Living and learning separately?

Ethnic segregation of school children in Copenhagen

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by

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Abstract:*Documenting the level of ethnic residential and school segregation in Copenhagen, I find low levels of residential segregation due to suburbanisation (opposite to the US experience), but high levels of school segregation, which for some student groups reach levels comparable to the extreme segregation typical for US cities. Thus, the evidence from Copenhagen suggests that low residential segregation does not necessarily translate into moderate school segregation: when school choice options are available, low residential segregation is compatible with high school segregation levels. A decomposition suggests that socio-economic differences do not seem to be the main driving force behind school segregation.*

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Contents

1 Introduction

The number of school children with an immigrant background has increased steadily in Denmark during the last decade. Like other European countries, Denmark has experienced an inflow of immigrants and refugees and as elsewhere, they tend to live concentrated around the big cities, e.g. in the Copenhagen region, and, particularly, in Copenhagen City[1,2]. Today, 27% of residents aged 6-15 in the City of Copenhagen have an immigrant background. They are not, however, distributed equally among neighbourhoods and schools. Schools and neighbourhoods with high and low concentrations of immigrant students alternate and are sometimes located only a short distance from each other. Segregation at the school level tends to be even more distinct than residential segregation because of school choice. This is especially troublesome as the school often is the main contact with the Danish community for immigrant students living in ethnically concentrated neighbourhoods. This would suggest that it is particularly important for their social integration and acquisition of Danish language skills to meet Danish children at school. Schools are of particular importance because of how they affect children's chances for achievement in their adult lives. Also, ethnic segregation might be bad for social cohesion. Burgess & Wilson (2005) provide evidence on the coincidence of high segregation levels for Asian students with the locations of the severe disorders in the summer of 2001 in England (in Bradford, Oldham and Burnley).

Recent research finds residential segregation in Europe to be more moderate than in American cities (Musterd, 2005). While income segregation in Copenhagen is shown to be low (Musterd, 2005), to my knowledge, so far no results on *ethnic* segregation exist for Copenhagen. To anticipate results, this study suggests that while residential (ethnic) segregation levels are low across municipalities in the Copenhagen metropolitan region and across districts of Copenhagen City, at the school level, ethnic segregation levels come close to the high/extreme segregation levels experienced by many US-cities. This suggests that even though Denmark might have been more successful in preventing residential clustering of immigrants, Copenhagen schools are similarly segregated as many US-schools.

This study adds to the literature of school segregation by providing one of the first studies using student-level data in a school segregation analysis[3]. This has two advantages. First, using data with information for the individual student on both the school-catchment area where they live and the school they attend, I can calculate segregation indices for

[1] Copenhagen City is in this study defined as the municipality of Copenhagen.

[2] While 8 percent of the Danish population lives in the City of Copenhagen, about 21 percent of the ethnic minority population does.

[3] One exception is Söderström & Uutsitalo (2004) who study the effect of school choice on segregation. Ellen et al. (2002) do in fact have student level data, but they do not make use of it, as they perform their analysis on data aggregated to the school level.

the same base (the school catchment and its (public) school). This is important for achieving full comparability of the level of residential and school segregation, because smaller units typically produce higher index values because they are more homogenous (Massey & Denton, 1988). Thus, the problem of comparability present in studies, where the aggregate for which the segregation indices are calculated does not contain the same number of neighbourhoods and public schools, is not present in this paper[4]. Second, using micro-level data, subsequent analysis into the sources of school segregation are feasible by decomposing the gap in the immigrant shares at schools experienced by different immigrant groups into a part due to socio-economic background, and a part which might be interpreted as being due to ethnicity. As a novelty in the literature of school segregation, the results of this paper show the additional impact of private school choice on school segregation. Most studies in the literature are limited to public schools inspite of typically high private school attendance rates in areas with a concentration of minority students. However, as the results of this paper show, omitting private schools underestimates school segregation levels. Also, this study is to my knowledge the first empirical assessment of the level and patterns of ethnic school segregation for Denmark. As such, another aim of this paper is to contribute to filling this gap[5].

The highest absolute number and the third highest percentage of immigrant students in a municipality in Denmark is found in Copenhagen City, which makes it an especially apt place to study segregation patterns. In addition, the availability of student-level data on school attendance for the year 2003 from the Copenhagen school authorities makes it possible to study Copenhagen as a case. The data from the school authorities were combined with administrative data on individual student background, providing a rich data set to study segregation patterns. I employ one of the most widely used indices of segregation, the dissimilarity index, to assess the extent of ethnic segregation[6]. I calculate dissimilarity indices for residential segregation at various levels (between municipalities across the region, between districts in Copenhagen City, and across school catchment areas) and for school segregation across Copenhagen City schools. School data is not readily available for other municipalities, and therefore, school segregation throughout the region is not studied here.

The paper proceeds as follows. Section 2 presents the relevant literature, while section

[4] However, in the separate analysis which adds private schools to the calculation of school segregation, the number of schools is greater than the number of school catchments, and this might produce higher school segregation indices simply as an artefact of the different bases for segregation.

[5] No attention is paid to explaining existing patterns of residential segregation, which obviously influence patterns of (public) school enrolments.

[6] "Isolation" is another measure that is frequently used in the literature on segregation. The isolation index measures the degree of contact between children of different ethnic groups. In this study, however, the focus is alone on segregation between natives and immigrants, and therefore, the analysis is restricted to the dissimilarity index.

3 details the data. In section 4, the segregation measure is briefly discussed and results on the level of segregation are reported. Section 5 presents results of a decomposition of segregation in a socio-economic and an residual (ethnic) part. Section 6 concludes.

2 Previous literature

While there is considerable research on school segregation in the US (e.g. Logan et al., 2002, 2003; Ellen et al., 2002; Clotfelter, 1999) and the UK (Burgess & Wilson, 2005; Burgess, Wilson & Lupton 2005; Burgess, Johnston & Wilson 2004; Gorard & Fitz 2000; Noden 2000; Taylor et al. 2001), there is only sparse evidence from other countries, e.g. the Netherlands (Clark et al.,1992; Gramberg, 1998), and a recent paper from Sweden (Söderström & Uutsitalo, 2004). For a detailed overview of the relevant literature, the interested reader is referred to Burgess, Wilson & Lupton (2005).

In the US and the UK with a long history of immigration, the focus is mainly on segregation between children of different races[7], while studies from European countries with more recent immigration experience focus on the segregation between natives and immigrants. Compared to Great Britain and the Netherlands, Denmark does not share these countries' experience with immigration from former colonies. Thus, the experience with immigrants from non-Western countries is comparatively recent for Denmark. This might be one of the reasons that there is only little parallel research on segregation for Denmark[8], and this research has not extended to consider segregation at the level of schools.

Research from the US shows that in many cities, the main source of school segregation is the exclusion of minority children from schools in the residential suburbs (Clotfelter 1999, Logan et al. 2003, Reardon et al. 2000). To see whether this pattern is replicated for Copenhagen, I conduct the analysis of residential segregation at both the regional level and the city level.

An interesting article by Burgess, Wilson & Lupton (2005) deals with neighbourhood and (public) school segregation. They compare patterns of segregation across Local Education Authorities (LEA) in England and find heterogeneity in segregation levels across different ethnic groups and across LEAs. Also, their results suggest that for most ethnic groups, school segregation is higher than neighbourhood segregation.

There is little evidence in the literature analysing the correlation between ethnic and socio-economic segregation of students, even though this has quite different policy implications. Exceptions are Söderström & Uutsitalo (2005) and Burgess & Wilson (2005) who

[7] One exception is Ellen et al. (2002) who examine immigrant vs. native segregation.

[8] See e.g. Hummelgaard & Husted (2001) on residential clustering.

extend their research on segregation to consider socio-economic segregation in addition to ethnic segregation.

3 Data

In this analysis, I employ three different data sources to document segregation patterns.

1. For the examination of residential segregation with the Copenhagen region as the aggregate unit, I rely on municipal-level public use data downloadable from Statistics Denmark (*www.dst.dk*) to calculate dissimilarity indices. Information on the number of individuals by country of origin, immigrant status and age group is available.

2. For the examination of residential segregation within Copenhagen City, district-data is downloaded from the website of the Copenhagen Statistical Office (*www.sk.kk.dk*).

3. The main data set for this study, a student-level data set for Copenhagen City, is used to describe residential and school segregation across school catchment areas. Student-level data are available for Copenhagen City only, as there is no centrally collected nationwide data from Statistics Denmark on the school attended for more recent generations of school children[9]. The student-level data for Copenhagen City are provided directly from the School Authorities of Copenhagen City. Figure 1 illustrates the two aggregate spatial units employed in this study: the Copenhagen region and Copenhagen City[10].

[Figure 1 about here.]

As the main data in this work are the student-level data for Copenhagen City, I will here only very briefly describe the two other regional data sets, but more information is provided in the section on results.

For each of the 50 municipalities belonging to the Copenhagen region, there is information on the number of inhabitants by immigrant group (i.e. by immigrant status (1^{st} or 2^{nd} generation[11]) and country of origin), and by years of age. The number of inhabitants

[9] At Statistics Denmark, only information on the school attended in 8^{th}-10^{th} grade is recorded, which are the grades, where school leaving exams are administered.

[10] Note that the spatial units at the sublevel of Copenhagen City (right panel) are the school districts, not the school catchment areas. The 15 school districts contain 63 catchments in all. A map with school catchment lines could not be provided.

[11] First generation immigrants are born abroad, while the second generation is born in Denmark to immigrant parents.

in the region is about 1.8 million. 12% of the total population, and 15% of the school-aged population (6-15 years) have an immigrant background.

Copenhagen-City is divided into 15 districts. Information used at this level is the same as for the Copenhagen region above. The city has 500.000 inhabitants, hereof 19% of immigrant origin (14% from non-Western countries). However, among the population of school-aged children the immigrant share is higher: 29% (27% from non-Western countries).

Turning to the main data set, in Copenhagen City, about 40,000 school children are educated in primary/lower secondary schools (pre-school class to 10^{th} grade[12]). At the school level, this provides information on the full set of students at all 63 public schools[13]. For the 77 private schools, however, there are only data on students who are residents in Copenhagen City[14], and therefore, only an *approximation* of student characteristics for these schools is available.

The student-level data include information on immigrant background (country of origin, 1^{st} or 2^{nd} generation), parental education, income, family structure, etc. (see Table 1). For use in this study, the immigrant categories are: immigrants from Western countries (Western-Europe, USA, Canada, Japan, Australia and New Zealand), and immigrants from non-Western countries by immigrant status (1^{st} and 2^{nd} generation). Due to small sample sizes for Western immigrants, and because the focus in this paper clearly is on immigrants from non-Western countries, Western immigrants are not subdivided into the 1^{st} and 2^{nd} generation in the following analysis. Table 1 describes the family background of the different student groups in the data set. The majority are of Danish origin (71%), about 1% of students are from Western countries, and 28% from non-Western countries. Among children with an immigrant background, only one out of five is born abroad (labelled 1^{st} generation immigrants), the others are born in Denmark (labelled 2^{nd} generation immigrants). Some of the children have one Danish and one immigrant parent. Following the standard definition of Statistics Denmark, they are, as are 3^{rd} generation immigrants, labelled as native Danes. The most important countries of origin[15] are Turkey, Pakistan, Lebanon, Iraq, Morocco, (former) Yugoslavia and Somalia. These seven immigrant groups comprise 69% of all non-Western immigrant students in Copenhagen City.

[Table 1 about here]

[12] The primary and lower secondary level is integrated in one school.

[13] Schools for children with special needs are excluded from the analysis.

[14] 70 percent of students attending Copenhagen City private schools are residents, while the other 30 percent live in other municipalities.

[15] I.e. with the highest number of students in Copenhagen City.

As suggested above, differences in the socio-economic backgrounds of Danish and immigrant students may affect the segregation and school choice patterns of these groups. Generally, Danish families have a more favourable socio-economic background than both immigrants from Western countries and, especially, immigrants from non-Western countries. Table 1 reports mean values of selected variables for Danes, immigrants from Western countries, 1^{st} and 2^{nd} generation immigrants from non-Western countries and for the seven most important countries of origin. There is a sizable gap in parental education levels between Danish and immigrant students: about 25% of Danish fathers are unskilled, while 34% of fathers of immigrant students from Western countries are. The numbers for non-Western immigrants are even higher: 39% of fathers of 1^{st} generation immigrants[16] and 50% of 2^{nd} generation immigrants; the corresponding numbers for mothers are 23%, 30%, 57% and 59%. Also the differences in income levels, especially earned income, are enormous. The total income[17] level of parents from Western countries are about 70-80% of that of Danish parents, while the income level of 1^{st} generation parents is only about 50% of that of Danes, and is only slightly higher for the parents of 2^{nd} generation students. However, this is total income. When only earned income is considered, i.e. total income net of unemployment benefits, social welfare and other income transfers, the gaps to Danes are considerably higher for non-Western immigrant families. These differences are mainly due to the weak labour market attachment of immigrant parents, particularly mothers: a much higher percentage of immigrant parents receive social welfare and/or are not active in the labour market. On the other hand, the family structure seems more favourable for 2^{nd} generation immigrants as 76% live with both natural parents, against only 59% of native Danes, 55% of immigrants from Western countries and 56% of 1^{st} generation immigrants[18]. However, while Danish families or families from Western countries (with a child in primary school) have two children on average, immigrant families have three. Also, more Danish than immigrant families own their dwelling, fewer are home-renters, and Danes live in more spacious homes (as measured by rooms per person). All in all, the socio-economic background is more favourable for Danish students than for immigrant students. Families from Western countries are more similar to Danes than to families from non-Western countries.

Also, we see tremendous diversity in the backgrounds of students originating from different countries. The single largest group, about 1,650 school children, is of Turkish

[16] The statistics for fathers of 1^{st} generation immigrants are somewhat unreliable, because information from the registers is missing for 29% of fathers.

[17] I.e. earned income plus other sources of income, e.g. income transfers.

[18] The low number for first generation students is due to fathers missing in the registers, most of them have probably never immigrated to Danmark. When we look at 1^{st} generation children where both fathers and mothers are in the registers, we find that 85% live with both parents, i.e. a higher share than for the 2^{nd} generation.

origin. Students with a Pakistani background represent the second largest group (over 1,550 children), while the third largest group comprises 1,200 Palestinians. The next-to-last row in Table 1 shows the share of 2^{nd} generation students, the remaining being 1^{st} generation immigrants. Iraqi and Somali students stand out as groups with the highest shares of 1^{st} generation immigrants (about 50%), while in the remaining groups less than 20% are 1^{st} generation immigrants.

Families with Turkish origin are characterized by low levels of education of both fathers and mothers even compared to other immigrant groups. Inspite of this, their mean income is close to the mean for 2^{nd} generation families. Students from Lebanon together with Somali students have most siblings on average of all groups (2.6 and 2.9). Also, these groups have very low levels of fathers' and particularly mothers' labour market participation[19]. Iraqi families are characterized by relatively high education levels of both parents. However, due to weak labour market attachment, their earned income is low. The discrepancy between relatively high education levels and low earned income could be due to a higher share of recently arrived families among Iraqi immigrants, as almost half of the Iraqi students were not born in Denmark. Families from (former) Yugoslavia earn significantly higher incomes than any other immigrant group.

As mentioned above, the immigration experience in Denmark is a quite recent one compared to European countries with former colonies and the long immigration history of the United States. However, during the 1990s, the development went fast: the share of bilingual students in the City of Copenhagen almost doubled over a period of only 16 years from 16% to 32% (1987-2003). This period with a sharp change in the ethnic composition of the student intake has led to a polarization of the schools into predominantly immigrant (with a majority of immigrant students) and predominantly native schools. Today, almost 30% of all students attends almost "all native" schools (with less than 10% immigrant students). On the other hand, one out of five students attends school with a majority of immigrant students. On average, students with a native Danish background attend schools with 18% immigrant students, while the number for immigrant students is 52%.

For studying school segregation in Copenhagen City, the level of analysis is the school catchment area. In Denmark, each public school has a fixed catchment area and in principle the local schools recruit their pupils from the surrounding residential neighborhoods and should have the same ethnic profile as the residential population. However, students can apply to enroll to any other public school in the municipality, which in principle must take in students up to their capacity limits. However, if the schools are oversubscribed, admission is based on place of residence with those living within a school's catchment area

[19] Overall, mothers' labour market participation rates are lower than fathers', and this is especially true for immigrants from non-Western countries.

given first priority. Students can also opt for a private school of which there are almost 80 spread over the city. This is a frequent choice: one out of four students attend private schools. Fees are low, as private schools are heavily subsidized by the state, and therefore, choosing private school is a potential option for most families.

4 Measuring ethnic segregation: methods and results

4.1 Measures of segregation

A great number of segregation measures have been developed in the scientific literature. In this paper, I rely on one of the most widely used indices of segregation, the dissimilarity index, which measures the unevenness of the ethnic distribution across units, e.g. neighbourhoods and schools. The dissimilarity index captures the extent to which two groups sort differently across schools or neighbourhoods and has been used extensively in both the residential and school segregation literatures. In this measure, the share in the total population of group a that lives in a certain neighbourhood or attends a certain school is compared to the share in the total population of group b that lives in that same municipality or neighbourhood, or attends the same school. The dissimilarity index takes on values between 0 and 1, where 0 indicates no segregation and 1 complete segregation. The index has a straightforward interpretation: for example, a D score of 0.50 for native-immigrant segregation would mean that 50% of either group must move to a different neighbourhood or school for the two groups to become equally distributed. According to Logan et al. (2003), researchers generally consider values below 0.30 to represent a low level of segregation. Values between 0.30 and 0.50 are interpreted as moderate segregation, and values above 0.50 are considered high levels of segregation. The value of D is symmetric, meaning that calculation with reference to Danes or immigrants is identical.

$$D = 0.5 \cdot \sum_i \left| \frac{D_i}{D} - \frac{I_i}{I} \right|$$

where (in the case of school segregation) D=the number of Danish school children in Copenhagen City, D_i=the number of Danish school children in school i, I=the number of immigrant school children in Copenhagen City, I_i=the number of immigrant students in school i. I calculate the index of dissimilation for each immigrant group, first across municipalities in the region of Copenhagen, then across districts and catchment areas (neighbourhoods) within the municipality of Copenhagen, and finally across schools.

This measure has some disadvantages. For example, two different dispersions may have the same index score. Furthermore, the measure is scale-dependent its value will differ for different spatial levels. As smaller units tend to be more homogenous per se,

they typically yield higher indices of segregation (Massey & Denton 1998). In spite of these disadvantages, the measure is frequently used in scientific studies[20]. I attempt to alleviate the effects of scale-dependence on comparisons by comparing indices calculated over units of similar (average) size. Residential segregation levels in the region and the city are compared using municipalities and city districts to calculate the index. The average number of inhabitants of the municipalities and districts are about 30,000[21]. School versus residential segregation is compared for the same base: the school catchment and its school. Thus, unlike many other studies, for this study, I have residential data on the school catchment area, which is the most relevant grouping when analysing segregation at the level of schools, as all students living within the (fixed) catchment boundaries are supposed to attend the local school. Therefore, I can directly compare who in principle *should* attend the respective local school, and the deviation in the student composition at school from what it should be according to the students' residential location.

4.2 Results

International evidence suggests that there may be different spatial and socio-economic patterns of segregation in different parts of the world. For the Metropolitan region of Boston, Logan et al. (2003) have shown that the main part of school segregation is due to suburbanisation, i.e. white families moving from the multi-ethnical inner cities out to the (white) suburbs. Logan et al. conclude (p.1) that "the exclusion of immigrant children from suburban neighborhoods and schools is the most significant key to racial inequality in the Boston region". On the other hand, in Amsterdam, segregation due to socio-economic differences between natives and immigrants across neighbourhoods *within* city borders is more important. According to Gramberg (1998), most of the Dutch children living in the City of Amsterdam have high-educated parents. These tendencies create a pattern, where the city is characterized by a rather strong division: large groups of immigrant families[22] with a low socio-economic background, plus a minor group of high-educated Dutch families. Clearly, this is a pattern that almost inevitably leads to a strong ethnic/socio-economic divide in neighbourhoods and, particularly, schools.

To investigate these issues for the Copenhagen case, I present two sets of results. First, I compare residential segregation of (i) all residents and (ii) school-aged residents across the municipalities of the Copenhagen region and across districts of Copenhagen City. Then, I present the same analysis for Copenhagen City students for both residential

[20] For an overview and a discussion of the strengths and weaknesses of the measure see Taeuber & Taeuber 1965; Zoloth 1976; James & Taeuber 1985; and Reardon & Firebaugh 2000.

[21] As this indicates, the municipality of Copenhagen is by far the most populous municipality in the Copenhagen region with 500,000 out of the region's 1,8 million residents.

[22] Only 35 percent of the Amsterdam residents under 18 years of age have two Dutch parents.

and school segregation.

4.2.1 Residential segregation in the Copenhagen region: Is segregation due to suburbanisation? For a systematic comparison of the patterns of residential segregation in the Copenhagen region, dissimilarity index values across municipalities have been calculated and the level of segregation in the region is then compared to segregation levels across residential districts within Copenhagen City. The average population size in both the municipalities of the region and the residential districts within Copenhagen Cities is similar, about 30.000 inhabitants, reducing concerns that differences in segregation level might be purely due to scale effects (as the use of smaller units typically results in higher index scores). There are 50 municipalities in the region and 15 residential districts in Copenhagen City.

Let us first consider the results for the region, and then compare segregation levels in the region to segregation level within Copenhagen City (Figure 2). For the population as a whole, the level of segregation against Danes for residents with an immigrant background as measured by the dissimilarity index is 0.21 for immigrants from other Western countries, and only slightly higher for immigrants from non-Western countries (0.25), indicating rather low levels of segregation. Surprisingly, segregation levels for immigrants from Western and non-Western countries against natives do not differ much. However, analyzing this issue in greater detail, the statistics reveal important differences between residential patterns for immigrants from Western and non-Western countries. While immigrants from Western countries are overrepresented (compared to Danes) in the well-off suburbs North of Copenhagen, immigrants from non-Western countries are overrepresented in the disadvantaged South-Western suburbs. Thus, while the dissimilarity index indicates a similar level of segregation from Danes for both groups, the spatial (and socio-economic) patterns of segregation are quite different.

The segregation level of 0.25 for immigrants from non-Western countries is substantially below the corresponding number for the large urban centres in the USA and UK, where indices of 0.5 to 0.7 are common (Musterd et al., 1998; Morrill, 1995; Logan et al., 2003; Musterd, 2005). Because comparing segregation levels across cities and countries is tedious due to methodological problems[23], results from such comparisons should be regarded merely as qualitative differences. However, the results indicate that the level of segregation across the region of Copenhagen is considerably lower than segregation levels experienced in many US and UK cities.

At the level of children, residential segregation is higher: for the Copenhagen region, the dissimilarity index increases from 0.21 to 0.28 and from 0.25 to 0.34 for immigrants

[23] See a discussion of this in Musterd (2005).

from Western and non-Western countries, respectively, but this is still at levels considered as low to moderate segregation. Results from the literature confirm these findings that segregation levels are higher for children than for adults (Clark et al., 1992; Logan et al., 2003).

[Figure 2 about here.]

Another interesting aspect is the residential assimilation process of immigrant generations. If 2^{nd} generation immigrants live less segregated from natives Danes than the 1^{st} generation, this would indicate a closing gap over generations. However, contrary to expectations, 2^{nd} generation immigrants live more segregated from native Danes than the 1^{st} generation (with index values of 0.30 and 0.23, see Figure 2). School-aged children live even more separated, the index value being 0.38 for the 2^{nd}generation and only 0.25 for the 1^{st} generation. This result is at odds with most of the literature, as studies of residential segregation tend to find that first-generation immigrants are more segregated than their later-generation counterparts (White, Biddlecom & Guo, 1993; Allan & Turner, 1996)[24]. There are also important differences between students by country of origin with index values ranging between 0.29 and 0.64 with Moroccans being the most segregated especially at the level of children, and Iraqis least segregated.

Finally, comparing segregation levels in the region to segregation levels in the about equally-sized residential districts within the City of Copenhagen, displays no substantial difference for the group of main interest, non-Western immigrants: residential segregation levels are low to moderate both in the region and across districts of Copenhagen City. Results by country-of-origin indicate much lower segregations levels in the city than the in the region for residents originating from Morocco, slightly lower for Turkey, Pakistan and Somalia, and higher levels at the city level for Lebanon and Iraq. These results mean that while e.g. Morrocans cluster in the municipality of Copenhagen rather than being spread across the Copenhagen region, they are more evenly distributed across districts *within* the city, while the reverse is true, albeit to a much lesser extent, for residents from Lebanon.

Overall, the level of residential segregation between the Danish and immigrant population in the Copenhagen region and city is low, indicating that spatial clustering across the metropolitan region is not the main source of school segregation. However, segregation levels are higher at the level of children and there is variation by country of origin.

[24] However, it is important to recognize that my results might differ from the cited paper because I do not look at immigrant generations within country-of-origin categories. Thus, my results may (partly) be due to composition effects.

4.2.2 Residential and school segregation in the City of Copenhagen The results of the previous paragraph suggest that the level of residential segregation is only low to moderate in Copenhagen. To examine how these low levels of residential segregation translate into segregation at the school level, I now turn to an analysis comparing residential and school segregation across school catchments and schools within Copenhagen City.

Residential segregation across school catchments The ethnic composition in the school catchment is an important indicator of the ethnic composition in the public schools. In some catchments, there is a sizable share of families with an immigrant background, which accounts for the rise of "concentration" schools. The results in Figure 3 suggest that residential segregation for school children between *school catchment areas* in Copenhagen City (0.44) is higher than between *municipalities* in the Copenhagen region (0.34) and between districts in Copenhagen-City (0.31) for immigrants from non-Western countries, but not for Western immigrants, where it remains at a low level. However, considerable caution is warranted. As mentioned above, the dissimilarity measure is scale-dependent. Therefore, index values for different spatial units are not readily comparable. Thus, at least part of the increase is probably due to the fact that municipalities and districts on average are four times bigger in terms of the population than school catchment areas[25]. The level of the dissimilarity index indicates for students from non-Western countries that 44% of students would have to move to a different school catchment area in order to achieve equal shares of immigrant children in all catchments. There is only sparse evidence in the literature on residential segregation within cities at the level of children. Burgess, Wilson & Lupton (2005) report dissimilarity indices for residential segregation for the aggregates of South Asian and Black students vs. White students in London of 0.54 and 0.47, respectively. They also calculate index values for eight non-White subgroups, of which only one (Pakistanis) is also considered in the present study. Burgess, Wilson & Lupton (2005) find an index value for Pakistani students of 0.58 for London compared to 0.43 in this study for Copenhagen, suggesting that segregation is lower in Copenhagen. Another study by Logan et al. (2003) report dissimilarity indices for Boston ranging between 0.50 and 0.70 for different immigrant groups against natives. All in all, the level of segregation of 0.44 for students from non-Western countries against natives in Copenhagen is slightly lower compared to the results for London and substantially lower compared to Boston. However, it is important to recall the point made above that differences in size between residential units across different cities render inter-city comparisons somewhat unreliable. Such comparisons can therefore only serve as rude indicators of differences in segregation

[25] The index values for residential segregation of school children at the school catchment level are on average 0.13 (or 42%) higher than for the school-aged population at the district level.

patterns across cities.

[Figure 3 about here.]

Unlike in the case of residential segregation across municipalities and districts, 1^{st} and 2^{nd} generation immigrants are about equally segregated across school catchments.

School segregation Public schools

In the previous sections, results showed moderate levels of residential segregation both for the region and for the city of Copenhagen. However, due to school choice, the level of segregation may be higher in schools. Results from the literature on school choice show that one of the most important factors guiding parental school choice is the peer group at the school. Therefore, parents may be very selective when choosing schools. In general, school segregation often replicates neighbourhood patterns. However, as shown in Figure 4, immigrant shares in schools are often higher than might be expected from levels of residential segregation. Particularly in school catchments with a high share of minority students, their share at school substantially exceeds their residential share, indicating that relatively more Danish families than immigrants are opting out of local schools. The general picture is that while residential segregation is important, school segregation adds a further dimension to segregation: if all students living in a catchment area attended their local school, the highest immigrant share at schools would be 63%. However, as a results of school choice options, the immigrant share is 94% at the highest concentration school.

[Figure 4 about here.]

The second and third columns of each panel in Figure 3 report the dissimilarity index at the school level; the second column is for public schools only. As expected, segregation is higher across schools than across neighbourhoods. The level of segregation of immigrant students from Western countries against Danes in public schools remains at a low segregation level (0.28), while segregation of students from non-Western countries increases slightly from 0.44 in the catchments to 0.47 in the schools.

My results are in line with Burgess, Wilson & Lupton's (2005) study for secondary school children in England. They show that for most ethnic groups, children are more segregated in school than in their neighbourhood. Clark et al. (1992) find that segregation in schools is higher than residential segregation in Amsterdam.

Segregation levels for the 1^{st} and 2^{nd} generation do not differ notably. When calculating the index for different countries of origin, we see that the segregation levels for students in public schools increase by one to nine percentage points compared to residential segregation. Public school segregation levels vary between 0.51 - 0.66 for different ethnic groups. School segregation is clearly the highest for students from Lebanon, of which two out of three must move to a different school for Danes and students from Lebanon to become equally distributed.

Results from the literature of public school segregation in cities are available for London, Boston, New York and Washington. Results for London (Burgess, Wilson & Lupton, 2005) show that the dissimilarity index values for South Asians and Blacks against Whites are 0.62 and 0.49. In their article, results are also reported for various subgroups, of which only Pakistanis appear in the present study, too. In London, for Pakistani students against Whites the dissimilarity index value is 0.68, i.e. higher that the level of 0.52 found for Copenhagen. This would suggest that public school segregation for Pakistanis in Copenhagen is lower than in London. However, the results for London are for schools covering students aged 11-16/18, while the Copenhagen schools include lower grades, too (6-15 years). This might explain part of the lower segregation level found for Copenhagen, as older students may be more separated for a variety of reasons: a longer distance to a school of own choice is more easily to overcome, social and cultural differences between ethnic groups may become more bothering for older age-groups. To examine whether this makes a difference, I have recalculated segregation levels for Copenhagen students in grades 5 to 9 only (ages 11-15 years). As expected, the segregation level for non-Western immigrants versus Danes increased slightly from 0.47 to 0.50, while the results for the Pakistani subgroup remained unchanged. However, another potential source of "bias" when comparing results across cities, might overstate segregation levels. Recall that smaller units alone will typically yield higher index values. As schools are typically smaller in Denmark than elsewhere, school segregation levels in Denmark might be overstated when compared to other countries. For the Copenhagen sample, the average school size is about 500 students, while school enrolment in the United Kingdom is 1000 students on average (Burgess, Wilson & Lupton, 2005). Logan, Oakley & Stowell (2003) report segregation levels for the City of Boston of about 0.45 for different ethnic groups against White. This might seem low, but it is important to mention that Boston is characterized by higher school segregation levels across the Boston *region* (0.55 - 0.68). The analysis of New York City public schools by

Ellen et al. 2002 is interesting, because they calculate dissimilarity indices separatly by race and by immigrant status[26]. Their results show that segregation of immigrants against natives is low (0.33), while segregation by race (White against Nonwhite) is high (0.68). This would suggest that segregation is so much not due to students' immigrant status, but to racial/ethnic segregation. Clotfelter (1999) calculates dissimilarity indices for school districts in the metropolitan area of Washington, D.C.[27]. The share of Nonwhite public school students is high throughout the whole region (50%), but is - with 96% - extremely high in the District of Columbia (i.e. the City of Washington). Clotfelter finds extremely high segregation levels (0.86) of Whites against Nonwhites in the District of Columbia.

All schools (public and private)

However, immigrant concentrations in public schools are not the only source of school segregation. When I plot the number of private school students by immigrant shares in the schools for the Copenhagen City data set (Figure 5), the distribution is U-shaped. This suggests that the private school sector in Copenhagen City acts as a sorting device of students into schools with high and low concentrations of immigrant students. These differences reflect the disproportionate private school attendance by a substantial share of Danish children whose families have remained in the city[28] on the one hand, and the rise of immigrant private schools on the other hand. In Copenhagen, 24% of all Danish students attend private schools, while 15% of immigrants from non-Western countries attend Muslim private schools[29]. Muslim private schools have become increasingly popular since the 1990s. They cater explicitly for immigrant students and thus add to the extent of ethnic segregation. Therefore, the increasing ethnic polarization in schools cannot be attributed solely to the behaviour of native parents. Specifically, 33% of students originating from Lebanon and Jordan attend Muslim schools, as do 28% of students from Iraq, 26% from Somalia, 25% from Syria, and 19% from Morocco. Thus, school choice patterns of both Danish and immigrant parents increase the ethnic polarization between schools. These patterns suggest that private schools should be added to the analysis to avoid underestimation of true school segregation levels.

[26] The native versus immigrant student population in New York and Copenhagen differ with respect to one important point: the share of Nonwhite in New York is similar in the native and immigrant student population (about 85%), while in Denmark, natives are almost all White and immigrants almost all from non-Western countries. This makes it difficult to disentangle the race effect from the effect of immigrant status on segregation in Denmark.

[27] Actually, Clotfelter calculates a variety of segregation measures for 18 metropolitan areas throughout the US, but the dissimilarity index is (by mistake?) only reported for Washington districts.

[28] Only 16% of all Danish school children in the Copenhagen region live in Copenhagen City, compared to 39% of school children from non-Western countries. 30% of the whole Danish population lives in the region of Copenhagen.

[29] Further 7% of non-Western immigrants attend predominantly Danish private schools.

[Figure 5 about here.]

I therefore proceed by calculating the index for the whole sample of public *and* private schools. The results indicate (Figure 3, third column in each panel) that the dissimilarity index increases further, suggesting that part of the school segregation level is due to parents opting for a private alternative. Interestingly, the index value for students from Western countries increases notably by 10 percentage points to 0.38, or 36%. As significant shares of both Danes and immigrants from Western countries attend private schools (24% vs. 41%), this indicates that they cluster in *different* private schools. For example, international private schools are quite popular among Western immigrants: one out of three students from Western countries attends an international private school (i.e. schools with an English, French or German study programme). For students from non-Western countries the increase in the dissimilarity index is important, but less marked, from 0.47 to 0.53, or 13%. The increase in the index value from public schools only to public and private schools is 5 percentage points for both 1^{st} and 2^{nd} generation immigrants. Considering students by country of origin, we see that students from Lebanon, Iraq, Morocco and Somalia experience the highest increase when private schools are added (8 or 9 percentage points); as we saw above, all four countries enroll substantial shares of students in Muslim private schools.

Once again, it is interesting to compare segregation in Copenhagen schools with the pattern in Dutch cities. Clark et al. (1992) report levels of school segregation (including private schools) for other cities.The only study I am aware of including private schools is for Dutch cities. Clark et al. (1992) report levels of school segregation of 0.54 for Amsterdam, 0.59 for Rotterdam, and 0.44 for Utrecht. The level of segregation in Copenhagen City lies within the range of these Dutch cities.

As these results show, restricting the analysis to public schools, as is done in the US and UK studies I am aware of, might underestimate school segregation levels. E.g. Logan et al. (2003) report for Boston City that 50% of the white school children in the cities attend private schools. Disregarding the private school sector in a situation where 50% of whites attend private schools is likely to underestimate school segregation.

5 Sources of segregation: ethnic or socio-economic background?

Table 1 in Section 3 has documented the notable differences in family socio-economic background between native Danes and immigrants. As these are factors that might contribute to ethnic segregation, it is important to see whether ethnic segregation simply

reflects socio-economic segregation. If segregation is overwhelmingly due to differences in socio-economic characteristics, then the policy target should be to increase the socio-economic status of immigrant families. However, if there is segregation over and above socio-economic segregation, this requires different policy actions. In this section, I formally address this issue by controlling for differences in students' socio-economic backgrounds in the immigrant share in schools attended by Danish and immigrant students.

[Table 2 about here.]

Simple descriptives (see Table 2) show that immigrants from non-Western countries attend schools with substantially higher immigrant shares compared to Danish students and students from Western countries. For example, the average Danish child attends a school that is about 18% ethnic, while the average child from non-Western countries attends school with a slight majority of immigrant students (about 52%). Also, the immigrant shares vary between the immigrant groups selected for comparison. The lowest average immigrant concentration (apart from the residual category of students from "other non-Western countries") is found for the 2^{nd} generation from Yugoslavia (49% immigrant children at school), while the highest shares are found for the 2^{nd} generation from Lebanon (68%) and Somalia (66%). Further, for four out of eight selected immigrant groups, the share of immigrant students at the school attended is significantly different for the 1^{st} and the 2^{nd} generation. A test for different means indicates that Pakistani and Yugoslavian 1^{st} generation students attend schools with a significantly higher immigrant share than the 2^{nd} generation does, while the opposite is true for students from Lebanon and Somalia.

5.1 An empirical model of the immigrant share at school

The following model is set up to decompose school segregation in a part which is due to differences in socio-economic characteristics between ethnic groups, and a residual part that might be interpreted as "genuine" ethnic segregation. The model predicts for each child the share of immigrant students this child meets at his/her school. The predictors in this estimation are a range of socio-economic characteristics of the child and his/her family, and a set of variables indicating the immigrant group the child belongs to. This regression provides for each immigrant group an estimate of the share of immigrant students that the average child of this group meets at school (relative to Danish students, as Danes is chosen as the omitted category) *net of* measured socio-economic differences between the

named immigrant group and Danes. The coefficients for the immigrant group indicators are interpreted as approximate measures of ethnic segregation.

The estimation equation is specified as a reduced form equation, where the dependent variable, Y_i, is the percentage of immigrant children at the child i's school

$$Y_i = \alpha + X_i\beta + D_i\gamma + \varepsilon_i \tag{1}$$

and X_i is a vector of individual-level characteristics (e.g. age, family structure, parental education), D_i is a vector of immigrant group dummy variables, and ε_i is a disturbance term. The model is estimated using ordinary least squares. Estimation results are reported in Table 3.

Table 3 about here

Specification (1) represents the differences in means, not including any covariates. The omitted category is native Danes, so that the coefficients capture the *gap* between the percentage of immigrant students at schools attended by the named immigrant category and native Danes. These results simply reflect the raw differences in immigrant shares at school reported in Table 2.

In specification (2), I include measures of *personal characteristics* as age and gender, *family background* as family structure and number of siblings, information on *housing conditions*, *parental education* and *parental income*[30] *and labour market status* in addition to the immigrant group dummy variables[31]. The results show that younger cohorts and students with more siblings attend schools with higher immigrant shares. As expected, higher levels of mother's and father's education and income are associated with a lower percentage of immigrant students at the child's school. The effect of parental education is not unimportant: for a given student, having two high-school graduated parents compared to two unskilled parents, the predicted percentage of immigrant students at the school attended is decreased by 5.6 percentage points. Having two university educated parents further decreases the predicted immigrant percentage by 4.7 percentage points. Housing

[30] In the regressions, I use total income rather than only earned income, because I want a proxy for the family's financial situation. Earned income is more closely related to labour market status, which I can control for by a variable indicating labour market status.

[31] I also include dummy variables that indicate whether no information on the mother, the father, or both could be found in the administrative registers from which I draw, and I include interaction terms for father/mother not living with student and father's/mother's wage. However, these coefficients are omitted in the results tabels for brevity.

conditions are related to the ethnic student composition at the child's school as well: children of home owners and families with more spacious homes (rooms per person) attend schools with a lower percentage of immigrant students. Also parental status on the labour market plays a role. However, the effects are not symmetric for fathers and mothers: while only fathers' higher unemployment is related to higher immigrant shares at their children's school, having a mother who is enrolled in formal education is related to lower immigrant shares compared to a mother who is a wage earner. Further, while mothers who are outside the labour force increase the predicted immigrant rate, the sign of this effect is reversed for fathers, an unexpected result. Self-employed parents are associated with lower immigrant shares at their children's schools, while social benefit recipients' children attend schools with on average higher immigrant shares.

[Figure 6 about here.]

The inclusion of parental income, education, and the other individual controls decreases the immigrant dummy variables estimates, i.e. immigrant students partly attend schools with higher immigrant shares due to a less favourable socio-economic background. For example, the gap between Danes and 1^{st} generation Turks decreases from 33% to 21% when differences in socio-economics are accounted for. However, there remains a sizable effect from the ethnic dummy estimates for all non-Western immigrant groups. The effect can be seen in Figure 6, which reports unadjusted and adjusted immigrant rates at the school attended by immigrants relative to native Danes. The unadjusted immigrant shares are the immigrant coefficient estimates from specification (1), and the adjusted immigrant shares are the coefficient estimates from specification (2). For all immigrant groups the adjusted shares are smaller in absolute value than the unadjusted shares, but important differences remain. The results in my study concerning the minor contribution of socio-economic differences in explaining immigrant concentration in schools are parallel to the results found for schools in the UK: Burgess & Wilson (2005) find that ethnic segregation is only weakly related to income segregation, and the results reported in Peach (1996) indicate only a weak relationship between ethnic and socio-economic segregation in Greater London.

5.2 Oaxaca methods: decomposing the gap

Thus, the results presented in Table 3 and Figure 6 suggest that the large variation in the immigrant share in schools attended by different groups of students can be explained to

some degree by differences in parental education, income, and other family background characteristics. However, only the *common* impact of socio-economic factors is identified by the method employed above. To identify the *separate* contributions of each of the student background characteristics, I use a variant of the familiar technique of decomposing intergroup differences in a dependent variable. In the standard version of this method (Blinder 1973, Oaxaca 1973), the difference between immigrant shares at schools attended by groups a and b can be expressed as

$$\overline{Y}^a - \overline{Y}^b = \left(\overline{X}^a - \overline{X}^b\right)\widehat{\beta}^a + \overline{X}^b\left(\widehat{\beta}^a - \widehat{\beta}^b\right) \tag{2}$$

where $\overline{X}^a$ is a vector of average values for the individual level characteristics and $\widehat{\beta}^a$ is a vector of coefficient estimates for group a. The first term in the decomposition is the part of the gap that is due to group differences in average values of the independent variables, and the second term represents the part due to differences in the group processes determining immigrant rates. I further decompose the first term into the separate contributions from group differences in specific variables, such as personal controls, parental income and education, as it is not clear whether socio-economic segregation is due to parental income, education, unemployment etc. or all. The second term or "unexplained" portion relates to variations in the coefficients for specific variables across groups and includes the immigrant dummies. The unexplained portion is typically calculated by subtracting the first term in (2) from the total gap. Another alternative of calculating the decomposition (used in Betts & Fairlie 2001, Neumark 1988, and Oaxaca & Ransom, 1994), is to weight the first term of the decomposition expression using coefficient estimates from a pooled sample of the two groups. I follow this approach to calculate the decompositions. I use coefficient estimates from a regression that includes a pooled sample of all ethnic groups (using specification (2) of Table 3). I then use native Danes as the reference group and calculate the decomposition for the ethnic share gap between Danes and each immigrant group. Thus, the first term in the decomposition that captures the explained variation in mean immigrant rates between group b and the Danish group (D) is

$$\left(\overline{X}^D - \overline{X}^b\right)\widehat{\beta}^* \tag{3}$$

where $\widehat{\beta}^*$ are the pooled coefficients. The unexplained term in the decomposition is calculated by subtracting (3) from the total gap $\overline{Y}^a - \overline{Y}^b$in (2).

This variant of the standard model has the advantage that the use of the same coefficient estimates for weighting the explained part of the decomposition allows for straightforward comparison of results across groups. Moreover, the problem of using imprecisely

estimated coefficients for some of the smaller immigrant groups is avoided by the pooled-sample approach.

Figure 7 (and Table A1) reports the results from the decomposition of the immigrant rate gap between Danes and the immigrant groups. I begin with an analysis of the ability of each group of variables to explain the overall gap in immigrant student shares between Danish students and all immigrant categories together. In general, only part of the gap can be explained by the factors included in the decomposition, the share ranging between 43% for students from Western countries, to only 30% for 2^{nd} generation immigrants from non-Western countries (shown in the three top-rows of Figure 7).

[Figure 7 about here.]

Immigrants from Western countries attend schools with higher shares of immigrant students than Danes, although the difference is not large. About 22% of this gap can be explained by lower levels of income and labour market status among the parents of school-children from Western countries. On average, income levels for immigrants from Western countries are 20% and 33% lower (for fathers and mothers, respectively) than for Danish parents, and labour market participation rates are notably lower, too. Differences in the parental education levels between immigrants from Western countries and Danes explain 13% of the gap in immigrant shares in schools attended, while differences in housing conditions explain about 8%. Variations in family controls account for only little of the gap, while personal controls (age, gender) explain virtually none of the difference. This is most probably due to the lack of variation in these variables across the two groups. Immigrants from non-Western countries attend schools with a substantially higher share of immigrant students than Danes do. For this group, this gap is less well explained by the included family characteristics than for immigrants from Western countries. Even though income levels and labour market participation rates are much lower for immigrants from non-Western countries than for Danes, this accounts for only 16 and 12% of the gap for 1^{st} and 2^{nd} generation immigrants. Similarly, differences in parental education levels compared to Danes explain only a small part of the gap, as do housing conditions (about 7-9% each). In general, despite some variation between immigrant groups in the percentage of the gap explained by the different groups of controls, the broad picture is similar for immigrant groups by country of origin.

Thus, the overall picture is clear: (i) socio-economic differences between native Danes and immigrants can explain only a minor part of the total gap in minority shares in the

children's schools (30-43%), and (ii) differences in parental income and labour market status are the strongest explanatory factors, followed by parental education and housing conditions, while differences in personal characteristics and the family structure explain only very little of the gap.

6 Discussion and conclusion

In this study, I document the extent and patterns of residential and school segregation for children in Copenhagen. These findings are the first Danish evidence on ethnic segregation at the level of schools. I have not found evidence of substantial residential segregation across the region, as it is often observed in the US. However, I find that children live more segregated than the population as a whole. While residential segregation levels across municipalities in the Copenhagen region and across districts within Copenhagen City are low to moderate, segregation across school catchment areas in Copenhagen City are higher[32]. School choice, and particularly private school choice, contributes to increased segregation, leading to high levels of school segregation. Thus, the evidence from Copenhagen suggests that moderate levels of residential segregation need not necessarily translate into low school segregation: when school choice options are available, moderate residential segregation is compatible with high school segregation levels.

The analysis of the determinants of the minority share at children's schools indicates that an important part of the gap seems to be genuine ethnic segregation as measured differences in the socio-economic background of students are able to explain only a minor part of the gap. A further decomposition of the gap suggests that particularly differences in parental education levels, income, labour market status and housing conditions contribute to explaining the gap.

Over the past few years, the phenomenon of schools with very high and very low shares of immigrant students coexisting in close proximity has been a concern for the city government of Copenhagen. Results from the literature on the effects of school segregation/integration suggest that segregation harms ethnic students and students from lower socio-economic backgrounds (Hanushek et al. 2003), while integration does not hurt students in receiving schools (Angrist & Lang, 2004)[33]. Suggestions of how to achieve a more even distribution of immigrant students have been discussed, but no fundamental

[32] However, as discussed above, this is probably at least partly due to the scale-dependence of the dissimilarity index.

[33] Angrists and Lang's study analyses the impact of the Boston Metco (Metropolitan Council on Educational Opportunity) program, which is a desegregation programme that sends (mainly black) students from Boston schools to more affluent suburbs. Their study shows no impact on white non-Metco students in the receiving schools, while there is some evidence of a modest and short lived (negative) effect on the scores for non-Metco ethnic students.

and effective measures have been implemented in Copenhagen, yet. There have also been slighter changes in the borderlines of school catchment areas, but this has had only minor effects on the residential composition. The most recent initiative of the city government trying to integrate schools involves the use of quotas to make sure that (some) schools with few ethnic students reserve a certain number of places to students from catchments with a high ethnic concentration, and turning (some) high concentration schools into so-called magnet schools to attract more native Danish students.

While the city government is concerned about schools with a high share of immigrant students, the Danish government is advocating freer school choice. They reason that school choice should be a real option for everybody. Today, with the major option beside the local school being fee paying private schools (low fees, however), well-educated families with well-paid jobs are more likely than others to choose private schools for their children (see Rangvid (2003) for Danish evidence). While proponents of freer school choice argue that free school choice should be within the reach of every family, opponents argue that this would lead to further creaming off in the local public schools.

Surprisingly, the effect of freer school choice on *residential* patterns is seldom discussed. Today, the residential address is tightly linked with which public school the child is eligible to attend, and thus there is residential sorting between school catchment areas on these grounds. Freer choice of public school would loosen the link between residential choices and eligibility of public school, which might make it more attractive for well-off Danish families to locate in neighbourhoods with higher immigrant concentrations. So even if freer school choice might cause more segregation at the school level in the short run, with Danish families possibly returning to high concentration areas for living, this might be a starting point for less segregated neighbourhoods and schools in the longer run. Söderström & Uutsitalo (2004) show that increased school choice in Stockholm schools decreased residential segregation (but, school segregation increased). However, school choice patterns in Copenhagen need to be examined in more detail to discuss possible solutions for more integration. Patterns of school choice within the public sector and between public and private schools will be the topic of future research.

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		Percentage immigr. students at school	Gap relative to Danes	Contributions from group differences in														
				Personal controls		Family controls		Housing		Parental education		Vage&labour marke		Explained		Unexplained		In all (%)
All minorities	**1st gen**	50.8	50.8	-0.308	*-1.0%*	0.800	*2.5%*	2.477	*7.6%*	2.762	*8.5%*	2.656	*8.2%*	8.387	*25.9%*	24.013	*74.1%*	100%
	2nd gen	52.9	52.9	0.059	*0.2%*	0.844	*2.4%*	2.512	*7.3%*	2.682	*7.8%*	2.393	*6.9%*	8.491	*24.6%*	26.009	*75.4%*	100%
Turkey	**1st gen**	51.2	51.2	-0.400	*-1.2%*	0.810	*2.5%*	2.440	*7.4%*	4.525	*13.8%*	2.338	*7.1%*	9.712	*29.6%*	23.088	*70.4%*	100%
	2nd gen	51.8	51.8	-0.030	*-0.1%*	0.651	*1.9%*	2.240	*6.7%*	4.205	*12.6%*	1.586	*4.7%*	8.651	*25.9%*	24.749	*74.1%*	100%
Pakistan	**1st gen**	54.4	54.4	-0.285	*-0.8%*	1.094	*3.0%*	2.387	*6.6%*	3.474	*9.7%*	2.674	*7.4%*	9.344	*26.0%*	26.656	*74.0%*	100%
	2nd gen	50.0	50.0	-0.085	*-0.3%*	1.178	*3.7%*	2.409	*7.6%*	2.973	*9.4%*	1.870	*5.9%*	8.344	*26.4%*	23.256	*73.6%*	100%
Lebanon	**1st gen**	59.0	59.0	-0.433	*-1.1%*	1.501	*3.7%*	3.382	*8.3%*	3.464	*8.5%*	4.538	*11.2%*	12.452	*30.7%*	28.148	*69.3%*	100%
	2nd gen	67.8	67.8	0.146	*0.3%*	1.413	*2.9%*	3.507	*7.1%*	3.089	*6.3%*	4.744	*9.6%*	12.899	*26.1%*	36.501	*73.9%*	100%
Iraq	**1st gen**	61.1	61.1	-0.272	*-0.6%*	1.123	*2.6%*	3.167	*7.4%*	2.162	*5.1%*	3.940	*9.2%*	10.120	*23.7%*	32.580	*76.3%*	100%
	2nd gen	62.2	62.2	0.283	*0.6%*	0.733	*1.7%*	2.994	*6.8%*	1.314	*3.0%*	3.693	*8.4%*	9.017	*20.6%*	34.783	*79.4%*	100%
Morocco	**1st gen**	51.9	51.9	-0.291	*-0.9%*	0.984	*2.9%*	2.615	*7.8%*	3.506	*10.5%*	3.618	*10.8%*	10.432	*31.1%*	23.069	*68.9%*	100%
	2nd gen	56.1	56.1	0.032	*0.1%*	1.029	*2.7%*	2.592	*6.9%*	3.259	*8.6%*	2.893	*7.7%*	9.805	*26.0%*	27.895	*74.0%*	100%
Jugoslavia	**1st gen**	53.6	53.6	-0.408	*-1.2%*	0.527	*1.5%*	2.179	*6.2%*	2.411	*6.8%*	2.442	*6.9%*	7.152	*20.3%*	28.048	*79.7%*	100%
	2nd gen	49.1	49.1	-0.045	*-0.1%*	0.471	*1.5%*	1.758	*5.7%*	2.564	*8.4%*	1.569	*5.1%*	6.317	*20.6%*	24.383	*79.4%*	100%
Somalia	**1st gen**	60.0	60.0	-0.276	*-0.7%*	1.612	*3.9%*	2.923	*7.0%*	3.294	*7.9%*	3.992	*9.6%*	11.544	*27.8%*	30.056	*72.2%*	100%
	2nd gen	66.0	66.0	0.389	*0.8%*	1.476	*3.1%*	3.339	*7.0%*	2.544	*5.3%*	4.738	*10.0%*	12.486	*26.2%*	35.114	*73.8%*	100%
Other	**1st gen**	41.4	41.4	-0.297	*-1.3%*	0.288	*1.3%*	2.012	*8.7%*	2.275	*9.9%*	1.514	*6.6%*	5.792	*25.2%*	17.208	*74.8%*	100%
	2nd gen	44.7	44.7	0.098	*0.4%*	0.502	*1.9%*	2.244	*8.5%*	1.582	*6.0%*	1.561	*5.9%*	5.986	*22.8%*	20.314	*77.2%*	100%

Table A1: *Results from the Oaxaca decomposition*

Table 1: Statistical portrait of students

	Danes	***Western countries***	***Non-Western countries***									
			1st gen. imm.	***2nd gen. imm.***	**Turkey**	**Pakistan**	**Lebanon**	**Iraq**	**Morocco**	**Yugoslavia**	**Somalia**	**Other NWC**
% of all	***70.8%***	***1.3%***	***6.0%***	***21.9%***	***4.1%***	***3.9%***	***3.1%***	***2.3%***	***2.3%***	***2.0%***	***1.6%***	***8.7%***
Year of birth	92.696	92.209	90.758	93.066	92.234	91.962	93.297	92.924	92.739	92.089	93.085	92.632
No. siblings	0.951	1.047	1.927	1.905	1.668	2.259	2.600	1.972	2.101	1.473	2.878	1.481
Female	49.7%	49.9%	49.8%	49.1%	50.8%	49.8%	50.3%	49.1%	49.3%	44.8%	50.9%	48.6%
Lives with both parents	59.0%	55.3%	56.0%	75.5%	81.8%	83.8%	75.2%	77.4%	81.3%	73.9%	40.9%	60.1%
Lives in owned dwelling	54.7%	36.3%	13.6%	16.8%	23.3%	24.5%	0.9%	2.1%	19.7%	34.2%	2.1%	15.5%
Lives in rented dwelling	34.7%	47.1%	72.8%	70.7%	65.0%	62.3%	86.9%	83.7%	70.4%	54.4%	85.7%	70.4%
Other type of dwelling	10.4%	16.1%	13.1%	12.4%	11.4%	12.9%	12.0%	13.4%	9.9%	11.3%	11.9%	13.9%
Rooms per person	1.153	1.090	0.732	0.773	0.779	0.727	0.637	0.729	0.741	0.807	0.620	0.850
Father's income	295	236	134	146	133	139	126	105	156	209	136	153
Father's earned income	276	198	60	90	88	96	43	23	94	165	36	100
Father wage earner	77.6%	57.0%	28.0%	38.6%	40.5%	40.2%	21.5%	11.9%	41.2%	63.4%	20.1%	41.3%
Father self-employed	9.7%	13.5%	12.4%	16.2%	23.8%	22.3%	10.8%	20.8%	7.3%	9.9%	1.5%	14.1%
Father unemployed	2.8%	5.0%	3.5%	7.6%	14.2%	6.1%	5.5%	1.6%	9.0%	8.0%	2.9%	5.4%
Father student	1.0%	1.4%	1.5%	1.1%	0.2%	0.6%	1.4%	2.8%	0.1%	0.5%	3.5%	1.4%
Father permanent income transfer	2.1%	1.2%	6.3%	7.7%	3.6%	9.8%	7.0%	4.9%	15.6%	2.5%	4.0%	8.8%
Father not active in labour market	6.8%	21.9%	48.2%	28.8%	17.7%	21.0%	53.6%	58.0%	26.6%	15.6%	68.0%	29.0%
Father unskilled	24.9%	34.4%	39.3%	50.4%	75.8%	52.1%	54.7%	29.9%	55.7%	39.1%	40.6%	36.1%
Father vocational education	31.4%	25.4%	24.8%	21.6%	13.6%	19.8%	16.9%	22.0%	18.5%	42.6%	19.9%	26.5%
Father high-school	9.7%	6.9%	12.2%	11.5%	3.1%	19.4%	14.9%	16.1%	10.9%	6.9%	16.8%	10.4%
Father short further education	4.6%	5.0%	8.6%	5.3%	3.1%	2.4%	5.1%	8.2%	3.7%	3.9%	9.1%	9.3%
Father medium-term further education	13.1%	11.4%	8.7%	6.8%	3.7%	4.3%	5.9%	13.5%	7.3%	4.3%	6.0%	10.0%
Father long further education	14.7%	14.5%	5.9%	4.3%	0.7%	2.1%	2.5%	10.2%	3.9%	3.2%	7.7%	7.1%
Father PhD	1.7%	2.4%	0.5%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.6%

… continued

Table 1, continued

	Danes	***Western***	***Non-Western countries***									
		countries	***1st gen. imm.***	***2nd gen. imm.***	**Turkey**	**Pakistan**	**Lebanon**	**Iraq**	**Morocco**	**Yugoslavia**	**Somalia**	**Other NWC**
Mother's income	227	151	117	125	128	95	114	111	120	157	117	134
Mother's earned income	201	116	35	49	59	33	8	11	40	99	3	67
Mother wage earner	77.8%	50.0%	19.5%	27.9%	38.2%	21.9%	4.6%	6.5%	23.4%	48.4%	1.9%	35.2%
Mother self-employed	4.0%	9.2%	2.1%	3.2%	1.9%	5.4%	0.5%	2.9%	0.7%	0.4%	0.7%	4.9%
Mother unemployed	3.0%	4.8%	2.4%	4.9%	8.4%	3.6%	1.9%	0.8%	5.3%	8.4%	0.0%	4.2%
Mother student	4.0%	5.2%	1.0%	2.0%	0.9%	0.7%	1.1%	1.6%	1.1%	0.6%	0.5%	3.7%
Mother permanent income transfer	1.3%	1.9%	0.8%	1.3%	1.0%	1.7%	0.7%	0.8%	2.1%	0.8%	0.5%	1.3%
Mother not active in labour market	9.9%	28.8%	74.1%	60.8%	49.6%	66.7%	91.3%	87.2%	67.4%	41.3%	96.4%	50.7%
Mother unskilled	23.4%	30.2%	57.2%	58.9%	81.6%	64.1%	67.7%	54.4%	72.8%	51.2%	59.5%	40.5%
Mother vocational education	27.0%	22.1%	15.9%	17.5%	7.4%	11.8%	10.1%	14.4%	13.9%	35.4%	11.5%	25.3%
Mother high-school	8.9%	14.3%	14.4%	13.7%	9.3%	17.9%	16.5%	16.1%	7.3%	6.0%	21.4%	14.7%
Mother short further education	4.3%	7.6%	3.3%	2.9%	0.6%	2.6%	2.5%	3.8%	1.6%	2.2%	2.9%	4.9%
Mother medium-term further education	24.5%	13.7%	5.7%	4.8%	0.9%	2.2%	2.5%	6.4%	3.2%	3.8%	3.2%	9.8%
Mother long further education	11.0%	11.6%	3.4%	2.2%	0.1%	1.4%	0.7%	4.8%	1.2%	1.6%	1.5%	4.7%
Mother PhD	1.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Father not in register	5.0%	21.3%	28.9%	4.2%	2.9%	6.8%	1.9%	5.1%	5.4%	5.2%	27.3%	16.5%
Mother not in register	0.5%	2.1%	7.2%	0.7%	1.6%	2.2%	1.5%	0.5%	1.3%	2.3%	6.1%	2.2%
2nd generation		64%	0%	100%	89%	85%	92%	56%	93%	83%	52%	73%
No. observations	28326	535	2383	8767	1648	1557	1234	916	913	790	623	3469

Group	Proportion	N	Proportion	N	
Danes	18.2%	28,326			
Other Western Countries	26.6%	535			
	1st gen. immig.		2nd gen. immig.		Significance of different means
All minorities	50.8%	2,383	52.9%	8,767	***
Turkey	51.2%	176	51.8%	1,472	
Pakistan	54.4%	235	50.0%	1,322	**
Lebanon	59.0%	100	67.8%	1,134	***
Iraq	61.1%	406	62.2%	510	
Morocco	51.9%	68	56.1%	845	
Yugoslavia	53.6%	134	49.1%	656	*
Somalia	60.0%	302	66.0%	321	**
Other Nonwestern countries	41.4%	962	44.7%	2,507	

*Note: ***, ** and * denote significance at the 0.001, 0.01 and 0.05 level, respectively.*

Table 2: *Minority shares at school attended by different ethnic groups*

Table 3: *Determinants of the minority share at the school attended*

		Model 1			Model 2		
Variable		Coef.	SE	Sign.	Coef.	SE	Sign.
Western countries		**8.365**	0.908	<.0001	**5.203**	0.880	<.0001
Turkey	**1st gen**	**32.971**	1.573	<.0001	**20.955**	1.540	<.0001
	2nd gen	**33.538**	0.556	<.0001	**22.865**	0.583	<.0001
Pakistan	**1st gen**	**36.163**	1.363	<.0001	**24.542**	1.340	<.0001
	2nd gen	**31.796**	0.585	<.0001	**20.856**	0.619	<.0001
Lebanon	**1st gen**	**40.771**	2.084	<.0001	**26.439**	2.029	<.0001
	2nd gen	**49.554**	0.630	<.0001	**34.717**	0.689	<.0001
Iraq	**1st gen**	**42.915**	1.040	<.0001	**30.153**	1.057	<.0001
	2nd gen	**44.007**	0.929	<.0001	**32.852**	0.937	<.0001
Morocco	**1st gen**	**33.734**	2.526	<.0001	**20.961**	2.442	<.0001
	2nd gen	**37.862**	0.726	<.0001	**26.018**	0.741	<.0001
Jugoslavia	**1st gen**	**35.407**	1.801	<.0001	**27.286**	1.744	<.0001
	2nd gen	**30.921**	0.822	<.0001	**23.413**	0.803	<.0001
Somalia	**1st gen**	**41.762**	1.203	<.0001	**28.506**	1.228	<.0001
	2nd gen	**47.816**	1.168	<.0001	**32.987**	1.174	<.0001
Other	**1st gen**	**23.185**	0.682	<.0001	**15.411**	0.707	<.0001
	2nd gen	**26.442**	0.433	<.0001	**18.540**	0.452	<.0001
Year of birth					**0.167**	0.032	<.0001
No. siblings					**0.845**	0.125	<.0001
Male					*Reference category*		
Female					0.258	0.200	0.197
Lives with both parents					0.065	0.381	0.865
Does not live with both parents					*Reference category*		
Lives in owned dwelling					*Reference category*		
Lives in rented dwelling					**3.137**	0.239	<.0001
Other type of dwelling					**1.170**	0.343	0.001
Type of dwelling missing					3.285	2.328	0.158
Rooms per person					-3.671	0.286	<.0001
Father's income					**-0.006**	0.001	<.0001
Father wage earner					*Reference category*		
Father in formal education					**2.727**	1.035	0.008
Father self-employed					**-2.243**	0.403	<.0001
Father permanent income transfer					0.680	0.597	0.255
Father unemployed					**1.827**	0.555	0.001
Father not active in labour market					**1.148**	0.372	0.002
Father unskilled					*Reference category*		
Father vocational education					**-1.992**	0.279	<.0001
Father high-school					**-3.349**	0.385	<.0001
Father short further education					**-2.708**	0.512	<.0001
Father medium-term further education					**-4.127**	0.386	<.0001
Father long further education					**-4.642**	0.408	<.0001
Father PhD					**-3.693**	0.962	0.000

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Table 3, continued

	Model 1			Model 2		
Variable	Coef.	SE	Sign.	Coef.	SE	Sign.
Mother's income				**-0.009**	0.001	<.0001
Mother wage earner				*Reference category*		
Mother in formal education				**-2.848**	0.596	<.0001
Mother self-employed				**-4.189**	0.630	<.0001
Mother permanent income transfer				*1.798*	0.927	0.052
Mother unemployed				-0.361	0.574	0.529
Mother not active in labour market				**4.950**	0.350	<.0001
Mother unskilled				*Reference category*		
Mother vocational education				**-2.539**	0.289	<.0001
Mother high-school				**-2.319**	0.369	<.0001
Mother short further education				**-5.242**	0.552	<.0001
Mother medium-term further education				**-5.727**	0.335	<.0001
Mother long further education				**-5.839**	0.454	<.0001
Mother PhD				**-6.432**	1.259	<.0001
Intercept	**18.215**	0.124	<.0001	**13.553**	3.084	<.0001
No. obs.		40010			40010	
Adj. R-sq.		0.37			0.42	

Note: An intercept and dummy variables for father/mother missing in register, dummies for missing values for type of dwelling and number of rooms per person, and interaction terms for father/mother not living with student and father's/mother's wage and unemployment included.

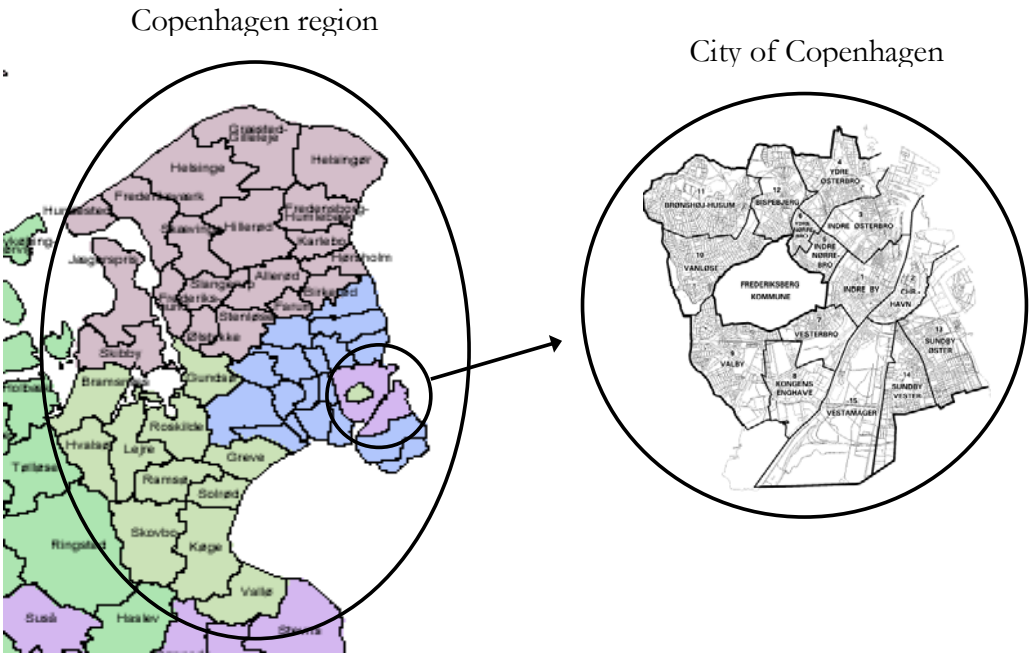

Figure 1: *Copenhagen: the region and the city*

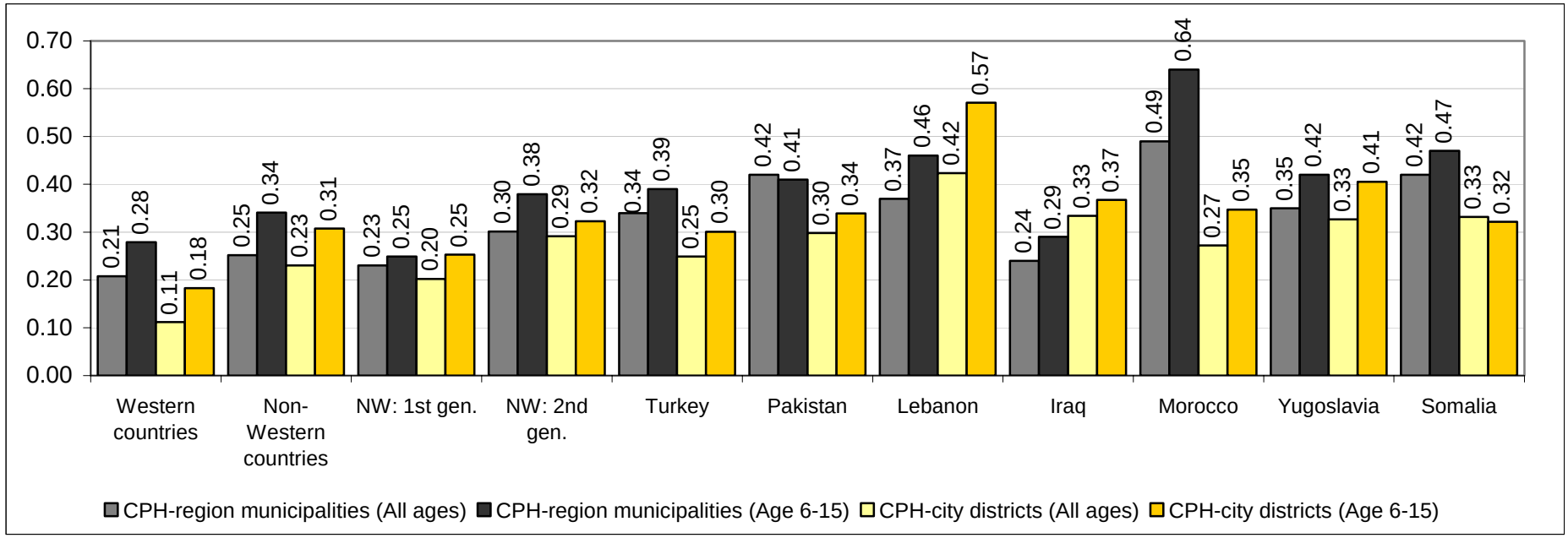

Figure 2: *Dissimilarity index for native Danes against immigrant groups across (i) municipalities of the Copenhagen region, and (ii) districts within Copenhagen City*

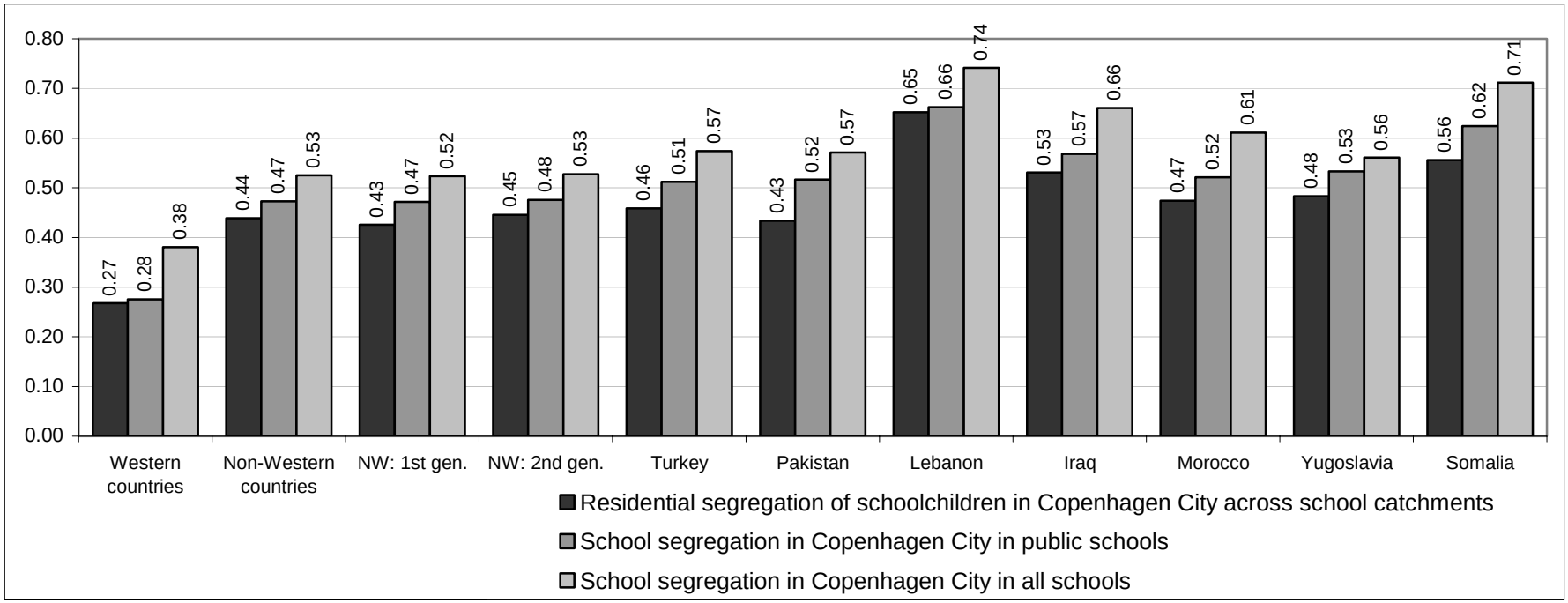

Figure 3: *Dissimilarity index for native Danes against immigrant groups across school catchments and schools in Copenhagen City*

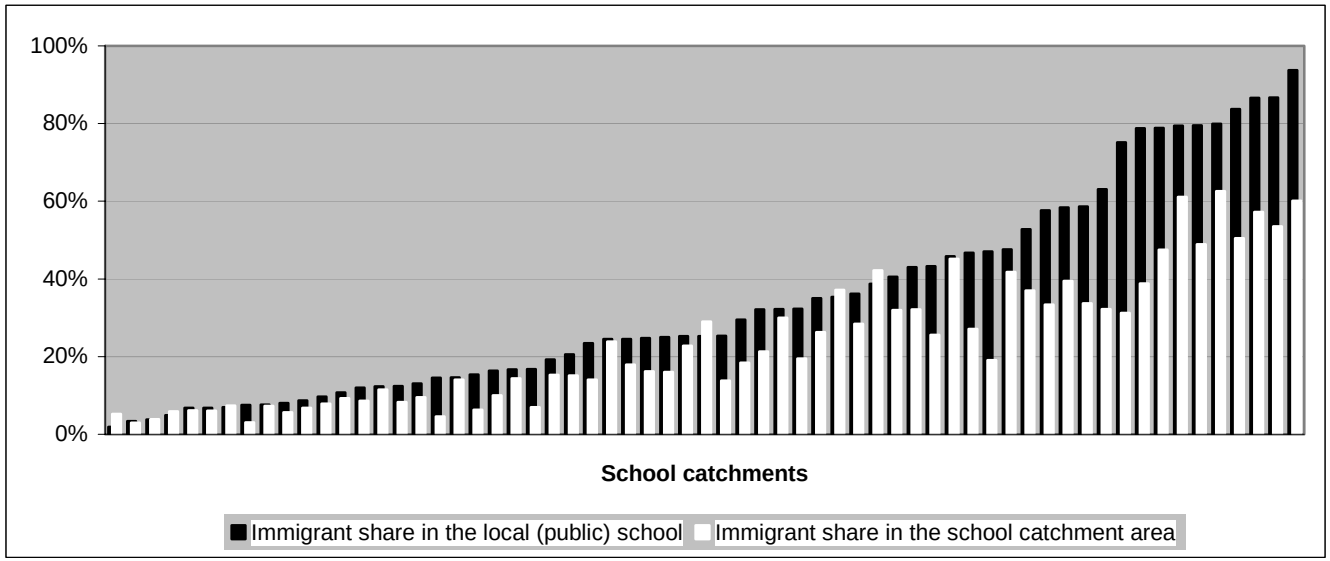

Figure 4: *Residential immigrant share in school catchment areas vs. school immigrant share in local (public) schools*

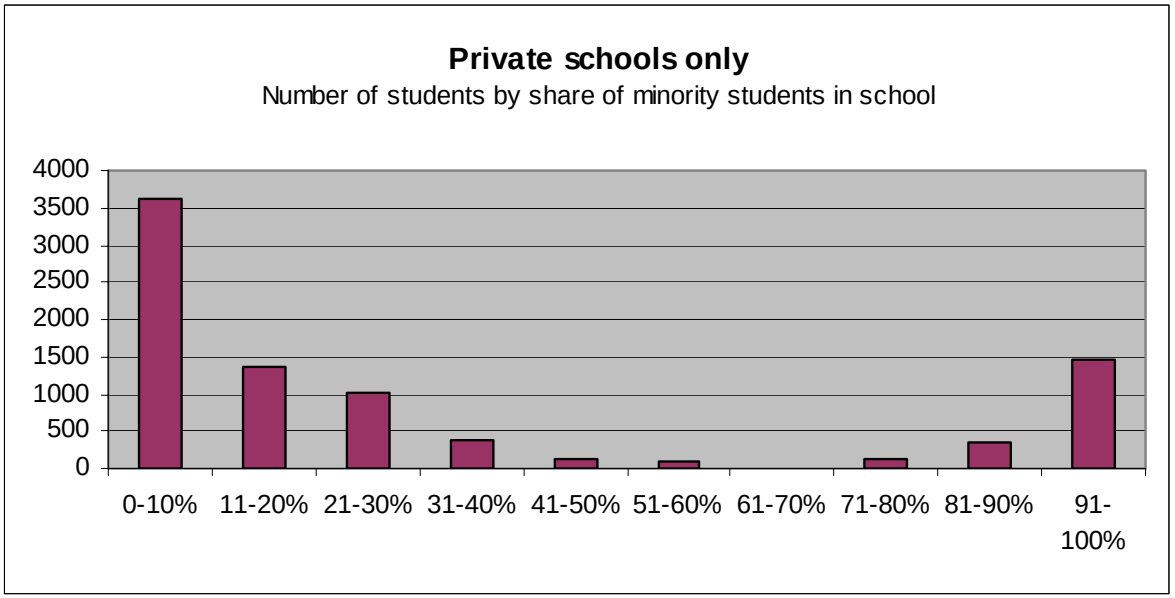

Figure 5: *Number of students in private schools by share of immigrant students in school*

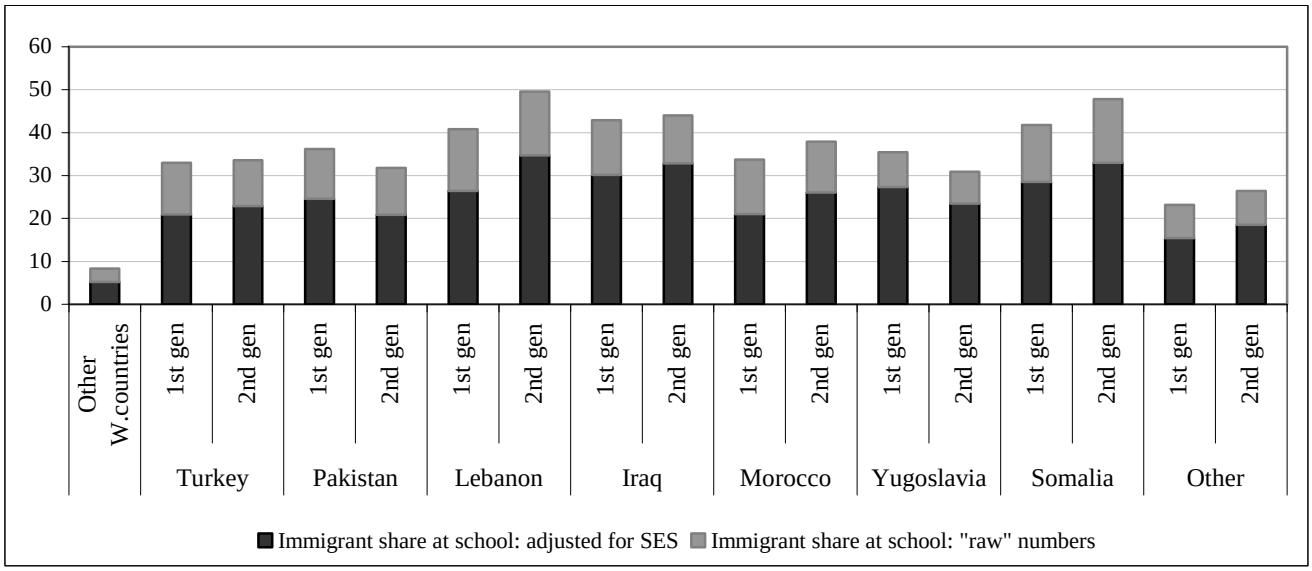

Figure 6: *Adjusted and unadjusted (relative) immigrant shares in schools attended by each ethnic group*

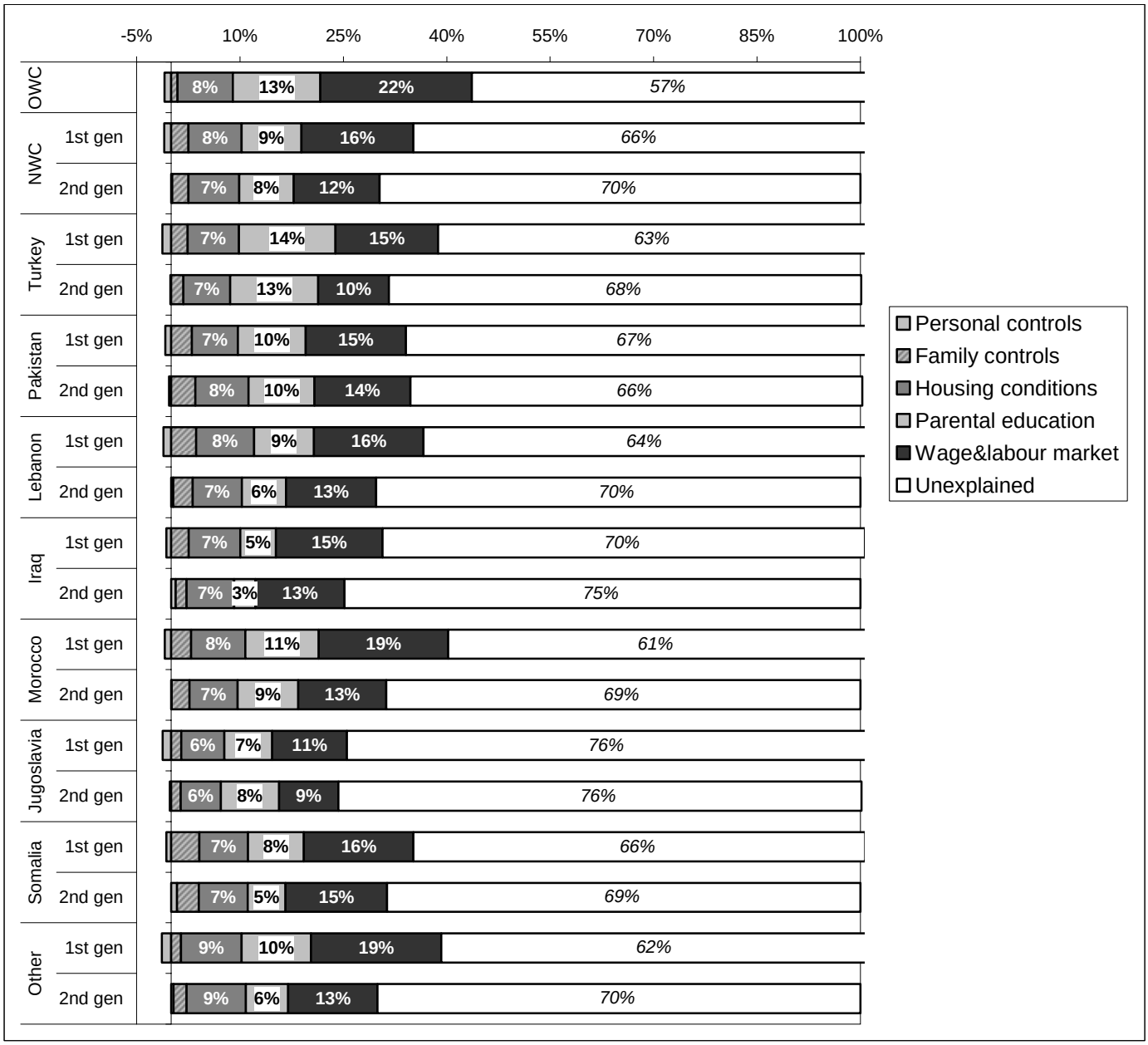

Figure 7: *Decomposition of the difference in the immigrant share at the school attended between native Danes and immigrant groups*