

EDUCATIONAL ACHIEVEMENT OF IMMIGRANT-ORIGIN AND NATIVE STUDENTS: A COMPARATIVE ANALYSIS INFORMED BY INSTITUTIONAL THEORY

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Throughout the industrialized regions of the world, immigrant children and children of immigrants comprise a rapidly growing segment of the school-age population. This is true in countries with a long history of immigration, such as the United States and Australia, as well as in European nations where large-scale immigration is a much more recent phenomenon. Changes in the global economy coupled with changes in immigration policies and other forces have spurred a recent wave of immigration to industrialized world regions of a magnitude heretofore unseen. This new wave of immigration has raised questions and concerns regarding the effects of immigration on receiving nations and on the lives of immigrants and non-immigrants within these nations.

For the sizable segment of the immigrant population that is young, key adaptation outcomes and prospects for social mobility largely stem from their experiences in the educational system. To the extent that educational achievement is a strong predictor of social and occupational mobility,

achievement differences among foreign-origin and native students are important predictors of the long-term mobility prospects of immigrants and their integration into the host society. Despite the importance of this issue, research comparing the educational achievement of immigrant and non-immigrant children has been quite limited. While a growing body of literature examines the determinants of academic achievement for children of immigrants in the United States (Hirschman & Wong, 1986; Kennedy & Park, 1994; Kao & Tienda, 1995; Portes & MacLeod, 1996, 1999; Zhou & Bankston, 1998; Mouw & Xie, 1999), few studies have examined attainment and achievement gaps of immigrants in a comparative context. Thus, Alejandro Portes' (1997) comments regarding the study of immigration nearly a decade ago still apply today: "the vigorous resurgence of the sociology of immigration in recent years has been, by and large, a single-country phenomenon ... the wave of novel research and theory on immigration in the United States has not been accompanied by a comparative thrust of similar vigor" (p. 818). As a result, very little is known about how immigrants compare to non-immigrants in terms of their educational performance or attainment across societies; to our knowledge, there are no systematic, comparative quantitative analyses of immigrant educational achievement or achievement gaps across nations.

Portes (1997) goes on to argue that systematic cross-national research is useful for three purposes: "first to examine the extent to which theoretical propositions 'travel,' that is, are applicable in national contexts different from that which produced them; second, to generate typologies of interaction effects specifying the variable influence of causal factors across different national contexts; third, to themselves produce concepts and propositions of broader scope" (p. 820). Portes' comments regarding the utility of comparative research for theory building align well with the goals of this chapter. First, as we examine patterns of educational achievement among immigrant-origin and native-born students in 14 industrialized countries, we seek to determine the extent to which theoretical propositions developed to explain achievement differences in the United States apply across a range of industrialized nations with large or growing immigrant populations. Second, like other contributors to this volume, we believe that comparative research is especially well-suited for building and testing institutional theory, as it provides researchers with a framework to examine *how causal factors have variable influences across different institutional contexts*.

Using data from the Third International Math and Science Study (TIMSS), we examine the determinants of mathematics achievement scores for immigrant and native students. The TIMSS is especially well-suited for

such comparative research as it provides systematic data on representative samples of 13–14 year-old students – including their performance on internationally standardized achievement tests – for a wide range of countries. We investigate the relationship between immigrant status and educational achievement in each nation and examine the relevance of two prominent “individual-level” explanations for gaps in achievement between immigrant and native students: (1) arguments which maintain that differences in academic performance are largely due to differences in family background, such as parental education, socioeconomic status and family structure; and (2) perspectives that emphasize differences in language ability as the primary factor predicting achievement differences. Then, we build on institutional perspectives to develop the proposition that educational achievement of immigrant students is related, in part, to institutional variations in the mode of incorporation of immigrants in the host society. Both governmental policies and public attitudes toward immigrants may have enduring effects on the incorporation patterns of immigrants into their host societies. All societies have developed legal rules, discursive practices and organizational structures that define both the status of immigrants and the degree of their participation in the institutions of the host society (Soysal, 1994, p. 32). In some nations, the practices and policies that determine membership are exclusionary in that there exist strong cultural and economic boundaries between natives and foreigners and immigrants are seen as temporary residents in the host society (Baker, Esmer, Lenhardt, & Meyer, 1985; Freeman, 1995). Other nations are more inclusionary, with policies and practices that encourage the integration of immigrants into the host society. Institutional variations in the degree of exclusion/inclusion of foreigners should be important determinants of immigrant incorporation, over and above the cultural background or individual characteristics of the immigrants themselves.

In this chapter, we compare countries with different immigrant incorporation regimes and investigate the degree to which immigrant/native achievement differences correspond to these institutional variations in the host societies. After controlling for individual and family background factors, we find that immigrant achievement gaps are largest in nations with exclusionary immigration regimes and smallest in nations with inclusionary regimes. In light of the very limited comparative research on immigrants educational experiences, these findings help advance the study of how immigrants’ experiences are different across Western, industrialized societies. Moreover, they demonstrate the utility of comparative research for developing institutional theory and at the same time they underscore the value of

institutional arguments for providing a more complete understanding of cross-national variations in the achievement gaps between native-born and immigrant-origin students. Because this chapter is only a first step in the study of the impact of institutional variations in immigrant incorporation; we conclude with suggestions for future research on how variations in immigration regimes may impact host societies and the individuals, both immigrant and native born, within them.

EXPLANATIONS FOR ACHIEVEMENT GAPS: INDIVIDUAL-LEVEL AND INSTITUTIONAL PERSPECTIVES

With some important exceptions, immigrants tend to lag behind native students in terms of educational attainment and academic achievement. Prior research has focused on two individual-level explanations for the educationally disadvantaged position of immigrant students.

Differences in Family Background. According to human capital and status attainment perspectives, achievement gaps between immigrants and native students are largely due to differences in the family background and socioeconomic status of these groups. A well-developed literature on social stratification carefully explores how parents' education and occupational status, family income and family size and structure influence educational outcomes (Blau & Duncan, 1967; Duncan, Featherman, & Duncan, 1972; Sewell & Hauser, 1975; Hout, Raftery, & Bell, 1993). Research from the United States and a range of other countries documents a negative relationship between family size and educational attainment¹ (Blake, 1989; Downey, 1995), and the negative effects of single parenthood on children's educational outcomes range from a greater probability of school dropout to lower achievement (see Seltzer, 1994, for a review).

To the extent that immigrant children are more likely to come from disadvantaged family backgrounds than native students, we should expect related lags in attainment and achievement among immigrant children. Once family background factors are held constant, gaps in educational outcomes should substantially decline or disappear. The findings of much of the U.S.-based research support this argument. For example, studies comparing Hispanic-immigrant and native-born students in the United States find few independent effects of ethnicity and immigrant status, after controlling for parent's education, occupation, income and other family background char-

acteristics (Duncan & Duncan, 1968; Bean & Tienda, 1987; Jones, 1987; Kennedy & Park, 1994; Warren, 1996).

Differences in Language Ability. Other research emphasizes differences in language ability as a primary determinant of the gaps in educational performance. For example, Fernandez and Nielsen (1986) find that Mexican-origin students in the United States who do not speak fluent English are at a serious disadvantage in school. Several studies indicate that low-socioeconomic status and poor language ability are important factors for the underachievement of immigrant youth in the United States, although the effects of socioeconomic status are generally larger than language ability (Rosenthal, Baker, & Ginsburg, 1983; Glenn & de Jong, 1996). In addition to having difficulty communicating in school, students with language deficiencies may be more likely to be viewed as slow learners. Alternatively, recent studies point out the value of bilingualism, whereby students of foreign origin who maintain their native language, in addition to speaking the language of their host country, appear to have advantages over mono-lingual students (Zhou & Bankston, 1998; Mouw & Xie, 1999). For these students, bilingualism may facilitate greater parent–child communication in households where parents are native speakers.

Institutional Variations in Immigrant Incorporation. The above explanations focus primarily on individual differences – in terms of family background, sociocultural adaptation, language ability, etc., – to explain variations in educational outcomes of different immigrant groups. Prior research has paid little attention to institutional variations across host societies as a potential factor in immigrant/native student achievement gaps, likely because so much of the research in this area has focused on immigrant experiences in a single context, most notably the United States. This is unfortunate, since features of the host society may play an important role in immigrants' process of adaptation, even net of variations in individual and family characteristics.

A very different approach is found in institutional theory, where the main focus is not on individual attributes of different groups (e.g., immigrants and non-immigrants) but on collective-level and cultural processes. As Jepperson (2002b) explains, “by focusing on the broad institutional frameworks of society, sociological neoinstitutionalism then defocalizes ‘actors’ on purpose. This idea is pursued in order to envision features of the social world not easily captured – or not captured at all – when focusing upon actors” (p. 4). Institutional theory emerged largely from the ideas of John W. Meyer (1977) and his colleagues, who were “reacting to the enduring individualism of American sociology” (Jepperson, 2002b, p. 3). Institutionalists seek to

show how “many basic features of the entities examined – national states, organizations, individuals – are shown to be constructions of institutionalized cultural environments, rather than being ‘hardwired’ and pregiven outside the social system” (Jepperson, 2002b, p. 4).

How can institutional arguments help us understand differences in educational achievement between immigrant and native-born students? One line of institutional theory maintains that nation-states have distinctive “institutional logics” and political cultures that underlie patterns of nation-building and loci of authority (Jepperson, 2002a). For example, Meyer (1983) sketched a typology of modern polity types in which he distinguished between “statist,” “corporatist” and “individualist” nation-states (roughly France, Germany and the U.S., respectively); Jepperson (2002a) extended and modified this typology in order to understand the different paths that nations took to modernize. Other institutionalist scholars in sociology (Soysal, 1994) and political science (Freeman, 1995, 1997) have developed typologies of nation-state variation in the receptivity toward immigrants by examining the policy discourse and organization structures that deal with the incorporation of foreigners into society. For example, Yasemin N. Soysal (1994) shows that different polity forms in Europe led to different regimes for incorporating labor migrants. She argues that differences in immigrant incorporation regimes reflect “different collective modes of understanding and organizing members in host polities ... incorporation styles bear the imprint of collective paradigms of membership that persist over time” (pp. 35–36).

Thus, rather than locating the source of educational achievement gaps of immigrant and native-born students within individuals (in terms of their language abilities, family background, etc.), institutionalism urges us to focus on how the categories of “immigrant” and “native” may be constructed and certified differently across nation-states and how these patterns, in turn, may relate to variations in achievement gaps. Nations differ in their historical experiences with immigration, the degree to which they promote immigration, and public acceptance of immigrants within the host society. By attending to national-level variations in the receptivity toward immigrants, we can begin to group countries into institutional “types” in terms of the degree to which their policies and practices are exclusionary toward immigrants and then make predictions on how these institutional variations relate to several aspects of immigrants’ experiences, including their educational achievement relative to native-born students.

Countries that have long immigrant traditions tend to have inclusionary immigration regimes. Migration was critical to the founding and develop-

ment of countries like the United States, Canada, Australia and New Zealand. According to Freeman (1995), they are “prototypical countries of immigration, and they stand alone today in encouraging mass immigration for permanent settlement.” Since these nations adhere the principle of citizenship *jus soli* (according to place of birth), second-generation immigrants are citizens and have a secure legal basis on which to make decisions about their futures (Castles & Miller, 1993, p. 222). Moreover, Canada and Australia have pursued multicultural modes of incorporating immigrants into society; the United States has used a combination of multicultural and assimilationist modes – whereby immigrants often form ethnic communities and are gradually accepted as part of a pluralist society. While multiculturalism remains a controversial topic of debate in these nations, it continues to evolve and gain greater acceptance (Castles & Miller, 1993, p. 229).

In contrast to traditional immigrant societies, most countries in Northern Europe have adopted a more exclusionary stance toward immigrants (Baker et al., 1985). These nations did not see immigration as “necessary or important to nation building or integral to the national identities of European states” (Freeman, 1995, p. 885). Instead, Northern Europe has only recently experienced mass influxes of immigrants. After World War II, Northern European nations began programs to recruit temporary guest workers primarily not only from Southern and Eastern Europe, but also from former colonies and other developing regions, to meet labor demands. By 1970, Germany had admitted 3 million foreigners, most of whom were migrant laborers (Fassmann & Münz, 1994, p. 7). During the 1970s, with the onset of economic recession and growing anti-foreigner movements, most countries halted the recruitment of foreign labor; but family reunification, an inflow of refugees from Eastern Europe and higher-than-average birth rates of immigrants led to increasing immigrant populations in Northern Europe through the 1990s. Several writers have argued that this large-scale immigration poses serious dilemmas with respect to citizenship and nationality in Northern European societies, which have little remembered history of such problems and slight inclination to accommodate the cultural demands of minorities (Freeman, 1995; Brubaker, 1990; Quillian, 1995). As a result of these realities, the responses of governments and the public toward immigration are much less positive than in traditional immigrant societies.

One striking example of the difference between inclusionary and exclusionary regimes relates to the policies and practices regarding the granting of citizenship to foreigners. In contrast to traditional immigrant countries, Northern European nations generally do not grant citizenship on the basis of birth in the country; immigrants, and their children, must contend with

more restrictive naturalization procedures in order to become citizens (Soysal, 1994). In Germany, Switzerland and Denmark, citizenship is granted *jus sanguinis* (according to citizenship of the parents), rather than *jus soli* (according to place of birth). For example, by German law, children born in Germany are still considered foreigners if they are not of German ancestry. At the same time, children able to prove even the most distant German ancestry are granted citizenship, regardless of their knowledge of German language or culture (Convey & Kupiszewski, 1996). While in recent years, countries with the most restrictive naturalization policies have begun to widen access to citizenship – especially to children of immigrants who have lived in the country for many years – immigrants’ naturalization rates remain very low in most Northern European countries (OECD, 1997).

Of course there are important variations within this general Northern European “exclusionary” pattern (see e.g., Soysal, 1994). Some countries, most notably Germany, but also Switzerland and Austria, cling to idea that they are not countries of immigration and that their sizable populations of foreign-origin are not immigrants, but temporary migrants (Convey & Kupiszewski, 1996). This view, coupled with very restrictive naturalization policies, means that most foreign residents do not have access to a range of rights and services and are denied political representation and participation. On the other hand, Sweden and the Netherlands have more readily come to terms with the idea that migrants admitted as temporary laborers are likely not returning home, and they have recognized the need for the long-term integration of these immigrants. Since the 1980s both nations have tried, with varying success, to implement policies toward that goal, sometimes looking to the multicultural models of Australia and Canada for guidance. The Netherlands, Sweden and Norway have also relied more strongly on the welfare state to accommodate immigrants (Entzinger, 1994; Brochmann, 1999).

We compare inclusionary immigrant countries and exclusionary Northern European countries with a third group of countries in southern Europe, which have a rather neutral stance toward immigrants. The nations of Spain, Portugal and Greece have long been poorer than their northern counterparts and, therefore, accustomed to exporting labor to other regions in Europe. But in recent decades, these countries have made a rapid transition from sending to receiving countries. Return migration first exceeded emigration in Spain and Greece in 1975 and in Portugal in 1981; since then, these countries have received significant numbers of immigrants from outside the European Community, while they continue to send nationals abroad (Freeman, 1995). The forces contributing to these changes in South-

ern Europe include rapid economic growth, the development of segmented labor markets with large informal sectors, lax or nonexistent immigration control mechanisms and intense migration pressures from nearby countries. In contrast to Northern European contexts, public views have been either largely indifferent (Portugal) or even receptive (Spain) toward immigration, as the demand for low-cost labor still exceeds supply (Freeman, 1995, p. 884).

Differences among host countries, their history with and receptivity toward immigrants may, in part, explain immigrants' adaptation to their host societies and, specifically, the educational experiences and performance of immigrant children, net of family background and individual characteristics. Given the recent nature of large-scale immigration and the generally more restrictive, exclusionary views and policies toward immigrants in many Northern European countries, we expect that immigrants' integration will be more problematic in these societies and be reflected in larger achievement gaps between immigrants and native students in these nations, in comparison with Southern European and immigrant nations.

Other factors likely are important to consider in making any broadly comparative claims about variations in nations' histories, policies and modes of incorporating immigrants. Countries vary in their investment in education, their extent of support for a welfare state, the degree to which immigrant enclaves in the host society exist and support newcomers and many other factors. Nonetheless, if evidence indicates that net of individual-level factors, immigrant achievement gaps are patterned according to the institutional differences outlined here, we gain confidence that institutional variations in incorporating immigrants practiced by host societies should be studied further as plausible sources of immigrant achievement gaps.

HYPOTHESES

On the basis of the above explanations, three hypotheses emerge that we test empirically in the analyses that follow.

Hypothesis 1. Immigrant achievement gaps are primarily due to differences in family background. After controlling for differences in parental education, socioeconomic status, family size and structure, achievement gaps between immigrant and native students will be greatly reduced or eliminated.

Hypothesis 2. Immigrant achievement gaps are both due to differences in family background and proficiency in the language of the host country. Immigrant children from households where the language of the host country is seldom or never spoken will demonstrate lower achievement than students from households where the host country language is always spoken. After controlling for family background factors and language proficiency, achievement gaps between immigrant and native students will be greatly reduced or eliminated.

Hypothesis 3. National-level institutional variations in the modes of incorporation of immigrants condition the effects of immigrant status on educational achievement. In Northern European countries, immigrant achievement gaps should be larger, and remain larger net of family background and language proficiency, than in Southern European or Immigrant Countries. Immigrant gaps should be smallest in Immigrant countries relative to both Southern and Northern European countries.

DATA AND METHODS

To test these hypotheses, we use data from the TIMSS. TIMSS was conducted by the International Association for the Evaluation of Educational Achievement (IEA) in 1995, and is one of the largest international survey on educational achievement to date (IEA, 1995, 1997). It includes systematic data on indicators for student background, attitudes and activities, math and science achievement scores and school characteristics for student populations in primary, middle and late-secondary schools in 42 countries. We conduct analyses using data from three sets of countries that correspond to the institutional typology outlined above: seven Northern European countries (Germany, Switzerland, Austria, Netherlands, Sweden, Denmark, Norway), three Southern European countries (Spain, Portugal, Greece), and four Immigrant Countries (United States, Canada, Australia, New Zealand).

We use data for the middle-school population, technically defined as “all students enrolled in the two adjacent grades that contain the largest proportion of 13-year-olds at the time of testing” (IEA, 1997). This population basically corresponds to seventh- and eighth-grade students and is most similar in age to those used in prior research on immigrant student populations.

The survey entailed substantial efforts to standardize measures and procedures across countries and to document national deviations from international norms established by the IEA. In each country, students were sampled for testing through a two-stage stratified cluster design. At least 150 schools comprising a representative population were selected; very small or geographically remote schools and those with a curriculum very different from that prevailing country-wide were excluded (IEA, 1997). Within selected schools, a sample of mathematics and science classrooms was randomly selected and all students in these classes were surveyed. In the mathematics classes, students were administered a ninety-minute mathematics test consisting of 151 multiple-choice, short-answer and extended response items. Raw scores on this test were used to compute an international mathematics achievement score for each student.²

We estimate ordinary least squares (OLS) regression models to determine the effects of immigrant status and other independent variables on mathematics achievement by country in the form,

$$M_c = \alpha_c + \beta_c X_c + \varepsilon_c$$

where c indexes countries, M equals math achievement scores, X represents independent variables and α and β are parameters to be estimated.

To examine the relationship between immigrant status and math achievement, we compare three generational groups: (1) *first-generation immigrants* are foreign-born children with one or both parents of foreign origin, (2) *second-generation immigrants* are native-born children with one or both parents of foreign origin, and (3) *native students* are students born in-country of native-born parents. This definitional strategy has both strengths and limitations. First, it is the conventional strategy of defining immigrant status used by most prior research on the educational performance of immigrant students in the United States (Kao & Tienda, 1995; Portes & MacLeod, 1999), so the results from the comparative analysis can be readily compared to those of prior research. Second, it distinguishes aspects of immigrant status that should matter for educational achievement in all countries. Importantly, however, in light of the discussion regarding citizenship policies above, this generational definition may not capture some important variations in the Northern European countries where citizenship is not granted according to place of birth. For example, given that German children classified as “native” according to the above definition are considered foreigners if they are not of German ancestry, it is possible that in Germany, our analyses underestimate differences by immigrant status, as some students

classified as natives may be disadvantaged. Unfortunately, the survey did not ask questions regarding citizenship status.

An additional limitation of the TIMSS data is that students were not asked about their country of origin or ethnicity. Thus, we are not able to examine possible differences by the country of origin for first- and second-generation immigrants. This is unfortunate since much of the research on immigrants' educational experiences in the U.S. finds substantial differences among immigrants of different origins. Students of Chinese, Korean and Filipino origin are seen as examples of successfully adapting to school, while children of Latin minorities are said to confront serious handicaps (Portes & MacLeod, 1999, p. 374; Hirschman & Wong, 1986; Zhou & Bankston, 1998). The data do not allow us to examine the internal diversity of immigrant populations in different countries or the role such diversity may play in shaping differences in educational achievement. Nonetheless, we maintain that these data are appropriate for testing the institutionalist idea that the categories of "immigrant" and "native" may be constructed and certified differently in countries with different immigration incorporation regimes. Regardless of achievement variations that may exist within immigrant populations, if the patterns in the achievement gaps between immigrants and native-born students correspond to institutional variations discussed above, it is reasonable to construe this as evidence in support of the institutional hypothesis.

Other independent variables include individual and family background characteristics. Student's *Age*, in tenths of a year, is based on birth date. *Female* is a dummy variable coded 1 if the student is female. *Father's education* is the student's report of his or her father's educational status, consisting of four categories: did not complete secondary, completed secondary, vocational education and university. Because the survey contains no direct measure of parental income or occupational status, we use a measure of household resources as a proxy measure of *socioeconomic status*. It is derived as the sum of "yes" responses (= 1) to a series of questions about possessions (e.g. car, television, computer) in the household, ranging from 0 to 16. *Family size* is the respondent's report of the total number of people living in the household. *Single Parent* is a dummy variable coded 1 if student lives with only one parent, either mother or father. Finally, *home language* is a dummy variable coded 1 if the student reports that the language of the test³ is always or almost always spoken at home (versus sometimes or never = 0). Detailed definitions and descriptive statistics for all variables used in the analysis are reported in Table A1 of Appendix A; Table B1 of Appendix B shows country-specific descriptive statistics for math achieve-

ment and background characteristics for the full sample and then for first- and second-generation immigrant and native students.

RESULTS

For each country, we first estimate a baseline model (model 1) that examines the impact of immigrant status on math achievement, controlling only for age and sex of the student. In terms of immigrant status, native students are the reference category. Tabular results for these analyses are presented in Table C1 of Appendix C. Math achievement scores of first-generation immigrants are significantly lower than native students in all countries except Spain, Portugal, Australia and New Zealand. In New Zealand, first-generation immigrants have significantly higher scores than native students. Achievement gaps are larger in Northern European countries. Second-generation immigrants also appear to have significantly lower math achievement in most countries, except Denmark, Norway, Canada, Australia and New Zealand, where there is no significant difference between math scores of second-generation and native students. Where significant, the achievement gap of second-generation immigrants is smaller than for first-generation immigrants in all countries, except in the United States, where it is larger. Females have significantly lower math achievement scores in all countries except Germany, Norway, Canada and Australia.

On the basis of these results, Fig. 1 graphically displays the gap in math scores between immigrants and native students for Northern European, Southern European and Immigrant Countries. The white bar represents the gap in mathematics scores of first-generation immigrants compared to native students; the black bar represents the gap between second-generation immigrants and native students.

A second model controls for family background factors (see Table C2 of Appendix C). In addition to age and sex of the student, this model controls for father's education, socioeconomic status, family size and structure. In all countries, father's education has a strong positive impact on math achievement. The effect of SES is also positive and significant in most countries (Austria and Denmark are two exceptions), though its effects are generally small. The effects of family size are less remarkable than we might expect on the basis of prior research; family size has no significant impact on achievement in four Northern European nations (Germany, Switzerland, Denmark and Norway). Though negative and significant in all other countries, its effects on math achievement are generally small. This may be due to the less

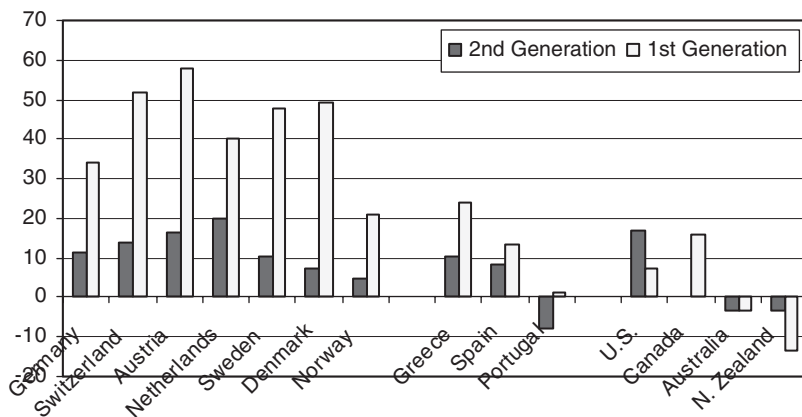


Fig. 1. Difference in Expected Math Scores between Natives and Immigrant Origin Groups in 14 Countries, Model 1

precise measure of family size – total number of people in the household – used here, instead of the preferred measure of total number of children, which more accurately reflects possible constraints of sibling size on educational outcomes that are results of the dilution of resources across children in the household. The negative effects of living with a single parent are larger and more consistent. In all but three countries (Austria, Spain and Portugal) children in single parent households have significantly lower scores than those in households with two parents.

In sum, these results generally correspond with much prior research, which finds that children of well-educated parents with more income and those who live with both parents in small families have higher rates of attainment and achievement than other children. With the addition of these variables, the previously significant negative effect of female is reduced to non-significance in some countries, but net of these factors, females still demonstrate significantly lower math achievement in Switzerland, Austria, Denmark, Greece, Spain, Portugal and the United States. While these effects of the control variables are interesting in their own right, our primary interest is with the effects of immigrant status, net of these factors.

In all Northern European countries, large negative effects of first-generation immigrant status remain, net of family background factors. Previously non-significant effects for first-generation immigrants in Spain and Portugal are now negative and significant. The effect of second-generation status on math achievement also remains relatively unchanged with the addition of

controls for family background. In line with prior research in the United States, we find that the achievement gap between first-generation immigrants and native students largely disappears (for second-generation immigrants the gap is reduced but still significant). Similarly non-significant effects of immigrant status in Australia and New Zealand indicate that, after controlling for family background and socioeconomic status, students of immigrant origin perform on par with native students. Interestingly, in Canada, achievement gaps remain large and significant in this model.

Figure 2 presents the gap in math scores between immigrants and native students in all countries with family background factors controlled. Indeed the pattern of results for Northern European countries does not appear much different from that presented in Fig. 1, indicating that the addition of family factors has little impact on the effects of immigrant status.

In a final model, we examine the combined impact of language ability and family background on achievement (see Table C3 of Appendix C). The results are displayed graphically in Fig. 3. Language ability has a positive significant effect on math achievement in all countries except for the Netherlands, Sweden and Denmark. For Northern European countries where language is significant (Germany, Switzerland, Austria and Norway) its effects on math achievement are large and first generation-native achievement gaps are substantially reduced – so much so in Norway that the achievement of immigrant-origin students is now indistinguishable from

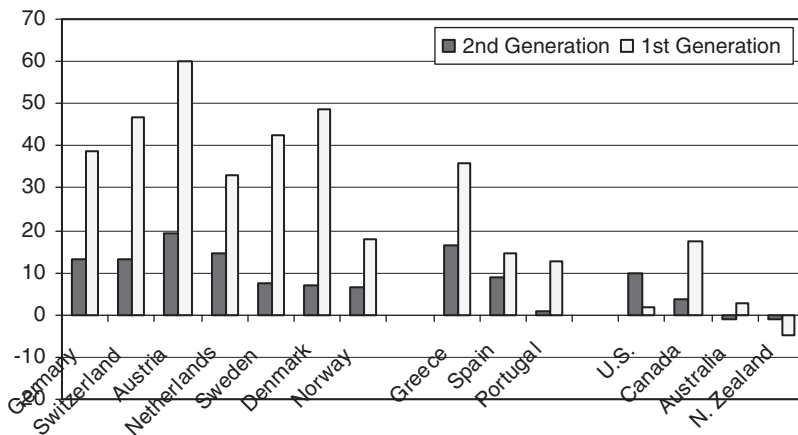


Fig. 2. Difference in Expected Math Scores between Natives and Immigrant Origin Groups in 14 Countries, Model 2

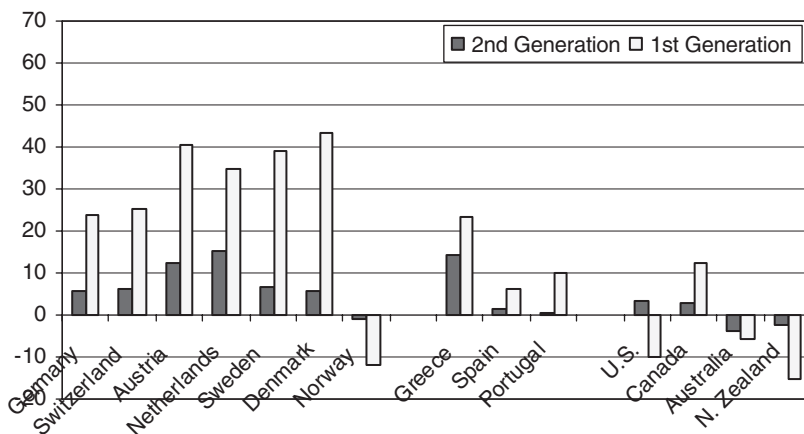


Fig. 3. Difference in Expected Math Scores between Natives and Immigrant Origin Groups in 14 Countries, Model 3

that of native students. In Germany, Switzerland and Austria, these gaps remain negative and significant.

In all Southern European and Immigrant Countries, children in households where the language of the host country is commonly spoken have significant advantages in math achievement. Even so, in Greece the negative effects of immigrant status remain. In Spain and Portugal, once language proficiency is controlled, immigrant-origin students perform as well in math as their native counterparts, while in the United States, Australia and New Zealand, some immigrant-origin students actually perform significantly better than native students. Again the case of Canada does not fit the pattern for other immigrant Countries; first-generation immigrants continue to under-perform relative to native students, net of controls for family background and language proficiency.⁴

On the basis of these results, Fig. 4 graphically presents the predicted math scores for natives, second- and first-generation immigrants in all 14 countries. Switzerland reports the highest scores for all three groups, Portugal the lowest. Within these extremes, however, there are several interesting comparisons. For example, predicted math scores for first-generation immigrants are higher in Norway, Sweden, Austria and Switzerland than in the U.S. For second-generation immigrants, predicted math scores are higher in all Northern European countries than in the United States. These comparisons underscore the point that, while Northern European societies

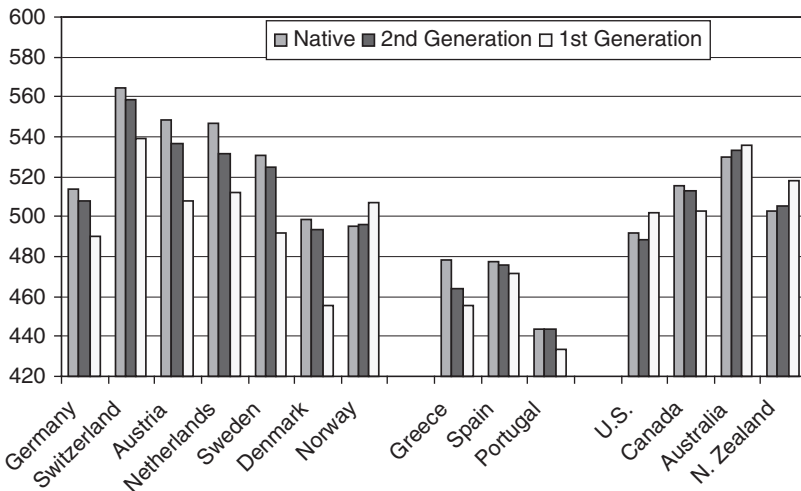


Fig. 4. Predicted Math Scores for Natives and Immigrant Origin Groups in 14 Countries, Model 3.

appear to fare poorly in terms of the math performance of their immigrant populations compared to their native populations, in terms of overall math achievement, immigrant-origin students in Northern Europe fare far better than immigrant-origin students in the United States. The immigrant achievement gaps in these countries are attributable, in part, to the high average achievement of native students. Similarly, the lack of achievement gaps in the United States is due, in part, to the lower achievement scores of all students. As countries aspire to high achievement rates for all students regardless of immigrant status, the case of Australia may be most informative. It demonstrates relatively high math achievement levels across all groups and small gaps between groups.

DECOMPOSITION ANALYSIS

In an attempt to get some sense of the mechanisms underlying the differences in immigrants’ achievement in different social contexts, we decompose differences in math achievement scores in Northern and Southern European regions with respect to Immigrant Countries. For these analyses we combine the student samples from all Northern European countries into a single

“Northern Europe” sample and all Southern European countries into a single “Southern Europe” sample. Cases from the United States, Canada, Australia and New Zealand are combined to form an “Immigrant Country” sample. For this analysis, it is necessary to create general measures for parents’ education and socioeconomic status that were measured in precisely the same way across all contexts. Thus, instead of using father’s education comprised of four categories in most countries, and three categories in some countries (see Table C2), we use a measure of parents’ education, which indicates whether at least one parent had completed secondary school. The variable for socioeconomic status is a simplified measure indicating whether the student’s household possesses three educationally relevant resources: a calculator, a computer and a study-desk. Beyond these measures, countries were allowed to add questions regarding other material resources in the home, so these measures are not standard across countries.

The main objective of this simulation exercise is to capture the extent to which differences in the educational achievement of immigrants across regions are explained by: (1) the mean background characteristics of immigrant groups in different regions (e.g., sex, parents’ education, SES, family size and structure, language) or (2) the social context of the host societies receiving immigrants, as reflected by differences in the returns to the background characteristics of immigrant groups. The following equation is used to produce the decomposition:

$$M_{ic} - M_{or} = \alpha_{ic} - \alpha_{or} + X_{or}(\beta_{ic} - \beta_{or}) + \beta_{or}(X_{ic} - X_{or}) + (X_{ic} - X_{or})(\beta_{ic} - \beta_{or})$$

where $M_{ic} - M_{or}$, is the difference in mean math achievement scores in Immigrant Countries (ic) relative to other regions (or), namely Northern and Southern Europe,

$\alpha_{ic} - \alpha_{or}$ is the difference in intercepts which, in this context, reflects differences in math achievement across regions when the independent variables equal 0,

$X_{or}(\beta_{ic} - \beta_{or})$ captures how much of the difference in achievement is due to differences in coefficients. It allows us to simulate the average math achievement score that would be obtained by immigrants in Northern and Southern European regions if the returns to background characteristics were the same as those returns for immigrants residing in Immigrant Countries.

Together, the difference in intercepts and coefficients estimate the extent to which disparities in math achievement scores are due to parameter es-

timates and thus capture the role of institutional context in affecting educational outcomes.

$\beta_{or} (X_{ic} - X_{or})$, captures the effect of differences in mean social background characteristics; that is the extent to which compositional differences in the immigrant population explain differences in math achievement scores.

$(X_{ic} - X_{or}) (\beta_{ic} - \beta_{or})$ (not reported) is an interaction term to balance the equation.

We perform this exercise for both first- and second-generation immigrants. The models estimated to produce the decomposition are reported in Table C4 of Appendix C; Figs. 5 and 6 graphically present the results from this decomposition.

Results in Fig. 5 indicate that, on average, first-generation immigrants have higher math scores in Immigrant Countries than in Northern or Southern Europe. The mean math achievement score (indicated by the column labeled “observed”) for first generation immigrants in Immigrant Countries is 511.8, in Northern European Countries it is 500.9 and in Southern European Countries it is 454.7. When we decompose this difference according to differences in parameters and means, the magnitude of the effect differs considerably across regions. The “parameters” column shows the impact of applying the coefficients of Immigrant Countries to Northern and Southern European Countries. If first-generation immigrants in these contexts experienced the same returns to socioeconomic characteristics as their counterparts in Immigrant countries, their math scores would be 5.8 and 46.5 points higher, respectively.⁵

The “means” column shows the predicted math scores of immigrants in Northern and Southern European countries if they had the same mean values of the independent variables as immigrants in Immigrant Countries. In this case their mean scores would be 3.7 and 4.3 points higher, respectively.⁶ Thus, while both differences in mean background characteristics and the returns to background characteristics are to blame for the lower math achievement of immigrants relative to natives in Northern and Southern Europe, more of the difference is attributable to differences in the returns to background characteristics. In other words, the different immigrant achievement gaps across the three contexts appear to stem less from differences in the socioeconomic composition of the migrant flow and more from differences in the context of immigrant incorporation. Southern European countries in particular appear to have greater difficulties in assimilating first-generation immigrants, but the disadvantaged situation of first-generation immigrants in Northern European countries relative to their counterparts in Immigrant Countries is also evident.

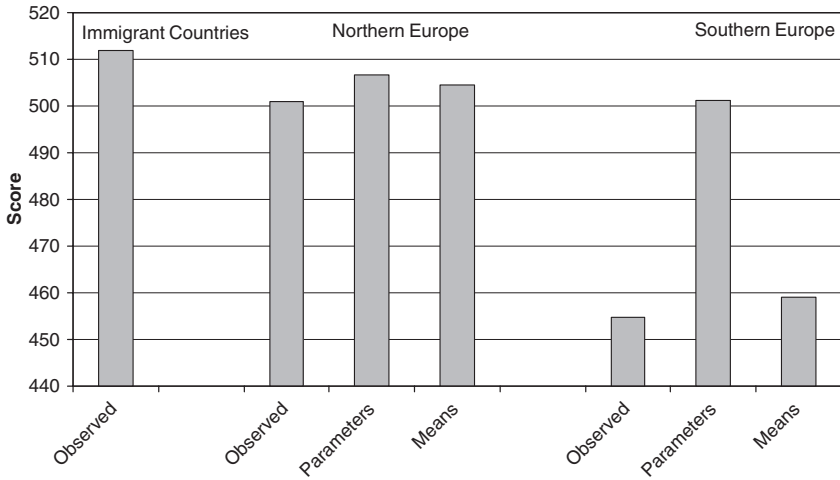


Fig. 5. Decomposition of Differences in Math Scores across Regions: First Generation.

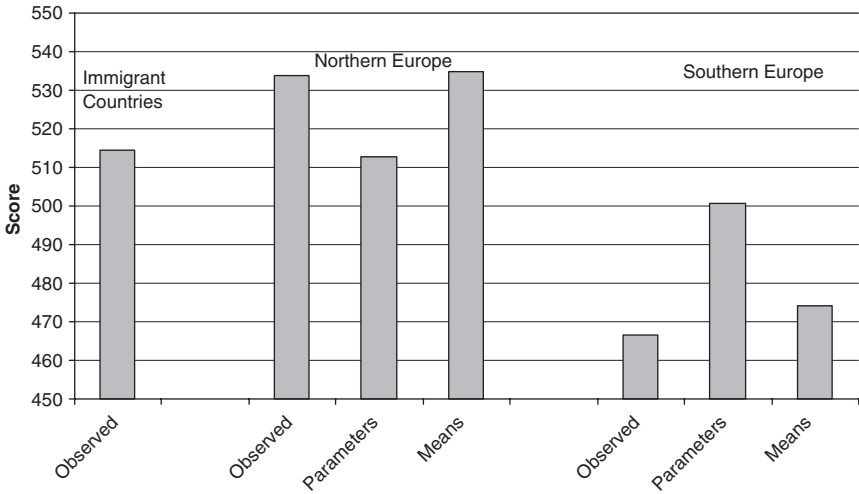


Fig. 6. Decomposition of Differences in Math Scores across Regions: Second Generation.

The decomposition results for second-generation immigrants reported in Fig. 6 are considerably different. The results indicate that if second-generation immigrants in Northern Europe had the parameter estimates of second-generation immigrants in Immigrant Countries their educational attainment would actually decrease. In Southern Europe, on the other hand, there is evidence of discrimination, or at least, barriers to assimilation of second-generation immigrants. If immigrants in Southern Europe had the parameters of Immigrant Countries their achievement would be considerably higher. For second-generation immigrants, differences in means do not contribute dramatically to differences in achievement scores across contexts.

Overall, these results suggest that immigrant achievement is affected considerably by the context of immigrant incorporation. In comparing the results for first-generation immigrants in Northern European countries with those in Immigrant Countries, it appears that a considerable portion of the immigrant achievement gap stems from difficulties in assimilating into the host society. Interestingly, second-generation immigrants in Northern European countries do not appear to suffer these same difficulties. The extent to which this difference between first- and second-generation immigrants reflects an increasing ability of migrants to adapt to their host society over time or, rather, changes in the migrant population themselves is unclear. It is plausible that the greater difficulties for first-generation immigrants relative to second-generation immigrants to attain math scores comparable to native populations indicate that recent waves of immigrants to Northern European countries are facing greater difficulties in assimilating than previous waves of immigrants. In Southern Europe, on the other hand, limits to assimilation are more pronounced and present for both the first and second generation. Their immigrant populations, however, remain relatively small. It is likely that these effects will change as immigration becomes more generalized.

CONCLUSIONS

In light of these findings, it appears that sweeping generalizations regarding the determinants of immigrant achievement gaps across a wide range of societies are not possible. While the lower achievement of immigrant students can be largely explained by differences in family background and language proficiency in the United States, as well as in some other societies with a long history and tradition of immigration, these factors do not explain the sizable gap in performance between immigrant-origin and native-born students in many Northern European societies. Thus, Hypotheses 1

and 2, developed primarily on the basis of prior research in the United States receive support in some contexts, but do not appear to hold in the European nations analyzed here.

Rather, the patterns of findings reported in Figs. 1–3, in conjunction with the decomposition analysis reported in Figs. 5 and 6, lend support to the hypothesis that national-level institutional variations in the incorporation of immigrants condition the effect of immigrant status on educational achievement. Immigrant achievement gaps in Northern European countries are larger and remain larger, net of family background and language proficiency, than in Southern European or Immigrant Countries. This is an important finding in that it indicates that institutional aspects of the host society matter for immigrant adaptation, even net of variations in individual and family characteristics. While these results are encouraging, they provide only a first step toward an understanding of how institutional variations may structure the experiences and mobility of immigrants in industrialized societies. We have sketched such institutional variations in very broad-brush strokes by grouping countries into institutional “types” in terms of the degree to which their policies and practices are exclusionary toward immigrants. Much work remains to be done in order to fill in the details.

For example, this chapter has not attended to the specific processes or mechanisms that may be the source of the lower achievement of immigrants in exclusionary societies. In Northern European countries, governmental policies and public animosity toward immigrants may mean that immigrant students are more likely to be segregated from native students. They may be discriminated against and have less access to quality educational resources. If they and their parents are denied citizenship rights, they may have little recourse to redress such inequities. Any or all of these factors may influence the educational achievement of immigrant-origin students. While cross-national analyses of numerous countries like the one in this chapter are useful for establishing broad patterns across a wide range of societies, they are less useful for determining the explanatory mechanisms within countries that are the source of these patterns. Studies that focus on detailed data from one or two countries are more suitable for achieving this goal.

One study, now 20-years old, exemplifies the kind of knowledge that can be gleaned with detailed data from a single country. David Baker and his colleagues examined how immigrant and native students were allocated to the three types of German secondary schooling – the *Gymnasium*, the *Realschule* and the *Hauptschule*. The *Gymnasium* is the most selective type of schooling and traditionally leads to a university education. The *Realschule* provides education appropriate for white-collar business or skilled trade

occupations. The *Hauptschule* is the least selective and provides the fewest career opportunities (Baker et al., 1985, p. 216). Immigrant students were most likely to enter the secondary school system via *Hauptschule* and remain there over the course of their secondary education. Moreover, in regions with large populations of immigrants, fewer native students were enrolled in the *Hauptschule* and more were enrolled in *Realschule* or *Gymnasium*. The authors maintain that in the face of growing enrollment of immigrants in the *Hauptschule*, native Germans avoid the *Hauptschule* and are either redistributed upward into higher status strata of secondary schools or migrate out of regions with large influxes of immigrants. The segregation of immigrant students in low-status schools and the reassignment of German students to high-status schools, whether through official or unofficial means, is one plausible explanation for the large immigrant achievement gap in Germany and other nations with an exclusionary stance toward immigrants. Future research could examine whether immigrant students tend to be segregated in low-status schools in other Northern European countries. Austria, Switzerland and the Netherlands have highly stratified secondary-school systems where students are allocated to schools that differ greatly in curricula and the extent to which they prepare students for higher education (Shavit & Müller, 1998; Eurydice European Unit, 1997). If research finds that immigrants are segregated in the lowest-strata of secondary schools in these countries, the understanding of how institutional variations wield their impact on immigrants' educational experiences will be advanced substantially.

Another fruitful line of research would redress the inability of the above analyses to examine the national origin of immigrants as a potentially important source of educational achievement variations. In addition to differences in the modes of incorporating immigrants, host nations differ in the types of immigrant populations they receive, in terms of their skills, their likelihood of integration, and their country of origin. Differences among immigrant populations that are not captured by the individual and family background characteristics in the above analyses may play a role in explaining national variations in the math performance of immigrants. Unfortunately, we know of no large comparative data sets on educational performance that include data on the nation of origin of immigrant students. Even the Programme on International Student Assessment (PISA), the largest and most comprehensive survey on educational achievement in industrialized countries to date does not report nation of origin data for immigrant students (www.pisa.oecd.org). Thus researchers likely will have to rely on comparative studies of a few countries to examine this issue. For

example, a study comparing the educational performance of Turkish immigrants in European nations with different modes of immigrant incorporation would effectively serve to hold nation-of-origin constant. Variations in the mean educational achievement of a single immigrant group across different contexts could reasonably be attributed to institutional variations in receptivity toward this immigrant group across contexts.

We hope that the ideas set forth in this chapter spawn future research on the educational experiences of immigrants in different host societies. The idea that the educational achievement of immigrant students is related, in part, to institutional variations in the host society is an important departure from prior research which has focused primarily on the individual attributes of immigrants and non-immigrants to explain achievement outcomes. In this regard, this chapter underscores the value of institutional arguments for providing a more complete understanding of cross-national variations in the achievement gaps between native-born and immigrant-origin students.

NOTES

1. But there are important exceptions to this pattern; see Shavit and Pierce (1991) and Blake (1989).

2. The IEA recommends that this score be used for international and within-country comparisons since it takes into account the specific difficulty of the items attempted by each student, their relative difficulty internationally, and the measurement error component (IEA 1997, chapter 6).

3. In Canada, Switzerland and Spain, the tests and surveys were administered in more than one language, depending on the region of the country and the language of instruction in the local schools. Canada: French, English; Switzerland: German, French, Italian; Spain: Castellano, Catalan, Gallego, Valenciano (IEA, 1997, pp. 7–9).

4. We tested whether coefficients for effects of immigrant status in all countries were significantly different from coefficients for the United States. Coefficients for first-generation status in Germany, Switzerland, Austria, the Netherlands, Sweden, Denmark, Greece, Spain, Portugal and Canada are significantly different from the U.S. coefficient. For second-generation status, coefficients for Germany, the Netherlands and Denmark are significantly different. There is little change in the effects of other control variables with the addition of language proficiency. The effects of female, father's education and family size are very similar in all countries. The effects of SES in Germany and Norway cease to be significant in Table C2. The effects for single parent are unchanged, except in the case of Austria, where it is now significant.

5. This result is indicated by the difference between the "parameters" and the "observed" column; for Northern Europe: $506.7 - 500.9 = 5.8$; and for Southern Europe: $501.3 - 454.8 = 46.5$.

6. This result is indicated by the difference between the “observed” column and the “means” column; for Northern Europe: $504.6 - 500.9 = 3.7$; for Southern Europe $459.1 - 454.8 = 4.3$.

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APPENDIX A

Detailed definitions and descriptive statistics for all variables are shown in Table A1.

Table A1. Definitions and Descriptive Statistics (full sample) for Variables Included in the Models.

Name	Description	Mean	S.D.
<i>Dependent variables</i>			
Math achievement	Score on International Mathematics Achievement Test (ranging from 144 to 887)	512.81	91.10
<i>Immigrant status</i>			
First generation	Student is foreign-born and one or both parents are foreign born	0.05	
Second generation	Student is native born and one or both parents are foreign born	0.15	
Native	Student and both parents are native born	0.80	
<i>Controls</i>			
Age	Child's age ranging between 13 and 18 years	13.73	0.80
Sex	Coded 1 if child is female	0.51	0.50
Father's education	Level of education attained by father. Coded as: 1 = did not complete secondary 2 = finished secondary 3 = finished vocational education 4 = university (some university or finished university)	3.53	1.68
Socioeconomic status	Sum of yes responses to series of questions regarding material possessions in the household (e.g., car, television, computer), ranging from 0–16	9.79	3.11
Family size	Total number of people live in the household	4.64	1.41
Single parent	Child lives with only mother or father	0.19	0.39
Home language	Language of school instruction is always spoken in the household, (versus sometimes or never)	0.91	0.28

APPENDIX B

Country-specific descriptive statistics are shown in Table B1.

Table B1. Math Achievement and Social Characteristics across Countries and Immigrant Status.

Country	Austria	Denmark	Germany	Netherlands	Norway	Sweden	Switzerland	Greece	Portugal	Spain	Australia	Canada	New Zealand	United States
<i>All</i>														
Math achievement	545.8 (89.0)	497.9 (81.4)	510.8 (86.8)	543.6 (83.5)	496.6 (83.8)	527.8 (87.6)	561.4 (88.2)	477.5 (89.5)	444.3 (65.5)	478.3 (75.2)	533.8 (93.8)	513.9 (84.6)	505.1 (89.2)	492.1 (91.3)
% Second generation	10.0	5.9	9.4	11.0	6.9	11.4	22.9	5.3	1.8	1.4	8.3	6.6	10.2	5.8
% First generation	5.2	2.7	6.7	3.0	3.6	5.4	8.5	2.3	6.8	12.8	29.1	19.8	20.8	14.1
<i>Natives</i>														
Math achievement	550.4 (86.8)	499.6 (81.2)	514.4 (85.8)	547.2 (82.0)	497.3 (83.4)	531.9 (86.6)	568.5 (87.1)	478.5 (89.6)	443.5 (65.2)	479.5 (75.7)	532.6 (93.1)	515.0 (83.9)	503.1 (88.3)	494.8 (90.8)
% Parent's secondary education	16.9	23.5	12.8	17.6	36.6	32.1	13.7	20.8	8.9	21.1	31.3	41.3	29.6	35.7
% Basic education resources	60.2	71.1	70.7	84.7	65.5	62.6	68.3	28.0	35.7	41.8	67.5	56.1	57.7	56.6
Family size	4.7	4.2	4.5	4.5	4.4	4.3	4.6	4.7	4.5	4.8	4.7	4.5	4.8	4.6
% Native language at home	(1.6)	(1.0)	(1.4)	(1.1)	(1.4)	(1.1)	(1.7)	(1.2)	(1.5)	(1.3)	(1.2)	(1.2)	(1.4)	(1.5)
	99.0	99.2	98.6	95.2	99.1	99.3	96.1	97.7	98.3	88.1	98.8	88.2	97.1	96.6
<i>First Generation</i>														
Math achievement	493.5 (95.9)	457.3 (83.6)	479.6 (84.3)	505.0 (92.4)	483.6 (86.1)	483.9 (86.9)	523.8 (92.7)	458.8 (79.3)	441.1 (58.6)	465.2 (72.5)	537.4 (96.6)	501.0 (91.3)	517.4 (94.1)	486.9 (95.5)
% Parent's secondary education	28.3	30.4	22.6	30.8	44.7	39.5	21.7	51.2	29.6	32.5	43.4	49.5	57.1	40.8
% Basic education resources	40.5	58.9	59.6	69.2	56.1	46.1	45.5	27.6	39.8	51.9	67.7	55.0	64.9	46.0
Family size	4.4	4.8	4.4	4.8	4.9	4.7	4.4	4.6	5.1	4.9	4.7	5.0	5.0	5.4
% Native language at home	(1.5)	(1.4)	(1.4)	(1.5)	(1.9)	(1.5)	(1.2)	(1.0)	(2.0)	(2.0)	(1.4)	(1.6)	(1.7)	(2.2)
	35.1	44.6	44.3	43.6	39.8	34.9	33.7	61.8	72.4	24.7	70.2	47.2	56.7	44.0
<i>Second Generation</i>														
Math achievement	534.3 (93.9)	490.8 (79.2)	501.0 (92.1)	526.3 (88.7)	494.1 (86.8)	518.3 (88.9)	554.2 (85.6)	468.0 (89.8)	455.5 (71.3)	471.7 (71.7)	535.4 (94.4)	513.7 (84.6)	505.9 (89.5)	478.5 (90.8)
% Parent's secondary education	29.2	29.8	17.5	27.7	50.2	37.7	19.7	28.3	21.3	15.0	34.6	53.0	37.3	33.6
% Basic education resources	59.8	66.9	64.4	78.5	71.5	60.7	65.2	37.1	51.5	47.8	69.8	67.1	60.3	49.5
Family size	4.4	4.1	4.5	4.5	4.7	4.3	4.3	4.6	4.7	4.5	4.6	4.7	4.9	5.2
% Native language at home	(1.7)	(1.3)	(1.7)	(1.3)	(1.8)	(1.3)	(1.1)	(1.4)	(1.7)	(1.2)	(1.2)	(1.3)	(1.6)	(1.9)
	76.7	87.6	72.2	76.5	84.5	81.7	76.1	92.2	93.0	33.2	90.3	80.4	90.7	66.6
N	3922	2042	3420	2620	3462	4788	7789	5331	5447	5499	8664	11652	4404	8590

Note: Parent's secondary education indicates the percent of students reporting that at least one parent had secondary school. Basic education resources indicates the percent of students reporting that their household has a calculator, a computer and a study desk.

APPENDIX C

Tabular results of the analyses are shown in Tables C1–C4.

Table C1. Regression of Math Achievement on Immigrant Status and Controls.

	Northern European Countries										Southern European and Immigrant Countries				
	Germany	Switzerland	Austria	Netherlands	Sweden	Denmark	Norway	Greece	Spain	Portugal	United States	Canada	Australia	New Zealand	
First Generation	-34.31** (6.18)	-51.68** (3.51)	-57.70** (6.47)	-40.40** (9.71)	-47.61** (5.39)	-49.27** (11.39)	-20.71** (7.91)	-24.11** (8.26)	-13.45 (8.65)	-1.34 (6.66)	-7.26* (4.23)	-16.07** (3.23)	3.23 (3.60)	13.26** (4.51)	
Second Generation	-11.45** (5.17)	-13.92** (2.32)	-16.58** (4.72)	-19.89** (5.30)	-10.18** (3.94)	-7.45 (7.90)	-4.53 (5.99)	-10.09* (5.57)	-8.34** (3.04)	7.78** (3.56)	-16.85** (2.85)	-0.33 (2.01)	3.14 (2.17)	3.56 (3.38)	
Age	0.46 (1.98)	20.17** (1.01)	3.50* (2.03)	-4.12* (2.17)	30.22** (1.52)	19.76** (2.89)	29.09** (2.39)	11.12** (1.73)	-1.86 (1.23)	-6.25** (0.80)	-6.94** (1.41)	9.41** (1.11)	17.84** (1.51)	15.28** (2.19)	
Female	0.82 (3.01)	-7.08** (1.92)	-12.17** (2.80)	-6.06* (3.28)	-4.01* (2.45)	-9.16** (3.61)	-4.13 (2.83)	-8.00** (2.46)	-9.21** (2.03)	-11.24** (1.76)	-7.10** (1.98)	-1.30 (1.57)	1.95 (1.94)	-6.33** (2.71)	
Constant	508.04** (28.43)	288.30** (14.29)	507.91** (28.12)	607.31** (29.99)	113.94** (21.25)	239.18** (38.91)	106.77** (32.18)	335.90** (22.87)	508.89** (16.95)	535.98** (11.41)	594.49** (19.73)	388.32** (15.07)	280.90** (21.02)	299.09** (29.68)	
R ²	0.01	0.07	0.03	0.02	0.10	0.04	0.04	0.01	0.01	0.02	0.01	0.01	0.02	0.01	
N	3350	7789	3966	2563	4608	1947	3297	5268	5421	5328	8489	11476	9367	4302	

(standard errors in parenthesis)

** $p \leq 0.05$;

* $p \leq 0.1$

Table C2. Regression of Math Achievement on Immigrant Status, Family Background and Controls.

	Northern European Countries										Southern European and Immigrant Countries				
	Germany	Switzerland	Austria	Netherlands	Sweden	Denmark	Norway	Greece	Spain	Portugal	U.S.	Canada	Australia	New Zealand	
First generation	-38.91** (6.16)	-46.79** (3.57)	-60.07** (6.46)	-32.83** (9.62)	-42.61** (5.54)	-48.55** (11.40)	-18.11** (7.97)	-35.73** (8.01)	-14.75* (8.50)	-12.72** (6.51)	-1.88 (4.09)	-17.38** (3.19)	-2.78 (3.48)	4.87 (4.44)	
Second generation	-13.21** (5.07)	-13.21** (2.31)	-19.13** (4.67)	-14.58** (5.27)	-7.49* (3.91)	-6.95 (7.84)	-6.55 (5.95)	-16.26** (5.36)	-8.87** (2.99)	-0.77 (3.49)	-9.89** (2.78)	-3.66* (1.98)	-0.99 (2.09)	0.84 (3.27)	
Age	2.10 (1.94)	2.58** (0.99)	5.84** (2.00)	-1.90 (2.14)	30.44** (1.50)	21.19** (2.86)	30.14** (2.37)	14.59** (1.67)	0.55 (1.22)	-3.24** (0.79)	-2.41* (1.35)	12.46** (1.09)	19.35** (1.45)	17.73** (2.12)	
Female	2.04 (2.97)	-5.51** (1.89)	-11.70** (2.79)	-4.64 (3.25)	-2.45 (2.42)	-10.09** (3.57)	-3.43 (2.81)	-6.67** (2.37)	-7.36** (2.00)	-6.44** (1.73)	-4.75** (1.89)	0.47 (1.54)	1.92 (1.87)	-3.33 (2.63)	
Father's Education (ref: less than Secondary)	21.05** (3.34)	14.36** (2.75)	22.11** (4.43)	17.98** (5.00)	14.60** (3.27)	12.84** (5.39)	3.10 (5.35)	23.76** (3.60)	21.75** (3.46)	13.37** (3.31)	17.77** (3.14)	15.54** (2.37)	2.71 (2.75)	-1.20 (3.55)	
Vocational	32.11** (7.13)	26.21** (3.80)	—	35.14** (4.91)	—	—	15.03** (4.44)	31.54** (3.26)	7.93** (3.84)	30.88** (4.88)	21.47** (3.68)	24.89** (2.81)	25.76** (2.76)	13.15** (4.48)	
Some university	49.55** (4.73)	49.59** (3.55)	61.04** (5.39)	42.02** (5.47)	34.29** (3.47)	32.83** (5.60)	26.56** (4.37)	54.60** (3.31)	18.99** (2.66)	39.94** (3.08)	50.50** (2.91)	35.87** (2.00)	48.93** (2.35)	37.21** (3.55)	
SES	1.30* (0.69)	2.32** (0.46)	-0.11 (0.62)	3.54** (1.14)	2.21** (0.52)	-1.17 (1.08)	1.18 (0.62)	1.41** (0.55)	4.08** (0.55)	3.24** (0.38)	1.15** (0.40)	1.92 (0.45)	6.35** (0.75)	2.38** (0.54)	
Family size	1.76 (1.01)	-0.55 (0.64)	-1.74** (0.89)	-2.97** (1.49)	-1.82* (1.09)	-1.42 (1.77)	-0.07 (0.96)	-7.72** (0.98)	-3.70** (0.76)	-1.99** (0.57)	-6.14** (0.59)	-3.03** (0.65)	-2.76** (0.77)	-7.46** (0.91)	
Single parent	-17.87** (3.76)	-15.24** (2.63)	-5.31 (3.69)	-14.81** (5.51)	-10.83** (3.36)	-22.04** (4.69)	-13.38** (3.64)	-18.34** (3.31)	-4.93 (3.18)	-2.92 (2.61)	-28.17** (2.05)	-16.42** (1.86)	-15.25** (2.36)	-27.03** (3.42)	
Constant	450.78** (29.63)	226.52** (15.85)	459.71** (29.24)	533.33** (32.19)	76.81** (22.29)	225.30** (42.00)	65.73** (32.86)	292.89** (23.41)	455.44** (17.78)	461.09** (12.40)	523.47** (19.84)	328.83** (15.68)	216.27** (21.35)	265.91** (30.02)	
R ²	0.06	0.11	0.06	0.06	0.13	0.07	0.07	0.09	0.04	0.09	0.1	0.05	0.09	0.09	
N	3350	7789	3966	2563	4608	1947	3297	5268	5421	5328	8489	11476	9367	4302	

(standard errors in parenthesis)
 ** $p \leq 0.05$;
 * $p \leq 0.1$

Table C3. Regression of Math Achievement on Immigrant Status, Family Background, Language and Controls.

	Northern European Countries										Southern European and Immigrant Countries				
	Germany	Switzerland	Austria	Netherlands	Sweden	Denmark	Norway	Greece	Spain	Portugal	U.S.	Canada	Australia	New Zealand	
First generation	-23.77** (7.13)	-25.36** (4.01)	-40.51** (7.80)	-34.72** (10.16)	-38.83** (6.92)	-43.14** (13.42)	12.08 (9.77)	23.86** (3.59)	-6.32 (8.68)	-10.17 (6.67)	-9.96** (4.45)	-12.32** (3.31)	5.75 (3.68)	15.03** (4.91)	
Second generation	-5.68 (5.36)	-6.18** (2.37)	-12.34** (4.91)	-15.27** (5.41)	-6.51* (4.06)	-5.71 (8.01)	1.02 (6.10)	31.34** (4.43)	-1.55 (3.39)	-0.25 (3.50)	-3.30 (2.94)	-2.68 (1.98)	3.62* (2.11)	2.38 (3.28)	
Age	2.27 (1.93)	22.11** (0.98)	6.50** (2.00)	-1.89 (2.14)	30.44** (1.50)	21.20** (2.86)	30.27** (2.36)	14.85** (4.43)	14.49** (3.83)	0.57 (1.21)	-3.17** (0.79)	12.46** (1.35)	19.22** (1.45)	17.86** (2.12)	
Female	1.58 (2.96)	-6.21** (1.88)	-12.25** (2.79)	-4.67 (3.25)	-2.51 (2.42)	-10.06** (3.57)	-4.32 (2.81)	-6.80** (2.36)	-7.08** (1.99)	-6.41** (1.73)	-5.22 (1.89)	0.46 (1.54)	1.58 (1.86)	-3.02 (2.63)	
Father's Education (ref: less than Secondary)	21.40** (3.33)	11.98** (2.74)	20.95** (4.43)	18.25** (5.02)	14.59** (3.27)	12.67** (5.39)	2.72 (5.32)	23.86** (3.59)	21.56** (3.45)	13.27** (3.31)	16.24** (3.14)	15.53** (2.37)	2.53 (2.75)	-1.53 (3.54)	
Vocational	31.91** (7.11)	24.00** (3.77)	—	35.41** (4.93)	—	—	14.85** (4.43)	31.34** (4.43)	8.25** (3.83)	30.74** (4.88)	19.77** (3.68)	24.20** (2.81)	24.73** (2.75)	12.52** (4.47)	
Some university	49.99** (4.72)	47.63** (3.53)	59.13** (5.40)	42.46** (5.52)	34.27** (3.47)	32.65** (5.61)	25.96** (4.36)	54.65** (3.30)	18.18** (2.66)	39.81** (3.08)	48.67** (2.92)	35.63** (2.00)	48.51** (2.35)	36.77** (3.54)	
SES	1.06 (0.69)	1.85** (0.46)	-0.31 (0.62)	3.56** (1.14)	2.17** (0.52)	-1.18 (1.08)	0.90 (0.62)	1.44** (0.55)	4.03** (0.54)	3.25** (0.38)	1.05 (0.40)	1.85** (0.45)	6.02** (0.75)	2.37** (0.54)	
Family size	1.90* (0.64)	-0.61 (0.89)	-1.73* (0.89)	-3.04** (1.49)	-1.79** (1.09)	-1.32 (1.78)	0.37 (0.96)	-7.56** (0.98)	-3.73** (0.76)	-2.01** (0.57)	-5.80** (0.59)	-2.99** (0.65)	-2.30** (0.77)	-7.07** (0.91)	
Single parent	-18.20** (3.75)	-16.15** (2.60)	-5.95* (3.68)	-14.74** (5.51)	-10.96** (3.36)	-22.10** (4.69)	-14.07** (3.63)	-17.84** (3.30)	-4.74 (3.17)	-2.97 (2.61)	-28.43** (2.04)	-16.56** (1.86)	-15.46** (2.35)	-26.32** (3.41)	
Language	28.29** (6.90)	36.47** (3.21)	31.37** (7.15)	-3.68 (6.34)	6.01 (6.60)	9.92 (13.01)	49.18** (9.30)	34.78** (6.90)	13.10** (2.86)	9.64 (5.61)	23.61** (3.54)	12.23** (2.19)	29.40** (4.18)	25.36** (5.27)	
Constant	422.38** (30.33)	192.49** (16.01)	422.89** (30.33)	536.57** (32.67)	71.18** (23.13)	215.17** (44.06)	17.90 (33.95)	259.06** (24.30)	444.20** (17.91)	450.62** (13.82)	502.08** (20.05)	318.54** (15.77)	189.61** (21.63)	237.88** (30.51)	
R ²	0.06	0.12	0.07	0.06	0.13	0.07	0.08	0.1	0.05	0.09	0.11	0.05	0.09	0.09	
N	3350	7789	3966	2563	4608	1947	3297	5268	5421	5328	8489	11476	9367	4302	

(standard errors in parenthesis)

*** $p \leq 0.05$;

* $p \leq 0.1$

Table C4. OLS Models Predicting Achievement Scores for Immigrant Generations by Region.

	Northern Europe	Southern Europe	Immigrant Countries
<i>First Generation</i>			
Female	-6.815** (3.301)	-1.635 (8.342)	1.555 (1.786)
Parents secondary educ	22.641** (5.065)	15.420* (8.467)	21.962** (3.778)
Socio-econ. status	17.024** (4.608)	19.560** (8.738)	44.773** (3.880)
Family size	-10.721** (1.615)	-6.494** (2.439)	-8.149** (1.084)
Single parent family	-10.701* (5.631)	2.907 (9.347)	-26.037** (4.322)
Native home language	18.247** (4.702)	-7.486 (8.214)	5.009 (3.692)
Intercept	533.882** (8.755)	477.066** (14.747)	518.114** (7.216)
<i>N</i>	1611	299	2446
<i>R</i> ²	0.072	0.066	0.132
<i>Second Generation</i>			
Female	-13.355** (2.671)	-0.885 (4.054)	-3.160** (1.040)
Parents secondary educ	18.531** (3.341)	27.791** (5.332)	28.962 (2.196)
Socio-econ. status	16.263** (3.119)	21.015** (4.181)	31.613** (2.282)
Family size	-3.692** (1.101)	-4.785** (1.425)	-7.284** (0.748)
Single parent family	-11.525** (3.678)	-11.928** (5.458)	-17.978** (2.617)
Native home language	26.923** (3.524)	-2.185 (4.251)	21.029** (2.819)
Intercept	522.724** (6.432)	477.066** (7.996)	505.294** (4.998)
<i>N</i>	3695	1362	6958
<i>R</i> ²	0.050	0.063	0.102