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Beyond the isolation thesis: exploring the links between residential concentration and immigrant integration in the Netherlands

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ABSTRACT

Residential concentration is often referred to as an obstacle to the integration of immigrant minorities. Originating from Wilson's isolation thesis (Wilson, W. J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press.), it is assumed that the high ratio of minorities in the neighbourhood decreases chances for social integration, which consequently affects other aspects of integration. This paper provides a comprehensive analysis on the topic by simultaneously examining the links between residential concentration and social, economic and identificational integration outcomes. We perform a quantitative analysis using data from the first wave of The Netherlands Longitudinal Lifecourse Study (NELLS 2009; $N = 1,973$), which provides a sample of Turkish and Moroccan origin residents in the Netherlands. The results show that a higher ratio of non-Western origin residents is linked to lower likelihood of social relations with natives. While social ties are indeed related to other integration outcomes, living in a more concentrated neighbourhood is not associated with worse integration outcomes in employment, income, and affiliation with Dutch identity. Consequently, we challenge the isolation thesis as a universal model and highlight instead the importance of the quality of relations and the relevance of neighbourhood social context for disadvantaged members of society.

Introduction

Residential concentration of ethnic minorities is widely perceived as both a cause and a consequence of *failed* immigrant integration (Iceland 2014). Most commonly, segregation is seen as a problem due to its presupposed influence on minorities' participation in social life – which, in itself, is assumed to be crucial for integration in other spheres, such as work, culture and identity. This has also been the case in the Netherlands, a country of immigration characterised by a long history of interventionism in the housing sector. The Dutch policy objective has always been to encourage 'social mixing' of different income groups, with less focus on ethnic concentration (Janssens 2015). Despite the lack of explicit focus on ethnic concentration in policy implementation, in the past couple of decades, ethnic segregation has received increasing attention in both political

rhetoric and policy memorandums. The following quotation also highlights that ethnic concentration, and not necessarily socioeconomic concentration, is the problem at hand:

> Concentration is especially disadvantageous for integration because it results in an accumulation of social problems which may give rise to a state of affairs that is very hard to handle (…). [It] makes the ethnic dividing lines more visible (…). That harms the image of ethnic minorities (…). Finally, concentration is particularly disadvantageous for the possibilities for meeting and contacts between persons from different origin groups (…) the diminishing contacts with native Dutch indirectly influence the social chances of ethnic minorities. (Ministerie van Justitie 2005, as cited in Bolt, Özüekren, and Phillips 2010, 176)

Contrary to the strong consensus on the negative effects of ethnic segregation in policy debates, academic research on the links between ethnic composition and different dimensions of immigrant integration is less conclusive. As Musterd and Ostendorf conclude in their 2009 review:

> Altogether, the relationship between residential segregation and integration has attracted extraordinary political but very little scholarly attention. (2009, 1530)

> [The] idea, often expressed in the Netherlands, that there exists a strong link between segregation and integration, does not find confirmation in empirical data. A negative effect on the "social career" of members of ethnic minorities living in areas with few Dutch is a very important hypothesis, but this hypothesis is not confirmed for the Dutch situation (ibid., 1528).

The Dutch and the international empirical literature on residential segregation has grown over the years (Zwiers et al. 2014). Separate studies have looked at the effects of neighbourhood composition on social ties, as well as the effects of social ties on economic outcomes (e.g. Aguilera and Massey 2003; Gijsberts, van der Meer, and Dagevos 2012; Lancee 2010; Nee, Sanders, and Sernau 1994). However, no study, to our knowledge, has looked at these three factors within the same framework, which would allow to examine the overarching and mediating relationships between them. Furthermore, while the structural, social-interactive and cultural areas of integration have received attention (e.g. Chiswick and Wang 2016; Moroşanu 2016; Vervoort 2011), the identificational domain has been notably understudied. In particular, no research to date has tackled the association between neighbourhood characteristics and self-identification with the receiving (Dutch) society.

With this paper, we aim to contribute to the literature in three main ways. First, we bridge the gap in the understanding of the interplay between residential concentration of immigrants and their overall integration by taking into account multiple dimensions of integration simultaneously. Secondly, we strive for a nuanced understanding of the role of interethnic relations by differentiating between strong and weak ties – a fundamental, yet rarely applied distinction in Dutch integration literature. Third, we include the typically overlooked aspect of immigrants' self-identification as an indicator of integration. Ultimately, using a sample of Turkish and Moroccan-origin residents from the Netherlands Longitudinal Life-Course Survey (NELLS) (de Graaf et al. 2014), we aim to bring forward a more holistic approach.

Immigrant segregation and integration policy in the Netherlands

In the Netherlands, people with a migrant background constituted an estimated 22.1% of the nearly 17 million inhabitants in 2016. Approximately half of this population was born

in the Netherlands, and those with a 'non-Western' origin – the Dutch administrative category for people from Middle-Eastern, African, Latin American and Asian countries – amount to over 2 million people. Turkey and Morocco are the two leading countries of origin within this group, with 397,471 and 385,761 people respectively (CBS 2016). The presence of both groups can be traced back to the post-World War 2 guest worker programmes in the 1960s and the subsequent family reunification flows (Bilgili 2014). Turks and Moroccans are chosen as the focus population of this paper given their high numbers, but also because these minorities comprise a particularly disadvantaged and segregated segment of the Netherlands' foreign-origin population.

The period during which the data in this study was collected (around 2009) was characterised by an atmosphere of social tensions around non-Western ethnic minorities and a continuing shift towards more restrictive integration policies; a trend that dates back to the 1990s. Ethnic minorities, especially groups of Turkish and Moroccan origin, were – and continue to be – lagging behind natives in socio-economic terms (Huijnk, Gijsberts, and Dagevos 2014). Far from the multiculturalist approach of the 1980s, in recent years the Dutch integration policy has also moved towards a 'policy of no policy' (Huddleston et al. 2015) or even as some argue a more assimilationist policy approach (Scholten 2011). There is less focus on targeted support to support immigrants, and a shift towards an understanding of integration as immigrants' responsibility whereby they are expected to fully and successfully participate in the economic, social and political life in the Netherlands (Huddleston et al. 2015, 14). Disadvantaged ethnic minorities are often blamed for their problems and it is argued that their physical and social segregation reinforces their problems. This is especially prevalent in the case of Turkish and Moroccan-origin people, who have been the most segregated minorities for decades (Crul 2008).

In terms of de-segregation policies, the Dutch government has invested for years on affordable (social) housing, mitigated the processes of neighbourhood decline and achieved a relatively low level of income segregation (Zwiers et al. 2014). They have a record of intervention in urban residential patterns, through urban restructuring and social mixing programmes which have the explicit focus of socio-economically deprived groups. However, especially in the past two decades, immigrant dispersal has been a clear underlying goal of these policies. The government sees a strong correlation between segregation and socio-economic integration and seeks to combat integration challenges by altering the uneven spatial distribution of affordable housing (Bolt, van Kempen, and van Ham 2008). These policies have been argued to prevent *ghetto*-like neighbourhoods in the Netherlands (Zwiers et al. 2014). Despite these efforts, residential segregation seems to exist in the Netherlands, with variations across cities (Dagevos 2009). For example, in 2008, one in five neighbourhood in the biggest cities of the Netherlands, more than half of the residents had a non-Western origin (See Table 1).

Table 1 illustrates the prevalence of residential segregation in the Netherlands about a decade ago. Today the debate in the Netherlands is about the changes in this picture. With the economic crisis in 2008, the government has retreated from investing in social mixing policies and it remains an empirical question to assess whether the lack of policies has further aggravated the situation (Zwiers et al. 2014). Our study aims to contribute to this debate as a reference point with regards to how integration issues were shaped by the policies at the time and what the long-term effects of the current (lack of) policies may be.

Table 1. Concentration of non-Western immigrants in zip-code areas (2008).

Zip code	0%–5%	5%–10%	10%–25%	25%–50%	50%–75%	75% or more	Total (N = 100%)
Total	2740	588	470	161	43	7	4009
	68	15	12	4	1	0	81
Amsterdam	7	7	36	30	17	3	72
Rotterdam	4	10	28	36	19	3	61
Den Haag	2	25	26	28	15	5	47
Utrecht	9	26	40	19	6	0	36
Almere	11	11	33	44	0	0	4009

Source: CBS (Statline), Kullberg et al. (2009) as cited in Dagevos (2009, 4)

Theory and hypotheses

Immigrant segregation and integration: the isolation thesis

The underlying logic of the policy approach presented in the introduction can be summarised with the isolation thesis. Originating from Wilson (1987), the social isolation thesis was applied to the Dutch immigrant segregation context by Bouma-Doff in her 2007 study *Confined contact*: 'the isolation thesis [assumes] that residential segregation hampers ethnic bridges between ethnic minorities and native Dutch, which in turn hinders integration into Dutch society' (2007, 998) (Figure 1).

One may note that this thesis lies on three assumptions leading up to one conclusion: (1) immigrant neighbourhoods provide limited opportunities for, and therefore reduce social mixing with natives; (2) social mixing in the neighbourhood is necessary for and conducive to social integration; (3) social integration is necessary for and conducive to integration in other domains; therefore, the residential concentration of immigrants has a potential to hinder their integration in all domains. The goal of this paper is to empirically test these assumptions.

Integration and its related domains are operationalised in this paper following Heckmann and Bosswick's (2005, 18) conceptual framework. The authors define integration as an interactive 'process of inclusion and acceptance of migrants in the core institutions, relations and statuses of the receiving society', involving immigrants and their descendants. Importantly, integration is understood as a multi-dimensional phenomenon, involving the structural, the interactive, the identification, and the cultural domains. The framework also highlights the relevance of the spatial element – such residential characteristics – in all areas of the integration process. For instance, housing is considered a dimension of structural integration but also of interactive integration as it provides the opportunity to meet and build relationships. Finally, identificational integration, is reflected in housing as the (desired or real) place of belonging which can carry emotional
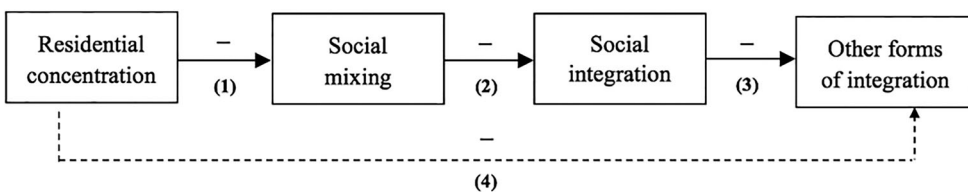
Figure 1. The isolation thesis.
Note: Authors' own, building on van der Laan Bouma-Doff (2007).

meaning for individuals within a spatial reference system. Since the structural, interactive and identificational domains of integrations are the ones linked to the spatial element within the chosen framework, these are the domains of integration this study focuses on.

Interactive integration involves migrants' social ties to host society, including private relations and primary group memberships; in this paper, this is referred to as *social integration*. Structural integration is understood as the acquisition of rights and status in the core institutions of the receiving society, including employment, education, housing, health services, political and citizenship rights. Within this dimension, this study focuses on *economic integration*. Finally, *identificational integration* measures incorporation through feelings of belonging to and identification with host society groups (Heckmann and Bosswick 2005). Connecting the isolation thesis' implications with the conceptual framework described above, we build a model hypothesising how residential concentration of immigrants is linked to outcomes of integration in multiple domains. The model is shown below.

Besides native (out-group) socialisation, it is equally important to consider in-group socialisation. Following the logic of the isolation thesis framework, we may expect in-group (i.e. co-ethnic) socialisation to have the opposite effect than socialisation with natives: the isolated resident – one who socialises mostly or exclusively with co-ethnics – will not successfully integrate in the economic and identificational sense. Beyond the isolation thesis, each of the underlying causal relationships suggested by the model above – indicated with arrows – have compelling theoretical bases: the heterogeneity theorem (Blau, Blum, and Schwartz 1982) or the hunkering-down thesis (Putnam 2007), social capital theory (Granovetter 1973; Putnam 2007), and the common in-group identity model (Gaertner and Dovidio 2000) (in respective order). These theories and the hypotheses derived from them are discussed in the next section.

Residential concentration and social integration: meeting opportunities or hunkering down?

Social integration can be defined as the migrant developing social ties with the native Dutch – whether those contacts are casual acquaintances or strong relationships. Therefore, in this study we refer to both weak and strong ties with native Dutch people. The relationship between the ethnic composition (or the diversity) of the neighbourhood and interethnic contacts is generally approached with three competing theories: contact, constrict and conflict theory (Huijts, Kraaykamp, and Scheepers 2014; Putnam 2007). Since in the Dutch context diverse neighbourhoods are generally the ones with a higher ratio of immigrants (Gijsberts, van der Meer, and Dagevos 2012; Vervoort, Flap, and Dagevos 2011), the two have similar theoretical implications.

Firstly, from Blau, Blum, and Schwartz (1982) heterogeneity theorem – popularly referred to as the *meeting opportunities* hypothesis – one could expect a higher percentage of immigrants (and therefore a lower percentage of native Dutch) in the neighbourhood to be associated with less social contact between immigrants and natives and more contact within the immigrant community. Meanwhile, Putnam's (2007) *'hunkering down'* thesis – also called constrict theory – predicts that multi-ethnic neighbourhoods will experience social cohesion problems, leading to individuals isolating themselves both from their own and from other ethnic groups (such as the native Dutch). In summary, both theories would

predict a higher percentage of non-Western migrants in the neighbourhood to reduce the number of native–immigrant contacts (strong *or* weak), but the effect on co-ethnic contacts is contested.

An alternative line of thought questions whether the ethnic composition of the neighbourhood has any effect at all on social integration. Gans (1961), stresses the necessity of personal similarities in order for spatial proximity to foster social bonding, while Bolt, Sule Özüekren, and Phillips (2010) underline that the closest neighbours (ones in the same housing stock) tend to share the same socio-economic background. Moreover, processes of individualisation, globalisation and the development of information and communication technology are thought to made the spatial context irrelevant to social interaction (Castells 2000, as cited in Bouma-Doff 2007). Countering these arguments, Bouma-Doff stresses that neighbourhood relations remain important particularly for the economically deprived and less mobile segments of society – in which migrants are often overrepresented.

The Dutch as well as the larger international empirical literature have so far been inconclusive regarding the theories outlined above. In a cross-national study of 21 European countries, Semyonov and Glikman (2009) find compelling support for the meeting opportunities theory, as do several Dutch studies (e.g. Bouma-Doff 2007; Huijts, Kraaykamp, and Scheepers 2014; Vervoort, Flap, and Dagevos 2011) observing a link between the relative size of the outgroup and contact. Multiple other studies (Gijsberts, van der Meer, and Dagevos 2012; Lancee 2010; Lancee and Dronkers 2011), however find support for the 'hunkering down' thesis – although in the case of Tolsma, van der Meer, and Gesthuizen (2009), the effect disappears after controlling for economic status. Finally, regarding the effect of the neighbourhood's composition on the *strength* of minority-majority relationships, Vervoort (2012) finds that higher ethnic concentration not only lowers the probability of the minority member having a social tie with a native, but also the probability of that tie being strong.

In summary, most (though not all) of the existing empirical evidence seems to support the thesis that there is a negative link between the share of minorities in a neighbourhood and minorities' social ties to natives; the effect on co-ethnic contact, however, is unclear. Furthermore, to our knowledge, no study has looked at these outcomes together including the strength of native ties.

Social integration and economic integration: social capital theory

Social capital – the sum of potential or actual resources that are available to the individual through their network of relationships (Bourdieu 1986) – can be a crucial factor to immigrants' economic integration. Social relations with co-ethnic and native individuals play a different role in this regard, as explained by Granovetter's (1973) theory of weak versus strong ties, or, in Putnam's (2007) approach, bridging versus bonding ties. Considering natives, the out-group and co-ethnics the in-group of the immigrant, contact with natives constitute bridging ties, while relationships with co-ethnics constitute bonding ties.

The effect of bonding capital on economic integration is not clear-cut. According to the emancipation (ethnic enclave) thesis, the development of a 'home base' through bonding ties within the ethnic community provides a safety net that is a prerequisite to integration (Bouma-Doff 2007; see also the 'closure argument' by Coleman 1990). On the other hand,

being embedded into ethnic networks might act as a mobility trap due to 'downward levelling norms' – an in-group mechanism that seeks to protect a disadvantaged group by preventing its members from participating in majority society (in fear of competing loyalties) (Portes 1998). Applied to the economic integration context, the bridging–bonding capital divide might be interpreted in the following way: contact with co-ethnics will increase the migrant's odds of employment, but not their income level.

The role of native contact is less ambiguous. Generally speaking, given the persisting group level socio-economic gap between foreign-born populations and natives (not to mention cultural capital and discrimination), status-altering opportunities – i.e. not just accessing *a* job, but a *better* job – are more likely to come from bridging ties with natives (Lancee 2010), even if these ties are more casual (Granovetter 1973). Following these theories, also on the individual level, one could therefore expect migrants who have more contact with native Dutch residents to be more successful in economic terms. In this study, this 'success' is measured through employment and income characteristics.

As noted by Ooka and Wellman (2003) – and reiterated one decade later by Lu, Ruan, and Lai (2013) – there is a general lack of studies considering the differences in how the economic integration of immigrants is affected by social ties with co-ethnics (or other immigrants) versus contacts with the native population. The Dutch quantitative research is particularly limited regarding the socio-economic effect of native contact; this is largely due to shortcomings in appropriate data (Bolt, Sule Özüekren, and Phillips 2010; see also Lancee 2010). As Bouma-Doff concluded in 2007, upon confirming the link between residential segregation on native contact, 'the next step will be to investigate whether or not this 'White contact' contributes to the socioeconomic participation of ethnic minorities' (1014).

We find that most of the international literature examining the role of social capital in migrant integration focuses on co-ethnic ties. Studies from the North American (Sanders, Nee, and Sernau 2002; Waldinger 1994) and Chinese (Lu, Ruan, and Lai 2013) context found a positive impact of co-ethnic networks on employment (typically in the 'ethnic' economy); in one US case, even earnings were positively impacted (Aguilera and Massey 2003). However, other authors – e.g. Fong and Ooka in Canada (2002), Nee et al. in the US (1994), Iosifides et al. in Greece (2007) – find evidence for the 'mobility trap' phenomenon for migrants relying on co-ethnic networks. At the same time, the latter study also found some evidence for native Greek contacts reducing workplace discrimination for migrants. One step further, Lancee and Hartung (2012) found that friendships with natives (bridging ties) facilitated re-employment for unemployed migrants in Germany, while bonding ties with co-ethnics had no such effect. The labour market-related benefits of social ties to natives were also confirmed by Moroşanu (2016) in the UK. The few available Dutch studies examining these links seem to confirm the notion that bridging native ties support immigrants' economic outcomes, and find no effect for bonding capital (Chiswick and Wang 2016; Lancee 2010). From this, in our study we expect that ties with natives will be linked to more successful economic integration both in terms of employment and income.

Social integration and national identity: common in-group identity model

The effect of interethnic ties on minority members' identification may be approached with Gaertner and Dovidio's (2000) common in-group identity model (CIIM). The CIIM

predicts that cooperation and contact between different groups in society can reduce inter-group bias via the re-categorisation of their segmented identities into an overarching group identity, such as a national identity. Extended contact (especially involving cooperation) is expected to increase groups' propensity to develop more inclusive social identities.

Identificational integration is measured by the strength of migrants' self-identification with the Dutch national identity in this paper. Applying the CIIM framework to the case of Dutch ethnic minority segregation, one may expect more contact and friendship with natives to strengthen the Dutch national identification of minority members. Co-ethnic contact, on the other hand, is predicted to weaken minorities' sense of Dutch identity. Vroome, Verkuyten, and Martinovic (2014) observed positive links between native Dutch contacts and migrants' national identification as Dutch; their results fall in line with evidence from other countries (Lubbers, Molina, and McCarty 2007; Maxwell 2009; Wu, Schimmele, and Hou 2010).

An extended version of the model presented in Figure 2 – now including the operationalised version of the concepts and the revised links between them – is shown below. The arrows indicate the hypothesised relationships between the variables. In sum, we expect higher residential concentration of minorities to be negatively linked with all forms of social ties to the native Dutch (the link is expected to be positive for co-ethnic ties). Given the expected positive link between social integration and other aspects of integration, we overall expect to observe lower economic and identificational integration outcomes for immigrants living in more concentrated neighbourhoods.

Data & methods

Data

The relationships in the model illustrated in Figure 3 are tested using data from the Netherlands Longitudinal Lifecourse Study (NELLS) (de Graaf et al. 2010). NELLS is a large-
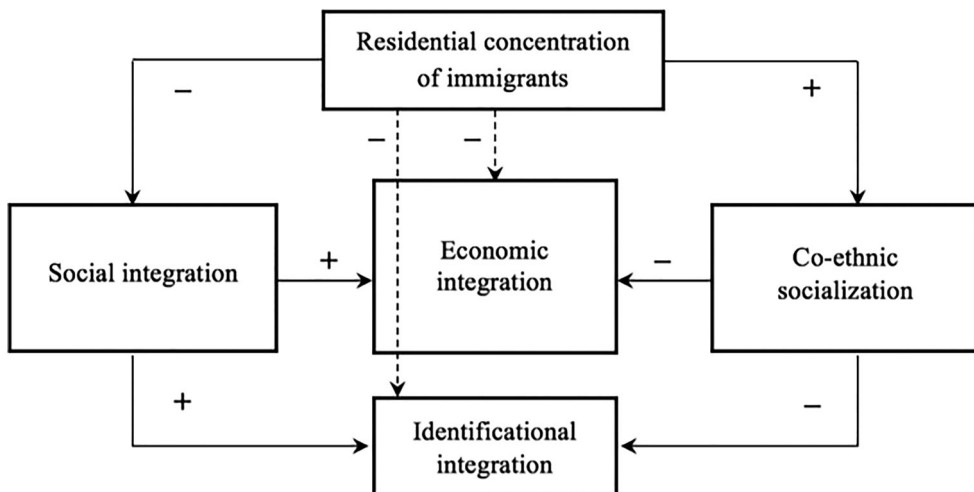

Figure 2. Relationships between residential concentration, immigrant socialisation, and different areas of integration.

Note: Authors' own model, building on Bouma-Doff (2007) and Heckmann and Bosswick (2005).

scale public use panel survey that explores themes of social cohesion, norms, values, and inequality with an emphasis on ethnic minorities. Data are collected using a two-stage stratified sampling process. The first stage involves a quasi-random selection of 35 municipalities by region and urbanisation. In the second stage, respondents are selected randomly from the population registry based on their age (15–45 years; working-age individuals) and national origin. People of Moroccan and Turkish origin are oversampled, representing nearly half of all respondents. Respondents are classified as being of Moroccan and Turkish origin if either them, or one of their parents, were born in Turkey or Morocco.

While we fully acknowledge the need for a longitudinal analysis on this topic, due to data limitations, we found it best to only use the first of NELLS's two waves (collected in 2009 and 2013, respectively). Namely, the second wave has half the sample size and substantial (partly or altogether) missing data for multiple of our key variables.

This research uses a subsample of NELLS's Wave 1 selecting Turkish and Moroccan origin respondents (2,301 in total). A further 13% of the subsample was excluded for not having completed the self-completion part of the survey, which contained key variables for our analysis; a few more observations (2%) that were rare outliers in terms of their missing information were also cut. The remaining patterns of missing data in the resulting sample were dealt with by performing multiple imputations for a total of seven variables (three of which dependent), and include binary, continuous and ordinal forms (see Table A1, Appendix). Using the chained equations method of multiple imputations, a total of 14 imputed datasets were created in STATA 15. Each completed dataset has 1,973 observations. The regressions were then performed using the *mi estimate* command in STATA, which performs separate analyses on each of the imputed datasets and consolidates them into a single set of MI estimates using Rubin's combination rules (Marchenko 2010).
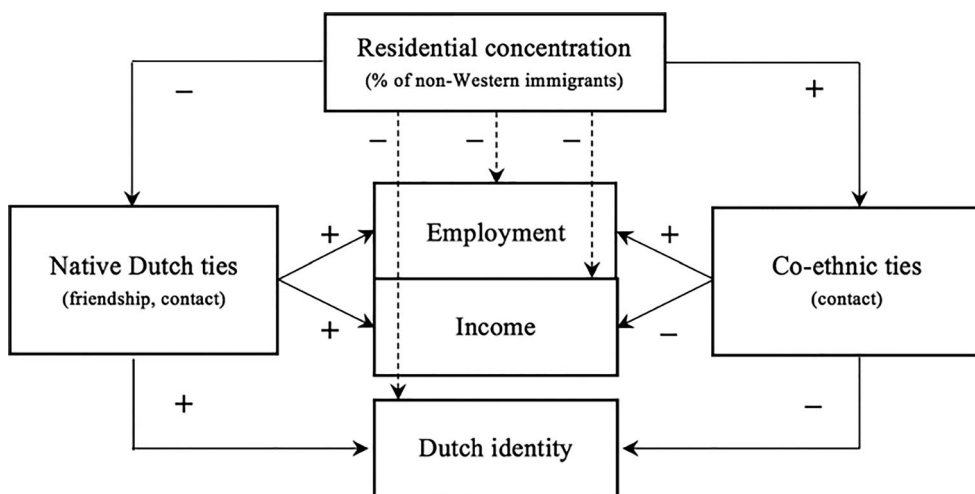
Figure 3. The revised model: hypothesised relationships between variables.
Note: Authors' own model, building on Bouma-Doff (2007) and Heckmann and Bosswick (2005).

The NELLS dataset also includes information on the districts and municipalities where respondents lived at the time of the survey. These contextual variables were constructed based on data from Statistics Netherlands for the year 2009, and they include demographic, socio-economic and geographic information. Our subsample contains 166 districts within 31 municipalities, with an average of 11.5 respondents per district. Assignment to districts is based on four-digit postal codes (de Graaf et al. 2010; Huijts, Kraaykamp, and Scheepers 2014). These district units provide the basis for the neighbourhood-level analysis of this study.

Dependent variables: indicators of integration

Social integration

The study includes two main measures of social integration, differentiating between strong and weak ties to the native Dutch. Strong ties are measured with friendships to Dutch people through a binary variable for having at least one friend of Dutch ethnicity. Weak ties to natives are assessed through the respondent's frequency of contact with 'Dutch origin' people in the neighbourhood. Personal contact was defined as knowing the other person's name and talking to this person occasionally. Answers were offered on a seven-unit ordinal scale ranging from (almost) daily to never, which we re-coded for higher values would indicate more frequent contact (see Table 2). Additionally, outcomes for contact with co-ethnics in the neighbourhood are included as a side result for social integration to gain a fuller picture. Co-ethnic contact was estimated with the same original ordinal scale on contact frequency as contact with Dutch neighbours (also recoded; see Table 2).

Economic integration

The economic integration of respondents is measured through their success in two domains in which Turkish and Moroccan origin minorities tend to lag behind the native majority: employment and income (Statistics Netherlands 2016). Employment status is split into three categories: employed in paid work, unemployed (but looking for work), and inactive (including non-working students, retirees, etc.; when employment status is used as a control variable, students form a fourth, separate category). The analysis focuses on respondents' relative odds of being unemployed versus being employed. Secondly, we examine income levels. To measure household income, NELLS does not ask exact money amounts but instead offers 16 categories to choose from based on the monthly income (before taxes) of the respondent and his or her partner, if they co-habit. Decreasing marginal effects are somewhat accounted for through gradually expanding ranges. To make marginal effect interpretation possible, categories were recoded assuming the mid-range value for each (with 75 Euros for 'less than 150' and 8000 Euros for '7000 or more'). The resulting values were then divided by number of people in the household to establish per capita income in the household. Acknowledging potential shortcomings of this measurement, alternative income models are presented in the Appendix.

Identificational integration

The identificational integration of minorities is assessed through the strength of their Dutch national identity, measured with the respondent's degree of agreement with the

Table 2. Summary statistics of dependent and main independent variables.

	Obs. / freq.	Range	Mean / Perc.	Std. dev.
Dependent variables				
Social integration				
Frequency of contact with native Dutch in the neighbourhood	1,973	1–7		1.70
Never (1)	144		7.3%	
About once a year	20		1.0%	
Several times a year	70		3.5%	
About once a month	101		5.1%	
Several times a month	233		11.8%	
Once or several times a week	661		33.5%	
(Almost) daily (7)	744		37.7%	
Has at least one native Dutch friend	1,962	0 / 1	76.8%	0.42
Frequency of contact with co-ethnics in the neighbourhood	1,973	1–7		1.88
Never (1)	197		10.0%	
About once a year	20		1.0%	
Several times a year	59		3.0%	
About once a month	93		4.7%	
Several times a month	175		8.9%	
Once or several times a week	550		27.9%	
(Almost) daily (7)	879		44.6%	
Economic integration				
Employment status (as dependent variable)	1,973			0.92
Employed	1,206	0 / 1	61.1%	
Unemployed	133	0 / 1	6.7%	
Inactive (incl. non-working students)	634	0 / 1	32.1%	
Household income per capita (Euros per month, before taxes)	1,739	7.5–4,250	525.6	510.00
Identificational integration				
Dutch identity ('I strongly identify as Dutch' – to what extent do you agree?)	1,954	1–5		0.88
Strongly disagree (1)	22		1.1%	
Disagree	172		8.8%	
Neutral	527		27.0%	
Agree	921		47.1%	
Strongly agree (5)	312		16.0%	
Independent variable				
Percentage of non-Western ethnic minorities in neighbourhood	1,973	2–85	27.0	17.64

statement 'I identify strongly with the Netherlands'. Answers ranged on a five-point scale, from 1 (strongly agree) to 5 (strongly disagree), the neutral option being 3. We use a re-coded version of the variable which associates higher values with stronger agreement (see Table 2).

Independent variables

Ethnic residential concentration

The primary explanatory variable in all models is the residential concentration of immigrant minorities in the neighbourhood, expressed in the percentage of non-Western immigrants in the district (included in NELLS as a zip code-level contextual variables). In the Dutch context, immigrant segregation is generally observed not by separate ethnic groups but rather between non-Western origin people versus white natives (Gijsberts, van der Meer, and Dagevos 2012; Huijts, Kraaykamp, and Scheepers 2014). Therefore, as is common in Dutch literature, this study uses the proportion of total non-Western immigrants instead of the ratio of co-ethnics in the district.

Control variables

Individual level controls include background (socio-demographic) features, human capital, and immigrant-specific characteristics. Background controls include age, gender, relationship status, household size and religiosity. Human capital characteristics include the educational level of the respondent and of their father; immigrant-specific controls are second-generation status, time spent in the Netherlands, Dutch speaking proficiency, perceived discrimination and 'ethnic' identification. Among neighbourhood characteristics, controls include large-city status, average house value estimate (log-transformed), share of low-income households, and share of unemployment benefit recipients in the neighbourhood.

Methods

The relationship between different integration outcomes and ethnic concentration in the neighbourhood is analysed with two sets of regression models. It is important to note that due to the cross-sectional nature of the data, we are only able to observe associations between variables, not causal mechanisms. The 'effects' mentioned in the following merely refer to the statistical relationship between variables and not to causal effects. Potential causal effects are considered in the Discussion section.

Models 1–3 observe the relationship between social integration and minority ratio in the neighbourhood. Models 4–6 look into economic (4&5) and identificational (6) integration outcomes, assessing how their variation is explained by the minority ratio in the neighbourhood and respondents' social ties (with natives and co-ethnics). All models include individual and contextual level control variables.

The regression methods were chosen depending on the nature of the outcome variable. For ordered categorical outcome variables such as contact and identity (Models 1, 3, and 6) were estimated using ordered *probit* regressions. Model 4 explores effects on employment status (unordered categories) in a multinomial logistic regression, using employed status as reference and observing the relative probability of unemployed status (inactive status is also included in the model but not discussed separately as the focus is specifically on employment versus unemployment). To ease the interpretation of the results of these four models, we also calculated the change in predicted probabilities of achieving a specific outcome category at different values of the independent variables of interest (setting the rest at their mean values). Examples are discussed alongside the regression results, with the full list of marginal effects provided in the Appendix.

Model 2 (friendship, binary) was calculated with LPM in order to avoid the issues concerning effect size interpretation and comparability that are associated with odds ratios from logistic regressions (see Mood 2010 for a thorough discussion of the issue). Nevertheless, a logistic regression version of this model is also provided in the Appendix as a robustness check. Lastly, Model 5 (income, continuous) is calculated with an OLS (Ordinary Least Squares) regression. The results of the latter two models are presented in Average Marginal Effects (AME), which express the average change in the outcome (or its probability, in the case of Model 2) associated with a marginal change in the predictor (e.g. a one-percentage-point increase in the share of minorities in the neighbourhood, or a 0–1 change in the case of a binary variable), keeping all other variables constant. Standard

errors are clustered by neighbourhoods in all six models to account for the grouped structure of the data. Before discussing regression results, the next section presents descriptive statistics for the key variables of the analysis.

Descriptive results

Table 2 provides an overview of summary statistics for the main variables used in the study, followed by a short descriptive analysis. A summary table for individual and neighbourhood-level control variables included in our models is found in the Appendix. In our sample, individuals are fairly well integrated in the social sense: an aggregated 71% have weekly or more frequent contact with native Dutch people in their neighbourhood; a ratio similar to that of respondents who have at least monthly contact with their co-ethnic neighbours (72%). The distribution of the two variables in their categorical form is shown in Figure 4 and illustrates a fairly parallel distribution between two types of contact. Additionally, three in four respondents (77%) have at least one native Dutch friend.

The indicators for economic integration reflect the relative disadvantage of the Turkish and Moroccan-background population in Dutch society. Only 61% of our subsample is employed, and the most prevalent household income category is 1000–1499 Euros per month. The average household income per capita is 525.6 Euros per month. For comparison: 91.67% of native Dutch respondents in the original NELLS sample are employed, and their average net household income per capita is around 861.44 Euros per month. Finally, an aggregated 63% of our subsample reports 'strongly' identifying as Dutch. While this may not seem like a high value, it is in fact barely lower than among native Dutch respondents, 66%.

Moving on to our key explanatory variable, the ratio of non-Western ethnic minorities in respondents' neighbourhoods ranges from 2% to 85%, with an average 27% of non-
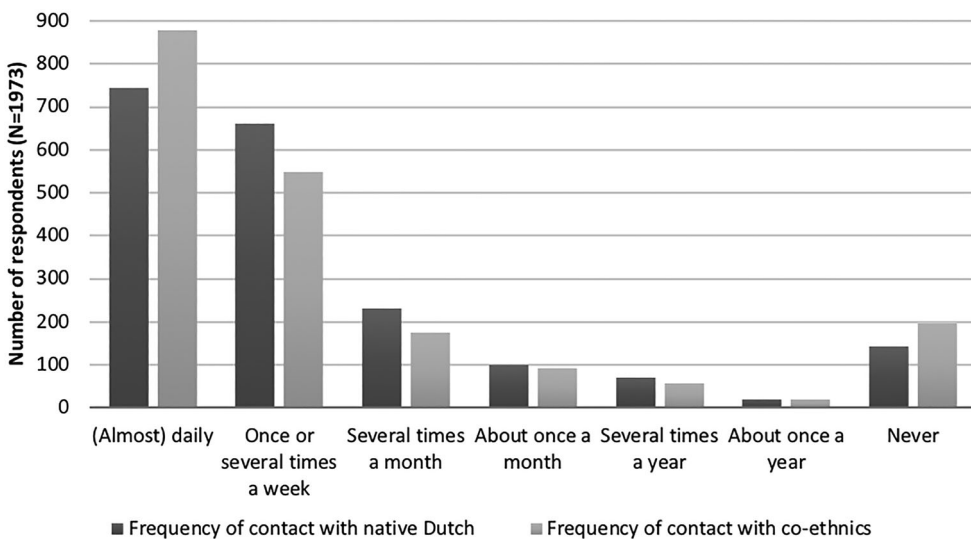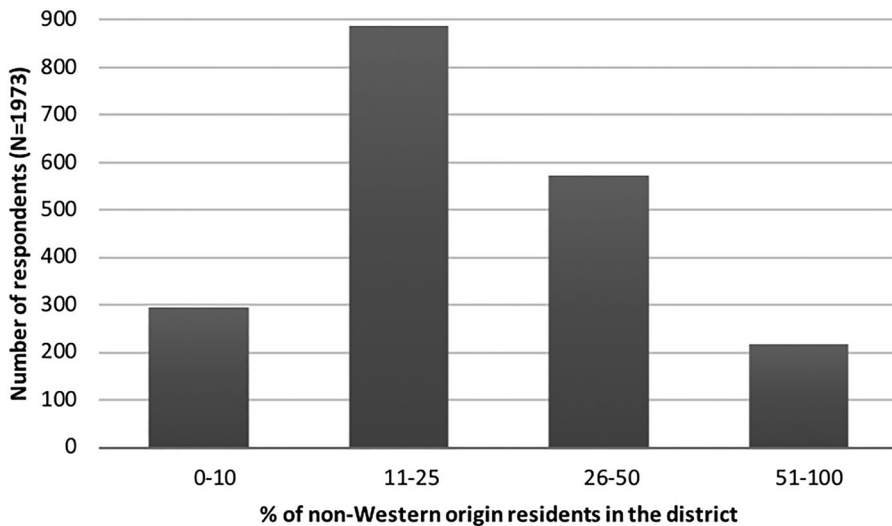

Figure 4. Frequency of contact with native Dutch and co-ethnic neighbours.

Figure 5. Frequency of respondents' neighbourhoods by percentage of non-western immigrant residents.

Western residents. Heavily concentrated immigrant neighbourhoods do not seem to be common in the examined context (see Figure 5). Most commonly, 42% of respondents live in a neighbourhood where the share of non-Western origin residents is between 11% and 25%, with a further 18% living in neighbourhoods where this share is between 26% and 50%.

Main results

Ethnic concentration effect on social integration

Table 3 presents the set of regression models estimating how the share of non-Western immigrants in the neighbourhood is linked to immigrants' social integration, as expressed by frequency of contact with native Dutch neighbours and their having native Dutch friend(s) (Models 1 and 2). In addition, contact with co-ethnics neighbours is examined in Model 3.

In line with our expectations, the results of Models 1 and 2 suggest that respondents living in neighbourhoods with a higher concentration of non-Western minorities tend to have less frequent contact with native Dutch neighbours and are, on average, less likely to have Dutch friends. Moreover, these respondents tend to have more frequent contact with neighbours of their own ethnicity (Model 3), also confirming expectations. As shown in Table A3 (Appendix), comparing neighbourhoods with a 5% versus 15% share of non-western immigrants (keeping other characteristics at their mean values), the predicted probability of having (almost) daily contact with native Dutch neighbours decreases by 3 percentage points, while the probability of daily contact with co-ethnics increases by 5 percentage points. Looking at the probability of having native Dutch friends, a ten-percentage-point increase in the share of non-Westerners in the neighbourhood (keeping all else constant) is associated with an average decrease of 3%.

Table 3. Regression models predicting social integration outcomes.

	(1)		(2)		(3)	
	Frequency of contact with native Dutch neighbours *Ordered probit*		Has at least one native Dutch friend *Linear probability model*		Frequency of contact with co-ethnic neighbours *Ordered probit*	
	b	se	b	se	b	se
Percentage of non-western immigrants in neighbourhood	−0.007***	(0.002)	−0.003***	(0.001)	0.011***	(0.003)
Age	−0.004	(0.006)	0.002	(0.002)	−0.027***	(0.006)
Female (ref.: male)	−0.117**	(0.048)	−0.023	(0.019)	−0.085	(0.055)
Married	−0.010	(0.073)	−0.036	(0.022)	0.002	(0.072)
Number of people in the household	0.087***	(0.019)	0.007	(0.006)	0.141***	(0.020)
Education level (ref.: secondary)						
Primary or less	−0.059	(0.065)	−0.056*	(0.033)	0.233***	(0.085)
Tertiary or higher	−0.201*	(0.106)	0.027	(0.036)	−0.163*	(0.097)
Employment status (ref.: employed)						
Unemployed	−0.171**	(0.078)	−0.078*	(0.042)	0.081	(0.085)
Student (non-working)	0.037	(0.085)	0.011	(0.025)	0.100	(0.103)
Inactive (excl. students)	−0.061	(0.069)	−0.106***	(0.027)	0.190**	(0.074)
Turkish (ref.: Moroccan)	0.076*	(0.045)	−0.008	(0.019)	0.137***	(0.053)
Muslim (ref.: non-religious or other faith)	−0.169**	(0.084)	−0.049**	(0.022)	0.432***	(0.095)
Second-generation immigrant (ref.: first-generation)	0.035	(0.078)	0.057**	(0.025)	0.003	(0.087)
Years lived in the Netherlands	−0.007	(0.005)	−0.000	(0.001)	−0.009*	(0.005)
Dutch speaking proficiency	0.184***	(0.039)	0.077***	(0.014)	0.004	(0.038)
Living in large city	−0.075	(0.072)	0.002	(0.028)	−0.231***	(0.079)
Log of average house value estimate in neighbourhood	0.262*	(0.153)	0.021	(0.060)	0.514***	(0.166)
Adjusted R^2			0.110			
Pseudo R^2	0.035				0.061	

Notes: Multiply imputed data, N = 1973. *$p < 0.1$ **$p < 0.05$ ***$p < 0.01$ (two-tailed), standard errors clustered by neighbourhood.
Thresholds of Model (1): 1 = 0.248; 2 = 0.323; 3 = 0.542; 4 = 0.788; 5 = 1.213; 6 = 2.137.
Thresholds of Model (3): 1 = 1.505; 2 = 1.567; 3 = 1.732; 4 = 1.951; 5 = 2.283; 6 = 3.099.

Models 1 and 3 also show that less-educated respondents and those living in a wealthier neighbourhood are more prone to neighbourhood contact in general, as are Turkish (compared to Moroccan) respondents. Respondents not living in a large city, as well as low-educated, economically inactive respondents and those who have been in the country for a shorter time tend to have more contact with co-ethnic neighbours in particular. Unsurprisingly, being employed (as opposed to unemployed), fluent in Dutch, are linked to more contact with Dutch neighbours and a higher likelihood of having native Dutch friends (Table A5, Appendix, presents a logistic version of Model 2; results are largely consistent).

Mediation effect between ethnic concentration and integration outcomes

The second set of models, shown in Tables 4 and 5 concerns economic (Models 4, 5) and identificational integration outcomes (Model 6). Besides residential concentration of minorities, these models also estimate how social relations with natives and co-ethnics (explored in Models 1–3) are linked to outcomes. In line with the isolation thesis, neighbourhood diversity is expected to be negatively associated with all three integration outcomes, while social ties with natives are expected to have a positive link.

Starting with economic integration, specifically employment status, in Model 4 a higher share of non-Western background residents in the neighbourhood is *positively* associated with employment, as the relative odds of unemployment are lower. For instance, a 5% to 15% increase in the share of non-Western neighbours is associated with 2.5-percentage-point decrease in the predicted probability of being unemployed (see Table A4, Appendix). Moving on to social ties, more frequent contact with native Dutch neighbours is associated with lower odds of being unemployed as opposed to being employed, while the opposite is true for contact with co-ethnic neighbours. Specifically, respondents in daily neighbourhood contact with natives have a 6.8 percentage points lower predicted probability of being unemployed than those who never have such contact (the opposite end of the scale). Considering contact with co-ethnics, the same increase in frequency is associated with a 3.3 percentage points *higher* predicted probability of unemployment. Interestingly, friendship with natives does not show a significant effect.

Next, Model 5 explores the predictors of household income per capita. Contrary to our expectations, neither the share of minorities in the neighbourhood, nor contact with natives shows a significant link to per capita income in the household. Friendship with natives does seem to matter: keeping all else equal, having at least one Dutch friend have is associated with an average 42.6 Euro increase in monthly per capita household

Table 4. Regression models predicting economic integration outcomes.

	(4)				(5)	
	Employment status (ref.: employed) Multinomial logit					
	Unemployed		Inactive (incl. students)		Household income per capita OLS	
	B	se	b	se	B	se
Percentage of non-western immigrants in neighb.	−0.029***	(0.009)	−0.002	(0.005)	1.057	(0.924)
Social ties						
Frequency of contact with native Dutch neighbours	−0.171***	(0.055)	−0.064	(0.042)	5.006	(6.400)
Has at least one native Dutch friend	−0.305	(0.265)	−0.284**	(0.133)	42.555***	(18.073)
Frequency of contact with co-ethnic neighbours	0.143***	(0.049)	0.139***	(0.042)	−30.680***	(6.234)
Age	0.043***	(0.021)	−0.069***	(0.014)	9.854***	(1.614)
Female (ref.: male)	−0.319	(0.258)	0.019	(0.173)	−13.166	(18.641)
Married	−0.828***	(0.251)	−0.633***	(0.147)	114.410***	(24.225)
Number of people in the household					−152.326***	(10.028)
Has children	−0.570*	(0.343)	−0.788***	(0.244)		
Interaction: female and has children	1.036***	(0.343)	2.007***	(0.260)		
Education level (ref.: secondary)						
Primary or less	−0.503	(0.315)	0.787***	(0.152)	−59.759**	(24.876)
Tertiary or higher	−0.344	(0.439)	0.194	(0.234)	224.765***	(54.463)
Father's education	−0.078	(0.063)	−0.062*	(0.034)	11.729*	(6.581)
Ethnicity (ref.: Moroccan; 1=Turk)	0.156	(0.190)	−0.207*	(0.117)	10.295	(19.271)
Second generation	0.050	(0.303)	−0.030	(0.165)		
Years lived in the Netherlands	0.002	(0.017)	−0.002	(0.009)	4.427***	(1.279)
Dutch speaking proficiency	−0.272*	(0.141)	−0.394***	(0.082)	33.250**	(13.104)
Living in large city					21.530	(28.325)
Perc. of low-income households in district	0.027*	(0.015)	−0.001	(0.008)	−3.257***	(1.230)
Unemployment benefit recipients in district	−0.001	(0.016)	0.035***	(0.011)		
Adjusted R^2					0.440	
Pseudo R^2			0.153			

Notes: Multiply imputed data, $N = 1973$. *$p < 0.1$ **$p < 0.05$ ***$p < 0.01$ (two-tailed), standard errors clustered by neighbourhood.

Table 5. Regression model predicting identificational integration outcomes.

	(6)	
	Strength of Dutch identity *Ordered probit*	
	b	se
Percentage of non-western immigrants in neighbourhood	0.002	(0.002)
Social ties		
Frequency of contact with native Dutch neighbours	0.069***	(0.020)
Has at least one native Dutch friend	0.243***	(0.063)
Frequency of contact with co-ethnic neighbours	−0.018	(0.017)
Age	−0.010**	(0.005)
Female (ref.: male)	−0.014	(0.051)
Married	0.054	(0.055)
Household income per capita	0.000	(0.000)
Education level (ref.: secondary)		
Primary or less	0.061	(0.076)
Tertiary or higher	−0.172	(0.133)
Ethnicity (ref.: Moroccan; 1 = Turk)	−0.198***	(0.051)
Muslim faith (ref.: non-religious or other faith)	−0.103	(0.096)
Second generation	−0.158*	(0.082)
Years lived in the Netherlands	0.017***	(0.004)
Dutch speaking proficiency	0.123***	(0.042)
Ever felt discriminated against	−0.230***	(0.045)
Strength of ethnic identity	0.011	(0.029)
Living in large city	0.057	(0.068)
Percentage of low-income households in district	0.001	(0.003)
Pseudo R^2	0.034	

Notes: Multiply imputed data, $N = 1973$. *$p < 0.1$ **$p < 0.05$ *** $p < 0.01$ (two-tailed), standard errors clustered by neighbourhood. Thresholds of Model (6): 1 = −1.523; 2 = −0.483; 3 = 0.520; 4 = 1.916.

income. Meanwhile, those in one-degree more frequent (e.g. daily versus weekly) contact with co-ethnic neighbours, are estimated to have a 30.7 Euros lower monthly per capita income in the household, on average ('daily' compared to 'never' contact thus adds up to a −184.2 Euro difference). As a robustness check, three additional analyses were performed using alternative measurements of income; as shown in Table A6 (Models 5a-c, Appendix), the results are consistent with those of Model 5.

Our final model (Table 5) explores strength of Dutch national identity. Opposing our expectations, neither the share of minorities nor co-ethnic contact in the neighbourhood seems to affect Dutch national identity. However, both forms of native social ties matter: respondents in daily contact with natives are predicted to have an 8.4-percentage-point higher probability of 'strongly agreeing' to having a strong Dutch identity than those 'never' in contact. Having at least one Dutch friend (as opposed to none) increases this probability by 5.2 percentage points (Table A4, Appendix). On an additional note, we see that having experienced discrimination has a significant negative link to the respondents' sense of Dutch identity.

Discussion

Almost a decade ago, Bolt, Sule Özüekren, and Phillips (2010) undertook the challenge of exploring the links between residential segregation and immigrant integration. The special issue they put together for Journal of Ethnic and Migration Studies highlighted some of the most important linkages in the field and made call for new perspectives and more quantitative research. Considering the persistent relevance of the topic in the post-2008

economic crisis period and the policy shift that followed, with this study we sought to address the knowledge gap on the links between residential concentration and different integration outcomes. Accordingly, we aimed to shed light on how current policies can be shaped in order to enhance the positive linkages between neighbourhood characteristics and immigrants' multidimensional integration.

The starting point and overarching framework of our investigation was Wilson's isolation thesis (1987). Our first set of results fit the first half of the isolation thesis: concentration leading to less social integration (as expressed by minority-native social ties). This is in line with the findings of Bouma-Doff from 2007, who called for future research to test whether the observed effect on contact also affects the socio-economic participation of minorities. In short, our results suggest that it does not: while social ties appear to matter for integration outcomes, this effect does not seem to originate from the ethnic composition of the neighbourhood. We observe no negative links between 'favourable' economic and identificational integration outcomes and minority concentration in the neighbourhood – not even before controlling for social ties.

Turning to a theoretical interpretation of our findings, our first set of results – in which a higher ratio of minorities is linked negatively with native ties and positively with co-ethnic ties – supports Blau et al.'s (1982) meeting opportunities hypothesis. As such, our results fall in line with much of previous Dutch literature and some international results (e.g. Huijts, Kraaykamp, and Scheepers 2014; Semyonov and Glikman 2009; Vervoort, Flap, and Dagevos 2011). In our second set of models, the negative link between neighbourhood contact with natives and unemployment, as well as the positive link between native friendship and income may be interpreted in support of social capital theory, with bridging (out-group) ties leading to better economic outcomes (Putnam 2007). This echoes the findings of Lancee and Hartung (2012), Moroşanu (2016), and (partly) those of Lancee (2010). The lower income outcomes associated with co-ethnic neighbourhood contact may be interpreted as evidence for the 'mobility trap' phenomenon (Nee et al.1994; Iosifides et al. 2007). Lastly, our results regarding the positive effect of native social ties on national identification support the common in-group identity model (Gaertner and Dovidio 2000), mirroring the existing international literature (Lubbers, Molina, and McCarty 2007; Maxwell 2009; Wu, Schimmele, and Hou 2010).

It is important to remember, however, that our results are merely associations and cannot confirm causal mechanisms; alternative explanations should therefore be considered. For instance, the links between social ties and residential characteristics may be due to selection bias: it is possible that instead of meeting opportunities shaping social relations, pre-existing social ties (and predisposition to them) influence the type of neighbourhood to which individuals choose (or are able) to move. Furthermore, a minority member's socio-economic status could exacerbate or override social barriers that hinder minority-native relations (and affect their reliance on co-ethnic contacts in the neighbourhood). Finally, it seems reasonable to expect that a minority member with a strong Dutch national identity will be more inclined to socialise with natives.

Above and beyond the above theories and alternative explanations, we also view our results as evidence for the continued relevance of the neighbourhood social community – native *or* co-ethnic – for the more vulnerable and less mobile segments of society (Bouma-Doff 2007). In our results, both native *and* co-ethnic neighbourhood contact are more prevalent among immigrants who are less educated and live in less affluent

neighbourhoods. Moreover, we observe higher engagement with co-ethnics among less economically integrated individuals and newer immigrants, but also lower chances of unemployment in immigrant-populated neighbourhoods, which could all point to the role of the ethnic enclave as a safety net for vulnerable immigrants (Coleman 1990).

Overall, our study brought three key contributions to the study of migrant integration: a joint analysis of multiple dimensions of integration; a differentiation between strong and weak native-immigrant ties; and the inclusion of the identificational aspect of integration. First and foremost, the simultaneous examination of migrants' housing, social ties, economic characteristics and national identity has allowed to examine – and defy – the isolation thesis' assumption of minority residential concentration as a root of all integration failures. Explored across the domains above, the evidence for the neighbourhood's isolating effect stopped at the social integration aspect and did not carry over into the rest of the models. In other words, the spill-over of residential 'isolation' to all other integration domains is not self-evident.

Secondly, the differentiation between strong and weak native ties appears to be meaningful, as they are associated with different outcomes. In line with Granovetter's (1973) theory, only weak native ties (neighbourhood contact) seemed to matter for employment, while strong ties (friendship) did not. Income, on the other hand, had a positive association with native friendship, but not contact; as mentioned above, however, it seems plausible that this speaks more to the role of socio-economic status in establishing native ties than the other way around. For identity, both forms of social ties were significant, but the marginal effect was more pronounced for strong than for weak ties. These results highlight the importance of studying the quality of relationships and explore the processes through which information, knowledge and value exchange between natives and immigrants take place to foster positive integration outcomes.

Thirdly, the study aimed to improve the sparse existing evidence concerning the determinants of identificational integration. The ethnic character of the neighbourhood and co-ethnic relations did not seem to be relevant to the migrant's identification with the host country. This result implies that stronger co-ethnic relations are distinct and independent from identification with the native population (Bilgili 2014). However, identification with Dutch society is strongly associated with the quality of relationships developed with the native population. In line with our expectations, we showed casual and, especially, close ties with natives relate positively to identification with Dutch society. Consequently, we reiterate the importance of not only looking at the frequency of contact but the *quality* of interactions taking place between immigrants and natives.

Conclusion

In conclusion, concerning the contested relationship between the ethnic composition of the neighbourhood and inter- and co-ethnic relations, we lend support for the 'meeting opportunities' theory. Our findings suggest that the simplistic dichotomy perceiving native presence and socialisation as a catalyst and co-ethnic presence and socialisation as an obstacle to integration do not fit well with the reality of immigrants' integration processes. Neither the negative association of co-ethnic contact nor the positive associations of native social ties are consistently confirmed throughout our study. Instead, a key takeaway of our study relates to the relevance of the neighbourhood context, pointing to an

increased social participation in the neighbourhood among less privileged and/or newly arrived migrants.

These results have policy implications in a context where two policy challenges co-exist: immigrants' multi-dimensional integration and the widening gap between wealthy and disadvantaged neighbourhoods in the post-2008 economic crisis period. As our results point to the importance of the wealth of the neighbourhood, addressing the concentration of poverty should remain as a policy priority. A shift towards focusing on the ethnic character of the neighbourhoods in this regard is not necessary. Especially in an increasingly globally connected world, ethnic linkages can benefit not only the co-ethnic populations but the overall population. Moreover, we propose that the residential concentration of immigrants should not be seen as a root cause of all integration problems; conversely, residential mixing will be no cure-all for these problems. While 'whiter' neighbourhoods may increase meeting opportunities with natives, increased contact will not necessarily translate to better overall integration, unless they lead to positive and strong relationships between immigrants and natives. Therefore, a decade after the 2008 economic crisis and with the revival of integration policy debates across all EU countries, our suggestion is to identify the vulnerabilities of the less educated and newly arrived immigrants, providing support for them to build better quality relationships and enhance social cohesion at the local level rather than merely managing social mixing in neighbourhoods.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix

Table A1. Multiple imputations: variables imputed.

	Observations (Sample N = 1,973)	Number missing	Share missing	Type of variable	Distribution used for imputation
Dutch friend(s)	1,962	11	1%	binary	logit
Household income per capita	1,739	234	12%	continuous	regress
Dutch identity	1,954	19	1%	ordinal	ologit
Father's education	1,703	270	14%	ordinal	ologit
Dutch speaking proficiency	1,935	38	2%	ordinal	ologit
Perceived discrimination	1,935	38	2%	binary	logit
Ethnic identity	1,933	40	2%	ordinal	ologit

Table A2. Descriptive statistics of control variables (individual and neighbourhood-level characteristics).

	Obs. / freq.	Range	Mean / Perc.	Std. dev.
Individual controls				
Ethnicity (Turkish=1)	1,973	0 / 1	50.1%	0.50
Age	1,973	14–49	30.93	8.97
Gender (female=1)	1,973	0 / 1	53.1%	0.50
Married	1,973	0 / 1	53.5%	0.50
Has a partner	1,973	0 / 1	64.4%	0.48
Has children	1,973	0 / 1	57.9%	0.49
Interaction: female and has children	1,973	0 / 1	32.2%	0.47
Number of people in the household	1,973	1–18	3.97	1.64
Muslim	1,973	0 / 1	88.4%	0.32
Educational level (highest completed)				
Primary (or less)	1,973	0 / 1	17.7%	0.38
Secondary	1,973	0 / 1	75.1%	0.43
Tertiary (or higher)	1,973	0 / 1	7.1%	0.26
Father's education (highest completed; 1: Lower than primary; 8: Tertiary)	1,703	1–8	2.47	1.88
Household income (Euros per month, before taxes	1,739	75–8,000	1592.19	1197.06
Household income per capita (Euros per month, before taxes)	1,739	7.5–4,250	525.6	510.00
Employment status (as independent variable)	1,973			
Employed	1,206	0 / 1	61.1%	0.49
Unemployed	133	0 / 1	6.7%	0.25
Student (non-working)	289	0 / 1	14.6%	0.35
Inactive (excl. students)	345	0 / 1	17.5%	0.38
Second-generation immigrant	1,973	0 / 1	36.2%	0.48
Years lived in the Netherlands	1,973	0–45	21.49	9.07
Dutch speaking proficiency	1,935	1–5	4.21	0.97
Perceived discrimination	1,935	0 / 1	60.6%	0.49
Ethnic identity ('I strongly identify as [own ethnicity]' – to what extent do you agree? 1: Strongly disagree; 5: Strongly agree)	1,933	1–5	4.04	0.93
Neighbourhood controls				
Living in large city	1,973	0 / 1	47.7%	0.50
Neighbourhood average house values estimate (1000 Euros)	1,973	18.7–40.2	26.79	4.22
Log of average house value estimate in neighbourhood	1,973	4.61–5.96	5.28	0.25
Low-income households in neighbourhood	1,973	17–74	48.87	10.95
Unemployment benefit recipients (per 1,000 individuals aged 15–64)	1,973	5–42	20.19	6.66

Table A3. Predicted probabilities for outcomes of Models 1 and 3 estimated at selected values of the explanatory variable.

	Model (1)	Model (3)
	Frequency of contact with native Dutch neighbours	Frequency of contact with native co-ethnic neighbours
Outcome:		
Prediction for value:	(Almost) daily contact (=7)	(Almost) daily contact (=7)
Values of independent variable:		
Percentage of non-western immigrants in neighbourhood[a]		
5	0.427	0.344
15	0.400	0.386
25	0.374	0.429
35	0.348	0.473
45	0.322	0.518
55	0.298	0.562
65	0.274	0.605
75	0.252	0.647
85	0.230	0.688

Note: [a]Other independent variables set at their mean values.

Table A4. Predicted probabilities for outcomes of Models 4 and 6 estimated at selected values of the explanatory variables.

	Model (4)	Model (6)
	Employment status	Strength of Dutch identity
Outcome:		
Prediction for value:	Unemployed (=2)	Strongly agree (=5)
Values of independent variables:		
Percentage of non-western immigrants in neighbourhood[a]		
5	0.111	(n.s.)
15	0.086	
25	0.066	
35	0.051	
45	0.039	
55	0.029	
65	0.022	
75	0.017	
85	0.013	
Frequency of contact with native Dutch neighbours[a]		
Never (=1)	0.119	0.086
About once a year	0.104	0.097
Several times a year	0.091	0.110
About once a month	0.079	0.123
Several times a month	0.069	0.138
Once or several times a week	0.059	0.153
(Almost) daily (=7)	0.051	0.170
Has at least one native Dutch friend[a]		
No (=0)	(n.s.)	0.109
Yes (=1)		0.161
Frequency of contact with co-ethnic neighbours[a]		
Never (=1)	0.038	(n.s.)
About once a year	0.043	
Several times a year	0.048	
About once a month	0.053	
Several times a month	0.059	
Once or several times a week	0.065	
(Almost) daily (=7)	0.071	

Notes: [a]Other independent variables set at their mean values. Calculations for independent variables whose effects are not significant (at a 90% percent significance level) not included; indicated with (n.s.).

Table A5. Alternative version of Model 2: logistic regression (results presented in odds ratios).

	(2a)	
	Has at least one native Dutch friend _Logistic regression_	
	b	se
Percentage of non-western immigrants in neighbourhood	0.984***	(0.006)
Age	1.010	(0.011)
Female (ref.: male)	0.874	(0.110)
Married	0.792*	(0.109)
Number of people in the household	1.043	(0.046)
Education level (ref.: secondary)		
Primary or less	0.799	(0.135)
Tertiary or higher	1.226	(0.327)
Employment status (ref.: employed)		
Unemployed	0.628**	(0.147)
Student (non-working)	0.587***	(0.082)
Inactive (excl. students)	1.057	(0.198)
Turkish (ref.: Moroccan)	0.933	(0.110)
Muslim (ref.: non-religious or other faith)	0.655**	(0.123)
Second-generation immigrant (ref.: first-generation)	1.526**	(0.260)
Years lived in the Netherlands	0.999	(0.009)
Dutch speaking proficiency	1.486***	(0.108)
Living in large city	0.986	(0.181)
Log of average house value estimate in neighbourhood	1.178	(0.448)
Pseudo R^2	0.105	

Notes: Multiply imputed data, N = 1973. *$p < 0.1$ **$p < 0.05$ ***$p < 0.01$ (two-tailed), standard errors clustered by neighbourhood.

Table A6. Additional regression models predicting household income and related outcomes.

	(5a)		(5b)		(5c)	
			Household income / National std. average household income		No difficulty to make ends meet in past 3 months	
	Household income _OLS_		_OLS_		_LPM_	
	b	se	b	se	b	se
Percentage of non-western immigrants in neighb.	3.385	(2.840)	0.002	(0.001)	−0.000	(0.001)
Social ties						
Frequency of contact with native Dutch neighbours	19.830	(21.199)	0.009	(0.010)	0.004	(0.008)
Has at least one native Dutch friend	139.677**	(60.184)	0.065**	(0.028)	0.050*	(0.028)
Frequency of contact with co-ethnic neighbours	−56.740***	(19.395)	−0.026***	(0.009)	−0.007	(0.007)
Age	36.713***	(5.069)	0.017***	(0.002)	−0.007***	(0.002)
Female (ref.: male)	7.357	(54.845)	0.003	(0.026)	0.008	(0.023)
Married	931.577***	(62.009)	0.433***	(0.029)	0.071**	(0.030)
Number of people in the household	−84.816***	(21.676)	−0.039***	(0.010)	0.011	(0.009)
Education level (ref.: secondary)						
Primary or less	−230.245***	(83.279)	−0.107***	(0.039)	0.035	(0.032)
Tertiary or higher	550.866***	(131.474)	0.256***	(0.061)	0.069	(0.043)
Father's education (ref.: secondary)	25.720	(19.113)	0.012	(0.009)	0.015**	(0.007)
Ethnicity (ref.: Moroccan; 1 = Turk)	157.562***	(58.983)	0.073***	(0.027)	−0.009	(0.022)
Years lived in the Netherlands	8.584**	(3.630)	0.004**	(0.002)	−0.002	(0.002)
Dutch speaking proficiency	145.320***	(45.425)	0.068***	(0.021)	0.048***	(0.017)
Living in large city	37.920	(84.080)	0.018	(0.039)	0.022	(0.032)
Perc. of low-income households in district	−14.979***	(3.760)	−0.007***	(0.002)	−0.001	(0.002)
Observations	1973[a]		1973[a]		1650[b]	
Adjusted R^2	0.343		0.343		0.040	

Notes: [a]imputed data.
[b]complete case analysis.
*$p < 0.1$ **$p < 0.05$ ***$p < 0.01$ (two-tailed), standard errors clustered by neighbourhood.