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## Housing context and childbearing in Sweden: a cohort study

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### ABSTRACT

Previous research has established the link between individuals' housing characteristics and their childbearing behavior. This study contributes to this literature by examining the association between first, second and third parity transitions and housing tenure and type. The study design distinguishes between owner-occupied apartments, rental apartments and owner-occupied detached houses. This study also uniquely takes into account individual housing histories in relation to later life fertility outcomes. The data used are an extract from Swedish registers covering 25% of the population. Housing information is available from 1986 to 2006, and the study follows four birth cohorts of women who are aged 15–18 when the study starts, until ages 35–38. Descriptive results on housing and childbearing transitions over the life course are complemented by event-history models to model the parity transitions. Women living in detached housing have the highest likelihood of parity transitions, while women living in rental apartments have the lowest likelihood. Although women from different housing backgrounds have similar outcomes in terms of parity and timing, housing of origin is related to housing context during childbearing transitions, and thus, serves as a good insight to individual housing norms and constraints.

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## Introduction

Housing and childbearing trajectories are interlinked over the life course. Adequate housing is an important factor for fertility, residential migration often precedes childbearing and constraints that hamper residential migration can serve to delay or prevent family transitions (Clark *et al.*, 1994; Feijten & Mulder, 2002; Kulu & Steele, 2013; Lo, 2012; Mulder, 2006; Öst, 2012a). Researchers have previously identified a number of housing characteristics as important for childbearing, including the type of housing (multi-family vs. single-family dwelling) (Kulu & Steele, 2013; Kulu & Vikat, 2008), the security of the housing situation and the housing tenure (rented or owner-occupied) (Mulder & Wagner, 2001; Murphy & Sullivan, 1985; Vignoli *et al.*, 2013), the affordability of the housing (Clark *et al.*, 1994; Courgeau & Lelievre, 1992), access to the housing market (Mulder & Billari, 2010), and housing conditions including size and urban location (Kulu & Boyle, 2009; Kulu *et al.*, 2007; Ström, 2010). While all of these factors have been found significant determinants

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of childbearing, previous research has often been restricted in studying multiple housing factors simultaneously due to data limitations.

This study draws on a rich extract from Swedish register data and follows a 25% sample of four birth cohorts over 20 years, from ages 15–18 in 1986 to ages 35–38 in 2006. In the first stage of the analysis, descriptive results show the progression of this cohort of young adults from their parental home through various housing and childbearing configurations. In the second stage of the analysis, I use an event-history approach to model the relationship between housing conditions and birth transitions. Housing spells are classified according to the housing type (multi-family, apartment housing or single-family, detached housing), housing tenure (ownership category), the individual's housing of origin and urban context. The final stage of the analysis is to examine the interaction between duration of a housing spell and housing type, and the relative risks of each parity transition.

This study makes a number of original contributions to previous research on the connection between housing and family transitions throughout the life course. The first of these is the cohort approach and the long timespan examined, which takes into account the entire period from leaving the parental home through family formation and towards the end of childbearing, rather than studying individual births or migration events. One strength of this approach is that it allows for the study of housing of origin in relation to childbearing behaviour. Housing of origin is an important proxy of individual housing norms, and is thus likely to be related to the willingness to have a child in different housing contexts. A further contribution of the study is the uniquely detailed information on housing type available from the registers, which makes it possible for the analysis to distinguish among housing spells according to both housing type and tenure. This study will investigate the difference among individuals living in owner-occupied houses vs. apartments to capture the importance of the size/location premium of detached housing, and between those living in owner-occupied vs. rental apartments to address property ownership specifically. In the following sections I summarize previous research on housing and fertility throughout the life course, review the data and method, present the results of the descriptive and event-history analyses, and provide a concluding discussion.

## **Theoretical background**

Individuals have housing preferences and constraints, which they balance with their constraints and preferences regarding childbearing and family formation. In this section, I first review previous literature on the extent to which some housing contexts are preferred by families with children. I set out hypotheses for the type of housing where parity transitions are likely to occur, and how these parity transitions are linked to residential moves. I then further characterize housing preferences and constraints and how they vary across groups of women. I give special focus to the 'housing of origin' for women, and argue that likelihood of childbearing within different housing contexts is likely to be influenced by individual housing norms shaped by experiences in the parental home.

### ***Housing context and childbearing***

Housing choices vary over the life course: individuals at different life stages face different economic constraints, and experience different needs and preferences with regard to

residential quality, location and size. Residential migration is best understood as an adjustment process where individuals bring their conditions in life with changes in their needs and preferences as a consequence of major life events (Clark, 2013; Courgeau, 1985). Residential moves typically occur at life course junctions as people leave the parental home, move in with partners, have children, experience divorce or widowhood and retire (Clark & Huang, 2003; Myers, 1999; Pollock, 2007). Childbearing is strongly associated with residential moves, which is intuitive as families with children often prefer housing different than that preferred by childless couples: they are likely to want more space, more secure tenancy and a family-friendly location. Additionally, housing and childbearing are interrelated processes and given high costs of housing and moving, it is likely that couples update their housing shortly prior to having children. This study investigates two topics of residential migration and childbearing: the housing context where childbearing is likely to occur, and the timing of the births in relation to the timing of the moves.

There are two main relevant parameters of housing that have been identified in demographic research: housing type and housing tenure. *Housing type* refers to a residence being a detached home (also known as a villa, a residence for one family) vs. an apartment (or alternative multi-family dwelling such as terrace housing). Owner-occupied villas have typically been considered the pinnacle of a housing career in Europe and the United States, and childbearing is most common in this housing form (Clark *et al.*, 1994; Kulu & Vikat, 2008; Murphy & Sullivan, 1985). There are several reasons why detached housing is preferred by families with children. Detached houses are generally more spacious than apartments, and space has been shown to be an important predictor for childbearing (Clark & Huang, 2003 for the UK; Ström, 2010 in Sweden). Detached houses also tend to be clustered in family-oriented neighbourhoods which provide convenient access to necessary services such as schools, day-care services and other facilities (Rabe & Taylor, 2010). While many individuals may live in an apartment regardless of partnership status, houses are typically larger and more expensive, and thus, more strongly associated with partnered living and, consequently, childbearing. In Finland, where the housing stock and family formation patterns are similar to Sweden, living in detached homes is associated with a higher likelihood of childbearing compared to living in apartments, and couples are likely to move into this housing form as they have more children (Kulu & Steele, 2013; Kulu & Vikat, 2008). This study will consider housing type as one of the key housing variables, with the expectation that individuals living in detached houses will have a higher likelihood of childbearing. Furthermore, due to the comparative spaciousness of such homes, this effect should be more pronounced for higher order births.

A further aspect of housing is the tenure (whether housing is owner-occupied or rented). The extent to which there are differences in childbearing patterns between those living in rented or owner-occupied housing depends on the conditions of housing and the security of contracts within the rental sector (Mulder, 2006). Home ownership provides security and has symbolic value, and may, thus, be seen as an essential step prior to childbearing. Additionally, the purchase of a home is a major economic investment in and both a financial and emotional commitment to the future, and is thus often a step taken by women who enter serious partnerships, and seen as a precursor to family formation (Mulder & Feijtjn, 2002; Mulder & Smits, 1999; Vignoli *et al.*, 2013). Therefore, within this study it is expected that ownership (regardless of housing type) is more likely to be associated with parity transitions. In some cases ownership may be negatively associated with fertility outcomes as

the costs of ownership are difficult for young families to bear, and thus, ownership might be associated with later ages at childbearing (Krishnan, 1995; Mulder & Wagner, 2001; Murphy & Sullivan, 1985).

In the Swedish housing system, there are three possible housing tenures. The first is apartment rentals in buildings available through the public sector (*Allmännyttig*). These are apartment buildings that are owned by the municipality and operated on a non-profit basis. In contrast to public housing in other countries, Swedish public housing is open to everyone and is not means-tested or targeted towards specific groups (Hedman, 2008). Rental apartments are typically allocated on the basis of queuing time, provide a quite high living standard and tenants have secure rental contracts. In addition, there are rental apartments which are owned by property companies. In this study, privately owned rental apartments are considered together with publicly owned rental apartments. Private rental contracts may be somewhat less stable, but in the Swedish context during the study period there is virtually no difference in the quality of the dwellings.

A second form of housing tenure is a form of tenant-ownership (*Bostadsrättsförening*) in apartment building or row-house cooperatives. Tenant-owners purchase the right to the apartment, and pay a monthly fee to the tenant association for the costs associated with the building. This housing form is not legally equivalent to apartment ownership, and owner-occupation was not legally possible in Swedish apartment buildings during the time of this study (Bengtsson, 1992). However, this 'indirect owner-occupation' is comparable to apartment ownership in other countries: the period of tenancy is indefinite, the tenant is a co-owner of the housing association, and tenancy rights function as capital and are traded freely at market prices (Ruonavaara, 2005). Although this form of ownership is limited by the fact that individuals must work within their tenant-cooperative on collective issues, for the purpose of this study, there is a strong parallel to 'ownership' in other housing contexts, particularly in the ways in which ownership matters in terms of economic and emotional investment and security. This tenancy form will, thus, be referred to as 'owned apartments' through the rest of the study for the sake of clarity. The third tenure type is private ownership, and this applies to detached houses dwellings where the occupiers have the full ownership of the dwelling.

During the period studied (1986–2006), owner-occupied detached houses made up about 38–40% of Swedish housing stock, tenant-cooperatives 15–18%, private rental housing about 17–20% and public rental housing about 23–25% (Karlberg & Victorin, 2004; Ruonavaara, 2005). A majority of Swedish families with children live in owner-occupied housing, and research has linked transition to ownership tenure with the timing of the first birth in Sweden (Öst, 2012a; Ström, 2010). Similarly to the fact that detached houses are more likely to be occupied by couples, property ownership is also more likely among couples rather than singles, and thus, be compositionally associated with childbearing outcomes. Ownership is likely to be associated with higher likelihood of childbearing at all parities, regardless of housing type, for the reasons outlined above.

In addition to examining housing type and tenure, this study considers the timing of residential moves in relation to the timing of childbearing. Residential moves are tightly bound with the first birth, suggesting that couples move in anticipation of having a child (Clark & Withers, 2006 in the United States; Kulu & Vikat, 2008 in Finland). Kulu & Steele (2013) model the likelihood of three parity transitions following the move to different types of housing, and find that the likelihood of childbearing is positively related to moving at

every parity, though the magnitude of the effect decreases with the birth order. Previous research, thus, shows the importance of taking the duration of residential spell into account when modelling housing influences on childbearing likelihood, and of considering the different relationship between the duration of occupancy and the childbearing risks at different parities. In this study, I will examine this relationship between occupancy duration and each parity transition. If births are strongly linked to a short period of occupancy, this suggests that women are likely to update their housing in anticipation of having an additional child (or that housing transitions encourage and enable further childbearing). It is likely that couples specifically move prior to the birth of their first child. However, I expect that the risk of birth should be higher at all parities after the move to a detached house, as it may be the case that couples remain in smaller living conditions after the first child, and update their housing in anticipation of the second (or third birth).

### **Housing preferences and constraints**

As discussed above, there are reasons to expect that more spacious (detached, single-family houses) and tenant-owned housing are preferred by families with children. However, due to constraints in the local housing market, or in the individual economy, many women may not be able to access either home ownership or live in a detached house. Below, I discuss norms and constraints first on the macro-level and then on the level of the individual.

The housing stock within a given environment affects the relationship between housing and childbearing. Differences in the stock of housing available constrain housing choice and contribute to differential fertility patterns between urban, suburban and rural areas (Kulu, 2006; Kulu *et al.*, 2007). In urban areas housing prices tend to be higher than in suburban and rural areas, and thus, a move to a detached home may be a stronger predictor of childbearing intentions than in other types of contexts (Kulu & Vikat, 2008; Michielin & Mulder, 2005). However, in addition to the constraining effect of different areas, the relative popularity of apartments vs. detached homes also determines the acceptance of these housing forms for families with children. In urban areas, apartments are often the norm and individuals residing in urban areas value the benefits of urban life, accepting apartment living as a part of the broader lifestyle. In other areas, living in an apartment is a stronger indicator of an individual's unwillingness or inability to live in a detached home, and thus, may have a stronger correlation with lower childbearing. In this study, the three major city municipalities in Sweden will be distinguished from other areas. This is because cities have a higher proportion of multi-family housing, different constraints and opportunities for mobility, and higher housing prices.

Individual perceptions of what is acceptable or desirable in terms of housing are constructed both by individual and social norms and experiences (Lauster, 2010). In particular, 'roominess' has been shown to be a major factor in childbearing, and the desire for a relatively large house or apartment is widespread in many contemporary societies. However, this desire, and the norm of large personal space, is constructed based on social status. This is true if we consider that historically a large amount of personal space has not been physically necessary for human reproduction or family living, and that within some societies and social groups much smaller or more crowded living spaces are seen as acceptable for families. Some women may feel like an apartment, or rental housing, is an inappropriate context for starting a family. However, others may face constraints

on their likelihood of ever achieving property ownership, while experiencing personal preferences and social expectations for childbearing. The extent to which occupancy of some forms of housing (that is apartment living, or rental tenure) is seen as possible and acceptable or desirable for childbearing, thus, varies based on social norms and individual preferences and constraints.

In this study, I will consider housing conditions in teenage years (one's 'housing of origin') as a source of housing norms, and a proxy for the likely housing constraints faced by an individual in their later life. One strong predictor of later life housing outcomes is an individual's housing of origin (Lersch & Luijkx, 2015; Murphy & Sullivan, 1985). This association is due in part because housing of origin is a proxy for social class of origin, and thus, inter-generational housing continuity is a consequence of resource transfers between generations. However, the inter-generational association in housing context is also a consequence of socialization into housing norms. In Sweden, multi-generational households are very uncommon, and most adults leave home between the ages of 18 and 22 (Dribe & Stanfors, 2005). Two-thirds of Swedish home leavers live independently, and young people tend to live in rented apartments (for example, student housing) for their first few moves (Abramsson *et al.*, 2004; Lauster & Fransson, 2006). However, as housing careers continue, correlations emerge between the housing of parents and their adult children (Aratani, 2011; Mulder & Smits, 1999) and research in Sweden suggests this link has strengthened among younger cohorts (Öst, 2012b). This correlation can be explained both in terms of constraints and preferences: individuals may occupy housing similar to that of their parents due to direct financial contribution by parents, geographic proximity and concentration of both generations in similar housing markets, inter-generational transmission of socio-economic status and childhood socialization (Smits & Mulder, 2008).

Young people build their preferences for housing tenure based on their experiences growing up (Rowlands & Gurney, 2000), and therefore, persons growing up in apartments or rental housing may be more willing to themselves have children in these housing types. In addition, the ability of individuals to access different housing contexts is limited by their socio-economic position. In Sweden children who grow up in rental apartments are less likely to leave the rental sector than other children – particularly those children with immigrant backgrounds, (Bråmås & Andersson, 2010). The perceived ability of women to access different types of housing is likely to be weighed against their preferences for a specific housing form, and their preferences for family formation and childbearing. If preferences for family formation are high for women across housing contexts, acceptance of other housing forms is likely and childbearing can be relatively high in rental housing or in apartments. Conversely, those who grew up in rental housing or apartments but are able to move to a more secure or larger form of housing may be more motivated to form a family. Therefore, this study will examine the relationship between the housing of origin and childbearing in different housing types.

## Data and methods

### Data

The register data used in this study are a 25% sample of the people in Sweden who were born between the years 1950 and 1985, provided by Statistics Sweden. Foreign-born individuals

are included in the study if they immigrated to Sweden before age 15. The data cover a 20 year time period spanning from 1986 to 2006, including complete residential migration histories. Each reported migration event is registered, including the date of the move, the housing type and the housing tenure of the new and old residence.

The data extract used in this study is individual based and does not include information on marriage or cohabiting partnerships. The group of women living in single-family housing is more likely to be partnered, and thus, homogenous than the other groups, so it is likely that the coefficient estimates for childbearing transitions in single family-owned housing are biased upwards. However, the differences found between housing types in this study are similar to those found when authors have used couple-level data to study housing and childbearing transitions in Finland (Kulu & Vikat, 2007). While partnership might be a mechanism that explains some of the differences in childbearing by housing context found in this study, taking an individual level perspective on housing context and fertility is nevertheless adequate for capturing and observing such differences.

This study restricts the data to women born between 1968 and 1971 and uses a cohort design, following the cohort from ages 15 to 18 (in 1986). Housing characteristics of the last residential spell beginning prior to age 15 are classified as the 'housing of origin'. If the first housing episode recorded began after age 15, it is not possible to identify a 'housing of origin', leading to some missing data. However, housing of origin can be identified for 90% of the study population. Due to data constraints, only the last episode prior to age 15 can be considered, and housing information from prior episodes is unavailable. While 'housing of origin' in the majority cases reflects housing episodes lasting longer than five years, for some women it represents only housing characteristics in teenage years. Though some women have shorter tenancy in their 'housing of origin', it is not possible to tell from the data whether these women experienced multiple types of housing or e.g. moved from one rental apartment to another. Nevertheless, housing conditions in teenage years matter in shaping perceptions of what housing is acceptable or desirable for families. In addition to the variation in tenancy duration, there are cases where 'housing of origin' is unavailable for women due to missing data in the migration records or missing data regarding type/ownership category of housing. According to additional descriptive analyses (not shown here), women who are missing information on housing of origin have roughly similar progress in terms of childbearing and a very similar breakdown in terms of parity and housing context compared to all women. Thus, this missing data are unlikely to bias the results reported in this study.

Migration histories were created using information from each move, and housing histories were created using housing variables. The 'type of housing' variable in the register differentiates between a detached house (a single-family dwelling, or in some cases duplexes), a detached house on a farm, or a multi-family dwelling (such as a row-house or an apartment building). The register also distinguishes between two tenure types, public (municipality-owned housing, applicable only for apartment buildings) and private (including privately owned detached houses and apartment ownership co-operatives). Privately owned rental apartments are analysed jointly with publicly rented apartments as housing conditions for these two groups are virtually identical. All detached houses in the study were assumed to be owner-occupied, as the rental market for such houses in Sweden is very small (<5% of the housing stock). Data held by Statistics Sweden are based on the registered ownership of the dwelling, and all detached houses are registered as privately



owned, making it impossible to exclude women living in privately rented houses from this analysis. This group of women is, thus, included in the current analysis as women living in owner-occupied houses, which potentially slightly biases estimates of childbearing in houses downwards – though does not substantively change the results.

The data used in the study are very detailed, as exact dates of each move are provided and every spell includes information on housing types. However, some housing information is categorized as missing in the study due to uncertainty about the housing conditions in the sample, or due to changes in the tenure type as a result of privatization of public housing which was significant during this study period. In the majority of cases, the housing information is classified as ‘missing’ because the registers do not have conclusive information on the time at which a public apartment building became privatized. It is, thus, not possible to distinguish whether women living in these apartments purchased an apartment on the market, or whether they were living in public housing which they then earned ownership rights to. This category, thus, includes women living in both rental and owned apartments, as well as other women with missing information on their housing histories and is analysed as a separate category in the models.

After entrance into the study, individuals were followed over the study period, until the end of the observation period in 2006, concurrent with ages 35–38 for the study cohort. Individuals were censored upon first international migration or in case of death. Data on children born to each woman were joined with the housing data. The risk of first birth begins after a woman’s first move after the age 15. The second and third birth risk begins after the previous birth. All analyses presented in this paper are shown for women only, though analysis for men produces similar results (available on request). Women in Sweden have children somewhat earlier than men, and thus, estimates using childbearing histories at ages 35–38 are more complete for women than for men. The age cut-off in this study does omit women who become mothers at a later age, and understates the transition rate to higher parities, particularly to parity three. However, additional analysis (not shown) confirms that the number of women who first become mothers after the age 35 is relatively low (2–4% of the sample). These women are more likely to live in owned apartments compared to women who become mothers younger. The omission of mothers at older ages may somewhat underestimate the coefficient for tenant-owned housing types, but the relatively small size of this group suggests that such a bias is not substantial.

This is a rich data-set which enables the detailed study of housing and childbearing trajectories, though there are also some data limitations. Housing information is only available for individuals who moved at least once during the study period. Multi-generational co-residence is very uncommon in Sweden, as the majority of all young adults form their own household (Dröbe and Stanfors, 2005). However, the study’s cohort design means that only the people who live in one place from childhood until the end of the study are not observed. The dates that moves are registered with the authorities (*de jure* migration) may differ from the *de facto* timing of moves, particularly for first moves away from home. However, for the whole sample, the timing of moving out of the parental home looks feasible and matches other data sources (See Appendix A1). Migration and housing histories are available from 1986 onwards, when individuals from the oldest cohort (1968) are already 18 years old and many are living independently.

Table 1 shows the descriptive characteristics of the study population, including the sample size, parity, housing of origin and number of moves observed. As can be seen in the table,

**Table 1.** Descriptive characteristics of the study population, women in Sweden born 1968–1971.

	N	Percentage (%)
Total women	58,112	
<i>Year of birth</i>		
1968	14,826	26
1969	14,067	24
1970	14,457	25
1971	14,762	25
<i>Parity in 2006</i>		
Childless	16,256	28
One child	8,656	15
Two children	22,985	39
At least three children	10,215	18
<i>Housing of origin</i>		
Rental apartment	12,357	21
Owned apartment	4962	9
Single-family house	34,849	60
Unknown	5944	10
<i>Number of moves observed</i>		
1–3 moves	12,926	22
4–14 moves	43,969	76
15–34 moves	1217	2
<i>Births observed by housing type</i>		
Rental apartment	24,568	29
Owned apartment	11,326	13
Single-family home	45,016	53
Unknown/other	4058	5

more than half of all women in the study grew up in a detached house, 21% in a rental apartment and 9% in an owned apartment. Detached homes are also the most common housing context for childbearing (53% of all births observed), with 29% of births observed in rental apartments and 13% in owned apartments. About 22% of the study sample move less than four times during the study period, but the majority make between 4 and 14 moves over the two decades observed.

## Method

The analysis is presented in three parts. The first part of the analysis is descriptive, and the aim is to show how the cohorts in the study progressed through different housing types and parities. This is shown by disaggregating the entire study population by each of the three housing types (owned apartment, rented apartment, detached house) and each of four parities (zero, one, two, three or more children) every year, starting at ages 15–18 until ages 35–38. Additional descriptive results show the group further disaggregated by the housing of origin type, separating those who started in owned apartments, rented apartments or detached houses. The aim of this disaggregation is to gain insight into the timing of housing transitions in conjunction with parity transitions, as well as to visually examine patterns of continuity between housing of origin and the types of housing within which individuals form families.

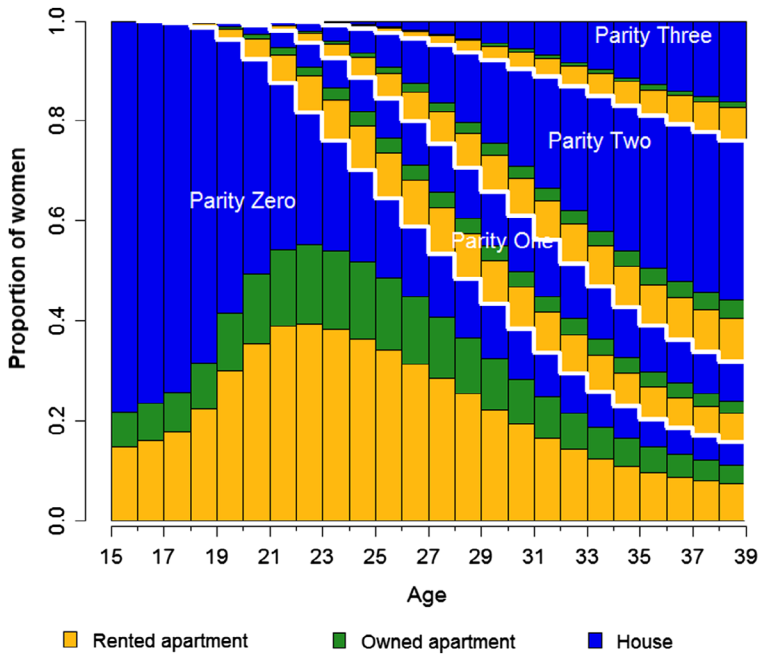
The second stage of the analysis is to study the likelihood of first, second and third births in relation to the housing characteristics. The event-history analyses were performed using

discrete-time piece-wise exponential event-history models, using months as the unit of time. The analysis performed in this study models each parity progression separately, which might introduce some bias into the regression results because each higher parity transition is conditional prior parity progression (Kravdal, 2001). However, it is important to examine housing characteristics for each parity progression separately because housing needs are likely to differ at each parity, and this approach has been adapted in other research on housing and parity transitions (Kulu & Andersson 2007; Kulu & Vikat 2008). Observations were censored at the individual's first emigration from the country, death, or at the end of the study period. The dependent variable for each model is the first/second/third birth, and the main covariates of interest are the housing type and the duration of the housing spell. The models also include a binary variable for residence in one of Sweden's three major cities (Stockholm, Malmö or Göteborg), and a variable for the housing of origin, as discussed above. Additional demographic covariates are the woman's age and years since previous birth.

## Results

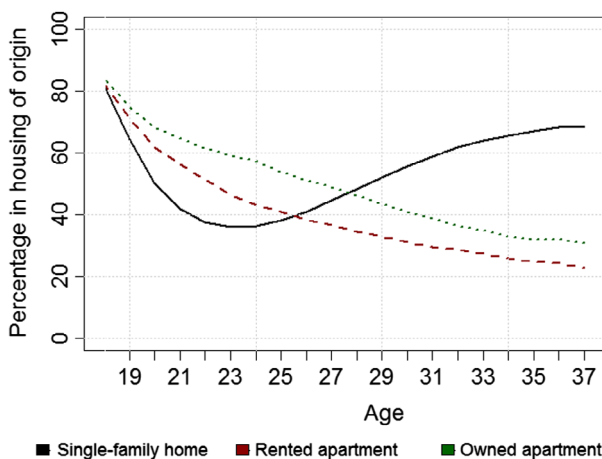
In this section I present the results of the analysis. Figure 1 shows all women at every age according to their housing type and their parity (spells in 'unknown' housing are omitted from the figure). The figure demonstrates the overall dominance of detached houses as the housing of origin, as well as the housing of destination for women who have two or more children. The figure also shows the flow of women to apartments in young adulthood before childbearing. Among the women who are childless by the end of the study, the majority live in apartments. The graph also shows the mixed housing situations for women with one child: the split is even between apartments (owned and rented) and detached homes. The results, thus, reveal a typical sequence of housing and childbearing and the importance of the birth of a second child as a transition point to detached homes. Although some women continue living in apartments with two children, the proportion shrinks further among those with three or more children.

Additional figures are available in Appendix B1, which presents the same visualization of housing and childbearing trajectories of women, disaggregated by housing of origin. This visualization reveals the extent of housing type continuities over the life course. Among women coming from owned apartments, very few moved out of the parental home into a detached house, although about 15% moved into rented apartments while being childless. They also continue living in apartments to a large degree when having just one child, and a larger than average share live in apartments when having two children. A similar trend for inter-generational continuity can be seen with women whose housing of origin is rental apartments and single-family houses. These descriptive results show that while the parity progression rates and the timing of fertility are very similar for all women regardless of housing origin, there are differences in the housing histories of women from different backgrounds. Furthermore, the descriptive results demonstrate the different housing conditions prevalent at every parity: whereas childless women or women with one child often live in apartments, women with two children reside mostly in detached houses, and the share living in apartments continues to decrease dramatically for women with three or more children.



**Figure 1.** Progression through housing and parity states over 20 years for women in Sweden, born 1968–1971. Source: Swedish register data, author's own calculations.

Figure 2 below further summarizes the trends in inter-generational housing continuity, and shows the dominance of single-family houses as the residence of choice. This figure presents the percentage of women living in the same housing as their housing of origin at every age, regardless of parity. The figure shows that the share of women living



**Figure 2.** Percentage of women in Sweden at every age living in the same category housing as their housing at ages 15–18. Source: Swedish register data, author's own calculations.

**Table 2.** Results for event-history analysis for women's first, second, and third parity transitions in Sweden.

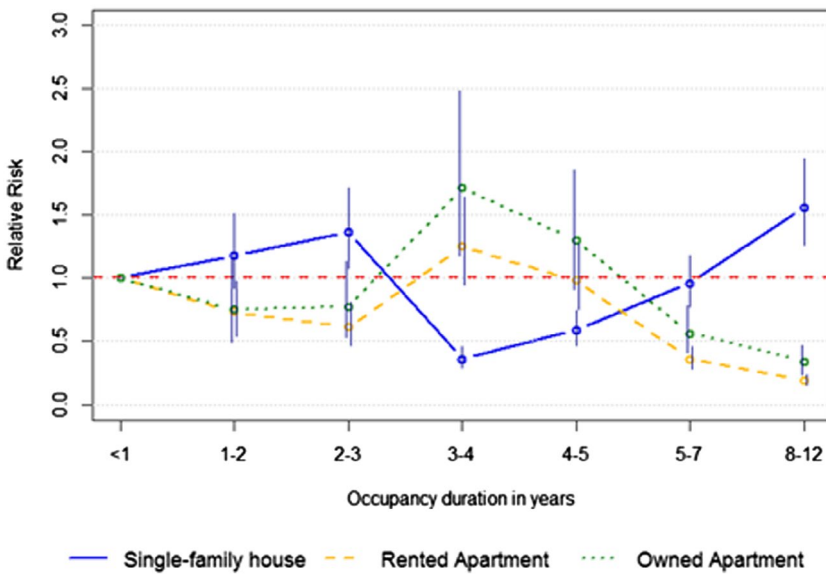
	Birth 1			Birth 2			Birth 3		
	HR	SE	P	HR	SE	P	HR	SE	P
<i>Housing type</i>									
Detached house	1 (Ref.)			1 (Ref.)			1 (Ref.)		
Rental apartment	0.55	0.01	***	0.45	0.01	***	0.71	0.03	***
Owned apartment	0.62	0.01	***	0.60	0.02	***	0.71	0.05	***
Unknown	0.76	0.02	***	0.69	0.03	***	0.90	0.07	
<i>Duration of occupancy</i>									
0–1 years	3.18	0.18	***	1.04	0.04		0.81	0.05	***
1–2 years	2.80	0.15	***	1.20	0.04	***	0.93	0.06	
2–3 years	2.78	0.13	***	1.05	0.04		0.93	0.05	
3–4 years	1 (Ref.)			1 (Ref.)			1 (Ref.)		
4–5 years	1.49	0.06	***	0.95	0.05		0.95	0.06	
5–7 years	1.34	0.05	***	0.74	0.03	***	0.90	0.05	*
8–12 years	1.56	0.07	***	0.69	0.08	***	0.88	0.14	
13+ years	2.45	0.14	***	0.51	0.18	**	0.92	0.78	
<i>Housing of origin</i>									
Detached house	1 (Ref.)			1 (Ref.)			1 (Ref.)		
Rental apartment	1.42	0.02	***	0.90	0.02	***	0.99	0.03	
Owned apartment	1.26	0.02	***	0.95	0.03	**	0.87	0.04	***
Unknown	1.13	0.04	***	0.97	0.05		1.03	0.09	
<i>Urban residence</i>									
Outside major city	1 (Ref.)			1 (Ref.)			1 (Ref.)		
Major city	0.78	0.00	***	1.06	0.03	***	1.10	0.06	*

\*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

in apartments (particularly rented apartments) declines steadily over time, and less than 40% of women remain in this form of housing after age 30. Meanwhile, women coming from single-family houses initially move into apartments and slowly rebound back into their housing of origin.

The results of the event-history analysis are presented in Table 2. Separate models were fitted for the transitions to first, second and third birth. The models include covariates for the type of housing, the duration of the housing occupancy spell, the housing of origin, and controls for time since last birth, age and living in a major city. The results show that at all three parity transitions, women living in a detached house were significantly more likely to have a further birth. When comparing owned and rental apartments, risks of first and second birth are higher in owned apartments but the risks for third birth are similar in owned and rental apartments. Despite concerns regarding modelling each parity transition separately, the regression results reflect the descriptive trends that most women living in detached houses have children during the study period (Table 2).

With regards to the housing of origin, the women who grew up in apartments have a higher rate of transition to early first birth, and significantly lower intensity of transition to the second birth (as well as third birth for those from owned apartments). Women from owned/rental apartment housing of origin have a higher likelihood of first birth transition in all housing forms. They are, thus, more likely to start a family in multi-family as well as



**Figure 3.** Risk for first birth for women in Sweden by the length of current occupancy and housing type.

single-family housing compared to women whose background is single-family housing. The urban municipality control is associated with a lower risk for first birth, but a slightly higher risk for the second and third births. With regards to timing of residential duration, the models reveal that for the first birth, the highest risk is in the first years of occupancy, and is lowest in the reference period, 3–4 years after a move. For the third birth, there are no clear patterns in relation to duration occupancy. For the second birth, risks are slightly higher within the first three years and decline smoothly after the first two years. The results on age follow observed fertility patterns in Sweden and are not shown. The results for the years since previous birth reflect the dominant spacing trend of 2–3 year birth intervals and are not shown.

The final stage of the analysis plots the interaction between occupancy duration and housing type for the risks for the first, second and third births (See Figures 3, 4, and 5). The results are based on the event-history models shown above but for timing ‘0–1 years’ is used as a reference category for occupancy duration in order to clearly illustrate how the likelihood changes over time. Figure 3 shows that the highest risk for the first birth comes during the first years of occupancy, and this relationship is very dramatic for those living in detached houses. The pattern in relative risks over time seems to be very similar for rental and owned apartments, and completely different for detached houses. There is an interesting pattern of significantly higher second birth risks for women living in owned apartments – birth spacing of 8–12 years is uncommon in Sweden and this result is thus anomalous. Due to data limitations it is not possible to further interpret the result. This result could be driven by space constraints which make families with multiple small children impractical, by childbearing across multiple partnerships by women, or due to women being granted ownership rights and forming families in the same apartment where they grew up (Figures 4 and 5).

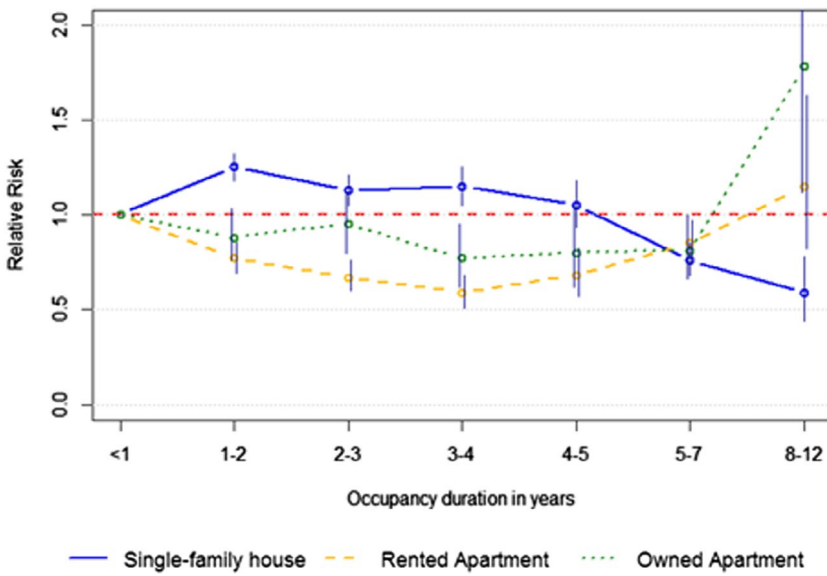


Figure 4. Risk for second birth for women in Sweden by the length of current occupancy and housing type.

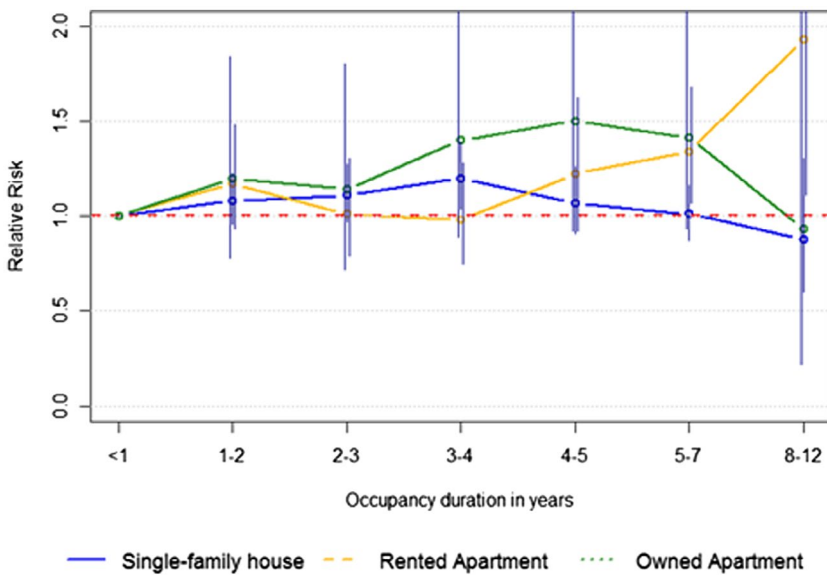


Figure 5. Risk for third birth for women in Sweden by the length of current occupancy and housing type.

### Discussion

This study analysed the relationship between housing and childbearing using a cohort perspective, drawing on Swedish register data and following a 25% sample of the 1968–1971 birth cohorts over 20 years. The cohorts in the study are aged 15–18 when the study begins, in 1986, and aged 35–38 when it ends in 2006. The first part of the analysis showed descriptively how women move from the parental home into independent living, and how the

distribution of the cohort into the various housing types changed over time as the women transitioned to parenthood. This analysis highlighted the predominance of the single-family house for women with children, but it also showed that housing choices were different at the different parities.

The long time period studied makes it possible to examine the relationship between women's housing of origin in relation to the housing context of their childbearing transitions. After the birth of the second child, detached houses slowly emerged as the preferred form of housing, though there were also patterns of continuity with the housing of origin. Such continuities suggest that there are housing preferences and constraints which affect women with different housing backgrounds differently. A housing history of moving from a single-family (parental) house to (own) single-family house may be easier for those living in areas where small houses are predominant. However, other explanations could be socialization of norms about appropriate housing for families, as well as inter-generational correlation in the economic resources necessary to purchase housing (Smits & Mulder, 2008). Likewise, a housing history limited to rental apartments could suggest inter-generational transmission of constraints on the housing market leading to difficulties in leaving the rental sector, a pattern which has been found for foreign-born families in Sweden (BråmÅ & Andersson, 2010).

Women in the study follow different housing trajectories based on their housing of origin, and this pattern reflect the existence of different housing norms/preferences as well as housing constraints. However, the timing of parity transitions, and the distribution of women at age 38 according to parity is strikingly similar for all groups of women. Although women living in houses have a higher likelihood of having a birth, and living in an apartment may have some fertility constraining effect, on the whole women with different backgrounds follow the same average fertility trajectory. Inter-generational continuities in housing – the case of women who both grow up in, and form families in, rental or owned apartments – reflect economic or other constraints these women face on the housing market and are potentially problematic. However, these housing constraints do not seem to restrict the fertility levels of these women below average. This result is interesting because the ability of women in different socio-economic conditions to achieve similar childbearing outcomes reflects the strength of childbearing norms and the relative equality across different socio-economic groups of Swedish society.

Following the descriptive results, event-history models were used to analyse transitions to first, second and third birth, taking into account women's housing of origin and current housing conditions. This analysis reflected the descriptive finding that children were most likely to be born when women were living in detached houses. The difference was very large, with a one-third lesser likelihood for a first birth in rental apartments and 43% lower risk in owner-occupied apartments. The higher likelihood of parity transition for women living in detached houses also held for the second and third births. These patterns may be interpreted in light of the findings on inter-generational housing continuities, as the group of women living in apartments is more heterogeneous in terms of housing preferences and plans than those living in single-family houses. Many women who grew up in single-family houses move into apartments in young adulthood, but they experience lower fertility in apartments than women who grew up in apartments – potentially because they have a stronger preference for a house. An interesting finding was the similarity in the likelihood of parity transition for women living in owned apartments and rental apartments. Although



women living in rental apartments were slightly less likely to have a child than women in owned apartments, the difference was much smaller than the difference between houses and apartments. These estimates suggest that the security and sense of commitment provided by property ownership is less important for childbearing than factors which constrain fertility for women living in apartments, such as dwelling size or neighbourhood quality. This finding echoes previous research from Sweden (Ström, 2010), where size of dwelling was seen as the most important factor for transition to first birth.

The final stage of the analysis expanded the event-history approach by examining the differing patterns in the likelihood of parity transitions by the years of occupancy for each housing type. The results showed that the interaction between type of housing and occupancy duration were different for each birth transition. While the first birth was often simultaneous with a housing move and heightened for two years, the second birth risks were highest 1–4 years into occupancy and there was no discernible pattern for the third birth. Housing adjustments happen in preparation for the first birth, and to some extent the second birth, while few women move in anticipation of their third birth. These results are similar to findings on fertility by housing type and on the joint timing of residential moves and childbirth transitions in Finland (Kulu & Vikat, 2008).

The findings of this study are generalizable to other countries with a mixed housing stock and a relatively easy access to mortgages (Mulder & Billari, 2010), and where norms on space requirements drive demand for detached houses (Lauster, 2010). The timing of births in relation to moves is similar to other Northern European findings (Kulu, 2008; Mulder & Wagner, 1998) where families tend to move during the period of conception. However, these patterns are in contrast to findings from the Netherlands, where people may purchase detached houses earlier in life in anticipation of future childbearing (e.g. Feijten & Mulder, 2002). Such differences are most likely to due to differences in affordability of housing. Finally, this study found inter-generational similarities in childbearing within different housing types, which builds on previous research that shows that preferences for and likelihood for home purchase are associated with housing of origin (Mulder & Smits, 1999; Öst, 2012b).

The descriptive analysis above showed the diverse combination of housing trajectories and family size, as well as the role of inter-generational continuity in housing. Further research could use sequence analysis techniques to analyse typical transitions out of the parental home and throughout the life course, and relate these transitions to the housing of origin. Analysis could also be performed with data that included information about co-residential partnerships, which would help distinguish more accurately those who are planning to start a family and thus, allow us to better study housing constraints as a constraint for childbearing.

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## Notes on contributor

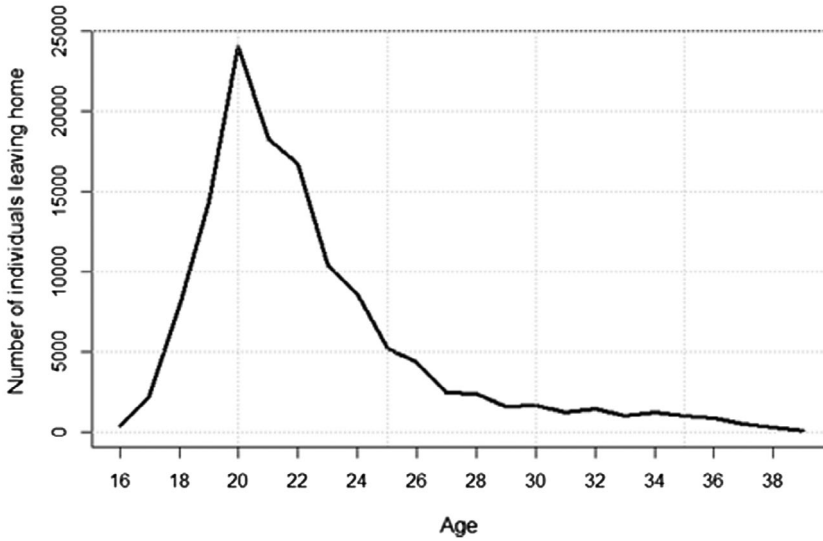
*Margarita Chudnovskaya* is a postdoctoral researcher at the Swedish Institute for Social Research (SOFI). Her research addresses social status and patterns of family formation.

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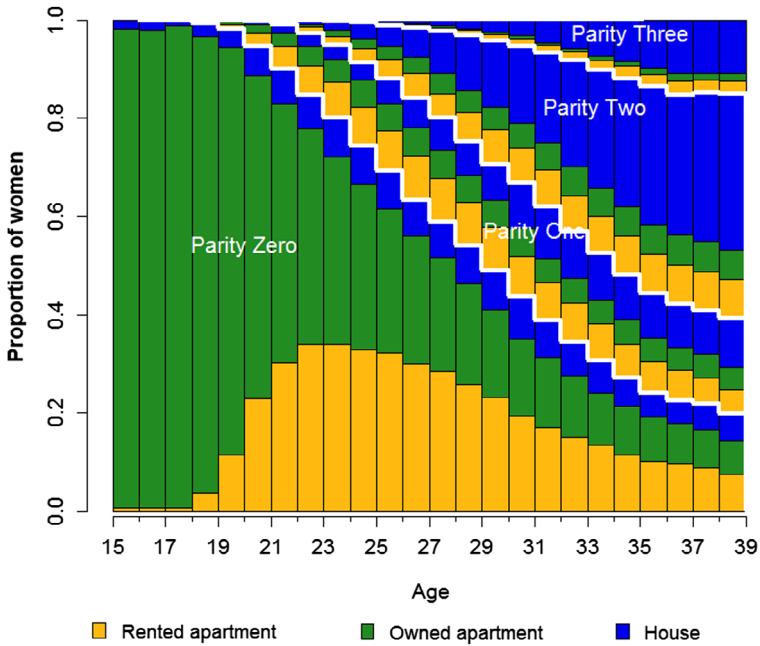
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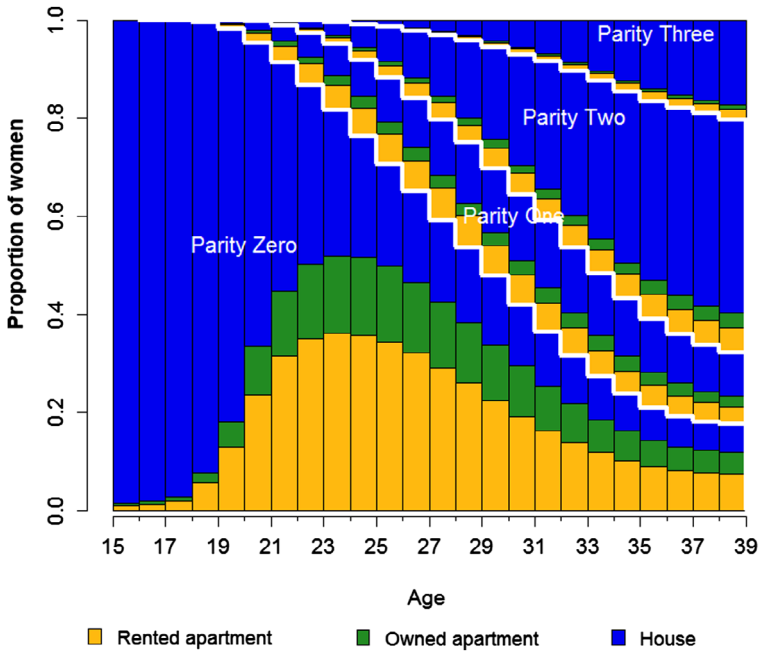
## Appendix



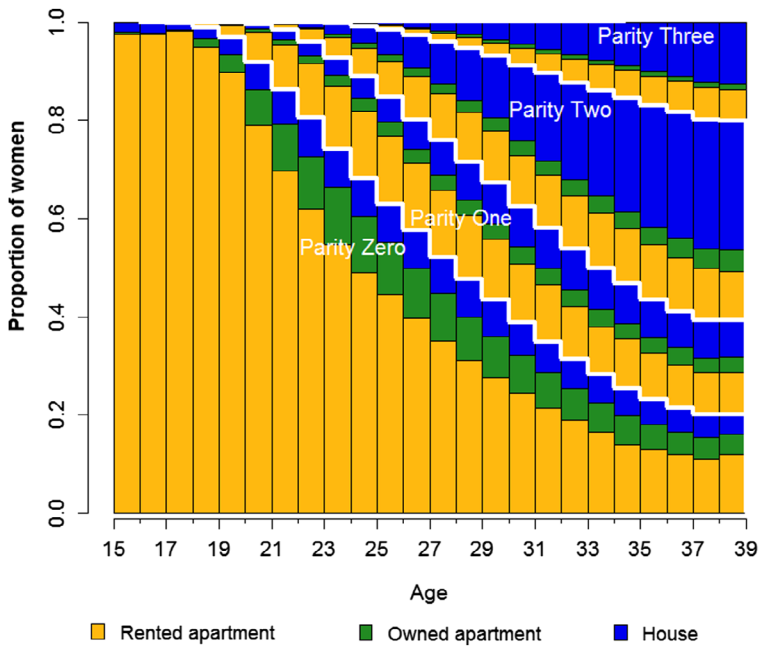
**Appendix A1.** Age at first move from parental home for the cohort born 1968–1971.



**Appendix B1.** Progression through housing and parity states over 20 years for women living in owner-occupied apartments at ages 15–18.



**Appendix B2.** Progression through housing and parity states over 20 years for women living in owner-occupied detached houses at ages 15–18.



**Appendix B3.** Progression through housing and parity states over 20 years for women living in rental apartments at ages 15–18.