KONINKLIJKE VLAAMSE ACADEMIE VAN BELGIE
VOOR WETENSCHAPPEN EN KUNSTEN

SOCIAL COHESION

CONTEMPORARY THEORETICAL PERSPECTIVES ON THE STUDY OF SOCIAL COHESION AND SOCIAL CAPITAL

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ETHNIC DIVERSITY IN THE NEIGHBORHOOD
AND SOCIAL TRUST OF IMMGRANTS AND NATIVES:
A REPLICATION OF THE PUTNAM (2007) STUDY IN A WEST-EUROPEAN COUNTRY.

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1. Introduction

Putnam (2007) claims that in the short run, immigration and ethnic diversity tend to reduce solidarity and social capital. He presents new evidence from the US that in ethnically diverse neighborhoods residents of all ethnic groups tend to 'hunker down'. Trust (even in one's own ethnic group) is lower, altruism and community cooperation is more rare, friends fewer. Since Putnam only analyses data for the US, he proposes to test his claim in other countries. Giddens (2007), although he acknowledges the tensions between diversity and the welfare state in Europe, believes that it is impossible to apply the same analysis to Europe, because of a lack of data. In this paper, using data from the Netherlands, we do apply an analysis analogous to that of Putnam in one of the EU member states.[23] The position of immigrants in the Netherlands is not exceptional in comparison with immigrants in other European societies (Fleischmann & Dronkers, 2007; Andre, Dronkers, & Fleischmann, 2008). There is therefore no reason to assume that the Netherlands is an outlier in Europe with respect to immigrants. Gesthuizen, Van der Meer and Scheepers (forthcoming; see also Hooghe, Reeskens, Stolle, & Trappers, 2006) also test Putnam's thesis. They refute the claim that ethnic diversity results in less social capital. However, both analyze ethnic diversity on the national level; using data from the Euro barometer or the European Social Survey. Differences in ethnic diversity at a national level are not the same as ethnic diversity in the neighborhood, as investigated by Putnam. As a consequence, these indexes of diversity at the country level might be indicators of general social and political processes relating not related with ethnic diversity (see for the dangers of ecological fallacy: Snijders & Bosker, 1999). Therefore, their rejection of the Putnam findings with European data might be fully wrong. Effects of ethnic diversity on the country level rather refer to the history, political environment and/or the media exposure of immigration related issues in a country. Hence, effects on a national level are not the same as effects on the neighborhood level (Murie & Musterd, 2004). Ethnic diversity in a country does for example not necessarily imply that an individual actually has inter-ethnic contacts.

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[23]. Leigh (2006) carried out a comparable analysis as Putnam did, using Australian data. He finds similar results as Putnam, but he finds that the effect of linguistically diverse neighborhoods is for stronger than that of ethnically diverse neighborhoods. We will test this explanation in a sequel of this paper.

This may explain why Gesthuizen et al. and Hooghe et al. do not find effects of ethnic diversity: the mechanism at hand is different. As opposed to ethnic diversity in a country, in an ethnically diverse neighborhood it is much more likely that people of different ethnicities actually meet. Face-to–face contact in turn affects sociological and psychological processes such as building trust. Hence, choosing a different level of analysis may imply exploring a different mechanism between ethnic diversity and social trust. It can therefore be expected that results are different. As Murie and Mustard conclude (2004, p. 1441): 'Understanding the role of neighborhood in social exclusion involves attention to different levels of analysis and different fault lines and to the resources that are produced within neighborhoods'. To further investigate Putnam's claim, an analysis on the neighborhood level is necessary.

The objective of this paper is twofold: 1) testing Putnam's hypothesis in an European context, by replicating his neighborhood study as closely as possible in this European context; and 2) extending Putnam's analysis by adding ethnicity of the respondent's neighbors as a lower level measure of ethnic diversity, and thus explaining the relation between the neighborhood diversity and individual trust by the ethnic diversity of concrete neighbors. We don' t have additional theoretical claims about trust and ethnic diversity, more profound than those of Putnam, but we would like to explain a possible relation between neighborhood diversity and individual trust by a less abstract mechanism (in our case the ethnicity of neighbors).

Our main question is "Can social trust also in Europe be explained by ethnic diversity in the neighborhood and that of the neighbors?" To answer this question we make use of multi-level regression, which allows us to control for individual, neighborhood, and municipality characteristics. As Gesthuizen et al. (forthcoming) and Hooghe et al. (2006) also note, multi-level regression allows to disentangle the contextual and individual characteristics in a more sophisticated matter than in the OLS regression as used by Putnam.

2. Theory and hypotheses

As a result of continuing immigration, the population of modern societies is becoming more and more ethnically heterogeneous. One of the major challenges that these countries face is how to deal with ethnic diversity. Putnam claims that –at least in the short run- ethnic diversity in the neighborhood reduces social solidarity and social capital.

Social capital implies that people well equipped with social resources – in the sense of their social network and the resources of others they can call upon- succeed better in attaining their goals. Hence, it is generally thought to be a true 'capital', in the sense that it yields positive returns (Portes, 2000). This holds for different outcomes, such as for example labor market performance (Granovetter, 1973, 1995; Aguilera, 2002; Lin, 1999) or political participation (Fennema & Tillie, 1999). More specifically, also social capital within the neighborhood appears to be beneficial for individuals, for example with respect to home-ownership (Brisson & Usher, 2007) or social participation (Dekker, 2007). However, Alesina and La Ferrara (2000) find for the US that ethnic diversity in the neighborhood negatively affects participation in social activities. It therefore seems worthwhile to further explore the impact of ethnic diversity on social capital in the neighborhood.

There are many different forms or elements of social capital; consequently even more definitions of the concept are being applied. As a result, Putnam (2007) chooses to adopt a 'mean and lean' definition. A helpful approach when conceptualizing social capital is to distinguish between structural and cognitive social capital (Poortinga, 2006; Lancee, 2008). The structural component refers to the 'wires' in the network: the frequency and intensity of links that contribute to the exchange of resources. As opposed to cognitive social capital,

structural social capital involves a behavioral component. The cognitive component refers to the 'nodes' in a network: attitudes and values such as perceptions of support, reciprocity and trust that contribute to the exchange of resources. Social solidarity is characterized by the motive of promoting group goals in their own right, provided the actor perceives positive attitudes from others towards himself (Wildegren, 1997; Bourgeois & Friedkin, 2001).

Most of the measures presented by Putnam (2007) -i.e. social trust and solidarity- can be characterized as cognitive social capital. However, he also claims his results to be valid for the behavioral component of social capital, such as having friends or volunteering. When analyzing social capital in the neighborhood, measurement therefore benefits from including a behavioral component as well. For example, Van der Laan Bouma-Doff (2007; see also Dagevos & Ode, 2003) finds that for immigrants in the Netherlands ethnic concentration exhibits a strong negative association with the probability of maintaining contacts with native Dutch. In the section 'data and measurement' we construct three scales that include both a cognitive and a structural part: *1)* the quality of contact with the neighbors, *2)* trust in the neighborhood and *3)* inter-ethnic trust. We take these scales as different dimensions of social trust.

Putnam (2007, pp. 141-142) discusses two theories that deal with diversity and social connections. According to the 'contact hypothesis', more diversity implies more inter-ethnic tolerance and social solidarity. The reasoning is that 'as we have more contact with people unlike us, we overcome initial barriers of ignorance and hesitation and come to trust them more'. This line of reasoning stems from the intergroup theory, which originates from Allport (1979) and is more recently extended by Pettigrew (1998). Intergroup theory states that the contact between groups is at a maximum when five conditions are met: equal status between groups, common goals to be reached, intergroup cooperation, support of laws and customs and the potential to friendship. Especially for this last condition it is necessary to take in account a longitudinal perspective. The theory predicts prejudice to be minimal when the intergroup contact is maximal, many investigations also found this result (see Pettigrew, 1998). Conflict-theory argues exactly the opposite: diversity fosters out-group distrust and in-group solidarity. In other words, the more we are brought into physical proximity to people of a different ethnicity, the less we trust the 'other'.

Putnam introduces 'constrict theory', suggesting that ethnic diversity might reduce both in-group and out-group trust. His (implicit) argumentation is that when the social context is more diverse in terms of ethnic groups, there are more people 'unlike you'. As a result, there are less people with whom one can identify, resulting in fewer social connections and lower levels of trust. That is, ethnic diversity may correlate negatively with social trust (see also Allen & Cars, 2001; Alesina & La Ferrara, 2002; Letki, 2008). Putnam shows that for the US this is indeed the case: in neighborhoods where ethnic diversity is higher, trust is lower.

We replicate Putnam's analysis and test this relation for a West-European country, the Netherlands. One might argue that the European context, and thus the mechanism between diversity and social trust, is different because European welfare states are in various ways more successful in reducing spatial and socio-economic inequality of their citizens and probably also of their immigrants (Esping-Anderson & Gallie, 2002; Parsons & Smeeding, 2006). For example, Musterd (2003) analyzes the relationship between segregation and several forms of integration in Amsterdam. It is suggested that in more polarized societies such as the US this relationship may be stronger, whereas in Western Europe, where more moderate levels of social and spatial inequality are predominant, this relation may be absent. Musterd finds that if there exists such a relationship in the Netherlands, it is not a very strong one. He concludes that programs that are aimed at de-segregation by mixing neighborhoods socially and ethnically will probably contribute little to enhancing integration in society.

Naturally, the question in this paper is whether (the absence of) this relationship also holds for diversity and social trust.

According to Putnam (2007, pp. 138-139), the negative relation between diversity and trust is a short-term process. In the long run, he argues, 'societies have overcome such fragmentation by creating new compassing identities that dampen the negative effects of diversity'. He however does not prove that claim systematically, but only by anecdotic evidence of recent successes of overcoming ethnic fragmentation in the USA. As opposed to the European countries, the US is a rather 'old' immigration country. That is, in the US, ethnic diversity has been present for a long time. Whereas the US has dealt with flows of immigrants for a number of years, the immigration wave of the 'guest workers' in Europe has started in the 1950s only (Parsons & Smeeding, 2006). That is, if the relation as found by Putnam is indeed one of the short term we certainly expect to find it in the European context. In order to understand the relation between ethnic diversity and social trust better, we distinguish between three forms: trust in the neighborhood, the quality of contact with the neighbors and trust between other ethnic groups.

Figure 1 gives the conceptual model of ethnic diversity in the neighborhood and individual social trust, but with our addition of the ethnic diversity of the neighbors of ego as intervening mechanism between the diversity of the neighborhood (which is in the Netherlands around 6,000 persons large) and the individual attitudes. The respective hypotheses are indicated in figure one.

Figure 1. A conceptual model of ethnic diversity and individual social trust.
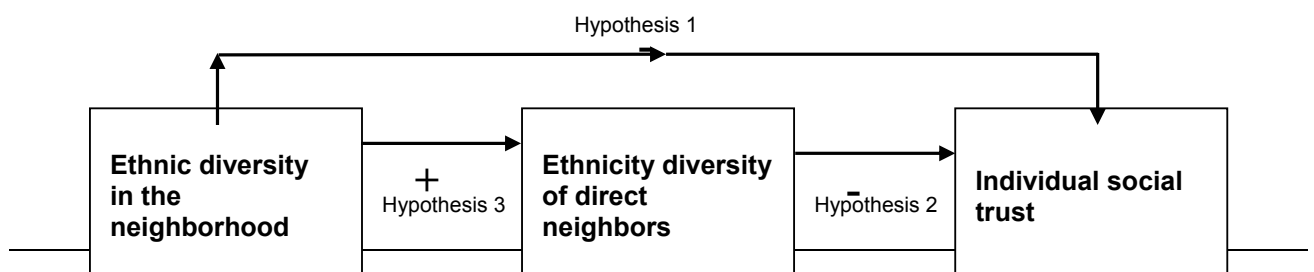
We follow Putnam's study, and we use our more elaborate conceptual model to reformulate his general hypothesis as follows:

H1   Ethnic diversity in the neighborhood negatively affects individual social trust, both for immigrant and native residents, independently of the ethnic diversity of ego's neighbors.

One could argue that, besides ethnic diversity in the neighborhood affecting social trust, trust is also affected by a more micro-level process. That is, whereas ethnic diversity in the neighborhood explains social trust; having ethnically different neighbors explains trust as well. This is even more important when one aims to explain trust in neighbors, as Putnam does in his main analysis. It is likely that if there is an effect of diversity in the neighborhood, this effect will be even more prevalent with respect to the ethnic diversity of the direct neighbors. Stolle, Soroka, & Johnston (2008) show with Canadian and US data that not

everybody in ethnically divers neighborhoods is equally sensitive to their environment. Individuals who regularly talk with their neighbors are less influenced by the racial and ethnic character of their surroundings than people who lack such interaction. Therefore, we include the ethnic diversity of the neighbors, a measure of ethnic diversity in the direct environment of ego. We assume that the mechanism is similar to that on the neighborhood level and therefore hypothesize that:

H2 Having neighbors that are ethnically different negatively affects individual social trust, both for immigrant and native residents, independently of the ethnic diversity of the neighborhood.

Having direct neighbors that are of different ethnicity is likely to be influenced by the diversity in the neighborhood itself (Bodygendrot & Martiniello, 2000). To further unravel the effect of diversity in the neighborhood on social trust, we also examine to what extent diversity in the neighborhood affects the likelihood of having direct neighbors that are ethnically different. This is formulated in hypothesis three.

H3 Ethnic diversity in the neighborhood increases the likelihood of having neighbors that are ethnically different.

If both the second and third hypothesis are upheld by our data, ethnic diversity of neighborhoods can have an indirect negative effect on individual trust, even if the first hypothesis (the direct effect) has to be rejected. Putnam did not unravel these direct and indirect effects of ethnic neighborhoods' diversity on individual trust, an omission that undermines the validity of his results.

2. Data and measurement

For measurement, we use the 'Sociale Positie en Voorzieningengebruik van Allochtonen' (Social Position and Facilities Use of Ethnic Minorities, SPVA; (Martens, 1999). The SPVA survey is the main data source for monitoring the disadvantage of ethnic minorities in the Netherlands (Guiraudon, Phalet, & Ter Wal, 2005). The SPVA data provide samples of households from the four largest immigrant ethnic minority groups in the Netherlands (Turks, Moroccans, Surinamese and Antilleans) and a comparable native Dutch sample. The survey is a stratified sample, in which the respondents are selected in thirteen communities with relatively large numbers of these four minority groups. Whereas the share of immigrants in the sample is larger than in the Dutch population, the survey aims to be representative for the Netherlands with respect to the selection of the characteristics of the communities and the socio-economic background of the respondents. SPVA surveys have been conducted in 1988, 1991, 1994, 1998 and 2002. We make use of the 1998 wave because it contains suitable indicators of trust in neighbors and the neighborhood.

Within the SPVA, an individual is classified into a minority group if he or she was born in the respective country or if one of their parents was born there. First generation immigrants are defined as those who are born in Turkey, Morocco, Suriname or the Dutch Antilles. Second generation immigrants are those that are born in the Netherlands with at least one parent born in one of the aforementioned countries, or those that are born abroad and migrated to the Netherlands at an age younger than six.
Putnam's neighborhood level is the USA census tract. The SPVA 1998 contains the four-digit postal code of all respondents, which are comparable to the USA census tracts used by

Putnam. Matching the respondents to the neighborhood they live in based on their Dutch four-digit zip code allows us to replicate Putnam's analysis. USA Census tracts contain between 2,500 and 8,000 inhabitants and, when first delineated, are designed to be homogeneous with respect to population characteristics, economic status, and living conditions. The average number of people that lives in a Dutch four-digit zip code area is with 6,543 (for 1998) highly comparable to that of a USA census tract.

Dutch four-digit zip codes overlap to a large extent with local neighborhoods ('buurten'), as defined by the municipalities. Neighborhoods are mostly defined based on natural borders such as parks, rail- and waterways or major roads. Since the borders often mark building styles and -periods as well, neighborhoods are relatively homogenous with respect to socio-demographic characteristics (Wittebrood & Van Dijk, 2007). Since the SPVA provides the four-digit zip codes of the respondents, we use this as the neighborhood level in our analyses[24]. Dutch zip code areas are somewhat less homogenous than neighborhoods, because, as opposed to neighborhoods, the borders of Dutch zip code areas are defined to facilitate the postal distribution process, not as an indication of local neighborhoods. Furthermore, the size of the population in a zip code areas is very similar across the Netherlands (Wittebrood & Van Dijk, 2007), while the size of the population s of neighborhoods varies more, just like the USA census tracts. The Dutch Statistical Office provides a number of relevant indicators on the zip code level (see below).

The dependent variables

For the US, Putnam (2007) uses variables such as inter-ethnic trust, trust in neighbors, intra-ethnic trust, confidence in local government, less expectation that others will cooperate, working in community project, giving to charity or volunteering, having close friends and confidents, less happiness and quality of life, more time spending on TV watching.

We construct different scales for three dimensions of social trust. First, we construct a scale that measures the quality of contact with one's direct neighbors. Second, we build a scale that measures trust in one's neighborhood. These scales contain items on the opinion with respect to the neighbors and neighborhood, the quality and frequency of contact with one's direct neighbors and people in the neighborhood. The third dependent variable can be seen as measure of social distance between ethnic groups or (rescaled) inter-ethnic trust, containing two items measuring the respondent's opinion on the background of the friends and the partner of one's children, ranging from very disturbing to not disturbing at all (comparable to Bogardus, 1933). Each of the scales has the same psychometric characteristics for the four immigrant groups and for the native Dutch. Whereas these scales contain both cognitive and behavioral items that deal with social trust, the scaling techniques used (item response theory and reliability analysis) clearly indicate that the items in the scales measure one single construct and that our results can not be blamed to one of these items separately. A detailed description of the construction of the scales and their psychometric characteristics can be

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[24]. Some contextual information is only available on the neighborhood level and not on the zip code level. This is dealt with in the following way. The Dutch Bureau of Statistics provides the most frequent zip code for all neighborhoods. Hence, respondents are matched to the most frequent zip code. However, since neighborhoods can be small, some have the same most frequent zip code. When this is the case, neighborhoods are aggregated to the zip code level. This is done by averaging the indicators on the neighborhood level, weighted by the number of people that live in the respective neighborhood. Those zip code areas which contain only one SPVA respondent were excluded from the analyses (20 cases).

found in the appendix. These three scales are referring to different dimensions of social trust: the first refers to the quality of contact with the direct neighbors, the second to trust in the neighborhood and the third to trust between ethnic groups. The correlations between the three indicators underline this difference: between the first two it is .50, between the first two and the last zero (see table A7).

Independent variables at the individual level

The controls included on the individual level are virtually equal to those used by Putnam. We control for the following: gender, age, marital status, educational attainment, family income and satisfaction with current finances[25], home ownership, citizenship, ethnicity and being a second-generation immigrant. Furthermore, to control for the language proficiency of the respondent we constructed a Mokken scale[26] (see the appendix, table A8 and A9 for the construction of this scale).
As mentioned in section two, the SPVA survey also provides information on the direct neighbors of the respondent. Respondents are asked to answer questions about two neighbors, who live either left, right, above or beneath them. As an extra measure of ethnic diversity on the sub-neighborhood level, we include the ethnicity of the direct neighbor(s). This is operationalized as whether or not (all) the neighbor(s) of the respondent belong to the same ethnic group as the respondent.

Independent variables at the zip code and municipality level

On the zip code level we include the following controls, obtained from the 'Kerncijfers wijken en buurten 2004', provided by the Dutch Statistical Office. First, based on the percentage of ethnic groups that lives in the respective zip code area, we construct a Herfindahl index of ethnic diversity (range: -1 till 0)[27]. The index is interpreted as follows: a value of -1 implies no diversity at all, i.e. the neighborhood consists of one ethnic group only. A value approaching zero means total diversity: all people in the neighborhood have a different ethnicity. This index is read as the inverse of the index of ethnic *homogeneity* as used by Putnam.
Second, we include the mean income, an income inequality ratio[28], the population density, the number of people moving house from or to the neighborhood[29], the percentage of renters, the

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[25]. Coded on a four-point scale; the exact wording of the item is: 'What do you think of your income/your family income, is it: more than enough, enough, too little, or by far too little to live off?'
[26]. The language items were not included for the native Dutch respondents, since it is their mother tongue. Therefore, the Dutch natives were given the highest score on the scale.
[27]. Putnam calculates an index of Ethnic *Homogeneity*. Since the topic at hand is diversity rather than homogeneity, we choose to use an index of ethnic diversity, which is the Herfindahl index as used by Putnam, multiplied by -1. The Herfindahl index of ethnic diversity is calculated as follows: $-((\text{fraction ethnic group 1})^2 + (\text{fraction of ethnic group 2})^2 +\dots+ (\text{fraction of ethnic group n})^2)$. The following ethnic groups are included: Turks, Moroccans, Antilleans, Surinamese, Other non-western immigrants, Western immigrants, native Dutch. The data used is the 'Kerncijfers wijken en buurten 2004', obtained from the Dutch Bureau of Statistics (www.cbs.nl).
[28]. The calculated neighborhood income inequality ratio is the percentage of people with an income lower than or equal to the 40 percentage points of the national income distribution, divided by the percentage of people with an income above or equal to the 80 percentage points of the national income distribution.

percentage of students in higher education, and the percentage of people over 65 years old. On the municipality level, we include the Gini-coefficient for income[30], and the percentage of non-violent and violent crimes[31]. These neighborhood characteristics are more or less comparable with those used by Putnam.

3. Results

In table 1A, a descriptive overview of the individuals of the sample is presented. The averages of the three indicators of trust are not very different for natives and immigrants. But the averages of age, income and satisfaction with current finances of the natives are higher than those of the immigrants. The educational levels of natives and immigrants deviate strongly, the natives being higher educated than the immigrants. Immigrants are more often male and married. House ownership is more frequent among natives and they have less often neighbors of another ethnic group. The bottom part of table 1A gives the distribution between the five ethnic groups in the sample.[32]

Table 1B presents the descriptive statistics of the variables at the zip code and municipality levels. In Figures 2, 3 and 4, the mean Herfindahl index of ethnic diversity in a municipality is plotted against each of our dependent variables. These figures are similar to those presented by Putnam (2007): in the municipalities where ethnic diversity is higher, trust is lower. The case of inter-ethnic trust shows a slight positive relationship at the municipality level.

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[29]. The number of people moving house is expressed as: the number op people per 1000 inhabitants of the neighborhood, who have moved from or to the neighborhood in the past year. This number consists of the number of intra-neighborhood moves, plus half of the sum of the leavers, plus half of the sum of the arrivals in the respective neighborhood.
[30]. The Gini-coefficient is not available on the neighborhood level and therefore included on the municipality level.
[31]. The percentage of violent and non-violent crimes is expressed as a fraction of the total population in the municipality.
[32]. Only 512 of the 4614 immigrants are second-generation immigrants.

Table 1A. Descriptive statistics individual level variables

	Native Dutch		Immigrants		Immigrants+ Natives	
	Mean	S.d.	Mean	S.d.	Mean	S.d.
Quality of contact with neighbors	0.63	0.13	0.61	0.14	0.61	0.14
Trust in the neighborhood	0.65	0.18	0.62	0.18	0.63	0.18
Inter-ethnic trust	0.7	0.22	0.73	0.27	0.72	0.26
Age	48.73	17.66	39.05	12.76	40.97	14.39
Language proficiency	1	0	0.61	0.33	0.69	0.34
Family income	3404.75	2071.83	2653.95	1477.73	2803.12	1640.63
Satisfaction with current finances	0.6	0.24	0.42	0.25	0.45	0.26
	%	N	%	N	%	N
Married	38.06	435	43.54	2009	42.55	2444
Female	47.94	548	40.83	1884	42.24	2432
Educational Degree						
Primary	22.57	258	46.53	2147	41.78	2,405
Lower Secondary	24.15	276	19.9	918	20.74	1,194
Upper Secondary	24.41	279	20.65	953	21.4	1,232
College/University	26.33	301	9.97	460	13.22	761
No info on educational level	2.54	29	2.95	136	2.87	165
Dutch citizen	100	1,143	71.69	3,308	77.31	4,451
Owns house	41.03	469	13.26	612	18.78	1,081
Ethnicity neighbor(s) different	4.9	56	77.2	3,562	62.85	3,618
Distribution between ethic groups					%	N
Turks					18.78	1,081
Moroccans					19.42	1,118
Surinamese					26.06	1,500
Antilleans					15.89	915
Native Dutch					19.85	1,143
Sample					100	5,757

Source: SPVA 1998

Table 1B. Descriptive statistics zip code and municipality level variables

		Mean	Sd	Range
Zip code level	Herfindahl Index	-0.29	0.20	-1-0
(N=291)	% In higher education	0.19	0.14	0-1
	Mean income per person	0.48	0.09	0-1
	Inequality ratio	0.31	0.18	0-1
	Population density	0.37	0.2	0-1
	% Over 65 years old	0.33	0.15	0-1
	% Renters	0.69	0.2	0-1
	Moving house mobility	0.44	0.12	0-1
Municipality level	Gini coefficient	0.53	0.24	0-1
(N=13)	% Violent crimes	0.58	0.37	0-1
	% Non-violent crimes	0.59	0.31	0-1

Source: CBS Statline

Figure 2. Ethnic diversity and quality of contact with one's neighbors
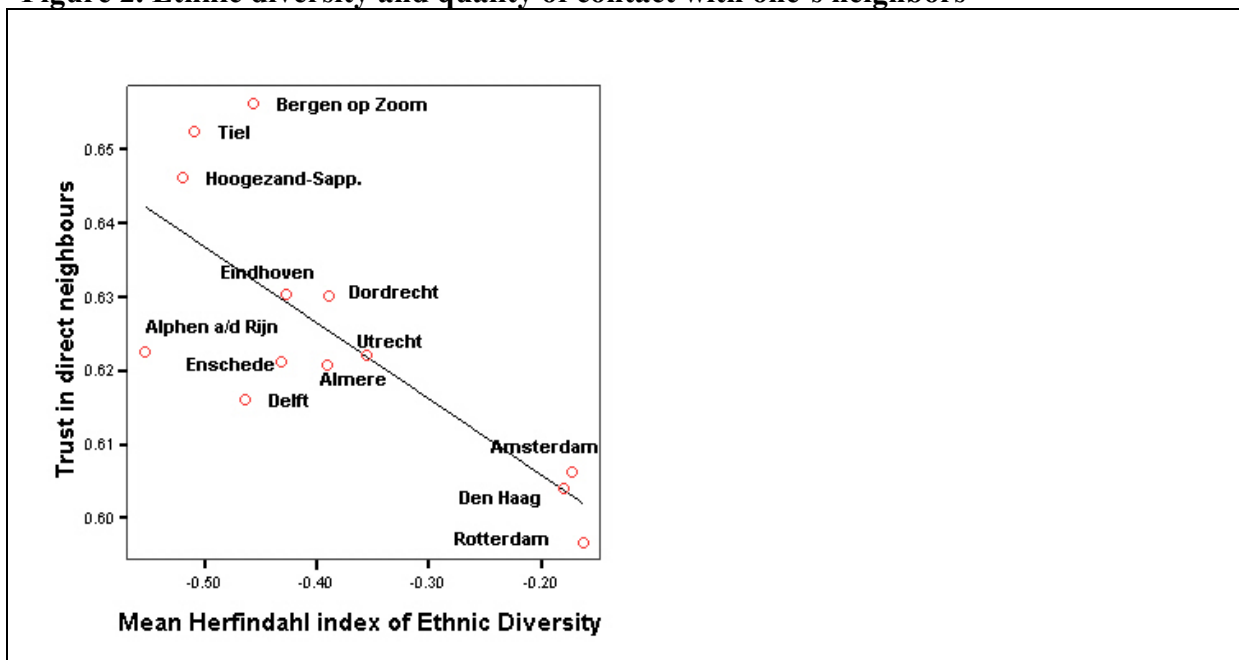
Figure 3. Ethnic diversity and trust in the neighborhood
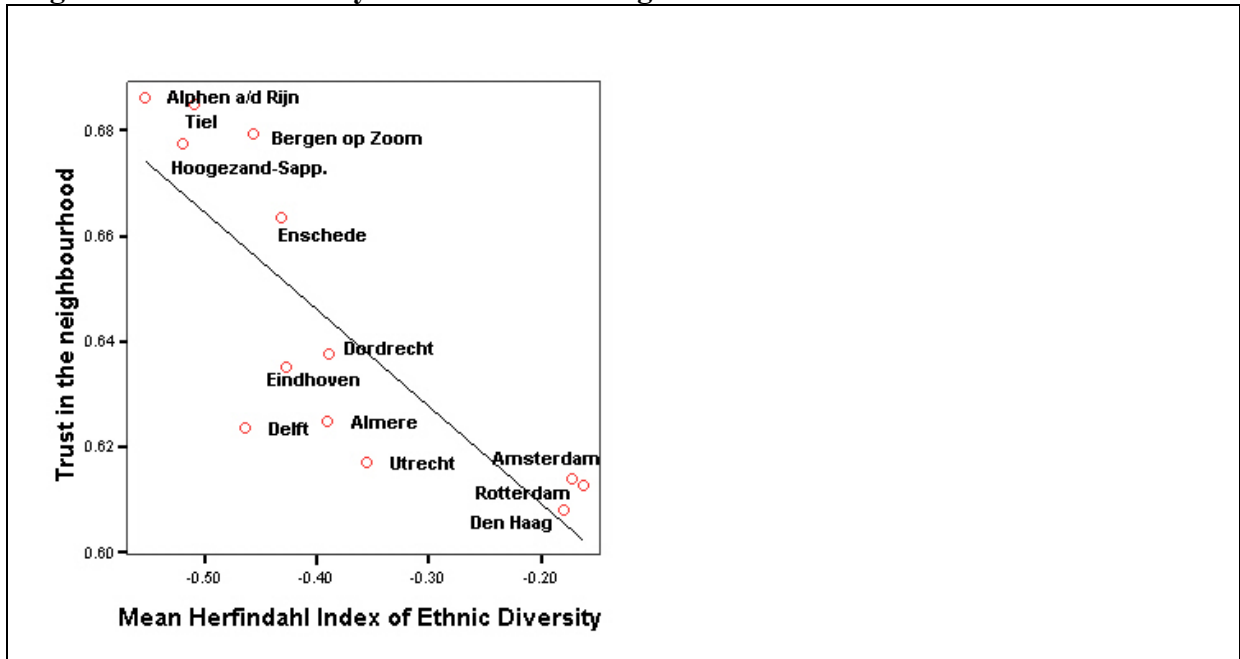
Figure 4. Ethnic diversity and inter-ethnic trust
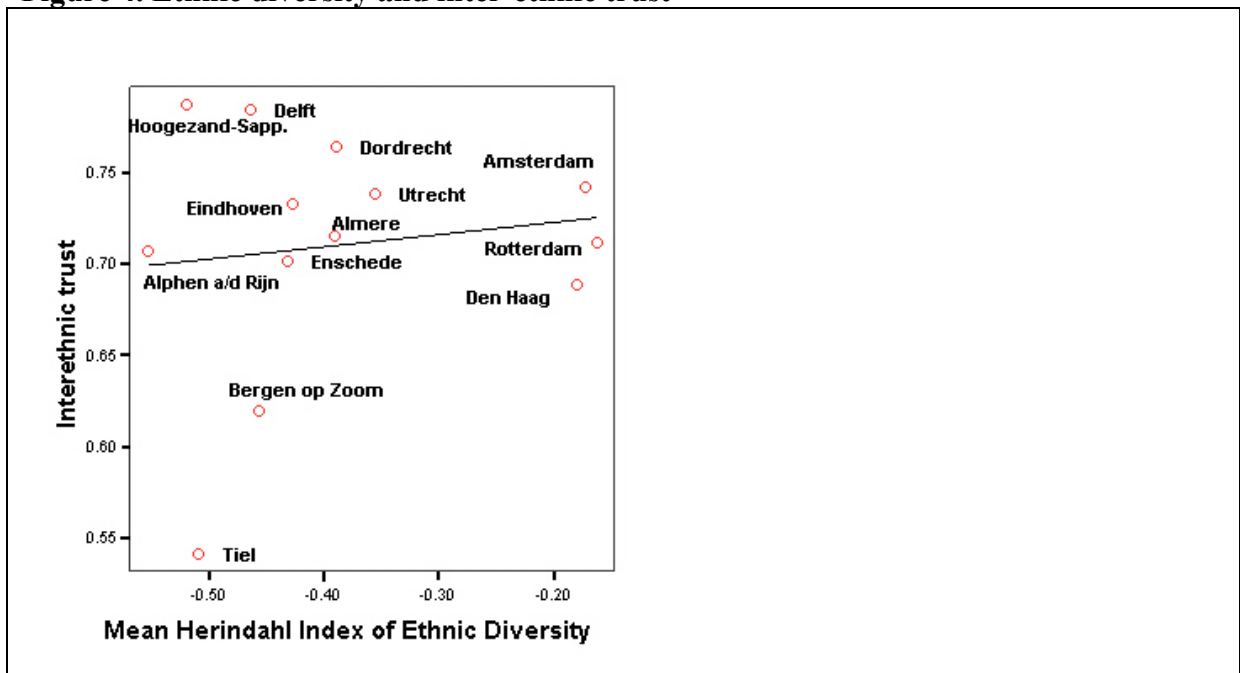
Naturally, this is simply a bivariate representation of the relationship in question, and these results might be spurious because differences in the individual and neighborhood characteristics might be responsible for these bivariate relations.

In the following tables we present multi-level regression analyses including the relevant controls at the individual and the neighborhood level.

Quality of contact with the neighbors

Table 2 presents a multilevel regression model predicting the quality of contact with the direct neighbors. Model one only contains the Herfindahl Index of Ethnic Diversity; its coefficient is negative and significant. In model two, the ethnic groups and a dummy for second-generation immigrants are added. Whereas for the Turks and the Moroccans the quality of contact with their neighbors is not different from the native Dutch, the Surinamese, Antilleans and the second-generation immigrants trust their neighbors less than the Dutch do. Controlling for the remaining individual characteristics (model three), we see that the effect of ethnic diversity hardly diminishes and remains significantly negative. Furthermore, Turks and Moroccans have a significantly higher quality of contact with their neighbors significantly than the native Dutch, while second generation immigrants score lower than the native Dutch. There is no effect of educational attainment, besides that of those who didn't provide information on their educational degree. Last, we see that those that are older, married or own a house have significantly better contact with their neighbors. Model four and five respectively introduce the neighborhood and municipality characteristics, just like Putnam. None of these controls appears significant and their inclusion does not change the effect of neighborhoods' ethnic diversity on the quality of contact with the neighbors. In model six the ethnicity of the neighbor is added. As expected, this significantly and negatively predicts the quality of contact: if the ethnicity of the neighbors is different of respondents' own, the quality of contact with the neighbors is lower. However, the effect of neighborhoods' ethnic diversity remains unchanged by this inclusion. This results supports both our first and second hypotheses: living in an more ethnical devours neighborhood and having neighbors of another ethnic group both decreases independently of each other the quality of contact with one's neighbors. Last, in model seven, an interaction term between the Herfindahl Index and the ethnicity of the neighbors is included: this interaction term is significant, while the effect of the Herfindahl Index becomes insignificant and that of neighbors' ethnicity even increases. This means that having ethnically different neighbors always lowers the quality of contact with one's neighbors, and that this decline is steeper if one has ethnically different neighbors in more ethnically diverse neighborhoods. The inclusion of this interaction term does not change the support of our second hypothesis, but qualifies the support of the first hypothesis. The later is only true if one lives next to neighbors coming from another ethnic group than ones own. We also tested whether the relation between ethnic diversity in the neighborhood and the quality of contact is different for the different ethnic groups by including the relevant interaction terms. We found no significant interaction terms (not shown here). This means that the results are true for both natives and immigrants alike, just as Putnam found: ethnic diversity in neighborhoods decreases the quality of contact with one's neighbors for immigrants and natives alike.

Table 2. Multilevel linear regression predicting quality of contact with neighbors

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Herfindahl Index of Ethnic Diversity	-.092***	-.093***	-.070***	-.058**	-.057**	-.060**	-.035
	(.011)	(.011)	(.011)	(.021)	(.022)	(.022)	(.025)
Dutch		ref.	ref.	ref.	ref.	ref.	ref.
Turkish		.005	.045***	.044***	.044***	.079***	.073***
		(.006)	(.009)	(.009)	(.009)	(.010)	(.010)
Moroccan		-.006	.031***	.031***	.031***	.069***	.063***
		(.006)	(.009)	(.009)	(.009)	(.009)	(.010)
Surinamese		-.012*	.008	.007	.007	.044***	.038***
		(.006)	(.006)	(.006)	(.006)	(.007)	(.008)
Antillean		-.028***	.004	.003	.003	.047***	.041***
		(.006)	(.007)	(.007)	(.007)	(.008)	(.009)
Second generation		-.025***	-.018*	-.017*	-.017*	-.017*	-.018*
		(.007)	(.007)	(.007)	(.007)	(.007)	(.007)
Female			.001	.001	.001	-.001	-.001
			(.004)	(.004)	(.004)	(.004)	(.004)
Age			.089***	.091***	.091***	.092***	.092***
			(.011)	(.012)	(.012)	(.011)	(.011)
Married			.023***	.022***	.023***	.021***	.021***
			(.005)	(.005)	(.005)	(.005)	(.005)
Primary education			ref.	ref.	ref.	ref.	ref.
Lower secondary			.010	.010	.010	.009	.009
			(.005)	(.005)	(.005)	(.005)	(.005)
Upper secondary			.009	.009	.009	.010	.010
			(.006)	(.006)	(.006)	(.006)	(.006)
College/University			.004	.005	.005	.007	.006
			(.007)	(.007)	(.007)	(.007)	(.007)
No info on educational level			.023*	.022*	.022*	.024*	.024*
			(.011)	(.011)	(.011)	(.011)	(.011)
Language proficiency			.037***	.037***	.037***	.039***	.038***
			(.009)	(.009)	(.009)	(.009)	(.009)
Dutch citizen			.005	.005	.005	.006	.005
			(.006)	(.006)	(.006)	(.006)	(.006)
Family income			.019	.019	.020	.018	.018
			(.021)	(.022)	(.022)	(.021)	(.021)
Dummy imputation family income			-.002	-.002	-.002	-.002	-.002
			(.005)	(.005)	(.005)	(.005)	(.005)
Home ownership			.023***	.023***	.024***	.024***	.024***
			(.005)	(.006)	(.006)	(.006)	(.006)
Satisfaction with current finances			.009	.010	.010	.011	.011
			(.008)	(.008)	(.008)	(.008)	(.008)
% in higher education				-.000	.007	.012	.011
				(.020)	(.020)	(.020)	(.020)
Mean income per person				-.061	-.059	-.049	-.050
				(.037)	(.037)	(.037)	(.037)
Inequality ratio				-.025	-.022	-.021	-.021
				(.017)	(.017)	(.017)	(.017)
Population density				-.027	-.024	-.026	-.025
				(.014)	(.015)	(.015)	(.015)
% over 65 years old				-.004	-.002	.004	.005
				(.018)	(.018)	(.018)	(.018)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
% renters				-.001	-.006	-.009	-.008
				(.017)	(.017)	(.017)	(.017)
Moving house mobility				.005	.007	-.001	-.001
				(.025)	(.025)	(.025)	(.025)
Gini coefficient					-.021	-.019	-.019
					(.012)	(.012)	(.012)
% violent crimes					.024	.018	.018
					(.026)	(.026)	(.026)
% non-violent crimes					-.027	-.023	-.023
					(.032)	(.031)	(.031)
Ethnicity neighbor(s) different						-.047***	-.056***
						(.005)	(.007)
Herfindahl*Ethnicity neighbors different							-.041*
							(.020)
Constant	.587***	.597***	.493***	.543***	.555***	.550***	.559***
	(.004)	(.006)	(.014)	(.031)	(.032)	(.031)	(.032)
Log-likelihood	3192.3	3219.3	3297.5	3301.7	3303.3	3350.3	3352.2

Source: SPVA 1998, Dutch Bureau of Statistics
* p<0.05, ** p<0.01, *** p<0.001
N_{indiv}=5,757; $N_{zipcode}$= 291; N_{mun}= 13 (standardized coefficients, standard errors between brackets).

Trust in the neighborhood

In Table 3 we present an analogous multilevel analysis explaining trust in the neighborhood. Model one shows a negative univariate relationship between ethnic diversity and trust in the neighborhood. In model two it appears that Turks trust their neighborhood more than native Dutch, Antilleans and second-generation immigrants less. When including the individual level characteristics (model three), only Turks score significantly higher on trust. Ethnic diversity in the neighborhood significantly predicts a lower trust in the neighborhood. Furthermore, upper secondary and college/university graduates trust their neighborhood less than those with a primary education only. As in the previous analysis, being married, older or owning a house positively predicts trust in the neighborhood. In model four and five, the neighborhood and municipality characteristics are added. Although none of the added variables but population density appear significant, ethnic diversity is no longer significant, probably due to the correlation between these neighborhood variables. In model six, the ethnic diversity of the neighbors is added. As expected, this negatively predicts trust in the neighborhood. Also with respect to trust in the neighborhood it was tested with interaction terms whether or not the relation between ethnic diversity and trust in the neighborhood is different for the ethnic groups. This appeared not to be the case (not shown here): the relation between ethnic diversity and trust in the neighborhood is the same for immigrant and native residents. Neither there was a significant interaction term between the Herfindahl Index and the ethnicity of the neighbors on trust in the neighborhood.
Model seven is a cleaned model with only significant variables: neighborhood ethnic diversity, population density and the different ethnicity of neighbors decreases trust in neighborhoods, while a Turkish respondent, a higher age, being married and home ownership increase trust in neighborhoods.

Table 3. Multilevel linear regression predicting trust in the neighborhood

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Herfindahl Index of Ethnic Diversity	-.120***	-.123***	-.093***	-.039	-.037	-.039	-.065***
	(.016)	(.016)	(.016)	(.029)	(.030)	(.031)	(.018)
Dutch		ref.	ref.	ref.	ref.	ref.	ref.
Turkish		.024**	.043***	.043***	.042***	.062***	.034***
		(.008)	(.012)	(.012)	(.012)	(.012)	(.006)
Moroccan		-.013	.004	.004	.004	.026*	
		(.008)	(.011)	(.011)	(.011)	(.012)	
Surinamese		-.014	.007	.006	.006	.028**	
		(.007)	(.008)	(.008)	(.008)	(.009)	
Antillean		-.032***	.005	.005	.005	.030**	
		(.008)	(.009)	(.009)	(.009)	(.011)	
Second generation		-.019*	.003	.004	.004	.004	
		(.008)	(.009)	(.009)	(.009)	(.009)	
Female			.005	.004	.004	.003	
			(.005)	(.005)	(.005)	(.005)	
Age			.102***	.101***	.101***	.102***	.099***
			(.015)	(.015)	(.015)	(.015)	(.013)
Married			.038***	.037***	.037***	.036***	.033***
			(.006)	(.006)	(.006)	(.006)	(.005)
Primary education			ref.	ref.	ref.	ref.	
Lower secondary			-.010	-.011	-.011	-.011	
			(.007)	(.007)	(.007)	(.007)	
Upper secondary			-.015*	-.015*	-.015*	-.014*	
			(.007)	(.007)	(.007)	(.007)	
College/University			-.022*	-.021*	-.021*	-.020*	
			(.009)	(.009)	(.009)	(.009)	
No info on educational level			.018	.018	.018	.019	
			(.014)	(.014)	(.014)	(.014)	
Language proficiency			.030**	.028*	.028*	.030*	
			(.012)	(.012)	(.012)	(.012)	
Dutch citizen			-.009	-.009	-.009	-.009	
			(.007)	(.007)	(.007)	(.007)	
Family income			.002	.000	.001	.001	
			(.027)	(.028)	(.028)	(.028)	
Dummy missing family income			.006	.005	.006	.006	
			(.007)	(.007)	(.007)	(.007)	
Home ownership			.046***	.047***	.047***	.047***	.045***
			(.007)	(.007)	(.007)	(.007)	(.006)
Satisfaction current finances			.009	.009	.009	.010	
			(.010)	(.010)	(.010)	(.010)	
% in higher education				.010	.019	.022	
				(.027)	(.028)	(.028)	
Mean income per person				-.046	-.043	-.038	
				(.050)	(.050)	(.051)	
Inequality ratio				-.038	-.038	-.037	
				(.025)	(.025)	(.025)	
Population density				-.037	-.043*	-.044*	-.053**
				(.020)	(.021)	(.021)	(.018)
% over 65 years old				.028	.022	.025	
				(.025)	(.025)	(.025)	

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
% renters				-.021 (.023)	-.022 (.023)	-.023 (.023)	
Moving house mobility				-.020 (.036)	-.025 (.036)	-.030 (.036)	
Gini coefficient					-.014 (.017)	-.013 (.017)	
% violent crimes					.064 (.038)	.061 (.038)	
% non-violent crimes					-.069 (.045)	-.067 (.046)	
Ethnicity neighbor(s) different						-.027*** (.006)	-.017*** (.005)
Constant	.592*** (.006)	.600*** (.008)	.518*** (.018)	.595*** (.042)	.611*** (.044)	.608*** (.044)	.578*** (.013)
Log-likelihood	1731.8	1761.5	1858.6	1864.2	1865.8	1875.2	1858.2

Source: SPVA 1998, Dutch Bureau of Statistics
* p<0.05, ** p<0.01, *** p<0.001
N_{indiv}=5,757; $N_{zipcode}$= 291; N_{mun}= 13 (standardized coefficients, standard errors between brackets).

Inter-ethnic trust

In Table 4 we present an analogous multilevel analysis explaining inter-ethnic trust. Model one shows a negative univariate relationship between ethnic diversity and trust in the neighborhood. Model two shows that Surinamese and Antilleans, but also second-generation immigrants, have higher inter-ethnic trust than natives, while second generations immigrants have higher inter-ethnic trust as first generation or natives. After addition of individual characteristics (which all have the usual effect on inter-ethnic trust) the negative effect of ethnic neighborhoods' diversity becomes insignificant. This later result is remarkable and it remains insignificant also after the addition of zip code and municipality variables. Having ethnically different neighbors increases one's interethnic trust as model six shows. Also with respect to inter-ethnic trust we tested with interaction terms whether or not the relation between ethnic diversity and inter-ethnic trust is different for the ethnic groups. This appeared not to be the case (not shown here): the relation between ethnic diversity and inter-ethnic trust is the same for immigrant and native residents. Neither there was a significant interaction term between the Herfindahl Index and the ethnicity of the neighbors on inter-ethnic trust.

Our results support that trust in neighbors and trust in neighborhood cannot be equalized with inter-ethnic trust. The first two forms of trust are negatively influenced by the ethnic diversity of the neighborhood and neighbors, while the latter is positively influence by having ethnically different neighbors.

Table 4: Multilevel linear regression predicting inter-ethnic trust

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Herfindahl Index of Ethnic Diversity	-.116***	-.053*	-.031	.014	.036	.038
	(.029)	(.021)	(.020)	(.038)	(.039)	(.039)
Dutch		ref.	ref.	ref.	ref.	ref.
Turkish		-.121***	.024	.026	.025	-.001
		(.010)	(.014)	(.014)	(.014)	(.015)
Moroccan		-.109***	.031*	.032*	.032*	.004
		(.010)	(.014)	(.014)	(.014)	(.015)
Surinamese		.156***	.187***	.188***	.188***	.161***
		(.009)	(.010)	(.010)	(.010)	(.011)
Antillean		.191***	.223***	.223***	.223***	.191***
		(.010)	(.011)	(.011)	(.011)	(.013)
Second generation		.049***	-.009	-.009	-.009	-.009
		(.010)	(.011)	(.011)	(.011)	(.011)
Female			.011	.010	.011	.012
			(.007)	(.007)	(.007)	(.007)
Age			-.025	-.028	-.028	-.029
			(.018)	(.018)	(.018)	(.018)
Married			-.034***	-.033***	-.033***	-.032***
			(.007)	(.007)	(.007)	(.007)
Primary education			ref.	ref.	ref.	ref.
Lower secondary			.021*	.021*	.020*	.021*
			(.008)	(.008)	(.008)	(.008)
Upper secondary			.040***	.039***	.039***	.038***
			(.009)	(.009)	(.009)	(.009)
College/University			.072***	.068***	.068***	.067***
			(.010)	(.011)	(.011)	(.011)
No info on educational level			.009	.008	.009	.008
			(.017)	(.017)	(.017)	(.017)
Language proficiency			.135***	.134***	.135***	.133***
			(.014)	(.014)	(.014)	(.014)
Dutch citizen			.039***	.040***	.040***	.040***
			(.009)	(.009)	(.009)	(.009)
Family income			.018	.012	.012	.013
			(.033)	(.034)	(.034)	(.034)
Dummy imputation family income			-.046***	-.047***	-.047***	-.046***
			(.008)	(.008)	(.008)	(.008)
Home ownership			.011	.012	.012	.012
			(.009)	(.009)	(.009)	(.009)
Satisfaction with current finances			.004	.003	.003	.002
			(.012)	(.012)	(.012)	(.012)
% in higher education				.024	.015	.012
				(.036)	(.037)	(.037)
Mean income per person				.097	.115	.108
				(.064)	(.065)	(.064)
Inequality ratio				-.041	-.037	-.038
				(.032)	(.032)	(.032)
Population density				-.012	-.009	-.007
				(.027)	(.028)	(.028)
% over 65 years old				-.029	-.027	-.030
				(.032)	(.033)	(.033)

% renters				.011	.006	.008
				(.030)	(.030)	(.030)
Moving house mobility				-.042	-.030	-.025
				(.046)	(.047)	(.047)
Gini coefficient					-.003	-.004
					(.022)	(.022)
% violent crimes					.051	.054
					(.050)	(.050)
% non-violent crimes					-.085	-.088
					(.059)	(.059)
Ethnicity neighbor(s) different						.034***
						(.008)
cons	.687***	.675***	.489***	.490***	.507***	.510***
	(.011)	(.011)	(.022)	(.054)	(.056)	(.056)
Log-likelihood	-211.4	559.7	737.8	743.7	746.2	756.4

Source: SPVA 1998, Dutch Bureau of Statistics

* p<0.05, ** p<0.01, *** p<0.001

N_{indiv}=5,757; $N_{zipcode}$= 291; N_{mun}= 13 (standardized coefficients, standard errors between brackets).

The ethnicity of the neighbors

In Table 5, the last link of our conceptual model is tested: to what extent does ethnic diversity in the neighborhood predict the ethnic diversity of the neighbors? Contrary to the early models we use logistic regression, in which parameters higher than 1.00 indicate that the dependent score is higher if the score on the independent score increases and parameters lower than 1.00 indicates that the dependent score is lower if the score on the independent score increases.

In model one, we see that without any controls living in an ethnic diverse neighborhood, the likelihood of having neighbors that are ethnically different increases. In model two, we see that the odds of having ethnically different neighbors can to be fully explained by belonging to one of the four immigrant groups. Independently of the ethnic diversity of a neighborhood, immigrants have much higher odds to live next to another ethnic neighbor than natives. Note that this does not mean that immigrants have a higher chance to live with a native neighbor, it only means that immigrants are less likely to live next to neighbor of the same ethnic group. However, it also means that natives live far more often next to natives, even in ethnically diverse neighborhoods than any of the four most important immigrant groups in the Netherlands. However, also when adding the remaining individual characteristics (model three), the ethnic diversity in the neighborhood is a significant but negative predictor for the ethnic diversity of the neighbors. The effect of neighborhoods' ethnic diversity on the likelihood of having ethnically different neighbors becomes insignificant when adding zip code and municipality characteristics, especially due to the variable 'moving house mobility' (models four and five). These results partly support our third hypothesis: living in ethnically diverse neighborhoods increases of the likelihood of having neighbors that are ethnically different, but this is only true for the natives. We also ran the analysis containing only the natives. For them, ethnic diversity in the neighborhood (including all controls) does predict the likelihood of having ethnically different neighbors significantly positive. Given the strong effects of having ethnically diverse neighbors on individual trust in neighbors and neighborhoods, the partial confirmation of our third hypothesis means that a part of the effect of ethically diverse neighborhoods on individual trust is intermediated by the ethnic diversity of one's neighbors.

Table 5. Multilevel logistic regression predicting neighbor with a different ethnicity or not

	Model 1	Model 2	Model 3	Model 4	Model 5
Herfindahl Index of Ethnic Diversity	1.760*	.104***	.116***	.457	.633
	(.390)	(.030)	(.034)	(.249)	(.355)
Dutch			ref.	ref.	ref.
Turkish		77.332***	118.351***	118.559***	119.305***
		(13.248)	(25.624)	(25.755)	(25.909)
Moroccan		117.938***	169.175***	169.736***	170.282***
		(20.654)	(36.419)	(36.628)	(36.721)
Surinamese		136.959***	165.026***	165.292***	167.770***
		(23.587)	(29.891)	(30.007)	(30.459)
Antillean		523.427***	652.465***	663.091***	678.834***
		(109.169)	(145.572)	(148.232)	(151.857)
Second generation		1.037	.962	.953	.959
		(.135)	(.136)	(.135)	(.136)
Female			.743**	.735***	.740***
			(.067)	(.067)	(.067)
Age			1.384	1.329	1.373
			(.353)	(.339)	(.351)
Married			.787*	.788*	.789*
			(.076)	(.077)	(.077)
Primary education			ref.	ref.	ref.
Lower secondary			.921	.923	.922
			(.099)	(.100)	(.100)
Upper secondary			1.156	1.142	1.149
			(.133)	(.131)	(.132)
College/University			1.444*	1.406*	1.408*
			(.224)	(.219)	(.220)
No info on educational level			1.196	1.192	1.200
			(.282)	(.280)	(.282)
Language proficiency			1.319	1.309	1.338
			(.225)	(.224)	(.229)
Dutch citizen			1.076	1.074	1.084
			(.110)	(.110)	(.111)
Family income			.840	.811	.789
			(.399)	(.385)	(.375)
Dummy imputation family income			.974	.966	.955
			(.104)	(.103)	(.102)
Home ownership			1.056	1.082	1.074
			(.132)	(.138)	(.137)
Satisfaction with current finances			1.233	1.223	1.225
			(.200)	(.199)	(.199)
% in higher education				3.255*	2.163
				(1.672)	(1.136)
Mean income per person				5.071	5.856
				(4.890)	(5.564)
Inequality ratio				1.352	1.373
				(.552)	(.556)
Population density				.634	.803
				(.226)	(.293)
% over 65 years old				1.512	1.870
				(.697)	(.874)

% renters				.670	.614
				(.282)	(.261)
Moving house mobility				.222*	.289*
				(.136)	(.178)
Gini coefficient					1.553
					(.486)
% violent crimes					.304
					(.207)
% non-violent crimes					2.262
					(1.837)
Constant	2.097***	.018***	.011***	.015***	.013***
	(.179)	(.003)	(.004)	(.012)	(.010)
Log-likelihood	-3734.4	-2458.8	-2440.7	-2433.4	-2428.1

5. Discussion

The first conclusion of our study is that the claim of Putnam (2007) that immigration and ethnic diversity tend to reduce solidarity and social capital can also be tested for Europe. In assuming that the right data are not available in Europe, Giddens (2007) was wrong. The data necessary to test this claim are available, but often out of reach of social scientists due to stricter European privacy laws and a larger hesitance of European social scientists to ask publicly political incorrect questions.

The second more important conclusion is that Putnam's USA conclusions about the negative effect of ethnically diverse neighborhoods on social trust are also valid for European welfare states, like the Netherlands. Putnam's results are thus not unique for immigrant societies like the USA, Canada or Australia (Leigh, 2006). At least at the short term there exists a negative relation between ethnic diversity of neighborhoods and neighbors on the one hand and the quality of contact with neighbors and trust in the neighborhood at the other hand. This relation cannot be explained away by the characteristics of the respondents, or characteristics of the zip code area or municipalities where they live. It will be not easy to falsify this conclusion; neither to portrait our Dutch results as an European outlier. The position of immigrants in the Netherlands is not exceptional in comparison with immigrants in other European societies (Fleischmann & Dronkers, 2007; Andre, Dronkers, & Fleischmann, 2008). Hence there is no reason to assume that our conclusion is not true for other EU member states.

However, the quality of contact with one's neighbors and trust in the neighborhood is something else than trust in other ethnic groups than one's own. Individual trust in neighbors and neighborhoods does not correlate significantly with inter-ethnic trust. This is reflected in our results: the neighborhood's ethnic diversity has no negative effect on the level of interethnic-trust; the same holds for the ethnic diversity of neighbors. In contrast, having ethnically different neighbors increases inter-ethnic trust, as predicted by the 'Intergroup theory'. Inter-group theory originates from Allport (1979) and is lately extended by Pettigrew (1998). Intergroup theory states that the positive impact of contact between different (ethnic) groups is at a maximum when five conditions are met: equal status between groups, common goals to be reached, inter-group cooperation, support of laws and customs and the potential to friendship. Contact between neighbors might meet a few of these conditions of a positive

impact of contact between different (ethnic) groups, like equal status, common goals and cooperation.

Often European political elites find it difficult to distinguish between these different forms of (dis)trust and lump them together as racism. As a consequence they deny or censure complains about the negative effects of ethnic diversity on the quality of neighborhoods as manifestations of racism. This denial or censure of the negative effects of neighborhoods' ethnic diversity on wrong grounds (racism) might explain the disenchantment of natives in ethnically diverse neighborhoods of mainstream politics and their tendency for extreme voting behavior.

Another interesting conclusion from our analysis is that policies aiming at promoting ethnically diverse neighborhoods in order to promote ethnic integration at the societal level might have an unintended inverse effect of decreasing individual social trust in these neighborhoods (compare with Musterd, 2003). Moreover, living in ethnically diverse neighborhoods only increases the odds of living next to a neighbor of another ethnic group only for the natives, not for immigrant residents. Natives in ethnically diverse neighborhoods have a greater likelihood of have non-native neighbors, but also immigrants in ethnically diverse neighborhoods have a lower chance of living next to neighbors from another ethnic group, although there is no effect after control for individual characteristics.

The explanation of these results might be the high importance of bridging social capital, especially in ethnic diverse neighborhoods in combination with the higher cost of forming bridging social capital. A related explanation might be the language diversity in ethnically diverse neighborhoods, which makes the forming of bridging social capital difficult and thus decreases social trust (Leigh, 2006). In a next paper we will try to test this explanation.

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Appendix

Construction of the dependent variables using cumulative scaling

For the measurement of trust we make use of Item Response Theory (IRT). IRT is used for modelling latent traits and is based on the pattern in the items regarding the number of people that gave a positive response. By taking into account the ordinal structure of the data, one constructs a scale that is not purely based on the correlation between the items. Since social trust is often understood in terms of 'more' and 'less' IRT, is especially suitable for measurement. It may therefore be more appropriate for scale construction than for example factor analysis (Van Schuur & Kiers, 2004).

Therefore a non-parametric IRT model for finding cumulative scales is used, the so-called 'Mokken scaling method'. The software used is the Mokken Scale Analysis for Polytomous Items, MSPWIN 5.0 (Molenaar & Sijtsma, 2000).This resulted in three scales (see tables A1, A3, A5). First, a scale that measures 'quality of contact with neighbors'; second a scale that measures 'trust in the neighborhood'; third, a scale that measures social distance, or 'inter-ethnic trust'.

There are several criteria that a set of items has to meet to form an acceptable Mokken scale. The relevant coefficients are presented in tables A2, A4 and A6, both for the total sample and split out for the different ethnic groups. The most important measure is Loevinger's Homogeneity coefficient (H). The following cut-off values are conventional to judge a Mokken scale: >.30 being a useful scale, >.40 a medium strong scale, and >.50 a strong scale (Mokken, 1996; Van Schuur, 2003). For each of the scales, H >.4. Furthermore, the test for monotone homogeneity (i.e. the positive response to each item is a function of the positive response to easier items in the same scale) and double monotonicity (to assess whether the degree of difficulty across items is the same for all individuals) is positive. Last, with respect to the reliability of the scales, the Cronbach's Alpha for the scales is satisfactory.

The actual scale consists of the sum of the items, and is than set to vary between 0 and 1. Before this computation, missing values for the individual items were imputed using two-way imputation (described in Sijtsma & Van der Ark, 2003). The imputation is done as follows (Van Ginkel & Van der Ark, 2007, p. 2): 'Let PM_i be the average of all observed scores of respondent i, let IM_j be the average of all observed scores on item j, and let OM be the average of all observed scores on all items and all persons. The missing value of respondent i on item j is then based on $X_{ij} = PM_i + IM_j − OM$'. Imputation was done for all cases with less than 60% of the scale items missing. Those cases with more than 60% of the values missing were deleted.

Table A1. Items scale 'Quality of contact with neighbors'

Trust in neighbors	Mean	Range	Item-H Homogeneity coefficient	Cronbach's Alpha if item deleted
Frequency of contact with one neighbor	2.18	1-4	0.44	0.76
Frequency of contact with other neighbor	2.10	1-4	0.44	0.76
Quality of contact with one neighbor	3.83	1-5	0.48	0.75
Quality of contact with other neighbor	3.79	1-5	0.49	0.75
Opinion on moving of one neighbor	3.43	1-5	0.45	0.76
Opinion on moving of other neighbor	3.38	1-5	0.44	0.76
Degree of nuisance with one neighbor (item reversed)	2.82	1-3	0.32	0.79
Degree of nuisance with other neighbor (item reversed)	2.82	1-3	0.32	0.79
Source: SPVA 1998.				

Table A2. Scale values and coefficients 'Quality of contact with neighbors'

	Scale value (0-1)	Homogeneity coefficient (H)	Cronbach's Alpha
Turks	.59	.46	.80
Moroccans	.59	.56	.82
Surinamese	.58	.42	.78
Antilleans	.57	.43	.77
Dutch	.61	.37	.75
Total	**.59**	**.44**	**.79**
Source: SPVA 1998.			

Table A3. Items scale 'trust in neighborhood'

Trust in neighborhood	Mean	Range	Item-H Homogeneity coefficient	Cronbach's Alpha if item deleted
Frequency of contact among people in the neighborhood	2.35	1-4	0.46	0.54
Feels comfortable in this neighborhood	3.35	1-4	0.39	0.62
Misses people in neighborhood when they move	1.44	1-3	0.52	0.58
Quality of contact among people in the neighborhood	3.56	1-5	0.44	0.65
Source: SPVA 1998.				

Table A4. Scale coefficients 'trust in neighborhood'

	Scale value (0-1)	Homogeneity coefficient (H)	Cronbach's Alpha
Turks	.65	.40	.61
Moroccans	.61	.42	.70
Surinamese	.62	.46	.64
Antilleans	.60	.47	.62
Dutch	.65	.49	.65
Total	**.63**	**.45**	**.65**
Source: SPVA 1998.			

Table A5. Items scale 'inter-ethnic trust'

	Mean	Range
Opinion on ethnic background friends of children	4.07	1-5
Opinion on ethnic background partner of children	3.68	1-5
Source: SPVA 1998.		

Table A6. Scale coefficients 'inter-ethnic trust'

	Scale value (0-1)	Homogeneity coefficient (H)	Cronbach's Alpha
Turks	.56	.60	.69
Moroccans	.57	.48	.61
Surinamese	.85	.67	.74
Antilleans	.88	.71	.88
Dutch	.69	.63	.79
Total	**.72**	**.68**	**.76**
Source: SPVA 1998.			

Table A7. Correlation between the three indicators of individual trust (Significance level between parentheses)

	Quality of contact with neighbors	Trust in the neighborhood	Interethnic trust
Trust in the neighborhood	0.50 (0.00)	1	
Inter-ethnic trust	0.00 (0.94)	-0.00 (0.79)	1

Source: SPVA 1998.

Construction of the independent variable language proficiency
In table A8 and A9, the items and relevant coefficients for the language proficiency scale are presented. The procedure followed is equal to that of the construction of the social trust scales.

Table A8. Items scale language proficiency

	Mean	Range
Problems with reading Dutch (item inversed)	2.10	1-3
Frequency of using Dutch with partner	1.88	1-3
Frequency of using Dutch with children	2.17	1-3
Problems with speaking Dutch(item inversed)	2.39	1-3
Source: SPVA 1998.		

Table A9. Scale coefficients language proficiency

	Scale value (0-1)	Homogeneity coefficient (H)	Cronbach's Alpha
Turks	.35	.60	.68
Moroccans	.42	.69	.70
Surinamese	.84	.54	.57
Antilleans	.77	.46	.56
Total	**.63**	**.74**	**.74**
Source: SPVA 1998.			