a]	
Family status: birth to wave 2										
continuously married (ref)										
continuously cohabit	1.50	*	1.36	†	1.29		1.47	†	1.24	
transition to marriage	1.78	*	1.71	*	1.62	*	1.69	*	1.45	
transition to cohabitation	3.06	***	2.73	***	2.41	***	2.76	***	2.33	***
live apart from father, both waves	3.05	***	2.72	***	2.71	***	3.09	***	2.68	***
dissolved relationship	2.82	***	2.54	***	2.56	***	2.94	***	2.55	***
married new partner	1.91		1.64		1.41		1.62		1.23	
Family transitions: waves 2-3										
no change (ref)										
to marriage or cohabitation with father					0.84		0.81		0.80	
dissolution/ form step-family					1.24		1.16		1.20	
owner occupier and										
to marriage or cohabitation with father							0.77		0.76	
dissolution/ form step-family							0.41		0.34	†
shared/other and										
to marriage or cohabitation with father							1.22		1.27	
dissolution/ form step-family							1.32		1.28	
Housing tenure at wave 2										
owner-occupier (ref)										
rent independently			1.15		1.33		1.10		0.91	
state subsidy/ housing project			1.74	**	2.00	***	1.77	**	1.31	
shared/other			1.08		1.21		1.07		0.89	
Housing transitions: waves 2 to 3										
no change (ref)										
to owner-occupation					0.82		1.45		1.64	
from own to (any) rent					2.65	**	3.14	*	3.04	*
to other (doubling up)					1.10		1.18		1.26	
from doubling up					1.07		1.25		1.14	
unmarried and										
to owner-occupation							0.33	*	0.32	*
from own to (any) rent							0.98		0.80	
to other (doubling up)							0.91		0.85	
from doubling up							0.84		0.91	
Housing quality										
overcrowded at wave 3									1.32	*
uncomfortably cold house									1.25	
smokers in household at wave 3									1.07	
N=3201										

*Note: *** p<0.001, ** p<0.01,* p<0.05, † p<0.10*

[a] *additional socio-economic controls included (see Table 3) as well as an imputation flag for overcrowding.*

TABLE 5: ODDS RATIOS FROM LOGISTIC MODELS OF POOR CHILD HEALTH ASSESSMENT AT AGE 3 (MOTHER RATING OF GOOD, FAIR, OR POOR)

	m1		m2		m3		m4		m5[a]	
Family status: birth to wave 2										
continuously married (ref)										
continuously cohabit	1.47	*	1.13		1.07		1.17		1.05	
transition to marriage	1.67	*	1.38		1.30		1.31		1.21	
transition to cohabitation	1.10		0.80		0.74		0.82		0.86	
live apart from father, both waves	1.69	**	1.17		1.07		1.16		1.34	
dissolved relationship	1.33		0.93		0.87		0.96		1.03	
married new partner	2.44		1.79		1.69		1.87		1.94	
Family transitions: waves 2-3										
no change (ref)										
to marriage or cohabitation with father					0.83		0.66		0.64	
dissolution/ form step-family					0.93		0.74		0.85	
owner occupier and										
to marriage or cohabitation with father							1.27		1.04	
dissolution/ form step-family							0.62		0.52	+
shared/other and										
to marriage or cohabitation with father							1.85		1.90	
dissolution/ form step-family							1.67		1.71	
Housing tenure at wave 2										
owner-occupier (ref)										
rent independently			1.81	**	2.36	***	2.05	**	1.56	+
state subsidy/ housing project			2.51	***	3.14	***	3.11	***	1.94	*
shared/other			2.13	**	2.51	**	2.45	**	1.89	*
Housing transitions: waves 2 to 3										
no change (ref)										
to owner-occupation					0.44	*	0.63		0.76	
from own to (any) rent					2.89	*	3.91	**	3.87	*
to other (doubling up)					0.97		1.81		1.83	
from doubling up					1.14		1.19		1.07	
unmarried and										
to owner-occupation							0.43		0.39	
from own to (any) rent							0.55		0.38	
to other (doubling up)							0.45		0.42	
from doubling up							0.97		1.04	
Housing quality										
overcrowded at wave 3									1.19	
uncomfortably cold house									1.47	*
smokers in household at wave 3									1.08	

*Note: *** p<0.001, ** p<0.01,* p<0.05, † p<0.10*

[a] *additional socio-economic controls included (see Table 3) as well as an imputation flag for overcrowding.*