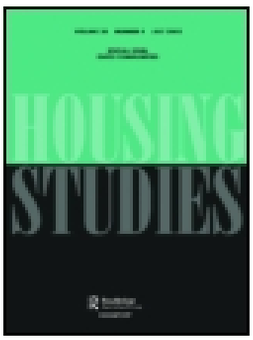

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Raising children in the inner city: still a mismatch between housing and households?

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ABSTRACT

Recent research suggests that inner-city parents have become more loyal to urban living. If this is true, it is certainly good news for compact-city policies, which incorporate residential stability as part of the package. We investigate this issue with empirical evidence from Oslo, using longitudinal data for first-time parents with native and non-native background. Our first analysis tracks two parental cohorts, from 1995 and 2005, over 10 years, and shows that non-native parents have become *less* stable, whereas native parents have the same stability in both periods. A second observation is that native parents, and only this group, are more stable in areas with spacious dwellings. Finally, we also show that parents who leave the inner city, especially non-natives, *increase* their representation in low-rise houses. The results as a whole indicate that minority integration and compact-city policies may collide. They also indicate that Oslo, despite green city awards, has failed to create stable inner-city communities. We conclude with policy recommendations.

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Families; parenthood; inner city; compact-city policies

Introduction

The inner city is traditionally seen as a 'transit port' for young households – a place that attracts singles and couples for a limited period of time, typically during studies and early labour career. A breaking point occurs, according to life-cycle theory, when people become parents. Rossi (1955) assumed that new parents would need larger dwellings and different surroundings than affordable inner-city neighbourhoods could provide. Most parents would therefore opt for a suburban location (for refinement and clarification of the theory, see Abu-Lughod & Foley, 1960; Guest, 1972).

Numerous scholars, however, question this one-sided picture of instability and mismatch. One counterargument concerns physical upgrading of inner-city areas. Compared with the industrial era, there is now a greater variety of housing and neighbourhood 'products' for middle-class households, including parents, who wish to remain in a central location (Boterman *et al.*, 2010; Butler & Robson, 2003; Karsten, 2003; Lilius, 2014). Planners and policymakers nurture a similar motivation

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in their efforts to shape urban environments, as one may see in the regulation of sustainable communities (Goodsell, 2013; Horton *et al.*, 2015), and in the more restricted promotion of compact cities (Easthope & Tice, 2011; Raynor, 2018).

Thus, there is a great deal of optimism on behalf of child-friendly dense environments. The question, of course, is whether new parents reflect and behave differently than previous cohorts. Our aim in this article is to provide *part* of the answer by exploring continued residence, that is, *survival*, in the inner city among first-time parents, added by an analysis of relocation geographies. We include *all* first-time parents, whether they belong to the middle class or some other social faction. That is, socioeconomic changes in the inner city are a relevant subtopic, but nothing more.

The city we study, Oslo, is in many ways a showcase of densification policies. A number of new initiatives were initiated in the 1990s, with numerous expansions in the 2000s and beyond. Assessing these policies, and pointing to increasing density in the inner city, Naess *et al.* (2011, p. 114) conclude that Oslo is 'close to the best practice, seen from the perspective of sustainable mobility'. Similar assessments lay behind Oslo's reception of the European Sustainable City Award (2003) and the European Union's Urban Green Capital Award (2019).

The implementation of compact-city policies coincides, in Oslo's case, with rapid growth and relocation of ethnic minority populations. A number of new groups replaced older groups in the inner city, whereas older groups converged towards the inner suburbs. The latter movement is part of the integration process, whereby groups are incorporated into mainstream society, and differs substantially from the corresponding movement of natives (Wessel *et al.*, 2017). We should therefore distinguish between these two groups.

With this background, the following questions arise: (1) Is there increasing stability among first-time parents in the inner city? (2) Are the correlates of stability different for different cohorts of first-time parents? In particular, is there increasing tolerance for compact housing? (3) Is the resettlement pattern among parents who leave the inner city stable over time? If patterns change, is there increasing acceptance of compact housing types? (4) Are there large and stable differences in survival and resettlement between natives and non-natives?

Our data consist of all inner-city individuals who received their first child in 1995 and 2005. We track the two cohorts over 10 years, using survival in the inner city as the dependent variable. Next, we look at settlement patterns among those who moved, partly with a binary variable that captures the distinction between houses and flats, and partly with a variable that combines housing type and location in three zones: the inner suburbs, the outer suburbs and the rest of Norway.

Our analyses include a combination of Kaplan-Meier estimators and logit models. We control for standard demographics, socioeconomic background and neighbourhood characteristics. We also compare survival curves for first-time parents and a control group consisting of singles and couples without children.

What we show, in brief, is that first-time parents maintain the classic pattern of outward mobility. The number of parents who remain in the inner city has *not* increased, but rather the opposite. There is a tendency for non-natives to adopt the native pattern of adjustment, which reduces overall stability in the inner city. We

further observe a weak tendency towards increased 'family gentrification', but no major change in the importance of housing structure. And quite astonishing, parents have become *more* inclined to relocate in low-rise houses. The results as a whole call into question Oslo's status as a parade example of compact-city policies. It is not a sign of success when new parents discard the inner city for a suburban location.

Theoretical framework

Compact cities have been the ideal in city planning in many European countries and the US since the 1990s, contrary to the urban sprawl that dominated this field from the 1950s. A major motivation behind the shift is to reduce transport needs and car use, and thus to create sustainable cities in the broadest sense (Burton, 2000; Naess *et al.*, 2011; Williams, 1999). The policy as such extends and complements older policies that targeted economic and community development in the inner city. Indeed, looking at various interpretations of the compact city, they invariably mention virtues such as population diversity, population stability, social equity, quality of life, sense of place and 'green growth' as part of the policy package (Bramley *et al.*, 2009; Burton, 2000; Dempsey *et al.*, 2011; Neuman, 2005; OECD, 2012; Williams, 1999).

The recognition of inner cities as diverse, vibrant and stimulating places, while broadly shared, comes with a built-in emphasis on youth and youth culture. Much of the literature on urban regeneration and gentrification highlights in-migration of young professionals without caring responsibilities (Zukin, 1998). A salient characteristic of these groups is their preference for land uses that juxtapose work, home and leisure space (Danyluk & Ley, 2007; Schwanen & Mokhtarian, 2004). The majority of young city-dwellers, however, will sooner or later enter parenthood. In this position, they may start to assess their needs differently, even if they maintain an affinity for urban living. Moving out of the city is bound to be a difficult choice for people who embrace urban density and diversity. Nowadays, it is also a choice that easily conflicts with political ideology. In concrete terms: moving to a low-dense suburb is hard to reconcile with the dominant conception of sustainable urbanism.

Parents in the inner city may thus experience inconsistency between attitudes. Psychological theory suggests that some of them will try to solve the challenge by various mental maneuvers, to remove the pressure (Festinger, 1957). They may, without realizing it, enhance the attractiveness of inner-city locations at the expense of outer-city locations (Schwanen & Mokhtarian, 2004). Others may steer towards the same alternative, that is, sustained residence in the inner city, without apparent discomfort. This can happen through ideological motivation, through conscious assessment of pros and cons, or both.

'Ideological motivation' is a convenient label for strong lifestyle aspirations. Put simply, some individuals develop identities, attitudes and patterns of consumption that contrast strongly with mainstream preferences for large dwellings, green spaces and valuation of family networks (Boterman *et al.*, 2010; Brun & Fagnani, 1994; Karsten, 2003, 2007; Lilius, 2014). Living in the inner city becomes an essential ingredient in these people's self-perception, often with layered identities at different geographical levels (Butler & Robson, 2003). A Dutch study of this topic argues that the

'couples with high economic capital and relatively low cultural capital have a higher propensity to move out of the central city, whereas couples with high cultural capital and low economic capital have a smaller chance of suburbanizing' (Boterman, 2012, p. 2397). Social capital, too, can stabilize families in their current location (Butler & Robson, 2003; Boterman *et al.*, 2010).

A different perspective highlights the complex web of interactions between home, work, shopping and leisure. Families in large cities are engaged in difficult trade-offs between costs and benefits of numerous locations – childcare facilities, schools, workplaces, daily groceries, playgrounds and sport clubs. In general, there is no 'spatial fix' to the logistical difficulties that such duties impose upon parents (Green, 1997; Jarvis *et al.*, 2003). Still, since labour markets, housing markets, retail developments and other institutional contexts overlap, one may certainly *reduce* the time needed to reach daily activities. Choosing an inner-city location may appear as a sensible solution for busy parents, even though ambivalent feelings tend to prevail (Boterman *et al.*, 2010; Brun & Fagnani, 1994; Butler & Robson, 2003; Karsten, 2007). As noted by Karsten (2003), it is not only a question of commuting time but also the *punctuality* of daily routines. The inner city is undoubtedly a favourable location in city-regions with frequent traffic jams and train delays.

Summary and implications

Our arguments relate to changes in the urban structure (economic shift and transformation of landscapes), in the policy arena (regeneration policies, cultural development policies and compact-city policies) and in the identities, preferences and behaviour of middle-class residents.[1] These changes may go both ways, from macro- to micro-scales and oppositely, but given the topic, we largely perceive macro-scale changes as enabling and constraining factors. The net result of all changes is straightforward – new parents can be expected to stay longer in the inner city. The mechanisms that explain continued residence are threefold: implicit/unconscious modification of attitudes, place-based sense of belonging and rational adjustments to opportunities in the inner city. We further propose that the changes in the sequence of family compositions, that is, the appearance of numerous life-course trajectories, lie between the macro and the micro context (van Ham, 2012).

The Oslo context

Inner Oslo (Figure 1) started to lose population immediately after World War II, as an effect of municipality extension and planned development of the surrounding region. This 'hollowing-out' process proceeded over more than four decades, but came to a halt around 1990. From this time onwards, a rather different pattern started to emerge. The protracted cycle of decline had left large swathes of land available for transformation and new development. These areas were systematically turned into classical postmodern landscapes, with spaces for business, entertainment, culture and top-end housing. Older residential neighbourhoods went through upgrading as well, partly through large-scale public intervention and partly through private

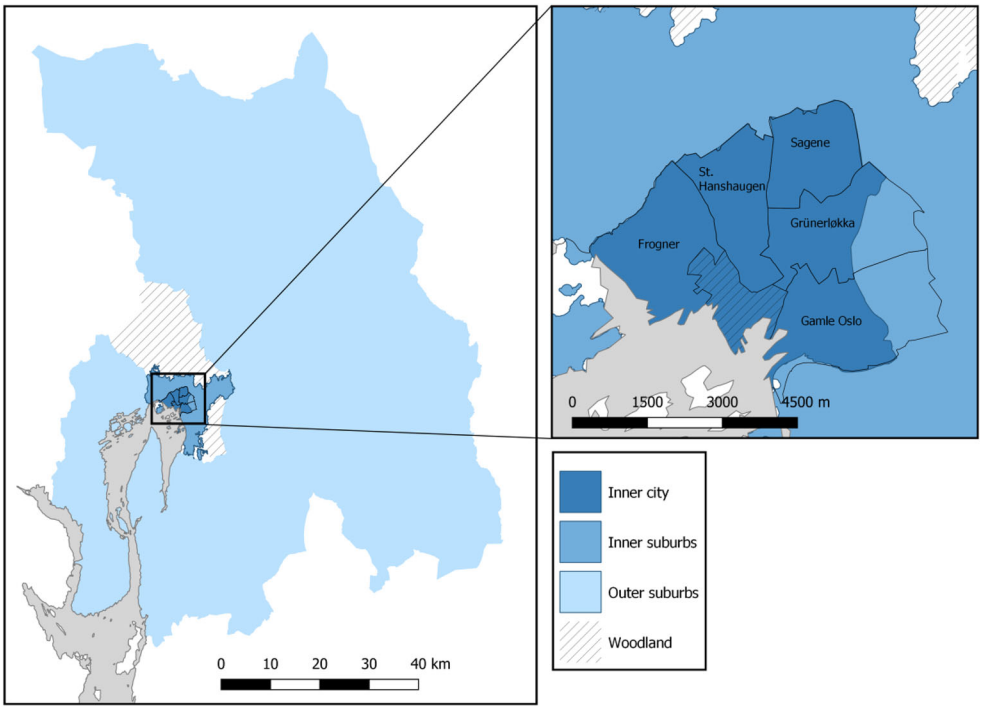

Figure 1. The inner city of Oslo and its surrounding suburbs.

investments succeeded by condominium conversion. A third piece of the picture is a downward spiral of social and physical problems in some of the inner suburbs, which were built in the 1950s, 1960s and 1970s. Both types of development, revival as well depression, had a massive effect on population trends. Most importantly, the inner-city population grew from 138,000 residents in 1990 to 226,000 residents in 2015.[2]

There is no doubt that many activities in the inner city, for example, along the waterfront, were set in train by central and local governments. This influence, however, faded over time. An illustration of the shift from public regulation to private management is the lack of updated plans for the inner city in the 1980s and 1990s. A plan from 1977 stood until 1998, although the underlying idea (zoning of activities) was seriously outdated. A new ideology centred on mixed uses, density, heritage preservation and population diversity had made its way into municipal planning even before 1977. This ideology strengthened its position among planning professionals and local politicians, who, on the other hand, lost strength in the larger context of urban development. Thus, while the local government developed strategies and tools to stabilize families in the inner city, they could hardly succeed without support from investors and developers. The most striking example of such rivalry concerns the use of quota regulations in housing construction. A report in 2005 discussed the need for a more family-friendly development of the inner city, and suggested to increase the share of larger dwellings (Oslo Municipality, 2005). Some years later, the proposal was implemented by the city council: at least 50% of all new dwellings should exceed 79 m^2, with additional requirements for smaller dwellings (Oslo City Council, 2007).[3] None of the major developers supported the decision, and started immediately to

lobby against it. This pressure led, after 5 years, to a moderation of the norm (Oslo City Council, 2013). Therefore, what we witness is a recurrent struggle between developers and politicians, with planning authorities squeezed in between. Every now and then, there is also a twist between the local and the national government.

The new family-oriented policy emerged in a period of rapid settlement change. Eastern parts of the inner city experienced substantial gentrification in the 1990s and 2000s, not only in new-built areas but also in the working-class quarters of the 19th century. As this process proceeded, some older immigrant settlements started to dissolve. Older minority groups (e.g. Pakistanis, Turks and Moroccans) relocated in the suburbs, and were replaced by a combination of Western gentrifiers, refugee groups from Asia and Africa (e.g. Iraqis, Afghans and Somalis) and labour migrants from Poland and other East European countries (Magnusson Turner & Wessel, 2013; Wessel *et al.*, 2018).

The changing population composition has clear implications for our study. We know from previous research that poor minorities in the Oslo area have a high tolerance for dense living (Wessel & Nordvik, 2019). Some of the new groups, however, are less deprived, and some of the older ones are likely to require additional space (Clark *et al.*, 2000).We therefore expect: (1) a higher stability among non-native families and (2) a declining native/non-native difference from the 1995 to the 2005 cohort.

Data and methods

Our two samples are drawn from a longitudinal database that contains the entire population. We have merged demographic, socioeconomic, geographical and housing/building statistics at the individual level, including some neighbourhood indicators, with registered residence between January 1, 1995/2005 and January 1, 2005/2015.[4] This procedure gave us a sample of 3328 first-time parents in 1995 and 4762 in 2005, which amounted to 33,280 and 47,620 person-years in the analyses of survival. All individuals in the study were alive throughout the 10-year period.

In addition, we also employed two control groups, one for each cohort. These groups include all singles and couples who fulfilled two criteria: (1) they were between 20 and 49 years of age on January 1, 1995/2005 and (2) they were childless throughout the observation period.

Our definition of inner Oslo coincides with the municipal borders that existed between 1878 and 1948. This includes the larger part of township 1, 2, 3, 4 and 5.[5]

Dependent variables

The initial pool of first-time parents may stay (survive) or leave the inner city. We exclude those who leave in a particular year from the analysis of subsequent years. Next, we turn to resettlement (i.e. the new location for movers), to highlight motivations that drive parents out of the inner city. Owing to limited data, we only measure the situation at the end of each period. Our first variable is a dummy indicator for those who resettle in houses rather than flats. We define 'house' as codes 111-133 in

the land registry, which crudely correspond to detached houses, semi-detached houses, terraced houses and atrium houses. Our second variable combines building type and geographical location. The exact values are: (1) inner suburb, house, (2) inner suburb, flat, (3) outer suburb, house, (4) outer suburb, flat and (5) rest of Norway. Inner suburbs contain all areas in the municipality of Oslo that lie *outside* of the inner city. Outer suburbs contain 29 surrounding municipalities (see Gundersen & Juvkam, 2013).

Independent variables

We noted above that the natives and the non-natives are differently situated in the housing market. We therefore present separate survival data for these two groups. We also employ national background as a key variable in the regression analyses. Our definition of the two groups follows standard practice in Norway: 'natives' are born in the country and have at least one Norwegian-born parent; 'non-natives' have two non-Norwegian parents.

Previous research has shown that inner-city residents who expand their families beyond one child are more likely to leave the inner city (Boterman, 2012). We control for this influence through two variables, separating between the second child and all additional children.

A basic intuition behind the study is that parents in the inner city respond negatively to lack of space. We expect, in consequence, a marked effect of dwelling size and dwelling distribution, in line with previous research (Boterman, 2012; Green, 1997). Our measurement here is average number of rooms per dwelling, based on linear interpolation and extrapolation of census data at the census tract level. A second variable ('population density') measures residents per unit land area (1000 m^2).

We further control for numerous factors that influence adjustment moves (see Clark & Dieleman, 1996): age (measured in 1995/2005), age squared, gender (woman), civil status (married/registered partner), educational level (university education at the bachelor level or higher), individual income and mean income in the census tract. The underlying income concept is income after tax, which includes wage, self-employment income, capital income and transfers. We log-transform both income measures, since their impact attenuates at higher levels.

Our analysis of resettlement includes the same set of individual variables, but none of the census tract variables. The rationale here is straightforward – it is hard to see how geographical location in the inner city should influence the choice of new residence. All individual variables, on the other hand, may have a bearing on this choice.

Four of our variables (national background, age, age squared and gender) are time-invariant, whereas the rest (civil status, arrival of a second child, arrival of additional children, education, individual income, census tract income, average dwelling size and population density) are time-varying. We lag these latter variables with 1 year; that is, we assume that parents respond to individual and census tract characteristics that obtain 1 year before the observation of survival.

Analytical approach

We first model the probability (p) that new parents will remain in the inner city (S) up to a specific year, t:

$$S(t) = p(T \geq t) \tag{1}$$

where time of survival (T) starts at 1 and decreases as t increases. We show the results as two Kaplan-Meier survival graphs, one with parents and the control group, and one with parents of native and non-native background.

Next, we introduce independent variables into the equation. We use a logit hazard model where the probability of two outcomes – survival and exit – is conditional on survival up to time t. This implies that each combination of person and year constitutes an observation as long as the person remains in the inner city. Our baseline model includes two significant terms – national background (N) and housing structure (H) – plus a vector of control variables (X):

$$h(t) = (T = \ t_i | T \geq t_i, N + H + X) \tag{2}$$

To see whether natives and non-natives respond differently to family extension and housing structure, we also need a refined version of the model, which is estimated separately for each cohort:

$$h(\mathrm{t}) = \left(T \ t_i \ T \geq t_i, \ \prod_{i=1}^{t} NH + X \right) \tag{3}$$

Our analysis of resettlement (rs) relies on two logit models, one binary and one multinomial, with the same specification:

$$p(rs) = \left(\prod_{i=1}^{t} CN + X \right) \tag{4}$$

We report estimates from the baseline model (Equation 2) as average marginal effects (AME) instead of odds ratios. AMEs facilitate comparison across models, and have a simple interpretation: each coefficient shows the average percentage points change (unit change) in the probability of a particular outcome, estimated over all observations. The more complex outcomes from Equations 3 and 4 lend themselves to graphical illustration rather than numbers. Here, we plot adjusted predictions at representative values of H (Equation 3) and average adjusted predictions of rs (Equation 4).

Limitations

A standard variable in similar research, housing tenure, lacks in our analysis. We did have sufficient information for one cohort, but not for both. However, as others have

Table 1. Descriptive statistics: independent variables measured over ten years.

	First child 1995		First child 2005	
	Mean	SD	Mean	SD
Age 1995/2005	29.738	5.01	31.690	4.49
Woman	0.524	0.50	0.517	0.50
Non-native background	0.207	0.41	0.183	0.39
Married/partner	0.520	0.50	0.535	0.50
Arrival of a second child	0.080	0.27	0.090	0.28
Arrival of additional children	0.034	0.18	0.030	0.17
University education	0.536	0.49	0.728	0.44
Log income	12.097	0.87	12.669	0.80
Mean log income (census tract)	11.684	0.24	12.296	0.26
Mean number of rooms per dwelling (census tract)	2.940	0.5	2.866	0.42
Population density (census tract)	12.851	8.44	14.021	8.83
Robustness checks				
Share of dwellings $\geq$80 m^2 (census tract)	0.459	0.237	0.416	0.217
Non-natives from Asia and Africa	0.131	0.338	0.132	0.338

argued (Nordvik & Magnusson Turner, 2015), Oslo differs substantially from most Western cities, with small tenure differences between the inner city and the suburbs. To take an example: the share of homeowners in 2011 at age 35 years was 67% in the inner city, 81% in the inner suburbs and 84% in the outer suburbs. Whether people own or rent, in other words, is not decisive. Including this variable could even bias coefficients of other life-course variables (ibid.).

A second potential limitation concerns loss of observations. Altogether 3.5% (1995 cohort) and 3.0% (2005 cohort) lacked registered income. We also excluded 0.5% (1995 cohort) and 0.3% (2005 cohort) with negative outcomes, since these cases reflect tax adjustments.

Descriptive statistics

A comparison of the two cohorts (Table 1) shows many similarities, but the 2005 cohort has a much higher level of education, in line with our portrait of settlement changes.[6] The 2005 cohort is also a bit older than the 1995 cohort, and contains fewer non-native individuals. Important as well, there is a marked increase in population density.

Results

Figure 2 shows the survival function for our two cohorts, with total probabilities along the *y*-axis. In the upper graph, we see that first-time parents are far less stable than singles and couples without children. Ten years after receiving their first child, less than 20% of the parents remain in the inner city, compared with 50% in the control group. Most of the difference appears in the first years, whereas the curves are parallel after 5 to 6 years. We thus observe great horizontal gaps in the middle of the graph. Look, for instance, at the 0.4 probability line: first-time parents reached this level after <4 years, whereas the control group reached it after 12–14 years. Moreover, there is no tendency towards increasing stability. The two curves for first-time parents follow each other closely, although with a slight gap in the middle of the

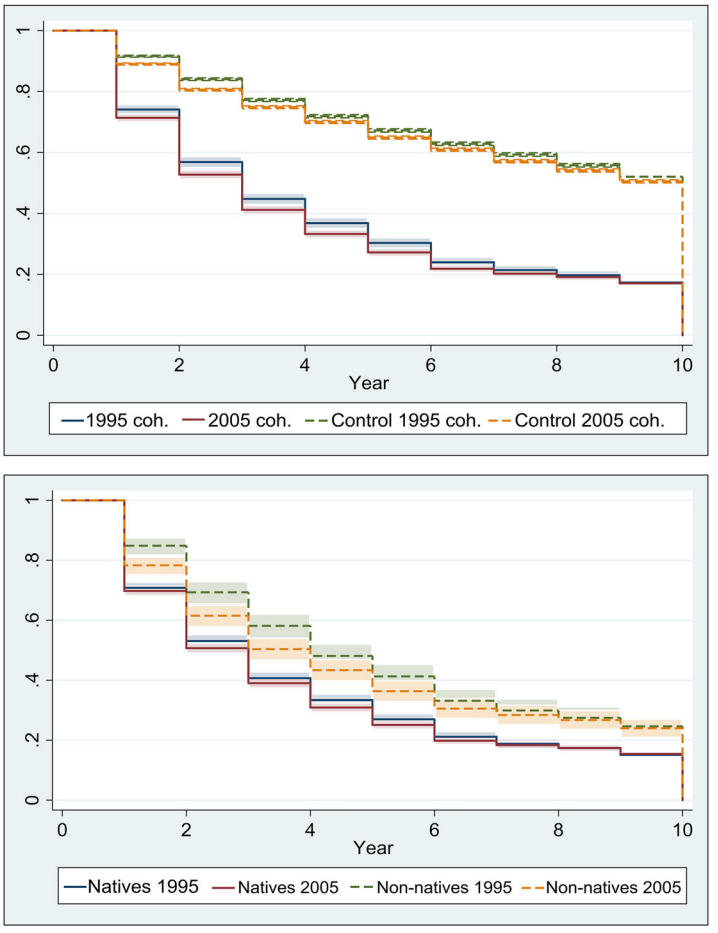

Figure 2. Continued residence in the inner city over 10 years: the Kaplan-Meier survival function, with 95% confidence intervals. Upper graph: Individuals who received their first child in 1995 and 2005, compared with two control groups. Lower graph: Individuals who received their first child in 1995 and 2005, divided by native/non-native background.

graph. Three to six years into parenthood, the 2005 cohort is actually *less* stable than the 1995 cohort ($p < .05$).

The lower half of Figure 2 displays results separately for natives and non-natives. We note a marked difference between the curves, with a faster decline in the native subgroup. The gap between the two groups reaches a peak after 3 years, and hovers around 10% points at the end of the two periods. Equally interesting, there is a *decline* in the gap due to decreasing difference between the non-native cohorts. In other words, non-native parents behave more and more similarly to the native majority.

To answer question 2 regarding correlates of stability, we will now look at results from the logit hazard model (Equation 2). We run four different versions of the model, two for each cohort. First, in Table 2, we show the overall picture for all 12 correlates, without any interaction terms.

We find, as expected, a significantly higher probability of survival among parents with non-native background, estimated to 14.0% and 6.9% points in the two cohorts.

Table 2. Survival in the inner city as a function of individual and neighbourhood characteristics, based on a 10-years observation window.

	1995 cohort	2005 cohort	Difference
Individual characteristics			
Age	0.014	−0.001	−0.015
Age squared	0.000	0.000	0.000
Gender (woman)	−0.023*	−0.026**	−0.003
Non-native background	0.140***	0.069***	−0.071***
Married/partner	−0.166***	−0.234***	−0.068***
Arrival of a second child	−0.073**	−0.030*	0.043*
Arrival of additional children	0.023	−0.011	−0.034*
University education	−0.003	0.029**	0.032*
Log income	−0.124***	−0.143***	−0.018
Neighbourhood characteristics			
Log mean income	−0.056	0.017	0.073
Number of rooms per dwelling	0.059***	0.035**	−0.024
Population density	−0.230**	−0.062	0.168
Number of observations	31,862	46,079	

Average marginal effects. *Notes:* *$p < .05$; **$p < .01$; ***$p < .001$, based on robust standard errors.

The decline in the estimate is highly significant ($p < .001$), and strengthens the impression from Figure 2: there is an increasing similarity in the behaviour of native and non-native parents, whether it is due to compositional changes or changing tolerance for dense living.

Another significant feature is a modest impact of housing structure and population density. It matters somewhat whether first-time parents live in census tracts with larger dwellings and/or intensive utilization of land.[7] A decrease in the impact of these variables does not reach statistical significance, but is nevertheless interesting. It gives a crude indication that the density is only one of the many factors that drive families out of the inner city. The key point, perhaps, is that *all* inner-city neighbourhoods are intensively utilized, and lack affordable housing at ground level. As it happens, we do have some evidence regarding this factor. A survey conducted among parents who left the inner city in the period 2014 to 2017 provides the following numbers: 81% wanted a dwelling with private out-door space, and 70% wanted a detached, semi-detached or terraced house (Barlindhaug *et al.*, 2018).

A third feature in Table 2 is a marked negative impact of child number two. Families who receive *more* than two children, on the other hand, appear to be less affected by family extension. But since the effect of child number two *decreases*, and since child number two weighs more than additional children (Table 1), we do not sense a major change in the impact of parenthood. Our tentative suggestion is that different changes, including the pattern for first-time parents, neutralize each other.

Other variables yield a combination of expected and unexpected results. It is fully foreseeable that couples are less stable than singles, given the different need for space. An expected result even obtains for education – increasing stability among university graduates may indicate a certain degree of family gentrification, as observed by Karsten and others. The stable negative impact of individual income, on the other hand, is surprising. The literature suggests increasing stability among middle-class parents, as part of the gentrification process. A rough but plausible explanation is that gentrification in Oslo unfolds in areas with few family-sized dwellings. Most neighbourhoods that gentrify were built for the working class (Hjorthol & Bjørnskau,

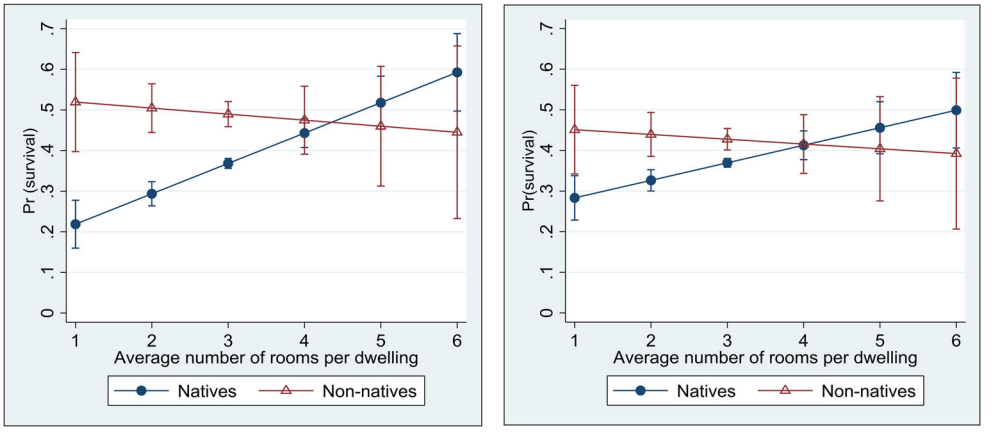

Figure 3. Adjusted prediction of survival by cohort, native/non-native background, and average number of rooms per dwelling (census tracts) with 95% confidence intervals. Left graph: the 1995 cohort. Right graph: the 2005 cohort. Based on a logit model with all control variables (Table 2).

2005), and have not been through a preceding change from middle-class to working-class domination. With such a background, one should not expect a large extent of family gentrification. In addition, there is also a tendency for high-income families to buy dwellings for their offspring in expensive parts of the inner city (Magnusson Turner & Wessel, 2019). It is highly likely that these dwellings are sold at a later stage, typically when children become parents themselves.

The next set of analyses explores interaction between native/non-native background and housing structure, estimated separately for each cohort (Equation 3). The results are shown in Figure 3, and demonstrate clear differences in the sensitivity to local housing structure. Natives are significantly more stable in census tracts with spacious dwellings. Non-natives, by contrast, do not respond to internal variations in housing structure. But non-natives, just like natives, have different probabilities in the two cohorts. Non-natives become *less* stable in all types of area. Natives become slightly *more* stable in areas with smaller dwellings, but *less* stable in areas with larger dwellings. This suggests, first, that quota regulations are more likely to stabilize native families than non-native families, and second, that such regulations have a slightly declining efficiency.

The pattern among non-natives deserves some comment. Following previous research, our interpretation is that many minorities avoid or leave prestigious areas in the inner city. The symbolic value attached to these places is highly priced, and may be swapped for tangible housing qualities in other parts of the city (Magnusson Turner & Wessel, 2013).

Resettlement

A central aspect of compact-city policies is to increase the share of multifamily houses, since these types of environment presumably require less energy for space heating and cooling per square meter (Naess & Vogel, 2012). Such environments may also facilitate investments in public transport, and may signal a departure from land-

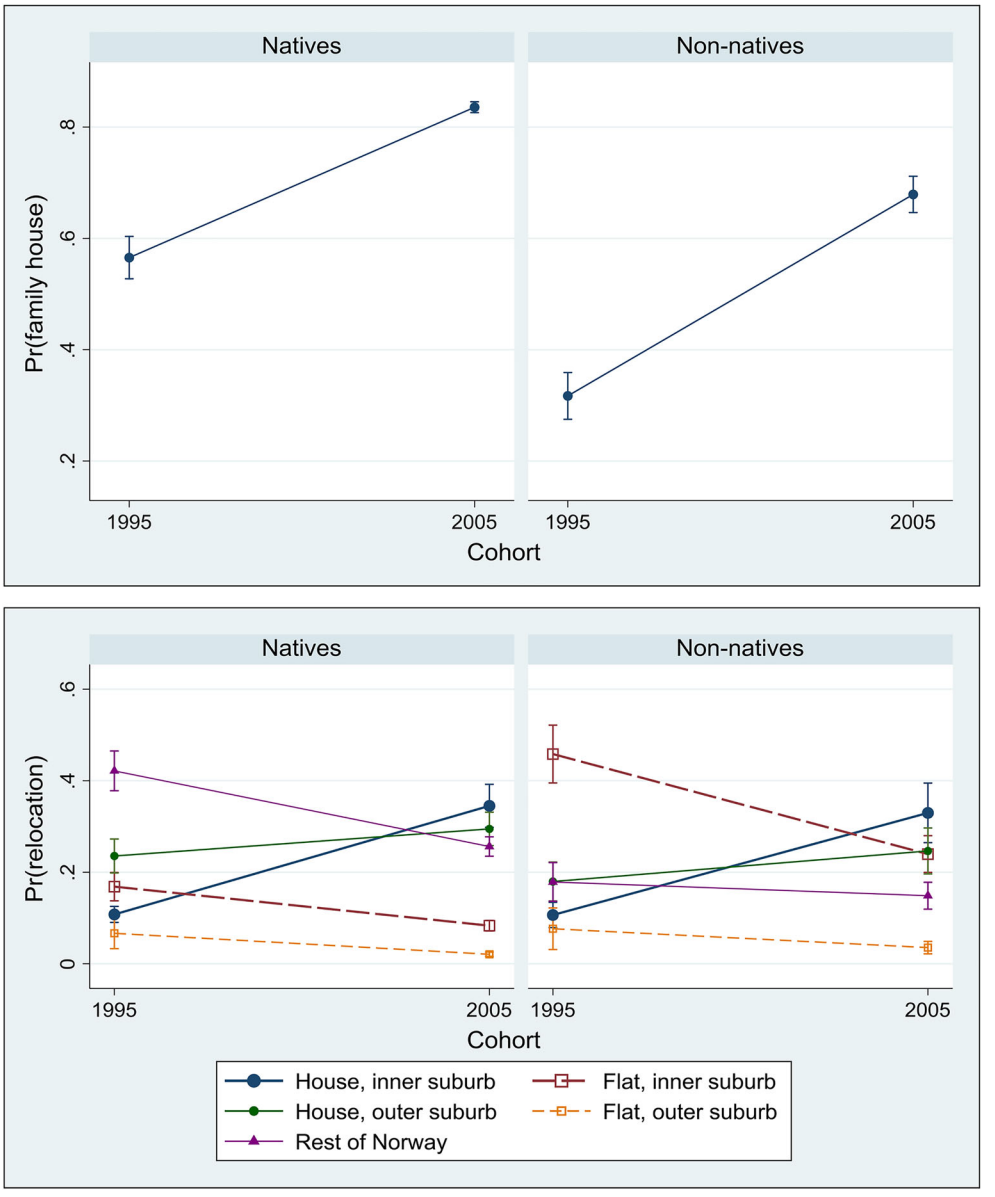

Figure 4. Adjusted prediction of relocation choices, with 95% confidence intervals. Upper graph: movement to a house by native/non-native background and cohort, based on a binary logit model. Lower graph: five choices by native/non-native background and cohort, based on a multinomial logit model. Control variables: age, gender, civil status, arrival of a second child, arrival of additional children, education, and log income.

consuming urban sprawl (ibid.). The implication for our study is clear: it smacks of failure for compact-city policies if families continue to relocate in suburban houses. It follows logically that stable orientation towards this type of housing and landscape limits the potential for family gentrification. The share of houses in the inner city is just 10% (2011), compared with 49 and 81% in the suburban zones (see note 2).

The upper half of Figure 4 shows that new parents are indeed conservative in their housing choices. The proportion of families who relocate in houses has actually *increased* for both natives and non-natives, with a steeper change for the latter group. While the pattern may comply with immigrant integration policies, it certainly does not comply with compact-city policies.

The lower half of Figure 4 illustrates the resettlement geography in greater detail. We see that the families of the 2005 cohort are weakly represented in suburban housing blocks compared with the 1995 cohort. The largest change obtains among families who relocate in the inner suburbs, with declining probabilities around 9–10 (natives) and 20–21 (non-natives) percentage points. A final detail is that the areas outside of the Oslo region have a declining attraction on native parents and a stable attraction on non-native parents.

Robustness checks

We conducted several tests to ensure that our core results hold up against alternative specifications. Appendix A shows three of these tests, using predicted stability in Table 2 as a comparative basis. We first consider the validity of logit hazard models. This method gives an intuitive idea of how time-variant and time-invariant variables predict discrete-time sequences. A potential problem, however, arises from the proportional odds assumption for time-varying variables (Nordvik & Magnusson Turner, 2015; Rabe-Hesketh & Skrondal, 2008). We therefore replicate the analysis with a standard Cox regression model (column 4-6). Fortunately, the pattern we observe does not change.[8] A second test concerns heterogeneity in the measurement of native/non-native background. Some recent minorities may, as noted above, integrate faster than groups from Asia and Africa. We test this prospect in column 7–9, and find a smaller change for Asians/Africans than for all non-natives. Part of the declining native/non-native difference in Table 2 may therefore emerge from changes in population composition, and not from changes in behaviour. Finally, we also test the sensitivity of housing structure. Column 10–12 shows that share of dwellings $\geq$80 m^2 gives the same pattern as mean number of rooms per dwelling.

Concluding discussion

Our empirical investigation documents that first-time parents in Oslo follow a classic time-space trajectory from the inner city to the suburbs. Comparing two cohorts, 1995 and 2005, we find no increase in the propensity to stay in the inner city, but rather the opposite. Much of the change is due to declining tolerance for compact living among non-natives, whereas natives have a more stable pattern. Similar patterns occur when we look at variations in local housing structure. Native parents have a high degree of stability in census tracts with a high share of larger dwellings. Non-native parents, on the other hand, are more or less indifferent to variations in the local housing structure. Our intuitive interpretation is that non-natives are less willing to pay a premium for a fashionable location, given a correlation between dwelling size and neighbourhood status. Even native parents with the opportunity for choice

appear to swap central location for more space and different environments in the suburbs, as indicated by a negative effect of individual income. We note, at the same time, an increasing impact of university education from one cohort to next. This latter trend, although weak, bears the hallmark of arising family gentrification. Its basis is clearly lifestyle and culture rather than economic status.

Our analysis further revealed that families continue to prioritize low-rise suburban landscapes. To our surprise, this tendency was *stronger* in the latest cohort, with larger changes for non-natives than for natives. The switch from multifamily flats to houses was most pronounced in the inner suburbs, that is, within the borders of Oslo municipality.

Why, one might ask, is there so little effect of macro-level changes on micro-level behaviour? Inner Oslo is undoubtedly cleaner, better equipped with services, more diverse and more lively than one generation ago. Do new parents ignore all these improvements? We cannot provide a clear answer, but three points seem relevant. First, the increasing flow of non-native parents out of the inner city represents a classic integration process.[9] The collision between this adjustment and compact-city policies is hard to avoid, especially in a city that favours social equality. Second, the two cohorts faced different sets of opportunities. New parents in the latter cohort were able to buy a house with little or no equity, except for some minor restrictions at the end of the period. The first cohort, in contrast, had limited access to housing credit, since many banks suffered from a financial crisis in the early 1990s. Legal restrictions and a careful lending mentality prevailed throughout the decade, but then, around 2000–2001, a more unrestrained practice emerged. A representative example of the new era is the share of households with loan-to-value ratios above 100%. In 2000, the share was 5.6%, in 2002, 10.5%, and in 2007, 13.8%, measured for the country as a whole (Finanstilsynet, 2018). Third, the rationales that guide housing choices are extremely complex, with multiple products and intricate search processes. It is not unlikely that different cohorts and generations make similar choices, but differ in their level of certainty. Families who moved from the inner city in the 1960s and 70 s viewed the suburb as a superb alternative – this was the 'hygienic city' with abundant space and light, as conveyed by a Norwegian historian (Benum, 1994). Current generations may prefer a suburban location in the child-rearing life stage, but they do not 'flee' the inner city. Various signs suggest that urban preferences are durable, and that re-migration to the city is more than rhetoric.[10]

Our findings reflect poorly on urban policies. Successive local governments have not achieved greater stability among inner-city parents, despite numerous declarations and initiatives. A mitigating circumstance in this context is that *other* groups display a similar pattern, with increasing out-mobility from the inner city (Figure 2). Therefore, it is possible that the local policies faced additional challenges in the second period. We have already pointed at available credit as a prerequisite for house purchases. Other influential factors are strong economic growth and low unemployment. Previous research has shown that periods of economic prosperity tend to coincide with high levels of migration (Carling, 1999). In short, local politicians and planners may have fought an uphill battle in their efforts to stabilize inner-city residents. They have also wrestled with powerful property developers and central

authorities bent on rapid housing production. A dominant trend in recent years has been to simplify the Planning and Building Act, for example, regarding storage space, room sizes and light exposure. It does not help, of course, that property developers succeeded in their lobby against the quota regulation for new housing construction. The change in the regulation in 2013 received massive support from the media, but not from the municipal planning agency, the Norwegian State Housing Bank or the leading opposition party. As we have seen, dwelling size is indeed an interesting tool. Increasing the share of family-sized dwellings is likely to affect population stability and population structure. A more pervasive change, however, requires additional tools. Access to outdoor spaces (e.g. play spaces, community gardens and safe streets) is an important ingredient in child welfare (Freeman & Tranter, 2012). The management of this concern in Oslo has often been criticized – recently in a municipal report. A norm from the 1980s required that all housing projects in the inner city had at least 25% outdoor space, with no further restraints regarding location, coherence or the division between private and public space. Housing developments were therefore allowed despite obvious defects; the most common being fragmented spaces, use of spaces for storage and deficient sun exposure (Oslo Municipality, 2012). There is now, since 2012, a more differentiated set of rules, but the underlying dilemmas remain unresolved. Regulating authorities have to balance on a sharp knife-edge between densification and housing provision, on one hand, and safeguarding outdoor spaces, on the other. Little or nothing suggests that current regulations are strong enough to secure child-friendly environments. The largest problem is that small infill projects (defined as less than 600 m^2) dominate in many areas. These projects obtain building permission according to a regulation that allows all outdoor space on the rooftop.

Although speculative, it is also useful to consider the importance of housing structure. The huge demand for low-rise houses represents a double-edged threat to compact-city policies. First, families who fail to acquire such a dwelling close to the city are likely to continue their search in more peripheral locations, which increases the danger for continued sprawl. Some peripheral municipalities are bounded by a common planning strategy, but others are free to develop low-density suburbs. Second, families who remain in the inner city have to cope with low residential stability, and thus with ingrained threats to trust, engagement and social interaction (Sampson *et al.*, 1999). In consequence, one sensible initiative would be to secure a diverse housing structure in parts of the inner city. This need not imply a return to low-density housing construction. A promising alternative, we believe, is the English-style townhouse with a small courtyard. The existing stock of such housing in Oslo is extremely popular, but also extremely costly. Thus, to achieve both social equity and sustainability of community (Bramley *et al.*, 2009; Dempsey *et al.*, 2011) one cannot do without some public intervention, for example, support through the Norwegian State Housing Bank.

All of this leads to the conclusion that Oslo, while successful in several respects, has failed to improve community aspects of social sustainability. Admittedly, we have only explored residential stability, and not the whole range of aspects that allow social organization at various geographical scales. But then again, residential stability may

facilitate cohesion, place attachment and the creation of collective groups. To quote a key source on this topic, 'stable neighbourhoods exhibit considerably higher levels of reciprocated exchange and intergenerational closure than do unstable neighbourhoods' (Sampson *et al.*, 1999, p. 656).

An utterly different alternative would be to accept the continuous flow of new families out of the inner city. Low stability is, after all, fully normal in certain stages of life (Kearns & Forrest, 2000; Wilson & Taub, 2006). A switch in this direction might even increase the credibility of urban policy.

Notes

1. We repeatedly point at middle-class households since much of the current debate on parenthood in the inner city concerns this particular group.
2. The numbers are estimated from the database.
3. A cruder room-based regulation existed in the period 2004–2007.
4. We chose the 2005 cohort to have a long period of observation, stretching up to the latest registration. The 1995 cohort was a natural choice as well, since we lacked income data before 1993, and since the housing market suffered a downturn between 1988 and 1993.
5. Three subareas of township 1–5, Bygdøy, Hasle-Løren and Helsfyr, lie outside of the old borders.
6. Our survival design implies that means and standard deviations may change over time, partly because parameters vary and partly because subgroups of parents exit the area at different points in time. These underlying variations are not displayed in the table.
7. The impact of dwelling structure increases by 30%–40% when population density is left out of the equation. The opposite operation yields a weaker change.
8. The effect of the proportional odds assumption is larger with just *one* or a few time-variant variables (see Nordvik & Magnusson Turner, 2015).
9. Spatial assimilation theory assumes that immigrants will diffuse from original settlements, particularly, inner-city areas, as part of the incorporation into a new society. The suitability of this theory in Europe is still controversial (for a Nordic study: see Wessel *et al.*, 2017).
10. Our database (the 2014 record) shows that around 16% of all movers from the inner suburbs to the inner city were between 45 and 79 years of age. Tracing this group further, we can identify 52% as inner-city residents at some earlier point.

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Appendix A. Robustness checks.

	Reference: Table 2			Cox regression			Non-natives from Asia and Africa			Share of large dwellings		
	1995 cohort	2005 cohort	Difference	1995 cohort	2005 cohort	Difference	1995 cohort	2005 cohort	Difference	1995 cohort	2005 cohort	Difference
Individual characteristics												
Age	0.014	−0.001	−0.015	1.019	0.985	−0.033*	0.013	−0.001	−0.014	0.014	−0.001	−0.015
Age squared	0.000	0.000	0.000	0.999	1.001***	0.001**	−0.000	0.000	0.000	−0.000	0.000	0.000
Gender (woman)	−0.023*	−0.026**	−0.003	0.988	0.983	−0.005	−0.022	−0.027**	−0.005	−0.023*	−0.025**	−0.002
Native/non-native background	0.140***	0.069***	−0.071***	1.377***	1.207***	−0.170***	0.173***	0.110***	−0.062*	0.136***	0.068***	−0.071***
Married/partner	−0.166***	−0.234***	−0.068***	0.741***	0.622***	−0.119***	−0.167***	−0.235***	−0.068***	−0.166***	−0.234***	−0.068***
Arrival of a second child	−0.073**	−0.030*	0.043*	0.813***	0.917***	0.104***	−0.076***	−0.034*	0.045*	−0.074***	−0.031*	0.043*
Arrival of additional children	0.023	−0.011	−0.034*	1.056*	0.951**	−0.105***	0.019	−0.015	−0.034*	0.023	−0.012	−0.035*
University education	−0.003	0.029**	0.032*	1.015	1.124***	0.109***	0.000	0.031**	0.031*	−0.002	0.029**	0.033*
Log income	−0.124***	−0.143***	−0.018	0.824***	0.815***	−0.009	−0.125***	−0.143***	−0.018	−0.124***	−0.143***	−0.019
Neighbourhood characteristics												
Log mean income	−0.056	0.017	0.073	0.809***	0.990	0.181**	−0.049	0.027	0.076	−0.020	0.019	0.039
Neighbourhood housing structure	0.059***	0.035**	−0.024	1.161***	1.099***	−0.062	0.061***	0.035**	−0.026	0.001*	0.001**	0.000
Population density	−0.230**	−0.062	0.168	0.396*	0.862*	0.469**	−0.242**	−0.061	0.181	−0.217**	−0.064	0.153
Number of observations	31,862	46,079		31,862	46,079		31,862	46,079		31,862	46,079	

Notes: *$p < .05$; **$p < .01$; ***$p < .001$, based on robust standard errors.