Assessing Non-school and School Based Explanations of Student Achievement: A Case Study of Finland and Sweden

DISSERTATION

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Abstract

In the 1990s Sweden and Finland performed roughly equally on international tests of math and reading skills yet today, Swedish students are a year’s worth of learning behind their Finnish peers in math and reading and two years’ worth of learning behind in science. What explains the “Finland Phenomenon” and why did its Nordic neighbor, so similar in many ways, not enjoy the same improvements? The typical lens used to address this kind of question focuses on differences in the countries’ school systems. But I consider whether changes in the broader social environment provide leverage for understanding this puzzle. With data from the Programme for International Student Assessment (PISA) 2012, I find that gaps in 15 year old students’ math, reading and science test scores between the two countries are better understood as a result of differences in non-school rather than school characteristics. For example, students’ background characteristics, including immigration, explain between 6% and 24% of the academic performance gap in these two countries. Overall, this dissertation highlights the value in exploring how students’ lives outside of school can explain trends in international test scores.
Dedicated to my grandparents, Kate and Gerry, who showed me the joy of knowledge.
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Chapter 1: Introduction

Over the last several decades, country-level comparisons of international test scores have become increasingly important to governments, policymakers and education stakeholders. Many countries see these performance rankings as an indication of how competitive their students are in the global marketplace. International comparisons are also frequently used to evaluate the structure, policies and reforms of participating countries. The release of the Programme for International Student Assessment (PISA) every three years is met with widespread attention by academics and media organizations. High placements on these assessments are a signal to the world that a country’s teachers and schools are meeting students’ needs and reaching their learning goals, while low scores suggest that an education system is not productive and in need of reform. Indeed, Hanushek and Wöessmann (2010) contend that increased student performance on international assessments is a necessary component of economic competitiveness and productivity. As international test scores and quantitative student data steadily become a central feature of educational policy formation, the rankings of academic performances will progressively influence students’ learning environments (Grek, Lawn, Linegard, Rinne and Simola 2009).

What qualities contribute to students’ performance on international comparisons? With the rise of country-level comparisons, researchers have sought to explain why some
countries perform better than others on international assessments. While students’
individual skills certainly play a role in their educational successes, scholars have
extensively documented the importance of social and organizational determinants of
academic outcomes (Coleman 1966; Gamoran 2001; Farkas 2003; Raferty and Hout
1993; Downey, von Hippel and Broh 2004). Despite the preponderance of work in this
area, theoretical and empirical studies of comparative educational outcomes are not
consistent. In fact, Breen and Jonsson (2005:223) state that “unambiguous conclusions
about trends and rankings of countries have proven elusive. In addition, no strong
evidence exists that explains intercountry differences.”

Why are achievement scores important?

One of the primary goals of PISA is to determine what students know and can do
(OECD 2014). In particular, PISA assesses students’ current body of knowledge as well
as their ability to translate their learning to the world around them. By estimating
cognitive scores, PISA provides an indication of the human capital skills among students
preparing to enter the workforce (Hanushek and Wöessman 2010). With increased
cognitive skills and human capital, countries are in better positions to improve their
productivity. Research suggests that advancements in human capital are essential for
economic growth. Goldin and Katz (2010) systematically chronicle the expansion of
education in the United States over the course of the 20th century. They demonstrate that
investments in human capital were critical for America’s economic expansion. However,
the authors contend that over the last several decades, labor market demands have not
been met by qualified workers, which has contributed to a financial weakening.
Achievement scores are important components of not only populations’ human capital levels, but also their capacity for economic competitiveness. While many students remain in school beyond their participation in PISA, their scores are predictive of future educational attainment and readiness for the labor market (Hanushek and Woessman 2010).  

Theoretical Foundations

To better understand variations in cross-national educational performance, I draw on two unique theoretical perspectives. First, I examine institutional structures and internal characteristics of educational systems. Institutional research links inequalities in students’ performances to the overall degree of stratification within the school structure (Kerckhoff 1995; Hanushek and Woëssmann 2005; Buchmann and Park 2009). Additionally, comparative studies of educational performance emphasize the role of internal characteristics, such as teacher training and quality and school resources (Akiba, LeTendre and Scribner; Park and Kyei 2011; Sahlberg 2011; Hargreaves, Lieberman, Fullan, Hopkins 2010). Overall, this theoretical tradition concentrates on school-based explanations of variations in international educational performance outcomes—international test scores reflect the quality of teachers’ instruction and curriculum choices, the ability of teachers to make autonomous decisions, and the degree to which an education system selects students into different schooling trajectories.

1Increased educational achievement has also been linked with improved social capital, civic engagement and economic inequality (Helliwell and Putnam 2007; Milligan, Moretti and Oreopoulous 2004; Dee 2004; Raudenbush and Kasim 1998; Gregorio and Lee 2002; Martins and Pereira 2004).
An equally important, yet often underutilized theoretical perspective in cross-national descriptions of student achievement views academic disparities as the product of social factors outside of the school setting. In 1966, Coleman and colleagues demonstrated the influential role of parental involvement in determining students’ success. Over the last several decades, scholars have shown that students’ experiences at home and with their families are crucial for their achievement within the classroom (Heyns 1978; Wahlberg 1984; Entwisle and Alexander 1992; Hart and Risely 1996; Downey et al. 2004; Downey, von Hippel and Hughes 2008; Reardon 2011; Merry 2013).

This perspective emphasizes the role of parents in guiding their children through the school process by helping with homework and providing education related experiences (Teachman 1987; Lareau 2003). A family’s ability and knowledge to navigate their country’s education system is an important mechanism by which educational disparities are created and maintained (Pfeffer 2008).

**Selection and Differentiation**

In cross-national studies of educational performance, selection and differentiation processes are shown to have a negative effect on students outcomes’ (Hanushek and Wöessmann 2005; LeTendre, Hofer and Shimizu 2003; Buchmann and Park 2009; Schofield 2010). Selection and differentiation in comparative educational studies refers to the extent to which students are placed in different schooling environments based upon their perceived skills. Education systems that select children at early ages and have many school trajectories are considered to be the most differentiated. For example, Germany has a highly differentiated and rigid system, where the selection of students into a range
of secondary schools begins at age 10 or 12 (LeTendre et al. 2003). Other European countries like France and England also differentiate their school types; however, Germany is unique for its degree of differentiation and early age of selection.

As an organizational practice, the intended purpose of differentiation is to educate homogeneously skilled students and provide them with learning experiences that will be helpful in the labor market. In differentiated schooling systems, the assumption is that educating similarly skilled students together is more efficient than educating mixed-skilled students in the same classrooms (Huang 2009). With this organizational practice, education systems are willing to exchange equality for academic efficiency (Hanushek and Wöessmann 2005).

Although countries may implement these practices with the best of intentions, many scholars are critical of differentiation, maintaining that the disadvantages outweigh the benefits. Schofield (2010) argues that differentiation not only produces greater disparities in the educational achievement gap between high and low skilled students, but it also perpetuates unequal outcomes according to children’s social class and racial/ethnic background or immigration status. In Germany, Alba, Handl and Müller (1998) show that ethnic minority and low-income students are overrepresented in the lowest skill-level schools that do not award valuable diplomas or provide career apprenticeships. A report by the OECD (2005) indicates that countries with school systems that select students at an early age have greater between-school variations in test scores due to the fact that children’s socio-economic status is not distributed randomly.
Using a difference-in-difference model, Hanushek and Wöessmann (2005) examined the effect of school type differentiation on international test scores with PIRLS, TIMSS and PISA. They find that when education systems are differentiated and track students into stratified school settings, the average performance declines. Furthermore, they estimate that while students of all achievement levels are disadvantaged by these systems, pupils with the lowest proficiencies lose the most learning. The authors suggest that tiered systems of education do not attain their goals of increased efficiency in exchange for equity. Similarly, Buchmann and Park (2009) use PISA data to show that students from advantaged families are more likely to be placed in college preparatory schools, while students with fewer resources are placed in vocational-oriented schools. Furthermore, they demonstrate that the type of school students attend influences their future occupational goals; students who receive a vocational education are less optimistic about their future jobs.

Organizing schools and classes according to homogeneous skill levels, also known as ability grouping, has been found to reproduce educational disparities. Using TIMSS data, Huang (2009) examines whether or not children learn better when they are grouped into classrooms with peers of similar ability in 24 countries. He shows that ability grouping for mathematics increases educational inequalities. According to his findings, high-skilled students are learning while low-skilled students are disadvantaged. Overall, international research suggests that low performing students do better in heterogeneous classrooms (Schofield 2010). Furthermore, when students are tracked, high-skilled students gain more learning, while their less skilled peers do not benefit from
this organizational practice (Opdenakker and Van Damme 2001; Opdenakker, Van Damme, De Fraine, Van Landeghem and O’Nghena 2002). Evidence from the Netherlands indicates that ethnic minority students are at greater risk of downward track placement (Kalmijn and Kraaykamp 2003). Research on tracking and ability grouping from the United States over the last few decades suggests that low-income and racial and ethnic minority students are overrepresented in groups with less challenging curriculum which has a negative influence on their learning outcomes (Oakes 1985; Hallinan 1994; Condron 2008).

**Decentralization**

The decentralization of educational systems internationally had been a feature of global school policy for the past several decades (Astiz, Wiseman and Baker 2002). As an extension of the neoliberal movement of the 1980s and 1990s, the aim of decentralization is to improve educational efficiency of schools through deregulation. By increasing the local autonomy of schools and providing parents with choice, advocates of decentralization contend that students will learn more once bureaucratic barriers to their success are removed (Chubb and Moe 1990). In practice, decentralization policies often take the form of school choice and increased teacher control over school decisions. Over the last 25 years, the majority of OECD countries have expanded school choice options (Musset 2012). Yet critics argue that school choice encourages segregation or “cream-skimming,” where advantaged students leave behind their struggling peers.

International studies are not supportive of the notion that school choice improves student achievement. Östh, Andersson and Malmberg (2013) examine the influence of
school choice on educational performance in Sweden for cohorts graduating in 2000, 2003 and 2006. They suggest that school choice contributes to rising performance disparities. In a study of school vouchers in Chile, Hsieh and Urquiola (2006) show that attending private schools did not improve academic outcomes, but it did promote segregation. Furthermore, Chile’s comparatively low PISA performance is consistent with its Latin American neighbors (Vegas and Petrow 2007). Cross-national studies indicate that school choice does not predict students’ success on international assessments, once family resources are accounted for (OECD 2010).

**Teacher Quality**

An expanding area of research has concentrated on the effects of teacher quality and training on student achievement (Sahlberg 2011; Kane and Staiger 2008; Hanushek and Rivkin 2011; Chetty, Friedman and Rockoff 2011). The majority of the research on the effects of teacher quality is based in the U.S. Work by Kane and Staiger (2008) uses experimental data from the Los Angeles Unified School District to examine the contribution of teachers to their students’ learning. They suggest that teachers are influential for the success of their students. While comparative studies of teacher quality are more limited, Akiba et al. (2007) examine math achievement in 46 countries; they contend that countries with higher quality teachers also exhibit better math performance.

**Seasonal Comparison Explanations**

Assessing international educational outcomes is a complex task. Across different countries, schools must train students who arrive at the classroom with a broad range of skills and needs. Teachers with students from disadvantaged circumstances address
different issues than teachers with affluent students (Ladd 2012). An emerging body of literature acknowledges the skill variations that students bring to the classroom. Seasonal comparative research examines how students’ non-school environments influence learning when they are in school (during the academic year) compared to when they are out of school during the summer (Heyns 1978; Entwisle and Alexander 1992; Downey, von Hippel and Broh 2004; Downey, von Hippel and Hughes 2008). For example, Downey and colleagues (2004) demonstrate that academic disparities grow more rapidly during the summer months when children are not in the classroom. Furthermore, they document that during the academic year, students of all types learn at the same rate. They contend that educational disparities would be larger if there were no schools. Findings from the seasonal comparative research indicate that students’ lives outside of school are influential for how much they learn in the classroom. This literature challenges us to re-examine the association between inequality, schools and educational outcomes. Understanding how teachers, schools and education systems matter for international assessment outcomes is challenging because most of the indicators of school-related processes are confounded with non-school factors, making it difficult to isolate schools’ contribution to student learning. By treating the school year as a natural experiment, Downey et al. (2008) identify the time when students are in school during the academic calendar as a “treatment” while the time school is not in session acts as a “control.” Using impact measures, they find that many schools that are thought of as “failing” have been unjustly labeled and actually are performing well. The implication of
this research is that it is important to consider the contexts in which schools are embedded.

With this dissertation, I apply the findings from the U.S. based seasonal comparative work to our understanding of international assessment outcomes. Although studies of school-based educational arrangements are useful for describing variations in international test scores, I extend this research by considering how social and demographic characteristics influence learning outcomes in an international context. In particular, I explore the role that immigration plays in international learning outcomes. Families leave their countries of origin for many reasons. Some immigrate for economic opportunities and a better life for their children, while others are fleeing hostile social and political environments with few resources, skills or access to social networks in their new location. Once they reach their country of destination, families are faced with rebuilding their lives. To function in a new society, first and second generation immigrants must learn the language and practices of their new country as well as navigate the labor market, find housing and transportation and schools for their children. While immigrants who move under more voluntary circumstances may have an easier time transitioning and assimilating, immigrants who were forced to leave their home countries experience many challenges. For those immigrating because of social instability in their countries of origin, many might have witnessed atrocities associated with war, oppression and discrimination. These negative experiences can have serious psychological implications that also influence immigrants’ ability to establish themselves and their families in new destinations. To the extent that both voluntary immigrants and refugees are emigrating
from underdeveloped countries, it is likely that due to a lack of human capital skills, they will face difficulties in the labor market.

Demographic and immigration transitions are related to educational achievement in several important ways. When immigrant families experience less success in the labor market because of underemployment or unemployment, there is less disposable income for supplemental educational opportunities. Evidence from the U.S. suggests that students who experience poverty at home have poorer outcomes in school (Brooks-Gunn and Duncan 1997; Downey et al. 2004; Downey et al. 2008). Students who are first generation refugee immigrants will also encounter barriers to academic achievement. Children who are emigrating because of civil strife may experience long stretches of time without any formal schooling and live in many different countries before reaching their final destination, both of these conditions can make catching up difficult. Research suggests that the psychological costs associated with leaving unstable countries affects learning outcomes for first generation immigrants and their children (Martens 1997; Szulkin and Jonsson 2007). Finally, language barriers among first and second generation students can inhibit academic outcomes. Learning a new language is not only challenging in itself, but it impacts students’ vocabulary development and literacy skills. Students with limited language skills will also experience difficulties in understanding other subjects, including math and science.

It is possible that some countries do not perform as well on international assessments due to changes in the student population from immigration shifts. Isolating the contribution of school-based factors and students’ non-school environments on
international test scores is difficult. Currently, internationally comparable seasonal data are being collected, but not yet available for analysis (Center for Evaluation and Monitoring 2015). My solution is to examine academic achievement and demographic changes in two countries, Finland and Sweden. The utility of this approach lies in the fact that both of these Nordic countries have generous social welfare programs, yet very different international test scores and immigrant populations. By conducting case studies of these two educational systems, I explore school and non-school based and demographic explanations of student success on international assessments. If there are variations in school-related factors, then this would explain the disparity of their international test scores. However, to the extent that students’ lives outside of school differ, then perhaps a contextual view of academic performance that includes demographic and environmental characteristics should be considered.

The Present Study: Finland and Sweden

What accounts for Finland’s success on international assessments of student learning and for Sweden’s lagging behind? Since the Second World War, the Nordic countries experienced a rapid expansion of their education systems. The rise of Finland from relative obscurity to leading international assessments in reading, mathematics and science at the turn of the 21st century was unexpected. Over the last several years, Finland has been closely watched by politicians and researchers alike to see if their success is sustainable. Many countries have sent delegations of scholars, policymakers and union leaders to observe Finnish schools in hopes of replicating this model and boosting their own students’ test scores. Furthermore, prominent international bodies
like the Organization for Economic and Co-operative Development (OECD) have regularly published positive assessments of the Finnish educational system (Grek et al. 2009).

The strength of the welfare state is often cited as one of the many reasons Finnish students perform so well on PISA, a global study of 15 year old students, developed by the OECD (Sahlberg 2011; Gorard and Smith 2004; Antikainen 2006). Nordic states have established socially democratic welfare programs and, compared to other Western industrialized nations, they are much more likely to equalize students’ non-school environments than are their liberal and corporatist-conservative counterparts (Lundahl 2011). For example, Nordic countries offer housing assistance, unemployment aid, childcare, eldercare and healthcare to their populations. These social assistance programs serve to reduce inequality among students. Although no one would deny that these countries have unique educational policies and operations, scholars have suggested that the Nordic model of education uses generous welfare programs to place students on a level playing field when they enter the classroom; this produces greater learning (Antikainen 2006 and Frímannsson 2006) and ultimately leads to higher international test score rankings (Sahlberg 2011). The Nordic model of education is based on a broad definition of what it means to offer educational opportunities and educational equality (Antikainen 2006). From this perspective, educational equality means that all children, regardless of gender, ethnic background and socio-economic status, have the resources that foster learning and achievement in school. Alternatively, countries with more limited views of educational opportunity concentrate on accessibility and place less emphasis on
addressing the disadvantages produced by growing up in poverty or equalizing school-level resources, including funding and the quality of schools’ facilities.

In general, education policy in Finland and Sweden seeks to provide schooling for all children, with a conscious effort towards reducing inequalities shaped by socio-economic status, gender and ethnic background (Lundahl 2011; Simola 2005; Sahlberg 2011; Antikainen 2006). For example, for several decades Sweden and Finland have provided free meals to all pupils. This not only addresses food insecurity among low-income students, but it also promotes the health and readiness to learn of the entire student population (Lundahl 2011). Additionally, Finland and Sweden provide universal childcare, preschool, and healthcare. Research has demonstrated that one of the reasons for extensive educational inequalities in other countries is due to childhood poverty and a lack of social redistributive policies (Brooks-Gunn and Duncan 1997; Downey et al. 2004; Downey et al. 2008; Gamoran 2001; Merry 2013).

Recent international findings have suggested that countries with less stratification have some of the highest PISA scores (Sahlberg 2011). While a compression of stratification in Finland has certainly contributed to their educational success, does the strength of the welfare state alone explain the whole story? It remains unclear as to why social policies would work to boost international test scores in Finland, but not in Sweden. Figures 1, 2 and 3 display performance trends in math, science and reading. Based upon the available data, it is clear that during the mid-1990s, average Finnish and Swedish scores were roughly equivalent, yet over the last decade and a half, their scores have diverged considerably. During the 1990s, 8th grade students in Finland scored only
1 point higher in math than their Swedish peers (Trends in International Mathematics and Science Study 2011). Similarly, Sweden and Finland had the same science achievement scores in 1995 and 1999 respectively, yet by 2011, Finland was 20 points ahead (TIMSS 2011). Although data from the Progress in International Reading Literacy Study (PIRLS 2011) are more limited for Finland and Sweden, in 2001 Sweden had an average score of 561 points, but 10 years later their average score had dropped to 542 points while Finland scored 568 points.

Figures 4 to 6 present PISA achievement trends for Finland and Sweden. Over the ten year period, the scoring disparities between these two countries have widened. In 2000, Finland and Sweden had an initial reading achievement gap of 30 points. Figure 4 shows that as of the most recent assessment cycle in 2012, the difference between Finland and Sweden had grown to 41 points. A similar trend can be observed in math and science achievement. The first shows that Sweden lags 26 points behind Finland in both math and science. As of 2012, the math performance disparity between these two countries has grown to 32 points. Figure 5 also demonstrates that the difference in math scores was at its largest in 2006. Finland and Sweden have diverged the most in science achievement scores. From 2006 until the most recent cycle, Sweden averaged 60 fewer points per assessment than Finland. It is interesting to note that Finland’s overall achievement has also slightly declined over the course of the PISA cycles.
Figure 1. 8th Grade Mathematics Learning Gap: Finland and Sweden
Figure 2. 8th Grade Science Learning Gap: Finland and Sweden
Figure 3. 4th Grade Reading Learning Gap: Finland and Sweden
Figure 4. PISA Average Reading Scores
Figure 5. PISA Average Mathematics Scores
Figure 6. PISA Average Science Scores.
Finally, Figure 7 follows PISA achievement disparities using standard deviation learning units between the two countries. By converting test results to Cohen’s $d$ standard deviation units, performances on different assessments can be compared. Cohen’s $d$ evaluates the magnitude of the effect size of the gap between these two countries by standardizing the difference in their average scores. It is calculated by taking the difference between the two countries scores and dividing it by the pooled average of each countries standard deviation. This measurement assumes that the sample of students’ test scores is representative of their countries. Standard deviations that are between 0.3 and 0.4 represent 1 years’ worth of a learning disparity (Merry 2013; Willms 2004).

According to PISA achievement patterns, Swedish pupils are roughly one year’s worth of learning behind their Finnish peers in reading and math, and lag by two years’ worth of learning in science.
Figure 7. PISA Achievement Gaps between Finland and Sweden.
To test the relative contributions of school and non-school explanations for international assessment outcomes, I compare the structure and organizational practices of the educational systems in Finland and Sweden. If these two countries differ significantly with respects to their policies for school choice, teacher quality, funding or ability grouping, then perhaps school characteristics can explain why Swedish students are one year’s worth of learning behind Finnish children. However, if these Nordic countries diverge in their social policies or the non-school environments of students, then perhaps our understanding of international test outcomes needs to consider the contribution of demographic characteristics and immigration transitions to academic achievement.

One of the broader goals of this research agenda is to clarify what the role immigration plays in international test performance rankings. Additionally, I explore how demographic variations influence Finland’s educational advantages and Sweden’s educational challenges. In doing so, I assess whether Finland’s success is the result of a superior educational system or due to a homogeneous population. To accomplish these goals, in Chapter 2, I document the structure of the Nordic model of education. I consider whether the features of Finland and Sweden’s school systems explain the academic achievement gap between these two countries. Next, I turn to an exploration of social, political and demographic changes in Finland and Sweden. More specifically, I examine variations in these Nordic countries’ populations and discuss how variations in their immigrant communities are important for their educational outcomes. To test the influence of demographic characters and school based explanations of academic
performance, I use multilevel models of student achievement in math, reading and science using PISA 2012 data. I discuss the implications of my findings and directions for future research.
Chapter 2: Do Schools Explain Finland and Sweden’s Diverging Paths?

The Nordic Model of Education and the Rise of the Global Educational Reform Movement

The traditional Nordic model of education emphasizes equality of schooling opportunities regardless of gender, ethnicity and social class (Frímannsson 2006; Arnesen and Lundahl 2006; Lundahl 2011; Antikainen 2006). In this respect, the growth and strength of Nordic society is dependent on the life chances of its population and vice versa. From this collectivist perspective, education in these countries is seen as a public good, where the needs of society are served by providing quality schooling to all students. The ideological principles of the Nordic model of education would be undermined if the inequality students experienced outside of the classroom were to be reproduced in schools. Despite generous social welfare programs to ensure that all pupils are successful in their school careers, over the last few decades these countries have transitioned from treating education as a societal benefit to an individual commodity. Since the 1990s, a growing trend in Nordic educational policy has been to focus on personal choice rather than equality (Frímannsson 2006). The ground level effect of this transition has been a movement away from classroom-centric education to individualized teaching and learning plans (Frímannsson 2006; Carlgren and Klette 2008; Johannesson et al. 2002).
What explains this ideological shift among Nordic countries? During the 1990s, both Finland and Sweden experienced massive economic recessions (Miron 1998; Lundahl 2011; Rinne et al. 2010). The subsequent educational policy overhaul was sponsored by center-right governments who saw market-based reform in education as a solution to the economic crises they were experiencing. The policies that came out of this era reflect a global shift towards the application of free-market ideas to the school context and can be attributed to the educational rhetoric made popular by *A Nation at Risk* (1983) in the United States and England’s Education Reform Act of 1988 (Tjeldvoll 1998). The message of these policy recommendations was that the key to economic stability and growth was through the restructuring and reforming of national education systems. Although school reform seems an indirect path towards economic stability, it is not uncommon for politicians to propose changes to the education system. While education reform can certainly create serious disagreements among stakeholders, it is also less politically risky than other social and financial reforms (Husén 1998).

The logic behind these market-based policies is that centralized systems are too bureaucratic and therefore the ability to meet students’ needs is compromised (Carlgren and Klette 2008; Klette 2002). Similar to other Western nations, the education reforms adopted by the Nordic countries were designed to increase local school autonomy and parental control over school selection. Advocates of market-reforms in education suggest that when parents have the power to choose which school their child attends, the competition produced by school choice will benefit all students because schools will devote more effort to attracting pupils through the quality of the education they provide.
(Chubb and Moe 1990). By decentralizing the education system, increasing local schools’ decision making power over curriculum and funding, and encouraging parents to select schools that best meet their child’s needs, policymakers have sought to raise academic performance for all students (Chubb and Moe 1990).

A global emphasis on accountability in education over the last several years is the result of governments applying market-based practices to schooling. Many Western countries have transitioned to a management-by-results orientation, whereby teachers and schools are evaluated by the strength of their students’ test scores. Of the Nordic countries, Sweden has pursued the use of market forces most extensively (Rinne et al. 2010; Tjeldvoll 1998). Due to the educational reforms that Sweden has adopted, Arnesen and Lundahl (2002) argue that individualism in teaching and learning is particularly salient there. Research by Johannesson et al. (2002), Carlgren and Klette (2008) and Klette (2002) supports this claim. Additionally, Sweden is unique amongst its neighbors for implementing a large-scale school choice program and using standardized testing to monitor the academic progress of schools, teachers and students. Although Finland’s educational structure shares some of these characteristics, they are more restrained.

**School Choice**

At the start of the 1990s, Sweden implemented a school voucher program that allowed parents to select an independent school for their student(s), with the cost of attending the school covered by local municipalities. With a more conservative

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2 Accountability in education can certainly occur in ways that are unrelated to neoliberal ideologies. However, much of the rhetoric of these school policies uses the word “accountability” in their reasoning, to the degree that accountability in education is often a synonym for market reforms in schools.
government than in previous eras, Sweden championed the marketization of schools as a means of increasing their educational and economic competitiveness (Miron 1998). Since the early 2000s, the popularity of the school voucher program has risen dramatically and is perhaps one of the greatest sources of variation in school structure and policy between the two countries. And although Finland introduced school choice around the same time as Sweden, access is more tightly controlled. In a study of Finnish school choice policy, Rinne et al. (2010) conducted interviews with education stakeholders and examined governance documents. They found that school choice is permitted only when there is space after all students within the local neighborhood have been enrolled. Under this system, attending a private school does not qualify as a state supported school choice option. Furthermore, Simola (2005) argues that of all Nordic countries, Finnish parents are the most content with their schools and are the least likely to favor free market practices in schools. In a more recent study of teachers’ status around the world, Dolten and Macenaro-Gutierrez (2013) find that in a sample of 21 countries, Finns have the greatest amount of trust in their education system. To the extent that Swedish parents are more supportive of individualism and competition in school than are Finnish parents, this could explain Sweden’s more extensive voucher program.

As an educational policy, school choice is supported by key stakeholders, including politicians, policymakers and parents. Despite public opinion, some scholars are skeptical that school choice and increased competition has the ability to enhance educational outcomes for students. Research from the U.S. demonstrates that school choice programs stratify educational opportunities by social class and racial/ethnic backgrounds (Renzulli
and Roscigno 2005; Renzulli and Evans 2002; Cookson 1994; Henig 1994; Wells 2002; Frankenberg and Lee 2003; Cooper 2005; Frankenberg and Siegel-Hawley 2009). The goal of voucher programs is to offer parents and students more educational options and improve efficiency within schools, however, research on school choice in the U.S. suggests that the marketization of school selection does not achieve the aims of increased academic performance and may even hinder it (Bifulco and Ladd 2007; Cullen, Jacob and Levitt 2006; Renzulli and Roscigno 2008).

In Sweden, studies indicate that the effects of the voucher program are similar to findings in America. Over the last two decades in Sweden, there has been a significant migration by families and pupils to state funded independent schools (Miron 1998). Several of these independent schools require expensive fees which can be cost prohibitive for low-income families. Miron (1998) finds that the voucher programs in Sweden have resulted in greater educational segregation between schools and a widening of achievement gaps. This pattern is consistent with school choice research in the U.S. (Renzulli and Evans 2005; Saporito 2003). Similarly, Gustafsson (2006) maintains that “the results [of the trend towards independent schools and decentralization] point to a strong and mainly linear increase in school segregation in terms of foreign status, grades and educational background from 1992 to 2000 (translated and quoted in Lundahl 2001 p.168).” In a study of the influence of social class on reading achievement, Yang Hanson, Rosen and Gustafsson (2011) observe that socio-economic inequality explains more of the variation in reading scores after a decade of school vouchers than it did ten years earlier. If school
choice has produced significant inequalities in educational opportunities, this may explain, in part, why Swedish students are a year’s worth of learning behind their Finnish peers.

*Teachers and Pay-For-Performance Policies*

Tying teachers’ salaries to the academic performance of their students has gained a remarkable amount of political support across the world. Currently, Sweden, England, the Czech Republic, Mexico, the Netherlands and Turkey use teacher performance as a component for deciding salary awards (OECD 2012a). The logic of pay-for-performance suggests that teachers will be more effective if the right sorts of behavior are incentivized (Lazear 2003). Finland does permit some performance related economic bonuses, but this is done in a supplementary fashion (OECD 2012a). Despite the widespread implementation of pay-for-performance programs, there is no conclusive evidence that such policies increase student achievement. In an examination of educator wages and learning rates, the OECD (2012a) found that there was no association between teacher earnings and international performance rankings in PISA.

Incentives in education are viewed with skepticism by many scholars in the United States. Since the implementation of accountability through high-stakes testing under No Child Left Behind, accounts of teachers and schools gaming the system have been documented (Ravitch 2010). Furthermore, research on the effects of incentive based programs suggests that they increase educational stratification rather than reduce it (Booher Jennings 2005; Reback 2008; Diamond and Spillane 2008). If incentives do in fact encourage maladaptive behaviors on the part of educators, performance based salaries may not produce their intended effect.
Curriculum and Evaluation

An essential feature of Finland’s educational restructuring has been a focus on educator driven curriculum development and evaluation. In fact, Simola (2005) argues it is one of the most important components of teachers’ professional obligations. Johannesson et al. (2002) suggest that while curriculum planning and teacher driven evaluations are gaining popularity as both policy and school strategy in other Nordic countries, in Finland, teachers’ evaluations of their students and themselves are a cornerstone of the Finnish educational system. Under the Finnish system of schooling, the responsibility for curriculum development and lesson content lies with teachers and schools, and not with a government organization. This model requires teachers and principals to submit their curriculum plans to local municipalities for approval. With such professional obligations comes the implicit assumption that teachers have the expertise to decide what to teach their pupils and that they can be trusted to educate their students well.

Due to the potentially heterogeneous nature of teacher generated courses and lessons, externally administered standardized exams are not the best method for assessing students’ learning gains. In Finland, students’ progress is evaluated by the pupils’ teacher. Ideally, this serves to not only increase student achievement, but it also provides the teacher with her own performance evaluation (Sahlberg 2011). Furthermore, teachers are considered to generate the most accurate estimate of their pupils’ performance because they are able to observe their learning gains directly and over time. Although this method of evaluation makes school-based analyses difficult, the disadvantages
associated with standardized testing, such as narrowing of the curriculum and teaching to
the test, are viewed as more detrimental to students’ learning.

Curriculum policy in Sweden is similar to Finland in that teachers have discretion
over course content. Despite some policy parallels, Carlgren and Klette (2008) suggest
that teachers in Finland have more independence with curriculum development than do
educators in Sweden. In general, educational policy goals are broadly stated in Swedish
steering documents and the manner in which these learning targets are achieved is left up
to teachers and schools to decipher (Carlgren and Klette 2008). This practice
simultaneously assigns more autonomy to local schools, but it also generates more
professional demands for teachers. Qualitative interviews with Nordic teachers suggest
that Swedish educators are having the most difficulty responding to the school reforms
being implemented (Carlgren and Klette 2008). There is some indication among Swedish
educators that the more time they devote to satisfying these educational goals, the less
time remains for their traditional teaching activities (Johannesson et al. 2002; Klette
2002; Carlgren and Klette 2008). When comparing Swedish and Finnish education
policy, research suggests that Finland’s steering documents are more specific regarding
their standards for students’ academic achievement (Carlgren and Klette 2008). It is
possible that adopting clearer learning objectives helps teachers in Finland to develop
more effective curriculum.

Accountability and evaluation

Sweden relies on mandated standardized assessments to evaluate and monitor the
progress of schools, teachers and students. The goal of this policy is to improve quality
assurance in education by following trends in students’ scores (Grek et al. 2009). National testing has expanded even more in Sweden in recent years; as of 2011, the Swedish Education Act mandates students be tested in years 3, 6, and 9 of their compulsory schooling (Swedish Institute 2012). With the increased focus on accountability in Sweden, education reforms expect teachers to have all of their students successfully complete their compulsory schooling. Furthermore, to ensure quality standards are being met, Sweden offers its teachers performance pay as a positive incentive or the threat of being transformed into an independent school as a disincentive (Klette 2002; Lazear 2003). While it is true that Finland does have some standardized testing, it is limited to the 9th year of schooling. Furthermore, and perhaps more importantly, it is a voluntary diagnostic tool for teachers in Finland and is used to assess how well students are learning—there are no incentives or sanctions attached to how well pupils perform on the exam.

A growing body of research from the U.S. questions the efficacy of accountability policies and standardized testing to raise student outcomes in meaningful ways. Quantitative analyses of high stakes assessments demonstrate that improvements in student test scores are rarely consistent across subjects or grade levels (Amrein-Beardsley and Berliner 2003; Jacobs 2005; Carnoy and Loeb 2002; Hanushek and Raymond 2005). There is some evidence that when high stakes tests are implemented, the first wave of students see learning gains, however, subsequent cohorts become better test takers, but not better learners (Jacob 2005). Both qualitative and quantitative research suggests that some student groups are disadvantaged by the implementation of accountability policies.
through standardized testing (Reback 2008; Booher-Jennings 2005; Dworkin 2005). In fact, many scholars have argued that the negative consequences brought about by accountability policies are much more likely to fall on the shoulders of minority and low-income students (Jennings and Beveridge 2008; Diamond and Spillane 2004; Booher-Jennings 2005; Scot, Callahan and Urquhart 2008). In order to comply with accountability standards that require schools and teachers to demonstrate the academic progress their students have made, many schools have narrowed their curriculum, taken time away from non-tested subjects and triaged their students according to their likelihood of passing state assessments (Ravitch 2010; Reback 2008; Diamond and Spillane 2004; Booher-Jennings 2005). A common theme among American studies of the effects of accountability policies on teachers (which includes the supervision of instructors and students through standardized assessments) showed that the implementation of these educational reforms made teachers feel as though the public did not respect them as professionals who wanted their students to be as successful as possible (Finnigan and Gross 2007; Olsen and Sexton 2009; Seashore, Febey, and Schroeder 2005). Qualitative research has demonstrated that teacher accountability policies contribute to decreased morale among educators, which may have serious unintended consequences for the pupils in their class (Finnigan and Gross 2007; Olsen and Sexton 2009; Seashore, Febey, and Schroeder 2005).

Certainly Sweden’s accountability reforms of the last several years are not as strict as testing policy in the United States, but the fact that teachers are required to have their students pass classes, and the increased reliance on assessments as a method for
quality control suggests they have incorporated more free-market practices in their schooling system than Finland has. Although recent news media articles argue that laissez-faire reforms in schools have contributed to Sweden’s decline in international rankings (Sahlberg 2012), there is currently no quantitative research that has tackled this question. Furthermore, it remains unclear as to whether Finland’s lack of free market practices has helped to keep their scores high.

**Teacher Professionalism in Finland and Sweden**

Insider observations of the Finnish school system argue that teachers are the key to this Nordic country’s success (Sahlberg 2011; Simola 2005). Historically, teachers’ unions in Finland were an integral part of their educational expansion during the last half century and actively involved in the formation of school policy (Simola 2005). Unlike the relationships between governments and teachers’ unions in places like the United States and Australia, Finnish politicians are not antagonistic towards these labor organizations. Simola (2005) maintains that due to this lack of strife, teachers in Finland are able to pursue their professional development and gain the public’s trust and respect, which is unique to this country.

According to Sahlberg (2011), the culture of professional admiration surrounding educators is one of the most distinctive aspects of the Finnish school. The occupational prestige associated with being a teacher is comparable to the social status of physicians and lawyers. Because teaching is such a culturally desirable and prestigious job in Finland, scholars suggest that competition to gain entry into the profession increases the caliber of all educators and ultimately the instruction of students (Simola 2005; Sahlberg
Sahlberg (2011) suggests that because parents and politicians trust their teachers as educational professionals, they do not require them to spend extensive amounts of time proving their worthiness through high-stakes standardized tests, allowing more time for students to learn. Furthermore, he argues that Finnish teachers are effective because of the national requirement for educators to possess a master’s degree to work with primary or secondary level students. While compelling instructors to obtain advanced education in order to raise the caliber of their teaching might make intuitive sense, there is very little research to confirm or challenge these claims. The one exception would be Dolten and Marcenaro-Gutierrez’s 2013 comparative study of the status of teaching profession around the world. They find that 20% of Finns said that educators were the most similar to social workers (compared to a list of doctors, librarians, nurses and local government managers). Less than 5% of people identified teachers as being similar in social status to doctors. Additionally, they also found that less than 20% of respondents would encourage their children to become teachers.

One of the ways respect for a profession is evaluated is through their average salaries. It is challenging to reconcile teachers’ salaries in Finland and Sweden with Sahlberg and Simola’s position. Based on a report by the European Commission (2013), teachers’ average pay in both countries is between $35,000 and $36,000 per year. While it is likely that the teaching profession in Finland does not experience the same amount of strife that American educators face, arguing that respect for teachers’ professionalism is the source of Finland’s success seems tentative. If teachers were respected as much as physicians, then we would expect to see similar wages across these occupations. Yet,
this is not the case—doctors in Finland and Sweden make between $65,000 and $70,000 per year. When Finnish teachers’ salaries are adjusted for purchasing power parity, they make $28,780 per year, compared to $44,917 for American teachers (Dolten and Marcenaro-Gutierrez 2013).

Simola (2005) contends that the classroom environment teachers in Finland create influences international assessment scores. Compared to their Nordic neighbors, Simola characterizes Finnish culture as authoritarian with an emphasis on obedience. According to this argument, Japan and South Korea have similar educational climates and also perform well on international assessments. Classroom observations in Finland suggest that teachers are more emotionally distant from their students than Sweden and other Nordic countries (Simola 2005). Instead of building personal relationships with children and their families, teachers in Finland concentrate on maintaining professional boundaries. Operating from a position of authority in a teacher centered classroom may contribute to higher scores on international tests.

School Funding

Overall, the contribution of funding to public schools has declined in Finland and Sweden. Due to the economic instability of the early 1990s, these Nordic countries responded by reducing their expenditures for education (Miron 1998; Johannesson et al. 2002). In a study of Sweden’s school system, Miron (1998) suggests that the reduction of school expenditures was the result of local governing bodies having fewer resources and not from neo-liberal policy goals. He notes that while education reforms cut schools’ budgets, their operating expenses rose by 8%. The outcome of these changes meant that
class sizes in Sweden grew and there was less funding for special needs teachers. According to Rinne et al. (2010), educational expenditures in Finland were reduced by 20% from 1990-1994. They argue that the effects of such cuts were still felt by schools and students a decade later. The consequence of these reforms was similar to Sweden—an increase in the average class size as well as a decrease in the number of teachers for students with learning differences. Different levels of financial support are often thought to contribute to varying rates of academic performance (Greenwald et al. 1996; Condron and Roscigno 2003). If Sweden decreased its educational funding at a greater proportion than Finland did during the 1990s, then it is possible this policy change produced the learning gap between these two countries that we see today.

*Ability grouping and tracking*

Neither Sweden nor Finland practices ability grouping or tracking within schools and classrooms. Such processes are unpopular due to the belief that they discourage equality in education and prevent disadvantaged, albeit talented students from succeeding. Nordic countries in general have an ideological commitment to equality, especially in education. The Nordic model of schooling has been designed to promote educational opportunities for all students, regardless of their gender, social class or ethnic background (Lundahl 2011; Frímannsson 2006). Therefore, organizational practices like ability grouping and tracking that have been found to increase educational stratification are not supported in these countries. Perhaps more so in Finland and Sweden than other countries, there is a widely held belief that the health of a society, economic and otherwise, is dependent upon its citizenry having equal access to a quality education.
When capable but underprivileged children are not successful in school, it means that the country is losing out on the contribution those students could have made to their communities and country. The reproduction of social inequalities is seen as disadvantageous for the whole of society and therefore schooling policies that promote stratification are not used in Nordic education systems.

Curriculum variations

The curriculum of upper-secondary education in Finland is organized in a unique manner that may contribute to their international success. Instead of following a traditional grade level format where all subjects occur within a specific school year, the educational content is planned according to modules (Välijärvi and Sahlberg 2008). Beginning in 1985, the traditional two semester design was changed to a five or six topical lesson plan that lasted for six or seven weeks (Sahlberg 2011). This restructuring of curriculum enabled Finland to move away from the conventional age-based grade levels to “nonclass organizational system in the mid-1990s” (Sahlberg 2011:25). Proponents of the Finnish education system contend that the implementation of learning modules promoted important skills and knowledge among vocational students and eliminated the need for grade retention (Välijärvi and Sahlberg 2008; Sahlberg 2011).

Up until this point, the majority of comparative education research concentrates on the features of school systems to explain differences in students’ outcomes. Proponents of Finland’s education system reflect this position and contend that Finland’s success is attributable to teachers’ caliber, professionalism, autonomy over their jobs and ability to develop their own curriculum and assessments (Sahlberg 2011; Carlgren and
Klette 2008; Simola 2005; Johannesson et al. 2002). Alternatively, the current argument for Sweden’s decline has been attributed to their lack of guidelines for curriculum formation and assessment, increased standardized testing, and implementing free-market policies in schools (Salhberg 2012; Carlgren and Klette 2008). Table 1 provides a summary of the distinctions between the Finnish and Swedish education systems as well as popular claims made about them.

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<tr>
<th>Finland</th>
<th>Sweden</th>
<th>Similarities</th>
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<tr>
<td>Teacher professionalism</td>
<td>School choice</td>
<td>Primary and secondary school structure</td>
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<td>Teachers as authority figures</td>
<td>Standardized testing</td>
<td>Grade Transitions</td>
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<td>Market-based school reforms</td>
<td>Equitable funding of schools</td>
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<td>Lunches provided to all students</td>
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<td>Curriculum development</td>
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In the midst of Finland’s rise to prominence on international assessments of learning and Sweden’s fall, important changes outside of the classroom have occurred. Both of these countries experience economic collapses of their financial systems. Over the last several years, Sweden in particular has received a dramatic influx of immigrants. Chapter 3 considers whether these shifts beyond the school setting are influential for learning outcomes.
Chapter 3: Do Non-School Characteristics Explain the Diverging Paths?

In Chapter 2, I considered a variety of current school-based explanations for the diverging educational performance of Finland and Sweden. In Chapter 3 I consider a different possibility, that their diverging test scores are a result of non-school characteristics. I examine four aspects of the non-school environment, including changes to the social safety net, immigration, residential segregation and crime.

Is The Nordic Welfare State in Decline? Changes to the Social Safety Net

Nordic countries are unique among Western nations because of their extensive social welfare programs. Both Sweden and Finland provide their residents with healthcare, childcare, eldercare, housing assistance and unemployment assistance. Furthermore, access to these services is universal (Esping-Anderson 1990)—it is available to native born citizens as well as foreign residents and is not contingent upon employment status. Due to the interventionist nature of the welfare state, Finland and Sweden are able to reduce the number of families and individuals at risk of poverty quite substantially. Table 2 presents Eurostat (2014) data on risk of poverty among European Union countries, Finland, and Sweden. Not only is the risk of poverty or social exclusion lower in the Nordic countries, compared with their European counterparts, but the percentage of vulnerable individuals is slightly lower in Sweden than it is in Finland.
Table 3 shows risk of poverty and social exclusion among children age 0-15; the rates of disadvantage are virtually identical.

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<tr>
<th>Table 2. Percent at Risk of Poverty or Social Exclusion, Adults.</th>
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<td>European Union (27 Countries)</td>
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<td>European Union (27 Countries)</td>
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A review of the scholarly work on stratification and education demonstrates that pupils’ home and family resources have a considerable influence on academic outcomes, even from early ages (Coleman et al. 1966; DiMaggio 1982; Gamoran 2001; Farkas 2003). Evidence from the United States and Canada suggests that the environment children grow up in, including neighborhood quality, poverty, food security, access to healthcare, and family structure is responsible for the size of the cognitive disparities between advantaged and disadvantaged students both within and across countries (Downey et al. 2004; Downey et al. 2008; Merry 2013; Evan 2004; Brooks-Gunn and Duncan 1997). Furthermore, previous research finds that learning is cumulative; growth
in cognitive and non-cognitive skills is not only shaped by environmental characteristics, but also the extent to which the advantages and/or disadvantages children experience are compounded over time (Heckman 2006). Given the effectiveness of the welfare state to reduce social disparities, and an established body of education research, the academic performance of Finnish and Swedish students should be roughly equal as there are many similarities across these systems of education, including generous pre-school education to children regardless of their background, schools are funded fairly, all students receive healthy lunches, ability grouping is prohibited, and teachers develop their own less plans. Despite these similarities, a large achievement gap exists between the two countries. Recent international test results indicate that the educational performance of Swedish pupils ranks below that of the United States, a country with far less social redistribution and significantly higher childhood poverty rates.

The Nordic financial crisis of the 1990s, coupled with the use of free-market applications to social programs and services has made some scholars question whether the welfare state is not as strong as it once was. In his landmark work on welfare state retrenchment, Pierson (1994, 1996) shows that the social services and benefits provided by governments are accepted and relied upon by residents. Voters view reductions to these benefits as very undesirable (Starke 2006). Furthermore, the subsequent growth of interest groups that exist to maintain access to these social services will use their resources to prevent the threat of welfare retrenchment (Pierson 1994). During unstable economic times, governments may seek to reduce the financial support given to social welfare programs, despite public support for the services. In order to control the political
damage of reducing expenditures to benefit programs, Pierson (1994) argues that elected officials will limit severe cutbacks to popular programs and adopt a strategy of “the politics of blame avoidance.” He contends that welfare retrenchment occurs not only in liberal welfare countries like the U.S. and the U.K., but also in more socially redistributive countries like Germany and Sweden.

Despite Pierson’s seminal work, there still is not a strong consensus that Sweden has lost its key features as a socially democratic welfare state. Lindbom (2001) compares unemployment benefits, illness cash benefits, means-tested poor relief, private pensions and private healthcare spending in 1980 and 1997/1998; he finds no significant change to social security programs or a trend towards liberalism and suggests that although Sweden embraced free market ideals in politics, “the generosity of Swedish social security was on average the same in 1998 as in 1980 (p. 187).” Furthermore, Lindbom argues that a move towards free-market ideologies is not sufficient evidence of welfare retrenchment. In a content analysis of Nordic political parties and their election platforms from 1970-2003, Nygård (2006) observes a moderate reduction in party emphasis on welfare state expansion in Sweden. Alternatively, political parties in Finland have remained consistently more supportive of welfare state expansion during the last three decades.

While some scholars contend that the welfare state in Sweden is not markedly different than previous decades, others suggest it has reduced its support of services generally relied upon by low-income and immigrant families. Martens (1997) contends that the reduced financial aid for childcare, schools and recreational facilities, especially in more densely populated areas, has limited the effectiveness of social programs to
compensate for inequalities in students’ home experiences. He argues that when low-income families do not receive the support they need, they are at a greater risk of low self-esteem and have less optimism about the future.

Andersson, Magnusson Turner and Holmqvist (2010) argue that social service programs have become less beneficial for marginalized people. In recent legislative documents, “the Government describes the relatively generous health insurance system as detrimental for getting people back to work… (Andersson et al. 2010:18).” Fees for unemployment insurance have risen, which in turn has made it difficult for recent graduates and immigrants to receive unemployment benefits, ultimately increasing their risk of poverty. Also, over the last several years, housing allowances have declined, making overcrowding a salient social issue. And although income inequalities are low in Sweden, the disparity between the lowest and highest quintiles is growing.

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<th>Table 4. Percent with Housing Cost Overburden</th>
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<th>Table 5. Percentage of Children Living in Overcrowded Housing</th>
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Tables 4 and 5 represent the changes to affordability and over crowdedness, aid to families and children and unemployment benefits using Eurostat (2014) data. Perhaps the most notable trend is the difference between Finland and Sweden in terms of housing costs being a financial burden to families as well as the number of children living in overcrowded households.

<table>
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<th>Table 6. Percentage of Total Benefits Given to Families and Children</th>
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Although the proportion of benefits designated for families and children has remained fairly consistent over the years, Table 6 shows that Finland allocated a slightly larger percentage during the early 2000s. Perhaps one of the more significant trends is the disparity in unemployment benefits between the two countries, shown in Table 7. Finland devotes more of its resources towards this social program. Sweden, however, started off with a lower rate of unemployment assistance which continued to decline over the decade.

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<th>Table 7. Percentage of Total Benefits Given to Unemployment</th>
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How do changes to the social safety net matter for educational achievement?

Public services and social benefits are an important mechanism through which economic resources can be redistributed to address inequality (Kentworthy 2008; Esping-Anderson 2007; Gangl 2005; Fischer, Hout, Jankowiski, Lucas, Swindler and Voss 1996). By providing housing assistance, healthcare, and childcare, the Nordic welfare model has set up families and children to be as successful as possible in school. Traditionally, the Nordic welfare model not only addresses inequality of opportunity, i.e. receiving high quality schooling regardless of socio-economic status, gender or ethnic background, but it also concerns itself with inequalities of condition, where access to valuable resources such as housing, healthcare, childcare and meals in schools for all students are distributed more widely in society (Breen and Jonsson 2005). Yet, to the extent that the Swedish welfare state has become less generous especially to those with real need, then children growing up in these environments may have poorer academic performances.

*Immigration*

One of the most salient differences between Finland and Sweden over the last several decades has been their acceptance of foreign nationals. Immigration to Sweden has risen dramatically while entrance into Finland is much more restrictive (Andersson et al. 2010; Vaattovaara, Vilkama; Yousfi, Dahlmann and Kaupinnen 2010). Prior to 1980 the majority of immigrants to these countries migrated from other Nordic countries (Andersson et al. 2010; Vaattovaara, Vilkama; Yousfi, Dahlmann and Kaupinnen 2010). Over the last several decades, however, Sweden has received more political refugees of non-European origin (Andersson et al. 2010). Alternatively, Finland has attempted to
lessen its popularity as an immigrant host country (Vaattovaara et al. 2010). For example, in 2010, Finland cut its economic support for asylum applicants by almost one-third to discourage unwarranted appeals. Schnepf (2004) argues that countries with more restrictive immigration policies are able to select families with human, social and economic capital that is more transferrable to the host country. This trend has been documented in Australia, New Zealand and Canada (Schnepf 2004; Levels et al. 2008). Even if immigrants are leaving less developed countries with fewer skills, their optimism and hope for economic opportunities makes them different than immigrants who relocate for political reasons (Levels et al. 2008). Examining 35 origin and 13 destination countries, Levels et al. (2008) demonstrated that politically driven immigration has a negative influence on math achievement. Even students born in destination countries to immigrant parents experience this educational disadvantage. Furthermore, work by Dronkers and van der Velden (2013) suggests that both native-born and immigrant students learn less in ethnically diverse schools.

As a result of diverging immigration policies, the foreign-born population in Sweden is 15% compared to Finland’s 5% (Eurostat 2014). Immigration has been so influential for Sweden’s population that virtually all of its growth has been due to migration. Absent immigration, the Swedish population would be the same size as it was half a century ago (Andersson 2007). Figure 8 shows recent immigration trends in Finland and Sweden respectively (Statistics Sweden 2013; Statistics Finland 2014). It clearly demonstrates that Sweden’s immigration rate is far larger.
The immigrant populations of these two countries are characteristically different. Over the last several decades, the proportion of individuals emigrating from Eastern Europe and developing countries has risen at a substantial pace in Sweden (Martens 1997). In general, the countries of origin of non-European immigrants to Sweden have experienced political strife and civil war and include Chile, Eritrea, the Middle East (Iran, Iraq and Lebanon), Somalia and Sudan (Martens 1997). Table 8 presents trends for the immigrant populations of Finland and Sweden from less developed, non-European regions. Many of the individuals migrating to Sweden are more likely to come from poor
countries, or from countries with internal political strife. Although the majority of immigrants to Finland and Sweden are from Europe, since 2001, Sweden has had a smaller proportion of European immigrants. Furthermore, the European immigrant population has declined more in Sweden than it has in Finland. Additionally, Sweden has a larger proportion of immigrants from Asia and South America. Recent media reports suggest that discrimination against Muslims in Sweden is a growing issue (Eddy 2015).

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<td>Africa</td>
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<td>8.51%</td>
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<td>Asia</td>
<td>14.25%</td>
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<td>18.39%</td>
<td>19.20%</td>
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The association between immigration and school performance is highly contextual. Non-native students’ educational performance varies depending on their country of origin and country of destination, even after accounting for students’ individual factors (Schnepf 2004; Levels, Dronkers and Kraaykamp 2008; Entorf and Minoiu 2005). When students immigrate to Western Europe from under-developed countries, they can have a difficult time catching up due to language limitations and the
cultural and financial resources of their parents (Entorf and Minoiu 2005). Recent research has examined immigration changes within the student-aged population as a determinant of educational disparities (Andersson, Östh, and Malmberg 2010; Östh, Andersson and Malmberg 2013; Bernelius 2006; Bernelius and Kauppinen 2012). While some scholars suggest that poor academic achievement is the result of ethnic segregation (Andersson, et al. 2010; Östh et al. 2013), others contend that the performance discrepancies are largely attributable to the school choice system (Bernelius 2006).

Previous research indicates that first and second generation students have lower educational outcomes than their native counterparts, using a variety of indicators (Entorf and Minoiu 2005; Portes and MacLeod 1996; Kao and Thompson 2003). To the extent that Sweden’s non-native student population is increasing, there may be a corresponding suppression of educational performance. Work by Dronkers and van der Velden (2013) demonstrates that student immigrants from Muslim countries of origin have poorer language skill performance than their native peers, even after controlling for socio-economic status, school features and the education system. Additionally, they find that increased ethnic diversity in schools is associated with lower language test scores. Interestingly, they show that cultural diversity does not influence school performance, suggesting that ethnicity is a salient component of immigrant students’ educational experience. Furthermore, any growth in inequality or reduction of social services will be felt by those with the most need. Not only are immigrants in Sweden and Finland at a greater risk of poverty (Andersson et al. 2010; Vaattovaara et al. 2010), but this disadvantage may be reflected in immigrant students’ academic achievement. In recent
decades, immigrants’ labor market participation is worse than that of native residents in both of these countries (Andersson et al. 2010; Vaattovaara et al. 2010). In 2000, 40% of immigrants in Sweden were unemployed and in Finland, 31% of immigrants experienced unemployment (Andersson et al. 2010; Heikkilä 2010). Additionally, immigrants to Sweden are at a greater risk of living in overcrowded housing and in ethnically segregated neighborhoods. Because immigrant families experience more disadvantages, over time, these factors may contribute to an overall decline in student performance. The implications are particularly important for Sweden as it has a larger immigrant population, many of whom are poor and/or emigrating from less developed countries.

An examination of immigration trends and student achievement scores reveals some interesting differences between Sweden and Finland. PISA categorizes all students who were born outside of the test country to be first generation immigrants. Students who were born within the test country, but whose mother and father were born outside of the test country are considered to be second generation immigrants. Table 9 shows the proportion of native students as well as first and second generations students, for the 2000-2012 PISA cycles. In general, Swedish schools serve a larger immigrant student population.³

³ It is unclear whether the sudden increasing in Finland’s immigrant student population is based on actual growth or an oversampling of this population. The interactive database for PISA 2012 shows the foreign born student population to be 3.30%.
However, achievement trends by country of birth status are even more illuminating. Consistent with previous research, first generation immigrant pupils do not perform as well as native students, as expected. One of the most interesting trends to emerge from the PISA data are the declines in average reading, mathematics and science scores among native-born Swedish children.

Figures 9 through 14 compare PISA achievement trends among native and foreign-born students in reading, math and science by country. Reading achievement among native born and foreign born Swedish students is lower in Figure 9 than reading achievement among Finnish students in Figure 10. Reading achievement scores for foreign born students in Finland is closer to Sweden’s native born pupil than their foreign born counterparts. Performance in math and science in these two countries follows a

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similar pattern. In Figure 11, math performance for Swedish foreign born students is lower than similar students in Figure 12. At times, achievement among foreign born students in Finland is similar native born students in Sweden. Figure 13 indicates that science performance has declined for both native born and foreign born students. Alternatively, Finnish science achievement in Figure 14 has grown while foreign born students dropped slightly.

Based upon the overall performance declines in Sweden over the last several years, especially among students born outside of the country, it is possible that immigration shifts are influential for international assessment outcomes. To the extent that the immigrant student population in Sweden is, or has parents from underdeveloped countries, experiences greater household overcrowdedness, has less access to educational resources, but is also growing in size then these forces may contribute to the achievement gap between these two countries.
Figure 9. Country of Birth and PISA Reading Scores—Sweden
Figure 10. Country of Birth and PISA Reading Scores—Finland
Figure 11. Country of Birth and PISA Mathematics Scores—Sweden
Figure 12. Country of Birth and PISA Mathematics Scores—Finland
Figure 13. Country of Birth and PISA Science Scores—Sweden
Integration

In response to the increasing diversity of the population, Sweden adopted a policy of multiculturalism, in which the linguistic, cultural and religious differences of new residents were to be respected and even supported by the state (Andersson 2007; Koopmans 2010). This includes the right of parents to have their children educated in their mother tongue, as well as be taught religious lessons according to their faith traditions. Immigrants are also permitted to display personal religious symbols such as headscarves in public institutions. Furthermore, immigrants have a right to public
broadcasting, including radio and television that reflects their culture and language. Koopmans (2010) argues that the multicultural integration policies coupled with a generous welfare state not only reduces immigrant labor market participation but it also contributes to increased ethnic and spatial segregation.

“…There indeed seems to be a connection between multicultural integration policies and social segregation, as suggested by the high levels of residential segregation found in Belgium, Sweden, the Netherlands, and the United Kingdom. By contrast, countries that have put more emphasis on assimilation show more moderate levels of residential segregation. In Sweden, Belgium, and the Netherlands, high levels of spatial segregation combine with low labor market participation, but in the United Kingdom high levels of ethnic segregation co-exist with a relatively high rate of labour market participation” (Koopmans 2010: 25).

Although the aim of a multicultural approach to integration is to preserve cultural heritage, as a policy, it may have the unintended consequence of reducing some element of assimilation that promotes students’ educational outcomes. When students lack experience and comfort with the national dialect, language barriers will make success in school challenging. Furthermore, if students do not feel connected a country’s own cultural traditional, they may experience perceived or real social isolation from their peers. Growing up in this type of environment can reinforce behaviors that are not helpful in the classroom.
Residential Segregation

In Sweden, residential segregation by ethnicity is amongst the highest in Europe (Andersson et al. 2010). From 1984-1994 the Swedish government attempted to prevent segregation by evenly dispersing immigrant families throughout the country, this policy was largely ineffectual and eventually abandoned; the majority of immigrants are now concentrated in metropolitan suburbs while more affluent families live in city centers (Szulkin and Jonsson 2007; Andersson et al. 2010; Vaattovaara et al. 2010). Indeed, much of the ethnic segregation over the last several years was driven by native Swedes (Andersson 2007; Andersson et al. 2010).

Residential segregation becomes a problem for educational outcomes when families and students who live in segregated spaces are at a greater risk of poverty, overcrowding, unemployment and underemployment. Research from the U.S. indicates that students spend a majority of their waking hours not only outside the school setting, but also in vastly different neighborhood environments (Walberg 1984; Downey et al. 2004; Evans 2004). A sociological view of educational achievement suggests that the composition of a neighborhood exerts an additional effect on students’ school success, above and beyond individual and family level characteristics (Szulkin and Jonsson 2007; Breen and Jonsson 2005). Parents and adults in neighborhoods operate as role models for students by contributing to skill formation in children, passing on social norms, and creating boundaries through social control. Peer networks are also important for academic success; pro-school attitudes and habits are beneficial for students completing homework together and promoting educational ambition. Additionally, community level
infrastructure like recreational facilities and activities, religious organizations, museums, and neighborhood centers proved a resource to students that reduces the opportunity for deviance (Marten 1997) and indirectly promotes school performance. From this perspective, neighborhoods are increasingly important for student outcomes as pupils age (Brännström 2004). As children grow up, friends and peer networks exert more influence on students and their behaviors while parents are more limited in their ability to watch over their children. To the extent that adolescents are spending more time and interacting in their communities, the neighborhood characteristics have a greater chance of effecting school outcomes.

Neighborhood effects on educational achievement can be particularly acute for first and second generation immigrant students. Szulkin and Jonsson (2007) argue that a lack of social ties to out-group networks limit access to information channels about schooling in the host country as well as labor market conditions. Without firsthand knowledge of the education system or job opportunities, immigrant families face additional barriers to upward mobility. Ethnically concentrated spatial disparities may limit the language acquisition of parents and other adult role models in the community. Furthermore, educational credentials earned outside the host country may not have the same economic returns they initially had in their country of origin. Taken together, immigrant parents in segregated neighborhoods experience more challenges transferring skills and cultural capital to their children (Szulkin and Jonsson 2007).

Scholars note that the lives some immigrant families have left behind may have serious implications for how successfully they are able to establish themselves in a new
society (Martens 1997; Szulkin and Jonsson 2007). To the extent that a growing share of immigrants to Sweden left countries with civil war, oppression, and discrimination, parents and children might experience social or psychological challenges that reduce social cohesion, collective efficacy and educational achievement (Martens 1997; Szulkin and Jonsson 2007). In fact, Sweden has the most asylum applications per capita, almost 10 times higher than Finland (OECD 2013). Indeed, Martens (1997 p. 199) states “… the children of those immigrants who came to Sweden before the mid-1980s were better off than the children of immigrants who arrived during the most recent ten year period.”

When immigrant students live in segregated neighborhoods and attend segregated schools their educational performance can be depressed. A lack of interaction with native born peers impedes language proficiency and ultimately school achievement. Szulkin and Jonsson (2007) suggest that classrooms with greater proportions of students with limited language skills experience more disruptions, making the learning environment less productive.

To date, studies of the effects of residential segregation on academic performance in Sweden are mixed. Some scholars suggest that residential segregation depresses academic performance (Bygren and Szulkin 2010; Szulkin and Jonsson 2007). Work by Szulkin and Jonsson (2007) demonstrates that residential segregation is associated with schools having a lower overall grade point average, and immigrants within segregated schools experience even greater grade point average declines, compared to schools with less diversity. They contend that between-school variation is not the culprit, rather, greater densities of immigrant pupils in some schools may contribute to a more
challenging academic experience; they attribute this to language barriers and a lack of positive role models. The results of Bygren and Szulkin’s 2010 study are consistent with these findings, however, they suggest that the effect of growing up in a residentially segregated neighborhood has less influence over an individual’s educational attainment than do family level characteristics. Although there is some indication that ethnic segregation contributes to educational outcomes at large, not all scholars agree.

Brännström (2004) compares the effect of neighborhood characteristics on education outcomes, instead of immigrant density. He finds that when observable student characteristics are equal (i.e. financial resources, family structure, receiving state aid), but their neighborhoods differ, the student who grows up in a wealthy neighborhood has no academic advantage over a student who grows up in a poor neighborhood. Yet, Brännström’s study is not without its limitations. Although the data are longitudinal, tracking a birth cohort of Stockholmers from 1953 to 1983 does not reflect the substantial demographic changes Sweden has undergone. While he maintains this offers a conservative test of the effect of Sweden’s social welfare golden age on life chances when unemployment was low and the population was more homogeneous, the lack of diversity among the respondents makes me question the generalizability of the results. In fact, Szulkin and Jonsson (2007) suggest that Sweden provides an empirical opportunity for understanding the effect of ethnic enclaves on educational outcomes due to the fact that they have a growing immigrant population and generous social welfare programs.
Crime

Outside of the classroom, students spend a good deal of their waking hours in a variety of environments. Growing up in different environments is influential for students’ readiness to learn. When students do not feel safe and secure, success in school is challenging. For example, Bowen and Bowen (1999) find that witnessing neighborhood violence contributes to poorer attendance and lower grades in American high school students. In light of these considerations, I explore whether crime trends in Finland and Sweden might influence the achievement gap in these two countries.

Penal systems in Nordic countries are unique for their low imprisonment rates and less harsh criminal sentencing (Lappi-Seppala and Tonry 2011). However, with the exception of homicide, their crime rates are similar to other developed countries (Ibid). Despite “consensual and corporatist-political cultures” and generous social assistance programs, Nordic penal systems have not been static institutions (Ibid). Due to the economic collapse of the 1990s and a global shift towards more severe punishments, “crime control policies in Nordic countries have become more aggressive, more politicized and more responsive to the view and voices of the media” (Lappi-Seppala and Tonry 2011: 11). During the 1980s and 1990s Sweden pursued stricter drug laws, while Finland followed later. Since the 1990s, imprisonment rates have risen across the Nordic countries at varying time points; however, it remains to be seen as to whether or not this trend has wider implications (Ibid).

Work by Martens (1997) indicates that population changes may be driving the recent criminal justice policy shifts in Sweden. Following the arrival of refugees from
Kosovo, media accounts circulated, attributing the increase in thefts to the influx of immigrants. In fact, the minister of immigration publically stated that theft was a cultural element of Kosovo society. With a more conservative government during the 1990s, new legislation made it possible to deport immigrants for less serious violations.

When neighborhoods have higher concentrations of poverty, overcrowded housing and unemployment, they might also experience higher crime rates. Violence in communities disrupts children’s feelings of safety and impedes their educational performance. Ahlberg (1996) finds that immigrants, particular visible minorities, are more likely to be suspected of committing a crime and that they have higher participation rates in the criminal justice system. Furthermore, Martens (1997) suggests that first generation immigrants to Sweden not only have higher offending rates, but they are also more likely to be involved in violent crimes. He contends that recent social welfare program cuts have resulted in marginalized families, particularly recently arrived in Sweden, to be at a greater risk for deviance. If crime rates are higher in economically depressed and/or ethnically segregated neighborhoods, this trend could reduce students’ academic success.
Table 10 provides a summary of the social, economic, and demographic variations between Finland and Sweden presented in this chapter. While both countries are generous social welfare states, in recent years Sweden has had a growing number of individuals and families that benefit from their programs.

What explains variations in international assessments of student learning? Over the last two decades, Finnish and Swedish test scores have declined—this dissertation explores the source of the divergence between these two countries. In Chapter 2, I compared the school structures and educational policies of Finland and Sweden. These countries share many important characteristics. The distinction between primary school and secondary school is the same in both countries, as is the age at which students transition from one to the other. Also, each country provides families with generous social assistance to ensure that all children, regardless of background can make the most out of their school experience. Despite these similarities,ponents of Finland’s
system argue that the quality of their teachers is the source of their success while Sweden’s implementation of market-based school reforms has had a negative effect on their academic performance (Sahlberg 2011; 2012). Yet, to date, these claims have not been empirically verified. Therefore, in Chapter 3, I consider alternative explanations—that social, economic and demographic population changes have had an effect on the performance gap in these Nordic countries. More specifically, I discussed whether changes to the social safety net or variations in immigrant populations might inform our understanding of international test score outcomes. To assess the impact of these arguments, in Chapters 4 and 5, I provide an empirical analysis of the themes presented in Chapters 2 and 3.
Chapter 4: Data and Methodology

This study uses the 2012 wave of the Program for International Student Assessment (PISA). PISA is a comparative, cross-national data set of educational achievement in mathematics, reading and science among 15-year olds in 64 countries. The student population is representative of all 15-year old pupils attending public and private schools in each country. Participating education systems were required to have a sample of at least 150 schools and 4,500 students. Data were collected using a two-stage stratified sampling technique. Initially, schools were systematically selected according to the grade levels of the school, type of school, region of the country, population density and minority composition. Thirty-five students per school were randomly selected between the ages of 15 years, 3 months and 16 years, 2 months. While the number of students sampled per school could differ from 35, there could not be fewer than 20.\(^4\)

I limit the sample to include only students from Finland and Sweden. Finnish and Swedish students living abroad are omitted; however, foreign nationals within these

\(^4\)Countries were permitted to exclude up to 5% of the population by leaving out schools or students. PISA details five exclusion rules for students within schools (OECD 2012b). Students identified as intellectually disabled, functionally disabled, or with limited language experience are eligible for exclusion. Countries were also permitted to exclude students with dyslexia, dysgraphy and dyscalculy, provided these considerations were previously agreed upon. If students were taught in a language that PISA did not have test materials for, their scores could also be excluded. Sweden’s initial exclusion rate was 5.42%; however, following the removal of language exclusions from the overall exclusion rate, Sweden’s exclusion rate was below 5% (OECD 2013).
countries are present in the data. The final sample includes 8,362 students from 287 schools in Finland and 4,503 students from 202 schools in Sweden. Individual-level weights are used to inflate the student sample within each country to be representative of the overall student population.

**Dependent Variables**

I analyze three dependent variables: student scores in mathematics, reading and science as measures of academic achievement. Mathematics literacy includes six sub-categories: formulating situations, employing concepts, facts, procedures, and reasoning, interpreting, change and relationships, space and shape, quantity and uncertainty. The reading literacy dimension assesses students’ competency with locating, interpreting and synthesizing texts. Additionally, this section of the test gauges students’ ability to consider and engage with the texts. The science literacy section includes sub-categories to measure students’ skill with differentiating between scientific and non-scientific questions, describing scientific processes and using scientific evidence.

**Academic Achievement.** Standardized achievement scores were developed with Item Response Theory (IRT) modeling. Across participating countries, test scores have been standardized to have a mean of 500 and a standard deviation of 100, making comparisons across states possible.⁵

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⁵ Student achievement scores in math, reading and science were created by taking the average of five plausible values in each subject for each student (Levels, Dronkers and Kraaykamp 2008). Plausible values are not direct observations of student performance, rather, each value is a random number taken from the distribution of students’ scores that are attributed to each individual (OECD 2014).
Non-School Variables

Finland and Sweden. To estimate Finland’s educational advantage, I created a dummy variable, where a value of one means the student lives in Finland. Because I am only comparing two countries, there is not enough variation to include it at the school level. The reference category is Sweden.

Student Demographics. My demographic controls include age, gender (female=1), family structure (single-parent=1) and socio-economic background. Socio-economic background is an index created by PISA to measure students’ cultural, economic and human capital resources at home. It includes home possessions (cultural possessions, educational resources and the number of books in the home) and the highest occupational level and years of schooling of the pupil’s parents. This index was developed to broadly assess students’ socio-economic status, wealth and cultural background across countries by PISA.

Immigration. I distinguish between first and second generation students. First generation students were born outside of the test country and then immigrated at varying ages. Second generation students were born in the test country to non-native parents. Dummy variables were created for both of these student groups. Native students are the reference group.

School Variables

Teacher Culture. Teacher qualification is measured as the number of teachers with an ISCED 5A qualification (which is equivalent to a bachelor’s degree) divided by the total number of teachers in a school. Note that to be a secondary school teacher in
Finland requires the equivalent of a master’s degree. Therefore, for Finnish schools, this indicator also reflects the proportion of instructors with advanced tertiary education in Finland.

To measure teacher autonomy, I use PISA’s scale of teacher participation and autonomy in school decisions. Principals responded to whether teachers had authority and autonomy over a range of activities within their schools:

A) Selecting teachers for hire
B) Firing teachers
C) Establishing teachers’ starting salaries
D) Determining teachers’ salary increases
E) Formulating the school budget
F) Deciding on budget allocations within the school
G) Establishing student disciplinary policies
H) Establishing student assessment policies
I) Approving students for admission to the school
J) Choosing which textbooks are used
K) Determining course content
L) Deciding which courses are offered

*Accountability and Market-Based Policies.* The accountability measures are a series of dichotomous variables from the school questionnaire. Each of the indicators is based upon whether assessment scores are used for national performance evaluations, teacher performance evaluations, monitoring schools’ progress and comparing
performance outcomes among schools. Publishing student performance scores as public record and tracking assessment results through an administrative organization are also measured as dummy variables. Principals responded to whether test scores of students are used for the following purposes:

A) To compare the school to <district or national> performance
B) To monitor the school’s progress from year to year
C) To make judgments about teachers’ effectiveness
D) To compare schools with other schools.

Additionally, principals were also asked if achievement data were used in the following accountability practices:

A) Achievement data are posted publicly (e.g. in the media)
B) Achievement data are tracked over time by an administrative authority

I assess the impact of market-based educational reforms by including dummy variables for whether a school has to compete with another school for students and whether the school is a private or independent school.

*Analytic Strategy*

To examine the achievement gap between Finland and Sweden, I employ multilevel mixed models with heteroskedastic variance, to address the hierarchical features of the data (students nested within schools) (Raudenbush and Bryk 2002; Li and Hedeker 2012). Multilevel models are appropriate for analyses of achievement because they acknowledge that not all school characteristics effect students in exactly the same manner. Hierarchical

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* Performance data include aggregated grade level and school test results, marks or graduation rates.
modeling creates distinct estimates of the effects of the individual-level and non-school factors (Level 1), and the school-level (Level 2). This analytic approach corrects for biases that can arise from the clustering of students within schools. Additionally, I include a random effect at the student level to correct for the heterogeneous variance within schools. This allows the student level variance to vary in addition to the impact of the other factors (Hedeker, Mermelstein and Demirtas 2008). By addressing the heteroskedastic variance at the student level, I am able to relax the assumption that individual characteristics have the same influence in all schools. Put another way, the effect of students’ characteristics on academic achievement are permitted to vary at different rates across schools. To my knowledge, heteroskedastic variance treatments have not yet been applied to education research. The models are estimated using HLM 6.

The HLM software package cannot analyze cases with missing data. To address this issue, I use multiple imputation, which is appropriate for managing missing data (Allison 2002). Missing data were imputed using all 13,565 cases in the original sample with Stata 13. As there are no missing data with the dependent variables, I proceeded with the multi-level analysis.

Table 11 displays corrections for the heterogeneous variance at Level 1 by including a random effect for non-school factors. Significant, positive coefficients indicate that there is more variation for a given characteristic within schools, while negative effects indicate there is less. Table 11 demonstrates that achievement in math, reading for females varies less within schools, however, science achievement varies slightly more. Academic achievement by immigration status varies more within schools, across all subjects.
### Table 11. Correction of Heterogeneous Variance at Level 1

<table>
<thead>
<tr>
<th></th>
<th>Coef.</th>
<th>S.E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Math Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-0.19</td>
<td>***</td>
</tr>
<tr>
<td>Single parent</td>
<td>0.14</td>
<td>***</td>
</tr>
<tr>
<td>SES index</td>
<td>0.04</td>
<td>*</td>
</tr>
<tr>
<td>First generation</td>
<td>0.18</td>
<td>**</td>
</tr>
<tr>
<td>Second generation</td>
<td>0.10</td>
<td>*</td>
</tr>
<tr>
<td><strong>Reading Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-0.24</td>
<td>***</td>
</tr>
<tr>
<td>Single parent</td>
<td>0.15</td>
<td>***</td>
</tr>
<tr>
<td>SES index</td>
<td>-0.01</td>
<td></td>
</tr>
<tr>
<td>First generation</td>
<td>0.36</td>
<td>***</td>
</tr>
<tr>
<td>Second generation</td>
<td>0.21</td>
<td>**</td>
</tr>
<tr>
<td><strong>Science Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-0.21</td>
<td>***</td>
</tr>
<tr>
<td>Single parent</td>
<td>0.11</td>
<td>**</td>
</tr>
<tr>
<td>SES index</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>First generation</td>
<td>0.28</td>
<td>***</td>
</tr>
<tr>
<td>Second generation</td>
<td>0.13</td>
<td>**</td>
</tr>
</tbody>
</table>
To determine the contribution of school and non-school effects on academic achievement in Finland and Sweden, I add each variable in the model and examine the change in Finland’s coefficient. Accounting for the relevant covariates allows me to examine which factors are important for Finland’s educational advantage. The unconditional models of academic achievement, without any explanatory variables are as follows:

\[
\text{Model 1, Level 1: Academic Achievement}_{ij} = \beta_{0j} + r_{ij}
\]

\[
\text{Model 1, Level 2: } \beta_{0j} = \gamma_{00} + u_{0j}
\]

In Model 1, Academic Achievement (Math, Reading, and Science) for student \(i\) in school \(j\) is a function of the average Academic Achievement of school \(j\) (\(\beta_{0}\)) as well as the effect of the student level random variation from the school mean (\(r_{ij}\)) at Level 1. At Level 2, the average Academic Achievement in school \(j\), (\(\beta_{0j}\)), reflects the grand mean of Academic Achievement (\(\gamma_{00}\)), with a school-level random effect (\(\mu_{0j}\)). It is possible that students’ individual characteristics may influence their progress in math, reading and science differently. For example, success in reading is dependent upon students’ language and vocabulary skills. Students who are first or second generation students often are more comfortable with the dialect they speak at home, than the native language of the school. When immigrant students experience greater literacy challenges, their reading achievement is affected.

Second, I estimate the influence of Finland on the academic achievement slope. The coefficients for \(\beta_1\) display the effects of living in Finland on math, reading and science achievement, relative to living in Sweden. In the following models, this coefficient
empirically estimates the contribution of Finland to students’ academic achievement. A
decrease in the size of the coefficient demonstrates that the achievement gap between
Finland and Sweden is being accounted for. In these hierarchical models, the dummy
variable for Finland is treated as a fixed effect and therefore is included in Level 1. Because
I am concentrating on achievement disparities between Finland and Sweden, there is not
enough variation at the country level to make a three level model possible.

Model 2, Level 1: Academic Achievement$_{ij} = \beta_{0j} + \beta_{1j}Finland + r_{ij}$

Model 2, Level 2: $\beta_{0j} = \gamma_{00} + u_{0j}$

In Model 2, Academic Achievement for student $i$ in school $j$ is a function of the
average Academic Achievement of school $j$ ($\beta_0$) plus the effect of living in Finland ($\beta_{1j}$) and
student level random variation from the school mean ($r_{ij}$) at Level 1. At Level 2, the
average Academic Achievement in school $j$, ($\beta_{0j}$), reflects the grand mean of Academic
Achievement ($\gamma_{00}$), with a school-level random effect ($u_{0j}$).

Next, I introduce several student characteristics to the individual level (Level 1),
including age, gender, single parent family and SES. Model 3 allows me to determine if
differences in students’ background characteristics contribute to achievement gaps
between these two countries. The model is as follows:

Model 3, Level 1: $Academic\,\,Achievement_{ij} = \beta_{0j} + \beta_{1j}Finland + \beta_{2j}Age + \beta_{3j}Gender + \beta_{4j}SES + \beta_{5j}Single\,\,parent\,\,family + \beta_{6j}First\,\,generation\,\,student + \beta_{7j}Second\,\,generation\,\,student + r_{ij}$

Model 3, Level 2: $\beta_{0j} = \gamma_{00} + u_{0j}$

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In Model 3, *Academic Achievement* (Math, Reading, and Science) for student *i* in school *j* is a function of the average *Academic Achievement* of school *j* (*β_0*) plus the effect of Finland, age and gender (*β_{1j}, β_{2j}, and β_{3j})*, and family resources and arrangements (*β_{4j} and β_{5j}*) and student level random variation from the school mean (*r_{ij}*) at Level 1. At Level 2, *Academic Achievement* in school *j*, (*β_{0j})*, is a function of *Academic Achievement* (*γ_{00})*, with a school-level random effect (*μ_{0j})*.

With Model 4, I include first and second generation immigrant status in addition to students’ other personal characteristics. Model 4 assesses whether demographic factors are part of the reason for the learning disparity in Finland and Sweden. By including the immigration variables separately from other individual characteristics, I isolate the effect of these measures on educational achievement. Below is the demographic model:

Model 4, Level 1:  

\[
Academic Achievement_{ij} = β_{0j} + β_{1j}Finland + β_{2j}Age + β_{3j}Gender + β_{4j}SES + β_{5j}Single parent family + β_{6j}First generation student + β_{7j}Second generation student + r_{ij}
\]

Model 4, Level 2:  

\[
β_{0j} = γ_{00} + u_{0j}
\]

Expanding upon Model 3, in Model 4, *Academic Achievement* (Math, Reading, and Science) for student *i* in school *j* is a function of the average *Academic Achievement* of school *j* (*β_0*) along with the effects of Finland, age and gender (*β_{1j}, β_{2j}, and β_{3j}*) and family resources and arrangements (*β_{4j} and β_{5j}*) and immigration factors (*β_{6j} and β_{7j}*) and student level random variation from the school mean (*r_{ij}*) at Level 1. At Level 2, *Academic Achievement* in school *j*, (*β_{0j})*, is a function of *Academic Achievement* (*γ_{00})*, with a school-level random effect (*μ_{0j})*.
Finally, in Model 5, I include school-level characteristics at Level 2, in addition to the non-school and demographic factors at Level 1. The full model is presented below:

Model 5, Level 1: \( Academic \text{Achievement}_{ij} = \beta_{0j} + \beta_{1j} \text{Finland} + \beta_{2j} \text{Age} + \beta_{3j} \text{Gender} + \beta_{4j} \text{SES} + \beta_{5j} \text{Single parent family} + \beta_{6j} \text{First generation student} + \beta_{7j} \text{Second generation student} + r_{ij} \)

Model 5, Level 2: \( \beta_{0j} = \gamma_{00} + \gamma_{01} \text{Teacher certification} + \gamma_{02} \text{Teacher autonomy} + \gamma_{03} \text{District or national comparisons} + \gamma_{04} \text{Judgments of Teachers’ effectiveness} + \gamma_{05} \text{Monitor schools’ progress} + \gamma_{06} \text{Compare with other schools} + \gamma_{07} \text{Achievement data are posted publically} + \gamma_{08} \text{Achievement data are tracked by an administrative authority} + \gamma_{09} \text{School competition} + \gamma_{10} \text{Private school} + u_{0j} \)

Model 5 allows me to estimate the contributions of school and non-school characteristics to academic achievement and more broadly, the learning gaps between Finland and Sweden. At Level 2, \textit{Academic Achievement} in school \( j \), \( (\beta_{0j}) \), is a function of \textit{Academic Achievement} \( (\gamma_{00}) \), school characteristics \( (\gamma_{01} \text{ and } \gamma_{02}) \) and accountability policies and market practices in education \( (\gamma_{03}, \gamma_{04}, \gamma_{05}, \gamma_{06}, \gamma_{07}, \gamma_{08}, \gamma_{09}, \gamma_{10}) \), as well as a school-level random effect \( (\mu_{0j}) \). In Model 5, Level 1 is the same as it was in Model 4.
Chapter 5: Results

Table 12 presents descriptive statistics of the independent and dependent variables for Finland, Sweden and the analytic. The analytic sample is equally split by gender. Native born students comprise the majority of the sample, however, first and second generation students make up 8 and 9 percent of the sample, respectively. Fifteen percent of the students have single parents. Across schools, 83 percent of teachers have the ISCED 5A qualification. The majority of schools (62 percent) report that there are one or more schools nearby that they must compete with. Twelve percent of students attend private or independent schools. In general, Swedish schools experience more market-based reforms. The average academic achievement scores are 498 for math, 502 for reading, and 513 for science.
Table 12. Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Finland</th>
<th>Sweden</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>Math achievement</td>
<td>507.32</td>
<td>86.50</td>
<td>479.91</td>
</tr>
<tr>
<td>Reading achievement</td>
<td>510.25</td>
<td>95.90</td>
<td>486.17</td>
</tr>
<tr>
<td>Science achievement</td>
<td>527.29</td>
<td>95.62</td>
<td>487.06</td>
</tr>
<tr>
<td><strong>Level 1 Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>——</td>
<td>——</td>
<td>——</td>
</tr>
<tr>
<td>Age</td>
<td>15.71</td>
<td>0.28</td>
<td>15.73</td>
</tr>
<tr>
<td>Female</td>
<td>0.49</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>SES</td>
<td>0.34</td>
<td>0.83</td>
<td>0.28</td>
</tr>
<tr>
<td>Single Parent</td>
<td>0.17</td>
<td>0.37</td>
<td>0.11</td>
</tr>
<tr>
<td>First generation</td>
<td>0.09</td>
<td>0.28</td>
<td>0.08</td>
</tr>
<tr>
<td>Second generation</td>
<td>0.08</td>
<td>0.26</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>Level 2 Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualified teachers</td>
<td>0.88</td>
<td>0.15</td>
<td>0.77</td>
</tr>
<tr>
<td>Teacher autonomy</td>
<td>0.26</td>
<td>0.83</td>
<td>0.44</td>
</tr>
<tr>
<td>District or national comparisons</td>
<td>0.48</td>
<td>0.50</td>
<td>0.89</td>
</tr>
<tr>
<td>Judgements of teachers' effectiveness</td>
<td>0.22</td>
<td>0.41</td>
<td>0.45</td>
</tr>
<tr>
<td>Monitor school's progress</td>
<td>0.62</td>
<td>0.49</td>
<td>0.97</td>
</tr>
<tr>
<td>Compare with other schools</td>
<td>0.28</td>
<td>0.45</td>
<td>0.84</td>
</tr>
<tr>
<td>Achievement data are posted publicly</td>
<td>0.02</td>
<td>0.14</td>
<td>0.75</td>
</tr>
<tr>
<td>Achievement data are tracked by administrative authority</td>
<td>0.54</td>
<td>0.50</td>
<td>0.92</td>
</tr>
<tr>
<td>School competition</td>
<td>0.54</td>
<td>0.50</td>
<td>0.73</td>
</tr>
<tr>
<td>Private school</td>
<td>0.06</td>
<td>0.24</td>
<td>0.21</td>
</tr>
<tr>
<td><strong>N Students</strong></td>
<td>8362</td>
<td>4503</td>
<td>12865</td>
</tr>
<tr>
<td><strong>N Schools</strong></td>
<td>287</td>
<td>202</td>
<td>489</td>
</tr>
</tbody>
</table>
Model 1 of Table 13 is an unconditional model of math performance. Without any covariates, the average math score for students in Finland and Sweden is 493. In Model 2, I add the variable for Finland to the baseline model. Living in Finland contributes a 36 point advantage to students’ math achievement. The intercept for Model 2 has declined slightly from Model 1 to 480.

Model 3 of Table 13 tests the contribution of students’ individual characteristics to educational performance. This model tests the hypotheses that family resources and arrangements influence academic achievement. More specifically, greater family resources are associated with increased educational performance. In Model 3, students from single parent families do not differ from children of two parent families in their math outcomes. As socio-economic status increases, students gain a 34 point rise in their math achievement, for every one standard deviation they are above the mean.

Model 4 of Table 13 examines the impact of immigration on math achievement. Compared to their native peers, first generation students experience a 63 point reduction in their math scores and second generation students exhibit a 44 point decline. In Model 4, being the child of a single parent is associated with a 4 point decline in math achievement, yet this measure does not reach conventional levels of significance in the next model. Finland’s educational advantage has declined by 2 more points in Model 4, which represents a 7% narrowing of the achievement gap from Model 3 to Model 4 and a 21% decrease overall. Relative to Model 2, the coefficient for Finland has declined to 30 points. This decrease corresponds to a 15% reduction in the size of Finland’s educational
advantage. This change suggests that students’ lives outside of the classroom are influential for the learning that occurs when school is in session.

Model 5 of Table 13 is the full model and includes key school characteristics in addition to the non-school factors. The pattern of results produced does not provide support for school-related explanations for Finland’s success or Sweden’s decline. Teachers’ qualifications as measured here are not associated with the math achievement gap between these two countries. Similarly, teachers’ autonomy and participation in school decisions does not predict students’ math scores. Market-based reforms also do not help explain the differences between these two countries. Using assessment scores for district or national comparisons, judgments of teachers’ effectiveness, monitoring schools’ progress, or comparing schools with one another is neither beneficial nor detrimental for math outcomes. Furthermore, publically posting achievement data and results, or tracking achievement through an administrative authority does not have a negative effect. My results also indicate that attending a private school, or a school that competes with others in the area, does not influence math achievement. The coefficient for Finland in Model 5 is largely unchanged from Model 4. This suggests that market-based accountability measures are not the source of the achievement divergence between Finland and Sweden.

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7 I also tested the influence of teacher certification, which is the proportion of teachers in a school who are certified. This measure also had no impact on math, reading or science outcomes.
8 Many teachers across different education systems do not have authority over hiring, firing or salaries. I also estimated this model with the same measures for teacher autonomy at the school-level. The results were insignificant for both scales as well as across subjects.
Table 14 examines reading achievement in Finland and Sweden using multi-level model. These models present similar results as Table 13. The initial reading achievement gap between Finland and Sweden is 37 points. Model 3 includes the same non-school and individual factors as the math achievement analyses and tells a similar story. Age and gender remain significant. Unlike achievement in math however, being female increases reading performance scores by 53 points. Having a single parent does not predict reading achievement. A one standard deviation increase on the socio-economic index is associated with a 29 point gain in reading scores.

The immigration variables remain influential determinants of reading performance. First generation students experience an 80 point reduction in their reading scores. By comparison, second generation students also have lower scores in reading than their native peers, by 41 points. Because language acquisition is so crucial for vocabulary development and literacy skills, it is reasonable to expect that being a first or second generation immigrant has a large influence on students’ reading skills. Overall, including immigration characteristics reduces the reading achievement gap by 5% and 24% when all individual level factors are included.

An examination of the free market school practices of interest to this study suggests that teacher qualifications, autonomy and educational accountability policies are not influential for students’ reading performance. The coefficient for Finland’s educational advantage is 34 points, after including the school characteristics of interest. This corresponds to a 6% reduction in the reading achievement gap between the two
countries. Note that the deviance statistic has increased, indicating that Model 5 does not fit the data as well as Model 4.

Table 15 displays the effects of school and non-school factors on students’ achievement in science. Compared to math and reading performance, the disparity in science scores between Finland and Sweden is larger, with an initial gap of 56 points in Model 2. Just as with math and reading, family resources are influential for science achievement. Every one standard deviation above the mean SES is associated with a 34 point increase in science. Consistent with the other subjects, in Model 4, females have an 8 point advantage in science, unlike achievement in math. Yet in both math and science, the results suggest that students in single parent families do not perform as well, by 4 points.

Similar to the math and reading outcomes, Model 4 shows that immigration related measures impact science achievement. First generation students experience an 85 point decrease in their science scores. Second generation students also score 54 points less than their native peers. Model 4 reduces Finland’s science advantage by 5% from Model 3 and 18% from Model 2. The addition of teacher characteristics and educational accountability policies does not help explain the divergence of Finland and Sweden’s academic trajectories.
Chapter 6: Conclusion

In the midst of extensive research on international educational performance, it is important to pause and consider the contribution of students’ lives outside of the classroom to their academic achievement outcomes. Understanding how students’ individual characteristics influence learning in different countries is an understudied area. To gain leverage on this question, I document and examine educational performance in Finland and Sweden. These Nordic countries are remarkably similar in terms of their social welfare programs and systems of education. Both Finland and Sweden aim to ensure that students’ gender, social class and ethnic background do not limit their success in school. Additionally, these countries’ education systems are relatively undifferentiated, with grade transitions at the same time. Based upon the similarities across these two countries, it is reasonable to expect educational performance outcomes to also be consistent; yet over the last two decades, Finland and Sweden’s international test scores have steadily diverged. With this dissertation, I assessed and analyzed explanations for these different paths. In doing so, I showed that immigration does play a role in this achievement gap. Furthermore, despite arguments that free market school policies in Sweden have been the source of their performance decline (Sahlberg 2012), I did not find empirical support for this position.
The prevailing explanations focus on differences related to the school experience, while characteristics associated with students’ non-school environments receive less attention. Using Finland and Sweden as case studies, I document some variation in their education systems, as well as recent social and political changes. Overall, my dissertation finds evidence more consistent with the view that non-school characteristics explain the countries’ different test scores trajectories. More specifically, my results indicate that immigration-related experiences explain a share of the educational performance disparities between Finland and Sweden. First and second generation students’ achievement is lower than their native peers across math, reading and science. There are several explanations for why we find this relationship. In many instances, children from immigrant families are not comfortable with the language of their host country. Language limitations can have a profound effect on students’ learning new skills. Additionally, immigrant students who struggle with multiple languages may have a hard time interacting with their native peers, losing out on experiences that would improve their mastery of the new dialect. Based on a review of the literature and empirical analyses, I argue that Sweden’s educational performance is lower than Finland’s not only because there are more immigrant students in Sweden, but also because these students face more disadvantages outside of school. These results have implications for understanding the puzzling difference in international test scores between the two countries, and also raise questions about how non-school factors may help explain variation in international tests.
Summary of Results

In Chapter 2, I documented the structure and variations of Finland and Sweden’s educational systems. Substantial education research concentrates on within-school factors. One of the most consistent arguments for Finland’s performance is that because the teaching profession is more valued by society, they are able to recruit higher quality individuals into the field; this ultimately benefits students’ educational performance. Advocates of the teacher quality explanation contend that teacher training and preparation in Finland is of a higher caliber (Hargreaves, Lieberman, Fullan and Hopkins 2010; Sahlberg 2011). Despite the popularity of this claim, I do not find support for this explanation.

Some scholars also cite teacher participation in school decisions as an explanation for the academic success of Finnish students and the lackluster scores of their Swedish peers (Sahlberg 2011; Carlgren and Klette 2008; Simola 2005). By having control over the assessment of students, these scholars contend that Finnish teachers provide more accurate ratings of students’ learning progress. Stemming from the broader “teachers as education professionals” theme, scholars contend that when Finnish teachers have authority over curricula development, they are better able to address students’ needs and interests. Yet, at the same time, some contend that curriculum autonomy in Sweden has led to increased demands on educators’ time and resources, such that this policy is less beneficial than intended (Carlgren and Klette 2008; Klette 2002; Simola 2005). My results indicate that teachers’ participation and autonomy in school decisions is not influential for academic performance in this Nordic case study.
In Chapter 2, I also documented the extent of market-based education reforms in Finland and Sweden. Recent work demonstrates that educational accountability through assessment and school choice are much more central to the Swedish education system than they are in Finland (Miron 1998; Rinne et al. 2010; Tjeldvoll 1998). The Swedish education system has embraced standardized testing, school monitoring and judgments about teachers’ effectiveness in a way that is unique among Nordic countries.

Furthermore, over the last two decades school choice has become much more expansive in Sweden than in Finland. Studies of accountability policies and school choice in the U.S. suggest that the adoption of market-based practices in education have a limited effect or are even detrimental to students’ outcomes (Booher-Jennings 2008; Reback 2008; Diamond and Spillane 2004; Cullen, et al. 2006; Renzulli and Roscigno 2008; Bifulco and Ladd 2007). Based upon previous work, it would be reasonable to expect accountability through assessment and school choice to be the source of Finland and Sweden’s educational divergence. My analyses, however, do not support this conclusion. Rather, immigration-related measures are more predictive of the performance disparities between these two Nordic education systems.

In Chapter 3, I described variations in Nordic social and political arrangements. I explored demographic shifts and changes to the social safety net as way of gaining leverage on the contribution of non-school factors to students’ learning outcomes. This case study provides evidence that changes to the social safety net in Nordic countries warrants further attention. Unemployment aid and housing issues are serious social concerns in Sweden and may offer further insight to the cause of the educational
divergence. Between 2000 and 2011, the percentage of benefits given to unemployment aid in Sweden declined from 7% to 4%. Although unemployment benefits in Finland were also reduced during this period, they were initially more generous, allocating 11% of all benefits toward unemployment, and trimmed down to 7%. The cost of housing is much more central for Swedish families than their Finnish counterparts. In 2012, 33% of families in Sweden experienced housing cost overburden, while only 14% of families in Finland were overburdened. Furthermore, 13% of Swedish children live in overcrowded households, compared to only 6% of Finnish children. Goux and Maurin (2005) document that students in overcrowded households perform less well on academic assessments than their counterparts in uncrowded households.

Explanations of the Diverging Paths of Finland and Sweden

Immigration

An important explanation of diverging student achievement scores in Finland and Sweden is immigration. Across each of the academic subjects, first and second generation students fair less well on international assessments than their native born peers. Immigration to Sweden over the past few decades has been explosive. In 1960, Sweden’s foreign born comprised 4% of the population, however, by 2008, first generation immigrants accounted for 15% of the population (Eurostat 2014). As of 2012, foreign born children age 0-14 comprised 2% of the population in Finland, while in Sweden, 6% were foreign born (Statistics Sweden 2015; Statistics Finland 2015) Even though Finland’s immigration rates have increased slightly since the 1990s, they have remained comparatively low; just 5% of Finland’s population is foreign born (Eurostat
Sweden and Finland have distinct immigration histories. Finland has actively worked to reduce its attraction as an immigrant destination by decreasing social aid for asylum applicants. Alternatively, Sweden has played an important role in the global community by welcoming political refugees. These push and pull immigration factors associated with reducing aid to immigrants in Finland’s case or serving as a destination for families leaving behind dangerous environments as Sweden does has created different populations in Finland and Sweden as well as different student bodies. In 2011, 37% of immigrants to Sweden were from Africa, Asia or Central America, compared to 25% of immigrants in Finland (Statistics Sweden 2013; Statistics Finland 2014). Many of these families are ethnic, religious and language minorities. Students from these backgrounds may experience more difficulty assimilating into school due to their salient features. This distinction is relevant because political immigrants are at a greater risk of poverty, unemployment and crime victimization (Anderrson 2007; Anderrson et al. 2010; Martens 1997) Despite a tradition of tolerance and acceptance, Tedin (2010:1) argues that in practice, Swedish immigration policy “…has in reality led to a divided society with ghettos, estrangement and a large part of the population excluded from jobs and the culture around them.” Children and students who grow up in segregated neighborhoods with families who are more socially and economically vulnerable do not have the same learning outcomes as their advantaged, native peers. Decisions as to who is allowed to emigrate have important implications for educational performance. Countries with more selective admissions can choose families with greater access to economic and human capital. Students from these families stand a greater chance of being successful in school.
Alternatively, when countries are not restrictive and a refuge for families who have witnessed traumatic experiences, the migrants they receive may not have access to the tools and skills to make a successful transition. Furthermore, students from immigrant families with fewer resources face greater challenges to their learning.

The diverging paths of Sweden and Finland are attributable to differences in the student composition. In PISA 2012, 8% of the students in Sweden were first generation immigrants, compared to 3% of students in Finland. Swedish schools are educating pupils with more challenges, including learning a new, unfamiliar language. Indeed, work by Dronkers and van der Velden (2013) confirms the importance of immigration related factors for educational achievement. They find that the ethnic heterogeneity of schools substantially reduces the language skills of non-native students; the same effect occurs in differentiated and undifferentiated systems alike. The barriers to educational success for non-native students are often larger because of a lack of family resources. Immigrant students often do not have access to the supplemental resources advantaged families provide their children with outside of school hours or during school breaks (Downey et al. 2004; Entwisle, Alexander and Olsen 1997; Dronkers and van der Velden 2013; Reardon 2011).

For immigrant students, an important predictor of educational success is the age at which students begin to acquire their host country’s language. As students age, they have greater difficulty mastering their adopted tongue. Language barriers, in turn, delay academic progress in math, reading and science for many individuals. Because language acquisition is so crucial for vocabulary development and literacy skills, it is reasonable to
expect this measure to matter the most for reading achievement, although clearly it is influential for all academic subjects. Furthermore, language acquisition is important beyond first generation student status. To the extent that second generation students grow up in homes with non-native speakers and delay host country language adoption, their educational progress may also be impeded, albeit to a lesser degree than first generation students.

Family Resources and Structure

Both qualitative and quantitative research has documented the link between family resources and success in school (Coleman et al. 1966; Lareau 2002, 2003; Schneider and Coleman 1993; Sirin 2005; Reardon 2011). Families with limited means are constrained financially and by demands on their time and therefore are less able to invest in their children’s cognitive growth compared to advantaged families. Even in socially democratic welfare states, parental wealth, educational attainment, occupational prestige and cultural possessions matter for math, reading and science achievement.

Family structure is an important component of educational success. Previous research demonstrates that children of single parents perform less well on academic assessments than their peers from two parent homes (Downey 1995). Single parents face greater demands, often with fewer resources. They experience reduced earning power and frequently have less time to spend with their children. Due to more limited resources, students from single parent families often do not have the same school preparation that the children of two parent families have. Even in generous, Nordic
social welfare states, children of single parent families perform less well on the science assessment

_Beyond Finland and Sweden_

The results from my study highlight the need to broaden the inquiry of international test scores to non-school conditions. Unfortunately, little research has approached variations in test scores across countries from a perspective that gives serious consideration to non-school factors. Joe Merry’s 2013 study comparing Canada and the U.S is an exception. His provocative study forces us to rethink traditional school-based explanations for differences between American and Canadian children. American four year olds are not likely behind their Canadian counterparts for school reasons. Instead we need to consider differences in the broader social conditions that influence early childhood development.

A non-school lens may also be useful for understanding other patterns in international test scores. Beyond the Nordic context, attention to Poland’s educational performance is increasing. Between 2000 and 2012 Poland gained 48, 39, and 43 points in math, reading and science achievement respectively. What explains this dramatic improvement? Recent scholarly work attributes this rise to structural education reforms, where Poland has moved away from vocational education and embraced a more generalized curriculum (Jakubowski, Patritos, Porta and Wiśniewski 2010), but it is useful to consider this change in a larger context. Like Poland, the Czech Republic is also a former Soviet country whose educational history is worth exploring. At the beginning of PISA’s assessments, the Czech Republic’s performance surpassed Poland.
In 2000, Czech students were 37 points ahead in math and 25 points in reading. Yet, by the 2009 assessment, this trend had reversed. Compared to the Polish education system, the Czech Republic is far more selective and initiates streaming at age 11, 3 years before the OECD average. Educational disparities in the Czech Republic are largely derived from inequalities in students’ lives outside of school due to the reintroduction of capitalism and subsequent expansion of stratification (Průcha 2007). Additionally, the Czech Republic has become increasingly ethnically diverse, while Poland has remained ethnically homogeneous (Průcha 2007; Horner and Nowosad 2007). Given the social, economic and demographic variations in these two former Soviet countries, it is unclear how students’ family and home lives interact with their system of education to generate their performance outcomes. These recent changes indicate that the source of academic achievement is perhaps more complicated than previously thought. In fact, Dronkers and van der Velden (2013) argue that studies of educational systems must include an understanding of how students’ characteristics interact with the structure of schools. For example, when examining educational outcomes among Eastern European countries, it would be worth investigating what role the collapse of the Soviet Union had, including the long-term implications of economic restructuring on educational outcomes. Of course that is beyond the scope of this dissertation. Although focusing on educational achievement in Finland and Sweden has its utility, they are not representative of all PISA participants. However, taken together with this initial evidence from the Czech Republic and Poland, I suggest that the sources of educational achievement divergence go beyond the education system.
Contributions and Implications

This dissertation assesses the role of non-school factors and school characteristics in determining students’ educational achievement. As rankings of international test scores increasingly dominate the global and domestic policy landscape, understanding the factors associated with learning outcomes is essential. Even in generous social welfare states, achievement disparities are an important concern. How educational stratification mechanisms operate in areas with widely available social programs, benefits and assistance is less understood. My dissertation examines this question. These analyses suggest that further exploration of students’ non-school environments and their influence on schooling outcomes is warranted.

This dissertation empirically evaluates the major arguments for Finland’s success in international assessments of student learning, and Sweden’s decline. Sahlberg (2011; 2012) contends that the source of Finland’s achievement is attributable to the quality of their teachers, while Sweden’s drop is due to school choice policy and market-based reforms. Indeed, one of the results of Finland’s performance has been a growing educational tourism industry, where teachers, school administrators and district leaders observe Finnish educators and classrooms and then implement similar practices in their own schools. Yet, my dissertation suggests that a substantial amount of the variation in student performance is derived from their lives outside of school. The implication of this finding is that improving teacher quality is not the panacea of educational disparities. This is not to say that educator effectiveness should be ignored, but rather, it is unlikely to resolve the skill disparities that students bring to the classroom. The argument can also
be extended to the market-based reform debate. The implementation of school choice in accountability policies does not seem to be a judicious method for improving learning outcomes.

The relationship between education and immigration is complex and deserves thoughtful consideration. It would be hasty to conclude that restricting immigration should be an option for improving education. Sweden plays an important role in the global community by serving as a destination where people who have experienced discrimination, persecution, oppression, and war can have a safe place to reestablish their families and lives in a generous society. The road to educational improvement is littered with quick fix solutions, limiting immigration to Sweden to increase test scores is not only unethical, it also is not a panacea that will solve achievement gaps in schools. Currently, social science can explain a fraction of the variation in students’ outcomes. My results indicate that students’ lives outside of the classroom are important for how much they can learn at school, but they also suggests that future research needs to better assess the intricacies of students’ experiences both in and beyond the school setting. Future initiatives to improve student success must balance humanitarian commitments alongside broad based policies that support learning.

Finally, this dissertation joins other work, primarily done in the U.S., that begins to challenge the notion that differences in school characteristics play an important role in shaping children’s skill development. For example, the seasonal comparison studies indicate that, rather than serving as engines of inequality, schools actually reduce the magnitude of the achievement gaps we would observe in their absence (Heyns 1987;
Entwisle and Alexander 1992; Downey et. al 2004). These seasonal studies challenge the notion that schools serving disadvantaged children provide substantially poorer learning environments than schools serving advantaged children. In a similar vein, my study challenges a school-based explanation for Finland and Sweden’s diverging test scores. While it makes sense to search for a school-based solution—after all, children learn many of their skills in school—it turns out that many of the achievement gaps we are interested in have their source in conditions outside of schools.

**Limitations and Future Directions**

This dissertation is not without limitations. The school-based measures employed in my analyses lack the depth that I prefer. Certainly, the teacher quality indicator could use refinement. Education research has extensively documented the effect of observable teacher characteristics on student learning outcomes. This list includes, but is not limited to the certification processes, teachers’ achievement scores, the prestige of teachers’ degree granting institutions, subject matter expertise, having a master’s degree, years of experience and professional development. A survey of this literature suggests that observable teacher characteristics have a limited impact on students’ achievement (Rosenholtz 1986; Byrne 1983; Hanushek 1986; Darling-Hammond 2000).

As education research has grown more technically complicated, many scholars argue that the best method for isolating teachers’ contribution to student learning is to estimate the value they add to their students’ outcomes over the course of a year. When teacher quality is assessed in this manner research suggests that teachers are influential for learning outcomes (Hanushek and Rivkin 2010; Chetty, Friedman and Rockoff 2011;
Kane and Staiger 2008). This approach also has its limitations. Even with better data, it is unclear that teachers in Finland are more effective, or add more value to students’ learning than teachers in Sweden. When scholars adopt better measures of teacher and school quality, they produce surprising results. Downey et al. (2008) find no relationship between their impact measure of school quality and the SES of the student composition in a school. Furthermore, Lubienski and Lubienski (2013) demonstrate that value-added measures of learning indicate that public schools outperform private schools. In short, once fair measures of school quality are employed, we often do not see the patterns most would anticipate. At present, we have no output based evidence (i.e., student learning outcomes) that provide clear evidence that Finland’s teachers are better than Sweden’s.

Final Remarks

How should we approach international assessments of student learning? Based on a reading of comparative education literature, we would expect the structure of education systems and the quality of schools to be the main drivers of learning outcomes (Hargreaves et al. 2010). International education research primarily concentrates on systematic differentiation, centralized administrative control of schooling and teachers’ effectiveness and professionalism (Buchmann and Park 2009; Hargreaves et al. 2010; Wöstmann 2003; Sahlberg 2011). Yet an emerging area of research shows that students’ lives outside of the school setting are relevant for their academic outcomes. Merry (2013) demonstrates that cognitive gaps between children in the U.S. and Canada are established before they begin their school careers. And Downey and colleagues (2008) estimate that even after students are formally educated, they will still only spend
13% of their waking hours in school by the time they turn 18. Furthermore, just a third of students’ waking hours are spent at school, during the school year. Although school based explanations of international student performance are useful, I posit that an exciting and promising avenue is to give greater attention to how students’ realities outside of school shape their learning experiences inside the classroom.
References


112


Appendix A: Tables from Chapter 5
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