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Neighbourhood selection of non-Western ethnic minorities: testing the own-group effects hypothesis using a conditional logit model

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Abstract. The selective inflow and outflow of residents of different ethnic groups is the main mechanism behind ethnic residential segregation. In many studies it has been found that ethnic minorities are more likely than others to move to high-ethnic-minority-concentration neighbourhoods. An important question which remains largely unanswered is whether this can be explained by own-group effects, including own-group preferences, or by other neighbourhood factors. We use unique longitudinal register data from the Netherlands, which allow us to distinguish between different ethnic minority groups and simultaneously to take into account multiple neighbourhood characteristics. This allows us to test own-group effects—the effect of the share of the own-ethnic group on neighbourhood selection—while also taking into account other neighbourhood characteristics such as housing market composition. Using a conditional logit model, we find that housing-market constraints can partly explain the moves of ethnic minorities to high-ethnic-minority-concentration neighbourhoods: own-group effects are also found to be important in explaining neighbourhood selection. There are, however, important differences between ethnic minority groups. While these effects together explain why Surinamese and Antilleans move to high-ethnic-minority-concentration neighbourhoods, Turks and Moroccans are still found to move to neighbourhoods with concentrations of minorities other than their own ethnic group.

Keywords: segregation, neighbourhood selection, ethnicity, own-group preference, conditional logit

Introduction

Ethnic residential segregation is caused by the selective mobility of ethnic groups into and out of specific neighbourhoods and in-situ demographic processes regarding fertility and mortality. Selective mobility can be caused by choice, but a lack of choice can also cause selective-mobility patterns. There is a large body of research on selective outflow from neighbourhoods and especially 'white flight' (see, for example, Feijten and Van Ham, 2009; Pais et al, 2009; Van Ham and Clark, 2009). In this paper we study selective inflow into neighbourhoods, which has received somewhat less attention. Existing research shows that ethnic minority households are more likely than others to move to high-ethnic-minority-concentration (hereafter, minority-concentration) neighbourhoods (Clark and Ledwith, 2007;

Doff, 2010; South and Crowder, 1998). This might be explained by own-group effects: ethnic minorities might live among others of their own-group because of own group preferences; because they want to live close to ethnic-specific facilities; or because of the ethnic-specific networks they use to find dwellings. Interestingly, most studies investigating ethnic-selective residential mobility look at ethnic minorities as a single homogeneous group whereas in reality this group is often very heterogeneous. While ethnic minorities might have a preference to live among their own ethnic group, it is less likely that they will prefer to live among other ethnic minorities.

Although many studies suggest that the native majority is more likely to leave minority-concentration neighbourhoods, some of the literature on selective outflow from neighbourhoods is critical with regard to the influence of the ethnic composition of neighbourhoods on decisions to leave. Evidence has been found for the racial-proxy hypothesis (Ellen, 2000; Harris, 1999), which states that it is not the ethnic composition but, rather, correlated neighbourhood characteristics, such as a low neighbourhood socioeconomic status, that are responsible for white flight (Lee et al, 1994; South and Crowder, 1997). Also with regard to selective inflow into neighbourhoods, the racial-proxy hypothesis might be important: ethnic minorities might move to minority-concentration neighbourhoods not because they prefer to live among ethnic minorities, but because of other correlated neighbourhood characteristics. Ethnic minority households differ from the native majority population in their housing-market opportunities and constraints, and therefore different neighbourhoods are available and attractive to them (Manley and van Ham, 2011).

When neighbourhood selection is modelled, most studies test how a range of individual or household characteristics affect the probability of moving to a certain type of neighbourhood. These studies have an important limitation: they generally characterise neighbourhoods based on a limited number of characteristics (Hedman et al, 2011). Studies typically model whether or not households move into a poor neighbourhood (Clark et al, 2006; Logan and Alba, 1993), or into a minority-concentration neighbourhood or not (Brama, 2006; Clark and Ledwith, 2007; Doff, 2010; South and Crowder, 1998). However, in reality, the selection of a neighbourhood will depend on multiple neighbourhood characteristics that are assessed simultaneously and in combination (Hedman et al, 2011). This paper uses unique longitudinal register data from the Netherlands and conditional logit models to investigate neighbourhood selection by different ethnic minority groups. These data and methodology allow us to take into account multiple neighbourhood characteristics simultaneously and thus distinguish the effect of the share of the own ethnic group, other ethnic minority groups, and housing-market characteristics on neighbourhood selection.

Our approach will advance the current literature in two important ways. First, because we distinguish between the share of the own ethnic group and other ethnic minority groups we can test the own-group effects hypothesis: whether own-group preferences, networks, and facilities can explain the selection of ethnic minorities into minority-concentration neighbourhoods. Second, it allows us to take into account other neighbourhood characteristics, such as the neighbourhood housing-market composition, when modelling neighbourhood selection and thus to test for racial-proxy effects. Do ethnic minority households choose minority-concentration neighbourhoods because of own-group effects, or do they end up in these neighbourhoods because of a lack of choice? Is their lack of choice explained by a dependence on affordable dwellings which are spatially clustered in minority-concentration neighbourhoods, or do they also end up in the most concentrated neighbourhoods when housing-market characteristics are taken into account? These insights are important for the development of theory on the causes of segregation. There is a fierce debate in the literature on the role of own-group effects on the one hand, and restrictions on the other hand. More insight into these mechanisms will advance our understanding of segregation.

Literature review and background

Minority ethnic groups are found to be more likely than others to move to minority-concentration neighbourhoods (Brama, 2006; Clark and Ledwith, 2007; Doff, 2010; South and Crowder, 1998) and less likely to leave these neighbourhoods (Bolt and Van Kempen, 2010; Feijten and Van Ham, 2009; Pais et al, 2009; Van Ham and Clark, 2009). These patterns of selective mobility lead to segregation. The literature offers several perspectives on the possible mechanisms behind these selective-mobility patterns, which we discuss below.

According to the *preferences perspective,* ethnic residential segregation is caused by ethnic differences in preferences regarding the ethnicity of their neighbours. It is argued that ethnic minority residents prefer to live close to their own ethnic group and therefore select minority-concentration neighbourhoods (Bolt et al, 2008). There has been a lot of research on the advantages of living in an *ethnic enclave*, which has been found to be especially advantageous for new immigrants and ethnic minorities with low socioeconomic status (Musterd et al, 2008; Phillips, 2007). It is argued that minorities move to ethnic enclaves because they expect benefits from living among coethnics, such as opportunities for employment (Logan et al, 2002; Zorlu and Mulder, 2008); a familiar culture (Logan et al, 2002); family ties (Hedman, 2013); and social support and a sense of security or belonging (Phillips, 2007). As well as a preference to live close to the own ethnic group, ethnic-specific facilities and shops (Logan et al, 2002) can also be a reason for ethnic minorities to move to concentration neighbourhoods of their own ethnic group. Social networks can also influence neighbourhood choice (Logan et al, 2002) as these networks influence people's knowledge and opinions about neighbourhoods (Hedman, 2013) and coethnics can provide information about housing opportunities (Bolt, 2001). As social networks are often homogenous—in ethnicity, socioeconomic status, and residential neighbourhood—the dwellings people find through them are often in areas with high concentrations of their own ethnic group (Kleit and Galvez, 2011). Because the effects of preferences with regard to neighbours or ethnic-specific services and ethnic networks can often not be separated, we group these together and use the term 'own-group effects'.

According to the *human capital perspective*, ethnic residential segregation can be explained by ethnic differences in socioeconomic status and other personal characteristics (Crowder, 2001; Logan and Alba, 1993). Ethnic minority households in the Netherlands have, on average, lower incomes than natives and therefore fewer opportunities in the housing market (Bolt, 2001). Households who are dependent on the social housing sector can only move to neighbourhoods where social rented dwellings are available. Neighbourhoods with high shares of social rented dwellings will therefore often also be minority-concentration neighbourhoods and ethnic minorities will more often move to these neighbourhoods. This is in line with the racial-proxy theory: they move to these neighbourhoods not because of the ethnic composition, but because of housing-market constraints.

According to the *stratification perspective*, discrimination in the housing market limits the options for ethnic minorities to move into more desirable neighbourhoods, especially for groups who are stigmatised (Alba and Logan, 1992). Therefore, the most desirable neighbourhoods will be majority-concentration neighbourhoods (Phillips, 2007). Housing-market institutions can have discriminatory effects, and reduce the opportunities of ethnic minorities (South and Crowder, 1998). The role of institutional discrimination in the Netherlands is more limited than in the USA. However, in the Netherlands, lending institutions are found to have less trust in those belonging to ethnic minority groups, who as a result might have problems getting a mortgage (Aalbers, 2007) and ethnic minorities also experience discrimination in the private rented sector (Kullberg et al, 2009). In addition, the social housing sector can have discriminatory outcomes: for example, groups with lower

language proficiency or lower understanding of the allocation system are less likely to end up in attractive neighbourhoods (Bolt, 2001).

A final explanation as to why ethnic minority households might move to minority-concentration neighbourhoods is because they fear discrimination in majority-concentration neighbourhoods. Various researchers have shown that fear of discrimination or harassment prevented ethnic or racial minorities from moving to better (and 'whiter') neighbourhoods (Bowes et al, 1997; Hanhörster, 2013; Phillips et al, 2007). Also, research in the Netherlands shows that ethnic minorities do not want to live in neighbourhoods with mainly native Dutch inhabitants because they are afraid that they will not be accepted there or will not be able to relate to their neighbours (Kullberg et al, 2009).

Modelling neighbourhood selection

Most research modelling neighbourhood selection takes into account only one aspect of the neighbourhood: for example, whether households move into a poor neighbourhood or not, or into a minority-concentration neighbourhood or not, and estimate the effect of individual and household characteristics on neighbourhood selection (Hedman et al, 2011). Following Hedman et al (2011), we argue that it is important to model the combined effect of multiple neighbourhood characteristics on neighbourhood selection. In our study we are interested in the effect of the share of the own ethnic group and other ethnic minority groups on neighbourhood selection, while controlling for housing-market characteristics. The literature offers two alternative modelling strategies.

The first strategy is to use an aggregated model which estimates the number of households from a certain population group that moves into a neighbourhood. Zorlu and Mulder (2008) found that recent immigrants to the Netherlands move into neighbourhoods with high shares of ethnic minorities and, especially, high shares of their own ethnic group, even when other neighbourhood characteristics, such as housing-market composition, are taken into account. The disadvantage of such models is that they do not give insight into neighbourhood selection at the individual level.

A second modelling strategy is to use discrete choice models in which a (moving) household selects one neighbourhood from a choice set of a limited number of alternatives. Discrete choice models have been used before to estimate location choices (Kleit and Galvez, 2011), but mostly at a higher geographical level than neighbourhoods. Various authors have estimated the location choices of immigrants into municipalities (Aslund, 2005), metropolitan areas (Liaw and Ishikawa, 2008), provinces (Xu and Liaw, 2006), or states (Bartel, 1989). We know of only a few studies which used this strategy to model neighbourhood selection. Sermons (2000), who used a survey on the San Francisco metropolitan area, Ioannides and Zabel (2008), who used data from the National American Housing Survey, and Hedman et al (2011), who used register data from the city of Uppsala in Sweden, all included interactions between neighbourhood characteristics and households characteristics and estimated which households are more likely to move to which neighbourhoods. In these studies evidence has been found for neighbourhood reproduction through selective mobility: ethnic minorities move to neighbourhoods with higher shares of ethnic minorities (Hedman et al, 2011; Ioannides and Zabel, 2008) and all ethnic groups avoid neighbourhoods with higher shares of other ethnic groups (Sermons, 2000). As well as ethnic neighbourhood reproduction, these studies also suggest reproduction of other neighbourhood characteristics: families with children move to neighbourhoods with many families with children and low-income households move to neighbourhoods with a low average household income. However, these studies have not investigated whether ethnic minorities more often than others move to neighbourhoods with low average incomes, or with many families with children, nor whether they still move to neighbourhoods with high shares of ethnic minorities when these factors

are taken into account. With the current study we aim to fill this gap by using a discrete choice model to investigate in detail the neighbourhood selection of non-Western ethnic minorities.

Ethnic minority groups in the Netherlands

The four largest ethnic minority groups in the Netherlands are Turks (2.4%), Moroccans (2.2%), Surinamese (2.1%), and Antilleans (0.9%). Turkish and Moroccan immigrants originally arrived in the Netherlands as guest-workers, recruited by the government in the 1960s to solve shortages in the labour market. At the time, it was thought that these guest workers would return to their home countries; however, many of the guest-workers stayed, and in the 1970s and 1980s the immigrant population increased further because of immigration related to family reunification and family formation. Surinamese and Antilleans in the Netherlands are immigrants from (former) Dutch colonies. After the declaration of independence of Surinam in 1975, large-scale immigration of Surinamese to the Netherlands began. Up to 1990 Antilleans mainly came to the Netherlands for higher education; however, in more recent years, more underprivileged Antilleans have also come to the Netherlands to find jobs.

Turks and Moroccans have, on average, a lower socioeconomic position than Surinamese and Antilleans.[(1)] The sociocultural distance to the native Dutch population is larger for Turks and Moroccans than for Surinamese and Antilleans, mainly because of the colonial links (including language) of the Surinamese and Antilleans. Surinamese and Antilleans more often have contact with native Dutch and adhere to more similar cultural values than do Turks and Moroccans (Dagevos et al, 2007). Research on perceived ethnic hierarchies or preferences in the Netherlands suggests that all ethnic groups are most positive about their own ethnic group, followed by native Dutch. For native Dutch and Antilleans, Surinamese are the highest valued ethnic minority out-group, while Turks and Moroccans prefer each other over Surinamese and Antilleans (Gijsberts and Vervoort, 2007; Hagendoorn, 1995).

Neighbourhood selection by ethnic minorities in the Netherlands

The main question in this study is what explains the moves of ethnic minorities to minority-concentration neighbourhoods. We have discussed three competing theoretical frameworks, and it is most likely that a combination of these perspectives will apply, but different theoretical perspectives might be important for different ethnic groups. The three theoretical perspectives, in combination with the Dutch context as described above, have led us to formulate a number of expectations with regard of the roles of the share of the own ethnic group, the share of other ethnic groups, and housing-market characteristics in explaining neighbourhood selection.

Turks, Moroccans, Surinamese, and Antilleans are most positive about their own ethnic groups, but prefer native Dutch people over other ethnic minority groups. Based on the preferences perspective, we can therefore expect a positive effect of the share of the own-ethnic group on neighbourhood selection, but no positive effect for the share of other ethnic minorities.

[(1)] Non-Western minorities in the Netherlands have a lower average standardised net household income (€17 100) compared with the native Dutch population (€24 100). Moroccans (€16 200), Turks (€16 400) and other non-Western minorities (€16 700) have lower incomes than Antilleans (€17 200) and especially Surinamese (€19 200). Also the share of unemployed is much higher among non-Western minorities (12.6%) than among the native Dutch population (4.5%). Moroccans (14.6%) and other non-Western minorities (13.8%) are most often unemployed, followed by Antilleans (12.5%), Turks (11.3%), and Surinamese (10.4%) (Netherlands Statistics, data for 2010).

Turks, Moroccans, Surinamese, and Antilleans have on average a lower socioeconomic position than native Dutch people, and will therefore be more dependent on affordable dwellings. Based on the human capital perspective, we expect that the ethnic composition of neighbourhoods no longer affects neighbourhood selection once housing-market characteristics are taken into account; the neighbourhood ethnic composition is a proxy for affordable dwellings in the neighbourhood.

According to the stratification perspective, discrimination or fear of discrimination causes ethnic minorities to move to minority-concentration neighbourhoods. Based on the stratification perspective, we expect the overall share of ethnic minorities in a neighbourhood to have a positive effect on neighbourhood selection, even when the share of the own ethnic group and the neighbourhood housing-market characteristics are taken into account. Because of their large cultural distance from the native majority and their low position in the ethnic hierarchy, we expect Turks and Moroccans to be more likely than Surinamese and Antilleans to experience or fear discrimination and, therefore, to move to minority-concentration neighbourhoods.

The effect of neighbourhood characteristics might differ for low-income and high-income ethnic minority households. In the models this can be investigated by including interaction effects between household income and neighbourhood characteristics. If neighbourhood selection is explained by own-group preferences, high-income minorities, who have more options in the housing market, will be most successful in moving to own-group-concentration neighbourhoods. However, low-income minorities will benefit from living close to coethnics and ethnic facilities in an *ethnic enclave* and be dependent on coethnic networks in their housing search. If these mechanisms are important, low-income minorities especially will move to high own-group-concentration neighbourhoods. By including interaction effects between income and the share of the own group we can test whether own-group preferences or other own-group effects, such as networks and services, explain neighbourhood selection.

According to the human capital perspective, low-income minorities in particular will move to minority-concentration neighbourhoods, but only because they more often move to neighbourhoods with affordable dwellings. We thus expect that, once we take into account that low-income minorities move to neighbourhoods with affordable dwellings, the interaction effect between individual income and the neighbourhood ethnic composition will disappear.

As stated above we expect that according to the stratification perspective ethnic minorities move to minority-concentration neighbourhoods because of discrimination. Discrimination might particularly affect the neighbourhood selection of higher income ethnic minority households. Logan and Alba (1993) called this the *strong version of the stratification perspective*; ethnic minorities have lower location returns from a high income than do the native majority population. Whereas ethnic majority households will be able to move to less ethnically concentrated neighbourhoods if their income increases, this effect is less strong for ethnic minorities. Once we take into account that low-income households move to affordable neighbourhoods, we thus expect to find a positive interaction between household income and the share of ethnic minorities in the neighbourhood.

Data and methods

We use longitudinal register data from the Social Statistical Database (SSD) from Statistics Netherlands. The SSD data are unique because they cover the entire Netherlands population from 1999 to 2010, allowing researchers to follow individuals over a long period of time and to select households who have moved. The data include geocoded residential histories, allowing researchers to link neighbourhood characteristics. The size of the dataset makes

it possible to focus on a very specific group: in our case, ethnic minority households who moved within the Utrecht urban region, and to distinguish different ethnic groups within this larger group to test for own-group effects.

We needed a study area that functions as a single housing market to ensure that in theory all neighbourhoods in this area are part of the choice set for households. We also wanted an area with a good representation of all the main ethnic minority groups in the Netherlands, and with a large variation of neighbourhoods. The Utrecht urban region meets these criteria. The region consists of the city of Utrecht (the fourth-largest city in the Netherlands, with 322 000 inhabitants), and the surrounding suburban municipalities (adding to a total of 647 000 inhabitants). Most residential mobility occurs within the urban region. The social housing sector here uses a choice-based letting system which allows applicants to bid on dwellings all over the urban region. Social housing comprises 33% of the housing stock in Utrecht; 14% of the dwellings are private rented dwellings; and 52% of the dwellings are owner-occupied. Within the urban region of Utrecht the demand for housing is high, which results in high property prices and high rents in the private sector and long waiting times in the social rented sector. There is a large variety of neighbourhood types with regard to concentrations of various ethnic minority groups, property prices, waiting times for social housing, and tenure composition. The share of non-Western ethnic minorities in Utrecht is 16%, somewhat lower than in the three largest cities in the Netherlands, but higher than in most other cities.

Within the Utrecht urban region we identify 252 neighbourhoods (*buurten* in Dutch) based on municipal definitions. Neighbourhoods defined in this way are more in line with what people perceive as their neighbourhood than are other types of administrative units available in the Netherlands, such as postal code areas. We had to exclude 37 neighbourhoods because of missing data,[(2)] which left us with 215 neighbourhoods each of which on average have 2700 inhabitants and an average size of 1.5 km^2. The neighbourhood size varies from neighbourhoods with no more than 150 inhabitants to neighbourhoods with 10 000 inhabitants, and includes large low-density suburban areas and dense inner-city areas of only 0.5 km^2. Neighbourhoods are generally homogeneous with regard to building period and building type.

For our analysis, we selected all household heads [(3)] who lived in the Utrecht urban region on 1 January 2010 and who had moved within this region since 1 January 2006.[(4)] This resulted in the selection of 80 043 household heads, of whom 13 137 (16%) are non-Western ethnic minorities. Because of there being missing data for 37 neighbourhoods, we had to exclude 345 households who had moved to these neighbourhoods. Hence, we were left with 12 792 non-Western ethnic minority households (2254 Turkish, 4231 Moroccan,

[(2)] These neighbourhoods had missing data on average dwelling value. Average dwelling value is not provided for neighbourhoods with very few residential dwellings, such as rural areas or business parks. The excluded neighbourhoods are different from the included areas as they are generally low-density nonresidential areas with a slightly lower share of non-Western minorities compared with the included neighbourhoods. The exclusion of these neighbourhoods might bias the results; however, as only a very small share of the moving households moved to an excluded neighbourhood, the possible bias will be very small.

[(3)] To determine the ethnicity of the household we only use the ethnicity of the head of the household. In the remainder of the paper we use the term 'households' although we only look at household heads. Minority–majority households will not have a strong disruptive impact on our outcomes and the number of mixed minority–minority households is very small; therefore this choice will not have a strong impact on our results.

[(4)] The 2010 data are the most recent available. We focus on households who moved between 2006 and 2010 because we need a reasonably large number of moving households per ethnic group.

1867 Surinamese, 791 Antillean, and 3649 other non-Western ethnic minority households).[5] For these 12 792 moving ethnic minority households we model the selection of their destination neighbourhood (their neighbourhood on 1 January 2010). We assume that these households selected their destination neighbourhood from a choice set of all 215 neighbourhoods within the Utrecht urban region. In reality, some households might have considered moving out of the urban region, while others might only have considered a subset of neighbourhoods within the region. However, as most households have considered various neighbourhoods within the Utrecht urban region and selected their destination neighbourhood based on a comparison of these neighbourhoods, we can assume that all neighbourhoods within the urban region are part of the choice set.[6]

To model neighbourhood selection we use a conditional logit model (CLM).[7] A CLM estimates the probability that household i selects neighbourhood j from a choice set of J neighbourhoods. A CLM is consistent with the microeconomic theory of utility maximisation: households select the neighbourhood with the highest utility for them. The utility of a neighbourhood to a household is calculated as neighbourhood characteristics × parameters + an error term (Hoffman and Duncan, 1988; McFadden, 1974). If we assume that this error term is an identical and independent extreme value distributed across neighbourhoods, the probability that household i chooses neighbourhood j, and thus that the utility of neighbourhood j to household i is higher than is the utility of all other neighbourhoods, can be calculated with a CLM. Thus, let P_{ij} denote the probability that household i will choose neighbourhood j, based on the characteristics of the jth neighbourhood (N_j), and the characteristics of the other neighbourhoods in the choice set (N_k). Following Hoffman and Duncan (1988), the CLM is written:

$$P_{ij} = \frac{\exp(\beta N_j)}{\sum_{k=1}^{J} \exp(\beta N_k)} . \tag{1}$$

Thus, for every household i, the probability of selecting neighbourhood j is estimated as a function of the characteristics of that neighbourhood in comparison with the characteristics of all other neighbourhoods in the choice set. Because the selection is modelled *within* a household, the household characteristics do not vary between neighbourhood options. Thus, in order to include household characteristics in the model, these must be interacted with neighbourhood characteristics. This can be included in equation (1) by letting X_i denote the characteristics of the ith household.

$$P_{ij} = \frac{\exp(\beta N_j X_i)}{\sum_{k=1}^{J} \exp(\beta N_k X_i)} . \tag{2}$$

We measure neighbourhood characteristics for 2006 [denoted by $t-1$ in equation (3)] before the actual move took place. This is important to avoid the possibility of the characteristics of the moving household influencing the neighbourhood characteristics. Household income is measured for 2010 because the characteristics of the moving household are only known

[5] For comparison purposes (see figure 1 below) we also include the 57 353 native Dutch and 7605 Western ethnic minority households who moved within the Utrecht urban region between 2006 and 2010.

[6] For households who moved from elsewhere to the Utrecht urban region, we cannot assume that they only considered all neighbourhoods within the Utrecht urban region. Therefore, we excluded these households.

[7] The description of the CLM is adapted from Hedman et al (2011).

after the move (for example, when two singles form a couple with two incomes, the joint income determines the selection of dwelling and neighbourhood). The probability that the *i* th household will choose the *j* th neighbourhood or, in other words, will live in neighbourhood *j* at time *t*, is thus written:

$$P_{ijt} = \frac{\exp(\beta N_{j_{t-1}} X_{i_t})}{\sum_{k=1}^{J} \exp(\beta N_{k_{t-1}} X_{i_t})} . \quad (3)$$

This equation represents choice probabilities under the assumption that the error terms are identically and independently extreme values distributed across neighbourhoods. It is unlikely that the error terms are independent across all neighbourhoods; adjacent neighbourhoods or neighbourhoods within the same municipality might share unobservable characteristics that have an impact on their attractiveness to ethnic minority households. A nested logit or generalised extreme value (GEV) model could take spatial correlation in error terms into account (Chen et al, 2009, see also Ioannides and Zabel, 2008). However, these models require researchers to specify the form of spatial correlation, while the true form of the correlation pattern is unknown (Sener et al, 2011). As we have no theoretical or empirical assumptions concerning the form of spatial correlation, we use a simpler CLM. Although we acknowledge that spatial correlation might also occur in our data, since we use only internal neighbourhood characteristics and no neighbourhood accessibility measures that are, by definition, spatially correlated (Chen et al, 2009), we expect the impact of spatial correlation on our modelling outcomes to be limited.

Table 1 provides the summary statistics of the neighbourhood characteristics in 2006. In addition to neighbourhood characteristics, we also include a dummy variable for low

Table 1. Descriptive statistics of neighbourhoods in 2006 (source: own calculations based on SSD—made available by Statistics Netherlands—and Statistics Netherlands neighbourhood data).

	Mean	Standard deviation	Minimum	Maximum
Number of available dwellings [a]	968.4	1022.9	7	4872
Percentage of social rented dwellings	28.9	24.3	0	100
Percentage of private rental dwellings	14.3	11.8	0	92
Percentage new dwellings (built after 2000)	13.8	25.3	0	100
Average dwelling value (×1000)	251.9	123.7	123	1032
Percentage couples	27.5	6.7	10	51
Percentage households with children	32.6	13.9	4	64
Percentage non-Western minorities	11.7	12.1	0	79
Percentage Turks	1.8	3.1	0	21
Percentage Moroccans	4.2	6.8	0	47
Percentage Surinamese	2.1	1.6	0	10
Percentage Antilleans	0.7	0.5	0	2
Percentage other non-Western	3.0	2.1	0	12
Percentage Moroccans + Turks	6.0	9.5	0	68
N	215			

[a] This is the number of dwellings that have become available in a neighbourhood. This is calculated as the total number of household heads who moved to a neighbourhood between 1 January 2006 and 1 January 2010.

household income in our models to estimate if there are differences in neighbourhood sorting between high-income and low-income households.[8]

Results

In our analyses we focus on households who moved within the Utrecht urban region between 2006 and 2010. Figure 1 shows the share of non-Western ethnic minorities in their destination neighbourhood for all moving households and by ethnic group. Native Dutch households who moved within the Utrecht urban region selected neighbourhoods with the lowest shares of non-Western ethnic minorities (15%). Also, Western ethnic minority households selected neighbourhoods with few non-Western ethnic minorities (16%). Non-Western ethnic minority households, and especially Turkish and Moroccan households, moved to neighbourhoods with higher shares of non-Western minorities. Interestingly, figure 1 shows that ethnic minority households do not necessarily select neighbourhoods with high shares of their own ethnic group. Turkish households moved to neighbourhoods with a relatively high share of Moroccans and Surinamese, even higher shares than in the destination neighbourhoods of Moroccan or Surinamese households themselves. Not only the share of the own ethnic group, but also the share of other non-Western ethnic minorities, are high in the destination neighbourhoods of non-Western ethnic minorities. Therefore, concentrations of ethnic minorities are reproduced through residential mobility.

The fact that non-Western ethnic minorities, and especially Turks and Moroccans, move to neighbourhoods with high shares of non-Western minorities might be explained by other neighbourhood characteristics such as dwelling types or prices. Our data shows that, compared with native Dutch households, all non-Western minority groups, and Turks and Moroccans in

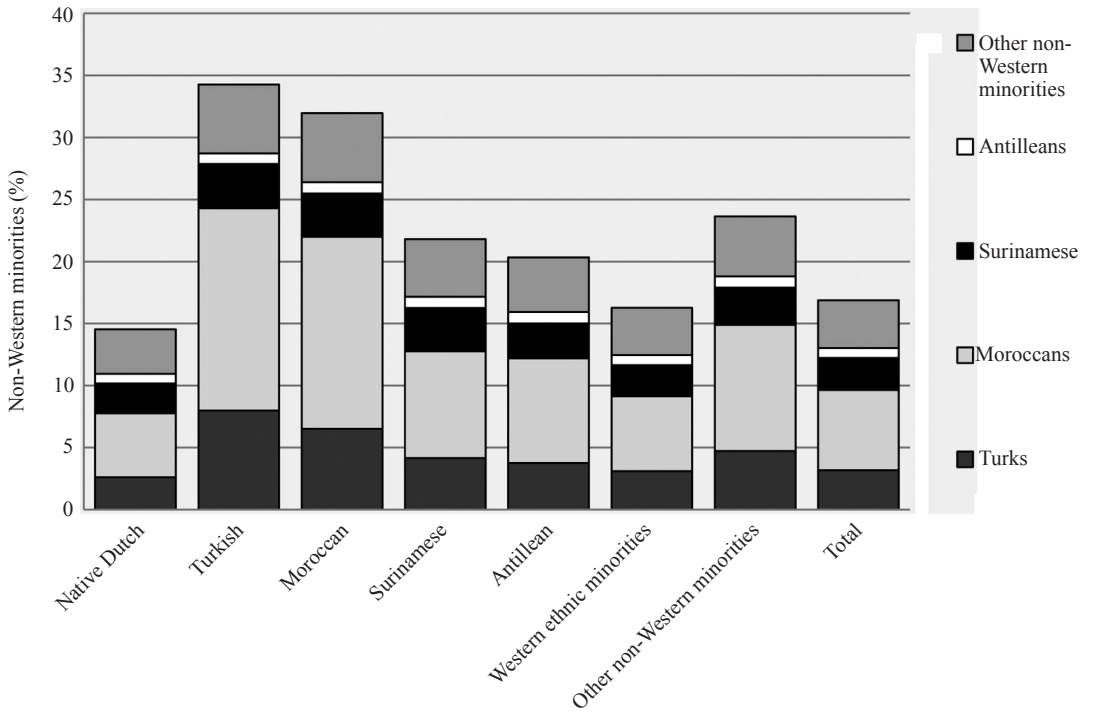

Figure 1. The share of non-Western ethnic minorities in the destination neighbourhood of moving households, by ethnic group ($N = 77\,763$).

[8] Low income households are defined as the 30% lowest income households in 2010 based on the income distribution on the national level. Of the moving households, 40% of the Turks, 40% of the Moroccans, 36% of the Surinamese, 42% of the Antilleans and 48% of the other non-Western minorities are classified as having a low household income.

particular, move to neighbourhoods with higher shares of social housing and lower dwelling values. An important question is whether housing-market constraints can explain why non-Western ethnic minority households select minority-concentration neighbourhoods. We will investigate this further using conditional logit models.

Explaining neighbourhood selection of non-Western ethnic minorities

Table 2 shows the results of five conditional logit models which estimate which neighbourhood characteristics determine that a neighbourhood is selected out of a choice set of all neighbourhoods. Model 1 shows that non-Western minorities move to neighbourhoods with high shares of non-Western minorities. A 1 percentage point increase in the share of non-Western minorities leads to a 4% [exp(0.036) = 1.036] increase in the odds of a neighbourhood being selected. This indicates that the most ethnically concentrated neighbourhoods (80% non-Western minorities) are 17 times (1.036^{80}) more likely to be selected than neighbourhoods with no non-Western minorities. Thus, although the parameters seem small, ethnic minority concentration has a substantial effect on neighbourhood selection. In model 2 we distinguish between the share of the own-ethnic group and the share of all other non-Western ethnic minorities in the neighbourhood. The own group has a strong positive effect on neighbourhood selection: a 1 percentage point increase in the share of the own group leads to a 7% [exp(0.069) = 1.07] increase in the odds of selecting the neighbourhood). In addition, non-Western ethnic minorities other than the own group have a positive effect on neighbourhood selection: a 1 percentage point increase in the share of other non-Western minorities leads to a 2% [exp(0.024) = 1.02] increase in the odds. We performed an *F*-test based on the change in the log-likelihood between the 0 model and models 1 and 2: both model 1 and model 2 are a significant improvement over the 0 model.[(9)] In model 3 we take into account housing-market and household-composition variables. Non-Western minorities select neighbourhoods with high shares of (social and private) rented dwellings, low property values, high proportions of new dwellings, and many couples and families with children. The effects of housing-market characteristics are much smaller than the effects of ethnic composition. A neighbourhood with only social rented dwellings has a 4 times [exp(100 × 0.014)] higher odds of being selected than a neighbourhood with only owner-occupied dwellings. Adding these variables to the model strongly reduces the effect of non-Western minorities other than the own ethnic group on neighbourhood selection, and significantly improves the model fit ($F = 1838$, df = 6, $p < 0.001$).

In model 4 we investigate how neighbourhood selection differs between high-income and low-income households by including interaction effects between a dummy representing low household income and neighbourhood ethnic composition. Adding the interactions significantly improves the model ($F = 40$, df = 2, $p < 0.001$). The interaction effect between household income and share of the own group is very small, and adding this interaction does not change the main effect of the own ethnic group. This indicates that there are almost no differences between low-income and high-income households in terms of the effect of the own-group concentration on neighbourhood selection. Adding the interaction effect between household income and the share of other non-Western ethnic minorities causes the main effect of non-Western ethnic minorities other than the own-ethnic group to become very small. The interaction effect itself is larger and shows that low-income non-Western ethnic minorities are more likely to move to neighbourhoods with high shares of other non-Western ethnic minorities.

[(9)] The *F*-statistic is calculated as −2 times the change in log-likelihood and distributed χ^2 with the total number of added parameters as degrees of freedom. For model 1, $F = 17914$, df = 1, and $p < 0.001$; thus, model 1 is a significant improvement over the 0 model. For model 2, $F = 18000$, df = 2 and $p < 0.001$; thus model 2 is also a significant improvement over the 0 model.

Table 2. Conditional logit models of neighbourhood selection by non-Western ethnic minority households, with standard errors shown in parentheses ($N = 12\,792$) (source: own calculations based on SSD made available by Statistics Netherlands and Statistics Netherlands neighbourhood data).

	Model 1	Model 2	Model 3	Model 4	Model 5
Neighbourhood ethnic composition					
Percentage non-Western minorities	0.036 (0.000)**				
Percentage own group		0.069 (0.001)**	0.046 (0.001)**	0.045 (0.002)**	0.048 (0.002)**
Percentage other non-Western minorities		0.024 (0.001)**	0.004 (0.001)**	0.000 (0.001)	0.003 (0.001)**
Neighbourhood housing market and household composition					
Number of available dwellings	0.001 (0.000)**	0.001 (0.000)**	0.001 (0.000)**	0.001 (0.000)**	0.001 (0.000)**
Percentage social rented dwellings			0.014 (0.001)**	0.014 (0.001)**	0.012 (0.001)**
Percentage private rental dwellings			0.009 (0.001)**	0.009 (0.001)**	0.010 (0.001)**
Percentage new housing development			0.003 (0.000)**	0.003 (0.000)**	0.003 (0.000)**
Average dwelling value			−0.005 (0.000)**	−0.005 (0.000)**	−0.004 (0.000)**
Percentage couples			0.018 (0.002)**	0.019 (0.002)**	0.018 (0.002)**
Percentage households with children			0.013 (0.001)**	0.013 (0.001)**	0.013 (0.001)**
Interaction effects					
Percentage own-group × low-income household				0.003 (0.002)	−0.007 (0.002)**
Percentage other non-Western minorities × low-income household				0.009 (0.001)**	0.000 (0.002)
Percentage social rented dwellings × low-income household					0.003 (0.001)**
Average dwelling value × low-income household					−0.003 (0.000)**
Pseudo-R^2	0.1304	0.1310	0.1444	0.1447	0.1454
Log-likelihood (0)	−68 701				
Log-likelihood (β)	−59 744	−59 701	−58 782	−58 762	−58 711

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

In model 5 we add interaction effects between household income and housing-stock characteristics to control for the fact that low-income households more often move to neighbourhoods with many social rented dwellings and lower property prices. Including these interactions significantly improves the model ($F = 102$, df = 2, $p < 0.001$) and causes the interaction effect between household income and the share of other ethnic minorities to disappear. This shows that housing-market characteristics explain why low-income households more often move to minority-concentration neighbourhoods (with ethnic minorities other than their own group). Surprisingly, however, the main effect of the share of non-Western minorities other than the own-ethnic group increases again, indicating that both high-income and low-income ethnic minority households are likely to move to neighbourhoods with higher shares of non-Western minorities other than their own ethnic group. Discrimination or fear of discrimination in majority-concentration neighbourhoods might explain this.

Once we take into account that low-income households move to affordable neighbourhoods, we find that the interaction effect between household income and the share of the own group becomes significant. Low-income households are less likely to move to neighbourhoods with high shares of their own ethnic group than are high-income minorities. As higher income households have more opportunities in the housing market and, therefore, more freedom in their neighbourhood choice, their stronger selection of neighbourhoods with high shares of own-group members is an indicator that own-group preferences are important in explaining neighbourhood selection.

Separate models for the four ethnic groups

To get a better understanding of which neighbourhood characteristics explain neighbourhood selection by the different ethnic groups, we estimate separate models for the four largest ethnic minority groups in the Netherlands (see table 3). For each ethnic group we show two models; one without and one with interaction effects. We first discuss the models without interaction effects.

All ethnic groups move to neighbourhoods with high shares of their own ethnic group.[(10)] The effect of a 1 percentage point increase of the share of the own ethnic group is largest for Antilleans: a 1 percentage point increase in Antilleans in the neighbourhood will increase the odds of selection by 67% [exp(0.511) = 1.67]. For Surinamese a 1 percentage point increase in the share of their own group will increase the odds of selection by 29% [exp(0.254) = 1.29], and for Turks and Moroccans the odds of selection increase only 3% [exp(0.032) = 1.03] and 2% [exp(0.024) = 1.02], respectively. However, the neighbourhoods with the highest concentration of Antilleans within the Utrecht urban region still include only 2% of Antilleans, while the maximum share of Turks and Moroccans is 68%. An Antillean household is 2.8 (1.67^2) times more likely to move to a neighbourhood with the highest concentration of Antilleans than to a neighbourhood with no Antilleans. A Turkish household is 8.6 (1.032^{68}) times more likely to move to a neighbourhood with the highest concentration of their own group than to a neighbourhood with no Turks or Moroccans. As well as moving to high own-group concentration neighbourhoods, Turks (model 6) and Moroccans (model 8) also move to neighbourhoods with high shares of other non-Western ethnic minorities, but this is not the case for Surinamese and Antilleans. The effect of other non-Western minorities, which is found in a model with only the ethnic composition of the

[(10)] For Turks and Moroccans the correlation between the share of their own group and the share of all other non-Western minorities in the neighbourhood was very high (78%), mostly because the correlation between the share of Turks and the share of Moroccans is very high (81%). Therefore, it was not possible to include the share of the own ethnic group and the share of other non-Western minorities in one model. Hence, we include the total share of Turks and Moroccans as 'own group' and the share of non-Western minorities who are not Turkish or Moroccan as 'other non-Western minorities'.

Table 3. Conditional logit models of neighbourhood selection for the four largest ethnic minority groups in the Netherlands, with standard errors shown in parentheses (source: own-calculations based on SSD made available by Statistics Netherlands and Statistics Netherlands neighbourhood data).

	Turks		Moroccans		Surinamese		Antilleans	
	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Neighbourhood ethnic composition								
Percentage own group	0.032	0.031	0.024	0.025	0.254	0.296	0.511	0.318
	(0.002)**	(0.002)**	(0.001)**	(0.002)**	(0.016)**	(0.018)**	(0.086)**	(0.115)**
Ppercentage other non-Western minorities	0.081	0.089	0.091	0.107	−0.001	−0.003	0.003	0.002
	(0.007)**	(0.009)**	(0.005)**	(0.006)**	(0.002)	(0.003)	(0.003)	(0.004)
Neighbourhood housing market and household composition								
Number of available dwellings	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**	(0.000)**
Percentage social rented dwellings	0.002	0.004	0.017	0.015	0.007	0.004	0.006	0.006
	(0.002)	(0.002)	(0.001)**	(0.001)**	(0.002)**	(0.002)*	(0.003)*	(0.003)
Percentage private rental dwellings	−0.014	−0.014	0.013	0.013	0.009	0.009	0.006	0.006
	(0.004)**	(0.004)**	(0.003)**	(0.003)**	(0.004)*	(0.004)*	(0.005)	(0.005)
Percentage new housing development	0.009	0.009	0.001	0.001	−0.003	−0.003	−0.002	−0.002
	(0.001)**	(0.001)**	(0.001)	(0.001)	(0.001)**	(0.001)**	(0.002)	(0.002)
Average dwelling value	−0.010	−0.008	−0.005	−0.004	−0.004	−0.003	−0.003	−0.003
	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**
Percentage couples	0.037	0.036	0.056	0.056	0.025	0.025	0.000	0.000
	(0.007)**	(0.007)**	(0.004)**	(0.004)**	(0.006)**	(0.006)**	(0.008)	(0.008)
Percentage households with children	0.000	0.000	0.013	0.013	0.017	0.017	0.005	0.005
	(0.004)	(0.004)	(0.002)**	(0.002)**	(0.003)**	(0.003)**	(0.005)	(0.005)

Table 3 (continued).

	Turks		Moroccans		Surinamese		Antilleans	
	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Interaction effects								
Percentage own group × low-income		0.000 (0.003)		−0.002 (0.002)		−0.116 (0.027)**		0.436 (0.164)**
Percentage other non-western min*low-income		−0.023 (0.014)		−0.04 (0.009)**		0.004 (0.004)		0.002 (0.006)
Percentage social rented dwellings × low-income		−0.004 (0.003)		0.004 (0.002)		0.007 (0.003)*		−0.001 (0.004)
Average dwelling value × low-income		−0.006 (0.001)**		−0.003 (0.001)**		−0.003 (0.001)**		−0.001 (0.002)
Log-likelihood (0)	−12 105		−22 723		−10 027		−4 248	
Log-likelihood (β)	−9 395	−9 381	−18 444	−18 428	−8 819	−8 791	−3 859	−3 853
pseudo-R^2	0.2239	0.2251	0.1883	0.1890	0.1204	0.1232	0.0915	0.0930
N	2 254		4 231		1 867		791	

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

neighbourhood (not shown) disappears for Surinamese and Antilleans once housing-market characteristics are taken into account. Own-group effects and housing-market constraints are thus important in explaining neighbourhood selection for all four groups. These two factors together explain why Surinamese and Antilleans move to minority-concentration neighbourhoods. However, for Turks and Moroccans, a third perspective is needed to explain their neighbourhood selection: when the share of the own-group and housing-market constraints are taken into account, they are still found to move to neighbourhoods with high shares of non-Western minorities other than their own ethnic group. Discrimination in the housing market, or fear of discrimination, in majority-concentration neighbourhoods, might explain this. *F*-tests show that models 6, 8, 10 and 12 are all significant improvements over their respective 0 models.

Models 7, 9, 11, and 13 test whether there are differences between high-income and low-income ethnic minority households in neighbourhood selection by including interaction effects between neighbourhood characteristics and household income. *F*-tests show that for all four groups the model significantly improves when interaction effects are included. This implies that for all four ethnic minority groups there are significant differences between high-income and low-income households in neighbourhood selection.

The main effects of the neighbourhood characteristics do not change when these interactions are included. As could be expected, we find that low-income households more often move to neighbourhoods with low dwelling values. Among Surinamese, low-income households more often move to neighbourhoods with higher shares of social rented dwellings. Taking this into account, we find differences between high-income and low-income households in the effect of the ethnic composition of the neighbourhood on neighbourhood selection.

For Moroccans and Turks we find that low-income households are less likely to move to neighbourhoods with concentrations of other ethnic minorities than are high-income households. This is in line with the strong version of the stratification theory (Logan and Alba, 1993), which states that the locational returns of income are relatively low for (stigmatised) minority groups.

For Surinamese and Antilleans we find interaction effects between the share of the own group in the neighbourhood and household income. Although both Surinamese and Antilleans move to neighbourhoods with high shares of their own ethnic group, for Surinamese this effect is strongest for high-income households whereas for Antilleans this effect is strongest for low-income households. The Surinamese results might be explained by strong preferences for living among their own ethnic group: higher income households have more opportunities in the housing market and will therefore be more successful in moving to the neighbourhood of their preference. The stronger selection of low-income Antilleans (who more often than other ethnic minority groups are recent immigrants) into own-group-concentration neighbourhoods can possibly be explained by their higher dependence on coethnic networks.

Conclusions and discussion

This study aimed to contribute to a better understanding of the mechanisms behind ethnic residential segregation. This is one of the first studies investigating neighbourhood selection to take into account multiple neighbourhood characteristics and analyse differences between ethnic minority groups. This has allowed us to test whether the share of the own ethnic group, housing-market characteristics, or discrimination are the driving forces of segregation. The descriptive analyses suggest that ethnic minority households are more likely to move to minority-concentration neighbourhoods than others. Using a conditional logit model we estimated whether this can be explained by housing-market characteristics or by own-group effects. We find that housing-market constraints play a role in neighbourhood selection for all ethnic minority groups. Ethnic minorities move to neighbourhoods with specific

housing-market and household characteristics and this partly explains why they move to minority-concentration neighbourhoods. Also the share of the own ethnic group is found to be important in neighbourhood selection for all four minority groups. They all move to own-group concentration neighbourhoods, probably because they prefer to live among, or find a dwelling via, members of their own ethnic group, or are attracted by facilities directed to their own ethnic group in those neighbourhoods. For Surinamese and Antilleans, neighbourhood selection can be explained by the housing-market characteristics and the share of their own group. However, we find that Turks and Moroccans move to concentration neighbourhoods of ethnic minorities other than their own ethnic group, also after controlling for the share of their own ethnic group and housing-market constraints.

An additional explanation is thus necessary to understand the neighbourhood selections of Turks and Moroccans. A first possible explanation is that Turks and Moroccans are discriminated against by housing-market institutions. The social housing letting system could have discriminatory outcomes if Turks and Moroccans are less likely to end up in (attractive) majority-concentration neighbourhoods due, for example, to their low language proficiency. Discrimination in the mortgage market (Aalbers, 2007), or in the private rented market, might also restrict ethnic minorities in their neighbourhood choice. In particular, Turks and Moroccans, who have a low position in the ethnic hierarchy, might experience such discrimination. A second possible explanation is that Turks and Moroccans *choose* not to move to majority-concentration neighbourhoods because they fear discrimination or exclusion. Turks and Moroccans are at a larger cultural distance from Dutch society than are Surinamese and Antilleans; therefore, a fear of exclusion might prevent them from moving into majority-concentration neighbourhoods. A third possible explanation might be that ethnic differences in personal characteristics affect neighbourhood selection. For example, our data did not contain information on education but, because we know that Turks and Moroccans have lower educational levels than the other ethnic groups, and education affects neighbourhood selection, this might explain why Turks and Moroccans end up in neighbourhoods with concentrations of ethnic minorities other than their own group.

An important contribution of this paper lies in the decomposition of the heterogeneous category of ethnic minorities into separate ethnic groups, which allows us to test the own-group hypothesis. While ethnic minorities might have a preference to live among their own ethnic group, the literature on ethnic hierarchies shows that it is unlikely that they prefer to live among other ethnic minorities. Decomposition into separate ethnic minority groups will allow researchers to gain a better understanding of the causes of ethnic residential segregation as it allows them to distinguish own-group effects from other reasons why ethnic minorities move to minority-concentration neighbourhoods, such as discrimination.

Our research has two limitations. First, because we use register data, we do not have insight in the choice process or the locational preferences of households and cannot ask them *why* they selected their neighbourhood or which neighbourhood characteristics were most important in their decision. Second, we do not take into account personal characteristics other than income. Characteristics such as educational level, language proficiency, or residential satisfaction are likely to affect neighbourhood selection but this information is not available in the register data we use. Also, the nature of the modelling strategy we use complicates the inclusion of personal characteristics because they can only be included when interacted with a neighbourhood-level characteristic.

The main finding of this study is that own-group effects are important in explaining the selection of ethnic minorities into minority-concentration neighbourhoods. This is important, as it could indicate that ethnic minority groups voluntarily segregate into minority-concentration neighbourhoods, because they prefer to live among their own ethnic group or

close to ethnic-specific facilities. Our research also shows that the share of the own-ethnic group can only partly explain neighbourhood selection: housing-market constraints and, for some groups, possibly discrimination, also constrain the neighbourhood choice of ethnic minorities and cause them to move to minority-concentration neighbourhoods. Although we study the case of the Utrecht urban region in the Netherlands, we expect that also in other urban areas in the Netherlands and beyond, similar effects can be found. In other regions ethnic minorities have also been found to move to minority-concentration neighbourhoods. This will be (partly) explained by housing-market characteristics as in most cities affordable dwellings are concentrated in neighbourhoods that are often minority-concentration neighbourhoods and ethnic minorities have, on average, lower incomes. The effect of the own-ethnic group might also be similar in other regions as previous research shows that ethnic minorities often prefer to live among, or find a dwelling via, members of their own ethnic group. It will be interesting for future research to investigate in different urban contexts with different ethnic compositions and housing markets to investigate for which groups these two mechanisms are sufficient to explain their selection into minority-concentration neighbourhoods, and for which groups discrimination or fear of discrimination affect neighbourhood selection.

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References

Aalbers M, 2007, "Place-based and race-based exclusion from mortgage loans; evidence from three cities in the Netherlands" *Journal of Urban Affairs* **29** 1–29

Alba R, Logan J, 1992, "Assimilation and stratification in the homeownership patterns of racial and ethnic groups" *International Migration Review* **26** 1314–1341

Aslund O, 2005, "Now and forever? Initial and subsequent location choices of immigrants" *Regional Science and Urban Economics* **35** 141–165

Bartel A, 1989, "Where do new US immigrants live?" *Journal of Labor Economics* **7** 371–391

Bolt G, 2001 *Wooncarrières van Turken en Marokkanen in Ruimtelijk perspectief* (KNAW/FRW, Utrecht)

Bolt G, van Kempen R, 2010, "Ethnic segregation and residential mobility: relocations of minority ethnic groups in the Netherlands" *Journal of Ethnic and Migration Studies* **36** 333–354

Bolt G, van Kempen R, van Ham M, 2008, "Minority ethnic groups in the Dutch housing market: spatial segregation, relocation dynamics and housing policy" *Urban Studies* **45** 1359–1384

Bowes A, Dar N, Sim D, 1997, "Tenure preferences and housing strategy: an exploration of Pakistani experiences" *Housing Studies* **12** 63–84

Brama A, 2006, "White flight? The production and reproduction of concentration areas in Swedish cities 1990–2000" *Urban Studies* **43** 1127–1143

Chen C, Chen J, Timmermans H, 2009, "Historical deposition influence in residential location decisions: a distance-based GEV model for spatial correlation" *Environment and Planning A* **41** 2760–2777

Clark W, Ledwith V, 2007, "How much does income matter in neighbourhood choice?" *Population Research and Policy Review* **26** 145–161

Clark W, Deurloo M, Dieleman F, 2006, "Residential mobility and neighbourhood outcomes" *Housing Studies* **21** 323–342

Crowder K, 2001, "Racial stratification in the actuation of mobility expectations: microlevel impacts of racially restrictive housing markets" *Social Forces* **79** 1377–1396

Dagevos J, Schellingerhout R, Vervoort M, 2007, "Sociaal culturele integratie en religie", in *Jaarrapport Integratie 2007* Eds J Dagevos, M Gijsberts (SCP, Den Haag) pp 163–191

Doff W, 2010, "The significance of self-selection for neighbourhood sorting", in *Puzzling Neighbourhood Effects* (IOS Press, Amsterdam) pp 121–138

Ellen I, 2000, "Race-based neighbourhood projection: a proposed framework for understanding new data on racial integration" *Urban Studies* **37** 1513–1533

Feijten P, van Ham M, 2009, "Neighbourhood change reason to leave?" *Urban Studies* **46** 2103–2122

Gijsberts M, Vervoort M, 2007, "Wederzijdse beeldvorming", in *Jaarrapport Integratie 2007* Eds J Dagevos, M Gijsberts (SCP, Den Haag) pp 282–309

Hagendoorn L, 1995, "Intergroup biases in multiple group systems; the perception of ethnic hierarchies" *European Review of Social Psychology* **6** 199–228

Hanhörster H, 2013, "Should I stay or should I go: Turkish home-owners in low-income neighbourhoods", paper presented at the European Network of Housing Research, 19–22 June; copy available from http://enhr.net/documents/Papers%20Spain/Papers/WS12/Hanhoerster%20ENHR%202013.pdf

Harris D, 1999, "Property values drop when blacks move in, because …: racial and socioeconomic determinants of neighbourhood desirability" *American Sociological review* **64** 461–479

Hedman L, 2013, "Moving near family: the influence of extended family on neighbourhood choice in an intra-urban context" *Population Space and Place* **19** 32–45

Hedman L, van Ham M, Manley D, 2011, "Neighbourhood choice and neighbourhood reproduction" *Environment and Planning A* **43** 1381–1399

Hoffman S, Duncan G, 1988, "Multinomial and conditional logit discrete-choice models in demography" *Demography* **25** 415–427

Ioannides Y, Zabel J, 2008, "Interactions, neighbourhood selection and housing demand" *Journal of Urban Economics* **63** 229–252

Kleit R, Galvez M, 2011, "The location choices of public housing residents displaced by redevelopment: market constraints, personal preferences or social information?" *Journal of Urban Affairs* **33** 375–407

Kullberg J, Vervoort M, Dagevos J, 2009 *Goede buren kun je niet kopen* (SCP, Den Haag)

Lee B, Oropesa R, Kanan J, 1994, "Neighborhood context and residential mobility" *Demography* **31** 249–270

Liaw L, Ishikawa Y, 2008, "Destination choices of the 1995–2000 immigrant to Japan; salient features and multivariate explanation" *Environment and Planning A* **40** 806–830

Logan J, Alba R, 1993, "Locational returns to human capital; minority access to suburban community resources" *Demography* **30** 243–268

Logan J, Zhang W, Alba R, 2002, "Immigrant enclaves and ethnic communities in New York and Los Angeles" *American Sociological Review* **67** 299–322

McFadden D, 1974, "Conditional logit analysis of qualitative choice behaviour", in *Frontiers in Econometrics* Ed. P Zarembka (Academic Press, New York) pp 105–142

Manley D, van Ham M, 2011, "Choice-based letting, ethnicity and segregation in England" *Urban Studies* **48** 3125–3143

Musterd S, Anderson R, Galster G, Kaupinnen T, 2008, "Are immigrants' earnings influenced by the characteristics of their neighbours?" *Environment and Planning A* **40** 785–805

Pais J, South S, Crowder K, 2009, "White flight revisited; a multi-ethnic perspective on neighbourhood out-migration" *Population Research and Policy Review* **28** 321–346

Phillips D, 2007, "Ethnic and racial segregation; a critical perspective" *Geography Compass* **1** 1138–1159

Phillips D, Davis C and Ratcliffe P, 2007, "British Asian narratives of urban space" *Transactions of the Institute of British Geographers, New Series* **32** 217–234

Sener I, Pendyala R, Bhat C, 2011, "Accommodating spatial correlation across choice alternatives in discrete choice models: an application to modelling residential location choice behavior" *Journal of Transport Geography* **19** 294–303

Sermons M, 2000, "Influence of race on household residential utility" *Geographical Analysis* **32** 225–246

South S, Crowder K, 1997, "Residential mobility between cities and suburbs: race, suburbanization, and back-to-the-city moves" *Demography* **34** 525–538

South S, Crowder K, 1998, "Leaving the hood; mobility patterns between black, white and integrated neighbourhoods" *American Sociological Review* **63** 17–26

van Ham M, Clark W, 2009, "Neighbourhood mobility in context: household moves and changing neighbourhoods in the Netherlands" *Environment and Planning A* **41** 1442–1459

Xu L, Liaw K, 2006, "Initial destination choices of skilled worker immigrants from South Asia to Canada: assessment of the relative importance of explanatory factors" *Canadian Journal of Regional Sciences* **29** 299–320

Zorlu A, Mulder C, 2008 "Initial and subsequent location choices of immigrants to the Netherlands" *Regional Studies* **42** 245–264