

2 Who cares? Individual differences in the determinants of residential satisfaction

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Submitted.

Abstract: Residential satisfaction is a key variable in understanding residential mobility. Many researchers have studied the individual level and neighbourhood level determinants of satisfaction, however, very few have studied which neighbourhood characteristics will affect satisfaction for whom. In this paper, a series of ordered logit models is estimated, explaining satisfaction from neighbourhood characteristics, personal characteristics and interactions. These interaction effects test whether neighbourhood characteristics have similar effects on all individuals, or whether individual characteristics affect the size and direction of these effects. Ethnic minorities are found to be less affected than natives by the share of ethnic minorities in the neighbourhood, because they prefer to live close to their own ethnic group. Satisfaction is found to be more dependent on neighbourhood characteristics for owner-occupiers and households with children than for other households. However, the impact of the neighbourhood ethnic composition on satisfaction does not differ with tenure or household type.

Keywords: residential satisfaction, ethnicity, racial proxy, interactions, residential mobility, segregation

§ 2.1 Introduction

Residential satisfaction is a key variable in residential mobility research (Speare, 1974). As dissatisfaction is thought to lead to mobility desires and behaviour, insight in the determinants of residential satisfaction is crucial for understanding residential mobility (Lu, 1999). People differ in which neighbourhood characteristics affect their residential satisfaction (Galster and Hesser, 1981). Declining property values, for instance, might lead to dissatisfaction among owner-occupiers, while for renters this is less likely to be the case (Ellen, 2000). High shares of minority residents are found

to lead to dissatisfaction among whites, but this effect is less strong among minorities themselves (Swaroop and Krysan, 2011).

Differences between individuals in the effects of neighbourhood characteristics on residential satisfaction lead to differences in mobility desires and thus to selective residential mobility. Selective residential mobility is one of the main driving forces of segregation. Therefore, to gain more insight in segregation and selective residential mobility it is crucial to understand which neighbourhood characteristics affect satisfaction for whom. Also for policymakers who try to create mixed, stable and attractive neighbourhoods it is important to have insight in which neighbourhood characteristics are important for whose satisfaction (Baum et al., 2009; Ellen et al., 2013; Pinkster et al., 2015).

Much research has been done on which personal characteristics affect residential satisfaction (Amérigo and Aragones, 1997; Galster and Hesser, 1981; Greif, 2015; Grogan-Kaylor et al., 2006; Lu, 1999; Parkes et al., 2002; Permentier et al., 2011). Similarly, many researchers have tested the effects of neighbourhood characteristics on satisfaction (Baum et al., 2009; Dekker, 2013; Galster and Hesser, 1981; Parkes et al., 2002). Within this field, there is a special interest in the effect of the neighbourhood ethnic or racial composition on satisfaction (Dekker, 2013; Harris, 2001; Swaroop and Krysan, 2011); does a higher share of minorities cause dissatisfaction with the neighbourhood, or is the ethnic composition a proxy for other correlated neighbourhood characteristics that lead to dissatisfaction? Much less research on satisfaction has focused on the interaction between the neighbourhood and the individual; that is, on differences between population groups in the effect of neighbourhood characteristics on satisfaction or on which neighbourhood characteristics are important to whom. To my knowledge, only Baum et al. (2009), Greif (2015), Parkes et al. (2002) and Swaroop and Krysan (2011) focus on tenure, ethnic or income differences in the effect of neighbourhood characteristics on satisfaction.

This research studies the determinants of individual satisfaction with the residential environment. Besides personal characteristics and neighbourhood characteristics, this research also includes interaction effects between personal characteristics and neighbourhood characteristics, thus testing differences between population groups in the effects of neighbourhood characteristics on satisfaction. These interaction effects test whether neighbourhood characteristics such as the neighbourhood ethnic composition, crime rates or dwelling values have similar effects on all individuals, or whether individual characteristics affect the size and direction of these effects. Based on data from the Housing Research Netherlands Survey, a series of ordered logit models is estimated in which individual satisfaction is explained from neighbourhood characteristics, personal characteristics and interactions.

§ 2.2 Residential satisfaction

Residential satisfaction is the key variable in the residential mobility model of Speare (1974). According to this model residential dissatisfaction will cause residential mobility and personal and neighbourhood characteristics will only affect mobility via satisfaction. Other authors have criticized this model, stating that people will only move beyond a certain level of dissatisfaction (Wolpert, 1965; Brown and Moore, 1970) and that also personal opportunities and constraints affect residential mobility; not all dissatisfied people will (be able to) move (Landale and Guest, 1985; Lu, 1998). However, residential satisfaction is a key variable in understanding mobility desires and behaviour (Lu, 1998). Therefore insight in residential satisfaction is crucial to understand selective residential mobility, neighbourhood change and segregation.

Residential satisfaction depends on the congruence of the residential situation with the desired residential situation (Brown and Moore, 1970; Lu, 1999a). The desired residential situation depends on a household's needs and aspiration (Grogan-Kaylor et al., 2006). Residential satisfaction is thus dependent on the congruence of the characteristics of the residential situation and the characteristics of the household (Lu, 1998). Households differ in their housing needs and aspirations and therefore will react differently to similar residential situations (Kahana et al., 2003). The next paragraphs will describe the (main) effects of personal and neighbourhood characteristics on satisfaction, while the next section will focus on the interaction effects, or on which neighbourhood characteristics are important to whom.

Individual level determinants of residential satisfaction

Personal characteristics are thought to mainly affect residential satisfaction through selection effects (Parkes et al., 2002; Permentier et al., 2011). Given the opportunity, people select environments that are in line with their residential needs (Rapoport, 1980). Therefore, people with more opportunities on the housing market are generally found to be more satisfied. A higher income (Parkes et al., 2002; Permentier et al., 2011) and a higher educational level (Harris, 2001; Lu, 1999) are found to be related to higher levels of residential satisfaction. Older people have had more time to select themselves into a neighbourhood of their preference and are therefore found to be more satisfied (Permentier et al., 2011). For households with children and owner-occupiers the neighbourhood is more important (Ellen, 2000), also because these groups generally stay longer in the same neighbourhood (Feijten, 2005). Much research has found that owner-occupiers (Dekker, 2013; Lu, 1999; Parkes et al., 2002; Swaroop and Krysan, 2011) and households with children (Dekker, 2013; Lu, 1999; Permentier et al., 2011) are more satisfied with their residential environment. Length of residence is thought to have a positive effect on satisfaction as over time residents

will have more social contacts in their neighbourhood and become more attached (Lu, 1999). However, in models taking into account other personal characteristics results are mixed. Although Parkes et al. (2002) find a positive effect of length of residence on satisfaction, other papers find insignificant (Swaroop and Krysan, 2011) or negative (Dekker, 2013; Lu, 1999) outcomes. This might be explained by the fact that in general people improve their residential situation over their housing career; most people who move, move to better dwellings and neighbourhoods (Clark et al., 2006). People with a long length of residence could be people who soon will move, or people who have been unable to move on, which are both related to lower levels of satisfaction. Also on the effect of ethnicity on residential satisfaction the results are mixed; some studies find that Whites are more satisfied than Blacks (Galster and Hesser, 1981; Lu, 1999) or non-western minorities less satisfied than native Dutch (Dekker, 2013). However, other studies find no effect of ethnicity on residential satisfaction (Harris, 2001; Parkes et al., 2002; Permentier et al., 2011). Possibly ethnic minorities are found to be less satisfied because they live in worse neighbourhoods, while the effect of ethnicity disappears when neighbourhood quality is taken into account.

Neighbourhood level determinants of residential satisfaction

Residential satisfaction also depends on the characteristics of the neighbourhood (Clark et al., 2006). Many researchers have tested the effects of neighbourhood characteristics on individual satisfaction. People are found to be more satisfied in neighbourhoods with high incomes and/or high dwelling values (Dekker, 2013; Galster and Hesser, 1981; Harris, 2001; Lu, 1999; Swaroop and Krysan, 2011). Also good schools and low crime rates (Harris, 2001; Parkes et al., 2002), accessibility (Baum et al., 2009; Parkes et al., 2002) and high shares of owner-occupied dwellings (Harris, 2001) are found to be related to higher satisfaction with the neighbourhood. Finally variables such as general appearance, noise (Baum et al., 2009; Parkes et al., 2002), dilapidated dwellings (Galster and Hesser, 1981) and deterioration (Harris, 2001) are found to affect residential satisfaction.

Many researchers have focused on the effect of the neighbourhood ethnic or racial composition on residential satisfaction. Higher shares of ethnic minorities are found to be related to lower levels of satisfaction (Dekker, 2013; Galster and Hesser, 1981; Harris, 2001; Swaroop and Krysan, 2011). However, according to the racial proxy theory, not the ethnic composition, but other neighbourhood characteristics, correlated with ethnic composition, are the cause of dissatisfaction. High shares of ethnic minorities often coincide with poverty, high crime rates or low school quality and these variables lead to dissatisfaction (Harris, 2001). To test the racial proxy hypothesis, researchers have tested whether neighbourhood ethnic composition still affects residential satisfaction (Dekker, 2013; Harris, 2001; Swaroop and Krysan, 2011), dwelling values (Harris, 1999), or neighbourhood outmobility (Ellen, 2000)

when other neighbourhood characteristics are taken into account. They find that other neighbourhood characteristics such as poverty, property values, turnover rates, school quality and disorder can only partly explain the relation between ethnic composition and dissatisfaction; also when these characteristics are taken into account people are still found to be less satisfied in neighbourhoods with higher shares of minorities (Ellen, 2000; Harris, 2001; Swaroop and Krysan, 2011).

§ 2.3 Which neighbourhood characteristics are important to whom?

Despite a very large body of research on the determinants of residential satisfaction, only very few studies have focused on differences between population groups in the effects of neighbourhood characteristics. Galster and Hesser (1981) made subsamples according to tenure, marital status, income and age and found that the effect of neighbourhood characteristics on satisfaction differed per subsample. Although they conclude that neighbourhood characteristics will have a different impact on different types of respondents, they do not draw conclusions on which neighbourhood characteristics will be more important to whom (Galster and Hesser, 1981). The next paragraphs describe earlier research on group differences in the effect of neighbourhood characteristics on residential satisfaction.

Preferences for the own ethnic group

In neighbourhoods with higher shares of ethnic minorities, people are found to be less satisfied (Dekker, 2013; Harris, 2001; Swaroop and Krysan, 2011) or more likely to want to leave the neighbourhood (Ellen, 2000; Van Ham and Feijten, 2008). This effect is often found to be stronger for natives than for ethnic minorities themselves (Harris, 2001; Swaroop and Krysan, 2011; Van Ham and Feijten, 2008) which can most likely be explained by own group preferences. People prefer to have contact with others who are similar to themselves (Putnam, 2007; Tajfel, 1982), therefore they feel more safe or more at home in neighbourhoods with higher shares of their own ethnic group (Dekker, 2013; Phillips, 2007). Living among the own ethnic group is advantageous (Bolt et al., 2008) as co-ethnics can provide opportunities for employment, housing, social security (Logan et al., 2002; Musterd et al., 2008) and a sense of security and belonging (Phillips, 2007). Both ethnic minorities and natives prefer to live among their own ethnic group (Cheshire, 2007; Clark, 1991). Therefore it can be expected that people are more satisfied with their neighbourhood if the share of their own ethnic group is higher (Dekker, 2013).

The effect of the neighbourhood ethnic composition on satisfaction will therefore differ between ethnic groups. Not only will ethnic minorities be less affected than natives by the share of ethnic minorities, also between ethnic minority groups there will be differences, since ethnic minorities will prefer to live among their own ethnic minority group and not among other ethnic minorities (Boschman and Van Ham, 2015).

Group differences in tolerance of ethnic minorities

Ellen (2000) and Goyette et al. (2014) test in the US whether there are individual differences in the effect of neighbourhood ethnic composition on mobility. Goyette et al. (2014) find that White households with young children are more likely to leave ethnic diverse neighbourhoods than other White households and Ellen (2000) finds that especially households with children and owner-occupiers avoid neighbourhoods with high or increasing shares of Blacks. Goyette et al. (2014) state that this might be explained by pure race reasons; White parents want to maintain a distance between their children and children of ethnic minorities. However, they state that also racial proxy reasons might explain these differences as minority concentration is correlated or perceived to be correlated with crime rates, school quality (Goyette et al., 2014) and declining property values (Ellen, 2000). These race-associated neighbourhood characteristics are especially important to owner-occupiers and households with children; therefore especially these groups avoid neighbourhoods with high or increasing shares of Blacks. Xie and Zhou (2012) use stated preferences research from the US to test whether there are individual differences in racial tolerance. Based on Farley-Schuman show cards (Farley et al., 1978) they test if people would want to move into neighbourhoods with increasing shares of Blacks and model the effect of personal characteristics on tolerance for Black neighbours. They find that home-owners, households with children, married couples, older people and lower educated people are less tolerant to Black neighbours. These aforementioned papers give insight in which population groups will be more sensitive to neighbourhood ethnic composition or more tolerant to ethnic minorities, however, the article by Greif (2015) on Los Angeles is the only one that focuses on individual differences in the effect of ethnic composition on satisfaction. Greif (2015) studies interaction effects between home-ownership and neighbourhood characteristics including the neighbourhood ethnic composition in models explaining satisfaction. She finds significant interaction effects, showing that home-owners are more sensitive to the neighbourhood ethnic composition than renters.

Based on the literature it can be expected that the effect of the neighbourhood ethnic composition on satisfaction differs between population groups. For home-owners and households with children the share of ethnic minorities is expected to have a stronger negative effect on satisfaction than for other households.

Group differences in the effects of other neighbourhood characteristics

Satisfaction is found to be more affected by neighbourhood characteristics for home-owners than for renters (Greif, 2015; Parkes et al., 2002). Greif (2015) models satisfaction and finds significant interactions of home-ownership with neighbourhood economic advantage, ethnic composition and the share of owner-occupied dwellings. Parkes et al. (2002) find in England that in affluent, predominantly owner-occupied neighbourhoods owner-occupiers are more satisfied than renters, while in poor neighbourhoods with high shares of rented dwellings, renters are more satisfied. Greif (2015) argues that disadvantageous neighbourhood characteristics are particularly important to home-owners as they could lead to declining property values and therefore financial problems. Home-ownership can hamper moving behaviour, especially when property values are declining. If neighbourhood characteristics are not congruent (anymore) with residential needs, dissatisfied renters can more easily than dissatisfied home-owners leave the neighbourhood. Therefore neighbourhood stressors such as crime, disorder, racial segregation or poverty will have a stronger effect on satisfaction for home-owners than for renters (Greif, 2015).

Similar to home-owners, also for households with children, neighbourhood satisfaction is thought to be more affected by neighbourhood characteristics. Households with children spend more time within the neighbourhood, therefore they are more affected by neighbourhood amenities and the population composition of their neighbours (Weck and Hanhörster, 2014). Secondly, having children makes parents more conscious of neighbourhood characteristics including school quality (Boterman, 2013) and safety (Permentier et al., 2011).

People prefer to live among similar people, not only in terms of ethnicity, but also with regard to tenure and income (Van Ham and Feijten, 2008; Schelling, 1971). Baum et al. (2009) study neighbourhood satisfaction in Australia and find that the share of social housing has a stronger negative effect on satisfaction for owner-occupiers than for public tenants and the share of low income households has a stronger negative effect on satisfaction for high income households than for low income households. Van Ham and Feijten (2008) study the desire to leave the neighbourhood in the Netherlands and also find preferences to live among similar neighbours; especially people who are different from the neighbourhood population in ethnicity, tenure or income want to leave the neighbourhood.

Based on the literature, it can be expected that residential satisfaction will be higher for people who live among similar people, not only in terms of ethnicity, but also in terms of tenure and income (Baum et al., 2009; Van Ham and Feijten, 2008). Home-owners are expected to be more sensitive to neighbourhood characteristics than renters (Greif, 2015; Parkes et al., 2002). Neighbourhood characteristics that could affect property values such as crime rates, amenities, poverty or ethnic composition

will have a stronger effect on satisfaction for owner-occupiers than for renters. Also households with children will be more affected by neighbourhood characteristics than other households.

§ 2.4 Hypotheses

This paper focuses on whether there are individual differences in the effects of neighbourhood characteristics on residential satisfaction. The first hypothesis is that neighbourhood ethnic composition affects residential satisfaction, and that this is not a racial proxy effect but remains significant also when other neighbourhood characteristics are taken into account (hypothesis 1). Secondly, I expect to find that personal characteristics affect the size and direction of the effect of neighbourhood characteristics on satisfaction. The share of ethnic minorities in the neighbourhood will have a less strong effect on satisfaction for ethnic minorities themselves than for natives, because people prefer to live in neighbourhoods with high shares of their own ethnic group (hypothesis 2). For owner-occupiers and households with children residential satisfaction is more dependent on neighbourhood characteristics including neighbourhood ethnic composition than for renters or households without children (hypothesis 3). People are more satisfied if their neighbours are more similar to themselves in income or tenure status (hypothesis 4).

§ 2.5 Data and methods

This study uses the Housing Research Netherlands survey (WoON 2012), a housing survey that is representative for the Dutch population 18 year and older (not living in institutions). In the Housing Research Netherlands survey respondents are asked about their satisfaction with their residential environment and this survey contains data on many personal characteristics such as ethnicity³, income, education, household type, tenure and length of residence. This dataset was combined with data on neighbourhood characteristics from Statistics Netherlands and the Leefbaarometer.

³ The data uses the Statistics Netherlands definitions of ethnic groups. Non-Western minorities are people of whom at least one parent is born in Africa, Latin America or Asia (except Indonesia and Japan). Western minorities are people of whom at least one parent is born in another country outside the Netherlands.

Statistics Netherlands has data on neighbourhood ethnic, household and dwelling composition and on average incomes, dwelling values and accessibility of all neighbourhoods. The Leefbaarometer has created an indicator of neighbourhood safety based on objective statistics about vandalism, disturbance, violent crime, theft and nuisance. The neighbourhood data is available on the level of administrative neighbourhoods (buurten) as defined by Netherlands Statistics. Neighbourhoods are the smallest administrative area level in the Netherlands and, more than larger areas, in line with what people perceive as their residential environment. Within urban areas, neighbourhoods are small, with an average size of 1.4 km² and an average number of 6,000 inhabitants. They often have natural borders such as main roads or waterways.

In total there are 69,330 respondents in the Housing Research Netherlands 2012 survey. In accordance with most other research on residential satisfaction, also in this research the focus is on urban areas. Within the Netherlands, there are large differences in ethnic composition between the four largest cities and other urban region. To be able to study the effects of neighbourhood ethnic composition, only respondents in the urban regions of the four largest cities in the Netherlands are included. Only respondents with independent housing careers are selected, because only these households are asked about their satisfaction with their residential environment. This selection includes 18,349 respondents.

To determine in which neighbourhood the respondent lives, the survey was merged with the municipal register data. However, for a small share of the respondents (53 respondents, 0.2%) the registered address did not match the address from the survey, therefore these respondents had to be excluded. For some neighbourhoods, neighbourhood characteristics such as average dwelling values, neighbourhood safety or the share of specific ethnic minority groups, is missing. To be able to include all neighbourhood characteristics in the models, respondents living in neighbourhoods with missing data (236 respondents, 1.3%) had to be excluded. All models are estimated on 18,060 respondents.

The dependent variable, satisfaction with the residential environment, is measured on a five point Likert scale. Most people are satisfied with their residential environment (Table 2.1). Only 1.8% is very dissatisfied, therefore this group was merged with dissatisfied. The dependent variable thus has 4 ordered categories. Therefore, to explain satisfaction I use ordered logit regression models. These models make use of the order of the response categories and estimate the effect of the independent variables on being in a higher category of satisfaction. In the ordered logit models, both personal and neighbourhood level variables are included. To control for the multilevel structure of the data, standard errors were clustered on neighbourhood level. The 18,060 respondents are clustered in 1,174 neighbourhoods. On average there are 15 respondents per neighbourhood (minimum = 1, maximum = 401).

	N	%
Very satisfied	4,886	27.1
Satisfied	9,385	52.0
Not satisfied/Not dissatisfied	2,408	13.3
Dissatisfied	1,054	5.8
Very dissatisfied	327	1.8

TABLE 2.1 Descriptive statistics concerning satisfaction with the residential environment (N=18,060)

Source: Own calculations based on WoON 2012, provided by Netherlands Statistics

§ 2.6 Results: Determinants of neighbourhood satisfaction

This section describes the results from a series of ordered logit models explaining satisfaction with the residential environment from neighbourhood characteristics, personal characteristics and interactions. In a first model (model 1, Table 2.2) only neighbourhood ethnic composition is taken into account. In neighbourhoods with higher shares of non-western minorities, satisfaction is lower, while in neighbourhoods with higher shares of western minorities, satisfaction is higher.

In a second model (model 2, Table 2.2), also other neighbourhood characteristics are taken into account. People are more satisfied in neighbourhoods with low crime rates, high dwelling values and good accessibility of facilities⁴. The share of owner-occupied dwellings in the neighbourhood has no effect on satisfaction. Also the share of high rise buildings and vacant dwellings, variables that could be used as indicators of general appearance or deterioration, do not affect satisfaction. When these neighbourhood characteristics are taken into account, the effect of the share of western minorities disappears. Western minorities more often live in neighbourhoods with good accessibility of facilities; not the high share of western minorities but the accessibility of facilities leads to higher satisfaction in these neighbourhoods. The negative effect of the share of non-western minorities, however, remains significant. This confirms the first hypothesis; the effect of non-western minorities on satisfaction is not a racial proxy effect, but remains significant also when other neighbourhood characteristics are taken into account. Possibly, however, this model does not accurately control for all neighbourhood characteristics correlated with ethnicity, in which case ethnicity could be a proxy for other neighbourhood characteristics not included in the model.

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I use the distance to the closest supermarket and the number of restaurants within 3 km as indicators of accessibility of facilities.

	MODEL 1		MODEL 2	
	B	p	B	p
% non-western minorities	-0,028	0,000	-0,021	0,000
% western minorities	0,027	0,000	0,003	0,717
Safety			0,003	0,027
Dwelling values			0,003	0,000
Distance to closest supermarket			-0,158	0,000
# restaurants within 3 km			0,000	0,001
% owner-occupied dwellings			0,001	0,377
% vacant dwellings			0,005	0,517
% high-rise buildings			0,001	0,658
R ²		0,036		0,043

TABLE 2.2 Ordered logit models explaining satisfaction from neighbourhood characteristics

Source: Own calculations based on WoON 2012, provided by Netherlands Statistics

In model 3 (Table 2.3) both neighbourhood characteristics and personal characteristics are included. Similar to model 2, people are found to be more satisfied in neighbourhoods with low crime rates, high dwelling values and good accessibility. Also personal characteristics are found to affect satisfaction. Non-western minorities are less satisfied than natives or western minorities. Couples, both with and without children are less satisfied than singles, single parent families or other households. Couples generally have higher demands for their neighbourhood and are therefore found to be less satisfied when neighbourhood characteristics are taken into account. In line with the literature, older people (over 45) and households with higher incomes are found to be more satisfied with their neighbourhood. Length of residence has a negative effect on satisfaction, possibly because households with a long length of residence wanted to move on but were unable to do so. Owner-occupiers, people in single family dwellings and healthy people are more satisfied.

The second hypothesis states that the share of non-western minorities in the neighbourhood has a less strong negative effect on satisfaction for minorities themselves than for natives, because people are more satisfied in neighbourhoods with high shares of their own ethnic group. Therefore, in model 4 (Table 2.3) interaction effects are included between the share of non-western minorities and individual level ethnicity. The main effect of the share of non-western minorities remains significant negative. The interaction effect of the share of non-western minorities with being a western minority is not significant and the interaction with being a non-western minority is significant and positive.

This indicates that the negative effect of the share of non-western minorities on satisfaction is less strong for non-western minorities themselves than for natives or western minorities⁵.

In model 5 (Table 2.3) an extra interaction effect is included between being a non-western minority and the share of the own ethnic group in the neighbourhood⁶. This interaction effect is significant and positive, indicating that non-western minorities are more satisfied if the share of their own ethnic group is higher. After inclusion of this interaction effect, the interaction with the total share of non-western minorities is no longer significant. This confirms hypothesis 2; model 4 shows that the negative effect of the share of non-western minorities on satisfaction is less strong for non-western minorities than for natives and western minorities. However, model 5 shows that this is explained by a preference to live among the own ethnic group. When it is taken into account that people are more satisfied in neighbourhoods with higher shares of their own ethnic group, the total share of non-western minorities in the neighbourhood has an equally strong negative effect on non-western minorities as on natives.

5 The positive interaction effect for non-western minorities is smaller than the negative main effect of the share of non-western minorities in the neighbourhood. This indicates that also for non-western minorities, the share of non-western minorities has a negative effect on satisfaction, but this effect is less strong than for natives or western minorities.

6 For Turks, Moroccans, Surinamese and Antilleans, this is the share of their own ethnic group, while for other non-western minorities it is the share of other non-western minorities.

	MODEL 3		MODEL 4		MODEL 5	
	B	p	B	p	B	p
Neighbourhood characteristics						
% Non-western minorities	-0,021	0,000	-0,025	0,000	-0,025	0,000
% Western minorities	0,008	0,229	0,010	0,130	0,010	0,136
Safety	0,002	0,139	0,001	0,299	0,001	0,309
Dwelling values	0,002	0,000	0,002	0,000	0,002	0,000
% Owner-occupied	-0,001	0,390	-0,002	0,269	-0,002	0,273
Distance to closest supermarket	-0,167	0,000	-0,160	0,000	-0,161	0,000
# Restaurants within 3 km	0,001	0,000	0,001	0,000	0,001	0,000
Personal characteristics						
Non-western minority	0,330	0,000	0,024	0,789	0,016	0,853
Western minority	-0,042	0,394	-0,108	0,158	-0,108	0,158
Household type (ref single)	0,000	0,000	0,000	0,000	0,000	0,000
couple	-0,090	0,033	-0,094	0,026	-0,098	0,021
couple with children	-0,103	0,044	-0,113	0,027	-0,120	0,020
single-parent household	-0,048	0,534	-0,055	0,475	-0,051	0,509
other household	-0,100	0,245	-0,103	0,233	-0,106	0,221
Age (ref <45)						
45-55	0,128	0,003	0,126	0,004	0,125	0,004
55-65	0,362	0,000	0,358	0,000	0,358	0,000
65-76	0,598	0,000	0,596	0,000	0,595	0,000
75+	0,946	0,000	0,944	0,000	0,944	0,000
Income	0,002	0,004	0,002	0,005	0,002	0,005
Education (ref low)						
middle	-0,053	0,168	-0,050	0,193	-0,049	0,204
high	-0,159	0,000	-0,151	0,000	-0,150	0,000
Length of residence	-0,007	0,000	-0,008	0,000	-0,008	0,000
Tenure (ref=rented)	0,274	0,000	0,272	0,000	0,271	0,000
Dwelling type (ref =multifamily)	0,248	0,000	0,251	0,000	0,253	0,000
Health status (ref=less healthy)						
healthy	0,269	0,000	0,272	0,000	0,274	0,000
very healthy	0,761	0,000	0,767	0,000	0,768	0,000
Interactions						
% non-western minorities * non-western			0,009	0,000	0,005	0,058
% non-western minorities * western			0,003	0,233	0,003	0,233
% own ethnic group * non-western					0,016	0,010
R ²		0,0578		0,0583		0,0585

TABLE 2.3 Ordered logit models explaining satisfaction from neighbourhood characteristics, personal characteristics and interactions

Source: Own calculations based on WoON 2012, provided by Netherlands Statistics

Hypothesis 3 states that for owner-occupiers and households with children satisfaction is more dependent on neighbourhood characteristics including the neighbourhood ethnic composition than for renters and households without children. To test this, more models are estimated including interactions between these personal characteristics and neighbourhood characteristics. In Table 2.4 only the interaction effects are presented.

Based on earlier research (Greif, 2015; Xie and Zhou, 2012), home-owners are expected to be more sensitive than renters to the neighbourhood ethnic composition. To test this, firstly model 6 is estimated including (all variables included in model 3 plus) only an interaction effect between the share of non-western minorities and tenure. This interaction effect is significant and negative, indicating that indeed the share of non-western minorities has a stronger negative effect on satisfaction for home-owners than for renters.

Earlier research in the US has found that households with children are more sensitive to the neighbourhood ethnic composition (Ellen, 2000; Goyette et al., 2014; Xie and Zhou, 2012). To test this, model 8 is estimated including (all variables included in model 3 plus) only an interaction effect between the share of non-western minorities and a dummy variable for whether there are children in the household. This interaction effect is not significant; in the Netherlands there are no differences between household types in the effect of the share of non-western minorities on satisfaction. Possibly, neighbourhood ethnic composition is especially important for households with children because it is correlated or perceived to be correlated with school quality (Ellen, 2000; Goyette et al., 2014). This effect can be expected to be stronger in the US, where catchment areas determine school choice, than in the Netherlands, where parents have more freedom and can also choose a school outside the neighbourhood. This might explain why, contradictory to earlier research in the US, households with children in the Netherlands are not found to be more sensitive than other households to the neighbourhood ethnic composition.

In model 7 and 9 interaction effects of tenure and household type with the neighbourhood share of ethnic minorities as well as neighbourhood dwelling values and safety are included. Significant interaction effects are found between neighbourhood safety and tenure and between neighbourhood safety and household type. For owner-occupiers and households with children safety has a stronger effect on satisfaction than for renters and households without children. This is in line with hypothesis 3. There are no differences between household types or tenure types in the effect of dwelling values.

Similar to Greif (2015) and Xie and Zhou (2012), I found in model 6 that owner-occupiers are more sensitive than renters to the ethnic composition of the neighbourhood. However, if the interaction between tenure and safety is taken into

account, the interaction effect between tenure and the share of ethnic minorities disappears. In the Netherlands owner-occupiers are not more affected than renters by the neighbourhood ethnic composition, but more affected by neighbourhood safety, which is correlated with ethnic composition. Possibly, also in the US, Greif (2015) and Xie and Zhou (2012) might not have found tenure differences in sensitivity to neighbourhood ethnic composition if they would have taken into account tenure differences in sensitivity to other neighbourhood characteristics.

	MODEL 6		MODEL 7		MODEL 8		MODEL 9	
	Interactions with tenure				Interaction with children			
	B	p	B	p	B	p	B	p
Interaction effects with tenure or children								
% Non-western minorities	-0,004	0,028	-0,002	0,461	-0,003	0,091	0,001	0,129
Dwelling values			-0,001	0,274			0,002	0,406
Safety			0,003	0,037			0,004	0,048
R ²		0,058		0,058		0,058		0,058

TABLE 2.4 Interaction effects of tenure and children with neighbourhood characteristics

Source: Own calculations based on WoON 2012, provided by Netherlands Statistics (All models control for the same variables as included in model 3.)

Hypothesis 4 states that people are more satisfied if their neighbours are more similar to themselves in income and tenure status. People prefer to live among similar people (Schelling, 1971; Van Ham and Feijten, 2008). Earlier research in Australia (Baum et al., 2009) found that the share of social housing has a stronger negative effect on satisfaction for home-owners than for renters and the share of low income households has a stronger negative effect on satisfaction for high income households than for low income households. To test hypothesis 4, interactions are included between tenure and the share of owner-occupied dwellings in the neighbourhood and between income and the average income in the neighbourhood (these models are not shown)⁷. These interaction effects are insignificant. Neighbourhood income has a positive effect on satisfaction, however this effect does not vary with income. The share of owner-occupied dwellings in the neighbourhoods affects satisfaction neither for owner-occupiers nor for renters. Thus, hypothesis 4 has to be rejected; in the Netherlands people are not significantly more satisfied if they are similar to their neighbours in income or tenure.

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In all other models average income in the neighbourhood is not included due to high correlation with dwelling values. However, in this model I excluded neighbourhood dwelling values and included neighbourhood average income. I also estimated a model including dwelling values and an interaction between neighbourhood dwelling values and individual income to test if high income households are especially satisfied in neighbourhoods with high dwelling values, however, also this interaction effect is not significant.

§ 2.7 Conclusions

There are individual differences in the determinants of residential satisfaction; ethnicity, tenure and household type affect the size and direction of the effect of neighbourhood characteristics on satisfaction. Residential satisfaction is a key variable in understanding residential mobility desires and behaviour. If neighbourhood characteristics lead to dissatisfaction and therefore mobility desires and outmobility for specific groups, this will increase residential segregation. Therefore, to understand selective residential mobility and segregation it is important to have insight in which neighbourhood characteristics lead to dissatisfaction for whom. Within a long tradition of research into residential satisfaction, this is one of the first studies that focuses on interactions between individual characteristics and neighbourhood characteristics in order to understand individual differences in the effect of neighbourhood characteristics on satisfaction.

This paper combines literature on residential satisfaction with literature on residential mobility (desires) and literature on neighbourhood choice, in order to derive hypotheses about which neighbourhood characteristics are important to whom. To test these hypotheses, a series of ordered logit models is estimated, explaining satisfaction from neighbourhood characteristics, personal characteristics and cross-level interaction effects.

Firstly, the effect of neighbourhood ethnic composition on residential satisfaction is tested. According to the racial proxy theory, not the ethnic composition of the neighbourhood but other neighbourhood characteristics correlated with ethnic composition lead to dissatisfaction (Harris, 2001). Based on the racial proxy theory, the effect of neighbourhood ethnic composition on satisfaction is expected to disappear when other neighbourhood characteristics are taken into account. However, most research on the racial proxy theory still finds some effect of the neighbourhood ethnic composition on satisfaction (Harris, 2001; Swaroop and Krysan, 2011), dwelling values (Harris, 1999) or outmobility (Ellen, 2000) also when other neighbourhood characteristics are taken into account. Also in this paper, I find lower satisfaction in neighbourhoods with higher shares of non-western minorities, an effect which remains significant when other neighbourhood characteristics are taken into account. Thus, ethnic composition is not a proxy for other neighbourhood characteristics but has an independent effect on satisfaction. It is, however, possible that this paper and earlier papers do not accurately control for (unmeasured) neighbourhood characteristics correlated with ethnicity such as reputation, disorder or school quality, in which case ethnicity could be a proxy for other neighbourhood characteristics that mistakenly were not included in the model.

If the ethnic composition would be a proxy for other neighbourhood characteristics such as reputation, a higher share of non-western minorities would lead to dissatisfaction for all ethnic groups. On the other hand, an independent effect of the neighbourhood ethnic composition on satisfaction is most likely explained by a preference to live among the own ethnic group, in which case there will be ethnic differences in the effect of the share of non-western minorities on satisfaction. I find that the share of non-western minorities has a stronger negative effect on satisfaction for natives than for non-western minorities. This is not because natives are more averse to 'others' than non-western minorities; non-western minorities are less affected by the share of non-western minorities in the neighbourhood because they are more satisfied in neighbourhoods with higher shares of their own ethnic group. This indicates that the relation between neighbourhood ethnic composition and satisfaction is not a racial proxy effect but a pure race effect; people are more satisfied if they live among their own ethnic group, while higher shares of 'others' lead to dissatisfaction. This shows how important it is to distinguish between different categories of non-western minorities. The total share of non-western minorities has a negative effect on satisfaction for non-western minorities as well as for natives, however the share of the own non-western minority group has a positive effect.

Based on earlier research (Boterman, 2013; Ellen, 2000; Goyette et al., 2014; Greif, 2015; Parkes et al., 2002; Weck and Hanhörster, 2014), residential satisfaction of owner-occupiers and households with children was expected to be more dependent on neighbourhood characteristics. The effect of neighbourhood safety on satisfaction was indeed found to be stronger for these groups; especially home-owners and households with children are more satisfied in neighbourhoods with low crime rates.

Satisfaction was also expected to be more dependent on the neighbourhood ethnic composition for owner-occupiers and households with children. Earlier research in the US found that home-owners and household with children are less tolerant to Black neighbours (Xie and Zhou, 2012) and their residential satisfaction (Goyette et al., 2014; Greif, 2015) and mobility behaviour (Ellen, 2000) is more dependent on the neighbourhood ethnic composition. This might be explained by pure race reasons; people want to maintain a distance between their children and ethnic minorities (Goyette et al., 2014). However, this might also be due to racial proxy reasons; people associate ethnic concentration with neighbourhood characteristics that are especially important to home-owners or households with children such as declining property values or low school quality (Ellen, 2000; Goyette et al., 2014). Also in this paper, initially satisfaction is found to be more dependent on neighbourhood ethnic composition for home-owners than for renters. Unlike Ellen (2000) and Goyette et al. (2014), I subsequently test whether this is a pure race effect or a racial proxy effect by taking into account interaction effects between tenure and other neighbourhood characteristics. When it is taken into account that for owner-occupiers satisfaction

is more dependent on neighbourhood safety, the effect of ethnic composition on satisfaction does no longer vary with tenure, indicating that the ethnic composition was a proxy for other correlated neighbourhood characteristics.

Finally, this research tested the hypothesis that people prefer to live among people similar to themselves in tenure status and income. However, this hypothesis was rejected; I did not find a different effect of the neighbourhood tenure composition on satisfaction for home-owners than for renters nor income variation in the effect of neighbourhood average income on satisfaction.

This research has thus found differences between ethnic groups, tenure groups and household types in the effect of neighbourhood characteristics on satisfaction. This indicates that within one neighbourhood, some groups will be satisfied, while for other groups certain neighbourhood characteristics lead to dissatisfaction and desires to leave the neighbourhood. This might lead to selective residential mobility, segregation and high turnover rates. Policymakers in many countries try to create stable, attractive and mixed neighbourhoods (Bolt et al., 2010; Baum et al., 2009; Cheshire, 2007), also by attracting higher income households to deprived urban restructuring neighbourhoods (Boschman et al., 2013). For effective policy design it is very important to know which households will be satisfied despite neighbourhood stressors such as high crime rates or ethnic minority concentrations; that is, to have insight in which neighbourhood characteristics are important to whom (Baum et al., 2009; Ellen et al., 2013; Pinkster et al., 2015).

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