Ethnic Residential Segregation: A Family Matter? An Integration of Household Composition Characteristics into the Residential Segregation Literature

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Received: 12 June 2017 / Accepted: 18 December 2018 / Published online: 29 January 2019
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Abstract

The ethnic residential segregation literature seldom considers household characteristics, despite their importance for residential mobility. This study offers a first step to amend this lacuna by focussing on the relationship between marital status and the presence of children on the one hand and the extent to which ethnic majority households live segregated on the other. We investigated this association with data from the 2011 Belgian Census. We performed a conditional logit model on a sample of households formed by young adults of Belgian origin living in the metropolitan areas of Antwerp (N = 11,241), Brussels (N = 6690), Charleroi (N = 3483), Ghent (N = 7825) and Liège (N = 5873). It appeared that households with children are less likely than childless households to live in diverse neighbourhoods. Considering partnership status, we find that singles are the most likely to live in diverse neighbourhoods. Amongst the couples without children, those couples in legal cohabitation are less likely to live in diverse neighbourhoods than married or other unmarried couples, while married couples with children are less likely to do so when comparing to unmarried couples with children, both legally cohabiting and others. We, therefore, conclude that it is important to consider (the interaction between) partnership status and the presence of children when studying ethnic residential segregation.

Keywords Ethnic residential segregation · Self-segregation · Ethnic majorities · Life-cycle mobility · Conditional logit modelling

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1 Introduction

Ethnic residential segregation is the unequal distribution of ethnic groups across neighbourhoods within cities (Massey and Denton 1988). Although segregation is stagnating or slowly declining, cities in both the USA and Europe remain strongly segregated (Andersson et al. 2017; Musterd 2005; Timberlake and Iceland 2007). The residential behaviour of ethnic majority households is one of the factors related to this segregation (Crowder 2000; Frey 1979; Krysan 2002). These households are often found to leave or avoid neighbourhoods with high percentages of ethnic minority inhabitants (Crowder 2000). This residential avoidance is often related to the in- and out-group preferences of ethnic majorities (Crowder 2000; Frey 1979; Krysan 2002), although other factors, like socio-economic resources, the availability of adequate housing or neighbourhood amenities (Coulter et al. 2011; Dewilde and Lancee 2013; Estiri 2012), will likely be relevant as well.

The impact of household composition characteristics on residential mobility is seldom considered in the segregation literature (Iceland et al. 2010). Nevertheless, others find such differences in the USA (Iceland et al. 2010) or find that white households with children younger than 6 years of age were more likely than other white households to leave neighbourhoods with increasing percentages of black residents (Goyette et al. 2014).

Given the major importance of household characteristics to understand residential mobility and behaviour (Clark and Dieleman 1996), we believe it is crucial to incorporate these household characteristics into the study of segregation. Therefore, we examine the extent to which different household types, formed by young adults and living in the metropolitan areas of Belgium's five largest cities (i.e. Brussels, Antwerp, Ghent, Liège and Charleroi), have diverging chances to live in neighbourhoods with a certain percentage ethnic minority inhabitants. In order to answer this research question, a conditional logit analysis is performed on the Belgian Census of 2011. The focus on young households is chosen as this ascertains that these households have recently moved. Moreover, we focus on the aforementioned metropolitan areas because of the prominent role larger cities play in the life course of young adults (Gautier et al. 2010; Van Criekingén 2009) and because of the larger presence of ethnic minorities in these areas compared to other Belgian areas. Finally, this article will only focus on Belgian households as the mechanisms that are relevant to understand residential segregation partly differ between the ethnic majority and ethnic minority groups (Brama 2006; Coenen et al. 2019; Charles 2003; Frey 1979).

2 Theory and Hypotheses

The white flight (Frey 1979) and the white avoidance (Brama 2006) hypotheses describe how ethnic majority households tend to leave and avoid neighbourhoods with high percentages of ethnic minority inhabitants (Crowder 2000; Hedman et al. 2011; Pais et al. 2009). Many scholars relate this tendency to the (residential) preferences of ethnic majority households. These preferences either relate to in-group

preferences and out-group hostility of the ethnic majority (Crowder 2000; Frey 1979; Krysan 2002) or to a wish to escape poverty or a lack of safety instead of to ethnic diversity itself (Ellen 2000; Emerson et al. 2001; Harris 1999). The fact that ethnic minority members are found to also avoid neighbourhoods with a concentration of disadvantaged residents (Harris 2001; Pan Ké Shon 2010) may support this latter view. Aggregated ethnic residential segregation can be related to these individual moves of white flight and avoidance (Clark and Dieleman 1996).

However, even in the absence of residential preferences for segregation, segregation could still arise. Structural homophily offers a first possible explanation (McCrea 2009). This occurs as *'residents with similar social characteristics may consider similar physical attributes of neighbourhoods important and so move to similar neighbourhoods'* (McCrea 2009, p. 2201). As such, the morphology of the housing market, with specific types of housing that are often geographically clustered, can relate to segregation as well (McCrea 2009). A second explanation ignores preferences altogether, but focuses instead on housing costs and opportunities. Different neighbourhoods have different prices. Many ethnic minorities in Belgium lack the financial means to move out of disadvantaged neighbourhoods as they often have a lower socio-economic status (FOD Werkgelegenheid Arbeid en Sociaal Overleg and Unia 2017; Tielens 2005). Ethnic majority households who can spend more on housing will thus live more segregated than ethnic majority households with a smaller housing budget.

What tends to be ignored in the segregation literature (Iceland et al. 2010) is the fact that households' residential preferences, needs and capabilities are not static, but are associated to factors including the demographic situation of that household (Clark and Dieleman 1996). For example, larger families need more space (Solari and Mare 2012). The amenities that are considered important are also subject to change: when couples have (or are planning to have) children, neighbourhood safety and school quality become major factors in the evaluation of their residential situation, while singles or childless couples pay more attention to price, proximity to work and recreational amenities (Boterman 2012, 2013; Feijten et al. 2008; Kulu and Boyle 2009). These diverging needs, capabilities and preferences could relate to differences in the extent to which ethnic majority households live segregated (e.g. Iceland et al. 2010).

Families with children are assumed to be most averse to having ethnic minority neighbours (Ellen 2000; Iceland et al. 2010; Krysan 2002). This could be related to prejudices and concerns that families might have with regard to the possible influence of ethnic minorities on their children (Harris 1997; Pinkster and Fortuijn 2009). This aversion could also be associated with concerns about neighbourhood safety and the quality of schools or day care facilities based on the ethnic composition of the neighbourhood (Emerson et al. 2001). These amenities are more important for households with children and households who expect to have children than they are for other households (Boterman 2012, 2013; Feijten et al. 2008). It can thus be assumed that households with children are less likely to live in diverse neighbourhoods than households without children and those households who are more likely to desire children are less likely to live in diverse neighbourhoods than households who are less likely to desire children.

Moreover, even when different household types have similar residential preferences in relation to the ethnic composition of their living environment, segregation could still arise. Firstly, because households, who plan to move again within a relatively short period of time, will more easily accept neighbourhood characteristics they perceive as worse (Pinkster et al. 2014). As such, the permanency with which households settle could be related to segregation as well. The households that are known to settle more permanently are those with children or those formed by married partners (Michielin and Mulder 2008; South and Deane 1993). For the former households, children often create ties to the neighbourhood that inhibit further residential moves (Pinkster et al. 2014). For the latter households, marriage has been found to result in a brief initial period of heightened residential mobility, but eventual increased residential stability (Michielin and Mulder 2008). As such, it can be assumed that households with children and married households are more likely to live in less diverse neighbourhoods than other household types.

Finally, general socio-economic differences between household types could also relate to differences in the extent to which household types live segregated. Major socio-economic differences exist between single-headed and single-earner households and dual-headed and dual-earner households (Eurostat 2010). Moreover, more settled households, and thus older households, will likely have a larger budget due to the automatic link between seniority and pay-rises in Belgium. As such, it can again be assumed that households with children or households who desire to have children are less likely to live in diverse neighbourhoods than households without children or a desire to have children.

Based on these assumptions, we formulate the following hypotheses:

(H1) households of Belgian origin with children are less likely to live in diverse neighbourhoods than similar households without children.

(H2a) amongst the households of Belgian origin without children, those formed by married couples are the least likely to live in diverse neighbourhoods.

(H2b) amongst household of Belgian origin without children, unmarried, legally cohabiting couples are less likely to live in diverse neighbourhoods than unmarried, not legally cohabiting couples.

(H3) amongst all household types, singles are the most likely to live in diverse neighbourhoods.

3 The Belgian Context

Belgium is an ethnically diverse country: At the turn of the century, every Belgian municipality had inhabitants with foreign roots, while more than a 150 different nationalities could be found amongst the inhabitants of Antwerp (Timmerman 2003). Moreover, the numbers of undocumented migrants are estimated to be

at least a hundred thousand in Brussels and Flanders, and it is assumed that they mostly live in Belgium's largest cities (Agentschap Integratie en Inburgering 2017). However, the majority of Belgium's inhabitants of foreign origin can be divided into five broader categories (Verhaeghe 2012): people from neighbouring countries; Southern European guest labourers and their offspring; Turkish and North-African guest labourers and their offspring; Eastern and Central Europeans; and the migrants from Belgium's former colonies: Congo, Burundi and Rwanda (Demart et al. 2017; Verhaeghe 2012).

In addition to the increasing diversity in countries of origin, Belgium is becoming increasingly superdiverse with the growing diversity in terms of regional descent, socio-economic status and residence status in Belgium within these ethnic groups (Timmerman 2003; Verhaeghe and Perrin 2015; Vertovec 2007). However, studies keep identifying a high degree of socio-economic ethno-stratification in Belgium with respect to employment, income, job characteristics and educational attainment (FOD Werkgelegenheid Arbeid en Sociaal Overleg and Unia 2017; Tielens 2005; Timmerman et al. 2003; Van Praag et al. 2014). At the same time, ethnic minorities stemming from North-African countries or Turkey still face discrimination in employment, on the housing market and in schools (Baert et al. 2015; D'hondt 2015; Verhaeghe et al. 2017).

The majority of this foreign Belgian population lives in the triangle Antwerp–Brussels–Ghent or close to former mining sites in Limburg and Wallonia (Charleroi, Liège, Mons and the Borinage) and lived residentially concentrated in the disadvantaged neighbourhoods of these cities in 2001 (Vanneste et al. 2007). This makes Belgium substantially segregated, as Andersson and colleagues (Andersson et al. 2017; see also Costa and De Valk 2017) showed. They calculated the segregation of non-EU foreigners. They found that close to 50% of all non-EU foreigners in Belgium would have to move to completely desegregate Belgium. This confirms previous numbers for Turks, Maghrebians and Eastern and Central Europeans in Ghent, although residential segregation there is declining (Verhaeghe et al. 2012).¹

This segregation arose during the “golden sixties”, with the arrival of the Turkish and Moroccan guest labourers (Peleman 2003). Thanks to the economic boom and the redistributive welfare pact, even the Belgian manual labourers living in the 19th age belt managed to leave dense inner-city neighbourhoods and move to the suburbs. They were replaced by the (Turkish or North-African) labour migrants. The residential segregation that followed became consolidated as the economic crisis of the 1970s inhibited the socio-economic upwards mobility of these labour migrants (Peleman 2003). As these ethnic minorities provided in their own needs by founding their own ethnic economy and institutions, the neighbourhoods they live in are best classified as ethnic enclaves (Verhaeghe et al. 2012). Since the 1990s, these enclaves transformed into a more open ethnic mosaic and ethnic minorities

¹ Dissimilarity scores were calculated for the following ethnic groups: Turkish (from 65% to 51%), Moroccan (from 53% to 42%), Tunisian (from 53% to 44%), Algerian (from 54% to 47%), Bulgarian (from 66% to 52%), Slovakian (from 73% to 46%) and Polish (from 56% to 36%).

started to suburbanise as well (Verhaeghe 2012; Verhaeghe et al. 2012). However, although ethnic minorities can leave the most concentrated neighbourhoods, they often remain trapped in housing of lower quality (Peleman 2003; Schillebeeckx et al. 2016). Many remain dependent on social housing or on the residual bottom tier of the private rental housing market. Others are forced to overspend their budget when making emergency housing purchases (Peleman 2003; Schillebeeckx et al. 2016).

Qualitative studies in Flanders have demonstrated that the presence of inhabitants of migration background is an important push factor for residential mobility (Meeus and De Decker 2015; Meeus et al. 2013; Schuermans et al. 2015). Most households of Belgian origin tend to avoid cities, as they perceive them to be dominated by inhabitants of migration background who are unwilling to integrate, particularly if these inhabitants are living in ethnic enclaves. People link such ethnic compositions to crime and poverty as well. Households of Belgian origin living in (larger) cities make the same connections, albeit at a smaller scale: they distinguish between neighbourhoods that are more and less diverse. Due to the negative associations between cities, migrants and deprivation, combined with a history of anti-urban housing policy, cities are strongly regarded as bad places for raising children, and they are therefore avoided (Meeus et al. 2013; Schuermans et al. 2015). Moreover, the strong anchoring of more highly educated young Belgian adults in the social networks of their youth and hometowns as they return home every weekend (de Olde 2014) can form a specific pull factor that might offset the importance of city-based social networks established during higher education (Boterman 2012).

Belgian housing policy has a long anti-urban tradition (De Decker 2008). It is anchored in policies that emerged in the nineteenth century with the objectives of promoting homeownership in rural and suburban villages and providing an extensive network of private and public transportation (De Decker 2011; Meeus et al. 2013). These objectives generated a hegemonic suburban residential ideal that would remain uncontested until the end of the 1960s, when suburbanisation became a matter of increasing criticism and certain countercultural groups began returning to the city. In Flanders, however, policy attention to cities (and particularly inner-city areas) would not emerge until the late 1990s, following the electoral breakthrough of the Flemish extreme right-wing party in disadvantaged and neglected cities. Although the initial focus was on combating poverty in these neighbourhoods, attention quickly shifted to large-scale urban renewal projects (Meeus et al. 2013). This shift led to gentrification, inner-city price increases and displacement (Meeus et al. 2013; Van Crielingen 2009). Today, housing costs are highest in the most popular suburbs and certain gentrifying inner-city neighbourhoods, with less expensive housing in the urban fringes and farther away from the central cities (Meeus et al. 2013; Slegers et al. 2012).

Homeownership is strongly tied to the dominant hetero-normative life-course ideal and notions that many adolescents and young adults share about adulthood. According to these notions, adulthood is 'performed' by having a stable job and relationship and owning a house, all to facilitate the upbringing of children. The ideal calls for achieving such stable adulthood by the age of 30 years (De Craene 2017; Meeus and De Decker 2015). Renting is thus regarded as immature (De Craene 2017) and as 'throwing away money' (De Decker 2011; Meeus et al. 2013). Owning

a house in the suburbs is considered the most convincing signal of adulthood, as this environment is seen as the best place to raise children (De Craene 2017). These perceptions have resulted in strong suburban tendencies amongst young adults (e.g. Meeus et al. 2013), with inner-city living largely regarded as an intermediate step that can facilitate career planning after graduation (Slegers 2010; Van Crielingen 2009).

4 Data and Methods

This study focuses on households formed by young adults of Belgian origin. These households often experience many changes in household composition, thus constituting a differentiated research population. Moreover, the neighbourhoods these households live in are less likely to have changed much since the arrival of these households, as they are only recently formed. Following studies by Boschman and van Ham (2015) and by Hedman et al. (2011), we apply a conditional logit model to data from the metropolitan areas of the five major cities in Belgium (Antwerp, Brussels, Charleroi, Ghent and Liège). This model tests how neighbourhood characteristics shape the likelihood that a household will live in a certain neighbourhood.

4.1 Data

We use data from the 2011 Belgian Census, which was drawn from several official registers. It contains highly accurate information about demographic characteristics, including country of birth and current nationality, socio-economic status, household composition, housing conditions and place of residence (i.e. census tract) for all official inhabitants of Belgium. These data nevertheless lack information about income. We focus on households formed by young adults living in the metropolitan areas of one of the five major cities in Belgium. We select all households living in the metropolitan areas with at least one head of household aged between 25 and 35 in 2011. Households whose heads already left the parental home before 2011 were removed.² Given our focus on the ethnic majority, we limit the dataset to people of Belgian origin.³ From this final dataset, we drew a random sample of 25% for Antwerp (N=11,241), Charleroi (N=3483), Ghent (N=7824) and Liège (N=5873) and 8% for Brussels (N=6690), as the models would otherwise have been too heavy to estimate.

² Selection based on these factors was made possible by a link between the Census of 2001 and the Census of 2011.

³ Origin, in our study, is based on the heads' own nationality and country of birth, along with the nationality and country of birth of both parents. Heads of household with Belgian nationality who were born in Belgium to parents who were also born there and who also have Belgian nationality are regarded as being of Belgian origin. The Belgian household members of households with mixed origins (i.e. households in which one head of household is of non-Belgian origin and the other is of Belgian origin) are also included. No separate analyses were performed on this sub-sample.

4.2 Methods

We use conditional logit modelling to estimate the likelihood of living in a given neighbourhood. This method models the likelihood that one alternative will be selected from a set of multiple possibilities based on the characteristics of these possibilities. Although it originated in economics, it has also been adopted in population (Ermisch and Mulder 2018; Haandrikman and van Wissen 2012) and segregation studies (Boschman and van Ham 2015; Hedman et al. 2011). Boschman and van Ham (2015) and by Hedman et al. (2011), for example, used conditional logit analyses to model the likelihood of households to reside in a given neighbourhood in Utrecht and Uppsala, respectively, based on neighbourhood characteristics.

This method offers the benefit of modelling neighbourhood selection based on neighbourhood characteristics, while allowing the possibility of linking this selection to household characteristics through the interaction of neighbourhood and household characteristics. It is thus possible to investigate the relation between the percentage of inhabitants of migration background in a given neighbourhood and the likelihood of various household types to live in that neighbourhood.

The determination of a ‘choice set’⁴ (i.e. the set of possible neighbourhoods in which to live) is an important step in the application of conditional logit modelling. The choice set should approximate the housing market in which households are searching for homes. In the studies by Boschman and van Ham (2015) and by Hedman et al. (2011), the choice sets are determined based on a single city. Given that households are not likely to restrict their housing searches to the borders of a specific municipality, we improve upon this methodology by examining the larger surrounding area of the cities under investigation. We expect this to result in a model that better reflects the housing market within which people search.

Following Hoffman and Duncan (1988), the conditional logit model can be expressed according to the following formula:

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

where P_{ij} stands for the likelihood that household i will choose neighbourhood j (N_j). The term N_k refers to the neighbourhoods from which this household chooses (i.e. the choice set) and their respective neighbourhood characteristics. As mentioned above, individual household characteristics can be included by adding interaction terms between neighbourhood characteristics and household characteristics (H_i). This results in the following formula:

$$P_{ij} = \frac{\exp(\beta N_j H_i)}{\sum_{k=1}^K \exp(\beta N_k H_i)}$$

⁴ Although the word ‘choice’ might imply that people are free to choose the neighbourhoods in which they wish to live, conditional logit modelling allows the inclusion of constraints as well.

The value of P_{ij} can be transformed into the likelihood that a given household will live in a given neighbourhood, depending on household type and the percentage of inhabitants of migration background in the neighbourhood.

We start by focusing on the main effects of the percentage and squared percentage of inhabitants of migration background in the neighbourhood, in order to incorporate the possibility of a tipping point (Card et al. 2008).⁵ This model also includes all of the control variables that are discussed below. The results are presented in Table 4. We then extend the model by including the interaction between the percentage of inhabitants of migration background and household type. This model allows the identification of associations specific to particular household types. Separate models are presented for each of the five selected metropolitan areas in Table 5. In the final model, the dataset for Brussels, the largest and most diverse city of Belgium, is divided according to educational attainment to control for socio-economic differences. These models are schematically represented in Table 1. All likelihoods are reported as predicted probabilities, which express the likelihood of living in a given neighbourhood, as compared to another neighbourhood. The neutral value of 0.5 indicates that a household is equally likely to live in either of the two neighbourhoods, while a predicted probability above or below 0.5 means that a household is more likely to live in either the former (for values greater than 0.5) or the latter (for values less than 0.5) neighbourhood. To ease interpretation, we present graphs for each model showing the relationship between the predicted probabilities of living in a given neighbourhood and the percentage of inhabitants of migration background in that neighbourhood. The figure for Brussels is presented below, and the other graphs are presented in “Appendix”.

4.3 Variables

4.3.1 Dependent Variable

Conditional logit modelling does not require a traditional dependent variable. Instead, it models the likelihood that a given alternative will be selected from a set of possibilities. We use it to model the likelihood of living in a given *neighbourhood*. This variable thus resembles a categorical dependent variable. Neighbourhoods are demarcated using the statistical sector demarcation, which was first defined in 1970, based on social, economic, urban and morphological characteristics (Jamagne et al. 2012). Statistical sectors resemble the census tracts used in Anglo-Saxon research, albeit at a smaller scale. We use neighbourhoods and statistical sectors synonymously throughout the remainder of this article.

⁵ The tests of the assumptions showed that the nonlinearity of the association between the percentage inhabitants with a migration background and the log odds of the dependent would be better modelled using another association than the currently used second-order association in Ghent (i.e. a third-order association) and Antwerp (i.e. a log transformation). However, sensitivity analyses showed that these more and less optimal models lead to the same conclusions. It is therefore preferred to show the results of these second-order associations for all five cities due to theoretical, comparability and simplicity reasons.

Table 1 Schematic representation of our model

Variables?	Model 1	Who chooses? (<i>research population—individual level</i>) Non-extended households That are formed by at least 1 member who left their parental home between 2001 and 2011 Whose member(s) were born in Belgium with Belgian nationality and whose parents were both born in Belgium and hold Belgian nationality as well That live in one of Belgium's 5 largest metropolitan areas in 2011	What is chosen? (<i>choice set—aggregated level</i>) One neighbourhood From the set of all neighbourhoods of the metropolitan area in which the respondent lives
			% inhabitants of migration background % apartments* % tertiary degree holders* Distance to city centre* Median taxable income* Population density* % new-build houses* # inhabitants*
	Model 2	Household Composition Interaction between the household variable and the % of inhabitants of migration background Educational attainment**	
	Model 3		
	Model 4		
	Model 1 + Model 2 + Model 3 +		

Model 4 is computed only for Brussels

* Added as a control variable. This variable is standardised

** Added as a control variable. This variable is used to split the dataset, rather than serving as an additional variable

Fig. 1 Selected metropolitan areas of Belgium

Metropolitan areas are demarcated using the classification developed by the Statistics Belgium department of the government (Luyten and Van Hecke 2007). These areas consist of the central agglomeration, the suburban communities and the commuter zones. The central agglomeration consists of the central city and all municipalities that together form a contiguous high-density built environment. A suburban municipality is one that forms functional unity with the central agglomeration. A commuter zone is a municipality from which at least 15% of the residents commute to a central city. Cities from which the residents commute to multiple central cities either do not belong to any single urban area or are assigned according to the dominant commuting pattern. These metropolitan areas resemble the functional urban areas defined by Eurostat. In terms of function, they also resemble the metropolitan areas used in Anglo-Saxon research, although they are smaller in scale and population size. The five areas that we investigate are the metropolitan areas of Belgium's largest cities, as plotted in Fig. 1. Two smaller metropolitan areas are plotted as well—Louvain (adjacent to Brussels) and Verviers (adjacent to Liège)—as they explain the non-concentric shapes of these two metropolitan areas.

4.3.2 Independent Variables

Household type is the only household characteristic that we include, and it divides the dataset based on two criteria: the presence of children and the partnership status

Table 2 Descriptive statistics at the household level

	Antwerp	Brussels	Charleroi	Ghent	Liège
# Households	11,241	6690	3483	7824	5873
Household type					
Actual cohabitation–no children	2103	1254	535	1667	963
Actual cohabitation–children	1452	962	764	894	966
Married–no children	891	547	237	596	392
Married–children	2088	1247	657	1434	1060
Legal cohabitation–no children	680	357	181	419	303
Legal cohabitation–children	775	440	282	470	403
Single and living alone	3252	1883	827	2344	1786

of the (two) head(s) of the household. The former criterion divides between households with and households without children, the latter between singles, partners who are married, partners in legal cohabitation and partners in actual cohabitation. This leads to seven different categories: (1) households formed by partners in actual cohabitation without children, (2) households formed by partners in actual cohabitation with children, (3) households formed by partners in legal cohabitation without children, (4) households formed by partners in legal cohabitation with children, (5) households formed by married partners without children, (6) households formed by married partners with children and (7) singles without children. Households formed by widowed or divorced people are excluded to avoid further complexity. Singles with children are excluded as well.

Partners in legal cohabitation are differentiated from both partners in actual cohabitation and married partners, as they form a legally separate group. Legal cohabitation requires the official registration of a partnership at the municipality administration. As such, partners in legal cohabitation are legally bound to each other. This is different for partners in actual cohabitation, who are living together only in practice. The legal bond and status of legal cohabitation are not as strong or elaborate as are those of married couples. Legal cohabitation thus constitutes a unique relationship between partners, with unique family-style rights and obligations (Sobotka and Toulemon 2008). We base our distinctions between the household types on the assumption that the legal and institutional distinctions are also related to higher or lower levels of engagement to the relationship that result in more and less stable relations. This variable is based on the National Register of 2011. Descriptive statistics for this variable are presented in Table 2.

Percentage of inhabitants of migration background is the second independent variable, and it refers to the percentage of the total population living in the neighbourhood in 2011 that has a migration background.⁶ The category of inhabitants of migration background includes all people with roots in parts of the world other than

⁶ Sensitivity analyses with the percentage of neighbourhood inhabitants of migration background in 2001 yielded similar results. These results are available upon request.

Northern, Southern and Western Europe.⁷ These regions are excluded because people with roots in these countries are unlikely to be considered as migrants (as in the case of Northern or Western Europe) or because these countries have been member states of the European Union for a long time (as in the case of Southern Europe).⁸ People with nationalities from other countries, people who were born in countries not belonging to these regions and people with at least one parent either with the nationality of or who was born in a country that does not belong to these regions are regarded as originating from migration. Their number is divided by the number of inhabitants in the neighbourhood and multiplied by 100. This measure was calculated using the full Census of 2011.

4.3.3 Control Variables

The following control variables are included in the analyses: *percentage of apartments*, *percentage of new-build housing* and *percentage of tertiary degree holders*, as well as the *number of inhabitants* in the neighbourhood, the *median taxable income* and the *density* of the neighbourhood and the *distance* between the neighbourhood and the respective city centre.

The *percentage of apartments*, *percentage of new-build housing*, *percentage of tertiary degree holders* and the *number of inhabitants* in the neighbourhood are all based on the Census of 2011. The first two variables were calculated by dividing the number of apartments and new-build houses, respectively, by the total number of houses in the neighbourhood. The *number of inhabitants* was aggregated from this census. The *percentage of tertiary degree holders* was computed by dividing the number of tertiary degree holders by the number of inhabitants in the neighbourhood. *Median taxable income* was downloaded from the website of Statistics Belgium. Density was calculated by dividing the number of inhabitants by the surface area of the neighbourhood (calculated using GIS software). *Distance to the city centre* measures the distance between the centre of a statistical sector and the centre of the statistical sector denoted by the Belgian government as the official centre of the central city. This variable was calculated using GIS software. All control variables were standardised and transformed when necessary to take their nonlinearity into account. As a consequence of these transformations, the control variables are difficult to interpret and therefore not included in the discussion of the results.

Percentage of apartments, *percentage of new-build housing*, the cultural and economic measure of neighbourhood socio-economic status (i.e. *percentage of tertiary degree holders* and *median taxable income*, respectively) and neighbourhood *density* were added, as they are related to the attractiveness of the neighbourhood (Feijten and van Ham 2009; Meeus and De Decker 2015; Meeus et al. 2013). In addition to

⁷ Northern European countries are Denmark, Finland, Iceland, Norway and Sweden; Southern European countries are Andorra, Cyprus, Gibraltar, Greece, Italy, Malta, Portugal, San Marino, Spain and Vatican City State; Western European countries are Austria, France, Germany, Ireland, Liechtenstein, Luxembourg, Monaco, Switzerland, the Netherlands and the UK.

⁸ Although people with roots in either of these geographical regions are not regarded as being of migration background, they are not included in the analyses in order to avoid further complication.

being related to suburbanisation and neighbourhood attractiveness, *distance to the city centre* is also related to proximity to jobs (Feijten and van Ham 2009; Meeus et al. 2013).

Finding control variables for the number of vacancies in the neighbourhood is less straightforward. For lack of better data, we use the *number of inhabitants* and the *percentage of new-build housing* in the neighbourhood. The latter variable does not allow the measurement of vacancies in the city centre, as most homeowners in the city live in renovated homes or apartments. It can nevertheless serve this purpose for the city agglomeration and commuter towns, as many people in Belgium still dream of building their own homes (Meeus and De Decker 2015; Meeus et al. 2013). Although the *number of inhabitants* is certainly not the best proxy, it does provide some indication of the opportunities that households have to move into a given neighbourhood: it would be impossible for 100 households to have moved into a neighbourhood in which only 50 households are living.

A final control variable—*educational attainment*—is measured at the individual level.⁹ The educational attainment of a randomly selected head of the household is used to measure this variable. This variable distinguishes between people who have not completed secondary education (670 households), people whose highest level of completed education is secondary education (2088 households) and people who have completed tertiary education (3932 households). This variable, which is based on information provided by the Census of 2011, was used to divide our dataset.

Descriptive statistics at the neighbourhood level are presented in Table 3.

5 Results

Before considering residential behaviours specific to particular household types, it is necessary to determine whether households formed by young adults of Belgian origin are generally less likely to live in diverse neighbourhoods than they are to live in neighbourhoods without any inhabitants of migration background. This can be seen in Table 4 and Fig. 2. The households represented in our dataset were indeed less likely to live in neighbourhoods with a higher percentage of inhabitants of migration background than they were to live in neighbourhoods with a lower percentage of such inhabitants. The only exception is Ghent, where the percentage inhabitants of migration background in the neighbourhoods appear not to be related to the chance that our households live in a certain neighbourhoods. This general pattern is in line with studies that find that households of Belgian origin tend to self-segregate (Meeus and De Decker 2015; Meeus et al. 2013; Schuermans et al. 2015).¹⁰

⁹ We also ran separate analyses for homeowners and renters. However, we decided to drop this variable as it did not significantly alter the results. These results are available upon request.

¹⁰ Including the third-order association between the percentage inhabitants of migration background and the log odds leads to results in line with the other cities.

Table 3 Descriptive statistics at the neighbourhood level

Neighbourhoods	Antwerp			Brussels			Charleroi			Ghent			Liège		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
963	963			3118			833			616			1171		
% MB inhabitants	10.02	13.60	0.00	80.22	12.89	16.19	0.00	92.45	7.42	8.35	0.00	65.22	6.05	9.83	0.00
% apartments	22.82	25.11	0.00	100.00	21.40	28.34	0.00	100.00	11.01	13.27	0.00	100.00	10.11	16.47	0.00
% Tertiary degree holders	24.04	8.74	1.92	54.33	28.31	9.68	1.92	60.00	20.11	9.45	1.28	54.76	27.60	10.00	2.45
Distance to city centre ^a	12.32	6.72	0.00	29.01	22.57	14.02	0.00	59.44	11.85	7.27	0.00	35.05	10.95	5.82	0.00
Median taxable income ^b	23.71	3.72	12.09	40.57	23.9	4.58	6.68	54.55	21.03	4.29	12.22	39.17	24.57	3.67	12.79
population density ^c	3.56	4.58	0.00	28.95	3.43	5.90	0.00	45.65	1.58	1.71	0.00	13.81	1.70	2.39	0.00
% New-build houses	9.06	8.71	0.05	99.28	8.80	8.39	0.05	98.40	7.18	7.73	0.13	60.87	9.93	7.07	0.07
# Inhabitants ^d	11.57	10.56	0.03	60.82	7.94	8.91	0.03	108.3	5.12	4.66	0.03	33.51	9.16	9.32	0.04

^akilometres^b1000 euros^c1000 inhabitants per square kilometre^d100 inhabitants. Although households living in neighbourhoods with less than 100 inhabitants were removed, these neighbourhoods were not deleted from the choice set. It is for this reason that there are neighbourhoods with 3, 4 or 5 inhabitants

Table 4 Results for the conditional logit model linking the presence of inhabitants of migration background to the likelihood of living in a given neighbourhood. Predicted probabilities and their 95% confidence intervals are reported

	% MB inhabitants			% MB inhabitants squared		
	Predicted probability	Confidence interval		Predicted probability	Confidence interval	
Antwerp	0.4958	0.4942	0.4973***	0.5000	0.5000	0.5000
Brussels	0.4979	0.4961	0.4998*	0.5000	0.4999	0.5000***
Charleroi	0.5015	0.4970	0.5059	0.4998	0.4997	0.4999***
Ghent	0.4977	0.4948	0.5006	0.5000	0.4999	0.5000
Liège	0.4993	0.4962	0.5024	0.4999	0.4999	0.5000*

The analyses were controlled for the percentage apartments, the percentage tertiary degree holders and the percentage new-build houses in the neighbourhood, the population density and the median taxable income of the neighbourhood and the distance to the city centre. The extended results are not presented here but available upon request

*** $p < .001$, ** $p < .01$, * $p < .05$, ° $p < .1$

Fig. 2 Results of Model 1, linking % MB inhabitants to the predicted probabilities of living in a given neighbourhood, for all five metropolitan areas

Table 5 Results for the conditional logit model linking the presence of inhabitants of migration background and household composition to the likelihood of living in a given neighbourhood

	Antwerp			Brussels			Charleroi			Ghent			Liège		
	Pred. Prob.	95% Conf. Int.		Pred. Prob.	95% Conf. Int.		Pred. Prob.	95% Conf. Int.		Pred. Prob.	95% Conf. Int.		Pred. Prob.	95% Conf. Int.	
% MB inhabitants	0.497	0.494	0.499*	0.501	0.498	0.503	0.505	0.495	0.514	0.502	0.498	0.505	0.502	0.497	0.508
Interaction: % MB–HH type															
Actual cohobitation–children	0.488	0.484	0.491***	0.491	0.488	0.495***	0.500	0.490	0.511	0.486	0.481	0.490***	0.492	0.485	0.499*
Married–no children	0.497	0.493	0.501	0.498	0.493	0.502	0.488	0.473	0.502°	0.488	0.482	0.493***	0.496	0.486	0.505
Married–children	0.484	0.480	0.487***	0.484	0.481	0.488***	0.494	0.482	0.505	0.474	0.469	0.478***	0.480	0.473	0.487***
Legal cohobitation–no children	0.494	0.490	0.499*	0.493	0.488	0.498**	0.494	0.476	0.511	0.495	0.489	0.500°	0.490	0.479	0.500*
Legal cohobitation–children	0.487	0.482	0.492***	0.487	0.481	0.492***	0.483	0.468	0.497*	0.484	0.479	0.490***	0.471	0.462	0.479***
Single and living alone	0.515	0.512	0.518***	0.510	0.507	0.513***	0.507	0.497	0.517	0.511	0.508	0.514***	0.516	0.510	0.522***
% MB inhabitants squared	0.500	0.500	0.500	0.500	0.500	0.500***	0.500	0.499	0.500**	0.500	0.500	0.500*	0.500	0.500	0.500*
Interaction: % MB ² –HH type															
Actual cohobitation–children	0.500	0.500	0.500***	0.500	0.500	0.500*	0.500	0.500	0.501	0.500	0.500	0.500***	0.500	0.500	0.500
Married–no children	0.500	0.500	0.500	0.500	0.500	0.500	0.501	0.500	0.501*	0.500	0.500	0.500***	0.500	0.500	0.500
Married–children	0.500	0.500	0.500***	0.500	0.500	0.500***	0.500	0.500	0.501	0.500	0.500	0.500***	0.500	0.500	0.500***
Legal cohobitation–no children	0.500	0.500	0.500*	0.500	0.500	0.500°	0.500	0.499	0.501	0.500	0.500	0.500	0.500	0.500	0.500
Legal cohobitation–children	0.500	0.500	0.500***	0.500	0.500	0.500*	0.500	0.500	0.501	0.500	0.500	0.500***	0.501	0.500	0.501***
Single and living alone	0.500	0.500	0.500***	0.500	0.500	0.500***	0.500	0.500	0.500	0.500	0.500	0.500***	0.500	0.500	0.500***

Predicted probabilities and their 95% confidence intervals are reported. The analyses were controlled for the percentage apartments, the percentage tertiary degree holders and the percentage new-build houses in the neighbourhood, the population density and the median taxable income of the neighbourhood and the distance to the city centre. The extended results are not presented here but available upon request

*** $p < .001$, ** $p < .01$, * $p < .05$, ° $p < .1$

With regard to residential patterns specific to particular household types (as presented in Table 5), there are clear differences in all cities.¹¹ Focusing on the presence of children (see Fig. 3 and the graphs in “Appendix”), households with children (represented by the black lines) are less likely to live in diverse neighbourhoods than are similar childless households (represented by the grey lines). This confirms the first hypothesis. The only exception is Charleroi, where the differences are less pronounced. In addition, single households constitute an exception to the general pattern shown in Fig. 2 as a tipping point can be established for them. They form the only category of households that are more likely to live in neighbourhoods with higher, albeit low, percentages of inhabitants of a migration background until a certain threshold, i.e. the tipping point (Card et al. 2008), is reached. In contrast, households formed by young adults of Belgian origin with children are the most likely to live in neighbourhoods without any inhabitants of migration background in all cities. This finding points to the importance of considering the presence of children in theories of residential segregation.

With respect to the partnership status of the two heads of household, several differences can be observed. First, it stands out that households consisting of people who are single and who live alone are the most likely to live in diverse neighbourhoods. This confirms the third hypothesis. To answer the second hypothesis, we focus on young childless couples of Belgian origin (i.e. we compare the different grey lines). There are no significant differences between married childless partners and childless partners in actual cohabitation in all cities except for Ghent. Contrary, childless partners of Belgian origin in legal cohabitation are less likely to live in diverse cities than other childless partners in all cities except for Charleroi. These findings contradict the first part of the second hypothesis but confirm the second part.

Differences based on partnership status between households formed by young adults of Belgian origin with children stand out as well.¹² Compared to childless households, the opposite pattern is found here. Married households are less likely to live in diverse neighbourhoods than are households in actual cohabitation in all cities except for Charleroi. In Charleroi, both are equally likely to live in diverse neighbourhoods. Moreover, there are no differences between partners in legal cohabitation with children and similar partners in actual cohabitation in all cities except for Liège and Charleroi. In Liège, the former are less likely to live in diverse neighbourhoods than the latter. In Charleroi, partners in legal cohabitation are less likely to live in diverse neighbourhoods than are married partners and partners in actual cohabitation.

Examining the results for the three educational groups separately, the percentage of neighbourhood inhabitants of migration background is negatively related to

¹¹ Coefficients specific to particular household types are acquired by multiplying the log odds of the main effect by the corresponding interaction coefficient. This must be performed for the first-order and second-order coefficients separately.

¹² For these analyses, we changed the reference category for the household-type variable. The results are not shown, but are available upon request.

the likelihood that a household will live in that neighbourhood, even amongst lower educated households. The only true exception to this finding can be observed for higher and middle educated singles who live alone. In addition, most differences between various household types are found amongst households with higher, to a lesser extent amongst households with moderate levels of education and, to an even lesser extent for households with low levels of education. Given that higher socioeconomic status implies more housing possibilities, housing can vary more amongst the households with a higher level of education. The overall mechanism nevertheless remains the same: households formed by young adults of Belgian origin with children are less likely than similar childless households are to live in a neighbourhood with a certain presence of inhabitants of migration background (Figs. 4, 5, 6, Table 6).

6 Discussion and Conclusion

Ethnic majority households are known for their tendency to move out of and avoid moving into ethnically diverse neighbourhoods (Crowder 2000; Hedman 2011; Pais et al. 2009). Many scholars relate this tendency to the persistence of residential segregation (e.g. Crowder 2000; Frey 1979). However, few studies examining this avoidance have taken household characteristics into account (Iceland et al. 2010), which play an important role in shaping residential (im)mobility (Clark and Dieleman 1996). The objective of this study is, therefore, to incorporate household characteristics (i.e. marital status and the presence of children) into the literature on ethnic residential segregation. This study focuses specifically on households formed by young adults of Belgian origin.

It appeared that households formed by young adults of Belgian origin with children are substantially less likely than similar childless households to live in neighbourhoods with a larger presence of inhabitants of migration background. With regard to the role of partnership status, one remarkable finding is that, of all households under investigation, those consisting of a single person are the most likely to live in diverse neighbourhoods. Significant differences can be observed between the married partners, partners in legal cohabitation and partners in actual cohabitation as well. Overall, married partners with children are less likely to live in diverse neighbourhoods than partners with children in either legal or actual cohabitation, while the partners in legal cohabitation without children are less likely to live in diverse neighbourhoods compared to other childless households. These household differences are most pronounced for households with higher levels of education, but differences can be found for all educational groups.

Given these findings, we conclude that the presence of children or/and the presence of a partner are important factors to consider when investigating the residential segregation of ethnic majority households formed by young adults. Moreover, taking the partnership status of the heads of households into account provides additional insight in residential segregation patterns. Segregation-related residential outcomes of all households should not be lumped together. Ignoring these differences could introduce bias into existing understandings of residential segregation. For

Fig. 3 Results of Model 2, linking % MB inhabitants and household type to the predicted probabilities of living in a given neighbourhood, for Brussels

example, our results indicate that, of all young households of Belgian origin, those who are formed by singles who live alone are the only ones to be more likely to live in neighbourhoods with a certain, albeit relatively small, percentage of inhabitants of migration background than they are to live in neighbourhoods without any such inhabitants. This finding could have implications for the reasons underlying racial tipping. Explanations for racial tipping (Card et al. 2008; Goering 1978) need to explain why such a threshold was observed only for singles, and not for all households in the data.

In addition, the fact that these households with children are most likely to live in neighbourhoods without any inhabitants of migration background could also point towards particular reasons for ethnic residential segregation. For example, segregation might arise due to a lack of child-friendly residential options in mixed neighbourhoods. On the other hand, our results could raise doubts concerning the importance of school quality, as it seems unlikely that small (or very small) percentages of inhabitants of migration background in neighbourhoods would have a strong influence on school quality. Investigating the mechanisms behind our findings could thus offer new insights into the study of residential segregation.

Our results might also prove insightful for the study of the consequences of segregation and the possible evolution towards desegregation. Advocates of mixed neighbourhoods point towards the potential socialisation benefits that such neighbourhoods would offer (Bolt et al. 2010; Kleinhans 2004). Our finding that households formed by young adults of Belgian origin without children are more likely to live in mixed neighbourhoods than similar households with children calls into question the potential benefits of desegregation for either children of migration background

Fig. 4 Results of Model 2, linking % MB inhabitants and household type to the predicted probabilities of living in a given neighbourhood, for higher educated households in Brussels

or children of Belgian origin. Furthermore, the fact that children of Belgian origin are raised in neighbourhoods without inhabitants of migration background and are thus socialised to live in segregated surroundings (Bonilla-Silva and Embrick 2007) raises questions concerning the implications of this situation for desegregation as these children will later consider it ‘normal’ to raise their own children in neighbourhoods without any inhabitants of migration background.

It is important to note that our method does not allow us to distinguish between the possible drivers of our findings. Do households of Belgian origin avoid diverse neighbourhoods? Do middle-class households avoid more deprived neighbourhoods? Are our results related to the structure of the housing market? In our analysis, we control for several neighbourhood characteristics in order to reduce the possible impact of these other neighbourhood characteristics. However, still other explanations, like the proximity to family members (Hedman 2013; Michielin and Mulder 2007), are hard to exclude. In addition, must also note that our method does not allow to uncover causal relations between where households live and the characteristics of these households or the neighbourhoods they live in. It is, therefore, also possible that our results reflect selection effects based on, for example, the housing opportunities different household types have or the fact that many of these households already grow up in majority dominated neighbourhoods. Longitudinal research that includes proper timing indicators for life-cycle changes and residential mobility will greatly help to understand the mechanisms behind our findings and allow to rule out such selection effects.

Fig. 5 Results of Model 2, linking % MB inhabitants and household type to the predicted probabilities of living in a given neighbourhood, for middle educated households in Brussels

Fig. 6 Results of Model 2, linking % MB inhabitants and household type to the predicted probabilities of living in a given neighbourhood, for lower educated households in Brussels

However, although it would have exceeded the scope of this article to address households of migration background, we did analyse the residential behaviour of households formed by young adults of Moroccan origin up to the second generation

Table 6 Results for the conditional logit model linking the presence of inhabitants of migration background and household composition to the likelihood of living in a given neighbourhood in Brussels, by educational attainment Predicted probabilities and their 95% confidence intervals are reported

	Lower educated			Middle educated			Higher educated		
	PP	Conf. Int.		PP	Conf. Int.		PP	Conf. Int.	
% MB inhabitants	0.4974	0.489	0.506	0.4964	0.491	0.502	0.5027	0.499	0.506
Interaction: % MB–HH type									
Actual cohabitation–children	0.5011	0.490	0.512	0.4986	0.492	0.505	0.4853	0.480	0.490***
Married–no children	0.4978	0.483	0.512	0.4996	0.490	0.509	0.4954	0.490	0.501°
Married–children	0.4839	0.472	0.495**	0.4861	0.479	0.493***	0.4825	0.478	0.487***
Legal cohabitation–no children	0.4848	0.466	0.504	0.4900	0.474	0.506	0.4935	0.488	0.499*
Legal cohabitation–children	0.4797	0.460	0.500*	0.4848	0.475	0.495**	0.4870	0.481	0.493***
Single and living alone	0.5072	0.498	0.517	0.5107	0.505	0.516***	0.5105	0.507	0.514***
% MB inhabitants squared	0.4999	0.500	0.500	0.5000	0.500	0.500	0.4999	0.500	0.500**
Interaction: % MB ² –HH type									
Actual cohabitation–children	0.4999	0.500	0.500	0.5000	0.500	0.500	0.5001	0.500	0.500***
Married–no children	0.5001	0.500	0.500	0.5000	0.500	0.500	0.5000	0.500	0.500
Married–children	0.5002	0.500	0.500°	0.5002	0.500	0.500**	0.5002	0.500	0.500***
Legal cohabitation–no children	0.5001	0.500	0.500	0.5000	0.500	0.500	0.5001	0.500	0.500
Legal cohabitation–children	0.5002	0.500	0.501	0.5001	0.500	0.500	0.5001	0.500	0.500°
Single and living alone	0.4999	0.500	0.500	0.4999	0.500	0.500*	0.4999	0.500	0.500***

*** $p < .001$, ** $p < .01$, * $p < .05$, ° $p < .1$

The analyses were controlled for the percentage apartments, the percentage tertiary degree holders and the percentage new-build houses in the neighbourhood, the population density and the median taxable income of the neighbourhood and the distance to the city centre. The extended results are not presented here but available upon request

for another study (Coenen et al. 2019). According to those results, married partners of Moroccan origin were less likely than partners in actual cohabitation of Moroccan origin were to live in diverse neighbourhoods. We were nevertheless unable to find differences between households with and without children, nor could we identify any clear spatial-assimilation tendencies amongst these households in Antwerp or Brussels. These results might imply that national origin plays at least some role in the residential mobility of young adults in Belgium.

The methodology we adopted is subject to two drawbacks. The first is related to the difficulty of controlling for household characteristics, such that splitting the dataset was our only option for controlling for socio-economic status. Although this was

insightful, it did not offer any formal test for socio-economic differences. Moreover, the lack of income information prevented us from controlling for financial means. The second methodological drawback is related to the choice set, which could be determined only according to theoretical arguments. We chose to include all possible neighbourhoods within a metropolitan area, with the reasoning that rarely selected neighbourhoods would automatically receive very low weights in our analyses. It is nevertheless reasonable to expect that there are better demarcations of the choice set (see, e.g. Crowder and Krysan 2016).

Two other remarks should be made about the operationalisation of migration background. The first concerns third-generation migrants. Our data provide information only about the parents of the heads of household and not on their grandparents, making it impossible to identify third-generation migrants. For this reason, we may have underestimated the percentage of neighbourhood inhabitants considered to have a migration background, especially in more suburban neighbourhoods, where these migrants could have spatially assimilated. The second concerns the inclusion of Brussels. We consider all people with foreign roots outside Western, Northern and Southern Europe as stemming from migration. This includes all Eastern European and non-European people who are either directly or indirectly related to the European Union in Brussels. We are convinced that this did not lead to bias, however, as our results for Brussels were similar to those for the other metropolitan areas. A final remark should be made about the inclusion of singles in our study. Differences between singles and the other household types could arise as other households have to negotiate and compromise the individual residential needs of its members. Singles, on the other hand, do not have to make such compromises.

Despite the limitations of our study, the findings offer new insights for ethnic residential segregation, due to the link between household characteristics and segregation, as well as to the new analytic technique we adopted. The results also invite further investigation of the likely diverging sensitivities that households have with regard to the ethnic composition of their neighbourhoods throughout their lives and life courses—not only with regard to ethnic majorities, but also with regard to ethnic minorities. In this study, we focus on households in the transition to adulthood, which we assumed would lead to greater sensitivity, as it often results in starting a family. For purposes of combating residential segregation, however, it would be interesting to know whether other transitions (e.g. becoming an ‘empty nest’) might make households less sensitive to the ethnic composition of their residential environments. It might be equally insightful to investigate changes in the preferences of households who remain childless after the transition to adulthood. Such research could offer a better theoretical understanding of links between segregation and household composition.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Appendix

The analogous graphs for Antwerp, Charleroi, Ghent and Liège.

See Figs. 7, 8, 9 and 10.

Fig. 7 Results of Model 2, linking % MB inhabitants and household type to the predicted probabilities of living in a given neighbourhood, for Antwerp

Fig. 8 Results of Model 2, linking % MB inhabitants and household type to the predicted probabilities of living in a given neighbourhood, for Charleroi

Fig. 9 Results of Model 2, linking % MB inhabitants and household type to the predicted probabilities of living in a given neighbourhood, for Ghent

Fig. 10 Results of Model 2, linking % MB inhabitants and household type to the predicted probabilities of living in a given neighbourhood, for Liège

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