

Assessment Reform, Immigrant Integration and School Segregation

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Throughout the 1990's, Sweden underwent a series of educational reforms, one of which was a shift from norm-scaled grades to criterion-based grading. Prior to 1998, each class was graded according to a normative distribution. After 1998, the grading criteria became based on teacher's evaluation of whether each individual student had sufficient mastery to earn a passing grade or not, irrespective of the performance of others in the class. This was done out of concern that the normative approach created a competitive and unfriendly atmosphere, and by adopting a criterion-based approach, teachers would then have a grading scale that was based on fixed-criteria rather than one that changes by time or place (Andersson 1999; Wedman 2000).

Grades serve an important role in the education system as they function as a means of assessing whether students have attained sufficient knowledge on a topic to display mastery as well as a tool for selection into higher or lower education tracks. By changing from a norm to criterion based assessment system, the competition for grades, and specifically the competition to gain admittance into higher education tracks, shifted from school based to nation-based. In this process, grade inflation became a notable issue (Wikström 2005; Wikström and Wikström 2005).

Over the last half-century, the proportion of second generation immigrants in Sweden has risen from nearly zero-percent to roughly fifteen-percent among those aged 15-34 (OECD 2015). The country of origin composition of migrants to Sweden has changed considerably over this time, moving from labor migration from other Nordic and European countries to refugee and family reunification migrants from Eastern Europe or non-European countries (Bengtsson, Lundh and Scott 2005; Westin 2003). The educational performance and outcomes of these immigrants and their descendants is unique relative the native born Swedes. The second generation immigrants perform worse, on average, than the children of native-born Swedes on teacher assigned grades as well as national and international standardized tests (Jonsson and Rudolphi 2011; OECD 2010), though country of origin and gender variation exists. Also, the characteristics and quality of the schools that immigrants and their descendants attend differ from natives, as second generation are more likely to attend schools which are overrepresented by ethnic and racial minorities compared to native Swedes (Nordin 2013). Attending a school with a greater proportion of non-Swedish students can have a detrimental effect on the academic performance and outcomes of students (Nordin 2013; Szulkin and Jonsson 2007). Since

immigrants and their descendants are over represented in such schools, this detrimental effect overwhelmingly impacts them rather than the native Swedes.

Despite the negative association between immigration status and school composition with educational attainment, the norm-based system may have helped alleviate some educational inequality. Prior to the reform, in attending more segregated and, presumably, lower performing schools, the competition for the higher scores was not so tough as it was at less segregated higher-achieving schools. After the reform, the grades among the more well to do who attended schools with a greater proportion of Swedes increased considerably, while the benefit was smaller among those from lower SES strata. This begs the question of whether the reform had a distinct effect among the children of immigrants and, if so, was this the result of school segregation formerly working to benefit at least some minority children. Further, did the policy change have the effect of making it more difficult for them to gain admission to academic high school tracks that then lead to university. This is the first project that considers the intersection of the grade reform and immigration status, along with the complicating issues of school segregation on inequalities in educational performance and attainment in Sweden. Prior to the grade reform, students at under or over performing schools, which would be influenced by the proportion of the student body with a minority background, could receive the same grade despite different levels of knowledge or mastery. As a result, students at underperforming schools may have had a greater chance of admission into upper-secondary or university than they would otherwise. After the reform, however, classes with a smaller minority presence may have a greater number of students achieving higher marks, which could be detrimental to minority students in attending a high school track that would put them on the path to university.

This project asks whether the grade reform had distinct effect on the children of immigrants relative those of native-born Swedes, and whether school composition had an effect on this difference. Data for this project comes from the Swedish Interdisciplinary Panel (SIP) database, which contains population-level registry data on those born between 1973 and 1995. Data from the education registry from 1989-2011 provides academic outcomes for individual students as well as a unique school identifiers, allowing us to aggregate school level characteristics, which, when combined with year information, provides class composition. This time span allows us to

separate samples into pre and post reform years, as well as construct class ethnic composition. Parent's immigration information is also available from 1973 onwards, providing a means to identify when they arrived, where they arrived from and if they departed. Additionally, Census information provides parents' education and income background as a way to control for a child's socioeconomic home environment. Using this information, we conduct multilevel models on children's education outcomes and the effect of the reform, controlling for parent's country of origin and socioeconomic background, as well class/school level variables. Finally, the database contains the multigenerational registry, which provides a means to link parents to all children, creating unique family identification numbers. Using this information, we can conduct family fixed-effect models on education outcomes and see whether, within families who have children in both periods, there is a change in education outcomes. Using these methods, we can better answer what the effect of the reform was on the children of immigrants and natives and whether the school's ethnic composition was a mediated or worsened the education inequality found between immigrants and their children and the children of native Swedes.

BACKGROUND

Assessment reform:

Over the course of the 1990's, the education system in Sweden underwent a series of changes, including decentralization, greater course autonomy for students and, notably, a change from norm-based grading to criterion-based grading. This change was done out of concern that a norm-based system bred competition among students, which in turn had a detrimental effect on the learning environment. As a result, the criterion-based system was implemented with a greater focus on absolute rather than relative mastery with well-defined goals in place (Andersson 1999; Andersson 2002; Wedman 2000). Although the skills to pass each class were specified, and teachers were supposed to follow these pre-defined specifications, teachers and schools still found room to deviate from these standards. This issue has persisted even after implementation of national standardized tests which were supposed to aid in the grade calibration (Lindström 2003). Prior to the reform, classes were expected to have a mean of 3.0 (out of a 5.0 scale) and a standard deviation of 1.0. After the reform, teachers issued categorized grades that include: "Fail", "Pass", "Pass with distinction" and "Pass with special distinction". These grades were intended to assess on an absolute scale built without any intent to quantify and rate students, and,

as a result, a class could be composed of 100% who fail or achieve pass with highest distinction. A major and immediate implication of this reform was a rise in grades, with much fewer students failing classes, while many more passed with the highest grades (Education 2003). Figure 1 displays the average grades in Swedish and math both pre and post reform, and the results are dramatic. Although the cause of this could be many, including an increase in mastery or students were more strategic in their courses, past research has found that is more likely the result of a lowering of teachers' standards rather than an improvement in students over time (Wikström 2005). This can be seen in the increase in the grade point average that cannot be accounted for by better achievement (as captured by national standardized test performance), selection effects or course choices.

Although the criterion-based grading was built to measure absolute knowledge, its importance in admission into upper-secondary schools is unavoidable. Because grades are central in upper-secondary (high school) track admission, the uneven impact of grade inflation (Wikström 2005) becomes problematic. Those who have benefited the most have been non-immigrant students of well to do parents. This uneven benefit given to already positively selected students could have been expected due to the nature of the norm-based grade assessment. Under a norm-based grading system, there are only so many high or even passing grades that can be given, whereas at underperforming schools, it may require less to achieve the highest grades. By shifting to criterion-based grading, attending middle class schools no longer penalizes students, and indeed, has a beneficial effect above and beyond their own economic status; conversely, attending schools of concentrated disadvantage can worsen an individual's performance (Caldas and Bankston 1997; Hornstra et al. 2014). Sweden experienced a wave of refugee migration in the late 1980s and the 1990s, which occurred at the same time as a widespread economic crisis (Englund 1999), resulting in increased racial and ethnic segregation in areas of concentrated poverty (Andersson 2007). As a result of the uneven benefit from the assessment reformation that was more concentrated among children of Swedes, and therefore detrimental to the children of immigrants who were competing for academic tracks at the upper-secondary level, this program may have contributed to the already present education inequalities between children of immigrants and native born Swedes due, in part, to the quality of schools they attended.

Education and Segregation among 2nd generation

Educational outcomes among second generation children tend to be lower than that of Swedish children. This includes poorer international test scores teacher assigned grades, national test scores as well as a greater proportion who drop out and a smaller proportion who go onto academic and university tracks, although some country of origin variation exists (Behtoui 2012; Jackson, Jonsson and Rudolphi 2012; Jonsson and Rudolphi 2011; OECD 2010; Westin 2003). Reasons given for this disadvantage include performance and choice effects (Boudon 1974; Jonsson and Rudolphi 2011). In addition to these individual level sources of disadvantage, first and second generation students frequently attend schools that are more segregated than those Swedish children attend (Andersson 2007; Dryler 2001). If children of immigrants are largely underperforming relative Swedish children, and they are attending segregated schools with each other, this would mean a second generation child is more likely to attend school with a large number of economically and academically disadvantaged students, which, post reform, is likely to have an even greater negative effect.

Although much of the poorer education outcomes is attributable to home environment (Heath and Brinbaum 2007; Lekholm 2011), several studies have found a negative relationship between minority school composition, and especially immigrant composition, and academic performance (Baysu and de Valk 2012; Nordin 2013; Szulkin and Jonsson 2007). Szulkin and Jonsson (2007) put forth several mechanisms for how school segregation could influence academic achievement above and beyond one's own background, mostly through peer effects. They hypothesize that attending a school with a large number of language limited first generation students, many of whom may have experienced some sort of traumatic experience, limits the opportunities for cooperation and reduces the education ambitions to be found in school, along with a general lack of positive role models in a community. The relative effect of attending a school with high rates of segregation would naturally reduce school performance; however, this relationship might be distinct or exaggerated dependent after the reform when high performing schools were no longer limited by the norm-based grade system. Drawing from this background, we develop several hypotheses:

H_0 : Assessment reform had no unique effect on children of immigrants vis-à-vis children of natives, while attending a segregated school neither benefited nor harmed the educational performance of immigrant children post reform.

H_1 : Assessment reform will uniquely penalize children of immigrants more than children of natives, but attending a segregated school neither benefited nor harmed the educational performance of immigrant children post reform.

H_2 : Assessment reform will uniquely penalize children of immigrants more than children of natives, some of which is driven by a uniquely negative relationship between attending a segregated school post assessment reform.

Data:

Data for the project comes from the Swedish Interdisciplinary Panel (SIP) database. Data is available for the entire Swedish population for cohorts born from 1973-1995. Information on education outcomes for these cohorts is available from 1989 to 2011, and will serve as the primary period of interest. Using this data, we have education performance at 9th grade (age 16) as well as whether the student dropped out or completed vocational or academic upper-secondary school. Using population information and the year of grade 9 attendance, we can construct level-2 characteristics on the class composition. In addition to education outcomes, SIP also has information on demographic characteristics, including immigration and emigration history to and from Sweden as well as parent's highest education. Also, we exploit the Swedish multigenerational register that links parent and children, allowing us to create family identifiers containing children and their siblings that allow us to conduct family-level investigations. The intergenerational linkage is a strength of this study as a means of isolating the effects of incorporation and dealing with unobserved individual heterogeneity (Lawlor and Mishra 2009). Our subsample consists of children of immigrants and natives that have birthplace information on both parents, report a grade point average and have upper-secondary school information. For analyses using the family models, it requires that respondents have at least one other sibling.

Methods:

We first look at the descriptive differences in group characteristics and education outcomes by pre and post reform status stratified by parent's country of origin. To investigate whether the reform had a uniquely negative effect on children of immigrants, OLS regression on educational performance and reform are conducted using family fixed-effects, while controlling for sex and birth order, which might influence our understanding of the effect of the reform. By comparing families in which one or more siblings attended school pre and post reform, this nets out many of the shared genetic and environment confounders. Although this approach is ideally suited to test hypothesis 1 on the effect of the assessment reform by removing so much observed and unobserved heterogeneity, this approach offers very little insight into the effects of school segregation. This is because the majority of siblings attend the same schools in a relatively short period of time, so there is likely to be only so much variation. Therefore, to look at the effect of school segregation on educational performance and outcomes, we employ a multilevel approach where level-1 is the individual student and level-2 is the class. This approach will provide insight as to whether the children of immigrants or natives benefited equally or not from the benefit dependent on school composition. Further, it will also elucidate whether the reform impacts second generation immigrants who attended schools with different composition similarly.

Measures:

Education Performance:

Educational performance is a measure of their average grade in their 16 best subjects during the final year of primary school (grade 9). This grade is of particular importance since it can strongly influence a student's options in both attending and choosing an upper-secondary education track (vocational vs. university preparatory). In addition to grade reformation, the grading system in Sweden underwent reform in 1997-1998, resulting in two distinct grading scales. The first, referred to as "average grade", is based on a 5 point scale and is used for respondents from 1989-1997. The second, referred to as "merit value", has been used since 1998 to present day and is based on a 320 point scale. As a result of these two scales, these have been standardized by year and, as a result, reflect relative grade standing by year and not necessarily the absolute grade.

Parent's country of origin:

To identify the respondent and parents countries of origin, we use information on an individual's birth country. Respondents are identified as third-generation Swedish (hereafter referred to as

“Swedes”) if they and their parents were born in Sweden. They are identified as second generation if the respondent is born in Sweden and both of their parents are foreign-born. Those respondents for whom there is information for only one parent are excluded due to uncertainty about proper categorization. Those who are children of one foreign-born and one native-born parent are excluded.

Dependent on classification by Statistics Sweden, historical experience and general characteristics, we identify individuals by country of origin as follows: Africa, East Africa (Ethiopia, Somalia and Eritrea), Iraq, Iran, Lebanon, Turkey, Thailand, Vietnam, Asia/Oceania, Chile, South America, non-EU-27 and Czech/Slovakia, Former Yugoslavia, former USSR and Poland, North America, EU-27 and Nordic (Finland, Denmark and Norway) countries. Following other researchers (Jonsson and Rudolphi 2011), among those whose parents come from two separate countries, they are assigned the culturally “closest” in the reversed listed order.

9th Grade Composition:

School composition is created from the education registry by identifying all respondents in a given school and graduating year that are first or second generation who have a non-western background, and dividing that number by the total class number. This includes those who have ancestry from... This gives the proportion of the class who have an immigrant background. This is examined in further detail as the proportion of all immigrants and the proportion of immigrants with a non-Western or European background, as these groups in particular have had a more difficult in Sweden.

Sex:

Sex of the respondent is taken from the birth registry.

Parent's Highest Education:

The singular highest parent education is considered as a way to measure the socioeconomic standing of a household. These categories consist of primary education, upper secondary vocational school, upper secondary academic and non-academic tertiary, university or professional license, and doctorate degree.

Sibling:

We identify siblings as those who share two identical parents matched via the multigenerational register. By linking the siblings together and using their birth information, we can identify the birth order. For this project, we identify those who are the oldest sibling or an only child as a way to control for their advantage in educational achievement (Black, Devereux and Salvanes 2005).

Results and Discussion:

Figure 1 and 2 displays the grade distribution in math and Swedish classes, respectively, conveying the effect of the reform in detail. Prior to the reform, more than 20% of students in a class report a failing grade, while afterwards, this falls to 5-7%, while the proportion who receive pass with highest distinction rises from 5% to almost 15%. This general increase in grade has been asserted to be unrelated to selection or distributional effects. Figure 3 displays the standardized grade point average distribution pre and post reform, which may provide a better idea of what happened after the reform. Pre-reform, as one would expect, there is a normal distribution, while after the reform, those that did poorly are more negatively positioned, as represented by the flatter, but longer distribution on the left. Conversely, there are many more who do well, so the distribution on the right is much more truncated and does not extend as long as the pre-reform period. As a result of the two distributions containing unique values, controlling for upper and lower tails (± 2) becomes necessary. Finally, Table 1 shows the average proportion of 9th grade classes that those with non-western and western backgrounds attended by reform status. Generally, the proportion of students with a non-western background increased during the time period of the reform, which is reflected in Table 1. Irrespective if the student has a western or non-western background, they are more likely to attend a school with a greater proportion of children with a non-western background. However, students with a non-western background, who were already attending schools with a greater proportion of students with non-western backgrounds saw the largest increase. In both periods, children of Swedish parents attend schools in which the overwhelming majority of classmates are also the children of Swedish parents. About than one-fifth of Swedish children attended a school in which non-western immigrants made up 10% of the class or more. This is in stark contrast to non-western immigrants, with 70% attending schools in which their 9th grade class was at least 10% was

comprised of students with a non-western background. Even more dramatic is that almost one-fifth of non-western students attended schools with 9th grade classes that were at least 40% non-western. We next present results from the family-fixed analyses.

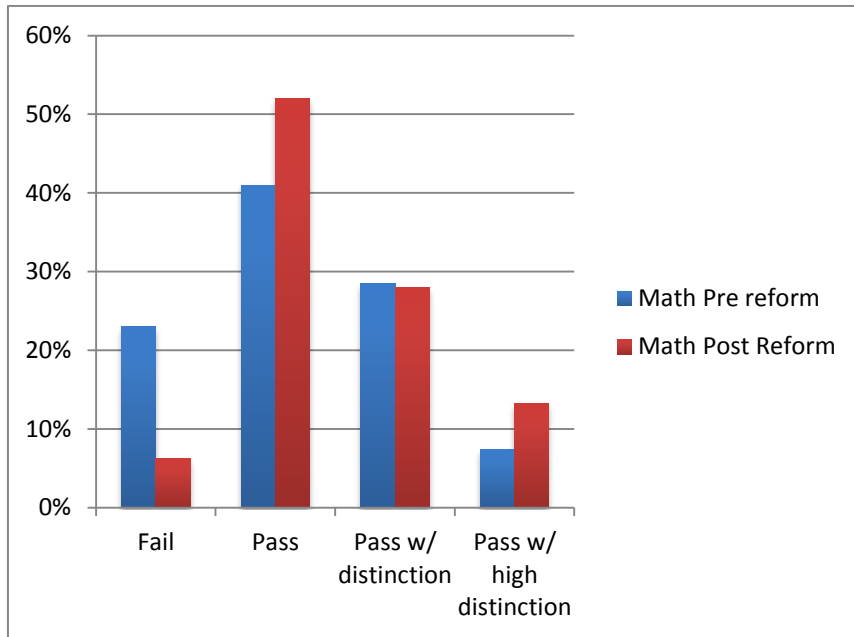


Figure 1: Math grades pre and post reform

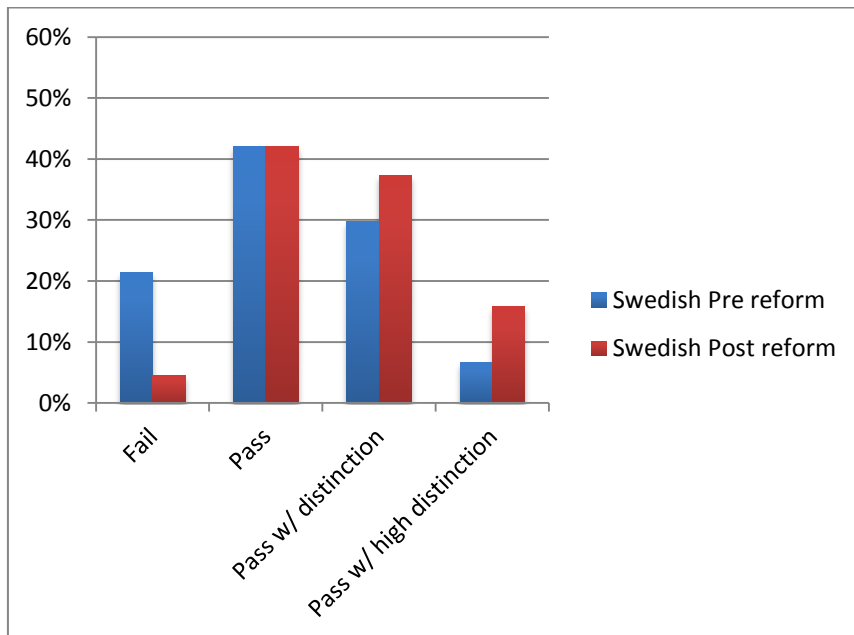


Figure 2: Swedish grades pre and post reform

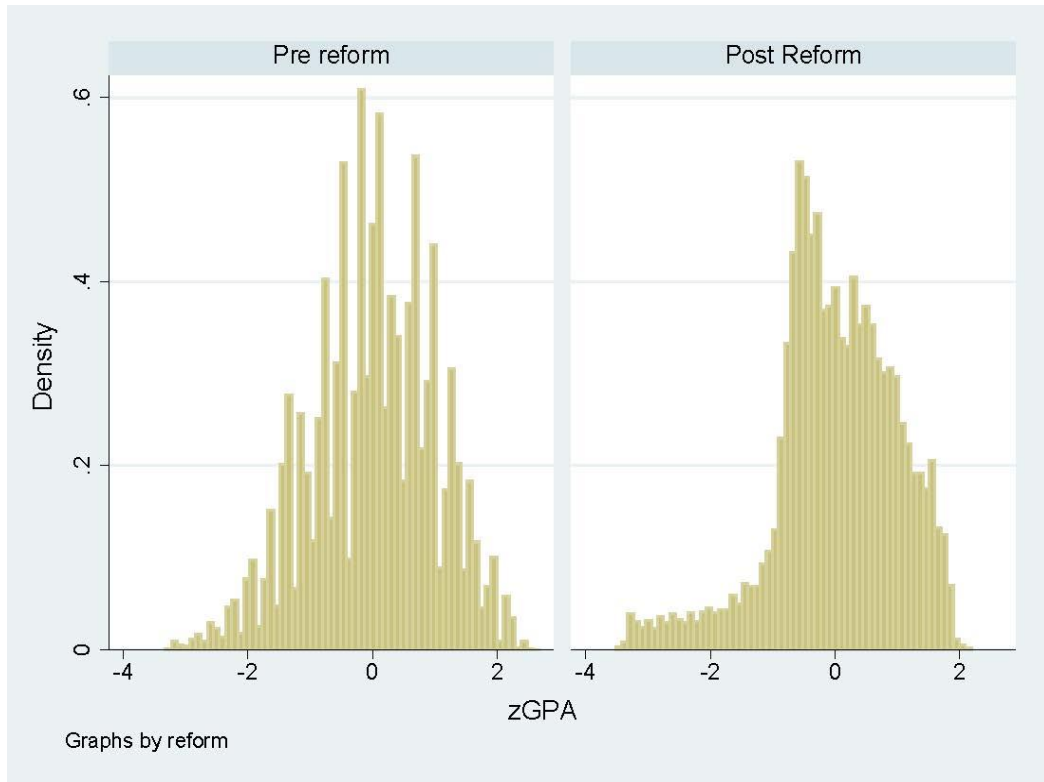


Figure 3: zGPA pre and post reform

Table 1: Average proportion of class with a non-western background among those with non-western and western backgrounds

	Pre-reform		Post-reform	
	non-west	West	non-west	west
<5%	28%	78%	12%	56%
5-10%	19%	12%	16%	21%
10-20%	23%	7%	23%	14%
20-40%	19%	2%	25%	7%
40-60%	8%	>1%	12%	1%
>60%	3%	>1%	11%	>1%

Table 2 presents results from family fixed analyses that have been stratified by parents' country of origin. These results are the clearest indicator of the effect the reform may have had on the GPA of the student by accounting for both observed and unobserved heterogeneity found at the family level. Each parent country of origin group includes a base model that includes controls for sex, birth order and parents' years since migration (PYSM) which are known to impact the academic performance of children in families. The groups who seem to benefit the most are Swedes, who, by dint of the assessment reform alone, increased their zGPA by .04 of a standard deviation, as well as the non-EU 27 European group, who experienced an average increase of .13.

Conversely, groups that suffered the most include those who have a parental background from East Africa, Iraq, Lebanon, Turkey and South America, who all experienced zGPA losses of .04 standard deviations or more. Fixed-effect regressions allow for comparability between analyses, so it can be said that, relative to the children of native Swedes, these groups were even more penalized by the assessment reform than is shown here.

Table 2: Regression on zGPA controlling for reform period, sex, PYSM and birth order, including family fixed-effects.

	Post Reform		Constant		Observations	Family Obs.	R ²
Sweden	0.04**	(0.00)	0.01**	(0.00)	1,395,948	600,506	0.362
Africa	0.00	(0.04)	-0.19**	(0.04)	8,206	3,443	0.436
East Africa	-0.16*	(0.08)	-0.07	(0.07)	3,642	1,557	0.398
Iraq	-0.10	(0.10)	-0.10	(0.10)	3,068	1,359	0.435
Iran	0.04	(0.06)	0.08	(0.06)	4,992	2,315	0.389
Lebanon	-0.09	(0.07)	-0.30**	(0.07)	5,111	2,049	0.475
Turkey	-0.04+	(0.02)	-0.33**	(0.02)	14,996	5,431	0.443
Asia	-0.02	(0.02)	0.01	(0.02)	20,602	8,562	0.395
Chile	0.01	(0.05)	-0.33**	(0.04)	5,311	2,414	0.438
South America	-0.05	(0.05)	-0.08	(0.05)	4,482	2,032	0.386
non-EU 27 Europe	0.13*	(0.05)	0.16+	(0.09)	3,299	1,497	0.365
Former Yugoslavia	0.01	(0.02)	-0.21**	(0.04)	16,677	7,466	0.393
Former Soviet Union/Poland	0.04	(0.03)	0.09**	(0.03)	9,894	4,612	0.403
W. Europe, N. America &							
Oceania	-0.01	(0.01)	-0.02	(0.02)	43,843	19,499	0.385
Nordics	-0.00	(0.01)	-0.22**	(0.02)	104,286	45,101	0.420

Conclusions and Future Analyses:

The assessment reform in 1998 had a considerable effect on the relative performance gap between second generation and native children. These preliminary results show that, among many second generation groups, siblings who attended school before and after the reform seemed to meet a different grading environment than children of native born Swedes. Comparing siblings who attended school before and after the reform, those with Swedish parents benefited from the reform, while many immigrant groups, specifically those with non-western backgrounds, were negatively impacted. These groups were already at a disadvantage, so an external assessment reform adding additional penalties while conferring benefits to the children of Swedish parents

would make things even more difficult as they pursue further education plans. The result of non-western groups being more negatively affected by the reform than others begs the question of the possible impact of attending schools with a greater proportion of co-ethnics, which is the next aim of this research project.

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