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The Intergenerational Effects of Intermarriage

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Abstract

This study closely examines long-term outcomes of intermarriage in Denmark in terms of children's educational performance, studying grades from final examinations. The study uses rich register data, where families are linked across generations, and contributes to the migration literature by providing new insights into the human capital formation in inter-ethnic families. The outcomes of children of intermarriage are very much in line with the outcomes of children with two native-born Danish parents. Compared to second-generation immigrants, children of intermarriage perform substantially better, and these differences remain even when school and family-level confounders are taken into account. Moreover, this paper explores the heterogeneous character of the 2.5 generation in Denmark and studies the importance of parental country of origin. Parental country of origin is of significance for the educational performance of children from intermarriage in Denmark, as the performance of children with a non-native parent originating from countries of Africa, Asia, and Latin America is closer to that of second-generation immigrants, rather than natives. This association remains (for certain groups) when controlling for unobserved heterogeneity at the school and family level.

Keywords Intermarriage · Denmark · 2.5 generation · Migration · Educational outcomes · Intergenerational effects

Introduction Intermarriage has long been regarded as an important indicator of immigrant integration. It has the potential to weaken ethnic group boundaries (Gordon 1964) as it connects families and social networks and leads to more interethnic contacts between majority and minority groups, resulting in more acceptance and less prejudice (Rodriguez-Garcia 2015). Intermarriage is a growing phenomenon in western Europe, although country differences exist (Lanzieri 2012).

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Compared to first- and second-generation immigrant children,[1] children of intermarriage (2.5 generation immigrants) (often) have more values in common with natives and tend to have more advantageous socio-economic positions (Kalmijn 2015). Nevertheless, outcomes of intermarriage are more complex, and aspects such as parental conflict and separation, which are more common in intermarriage (Zhang and van Hook 2009; Dribe and Lundh 2012), and cultural differences between the parents may lead to negative socio-economic outcomes for the children (Bernardi and Radl 2014). Moreover, children of intermarriage may also be viewed by the majority population as belonging to the minority group and may be subject to the same discrimination and prejudice (Kalmijn 2015). Here, the outcomes of children with intermarried parents would be more in line with the outcomes of children of minority groups.

Studying the educational achievements of children from intermarriage is of particular significance as it reveals long-term consequences of intermarriage, in terms of socio-economic outcomes. Research on this topic is still in its infancy, and most previous studies have been concerned with ethnic identity rather than educational outcomes (Kalmijn 2015).

Several factors, both social and cultural, determine the likelihood of intermarriage for an individual. An important finding in the literature on intermarriage is that immigrants with higher education and socio-economic status are more likely to marry natives (Qian and Lichter 2001; van Tubergen and Maas 2007) and, in addition to this, there are well-documented intermarriage premiums in terms of income (Meng and Gregory 2005; Dribe and Nystedt 2015). Although this paper takes a descriptive approach, selection is partially accounted for by introducing cousin fixed effects, comparing the grades of two first cousins where one cousin has one immigrant and one native parent, whereas the other has either two native or two immigrant parents. Introducing cousin fixed effects will control for unobserved factors shared between sisters and brothers, such as values and upbringing practices (Geronimus et al. 1994; Lee 2014). Two cousins are expected to share certain characteristics at the family level as their mothers and fathers shared family and neighbourhood characteristics while growing up. This study moreover controls for variation at the school level by introducing school fixed effects.

This is the first study on the educational outcomes of this particular group in Denmark. It also explores the heterogeneity of non-native parents, thereby highlighting the importance of parental origin.

Theoretical Background and Previous Research

A large literature has examined intergenerational correlates of various measures of attainment, focusing in particular on educational, occupational and earning attainment (Becker and Tomes 1986; Chetty et al. 2014). Benefits parents obtain through intermarriage may also affect child outcomes through parents' inputs or investments in their children. Previous research has shown that immigrants married to natives tend to outperform endogamously married immigrants[2] in terms of socio-economic outcomes

[1] Born in the receiving country with both parents born abroad
[2] Marriage within the same immigrant group

(Meng and Gregory 2005; Nielsen et al. 2009; Dribe and Nystedt 2015; Furtado and Theodoropoulos 2010; Elwert and Tegunimataka 2016). This is related to spousal spillover and network sharing, which enhances labour market assimilation and increases income potential. These positive effects of intermarriage are likely to be transmitted from one generation to the next, which then potentially leads to positive outcomes for children of intermarriage.[3] In other words, if an immigrant parent gets a boost in the labour market as a result of access to native networks, this is important also for the child as a higher income for parents translate into resources for the children.

Compared to children with two immigrant parents, children of intermarriage are more likely to live in a household with the host country language spoken, which is valuable in terms of educational achievements. A native parent may, due to language proficiency, be better equipped to help with homework and having a native-born parent may also result in more native connections for the family, which means more information shared about better schools, in terms of general school quality, such as class size, country of origin composition and number of educated teachers. Both immigrants and natives self-select (or rather parents select for their children) into schools and neighbourhoods, and due to factors such as weak labour market attachment, immigrants typically reside in areas where housing is cheaper and incomes are lower (Skifter Andersen 2010). Intermarried individuals are more likely to live in less segregated areas (Martinović, 2013), and their children benefit from attending schools with a larger share of native children.

Outcomes of children of intermarriage are furthermore dependent on the country of origin of the non-native parent. Many previous studies of immigrant integration have found that the country of origin matters for the path and speed of the integration process (van Tubergen et al. 2004; Borjas 1999).[4] Foreign-born from countries with a shorter cultural distance from Denmark are found to experience more successful economic integration (Statistics Denmark 2017), which would mean a positive spillover for the children.

Parental country of origin can moreover be discussed in relation to discrimination. Children who have a non-native parent from a more distant country, geographically and/or culturally, may experience greater identification issues, both regarding the child's own identification (Kibria 1997) and in terms of the identification received by the majority group (Kalmijn 2015). This is discussed further by Kalmijn (2015) referring to the traditional US specification of children of black-white intermarriage as *black* in accordance with the "one-drop rule". This may lead to the same discrimination as experienced by black children and thus the positive effects of intermarriage are diminished (Khanna 2010). Qualitative research has, in relation to this, found that biracial children experience stress when their identification does not fit with the way they are identified by the majority population (Kibria 1997).

[3] When studying educational outcomes of the 2.5 generation, it is vital to consider possible bias due to selectivity of the parents into intermarriage. The probability to enter into a mixed union is dependent on a number of important socio-economic factors and immigrants with higher income and education are more likely to marry natives. Since parental socioeconomic status affects the educational outcomes of their children, this may bias the effect of intermarriage.

[4] This study includes region of origins of the non-native parent of the 2.5 generation as proxies for country of origin.

Other aspects that affect children's educational outcomes are family conflict and parental separation (Bernardi and Radl 2014). This is related to loss of financial resources and emotional stress of parents and children, as well as changing parenting practices. Mixed marriages are on average less stable than both native endogamous marriages[5] and immigrant endogamous marriages (Zhang and van Hook 2009; Dribe and Lundh 2012). Differences in terms of religion, education and ethnicity reproduce differences in norms, values and ways of communication that may lead to increased conflict and possible dissolution. Intermarriages may also enjoy less support from relatives and family members (Kalmijn et al. 2005). It is furthermore expected that the greater the cultural distance between spouses, the greater the risk of union dissolution (Dribe and Lundh 2012).

Factors other than parental input may also affect the human capital of children of intermarriage and social and cultural factors of the host country are important to consider. The ethnic and social composition in neighbourhoods and schools affect children's school performance as the clustering of children from less resourceful families with low social background leads to less information about the educational system and the labour market, as well as fewer possibilities of learning as the spillover of human capital is weaker (Szulkin and Jonsson 2007).

Previous studies comparing children of intermarriage to children with two foreign-born parents in other contexts have generally found that intermarriage has a positive effect on the child's educational performance. Karthick Ramakrishnan (2004) argues that there are important differences between second-generation immigrants and children belonging to the 2.5 generation in terms of educational attainment and show that the second generation in the United States has a higher likelihood of dropping out of high school and lower educational attainment than the 2.5 generation. Chiswick and DebBurman (2004) studied the educational attainment of adults and found that having one immigrant parent is associated with around 0.4 years more schooling compared to individuals with two native-born parents. In a European context, Kalmijn (2015) studied language test scores earned by children of intermarriage in four countries and found that children from mixed marriages fall behind native-born children with native-born parents.

A few studies have considered the effect of the gender of the non-native parent and results have been mixed. van Ours and Veenman (2010) studied the educational attainment of children with one Dutch and one Moluccan parent and found that having a native mother leads to higher educational attainment compared to those with a native father. The authors' main explanation to this is the dominant role of Moluccan women in raising children, which would leave the (native)father in a less important position. Compared to children with Dutch mothers, this would be less beneficial as a Dutch mother have "greater knowledge of and experience with the Dutch educational system to the advantage of their children" (van Ours and Veenman (2010:117). Karthick Ramakrishnan (2004) studied the educational attainment of the 2.5 generation in the USA and found the opposite relationship, a native father has a more positive effect, for some of the studied outcomes (for example high-school completion): however, found that a native mother matters more for earnings. Karthick Ramakrishnan (2004) does not provide any clear explanations to their results, however, point out a need for further

[5] Marriage between two native spouses.

studies possibly taking aspects such as identity and parental involvement into account to explore this further. A study exploring the importance of the gender of the immigrant parent in Asian intermarriages found important differences between families where the father was Asian(native mother) and families where the mother was Asian(native father)(Basu & Insler 2016). Children of households with an Asian father tended to have higher dropout rates.

van Ours and Veenman (2010) exploited a natural experiment, while Furtado (2009) used an instrumental-variable approach focusing on dropout rates and found that children of intermarriage have lower dropout rates than children with two immigrant parents; however, when controlling for observed and unobserved characteristics, she found the opposite: that children of intermarriage have a higher likelihood of dropping out of school.

The Danish Context

In a western European setting, Denmark has a relatively modest foreign-born population of 8.5% of the total population along with a rather short history of immigration (Statistics Denmark 2014). It was not until the end of the 1960s when immigration outnumbered emigration due to a rising labour market demand which led to increased inflow of guest workers mainly from Turkey, Yugoslavia and Pakistan (Liebig 2007). The oil crisis of the 1970s put an end to further labour immigration and migration to Denmark has since then consisted mainly of refugees and family reunification migrants. The increasing inflow of refugees in the 1990s led to the introduction of overall stricter migration policy with reduced social benefits to migrants and limitations to family reunification.

Today, 58% of the foreign-born in Denmark originate from non-western countries with dominating groups from Iran, Iraq, Turkey, Pakistan and the Balkans. The foreign-born in Denmark are not fully integrated into the Danish labour market as there are large immigrant-native wage- and employment gaps. This can at least partially be explained by the shift in composition of foreign-born, with an increasing share of refugees from the 1990s onwards, but it could also be explained by a changing labour market structure which increased the importance of country-specific skills (such as language proficiency) resulting in a decreasing demand for immigrant employees (Rosholm, Scott and Husted 2006). About 7% of all marriages in Denmark are between foreign-born and natives; however, this relatively modest share is increasing (Eurostat 2012). There are differences in the most common countries of intermarriage for Danish men and women. While women tend to find their spouses in the neighbouring countries and in Western Europe, men are more likely to marry a spouse from an Asian country such as Thailand or the Philippines (Statistics Denmark 2014).

Denmark is commonly known as a Scandinavian welfare state with a high level of income redistribution, a well-pronounced equality goal and universalistic tax-financed welfare state arrangements (Esping-Andersen 1990). The Danish educational system is publicly funded and among the most comprehensive in the world with subsidized daycare and free tuition at all levels (Colding et al. 2009). There is 9-year mandatory schooling with a possibility to stay an extra tenth year in basic education, in order to increase the chances of getting accepted into secondary education. Education is until

class 10-track free, and the education offered is the same for all students regardless of the municipality or school district. All students make mandatory school-leaving examinations in class 9 that are marked by the class teacher as well as an external teacher that has the dominating opinion, which makes these grades comparable across schools (Danish Ministry of Education 2015).

Data and Methods

The analysis is based on administrative registers, covering the full population of Denmark. The data contains (longitudinal) individual-level information from a range of administrative registers, which gives information on familial and sociodemographic circumstances with a great deal of precision. The main outcome variables are final grades from nationally centralized final examinations in mathematics and Danish language in class 9 in the years 2002–2011. This study looks at outcomes of both subjects since they are indications of different skills. More specifically, for mathematics, less language proficiency is typically needed and thus the positive language spillovers that come with a native parent may be less significant. The exams are identical for all schools in Denmark, and thus considered comparable (Danish Ministry of Education, 2015). They are marked both by the class teacher and by an external examiner who has the dominating opinion. In order to ease the comparison, grades are standardized to have a mean of zero and a standard deviation of one within each school year. In both subjects, several exams are taken, and the outcome variable is the grade average of several exams. Although register data is longitudinal in nature, the data analyzed in this paper is cross-sectional since students take their class 9 exam once.

The main explanatory variable of interest is the background of students based on their parental country of origin. All children are born in Denmark and divided into groups depending on their parental origin (2.5 generation, second generation and native Danes). In order to account for the socio-economic position of the family, parental education is defined as the highest education obtained for both the mother and the father at the time of the child's exam. The variable has four categories: (1) unknown education, (2) primary education, (3) secondary education and (4) tertiary education. Parental labour-market attachment is another socio-economic indicator that is taken into account in the analysis. The variable is a dummy variable: (0) unemployed and (1) employed or self-employed.[6] The models further control for parental separation, number of siblings, birth order and year.

To measure the association between origin and child outcomes, an OLS regression is applied. The specification below expresses the grade average, Y_i, as a function of parental origin. G denotes the student group (native Danes,[7] 2.5 generation and second-generation) the individual belongs to. X is a vector of individual characteristics, whereas S_i^m denotes the level of education of the mother and βS_i^f the level of education

[6] The variable is created using the Employment Classification Module (AKM), based on information about personal income, education, industry of employment, unemployment insurance information, and reports from private companies, assigning individuals their labor market status.

[7] Born in Denmark with both parents born in Denmark

of the father. U_i^m denotes unemployment of the mother and βU_i^f unemployment of the father. The ε_i is the error term capturing unobservables.

$$Y_i = \alpha + \beta G_i + \beta X_i + \beta S_i^m + \beta S_i^f + \beta U_i^m + \beta U_i^f + \varepsilon_i \quad (1)$$

As parents are not randomly selected into intermarriage, there is a possibility that unobservable characteristics on the family level are biasing the parameters. Marriage formation cannot be treated as exogenous to the educational achievement of the children from these marriages. It is likely that both foreign-born and natives in intermarriage possess certain characteristics such as values, upbringing practices and attitudes, characteristics that may affect the school achievement of their children. Sisters and brothers are more likely to share these features than two random individuals, and thus, cousin fixed effects are applied in the analysis. This implies comparing grades of two cousins, where one cousin has one foreign-born and one native parent, and the other has two native or two foreign-born parents. Two cousins are expected to share certain characteristics at the family level as their mothers and fathers shared family and neighbourhood characteristics while growing up, and by applying cousin fixed-effects, bias from unobserved parental family background is partially controlled for (Geronimus et al. 1994; Lee 2014). Indeed, siblings are not identical in all respects and are not randomly assigned to a partner, and therefore, the cousin fixed-effects approach cannot be regarded as a causal method. There is furthermore a possible integration effect involved in this approach. For example, if immigrant siblings arrive in Denmark of different ages, they have spent different amounts of time in Denmark. It is possible that the younger sibling is more assimilated (perhaps also more prone to intermarry) and thus their different levels of "integration" may affect their children in different ways. In this paper, the cousin fixed effects approach is seen as an extension of the conventional control method and is preferable to a matching approach, as sisters and brothers are more similar in upbringing characteristics and fundamental values than individuals who are matched according to other commonly used measures of family background (Geronimus et al. 1994; Lee 2014), and thus, it is the preferred extension to the OLS approach in this study.

$$Y_i = \alpha + \beta G_{i,f} + \beta X_{i,f} + \beta S_{if}^m + \beta S_{i,f}^f + \beta U_{if}^m + \beta U_{i,f}^f + \mu_f + \varepsilon_{i,f} \quad (2)$$

Above, the model specification for the analysis with cousin fixed effects is outlined. The i, f subscript means that an individual i belongs to a certain family f. Two error terms are included, with u_f capturing shared characteristics on the family level (between cousins)[8] such as upbringing practices and values, whereas $\varepsilon_{i,f}$ captures unobservables on the individual level. Covariates are only estimated if there is any variation within the cousin pairs, meaning that covariates that are invariant between cousins cancel out.

Exploring within cousin pair variation imposes some data limitations. For an individual to appear in the cousin sample, both grandparents and at least one cousin born to an aunt or uncle must be found in the data. This is more frequent in the case of native Danes, but it is more uncommon for the second generation and 2.5 generation in

[8] Children of single parents are not included in the analysis.

the data since it is less likely to find grandparents in these cases. This data restriction leads to a large number of students being dropped from the sample, and in the cousin sample, about 10% of students belong to the 2.5 generation and about 2.5% are second-generation immigrants. Due to these data restrictions, the group of second-generation immigrants is very small in the cousin sample, and therefore, the second generation is not included when studying the effects of parental gender and region of origin.

Due to the above-mentioned shortcomings of both the OLS and the cousin fixed effects approach, the paper is mainly descriptive as the fixed effects approach can be regarded as an extension of the OLS and not a causal approach.

The analysis is furthermore extended to account for unobserved school heterogeneity by introducing school fixed effects in the model. By doing this, school characteristics that do not vary over time are taken into account. This includes, for example, resources available for students and the quality of teachers. As intermarriage is less likely in segregated areas, children of intermarriage are expected to be affected by school segregation to a lesser extent than second-generation immigrants.

Tables 1 and 2 below present variable means of the pooled sample and the cousin sample for grades in Danish (variable means in mathematics are available from the author upon request). In the analysis, the parental region of origin is used as a proxy for the country of origin. This is done because of the heterogeneous character of the Danish immigrant group. A limitation to this is that in, for example, the Asian region, many countries that may be of very different characters are included. Individuals belonging to this regional group may also have very different experiences in the Danish labour market (see Appendix Table 8 for a list of countries included in the different regions).

Non-native parents of the 2.5 generation are often born in Nordic or Western countries or in Asia. Parents of the 2.5 generation are the parents with the highest obtained level of education, indicating that individuals are positively selected into intermarriage according to educational attainment. About 43% of second-generation immigrants have an Asian background and about 30% a Middle Eastern background. Due to the aforementioned data restrictions, there are a few small changes to the data in the cousin sample; however, the overall pattern is the same.

Results

Main Models

Table 3 displays the association between parental country of origin and grades in Danish. The outcomes of native Danes and second-generation immigrants are compared to the outcomes of the 2.5 generation. The analysis is performed in a step-wise manner, with model A showing the crude association between parental ethnic background and grades in Danish. No significant difference is found between Native Danes and the 2.5 generation. For the second generation, the difference is more substantial, with the parameter estimate suggesting 65% of a standard deviation lower grades for the second-generation immigrants compared to the 2.5 generation. Results show that having two foreign-born parents is associated with negative outcomes in Danish, as the second-generation immigrants fare worse compared to the 2.5 generation and native Danes.

Table 1 Descriptive statistics (%), full sample (2002–2011) grades in Danish

	2.5 generation	*Native Danes*	*2nd generation*
Mother's highest education (%)			
Primary	16.06	18.50	42.27
Secondary	37.49	45.96	37.17
Tertiary	46.45	35.54	20.57
Father's highest education (%)			
Primary	16.82	21.25	34.06
Secondary	42.96	51.43	40.33
Tertiary	40.22	27.32	25.61
Birth region of the mother (%)			
Denmark	55.84	100.00	
Nordic countries	12.98		1.75
Western countries	13.22		8.95
Eastern Europe	4.52		7.22
Latin America	2.73		0.51
Africa	2.69		7.55
Asia	6.45		43.11
Middle-East and Pakistan	1.57		30.90
Birth region of the father (%)			
Denmark	48.5	100.00	
Nordic countries	11.21		1.39
Western countries	23.12		8.32
Eastern Europe	1.23		6.45
Latin America	2.06		0.41
Africa	4.01		7.41
Asia	4.67		42.91
Middle-East and Pakistan	5.2		33.11
Parents separated	38.56	31.68	20.29
Females (%)	50.15	50.72	51.08
Year (mean)	2007.06	2007.03	2007.39
Observations	44,383	259,536	22,257

[a] Sample constructed for studying final grades in Danish as outcome variable

Adding controls for parental education in model B, results look somewhat different. Now, the results rather demonstrate a negative association between intermarriage and grades, as native Danes have a 4% of a standard deviation higher grades than the 2.5 generation. The difference to the second generation is still large, but almost halves when parental education is introduced.

In model C, more controls are introduced and the difference between the 2.5 generation and native Danes once again becomes insignificant. The results in model C indicate gender differences in grade averages. The negative effect size of being a boy, compared to being a girl, is about the same as the negative effect size found for second

Table 2 Descriptive statistics (%), cousin sample (2002–2011) grades in Danish[a]

	2.5 generation	*Native Danes*	*2nd generation*
Mother's highest education (%)			
Primary	19.27	19.66	57.10
Secondary	34.46	47.58	30.91
Tertiary	41.27	32.75	12.00
Father's highest education (%)			
Primary	20.04	23.15	47.90
Secondary	45.09	52.47	35.29
Tertiary	34.87	24.38	16.81
Birth region of the mother (%)			
Denmark	53.87	100.00	
Nordic countries	13.77		1.75
Western countries	14.34		8.95
Eastern Europe	3.34		7.22
Latin America	2.45		0.51
Africa	2.54		7.55
Asia	6.34		43.11
Middle-East and Pakistan	3.35		30.90
Birth region of the father (%)			
Denmark	45.98	100.00	
Nordic countries	14.21		1.1.7979
Western countries	22.18		6.02
Eastern Europe	1.22		6.08
Latin America	2.22		0.68
Africa	4.21		4.53
Asia	4.57		45.92
Middle-East and Pakistan	5.41		34.98
Parents Separated (%)	42.67	35.06	17.55
Females (%)	50.47	50.49	52.15
Year (mean)	2006.69	2006.76	2006.14
Observations	10,408	91,794	2142

[a] Sample constructed for studying final grades in Danish as outcome variable

second-generation immigrants. Parental separation is furthermore associated with a negative grade outcome for children.

As expected from theory and previous research above, the grades of the 2.5 generation are substantially better than the grades of the second generation and much closer to the performance of native Danes. However, both positive and negative consequences of intermarriage are discussed, and as such, the results can be interpreted as the positive effects outweighing the negative. That is, the results may indicate both positive and negative spillovers, but with the former shown as stronger.

Table 3 Educational performance, 2002–2011, standardized grades in Danish

Variables	(A) OLS	(B) OLS	(C) OLS	(D) School FE
Generation				
2.5 generation (ref.)	ref.	ref.	ref.	ref.
Native Danes	− 0.006	0.040***	− 0.001	0.016***
	(0.005)	(0.005)	(0.005)	(0.004)
2nd generation	− 0.645***	− 0.395***	− 0.337***	− 0.325***
	(0.008)	(0.007)	(0.008)	(0.008)
Mother's education				
Primary (ref.)		ref.	ref.	ref.
Secondary		0.277***	0.227***	0.202***
		(0.004)	(0.004)	(0.004)
Tertiary		0.605***	0.547***	0.496***
		(0.005)	(0.005)	(0.005)
Father's education				
Primary (ref.)		ref.	ref.	ref.
Secondary		0.238***	0.194***	0.167***
		(0.004)	(0.004)	(0.004)
Tertiary		0.594***	0.534***	0.463***
		(0.005)	(0.005)	(0.005)
Sex				
Female (ref.)			ref.	ref.
Male			− 0.308***	− 0.297***
			(0.003)	(0.003)
Parents separated				
Yes			ref.	ref.
No			− 0.180***	− 0.137***
			(0.003)	(0.003)
Observations	326,176	326,176	326,176	326,176
R^2	0.024	0.159	0.206	0.159
Number of schools				1963
Standard errors in parentheses				

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Models control for year, parental unemployment, number of siblings and parity, standard errors in parenthesis

As previously outlined, unobserved heterogeneity at the school level may bias the results. First, neighbourhoods and schools may have an influence on grades as the clustering of children of low social background may be related to reputation and quality of the school, but also less human capital spillover between peers. This is partly taken care of by the introduction of school fixed effects in model D. Comparing the coefficients to model C (without the school fixed effects), there is a reemergence of a difference between the 2.5 generation and Native Danes. This indicates that a part of

the difference between the second generation and the 2.5 generation is explained by school-level factors.

Turning to results for mathematics, Table 4 (where grades in mathematics is the outcome) the same general picture emerges. There is a very small difference between Native Danes and 1.5 generation immigrants in model D including School FE. The second-generation immigrants are falling behind the other two groups in all models. The result from the analysis of grades in mathematics shows that parental background affects grades in both subjects similarly, although these school subjects potentially reflect different skills. Since less language proficiency is typically needed for mathematics, smaller differences between the second generation and the other groups were expected, however not found.

Turning the focus to the control variables included, the same patters as for grades in Danish are visible: parental education is positively associated with grade outcomes, while parental separation is negatively associated.

Extension to the Main Model: Cousin Fixed Effects

We now turn to Table 5 which instead controls for family-level confounders by introducing cousin fixed effects in the analysis. Here, the grade outcomes of an individual are compared within the extended family, that is, compared to the outcomes of a fraternal or maternal cousin. First, since two different samples are used (full sample and cousin sample), an OLS analysis using the cousin sample is conducted (model A). This is to make sure that the results in the cousin fixed effects analysis are not driven by sample selection. It is reassuring to see that the estimates of the OLS analysis performed on the cousin sample are similar to the OLS analysis on the full sample. In Table 5, model B when introducing cousin fixed effects, results are similar to the OLS analysis and no statistically significant differences exist between the 2.5 generation and native Danes. For both mathematics and Danish, there is a substantial reduction in the size of the coefficients for the second generation when introducing cousin fixed effects. These results indicate that the difference in performance between the second generation and the 2.5 generation can be explained in part by unobserved heterogeneity on the family level, shared between cousins, which is reduced in the fixed effect models.

Exploring Heterogeneity: Parental Country of Origin and Gender

It is well established that parental country of origin is significant for child educational outcomes. In Table 6, outcomes of the 2.5 generation are compared to outcomes of native Danes, the reference category. The analysis is separated according to the region of origin of the non-native parent of the 2.5 generation and the data is divided into seven regions of origin: (1) Nordic, (2) Western, (3) Eastern Europe, (4) Latin America, (5) Africa, (6) Asia and (7) Middle East and Pakistan. It is expected that the grade outcomes of children of the 2.5 generation in Denmark with a non-native parent originating from a country more culturally and geographically distant from Denmark will be lower than the performance of children of the 2.5 generation with a non-native parent originating from a county more proximate to Denmark. This is theoretically related to the importance of identification, both of the individual and the identification imposed by the majority group (Kalmijn 2015). Moreover, the cultural distance

Table 4 Educational performance, 2002–2011, standardized grades in Mathematics

VARIABLES	(A) OLS	(B) OLS	(C) OLS	(D) School FE
Generation				
2.5 generation (ref.)	ref.	ref.	ref.	ref.
Native Danes	− 0.008	0.039***	0.001	0.017***
	(0.005)	(0.005)	(0.005)	(0.004)
2nd generation	− 0.644***	− 0.394***	− 0.345***	− 0.333***
	(0.008)	(0.007)	(0.008)	(0.008)
Mother's education				
Primary (ref.)		ref.	ref.	ref.
Secondary		0.273***	0.225***	0.200***
		(0.004)	(0.004)	(0.004)
Tertiary		0.602***	0.545***	0.495***
		(0.005)	(0.005)	(0.005)
Father's education				
Primary (ref.)		ref.	ref.	ref.
Secondary		0.235***	0.194***	0.166***
		(0.004)	(0.004)	(0.004)
Tertiary		0.591***	0.537***	0.464***
		(0.005)	(0.005)	(0.005)
Sex				
Female (ref.)			ref.	ref.
Male			− 0.312***	− 0.300***
			(0.003)	(0.003)
Parents separated				
Yes			ref.	ref.
No			− 0.183***	− 0.140***
			(0.003)	(0.003)
Observations	325,368	325,368	325,368	325,368
R^2	0.024	0.158	0.204	0.157
Number of schools				1959
Standard errors in parentheses				

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Models control for year, parental unemploymnet, number of siblings and parity, standard errors in parenthesis

between spouses may lead to conflict and tension within the family that may have negative effects on the outcomes of children. The analysis controls for parental separation; however, conflict within the family is unobservable with the data at hand.

In the previous analysis, we found in general, little or no difference between the performance of native Danes and 2.5 generation immigrants. Table 6 presents the coefficients focusing on grades in Danish for different country-of-origin groups of the non-native parent, and we see large differences between the different parental regions of origin. No statistically significant differences are found between native

Table 5 Educational performance, 2002–2011, standardized grades in Danish, cousin sample

Variables	(A) OLS	(B) Cousin FE	(C) Cousin FE
Generation			
2.5 generation (ref.)	ref.	ref.	ref.
Native Danes	− 0.011	0.007	
	(0.009)	(0.015)	
2nd generation	− 0.421***		− 0.257***
	(0.021)		(0.015)
Mother's education			
Primary (ref.)	ref.	ref.	ref.
Secondary	0.255***	0.174***	0.106***
	(0.007)	(0.011)	(0.039)
Tertiary	0.574***	0.367***	0.284***
	(0.008)	(0.012)	(0.048)
Father's education			
Primary (ref.)	ref.	ref.	ref.
Secondary	0.224***	0.143***	0.066*
	(0.007)	(0.010)	(0.039)
Tertiary	0.590***	0.378***	0.308***
	(0.008)	(0.013)	(0.047)
Sex			
Female (ref.)	ref.	ref.	ref.
Male	− 0.324***	− 0.327***	− 0.314***
	(0.005)	(0.007)	(0.003)
Parents separated			
Yes	ref.	ref.	ref.
No	− 0.206***	− 0.135***	− 0.154***
	(0.006)	(0.008)	(0.035)
Observations	104,344	102,202	12,669
R^2	0.216	0.091	0.076
Number of families		49,444	9332
Standard errors in parentheses			

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Danes and the 2.5 generation with a Nordic, Western or Eastern European background in the OLS specification (models 1, 4 and 7). Turning to the other origin groups, it is obvious that having a parent with a Latin American, Asian, African or Middle Eastern background is less beneficial for child outcomes. These region-of-origin groups have more cultural and geographical distance from Denmark than the countries included in the other origin groups and having a non-native parent from these countries of origin groups is associated with a between 14 and 19% of a standard deviation compared to grades of native Danes. Results stay in general the same when school FE are introduced, with negative outcomes related to having a non-native parent originating from

Table 6 The effect of parental region of origin on the educational performance of the 2.5 generation in Denmark, grades in Danish, 2002–2011

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Nordic			Western			Eastern Europe		
Native Danes (ref.)									
2.5 generation	0.001	−0.014	0.005	0.001	−0.017**	−0.042	0.020	−0.016	0.087
	(0.010)	(0.010)	(0.032)	(0.008)	(0.008)	(0.028)	(0.023)	(0.022)	(0.092)
Observations	267,486	267,486	87,332	272,586	272,586	88,239	260,982	260,982	84,985
R^2	0.196	0.153	0.091	0.195	0.152	0.090	0.195	0.153	0.091
Number of schools		1931			1931			1930	
Number of families			40,837			41,282			39,766
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Latin America			Africa			Asia		
Native Danes (ref.)									
2.5 generation	−0.145***	−0.163***	−0.157*	−0.130***	−0.135***	−0.114***	−0.153***	−0.170***	0.060
	(0.024)	(0.023)	(0.091)	(0.019)	(0.018)	(0.035)	(0.011)	(0.011)	(0.055)
Observations	260,851	260,851	87,725	261,741	261,741	87,965	285,625	285,625	91,869
R^2	0.195	0.153	0.091	0.195	0.153	0.091	0.199	0.155	0.091
Number of schools		1933			1935			1954	
Number of families			42,478			42,603			42,850
	(19)	(20)	(21)						
	Middle-East and Pakistan								
Native Danes (ref.)									
2.5 generation	−0.191***	−0.187***	−0.004						
	(0.016)	(0.016)	(0.069)						
Observations	281,886	281,886	85,247						

Table 6 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
R^2	0.198	0.154	0.092						
Number of schools		1952							
Number of families			39,890						

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

countries geographically and culturally more distant from Denmark. But also, when introducing School FE, there is a negative effect also found for the western group. For the other groups, changes in size are very small, and thus, it is difficult to argue that unobserved school level factors matter very much when comparing educational outcomes between native Danes and the 2.5 generation. The general pattern is the same when performing the analysis using the sample for mathematics (available from the author upon request).

Applying cousin fixed effects (comparing the outcomes of cousins, where one cousin has two native-born parents and the other cousin has one native-born parent and one parent from a Nordic, Western, Eastern European, Latin American, African, Asian or Middle Eastern country), significant negative coefficients remain only for Latin American and African children. The coefficient for African parental background is reduced from 13% of a standard deviation lower grades than natives to 11% of a standard deviation lower grades. This means that, when comparing a child's outcomes within the extended family to a cousin with two native parents, a part of the difference is reduced. The remaining difference is possibly related to stress in accordance with the one-drop rule or parental conflict.

Table 7 The effect of parental gender on the educational performance of the 2.5 generation in Denmark, grades in danish and mathematics, 2002–2011

	Danish		Mathemathics	
	Father Danish	*Mother Danish*	*Father Danish*	*Mother Danish*
OLS				
Native Danes	ref.	ref.	ref.	ref.
2.5 generation	− 0.004	− 0.005	− 0.005	− 0.008
	(0.006)	(0.006)	(0.006)	(0.006)
R^2	0.195	0.196	0.193	0.194
Observations	281,251	282,204	280,655	281,613
School FE				
Native Danes	ref.	ref.	ref.	ref.
2.5 generation	− 0.023***	− 0.018***	− 0.023***	− 0.019***
	(0.006)	(0.006)	(0.006)	(0.006)
R^2	0.152	0.152	0.150	0.151
Observations	281,251	282,204	280,655	281,613
Schools	1938	1941	1932	1936
Cousin FE				
Native Danes	ref.	ref.	ref.	ref.
2.5 generation	− 0.006	− 0.010	0.003	− 0.011
	(0.021)	(0.020)	(0.021)	(0.020)
R^2	0.091	0.090	0.092	0.091
Observations	94,667	95,532	93,851	91,864
Families	45,783	46,230	45,382	42,944

The final analysis is focusing on the importance of the gender of the non-native parent for grades of the 2.5 generation immigrants in Denmark. Table 7 shows the association between grades and gender. Results are strikingly similar in both subjects and no differences are found between having a mother or a father that is non-native. No significant differences are found in the OLS analysis without school fixed effects, however. Applying school fixed effects, differences, however, differences emerge, as was also found in the main model.

The literature on this has been indecisive, and from the results here, it is hard to draw any conclusions about the importance of the gender of the non-native parent in a Danish context.

Conclusion

Studying the educational attainment of children of intermarriage is important since it tells something about the long-term outcomes—or the intergenerational effects—of intermarriage. This paper contributes to the literature by comparing grade outcomes in the core subjects Danish and mathematics of children of intermarriage to grades of native Danes, as well as to children belonging to the immigrant second generation. It furthermore considers the heterogeneity of the 2.5 generation in Denmark and studies differences in results depending on the parental country (region) of origin and gender of the non-native parent.

Overall, the results show that having a native parent is beneficial for children's educational outcomes. As expected, the performance of the 2.5 generation in Denmark is more in line with that of native Danes, while the second-generation immigrants lag behind the other two groups. Applying school fixed effects did not alter the results in any major way, which leads to the conclusion that unobserved heterogeneity on the school level is not a major driver of the difference found in the OLS analysis. The structure of the Danish educational system may explain the results found, as the education offered is the same for all students regardless of municipality or school district, which may lead to fewer differences between schools, also in terms of unobserved factors. A less egalitarian structure of the Danish school system could have resulted in larger differences between ethnic groups in terms of achievement.

Applying cousin fixed effects in the main analysis of this study, unobserved characteristics on the family level are taken into account, and the differences between the 2.5 generation and the second generation are further reduced, while no significant differences remain between the 2.5 generation and native Danes. This means that no significant differences in terms of outcomes remain between the children of intermarriage and native Danes, once family-level heterogeneity is accounted for.

As the non-native parents of the 2.5 generation originate from a variety of countries, different outcomes depending on the parental region of origin are likely. The OLS analysis shows that students with an African, Asian, Middle Eastern or Latin American background have substantially lower grades than students with a parent from a Nordic or Western country. This finding is in line with the discrimination theory as results show that, although the difference between the 2.5 generation and natives is fairly small when considering the 2.5 generation as a whole, larger differences appear when breaking down the 2.5 generation according to the parental region of origin. Children with a parent from a country that

resembles Denmark tend to perform more in line with Danes, whereas children with parents from countries that are more distant from Denmark perform substantially worse. It is likely that they experience the same kind of discrimination as immigrants or second-generation immigrants. Differences remain when introducing school fixed effects but, when accounting for family-level heterogeneity, negative effects remain only for children with a non-native parent originating a Latin American or African country. This means that even when controlling for unobserved characteristics on the family level, negative outcomes for the child are related to having a non-native parent originating from these origins. Even though the cousin fixed effects do not take care of all bias imposed on the family level and shall be regarded a control strategy rather than a causal method, the results are in line with the discrimination perspective. Other aspects such as cultural dissimilarities between parents can also be put forward as possible explanations.

The country of origin differences found in this study is common in migration research and perhaps not very surprising. On the other hand, the clear gradient in results taking country differences of the non-native parents into consideration, that remains for children with an African or Latin American background even after controlling for school and family level confounders, is a result that should be taken seriously. Future research should explore this finding further, studying different ethnicities and cultures and how this matters for children of intermarriage. Data on children's identification and experiences with discrimination would possibly also shed further light on this issue. It would furthermore be interesting to investigate if this is a phenomenon unique for Denmark or if the same pattern is found in other western immigrant-receiving countries.

Results or this study can also be seen as an important indication of that origin differences between students play an important part in their school performance which should be taken seriously by Danish policymakers.

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Appendix

Table 8 Countries of origin

Nordic	Western
Sweden, Norway, Finland, Iceland	Andorra, Austria, Belgium, France, Germany, Greece, Ireland, Italy, Liechtenstein, Luxemburg, Malta, Monaco, Netherlands, Portugal, San Marino, Spain, Switzerland, United Kingdom, USA, Canada, new Zealand, Australia
Eastern Europe	Latin America
Albania, Armenia, Azerbaijan, Bosnia-Herzegovina, Bulgaria, Estonia, Georgia, Greece, Yugoslavia, Croatia, Latvia, Lithuania, Moldavia, Macedonia, Poland, Romania, Slovenia, Slovakia, Czech Republic, Ukraine, Hungary, Belarus, German Dem. Republic (DDR)	Argentina, Antigua and Baruba, Bahamas, Bolivia, Barbados, Belize, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, Guatemala, Guyana, Haiti, Honduras, Jamaica, St. Knits and Nevis, St. Lucia, Mexico, Nicaragua, Panama, Paraguay, El Salvador, Suriname,

Table 8 (continued)

Nordic	Western
	Trinidad and Tobago, Uruguay, St. Vincent and Grenadines, Venezuela, British Virgin Islands
Africa	Asia
Ethiopia, Algeria, Angola, Burundi, Congo (Dem. Republic), Botswana, Comoros, Cameroon, Central African republic, Benin, Djibouti, Egypt, Equatorial Guinea, Ivory Coast, Eritrea, Congo, French Morocco, Ghana, Gabon, Guinea-Bissau, Gambia, Guinea, Kenya, Cape Verde, Liberia, Lesotho, Libya, Morocco, Mozambique, Madagascar, Malawi, Mali, Mauritania, Mauritius, Nigeria, Namibia, Niger, Rwanda, Zimbabwe, Sierra Leone, Senegal, Somalia, Sao Tome and Principe, Sudan, Swaziland, South Africa, Tanzania, Chad, Tunisia, Togo, Uganda, Zanzibar, Zambia	Russia, Soviet Union, Afghanistan, Myanmar, Bangladesh, Bhutan, Brunei Darussalam, Sri Lanka, Cambodia, Fiji, Philippines, Grenada, Hong Kong, India, Indonesia, Japan, Kyrgyzstan, China, Kiribati, south Korea, Taiwan, Kuwait, Kazakhstan, Laos, Oman, Federation of Malaya, Mongolia, Micronesia, Malaysia, Maldives, North Korea, Nepal, Nauru, Vietnam, Papua New Guinea, Palau, Solomon Islands, Seychelles, Singapore, Tajikistan, Tonga, Thailand, Turkmenistan, Turkey, Tuvalu, Uzbekistan, Vietnam, Western Samoa, Vanuatu
Middle East and Pakistan	
Turkey, Syria, Lebanon, Israel, the West Bank and Gaza, Jordan, Iraq, Iran, Saudi Arabia, Yemen, Oman, United Arab Emirates, Qatar, Bahrain, Kuwait, Egypt and Libya, Pakistan	

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