

Contact opportunities in neighbourhoods, education and work

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Abstract

In some cities in the Netherlands there is a high level of ethnic concentration. Dutch national and local authorities fear that concentration of poverty and lack of contact between immigrant and native populations will result in increasing social tensions and poor integration of ethnic minorities. Consequently, they put much effort into social mixing policy. These measures, however, are subject to debate since they are radical and expensive while it is uncertain to what measure they are successful.

An alternative line of reasoning with regard to contact between immigrant and native populations would be that residents do not solely depend on the neighbourhood. Other activities such as education, work, care or leisure may also provide contact opportunities. This paper will focus on the relation between contact opportunities between immigrants and natives in the residential neighbourhood on the one hand, and schools or workplaces on the other. Relations are analysed at the level of individual pupils and employees. The results show that some immigrant pupils and employees living in ethnically concentrated neighbourhoods do indeed benefit from additional contact opportunities with native Dutch by going to school or work. In addition, it is evident that workplaces offer much more additional contact opportunities than schools. Although the results do not allow for a final conclusion on the necessity of neighbourhood mix policies, they do offer a broader view on the importance of mixed neighbourhoods for interethnic contact opportunities.

Key-words: contact opportunities, non-western immigrants, ethnic concentration, neighbourhoods, education, work, micro-data, The Netherlands

Introduction

In the Netherlands, as in many other advanced countries, non-western immigrants often have a rather unfavourable position in education and the labour market. The related poor income situation is key to their greater dependence on social housing, driving them together in certain neighbourhoods. The geographical concentration and segregation of non-western immigrants, combined with their relatively poor position in education and the labour market fosters the fear of Dutch national and local authorities that concentration of poverty and lack of contact between immigrant and native populations will result in increasing social tensions and poor integration of ethnic groups. As a consequence, they put much effort into social mixing policy, e.g. by restricting the settlement of lower income groups in some districts and by restructuring the housing stock (see, for instance, Ministerie van VROM 2009, 2007, 1997; for a historical and international outline of social mixing see, for instance, Sarkissian et al. (1990) and Cheshire (2007)). Restructuring, an integral part of the Dutch Large Cities Policy (*Grotestedenbeleid GSB*), basically means that the quality of the residential district is enhanced and, most importantly, that the share of owner-occupied housing is increased. The availability of owner-occupied dwellings is supposed to retain residents with higher levels of social mobility and/or attract (relatively) affluent households from elsewhere (Uitermark 2003).

Social mixing by urban restructuring is subject to debate since the demolition and subsequent construction of buildings and additional regulation of the housing market are far-reaching and expensive measures. Furthermore, it is uncertain to what extent it is successful or necessary. Some authors argue that in the Netherlands, where levels of social and spatial inequality are rather moderate, the relationship between segregation and (socio-economic) integration is at best a weak one (Musterd 2003; Musterd and Ostendorf 2007). Others maintain that demolition will only lead to the displacement of problems, the so-called water bed effect (Slob et al. 2008, Cheshire 2007), or that policy-makers falsely assume that social mixing will automatically lead to (positive) social interaction (Lancee and Dronkers 2008, Putnam 2007). Besides being redundant or ineffective, urban regeneration may also be damaging. According to the emancipation thesis, concentration supports the social institutions immigrants need. In economy this is referred to as agglomeration economies (Cheshire 2007). Rath (2007), for instance, argues that concentration of immigrants provides the social and economic basis for ethnic enterprises. Urban restructuring may disintegrate these networks. Finally, urban renewal has come under criticism by those who claim that urban renewal is misused: planners and politicians may claim to bring social mixing into action for the benefit of the urban poor, but they are using it for other reasons. In Belgium, Kesteloot (1998) places social mixing strategies in the perspective of social housing corporations and their need to find a more balanced and affluent clientele to compensate for the increasing instability of the traditional social tenants.

This paper joins the critical attitude towards urban restructuring and social mixing policy. We argue that other activities such as education, work, care or leisure may also offer contact opportunities, thus providing the interaction with the receiving society deemed necessary for integration. This paper will focus on the relation between contact opportunities with natives in the residential neighbourhood on the one hand, and school or work on the other. It will answer questions like: Which immigrants are vulnerable to accumulation of lack of contact with native Dutch? And to which immigrants do schools and workplaces offer additional contact opportunities? In the next section we will first provide a background on the distribution of immigrant and native populations in the Netherlands. Next, we will explore the importance of contact for social integration and provide a brief outline of research on contact between immigrants and natives. These sections are followed by a discussion of the data and analytical approach adopted in this paper. Next, the contact opportunities of secondary school pupils of non-western descent are discussed, followed by a section on contact opportunities of employees. Finally, the concluding section will compare the results for education and work, elaborating differences and similarities where possible and highlighting their relevance to neighbourhood mix policies.

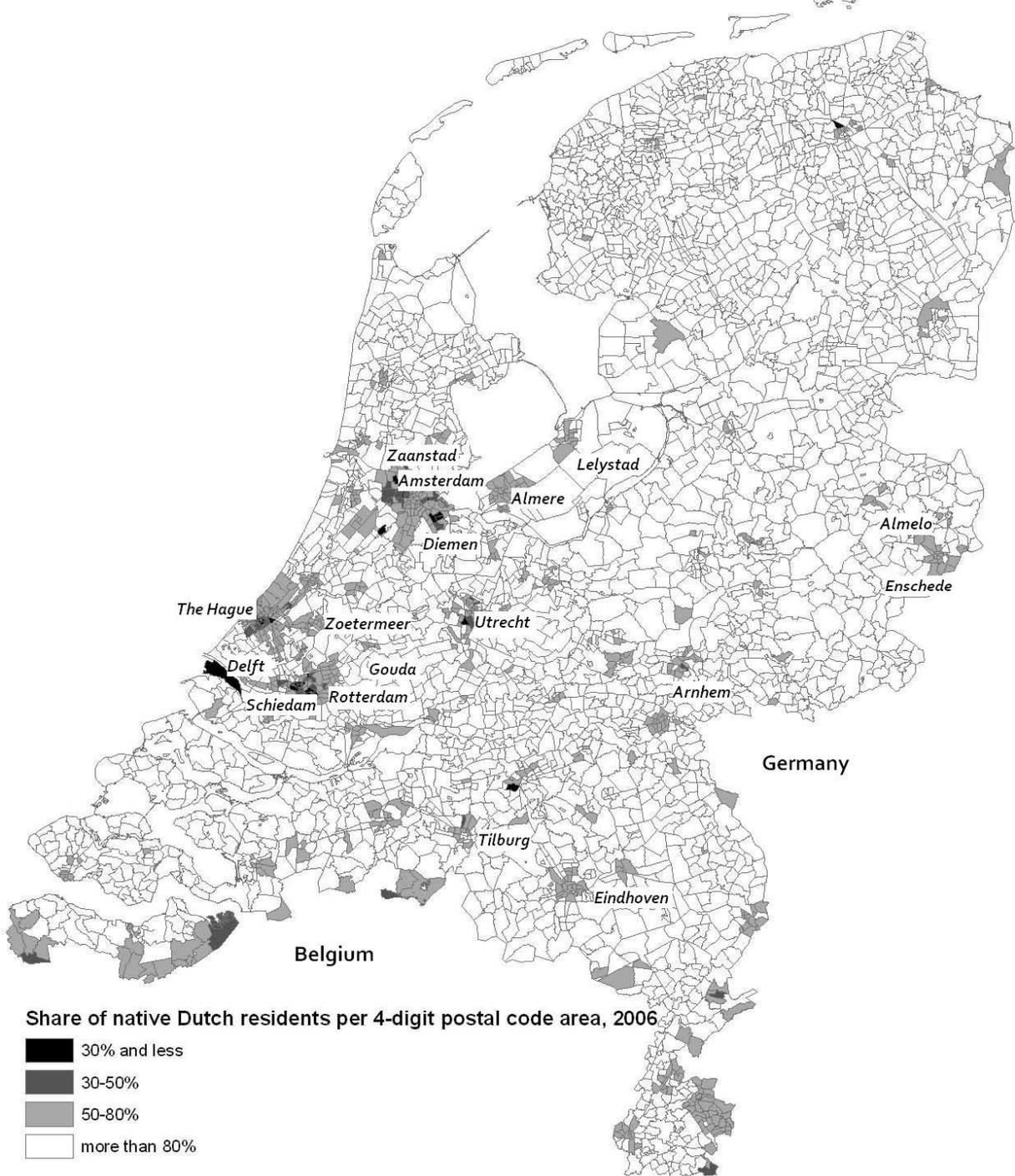
Geographical distribution of immigrant and native populations

The Netherlands had been accustomed to the exchange of residents with other (western) countries for a good length of time, when the strong economic developments of the 1960s started attracting successive waves of immigrants from Mediterranean countries; residents from former colonies followed these groups in the 1970s, asylum seekers in the 1980s, while residents from the new European member states followed more recently. The numbers and shares of immigrant populations have grown both by the attraction of other immigrants from their home countries, by family formation and in some cases also by relatively high levels of fertility.

At present, almost 20 percent of the Dutch population is composed of first and second generation immigrants from both western and non-western origin. Rather more than half of these immigrants are of non-western descent, including the four largest groups from Turkey, Morocco, Surinam and

the Antilles (including Aruba). The shares of second generation immigrants vary from well over 40 percent for non-western immigrants to almost 60 percent for western immigrants.

Figure 1 Share of native Dutch population per 4-digit postal code area



Immigrants are not spread evenly across the country. Western immigrants are concentrated in the border regions to the south and east of the Netherlands and in the areas in and around the cities of The Hague and Amsterdam. Non-western immigrants, on the other hand, were often attracted to the main economic urban areas in the western part of the country. In particular to Rotterdam, Amsterdam and The Hague where, at present, over 1 in 3 residents is of non-western origin (first and second generation). Other popular cities include Utrecht and (former) industrial areas like Arnhem,

Enschede and Almelo in the (mid-)East and Eindhoven and Tilburg in the mid-South. In these areas the shares of non-western immigrants presently amount to 13 to 20 percent.

The initial process of concentration was accelerated by a selective suburbanization of natives. Non-western immigrants are, however, increasingly making their way into suburbia (Kullberg et al. 2009, De Groot 2004). As a consequence, suburbs and (former) new towns like Almere, Diemen and Schiedam, (23 to 26 percent of non-western immigrants), Lelystad, Zaanstad, Capelle aan de IJssel, Vlaardingen, Dordrecht, Maassluis and Delft (16 to 18 percent) and Zoetermeer and Gouda (14 to 15 percent) now also have above average shares of non-western immigrants.

Since we are interested in the contact opportunities of (non-western) immigrants with native Dutch population, figure 1 shows the share of native Dutch residents per (4-digit) postal code area in the Netherlands. Clearly, the presence of (western) immigrants pushes down the share of natives in the border regions, particularly in the south. In other areas with lower shares of native Dutch residents, non-western immigrants are often 'responsible', whether or not in combination with western immigrants.

Social integration and contact

Integration in a sociological context refers to stable, cooperative relations within a clearly defined system. In addition, it can also be viewed as a process of strengthening these relations, and of introducing new actors and groups into the system and its institutions. Bosswick & Heckman (2006) suggest that the integration of immigrants should be understood as a reciprocal process, with consequences for both migrants and the receiving society. It comprises four basic forms of social integration, including socialisation, placement, interaction and identification. Others distinguish between the socio-economic and socio-cultural integration of immigrants (Musterd and Ostendorf 2007), the first referring to social mobility and the educational and employment situation of immigrants, while the latter is often measured in terms of interethnic contact, language skills and the adaptation of the values of the receiving country (e.g. opinions on gender roles).

Evidently, contact between immigrants and natives is key to all types of social integration since contact is key to the exchange of views and capital between people. However, the effects of diversity and interethnic contact on integration are not undisputed. According to the *contact hypothesis*, contact between immigrants and natives will lead to social integration because contact lead to mutual trust (see Putnam (2007) for a discussion of this theory). In continuation of this theory, the *isolation theory* assumes that when immigrants live in concentration neighbourhoods and have less contact with natives, this will impede their social integration (see Van der Laan Bouma-Doff (2007) for a discussion).

These views are challenged by two other theories claiming that not all contact has positive effects. According to the *conflict theory*, diversity fosters out-group distrust and in-group solidarity (see Putnam (2007) for an outline). Putnam (2007) finally, challenges the idea common to the other theories that in-group and out-group ties are negatively correlated. Or, as Putnam puts it, high bonding between people who are alike, may well be compatible with high bridging between people who are unlike each other, and low bonding with low bridging. Taking this one step further, Putnam (2007) stretches the theoretical playing field by proposing the *constrict theory*, the concept of diversity reducing in- and out-group trust simultaneously, at least in the short run. He also produces some initial evidence for the USA. Lancee and Dronkers (2008) reproduce some of his findings for the Netherlands.

Contact in education, work, caring and leisure research

Notwithstanding the above-mentioned contradicting views, ultimately bridging contact between immigrant and native populations is vital to the integration of immigrants. It is 'simply' a matter of preserving the positive effects while trying to avoid the negative. Or, working towards bridging as well as bonding, to put it in Putnam's vocabulary. Hence, this paper does not challenge the importance of contact. Nor does it elaborate on the (circumstances under which) contact will lead to positive or negative effects. This paper does, however, challenge the emphasis on residential neighbourhoods common to the large majority of literature on concentration, segregation and integration. Immigrants (and natives) often do not solely depend on their residential neighbourhood for contact. Other activities such as education, work, care or leisure may also provide contact opportunities. According to Hartgers (2008), *education* is key to integration. In addition to providing the knowledge and skills required for the labour market, education also advances the socio-cultural integration of immigrants, both by the teaching package and by 'exposing' pupils with varying cultural backgrounds to each other. Uytterlinde et al. (2007) emphasises the importance of teaching professionals who are trained to support the bridging and bonding processes between pupils and who can act as an intermediary. With regard to education research in the Netherlands, there are several studies comparing the ethnic composition of schools to that of the surrounding neighbourhood. About 8 percent of all primary and secondary schools in the Netherlands have at least a 50 percent share of non-western pupils, the majority of which can be found in the four largest cities (Hartgers 2008). In terms of segregation, 63 percent of all primary schools in 38 larger cities mirror the 'colour' of the surrounding neighbourhood, that is to say that the shares of non-western immigrants deviate less than 10 percent points; 17 percent of these schools are too 'white' while 20 percent are too 'black' compared to their neighbourhood (Wolfgram 2009).

The literature on *caring* activities mainly focuses on differences between population segments in the distribution of caring activities, for instance between family members. Merens and Keuzenkamp (2008) found that first generation Turkish and Moroccan woman spend more time on the housekeeping because they have more traditional views on the division of labour between men and women, and because they live in households with children more often. These studies, however, do not focus on (the consequences for) contact opportunities during these activities. In the field of *leisure* activities, much attention is paid to ethnic differences in the participation in leisure activities (e.g. Van den Broek 2008) and to the extent to which immigrants have contact with natives (and vice versa) during leisure activities (e.g. Van den Broek & Van Ingen 2008, Van der Laan Bouma-Doff 2007). Another paper presented in this workshop belongs to this line of work.

With regard to *work*, the majority of research concentrates on the employment situation of immigrants, although there is also some interest in the ethnic composition of the shop floor, including the over- or underrepresentation of population segments in certain sectors (Lautenbach et al. 2008). To date, research on concentration in work and education has compared the ethnic composition of enterprises and schools and that of the surrounding neighbourhoods at the aggregate level. What is lacking is a focus on individuals: do residents of concentration areas also lack contact opportunities with natives at work or school? And who are vulnerable to topping one contact poor environment on top of the other while others are able to 'escape' the immigrant communities?

Data and analytical strategy

In the literature on integration and segregation, the share of non-western immigrants is often used as a key indicator. Since we are interested in contact of non-western immigrants with native Dutch in the neighbourhood or at school or work, we use the *share of native Dutch residents, pupils or employees* as key indicators for contact opportunities of immigrants.

Following the definition of Statistics Netherlands, an individual is an immigrant when at least one parent was born outside the Netherlands. Immigrants who migrated to the Netherlands themselves belong to the first generation, while immigrants who were born in the Netherlands are part of the second generation. Immigrants from Turkey, Africa, Latin-America or Asia (excluding Indonesia and Japan) are called non-western immigrants, while others belong to the western immigrants. In principle, the distinction between western and non-western immigrants is based on the mothers' birthplace. In our analysis we will focus on non-western immigrants and further distinguish between Turkish, Moroccan, Surinamese, Antillean (including Aruban) and other non-western immigrants.

Neighbourhoods are defined as 4-digit postal code areas (postal codes in the Netherlands consist of four digits followed by two uppercase letters). Evidently, these areas are administrative rather than functional. However, since a lot of data is available on these areas, they are often used to define neighbourhoods. In this paper, for instance, we use the share of native Dutch residents based on the Municipal population records (produced by Statistics Netherlands).

The analyses on education are based on the Enrolment data on Secondary Education pupils 2005-2006 (*Basisregistratie Onderwijsnummers Voorgezet Onderwijs 2005-2006*; SE0506), made available by Statistics Netherlands. Secondary education encompasses schools providing pre-university education (VWO; 6 years), senior general secondary education (HAVO; 5 years) and pre-vocational secondary education (VMBO; 4 years); in case of the latter, we distinguish between the more practical (VMBO-bk) and the more theoretical (VMBO-gt) levels. The SE0506-data contain 912,601 pupils, 906,807 (99.4 percent) of which were linked to data on the characteristics of the pupils (based on the Municipal population records), their residential neighbourhood (in particular the share of native Dutch residents) and their (branch) school (including the share of native Dutch pupils). Almost 80 percent of the SE-pupils are native Dutch, 14 percent are non-western immigrants and less than 7 percent are western immigrants.

The analysis on work are based on the Social-Statistical Database on Work 2005 (*Sociaal Statistisch Bestand Banen*; SSDW-05), provided by Statistics Netherlands. Approximately one million self-employed or freelance workers, often working in businesses of one or two, are thus excluded. The SSDW-05 is an integral database containing 7,327,536 employees in the Netherlands, 7,186,183 (98.1 percent) of which were linked to individual characteristics (based on the Municipal population records), their residential neighbourhood and to the public service or private enterprise by which they are employed (see definition). About 84 percent of all Dutch employees are native Dutch, 8 percent are of non-western origin and another 8 percent of western descent. The employees' workplaces are clustered into the following sectors: agriculture, industry, retail, logistics, public services, health care and commercial services.

Definition: Branch school vs. workplace

A school or organisation may have several branches. We aim to execute the analysis at the level of these branches, since this is where pupils or workers meet each other. For pupils, all analyses are at the level of the branch school. For employees, we only have information on the employee's organisation and on the municipality in which the employee is stationed. When an organisation has more than one branch within a municipality, the 'average share of native Dutch co-workers at the workplace' refers to the aggregate level of these branches within a municipality.

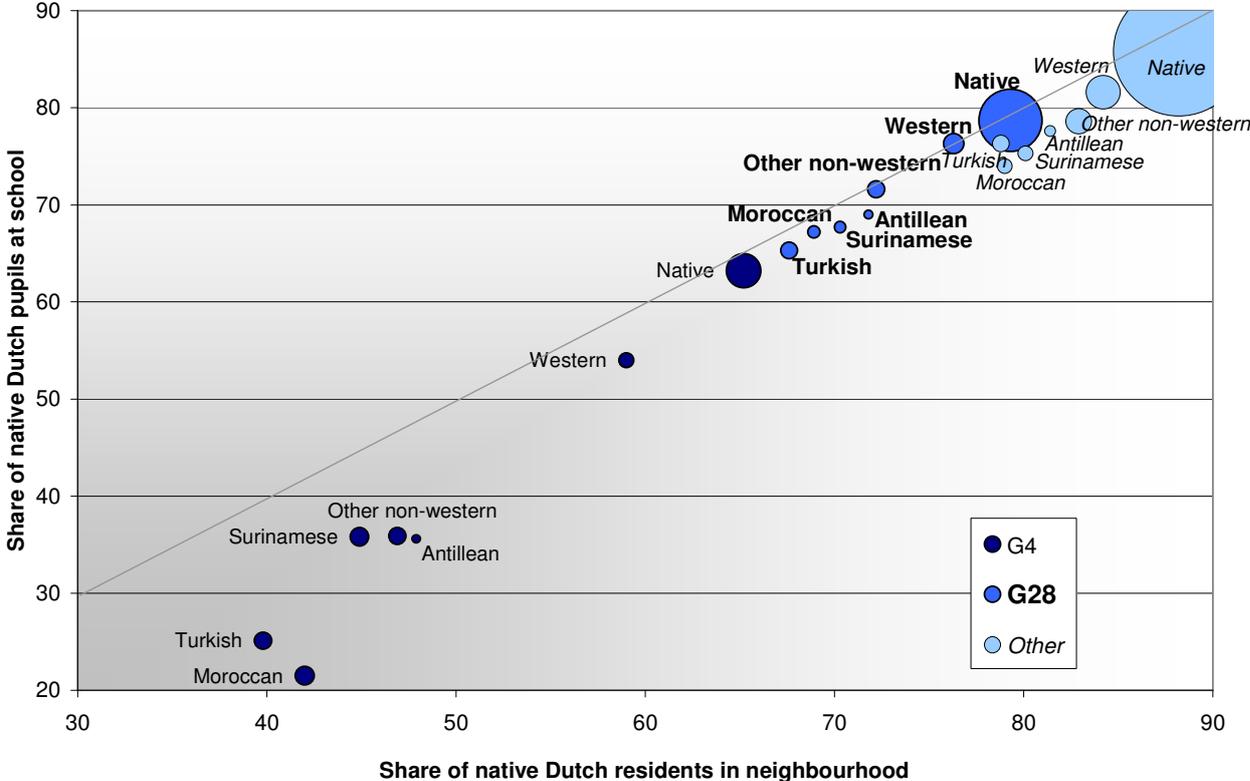
The shares of native Dutch residents, pupils and employees are used both as continuous variables and as categorical variables, including four categories ranging from less than 30 percent native Dutch ('very low'), 30 to 50 percent ('low'), 50 to 80 percent ('less than average') and at least 80

percent ('above average'). Furthermore, since the shares of native Dutch and immigrant populations vary considerably across the Netherlands (see figure 1), the analyses distinguish between cities according to size: the four largest and more ethnically concentrated cities Amsterdam, Rotterdam, The Hague and Utrecht (known as the G4), the remaining 27 cities and towns of the Large Cities Policy, supplemented with Almere (indicated by G28) and the remaining smaller towns (indicated by 'other').

Contact opportunities of secondary education pupils

For the average secondary school pupil, the share of native pupils at school is lower than the share of native Dutch residents in the neighbourhood. This applies to the population at large (79% vs. 82%), as well as to all ethnic population segments in each cluster of cities (see figure 2).

Figure 2 The share of native Dutch in the neighbourhood and at school for secondary education pupils, according to ethnic background and cluster of cities (the size of the circle is indicative of the number of pupils; N = 906,807)



In the four largest cities (G4), the averages are lower than those in the G28 and in the other cities and towns. Similarly, the averages for non-western immigrant pupils within each cluster of cities are systematically lower than those for western immigrants and native Dutch pupils within the same cluster. In the G28 and in the other cities and towns, the groups are all just below the line where the average of the neighbourhood equates that of the pupil's school. Hence, the contact opportunities with native Dutch at school are, on average, a bit lower than those in the neighbourhood. In the four largest cities, on the other hand, the immigrant groups drift away from this line. Both at school and in the neighbourhood, these immigrant pupils have very few contact opportunities with native Dutch. In addition, the contact opportunities at school are substantially lower than a linear relationship between these contact opportunities would imply. In the G4, for instance, Turkish and Moroccan pupils, an average live in neighbourhoods with 40 to 42 percent native Dutch residents, whilst going to schools with 20 to 25 percent native Dutch pupils.

At the national level, the Pearson correlation coefficient between the shares of natives in the neighbourhood and at school is very strong (0.73; $p = 0.00$; $N = 906,807$). A large part of this correlation should be attributed to the differences between (the clusters of) cities. But even controlled for this variable, the partial correlation coefficient still amounts to 0.50. Table 1 describes the relationship between the average share of native pupils at school and the average share of native residents in neighbourhood of secondary school pupils for various immigrant and native groups and within the clusters of cities using simple OLS linear regressions. The share of native Dutch pupils at the pupil's school is described by an intercept (B_0) and a slope parameter (B_1) for the share of native Dutch residents in the pupil's neighbourhood (see reservation). The intercept indicates the predicted share of native Dutch pupils at school in case the share of native Dutch residents in the pupil's neighbourhood equals 0. This intercept varies from -14 percent for Moroccan pupils to 44 percent for western pupils with the G28. In general, the intercept values for native Dutch and western pupils and for pupils in the G28 are higher.

Table 1 Simple linear regressions of the share of native residents in neighbourhood of secondary education pupils onto the share of native pupils at school for various ethnic groups and/or clusters of cities: intercepts (B_0), slopes (B_1) and explained variances (R^2); all coefficients $p = 0,00$; 2005-2006

	G4			G28			Other			Total NL		
	B_0	B_1	R^2	B_0	B_1	R^2	B_0	B_1	R^2	B_0	B_1	R^2
Native pupils	37.0	0.40	0.10	43.5	0.45	0.14	35.6	0.57	0.20	27.4	0.66	0.32
Western imm.	17.8	0.62	0.20	43.8	0.43	0.12	43.5	0.45	0.13	19.4	0.73	0.36
N.-western imm.	8.37	0.49	0.14	32.8	0.51	0.13	25.8	0.63	0.15	-4.64	0.96	0.52
Of which Turks	10.5	0.37	0.08	36.0	0.43	0.09	26.7	0.63	0.15	-4.71	0.97	0.51
Moroccans	5.64	0.38	0.09	35.0	0.47	0.08	26.6	0.60	0.11	-14.4	1.04	0.53
Surninamese	15.1	0.46	0.13	30.5	0.53	0.16	20.1	0.69	0.16	3.74	0.83	0.45
Antillean	5.47	0.64	0.23	26.0	0.56	0.18	17.6	0.73	0.23	-3.04	0.96	0.53
other	9.31	0.57	0.17	35.8	0.50	0.13	30.0	0.59	0.14	1.44	0.91	0.49
Total	4.80	0.76	0.30	34.8	0.54	0.19	31.0	0.62	0.22	5.48	0.90	0.53

Reservation

Theoretically, a multilevel regression model should be used since pupils are clustered into schools. This would also provide the opportunity to control for other individual, neighbourhood and school characteristics. Unfortunately, however, the structure of this model deviates from multilevel regression models in two important ways. First, the neighbourhood and school levels are not purely hierarchical: a single school may contain pupils from many neighbourhoods and different children from any one neighbourhood may attend several different schools. The consequences of ignoring an important cross-classification are similar to those of ignoring an important hierarchical classification (Rasbash et al. 2005). On top of that, the dependent variable is not at the individual level, but at that of the school. To date, model structures incorporating both cross-classified structures and higher-level dependent variables have only been explored theoretically.

The slope parameters for the share of native Dutch residents indicate the change in the share of native pupils at school when the share of native residents in the pupil's neighbourhood increases by one percent point. In the model for Moroccan pupils mentioned above, for instance, this slope equals one, indicating the shares of native Dutch run up equally. The slopes in the models for the various populations *within* the three clusters are, however, less steep. Hence, at the level of (groups of) cities, the shares of native Dutch pupils and native Dutch residents do not run up equally. This means that an increase in the share native Dutch residents in the neighbourhood does not result in an equal rise in the share of native Dutch pupils at the pupil's school, in particular for the Turkish and Moroccan pupils in the G4 and G28 since they have the lowest slope parameters.

Overall, the relationship between contact opportunities in the neighbourhood and at school is the strongest for Antillean and the weakest for Turkish and Moroccan pupils (see also the R^2 -values that express the share of variance in the contact opportunities at school that is explained by the contact opportunities in the neighbourhood). In combination with low intercepts, in particular for Turkish and Moroccan pupils in the four largest cities, this leads to the conclusion that in general these pupils have less contact opportunities with native Dutch pupils, even when they live in neighbourhoods with more (contact opportunities with) native Dutch residents.

Table 2 Pupils in secondary education with few contact opportunities (less than 50 percent native Dutch) in their neighbourhood and/or at school [% of pupils and total numbers]

	Neighbourhood and school	Neighbourhood only	School only	other	N
G4	31.8	9.4	19.3	39.4	92,564
<i>Turkish and Moroccan</i>	64.5	6.7	21.5	7.2	21,973
- VMBO b/k*	68.4	4.1	24.0	3.5	5,223
- HAVO or VWO*	57.7	11.0	18.1	13.1	3,759
<i>Other non-western</i>	46.2	10.6	21.7	21.5	24,117
- VMBO b/k*	56.0	7.6	24.5	12.0	4,766
- HAVO or VWO*	35.7	13.5	17.8	33.0	5,865
<i>Western</i>	17.5	11.4	19.0	52.1	7,405
- VMBO b/k*	32.3	12.4	24.6	30.7	696
- HAVO or VWO*	11.3	11.0	15.4	62.3	3,021
<i>Native Dutch</i>	7.4	9.7	16.7	66.2	39,069
- VMBO b/k*	12.2	12.9	23.1	51.8	4,622
- HAVO or VWO*	5.4	8.4	14.0	72.2	14,158
Outside G4	0.1	0.3	1.5	98.1	814,243
<i>Non-western</i>	0.5	1.8	7.1	90.6	82,133
- VMBO b/k*	0.9	2.2	12.9	84.1	15,530
- HAVO or VWO*	0.1	1.6	3.0	95.3	19,559
<i>Western</i>	0.0	0.6	2.0	97.4	51,687
- VMBO b/k*	0.1	0.8	4.2	94.9	6,171
- HAVO or VWO*	0.0	0.5	1.2	98.3	18,659
<i>Native Dutch</i>	0.0	0.1	0.8	99.0	680,423
- VMBO b/k*	0.0	0.2	2.1	97.7	86,223
- HAVO or VWO*	0.0	0.1	0.5	99.4	226,796
Total	3.3	1.2	3.4	92.1	906,807

* Excluding the first two school years (a period of basic secondary education)

In search of the immigrant pupils that are vulnerable to topping one contact poor environment on top of the other, three additional variables were tested including gender, generation and education level (other socio-economic characteristics such as household income or religious beliefs are not available). Using simple cross table calculations, only the latter variable proved to be distinguishing. Non-western immigrants, Turkish and Moroccan in particular, are in the practical pre-vocational secondary education (VMBO b/k) more often, whilst native Dutch pupils are in senior general secondary (HAVO) or pre-university (VWO) education (see also Hartgers 2008). As a consequence,

schools offering practical pre-vocational training frequently offer less contact opportunities with native Dutch pupils than the other secondary schools.

Table 3 Contact opportunities of secondary education pupils at school compared to their neighbourhood [% of pupils and total numbers]

	Much less	Less	Equal	More	Much more	N
G4, ≤ 50% natives in neighbourhood	25.0	18.6	27.7	13.1	15.6	38,168
<i>Turkish and Moroccan</i>	34.9	22.4	28.1	7.3	7.4	15,648
- VMBO b/k**	42.2	26.9	22.9	3.8	4.2	3,787
- HAVO or VWO**	27.1	19.6	30.7	9.9	12.7	2,583
<i>Other non-western</i>	23.7	20.0	28.2	14.7	13.4	13,690
- VMBO b/k**	31.5	26.8	31.1	9.3	9.2	3,029
- HAVO or VWO**	17.9	15.4	27.7	19.9	19.1	2,887
<i>Western</i>	16.5	14.5	26.8	18.3	23.8	2,140
- VMBO b/k**	28.0	24.1	18.0	7.7	22.2	311
- HAVO or VWO**	11.4	10.0	27.0	24.8	26.7	673
<i>Native Dutch</i>	7.3	8.3	26.1	21.6	36.7	6,690
- VMBO b/k**	13.7	15.9	17.1	12.6	40.7	1,160
- HAVO or VWO**	4.4	4.7	27.3	28.0	35.6	1,948
G4, other	23.0	20.3	42.3	12.9	1.5	54,396
Outside G4, ≤ 50% natives in neighbourhood	6.4	5.0	6.8	44.7	37.1	3,077
<i>Non-western</i>	9.4	7.5	8.7	50.6	23.8	1,886
- VMBO b/k**	11.6	13.5	9.7	55.6	9.7	475
- HAVO or VWO**	4.3	0.3	6.5	45.7	43.2	322
<i>Western</i>	1.9	1.2	5.3	27.0	64.6	322
- VMBO b/k**	1.9	3.7	7.4	31.5	55.6	54
- HAVO or VWO**	2.2	0.0	3.3	23.9	70.7	92
<i>Native Dutch</i>	1.4	1.2	3.2	38.3	55.9	869
- VMBO b/k**	1.9	4.4	6.3	45.9	41.5	159
- HAVO or VWO**	0.0	0.0	0.9	33.2	66.0	235
Outside G4, other	2.4	12.7	77.7	6.8	0.4	811,166
Total	4.6	13.4	73.2	7.6	1.2	906,807

* *Equal* refers to a difference between the two shares of less than 10 percent points; *Less/more* refers to a deviation of 10 to 25 percent points; and *much less/more* refers to a difference of at least 25 percent points.

** Excluding the first two school years (a period of basic secondary education)

Table 2 breaks down the total population into groups that are most and least vulnerable to accumulating contact poor environments. In order to reduce the size of this table, only the most important groups are presented. Over 3 percent of the pupils in secondary education simultaneously live and learn in environments with poor contact opportunities with native Dutch. These pupils are concentrated in the four larger cities, in particular among Turkish and Moroccan pupils in practical pre-vocational training. About 68 percent of these pupils have

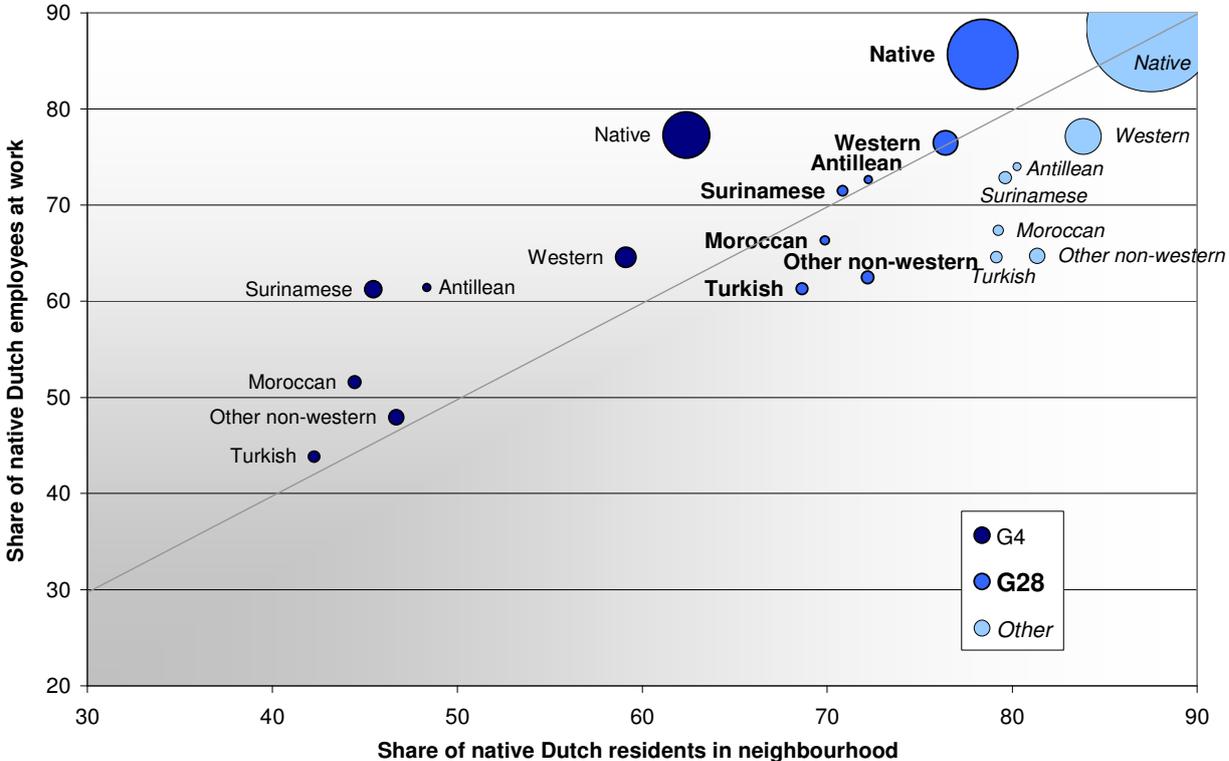
few contact opportunities with native Dutch in both the residential and the educational environment.

Table 3, finally, shows which pupils have more less, equal or more contact opportunities with native Dutch at school compared to the residential neighbourhood. Overall, the share of pupils that benefit from the school environment in terms of having (much) more contact opportunities amounts to less than 9 percent. For neighbourhoods with few contact opportunities these shares amount to 29 percent in the G4 and 82 percent outside these four cities. The majority of these pupils are, however, native Dutch since only 15 percent of the Turkish and Moroccan and 28 percent of the other non-western immigrants in contact poor neighbourhoods in the G4 visit schools that have more contact opportunities (against 58 percent of their native Dutch peers); outside the G4, 74 percent of the non-western pupils in contact poor environments go to schools with more contact opportunities (against 94 percent of their native Dutch peers).

Contact opportunities of employees

For employees, the average share of native Dutch colleagues at work amounts to 84 percent while the average share of Dutch residents in their neighbourhood totals 81 percent. Hence, on average, employees have more contact opportunities at work than in the neighbourhood. For non-western immigrant workers, however, contact opportunities at work (61 percent) are lower than in their neighbourhood (64 percent). Figure 3 demonstrates that this only applies to Turkish, Moroccan and other non-western employees in the G28 and all groups in other parts of the Netherlands. Hence, the groups that are in need of additional contact opportunities most, i.c. non-western immigrants in the G4, do indeed profit from the opportunities offered by the workplace.

Figure 3 The share of native Dutch in the neighbourhood and at work for employees, according to ethnic background and clusters of cities (the size of the circle is indicative of the number of employees; N = 7,186,180)



At the national level, there is a positive correlation between contact opportunities in the neighbourhood and at work; the Pearson correlation coefficient amounts to 0.43 ($p = 0.00$; $N = 7,186,183$). Yet, this correlation is much lower than that for secondary education pupils. Similar to table 1, table 4 breaks down the relation between the share of native Dutch at the workplace and that in the neighbourhood for various ethnic groups and clusters of cities using simple OLS regression (see reservation). The intercepts (B_0) indicate the share of native Dutch colleagues at work in case the share of native Dutch residents in the neighbourhood would equal zero. This share varies from 28 percent for employees of Turkish origin, to almost 70 percent for native Dutch employees in the four largest cities and the G28. In general, the intercepts are higher for native Dutch employees and lower for Turkish, Moroccan and other non-western employees.

The slope parameters (B_1) indicate the increase in the share of native Dutch employees at work when the share of native Dutch residents in the neighbourhood is raised by one percent point. In contrast to the analyses for education, the results show that the slopes for the national models are not much steeper than those for the three distinguished regions. In combination with the relatively high intercepts, the mild slopes indicate a rather weak relationship between the shares of native Dutch at work and in the neighbourhood, even at the national level. The rather low R^2 - values confirm this. At the national level, the R^2 vary from 6 to 18 percent. This is substantially lower than the national models for education. The R^2 -values for the cluster models (G4, G28 and other) are even lower. Apparently, for work, other (selection) mechanism are at work at all levels.

Table 4 Simple linear regressions of the average share of native residents in the employee's neighbourhood onto the average share of native employees at the workplace for various ethnic groups and/or clusters of cities: intercepts (B_0), slopes (B_1) and explained variances (R^2); all coefficients $p = 0,00$; 2005

	G4			G28			Other			Total NL		
	B_0	B_1	R^2	B_0	B_1	R^2	B_0	B_1	R^2	B_0	B_1	R^2
Native employees	69,3	0,13	0,02	70,0	0,2	0,03	56,1	0,37	0,07	59,2	0,33	0,11
Western imm.	53,0	0,2	0,02	58,6	0,23	0,01	49,9	0,32	0,02	46,7	0,36	0,06
N.-western imm.	44,1	0,21	0,02	42,4	0,33	0,02	40,2	0,34	0,02	39,6	0,34	0,08
Of which Turks	32,8	0,26	0,02	38,3	0,34	0,02	37,9	0,34	0,01	27,5	0,46	0,1
Moroccans	44,6	0,16	0,01	49,8	0,24	0,01	48,8	0,23	0,01	38,2	0,36	0,08
Surinamese	54,7	0,14	0,02	50,7	0,29	0,03	45,4	0,34	0,03	50,6	0,27	0,08
Antillean	52,7	0,18	0,03	54,4	0,28	0,02	42,4	0,39	0,04	47,7	0,32	0,09
other	35,9	0,26	0,03	36,2	0,36	0,02	30,0	0,43	0,02	30,8	0,41	0,09
Total	48,7	0,36	0,09	55,3	0,36	0,05	44,8	0,48	0,08	44,1	0,49	0,18

Table 5 first provides an insight into the volume and composition of the (immigrant) working population that accumulates contact poor working and residential environments. Subsequently, table 6 identifies the number of immigrant employees in neighbourhoods with few contact opportunities that benefit from having a job in terms of increasing their contact opportunities with native Dutch. Both tables focus on the characteristics that are most relevant to differences within the immigrant working population, including the clusters of cities, ethnic background, sector and generation. To reduce the size of the table, only the most relevant categories are presented.

Figure 3 has already shown us that, on average, Surinamese and Antillean employees have better contact opportunities, both at the workplace and in the neighbourhood. The other non-western immigrants, including employees from Turkish and Moroccan origin, have less contact opportunities, in particular in the four largest cities. In addition, first generation immigrant employees have a less favourable position in housing and work. Within the G4, over 17 percent first generation immigrant employees from Surinamese or Antillean decent and almost 34 percent of the

other first generation non-western immigrants top one contact poor environment on top of the other. Outside these four cities, this applies to less than one percent of the first generation immigrant employees of non-western origin.

Table 5 Employees with few contact opportunities (less than 50 percent native Dutch) in their neighbourhood and/or at the workplace [% of employees and total numbers]

	Neighbourhood and workplace	Neighbourhood only	Work only	other	N
G4	8.3	24	6.9	60.7	892,067
<i>Surinamese & Antillean</i>	16.0	41.4	8.5	34.1	95,476
- retail	33.4	27.2	17.7	21.6	14,575
- public s. & health	11.7	46.0	5.2	37	35,248
- 1 ^{rst} generation	17.0	42.9	8	32.1	72,801
<i>Other non-western</i>	31.7	30.7	14.6	23	135,001
- retail	47.0	18.2	22.1	12.7	43,403
- public s. & health	15.4	43.4	6.3	34.9	25,934
- 1 ^{rst} generation	33.9	29.4	15.4	21.2	103,421
<i>Western</i>	6.5	20.1	13.5	60	108,847
<i>Native Dutch</i>	1.7	20.2	3.4	74.7	552,742
Outside G4	0.0	0.3	2.2	97.4	6,294,116
<i>Non-western</i>	0.6	1.5	17.5	80.4	333,848
- retail	1,0	1.3	33.5	64.2	77,390
- public s. & health	0.1	1.7	4.2	94	69,833
- 1 ^{rst} generation	0.7	1.6	19.0	78.8	248,706
<i>Western</i>	0.1	0.5	6.9	92.6	487,211
<i>Native Dutch</i>	0.0	0.2	0.9	98.9	5,473,055
Total	1.1	3.2	2.8	92.9	7,186,183

Non-western immigrant employees are overrepresented in the retail sector. In particular Turkish and Moroccan and 'other' immigrants in the four largest cities working in these sectors live and work in environments with few contact opportunities. Within this population, almost 47 percent of the employees live and work in a setting with less than 50 percent native Dutch. On the other hand, non-western immigrants working in the public sector and in health care have the best compensatory contact opportunities, at least in part due to the underrepresentation of immigrant employees in these sectors.

Compared to the residential neighbourhood, about 26 percent of all employees have (much) more contact opportunities at work. In the G4, almost 77 percent of employees living in contact poor neighbourhoods have (much) more contact opportunities at work. Although this applies more to the native Dutch employees (92 percent), Surinamese and Antillean (78 percent) and other non-western (55 percent) immigrant employees from these neighbourhoods also enjoy better contact opportunities at work, even when they belong to the first generation (78 and 53 percent respectively) or work in the retail sector (55 and 36 percent respectively). The same situation is found outside the G4.

Table 6 Contact opportunities of employees at work compared to their neighbourhood [% of pupils and total numbers]

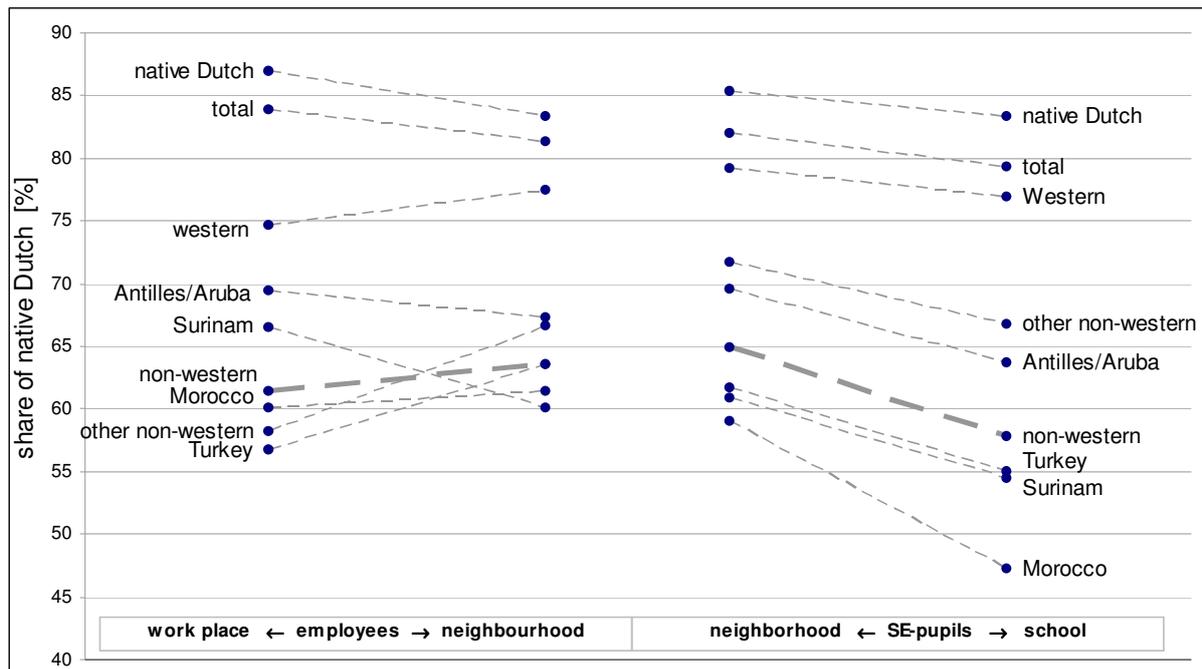
	Much less	Less	Equal	More	Much more	N
G4, ≤ 50% natives in neighbourhood	5.0	6.1	11.9	16.6	60.3	288,702
<i>Surinamese & Antillean</i>	3.1	5.3	13.3	19.5	58.9	54,850
- retail	7.7	14.2	22.9	21.6	33.7	8,840
- public s. & health	1.3	2.1	10.0	19.5	67.1	20,348
..- 1 st generation	3.1	5.5	13.1	19.0	59.5	43,597
<i>Other non-western</i>	13.1	13.6	18.3	17.1	37.9	84,199
- retail	17.1	21.2	25.6	15.9	20.1	28,304
- public s. & health	2.6	3.1	12.3	21.9	60.1	15,236
..- 1 st generation	14.0	15	18.5	16.5	36.0	65,558
<i>Western</i>	5.3	5.9	12.9	17.7	58.2	28,914
<i>Native Dutch</i>	0.3	1.3	6.6	14.8	77.1	120,739
G4, other	7.3	9.1	38.4	33.3	11.9	603,365
Outside G4, ≤ 50% natives in neighbourhood	4.9	3.3	7.4	14.3	70.2	21,100
<i>Non-western</i>	12.5	7.4	13.9	21.6	44.6	7,051
- retail	19.1	15.1	13.1	24.9	27.8	1,730
- public s. & health	1.2	1.0	5.5	13.1	79.1	1,242
..- 1 st generation	12.8	8.3	14.1	21.7	43.1	5,590
<i>Western</i>	4.7	2.9	8.0	16.8	67.7	2,690
<i>Native Dutch</i>	0.1	0.8	3.1	0.9	86.7	11,359
Outside G4, other	4.0	9.7	64.9	18.9	2.4	6,273,016
Total	4.4	9.5	60.4	20	5.7	7,186,183

* *Equal* refers to a difference between the two shares of less than 10 percent points; *Less/more* refers to a difference of 10 to 25 percent points; and *much less/more* refers to a difference of at least 25 percent points.

Conclusion and discussion

At the outset, this paper coined the idea that social mix policies may be redundant because other activities may also provide the contact opportunities that are important to the integration of (non-western) immigrants. Analyses were conducted at the individual level by relating the contact opportunities of secondary education pupils and employees in their neighbourhood to those at their (branch) schools and workplaces respectively. On average, the workplace offers more contact opportunities to most non-western immigrant workers in the G4 and G28 where ethnic concentration is relatively high. Outside these areas contact opportunities at work are lower compared to those in the neighbourhood. Contact opportunities at school are lower than those in the neighbourhood for all clusters of cities and ethnic groups. Figure 4 recapitulates these results. In part, these results are explained by the fact that native Dutch residents are, on average, older than non-western immigrants. Hence, native Dutch are underrepresented at schools. In addition, they are overrepresented in the working population due to lower levels of unemployment and higher levels of working women (Van den Broek & Keuzenkamp 2008).

Figure 4 Average share of native Dutch at work, school and in the neighbourhood for employees and secondary education pupils according to native country



The correlation between the share of native Dutch in the neighbourhood and that at school is substantially higher than that for employees. In part this is explained by the fact that 63 percent of the secondary education pupils go to school within their own hometown. For workers this share amounts to 45 percent. This warrants the conclusion that increasing the mix of native and immigrant population in the neighbourhood, will not (directly) increase the mix at work. At the same time, the weak relationship between the contact opportunities at work and the neighbourhood offers the opportunity of counterbalancing the lack contact opportunities with native Dutch in one environment with those in another. Indeed, in the four largest cities, 55 to 78 percent of non-western immigrant employees living in contact poor neighbourhoods have (much) more contact opportunities at work. Outside these cities, this share amounts to 66 percent. For education, the compensatory potential is much lower, in particular in the four largest cities where only 15 to 28 percent of the non-western secondary education pupils living in contact poor neighbourhoods have better contact opportunities at school.

In summary, it can be concluded that neighbourhood mix policies are redundant for the contact opportunities of most immigrant employees with native Dutch but vital to the younger generations that are still in school. Turkish and Moroccan pupils in practical pre-vocational training and living in the four largest cities prove to be most vulnerable to topping one contact poor environment on top of the other. Our analyses do not, however, draw for a final verdict on the need for social mix policies. First, only two activities were examined. Other activities such as leisure or caring may also provide contact opportunities. In addition, only secondary education and employees were examined. With regard to education, our conclusions are probably too feeble since concentration and segregation in primary education are stronger than in secondary education (Hartgers 2008). With regard to work, we are not aware of other studies that would allow for the extrapolation of our findings. Finally, integral register data can only provide an indication of statistical contact opportunities. Active contact between immigrants and native Dutch and the effects of these interactions can only be studied using additional survey data or case studies.

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