The spatial scale of white avoidance

Processes reconstituting ethnic segregation in Sweden

Abstract:

Since the migration crisis, worries of migrant integration have taken a dominant role in popular discourse. Ethnic segregation is often framed as a failure of migrant integration. However, Swedish ethnic segregation is (re)produced through white avoidance: the ethnic majority avoiding moving to areas with high concentrations of ethnic minorities. Current explanations for these patterns are either ethnic prejudice or homophily, or the quality-of-life-based racial proxy hypothesis. This study explores the strength of both explanatory mechanisms by predicting the ethnicity of an adult moving into a neighbourhood based on the sociodemographic characteristics of their new neighbours. Moreover, this study explores the effect of scale using a bespoke knn approach, estimating white avoidance at eight scales. I find that the ethnic concentrations are the strongest predictor of the decreasing odds of a mover being a visible majority. Other sociodemographic concentrations, unemployment and, to a lesser extent, homeownership matter more on less-detailed scales (1,600 nearest neighbours), thus suggesting that different sociodemographic concentrations matter to the individual at different scales: for ethnicity at the highest resolution (100 nearest neighbours), for unemployment and the lowest (6,400 nearest neighbours). Employing an ensemble model improves fit, indicating that areas of high ethnic and unemployed concentrations are less moved into by visible majorities. The findings stress that while socioeconomic conditions matter, ethnic concentration is the leading factor in determining ethnic mobility flows. Moreover, the findings underline that in the spatial segmentation of ethnic minorities, the behaviours, beliefs, and attitudes of the ethnic majority are of crucial importance.

Introduction

Sweden has become increasingly a migrant society (Malmberg & Clark, 2021) with 20% of the population having been born abroad (Statistikmyndigheten, 2025). With this increased migrant and migrant-descended population, ethnic residential segregation, the spatial polarisation of ethnic minorities away from the ethnic majority, has become the cause of considerable societal anxiety. In the European context, where ethnic minorities are often (non-Western) migrants or descendants of (non-Western) migrants, areas with large ethnic concentrations have been deemed "parallel societies" (Henley, 2022), "a hole in society", "ghettos" (Lundsteen, 2023) or similar terms. While this presumed negative relationship between integration and ethnic segregation is more complicated (Musterd, 2003), there are some negative consequences of ethnic segregation, mostly to the minority groups being spatially sorted. Ethnic segregation is associated with divergences in school results (E. Andersson et al., 2010), with reduced economic opportunities (R. Andersson et al., 2007) and lower well-being (Westra, 2024; Westra & Haandrikman, Forthcoming). Therefore, it is not surprising that it is mostly framed as a negative phenomenon.

The integration-focused discourse that is dominant in the public domain puts the onus of spatial sorting on the ethnic minorities themselves: ethnic segregation is supposed to be a result of homophily that is perceived as a failure of spatial integration. Nevertheless, in the past decade, the role of selective neighbourhood choice of the ethnic majority has been identified as a cause of ethnic segregation (R. Andersson, 2013; Skifter Andersen, 2017). Central in this residential (im)mobility-led discourse are the concepts of white avoidance and white flight: the tendency of the ethnic majority to avoid neighbourhoods with high concentrations of ethnic minorities and to move out when the number of ethnic minorities increases. In most European contexts, Sweden notwithstanding, the evidence for white flight is minimal, but the effects of white avoidance are rather strong (R. Andersson, 2013; Bolt, 2009; Bråmå, 2006; Skifter Andersen, 2017). Two competing causal pathways have been proposed for white flight and white avoidance. Firstly, there are explanations rooted in residential preferences in the white avoidance hypothesis. This line of reasoning is that the white avoidance and white flight are expressions of either homophily or negative perceptions of (areas with high concentrations of) ethnic minorities held by the ethnic majority. Alternatively, there are the quality-of-life-based explanations in the racial proxy hypothesis. This argues that ethnic segregation is a reflection of differentials of socioeconomic status, insider knowledge, and institutional power between the ethnic majority and minority (Dekker, 2012a; Swaroop & Krysan, 2011). Consequently, the ethnic majority is better able to leave and avoid less desirable neighbourhoods. The resulting ethnic landscape, then, is a result of differences in neighbourhood quality, for instance, housing quality, social structure, and amenities, and ethnic socioeconomic differences, rather than prejudice. Of course, these hypotheses are not mutually exclusive; however, research in the US context has found that the white avoidance explanation dominates (Swaroop & Krysan, 2011).

Consequently, the study has two aims: firstly, to test both the racial proxy hypothesis and the white avoidance hypothesis by exploring the qualities and population compositions of the destinations for residential movers in Sweden, 2009-2017. Secondly, to explore the scale at which this takes place in order to deepen the understanding of white avoidance and the racial proxy: whether it is the sociodemographic composition of nearest neighbours that matters, or whether wider sociodemographic profiles are avoided. If the ethnic composition at a detailed scale matters more, explanations around negative racial stereotypes become more persuasive, whereas if the wider area matters, it might reflect some wider-held negative ideas about minority dense neighbourhoods. Briefly, this paper aims to discover at what scale the ethnic majority avoids ethnic concentrated areas, economically deprived areas, has better access to homeowning, or areas with access to amenities and which of these factors matters the most.

The study makes two particular contributions. The first contribution is a thorough exploration of factors that could be racial proxies, such as socioeconomic composition, tenure landscape, and neighbourhood qualities such as access to amenities. Thus, it provides a deeper insight into the extent to which negative ethnic stereotypes might play a role in reproducing ethnic segregation. Moreover, this furthers the understanding of what exactly constitutes the racial proxy: whether it is socioeconomic factors, housing factors, or amenity factors. Secondly, the study connects to a growing body of literature studying the effects of scale by using a bespoke *k*nn approach, which has emerged from dissatisfaction with off-the-shelf territory-based conceptions of neighbourhoods (Lichter et al., 2015; Malmberg et al., 2018; Petrović et al., 2022; Reardon et al., 2008). These approaches tie into the rising awareness that humans do not focus on a single scale and that different neighbourhood factors might matter at different levels of scale (Petrović et al., 2022). Exploring the effect of various levels of nearest neighbours re-centres the discussion of white avoidance on the neighbours, the factor that is supposedly considered by movers, rather than a territory of land which have been relied on thus far. Therefore, this study considers the process of white avoidance at a resolution that has not been considered so far, including the very direct environment, such as flat or street level and conceptualises scale as fluid, rather than a single static unit. This further improves the understanding of the decision-making when moving, shedding light on the level at which racial stereotypes might function.

Background: Ethnic Residential Segregation and White Avoidance In Sweden

Ethnic segregation is the collective result of individual location decisions that are shaped by wider societal influences (Musterd, 2020). The polarised distributions of ethnic groups are due to two factors: differences in residential mobility and staying behaviour (Galster & Hedman, 2014) and differences in natural growth (Finney & Simpson, 2009). The causes of these differences can be divided into whether they are due to characteristics that are exogenous or endogenous to the minority (E. K. Andersson & Fransson, 2008). For instance, differences in the natural growth of ethnic minorities can be due to differences in age structures between ethnic groups, which are endogenous to the group. In terms of moving, ethnic minorities with a migration background might have less knowledge about the housing market, either personally accrued or generationally transferred. Alternatively, there are exogenous factors in which both white avoidance and white flight fall under: ethnic minorities are spatially sorted due to perceptions that the majority groups have of them, not due to intrinsic values of their own. Similarly, there might be institutional barriers in the housing market for migrant groups that natives do not experience. Together, these factors lead to different spatial distributions of ethnic groups, which in turn might have the aforementioned consequences for social mobility and well-being (Hedman & Galster, 2013).

Ethnic segregation has been extensively studied in Sweden, ever since the aforementioned rise in immigration since the 1990s (Malmberg et al., 2013). Most studies find a level of ethnic segregation similar to other European countries, such as the Netherlands, though with an overall larger migration population (E. K. Andersson et al., 2018). It is extremely rare for a nationality other than Swedish to be the majority in a neighbourhood. Nevertheless, an ethnic hierarchy has been observed, with, in particular, residents with a non-European background from Muslim countries living further away from Swedes without a migration background (E. Andersson et al., 2010). Most studies have found an increase in ethnic segregation, but Malmberg et al (2010) find that this is a function of the general increase in population with migration backgrounds, thus increasing the number of neighbourhoods with high concentrations of ethnic minorities. They find that overall, the minority population is more equally spread.

Several causes of ethnic spatial sorting have been found. Firstly, in previous studies of spatial sorting, evidence has been found of institutional barriers in the Swedish housing market. For example, individuals with a foreign-sounding surname have fewer bids on houses accepted (Ahmed & Hammarstedt, 2008). Similarly, many municipalities in Sweden use seniority-based queues to allocate housing, and some allow for intergenerational transfers of accrued queueing points. Migrants and migrant families have less time to queue for such housing and thus have fewer opportunities available (Scarpa, 2024). There are socioeconomic differences between ethnic minorities and the ethnic majority as well. An overlap is found between socioeconomic deprivation and ethnicity, for example, a considerable part of migrants in Sweden arrive as refugees who tend to have less savings and are not allowed to work for a couple of years (R. Andersson & Kährik, 2015). The overlap is so persuasive that socioeconomic and ethnic segregation are used interchangeably colloquially (R. Andersson et al., 2010). Nevertheless, Andersson & Kährik (2015) find that there is a mechanism of double sorting: low-income natives live in (socioeconomically) segregated in different neighbourhoods from migrants. Some migrants' more limited socioeconomic standing might contribute to their spatial sorting, but it does not explain the full sorting that takes place. Moreover, it suggests that some white avoidance is taking place.

Because of these socioeconomic and institutional barriers, evidence of place stratification has been found through mobility regimes. For example, Van Ham et al. (2014) find that ethnic minorities are most exposed to growing up in deprived neighbourhoods, which translates into their subsequent adult housing career. Moreover, studies find that the mobility of migrants is often not associated with leaving distressed areas, although it greatly matters what place a migrant arrives and how long they stay in their neighbourhood of arrival (Vogiazides & Chihaya, 2020). Besides the relocation behaviour of the ethnic minority, the ethnic majority has been sporadically studied as well. Bråmå (2006) finds descriptive evidence for white avoidance and white flight on a labour market level. Similarly, Andersson (2013) finds strong evidence of white avoidance at the same level, but a negligible level of white flight. Similar to other countries, similar results have been produced in other Nordic contexts (Skifter Andersen, 2017).

In conclusion, ethnic segregation is the collective outcome of, among others, mobility decisions. Differences in mobility decisions are caused both by factors intrinsic to ethnic groups and factors external to them. In the Swedish neighbourhoods, particularly in those at the edge of Swedish cities, ethnic segregation is the result of institutional barriers, ethnic socioeconomic differences, and white avoidance. Consequently, a landscape has emerged where those with a non-Western migration background are sorted into deprived neighbourhoods.

Background: the spatial scale of segregation

The scale and manner of spatial aggregation at which ethnic concentrations are measured are essential factors in the discovery of patterns and consequences of ethnic segregation. Bias due to the Modifiable Area Unit Problem (henceforth referred to as MAUP) has been well documented. Nevertheless, from a practical sense, in most contexts, there might be only a few spatial resolutions available (Amcoff, 2025; Petrović et al., 2020). Moreover, it is unlikely that there is one "right" scale to measure ethnic segregation: Reardon et al. (2008) find that different types of ethnic segregation become apparent on different levels of scale and report remarkable heterogeneity in the pattern of segregation across scale between American metropoles. Broadly, neighbourhoods and scales can be conceived in two ways: either as a territory with people in it, or as a community around individuals. The remainder of this section will discuss and contrast the operationalisation of these two approaches.

Territory-based conceptualisations are neighbourhoods that are based on a classification of a certain area rather than its residents. For instance, one might think of "the Bronx" or "Beverly Hills", but there are also types of land-based territories that might not have clear names, such as certain census tracts. Normally, these types of neighbourhoods are provided by national statistics agencies or local authorities. While they are normally very accessible for research, these areas might not be well-suited to study the phenomena at hand. In the Swedish case, many studies regarding segregation have used some form of predefined neighbourhoods. For example, the Small Market Statistics Areas (SAMS) previously used in studies on white avoidance (R. Andersson, 2013; Bråmå, 2006) have been found to measure neighbourhood effects poorly (Amcoff, 2012). Since then, alternative spatial units based on local voting districts and supposedly taking into account physical barriers between neighbourhoods have been introduced (Alm Fjellborg, 2018), but have rarely been used in segregation research due to the increased popularity of bespoke or individualised neighbourhoods.

Bespoke neighbourhoods are based on the individual rather than a territory or a group of individuals, and therefore take the neighbourhood as an area around people rather than an area with people in it (Östh et al., 2015). There are broadly two ways to draw individualised neighbourhoods: nearest areas around the centred individual and nearest neighbours around the centred individual (Amcoff, 2025), for distance-based approaches. A radius of a certain distance is drawn around each individual, with everybody in that area being part of the neighbourhood. For nearest neighbours, a *k* number of neighbours is set (*k*nn), and an increasingly large radius is drawn around every individual until the radius contains the *k* number of neighbours (Östh et al., 2015). *K*nn methods have been extensively used since the introduction of software like EquiPop Flow (Östh, 2014) and GeoContext (Hennerdal, 2018/2024) that rely on grid-based input, increasing the radius of cells until the number of *k* is met (Amcoff, 2025).

Knn has three major advantages. Firstly, it allows for exploration of multiple scales at once, thus allowing for interplay between various levels of scale (Amcoff, 2025). In addition, it is unlikely that humans function on one single scale at a time (Haandrikman et al., 2023; Petrović et al., 2022). Secondly, it allows for exploring results on a scale more detailed than territory-based neighbourhoods that might be more appropriate for the phenomenon studied. Thirdly, there might be a theoretical reason why comparing to nearest neighbours makes most sense. In the case of white flight and white avoidance, if these behaviours are induced by negative ethnic stereotypes, the neighbours, rather than the territory, are likely to be a frame of reference for the individual.

Nevertheless, some of the claims on the supposed benefits of the methods might have been overoptimistic (Amcoff, 2025). Firstly, while some claim it completely solves MAUP, this is refuted by the fact that the found patterns change greatly if the cell size of the population grid increases (Amcoff, 2025; Nielsen & Hennerdal, 2017). Secondly, the fabric of built environments differs greatly between regions and within cities. As such, the same area of land around an individual will have vastly different population counts, or the same number of neighbours will be spread out over vastly different distances. Thirdly, in the end, bespoke neighbourhoods are just a crude resident-based buffer, while human activity is rarely perfectly circular (Petrović et al., 2024). Consequently, bespoke neighbourhoods do not take into account physical disruptions in the urban landscape, such as major artery roads, rivers, or ledges, non-resident functional differences between areas, such as the presence of shops, office, and other major buildings, and the non-resident social structure, such as commuters, travellers, and unhoused people entering the neighbourhood (Amcoff, 2025), which might be considered better in territorial measures of the neighbourhood.

Conclusively, territorial land-based notions of the neighbourhood are increasingly abandoned in favour of bespoke *k*nn population-based notions of the neighbourhood. While these approaches are weaker in realising the functional form of a neighbourhood, they allow for a greater flexibility in exploring the scale and scope of segregation. Moreover, in the case of white avoidance, neighbour-based approaches are arguably more appropriate. Therefore, this study relied on *k*nn approach to explore the white avoidance and racial proxy hypotheses.

Data & methods

The empirical strategy to explore these hypotheses was as follows: white avoidance was assessed through logit models estimating the odds of a mover into an area being an ethnic majority for every move recorded from 2009 to 2017. To model the role of the neighbourhood, variables indicating the sociodemographic profile of the neighbourhood at various scales were created, namely ethnic concentration, homeowner concentration, and unemployment rate. Then, several variables indicating the level of amenities and green space were created to further test a racial proxy effect. The models are specified for seven bespoke levels ranging from 100 nearest neighbours to 6,400.

The data used for this study is the PLACE database, a compilation of various other databases of Swedish register data made available to Uppsala University. The data contains a wide variety of information on socioeconomic conditions such as housing, family status, and labour status. Moreover, it contains information on one's country of birth, their parents' country of birth, and their recorded residence on a 100 by 100 metres resolution. The years between 2009 and 2017 have been selected for this study, which are the years with the most reliable continuous information on housing. In order to explore white avoidance over various scales, the following approach is taken: first, all movers are selected. Second, a measure of ethnicity is selected in addition to socioeconomic status and tenure. Third, neighbourhoods over various scales are created at the destination of every mover. Fourth, models to estimate the propensity of relocations of white Swedes to certain spatialities will be specified.

Neighbourhoods and variables

The outcome variable of this study is the ethnicity of the mover. Rather than self-identified categories commonly used in American and British studies, this paper will use a measure of visible minorities in which their and their parents' country of birth is used as a proxy for ethnicity. A "Visible Minority" is an individual who is likely to look different from the ethnic majority (E. Andersson et al., 2010; Westra, 2024). If a person is born or has a parent born in a country in sub-Saharan Africa, Asia, or Latin America, they are assumed to be likely to look different from native-born Swedes without a migration background. The idea is that attitudes and behaviours of the ethnic majority towards them will differ (E. Andersson et al., 2010). Some people will get misclassified, but given the size of the register data used in many of these studies, the error is likely to be minor (Stronks et al., 2009). The same coding approach as Andersson et al. (2010) and Westra (2024) has been taken in this study.

Besides ethnicity, unemployment and homeowning variables are included to test the racial proxy. Unemployed individuals are coded as those who are registered as unemployed for at least a month that year. Homeowners are obtained through a combination of ownership type and building type (Wimark et al., 2020). For practical purposes, outright owners and owning through tenant collectives typical to the Swedish context are both considered homeowners. A drawback of the

Swedish registers is that it is not possible to see if the occupant is a homeowner. It could be that an occupant in an owner-occupied house is subletting the house through a second-hand or third-hand lease. For instance, Abed al Ahad et al. (2023) find that a surprisingly sizeable proportion of homeowners live in an owner-occupied dwelling. However, this might indicate a tendency to rely on second-hand leases rather than actual homebuying. Nevertheless, there is currently no way to obtain tenure more reliably from the registers.

These sociodemographic categories are aggregated into several neighbourhood levels to explore the scope and impact of scale: seven levels of bespoke *k*nn neighbourhoods were used. The chosen *k* levels are 100,200,400,800,1600,3200, and 6400, giving a range of ethnic concentrations well below and well over normal territory-based units (Westra, 2024) while keeping a natural growth curve to the increase of neighbourhood size. The neighbourhoods are created using the EquiPop Flow software (Östh, 2014). For each level, the concentrations of ethnic minorities, unemployed individuals, and homeowners will be measured, which will be introduced in the following sections.

Besides the sociodemographic concentrations, several individual-level indicators to measure the accessibility of amenities and green space are included. Access to amenities is assessed through the Euclidean distance to five different amenities: primary healthcare, secondary healthcare, hospitality, retail, and entertainment. These categorisations have been used in previous quality of life studies as well (Rijnks, 2020; Westra, 2024). The access to green space was assessed as the share of green and blue space in a 2 km buffer around the residence.

Some individual-level variables are included to control for individual socio-demographic differences in moving propensity and destination choice. The controls are: 1) socioeconomic status: income, education, and employment status; 2) demographic variables: gender, age, and number of non-adult kids in the household; 3) housing variables: tenure decade of construction, and area type of the destination as defined by the Swedish Assocation of local authorities and Regions (2017), which defines the urbanity of the place. A summary of all variables can be found in the appendices.

Thus, a population of all movers in Sweden is selected, their ethnicity is obtained through their country of birth. The population of the models was all movers over the study period, which amounts to 2,817,375 observations for 1,897,024 individuals. Of this population, 25.17% are visible minorities. Then, the socio-demographic characteristics of their destinations are calculated to estimate how they influence residential relocations.

Modelling approach and research population

The selectiveness of relocations is estimated using random effects logistic models predicting the likelihood of a mover being a visible majority: if the area characteristics negatively affect the odds of a mover being a visible majority, then this is evidence of either a racial proxy or white avoidance. The following assumptions underly the modelling approach: 1) If the ethnic concentration decreased the odds of a mover to be a visible majority, this indicates white avoidance; 2) If the level of unemployment decreases the odds of a mover being a visible majority, it is an indicator of socioeconomic avoidance: 3) If the variables indicating proximity to amenities and green space increase the odds of a mover being a visible majority, it is an indication of a racial proxy effect; 4) If the concentration of homeowners increases, the odds of a mover being a visible majority it is an indicator of institutional barriers on the housing market. In total, seven logistic random effects models have been estimated for each of the bespoke scales (Models 1a to 1g). Subsequently, an ensemble model is specified (model 1h), in which each sociodemographic concentration is measured at the *k* that has been revealed to be the best fit in the previous model, thus having an ensemble of sociodemographic concentrations at three different scales.

The models are as follows:

1. $$Logit\left(P\left(VM_{ij}=1\right)\right)=\beta_0+\sum_{r=E,U,T}\beta_r Knn_{ij}^{U}+\beta_2 RP_{ij}+\beta_3 C_{ij}+\beta_4 C_j+\left(u_i+\epsilon_{ij}\right)$$

In this model, VM_{ij} signifies a binary variable indicating if mover *i* in year *j* is a visible majority. $\sum_{r=E,U,T}\beta_r Knn_{ij}^{U}$ represents the sum of the effects of concentration *r*, which are the percentage of visible minorities *E*, unemployed *U*, and homeowners *T*, at the *k*nn around mover *i* in year *j*, which differ in each model. RP_{ij} signifies a vector of racial proxy variables such as the distance to five amenities and the greenness around the residence. C_{ij} is a vector of time-varying control variables and C_j are time-invariant control variables described in the previous section.

In summary, seven random effects logistic regressions are specified, which estimate the odds of a mover being a visible majority. Each model included the ethnic, unemployment, and homeowner concentration in the neighbourhood at various *k*nn levels (Model 1a to 1g). In addition, each model included the distance to five types of amenities and the green space around the residence. Lastly, individual socioeconomic, demographic, and housing controls were included to account for individual sociodemographic differences.

Results

Descriptive results

Before the ethnicity of movers is predicted, some exploration of the ethnic difference in settlement patterns is useful. Firstly, visible minorities are slightly more mobile. 27.34% are movers, whereas they form 23.67% of the staying population. The sociodemographic profile of their destinations varies as well, as shown in Figure 1. In general, the distributions follow a somewhat similar shape and are not completely segmented. Nevertheless, particularly for ethnic concentrations, a difference between visible minorities and majorities becomes apparent: the distribution of visible minorities' destinations has a longer right-hand tail, and their mean ethnic concentration is higher. This is particularly pronounced at the lower *k*s, whereas the differences have almost completely disappeared at *k*=6,400. For housing, the differences in concentration follow a mirrored pattern, becoming clearer at less detailed scales, particularly at *k*=6,400. At this level, it seems that visible majorities are more likely to move to areas with a high concentration of homeowners. For unemployment, the differences are not clearly pronounced.

In terms of distances to amenities and access to nature, as given in Table 1, no major differences can be discerned either. However, the destinations of visible majorities are, on average, further away from all amenities than those of visible minorities. They do, however, live in greener areas. This gives some mixed evidence of a racial proxy. A possible explanation could be urban-rural differences, as visible majorities are more likely to live in rural areas, which may have reduced access to amenities. For all racial proxy variables, the variance as expressed through the standard deviation is quite high: while there are some ethnic differences in mobility patterns, they might not be the most relevant dimension for these factors.

Table 1: Access to amenities and nature at the destination by ethnicity

Variable	Visible majorities	Visible minorities
Log(Distance to entertainment)	1.01 (3.03)	0.75 (3.08)
Log(Distance to hospitality)	1.22 (2.92)	0.62 (3.18)
Log(Distance to retail)	2.35 (1.84)	2.12 (1.96)
Log(Distance to primary healthcare)	1.96 (2.21)	1.58 (2.48)
Log(Distance to secondary healthcare)	1.75 (2.51)	1.53 (2.57)
% of nature around the residence	0.42 (0.23)	0.39 (0.26)

In sum, some ethnic differences between destinations of residential relocations can be discerned, but there is no major segmentation: the sociodemographic distributions are not mirrored. Scale-wise, differences are more pronounced for homeowners at larger *k*nns and for ethnicity at the smaller *k*nns, while the distribution of unemployment rates at the destination does not differ clearly between ethnic groups at any scale. Surprisingly, visible majorities tend to live further away from most amenities.

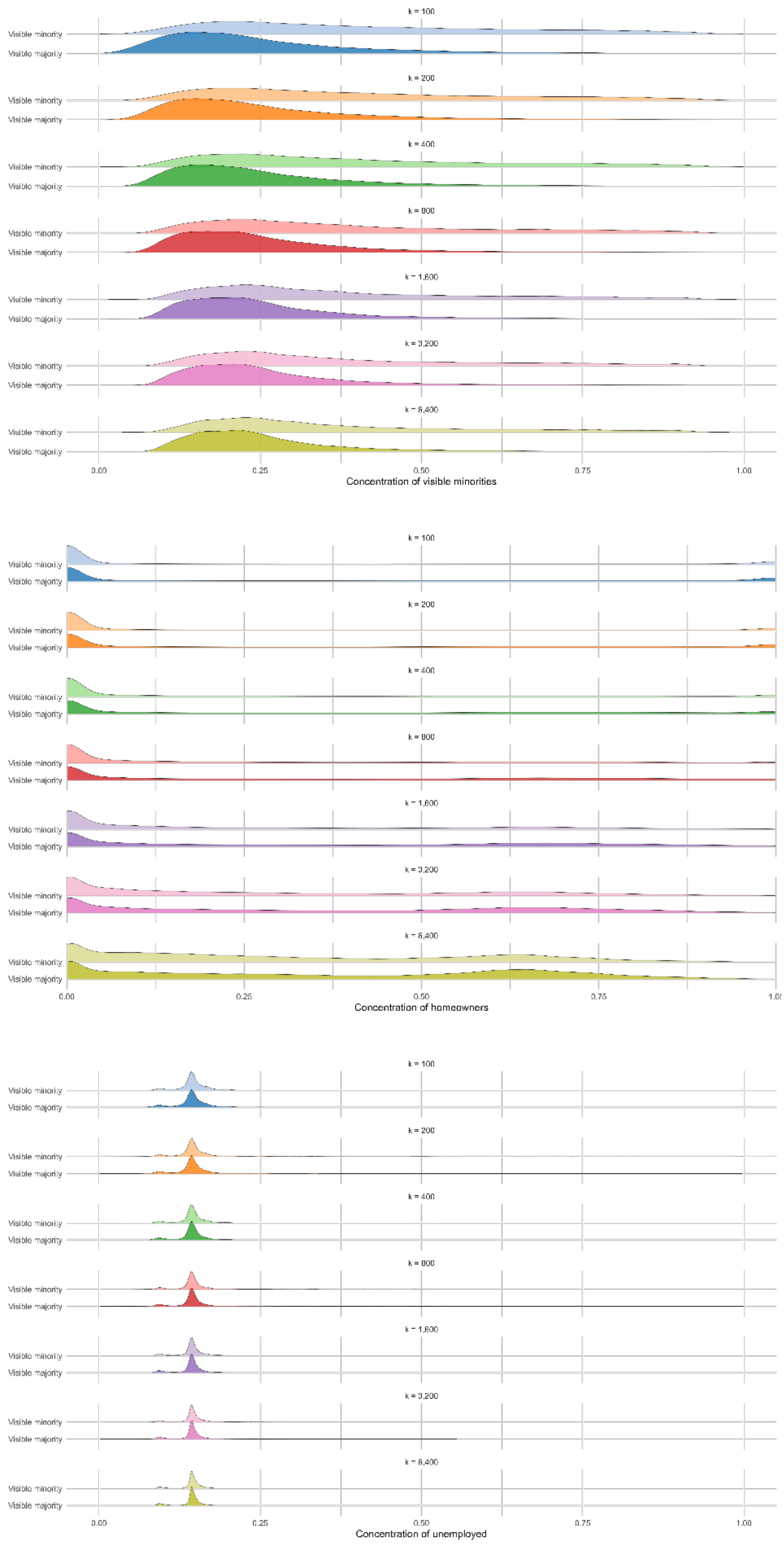
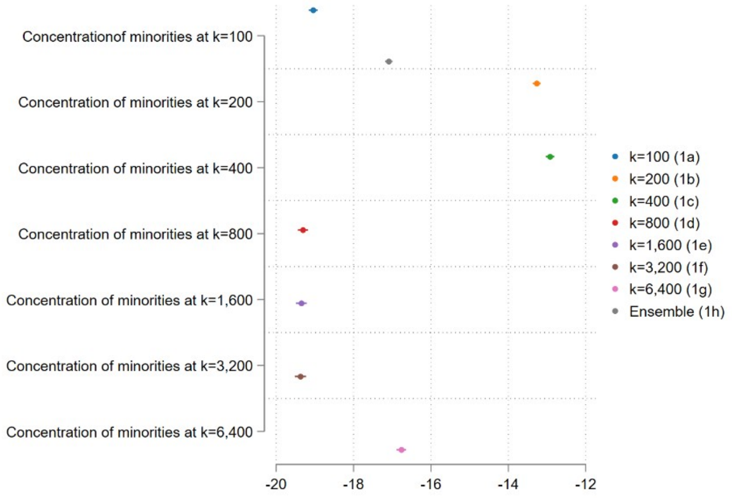


Figure 1: density of concentrations of visible minorities(top), homeowners (middle), and unemployed (bottom) at destinations for visible minorities and majorities.

Regression results
Ethnic, socioeconomic, and tenure concentrations



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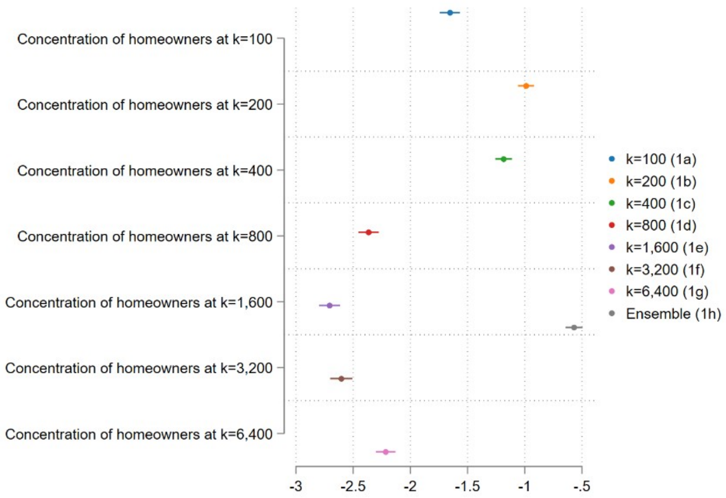

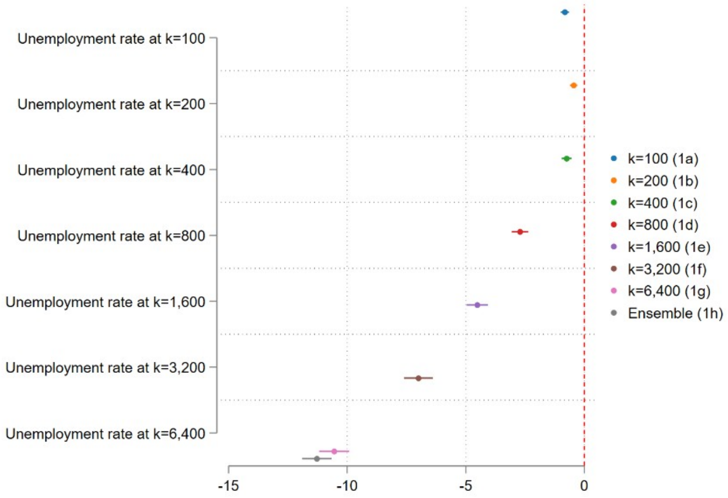

Figure 2:unstandardised coefficients of the associations between the concentrations of visible minorities (Top), unemployed (bottom), and homeowners (middle) at various knns *and the log odds of a mover being a visible majority in Model 1a to Model 1h. Controls include the distance to amenities, access to green space, and individual socioeconomic, demographic, and housing controls.*

The results for Model 1a to Model 1g are given in Appendix 1 and Figure 1. In every model, the ethnic concentration greatly decreases the odds of a mover being a visible majority. This can be taken as a clear indication of white avoidance. The coefficients for the models with *k*=100 (1a), *k*=800 (1d), *k*=1,600 (1e), *k*=3,200 (1f) are the largest. The coefficients for ethnic concentration at *k*=200 (1b), *k*=400 (1c), and to a lesser extent, *k*=6,400 (1g) are smaller, but still considerable.

There is evidence of avoidance of socioeconomically deprived areas by the visible majority as well. The strongest effects are found in model 1g at *k*=6,400. Moreover, the magnitude of the association is increasingly negative with every increment of *k*: coefficients are negligible in size up to model 1c, but from *k*=800 onwards, the concentration of unemployment is increasingly impactful. As the models do not study visible majority mobility in isolation, these associations might also be the result of the place stratification found in previous studies (Vogiazides, 2018; Vogiazides & Chihaya, 2020).

The associations found for the concentration of homeowners are the smallest of the sociodemographic impacts on almost every level of *k*. Surprisingly, the coefficients are negative, which means that visible majorities are less likely to move to tenure landscapes typified by high homeownership. This is not to say that visible majorities avoid homeowning; whether one moves into an owner-occupied house is associated with increased odds of being a visible majority as can be read in Appendix 2. Rather, they might avoid places that have single-tenure planning, which many of the aforementioned suburbs have. Alternatively, affordable renting might be more affordable for Swedes without a migration background through the aforementioned rental queue barriers, and thus, the homeowner landscape might be less appealing. Lastly, bias might be caused by the aforementioned impossibility of measuring whether the occupant is the actual homeowner. Like unemployment, the size of the association becomes more negative, albeit it peaks in model 1e rather than 1g. Nevertheless, at all scales, the ethnic concentration has the strongest impact on predicting the ethnicity of the mover and homeownership has the least. For all types of concentration, the association is weakest in Models 1b and 1c.

In summary, of the sociodemographic concentrations, the ethnic concentration has the strongest association predicting the ethnicity of movers, which can be interpreted as a white avoidance mechanism. Nevertheless, at larger bespoke scales, unemployment also plays a strong role in predicting the odds of visible minorities moving in, which can be taken as a sign of a racial proxy. Importantly, these processes seem to function differently on different scales: ethnicity seems to matter most at the most detailed scale, homeownership at the more intermediate levels, and unemployment at the lowest resolution.

Ensemble model: different sociodemographic factors, different considerations, and different scales

To further explore the varying impact of the different demographic factors at different scales, the ensemble model was specified. For each sociodemographic concentration, the level of *k* that had the largest impact was selected. As such, the ethnic concentration at *k*=100 (best fit overall), the homeowner concentration at *k*=1,600, and the unemployment rate at *k*=6,400 (largest associations) are included in a model (Model 1h). The model fit improves slightly with the ensemble approach. The impact of the unemployment rate remains similar to the *k*=6,400, which is much higher than the impact of unemployment in the best-fitting Model 1a (*k*=100). Both the ethnic and homeowners' concentration decrease in impact, homeowners to a size well below what it had in *k*=100 and 1,600 to a negligible impact. While the impact of the ethnic concentration has diminished, it remains by far the largest factor in predicting the ethnicity of the mover.

Including the different scales in different models leads to a better fit and shows that homeownership, and to a lesser extent ethnic concentration, is overestimated in some models at the cost of the unemployment rate. Moreover, the differences in scale can illuminate more about the extent of white avoidance. For instance, the importance of less-detailed scales for the unemployment rate can be explained as a wider consideration of economic opportunities and not so much a distaste for unemployed neighbours themselves: it could indicate an avoidance of areas with poor access to jobs. Conversely, the importance of the ethnicity of the very nearest neighbours can be interpreted as the result of some negative beliefs of ethnic groups. Crucially, this can be interpreted as that white avoidance works on a very micro scale, whereas racial proxies might take place at a higher level.

Disentangling the proxy: accessibility and green space

Besides neighbourhood concentrations, some other quality of life factors were included to test the racial proxy hypothesis: namely, access to amenities and green space. Their associations in every model are depicted in Figure 3. Two things stand out about proximity to amenities. Firstly, the coefficients are very small. Secondly, most of the associations indicate that if the distance to amenities increases, the odds of a mover being a visible majority increase, somewhat contrary to the racial proxy hypothesis but in line with the descriptive evidence. Some exceptions can be found for distance to entertainment, in which most models associate increased distance with decreased odds of being a visible majority. However, model 1a (k=100), which has the best model fit and the strongest white avoidance effects, does predict a negative association. Overall, the impact of amenities on the odds of a mover being a visible majority is rather small and in the opposite direction of a racial proxy. All models find a positive association between the proportion of green space around the residence and the odds of the mover being a visible majority. The association is still rather small in size compared to the sociodemographic concentration (measured on the same scale). The association is strongest in the k=100 model, which also has the best fit. Thus, it seems that there is a minor racial proxy effect for the green space around a residence: movers to greener areas are more likely to be visible majorities, but this association is much smaller than that of the sociodemographic concentrations at the destination.

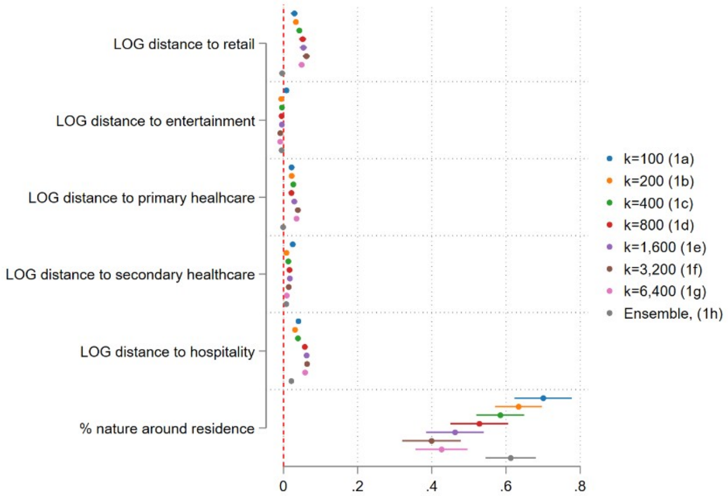

Figure 3: unstandardised association of the individual racial proxy variables at the destination on the log odds of a mover being a visible majority in all models. Controls include sociodemographic concentration at the destination and individual socioeconomic, demographic, and housing controls.

Discussion and conclusion

By predicting the ethnicity of movers based on socio-demographic characteristics at the destination over various geographical scales, this study has made two essential contributions to the understanding of spatial sorting through residential mobility. Firstly, this study has revealed strong evidence of white avoidance at all scales. While there is evidence of racial proxies mainly through socioeconomic avoidance as well, the results of this study have revealed that there is a factor rooted in ethnic compositions of neighbourhoods that dominates selective mobility, a pattern similar to findings in the North American context. Secondly, this study has revealed that the role of sociodemographic characteristics does not have a single set scale, but different sociodemographic aspects work differently on different geographical scales. In particular, the ethnicity of the most immediate nearest neighbours matters most. These findings further underline that ethnic perceptions might drive ethnic selective mobility. This is in line with previous findings, both in Sweden and other contexts: there is some element about ethnic concentrations that is likely to relate to the perception of the neighbourhood (Dekker, 2012b; Swaroop & Krysan, 2011; Westra & Haandrikman, Forthcoming).

In all models, the strongest predictor of a mover being a visible majority was ethnicity. Particularly, the ethnicity of neighbours on a local scale, in this paper, k=100, predicts white avoidance best, both in the single-scale model (1a) and the ensemble model (1h). Because the mobility of visible minorities and majorities is considered simultaneously, this white avoidance can also be the effect of the homophily and networks among visible minorities. The strongest effects and best fit on the k=100 could be interpreted as such. Furthermore, some of these effects may be due to a desire of migrant groups to live near other migrant groups, stemming from a desire not to be exposed to negative ethnic stereotypes by the ethnic majority (Swaroop & Krysan, 2011). Future research could further explore the level of avoidance or homophily certain ethnic minorities might feel towards each other, their avoidance of ethnic majority areas, and the strength of network effects in selective mobility. An argument against the results being a consequence of ethnic minority driven homophily is that the models perform much worse at k=200 and 400, where such network effects would also be expected. Moreover, Sweden's ethnic minorities are somewhat of an artificial category, classified by their migration background. Therefore, they might not necessarily experience a strong homophily towards other migrant groups themselves. As such, a stronger explanation is white avoidance through negative perceptions of migrant dense areas.

At the same time, evidence for racial proxies has been found. Socioeconomic avoidance in particular, has been found in the form of the concentration of unemployed neighbours at the destination. In the single-scale models, especially the ensemble and larger *k*nn models (1i, 1g, 1f), these concentrations still play a large role in predicting the ethnicity of the mover, only slightly smaller than the ethnic concentration. All the single-scale models find some avoidance of single-tenure landscapes by visible majorities, contrary to expectations. Nevertheless, these concentrations have a smaller impact, and homeownership is not well-measured in the registers. Moreover, the coefficient becomes close to 0 in the ensemble model, where the best levels of ethnic and unemployment concentration are included.

Surprisingly, factors as access to amenities and green space were shown to have a minimal impact on the odds of a mover being a visible majority: they are likely to move to areas slightly further away from most amenities but more likely to move to greener areas. While this can be taken as some evidence of a racial proxy, even if it is in the opposite direction than expected for amenities, the minimal impact of these factors does provide a strong challenge to the idea of the racial proxy hypothesis. Of course, certain variables that might prove important have not been included. Firstly, just the presence of amenities and green space is considered, not the quality. It could be that while access is very egalitarian, the quality greatly differs between minority-dense and minority-light areas. Secondly, important factors as crime have not been considered, which is inseparably related to discourse about both migrant-dense neighbourhoods (Gerell et al., 2022). Nevertheless, despite these shortcomings, socioeconomic and ethnic spatial sorting mechanisms have come forward as much stronger factors than quality-of-life factors, such as amenities.

The bespoke approach taken in this paper has yielded two major theoretical insights. Firstly, the scale at which sociodemographic concentrations are measured greatly alters the findings. For example, including the unemployment rate at the lower *k*nns yields a minimal role for racial proxies in the form of socioeconomic avoidance, whereas at higher *k*nns the role is substantial. Secondly, the ensemble model has illustrated that socio-demographic concentrations might take place on different scales, even if they seem related, like unemployment and ethnic concentration. This shows the strength of bespoke approaches: territorial, off-the-shelf, type neighbourhoods, such as municipalities, Swedish SAMS, British LSOAs, and equivalent, do not have the flexibility to explore multiple levels of scale or ensemble various levels in this manner. This rigidity of territorial approaches might lead to biases in estimating selective residential behaviour. Moreover, this illuminates that the rationale of selective location choice is different for different factors. The larger *k*nn-level impact for unemployment might suggest avoidance of areas that are deprived of opportunities or have a large distance to jobs, the largest impact of smaller *k*nn-level concentration of ethnic minorities strongly points towards negative ideas about ethnic minorities. Some caution is necessary, however. For instance, evidence for white flight, which is supposedly caused by similar considerations, in Sweden is relatively minor (R. Andersson, 2013; Malmberg & Clark, 2021). Together, this paints a complicated picture in which ethnic composition is less a factor in triggering a decision (white flight) but is in steering a decision regarding decision making (white avoidance). Certainly, more research about the scale of white flight in relation to racial proxy should be done in the future.

The paper has some limitations due to its study design and data, underlining the need for further inquiry. The previous section already highlighted the difficulty in separating the homophily of visible minorities from white avoidance, as only actual moves of the whole population are estimated. An additional problem is that the immobile visible majorities are not considered: it could be that one considers moving but declines due to the sociodemographic makeup of the potential destinations. Future research that better isolates the mobility of the visible majority and immobility is necessary. For instance, spatial interaction model approaches predicting the residential mobility flow of the visible majority between neighbourhoods could further explain potential absences of movement. Secondly, some other variables are worth studying in the future. Otherwise, the aforementioned network effects and impacts of the (violent) crime rate could be further explored.

Conclusively, this paper has provided compelling evidence for the persistence of white avoidance in residential mobility while providing important nuance to the racial proxy theory. By exploring how the sociodemographic composition of the neighbourhood, level of amenities, and green space predict the ethnicity of a mover, white avoidance explanations have been found to provide the most compelling explanatory pathway and tenure landscapes the least. The paper has made an important contribution to disentangling the racial proxy, finding that socioeconomic factors matter more than levels of amenities in the area. While both the unemployment rate and ethnic concentration matter, they function on different scales, suggesting that the individuals in the location decision-making process consider these factors in different ways.

This paper started out by describing how ethnic segregation is perceived as a failure of integration; however, the results of this study suggest that it is the ethnic majority that does not spatially integrate. Of course, a government cannot force their residents to live somewhere. Some initiatives in Denmark and the Netherlands, both focusing on limiting the residential choice of ethnic minorities, have been proven unsuccessful at this (Ouwehand & Doff, 2013; Seemann, 2021; van Gent et al., 2018), and there is no reason that a focus on the ethnic majority in such acts would be more successful. At the same time, the language used in media and politics (Blomberg, 2022; Henley, 2022) that depicts these places as other and undesirable and a social problem will not do good in alleviating ethnic stereotypes.

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Appendix 1: variables included in the models

Variable	M (SD)
Concentration of homeowners at k=100	0.32(0.386)
Concentration of homeowners at k=200	0.32(0.372)
Concentration of homeowners at k=400	0.33(0.355)
Concentration of homeowners at k=800	0.34(0.338)
Concentration of homeowners at k=1,600	0.35(0.319)
Concentration of homeowners at k=3,200	0.36(0.298)
Concentration of homeowners at k=6,400	0.37(0.277)
Concentration of unemployed at k=100	0.16(0.094)
Concentration of unemployed at k=200	0.16(0.081)
Concentration of unemployed at k=400	0.15(0.064)
Concentration of unemployed at k=800	0.15(0.047)
Concentration of unemployed at k=1,600	0.15(0.035)
Concentration of unemployed at k=3,200	0.14(0.027)
Concentration of unemployed at k=6,400	0.14(0.022)
Concentration of minorities at k=100	0.28(0.183)
Concentration of minorities at k=200	0.28(0.177)
Concentration of minorities at k=400	0.28(0.172)
Concentration of minorities at k=800	0.28(0.166)
Concentration of minorities at k=1,600	0.28(0.16)
Concentration of minorities at k=3,200	0.28(0.156)
Concentration of minorities at k=6,400	0.28(0.153)
% nature around residence	0.41(0.250)
LOG distance to retail	2.3(1.871)
LOG distance to entertainment	0.95(3.048)
LOG distance to hospitality	1.08(2.99)
LOG distance to primary healthcare	1.7(2.524)
LOG distance to secondary healthcare	1.87(2.282)
Log income	3.05(1.253)
Age	34.92(15.244)
Children in household	0.33(0.769)
Level of education	
<12 years of education	72.27%
>12 years of education	27.73%
Employment status	
Employed	58.29%
Unemployed	21.65%
Student	6.87%
Retired	13.19%
Gender	

Male	49.98%
Female	50.02%
Tenure	
Owner occupied	29.05%
Rental	66.27%
Other	4.68%
Decade of construction	
pre-20th century	6.12%
1900-1930	2.38%
1940s	2.18%
1950s	2.43%
1960s	3.64%
1970s	5.37%
1980s	3.09%
1990s	1.85%
2000s	72.11%
Area type	
Rural	4.48%
Rural with tourism	1.66%
Commuter area near town	5.47%
Town	13.3%
Low commuting near large city	5.96%
Commuting near large city	8.14%
Large city	26.82%
Commuting near metropole	16.09%
Metropole	18.09%

Appendix 2: regression tables

	Model 1a (*k*=100) Visible majority=1	Model 1b (*k*=200) Visible majority=1	Model 1c (*k*=400) Visible majority=1	Model 1d (*k*=800) Visible majority=1	Model 1e (*k*=1,600) Visible majority=1	Model 1f (*k*=3,200) Visible majority=1	Model 1g (*k*=6,400) Visible majority=1	Model 1h (ensemble) Visible majority=1
Concentration of minorities at k=100	-19.04*** (0.0599)							-17.09*** (0.0496)
Concentration of minorities at k=200		-13.27*** (0.0526)						
Concentration of minorities at k=400			-12.92*** (0.0565)					
Concentration of minorities at k=800				-19.31*** (0.0673)				
Concentration of minorities at k=1,600					-19.35*** (0.0709)			
Concentration of minorities at k=3,200						-19.37*** (0.0729)		

Concentration of minorities at k=6,400							(-16.76***)	
							(0.0637)	
Unemployment rate at k=100	-0.827***							
	(0.0868)							
Unemployment rate at k=200		-0.457***						
		(0.0812)						
Unemployment rate at k=400			-0.754***					
			(0.106)					
Unemployment rate at k=800				-2.718***				
				(0.178)				
Unemployment rate at k=1,600					-4.520***			
					(0.229)			
Unemployment rate at k=3,200						-6.999***		
						(0.308)		
Unemployment rate at k=6,400							-10.55***	- 11.28***
							(0.323)	(0.3155)
Concentration of homeowners at k=100	-1.654***							

	(0.045)							
Concentration of homeowners at k=200		-0.989*** (0.0363)						
Concentration of homeowners at k=400			-1.185*** (0.0371)					
Concentration of homeowners at k=800				-2.366*** (0.0459)				
Concentration of homeowners at k=1,600					-2.707*** (0.0471)			-0.57*** (0.0378)
Concentration of homeowners at k=3,200						-2.604*** (0.0493)		
Concentration of homeowners at k=6,400							-2.216*** (0.0439)	
LOG distance to retail	0.0291*** (0.00473)	0.0331*** (0.0039)	0.0425*** (0.00396)	0.0514*** (0.00488)	0.0534*** (0.00485)	0.0614*** (0.00489)	0.0486*** (0.00421)	0.0039 (0.0042)
LOG distance to entertainment	0.00762* (0.003)	-0.00636* (0.003)	-0.00444 (0.003)	-0.00548 (0.003)	-0.00477 (0.003)	-0.00895** (0.003)	-0.00924** (0.003)	-0.0054 (0.003)

LOG distance to primary healthcare	0.0214***	0.0218***	0.0262***	0.0211***	0.0288***	0.0384***	0.0348***	-0.0013
	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.00403)	(0.00356)	(0.0035)
LOG distance to secondary healthcare	0.0245***	0.00777*	0.0127***	0.0158***	0.0168***	0.0138***	0.00838*	0.0070*
	(0.00368)	(0.00305)	(0.00311)	(0.00374)	(0.00372)	(0.00375)	(0.00329)	(0.0023)
LOG distance to hospitality	0.0400***	0.0308***	0.0387***	0.0571***	0.0620***	0.0632***	0.0580***	0.02084***
	(0.00327	(0.00267)	(0.00273)	(0.00333)	(0.0033)	(0.00333)	(0.00292)	(0.0033)
% nature around residence	0.700***	0.634***	0.585***	0.528***	0.462***	0.399***	0.426***	0.6125***
	(0.0395	(0.0323)	(0.0329)	(0.0397)	(0.0396)	(0.0404)	(0.0357)	(0.0094)
LOG income	0.974***	0.723***	0.726***	0.946***	0.921***	0.897***	0.987***	0.921***
	(0.0155)	(0.00631)	(0.00628)	(0.00711)	(0.00715)	(0.00866)	(0.00906)	(0.0094)
Children in household	-1.753***	-1.294***	-1.279***	-1.861***	-1.836***	-1.866***	-1.692***	-1.682***
	(0.0108)	(0.00913)	(0.00921)	(0.0108	(0.0109	(0.0113	(0.0097	(0.0094)
Age	-0.0910***	-0.0592***	-0.0591***	-0.0884***	-0.0876***	-0.0851***	-0.0890***	-0.0091***
	(0.000858)	(0.000659)	(0.00067)	(0.000926	(0.00092	(0.000949	(0.0007)	(0.0007)
Employment status								
Employed	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	

Unemployed	-3.993*** (0.023)	-3.341*** (0.0175)	-3.334*** (0.0178)	-3.874*** (0.0229	-3.843*** (0.0228	-3.994*** (0.0229	-3.602*** (0.022	-3.457*** (0.022)
Student	-1.605*** (0.0402)	-1.759*** (0.0315)	-2.117*** (0.0317)	-1.557*** (0.0424	-1.489*** (0.0419	-1.637*** (0.0407	-1.842*** (0.052	-1.327*** (0.048)
Retired	-0.864*** (0.028)	-0.631*** (0.0235)	-0.633*** (0.024)	-0.915*** (0.0283	-1.002*** (0.028	-1.019*** (0.0286	-1.177*** (0.0235	-1.012*** (0.0229)
Education								
>12 years of education	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	
<12 years of education	-3.162*** (0.0219)	-2.798*** (0.0166)	-2.862*** (0.017	-2.982*** (0.0221	-2.919*** (0.022	-3.053*** (0.0222	-2.612*** (0.0232	-2.340*** (0.0229)
Gender								
Male	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Female	0.615*** -0.0178	0.476*** (0.0143	0.471*** (0.0146	0.588*** (0.0178	0.555*** (0.0178	0.572*** (0.018	0.547*** (0.0158	0.447*** 0.0153)
Tenure								
Owner Occupied	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.

Rental	-1.018***	-0.615***	-0.737***	-1.249***	-1.443***	-1.389***	-1.546***	-0.3866***
	(0.0456	(0.0358	(0.0349	(0.0394	(0.0381	(0.0378	(0.0331	(0.0341)
Other	0.220***	0.278***	0.301***	0.342***	0.407***	0.502***	0.450***	0.408***
	(0.0495)	(0.0402	(0.0403)	(0.0481)	(0.0476)	(0.0489)	(0.0426)	(0.04100)
Decade of construction								
pre-20th century	0.405***	0.453***	0.434***	0.552***	0.512***	0.590***	0.453***	0.427***
	(0.107	(0.0883	(0.0888	(0.104)	(0.103)	(0.106)	(0.0939)	(0.0893)
1900-1930	0.301***	0.384***	0.363***	0.437***	0.377***	0.442***	0.281***	0.289***
	(0.0489	(0.0411)	(0.0415)	(0.0471)	(0.0468)	(0.0477)	(0.0426)	(0.0413)
1930s	0.0147	0.135*	0.113*	0.119	0.0404	0.0869	-0.132*	-0.075
	(0.0645	(0.0542	(0.0548	(0.0623	(0.0617	(0.0631	(0.0556	(0.0549)
1940s	-0.0521	0.0848	0.0544	0.061	-0.00645	0.0382	-0.175**	-0.151***
	(0.0651)	(0.0551)	(0.0557)	(0.0632)	(0.0625)	(0.0637)	(0.0568)	(0.0536)
1950s	0.138*	0.185***	0.166**	0.205***	0.101	0.133*	-0.073	-0.006
	(0.0629	(0.053	(0.0535	(0.0609	(0.0603	(0.0615	(0.0545	(0.0536)
1960s	0.0631	0.0789	0.0503	0.0508	-0.057	-0.0498	-0.264***	-0.175***
	(0.0538)	(0.0448	(0.0454	(0.0516	(0.051	(0.0519	(0.0462	(0.456)

1970s	-0.327*** (0.0477)	-0.176*** (0.0399	-0.175*** (0.0405	-0.219*** (0.0455	-0.255*** (0.045	-0.242*** (0.0457	-0.426*** (0.041	0.557*** (0.0404)
1980s	-0.0798 (0.0572)	0.0712 (0.0482	0.0605 (0.0488	0.0228 (0.0553	-0.00771 (0.0548	0.0349 (0.0558	-0.115* (0.0498)	-0.259*** (0.0489)
1990s	0.118 (0.0693)	0.172** (0.0582	0.139* (0.0587	0.148* (0.0668	0.107 (0.0661	0.132 (0.0675	-0.0279 (0.0599)	-0.065 (0.0588)
2000s	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref,
Area type								
Rural	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref,
Rural with tourism	0.242** (0.08)	0.448*** (0.0644)	0.391*** (0.0652)	0.327*** (0.0788)	0.306*** (0.0784)	0.303*** (0.0793)	0.251*** (0.0711)	0.197** (0.0796)
Commuter area near town	-0.204*** (0.0554)	0.101* (0.0435)	0.0605 (0.044)	-0.0749 (0.0545)	-0.115* (0.054)	-0.115* (0.0544)	-0.154** (0.0492)	-0.253*** (0.0493)
Town	-0.392*** (0.048)	0.0605 (0.0379)	0.0196 (0.0384)	-0.236*** (0.0468)	-0.274*** (0.0465)	-0.312*** (0.0468)	-0.356*** (0.0426)	-0.376*** (0.0426)

Low commuting near large city	-0.503***	-0.0961*	-0.117**	-0.320***	-0.308***	-0.327***	-0.451***	-0.526***
	(0.0541)	(0.0425)	(0.043)	(0.0529	(0.0525)	(0.0529)	(0.0481)	(0.0481)
Commuting near large city	-0.619***	-0.207***	-0.236***	-0.426***	-0.424***	-0.456***	-0.509***	-0.5262***
	(0.0516)	(0.0407)	(0.0412)	(0.0505	(0.0501)	(0.0504)	(0.0456)	(0.04809)
Large city	-0.941***	-0.335***	-0.366***	-0.675***	-0.608***	-0.592***	-0.625***	-0.637***
	(0.0461)	(0.0363)	(0.0368)	(0.0449	(0.0446)	(0.0449)	(0.0409)	(0.0458)
Commuting near metropole	-2.393***	-1.614***	-1.580***	-2.129***	-2.000***	-2.007***	-1.998***	-2.367***
	(0.0475)	(0.0368)	(0.0375)	(0.0462	(0.0459)	(0.0461)	(0.0418)	(0.0410)
Metropole	-1.754***	-0.926***	-0.932***	-1.521***	-1.446***	-1.447***	-1.414***	-1.743***
	(0.0484)	(0.0381)	(0.0388)	(0.0474	(0.0471)	(0.0476)	(0.0433)	(0.0430)
Constant	19.99***	15.82***	16.30***	20.48***	20.77***	21.33***	19.45***	18.80***
Observations	2,50,8263	2,508,263	2,508,263	2,508,263	2,508,263	2,508,263	2,508,263	2,508,263
BIC	1,700,177	1,705,879	1,714,711	1,723,326	1,730,980	1,731,875	1,737,931	1,698,281