Determinants of Shadow Education: A Cross-National Analysis

Dissertation

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By

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ABSTRACT

The term *shadow education* refers to supplemental, privately-funded academic lessons outside of school. Shadow education is a global phenomenon that occurs in all nations with national levels of participation ranging between 10 to over 80 percent. Like a shadow, it generally goes unnoticed and it takes the shape of formal school in curricula and purpose. Shadow education takes many forms. It can be as informal as a senior student teaching a junior student or a teacher tutoring a student or group of students; or, it can be something more formalized and complex such as organized learning centers.

Shadow education is growing. In some areas, learning centers alone have experienced more than a 40 percent annual increase in franchises, expanding to every continent on earth. In some countries, the costs of shadow education are comparable to or exceed the national educational expenditure. Families everywhere demand more education for their children and an industry has formed to provide this service.

Despite its extensive use and growth, shadow education has received very little attention by scholars. To date, only a relatively small number of studies have looked at shadow education; those that have are most often case studies of nation states. These social scientists are concerned that shadow education is a powerful force in education

stratification. Given the stratifying nature of education generally, this privately-funded form has deep implications for issues of access and inequality.

Drawing upon PISA 2003 data which surveys over 200,000 15 year-old students from 41 nations, this study considers macro and micro level determinants of shadow education in order to ascertain whether its use is detrimental to educational equity. First, the study looks at potential national modal strategies. Second, it examines levels of family capital and gender on shadow education use. Logistic regression, correlation and descriptive statistics show the vast majority of nations use a modal strategy of remediation when employing shadow education, meaning shadow education is used for struggling students and not for high performing students, and all nations employ a remediation strategy when considering tutoring as apart from formal learning centers – in no nation do high performing students employ tutors. Moreover, national levels of inequality are associated with the use of shadow education. As inequality increases, so too does additional schooling.

Family decisions regarding the use of shadow education are driven by levels of economic, social and cultural capital. Comparing low- medium- and high-use of shadow education nations reveals similarities in resource allocation processes despite great national differences. Specifically, as family capital increases so too does the use of the shadow education; it is utilized more by girls than by boys; and, cultural capital is the best predictor of shadow education. Families with high levels of cultural capital and high levels of social capital are more likely to purchase shadow education compared to families with lower levels of capital.

Findings indicate shadow education is used in a variety of ways that include advantaging females, leveling the disadvantage of speaking a foreign language in the home, and is also a modern way that families reproduce a social class advantage. The complexity of shadow education use demands additional investigation as to the mechanisms behind its use – specifically, the decision-making process of families that includes the intersections of gender and class. The social reproductive aspect of shadow education use has implications on education inequality, particularly in light of recent efforts by the United Nations to provide free public primary education to all children. While mass education helps integrate children into a global economy, the use of shadow education will maintain existing patterns of stratification. However, the high use by girls indicates that shadow education is also being used to decrease gender inequality. These mixed findings point to a complex supplementary educational system that can both maintain inequality as well as reduce it. Recommendations include an increase in public awareness, national monitoring and regulation of shadow education.

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The early Saxon educationalist Johannes Parvus ([1159] 2009) acknowledges an earlier philosopher when he says “We are like dwarfs on the shoulders of giants, so that we can see more than they, and things at a greater distance, not by virtue of any sharpness of sight on our part, or any physical distinction, but because we are carried high and raised up by their giant size.” No better metaphor describes my experience working with the sociology faculty at The Ohio State University. It is my distinct pleasure to acknowledge them now, declare my gratitude and offer my deepest respect for their dedication, not only to me but to the discipline of sociology. It is a great honor having had the opportunity to work with such giants.

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CHAPTER 1

INTRODUCTION

One corollary of the expansion of worldwide mass education has been the use of privately funded assistance in school subjects, termed shadow education (Stevenson and Baker 1992). Every nation in the world has formal outside of school classes and private tutors that are used to help students navigate a successful passage through the education system and into adulthood (Baker and LeTendre 2005). The national use of this shadow education varies, but even in nations where it is least utilized, about 20 percent of students report having accessed shadow education throughout their academic career (Baker et al. 2001). This megatrend to privately fund education in tandem with public schooling has garnered the attention of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and other educationalists concerned with stratification in education. Specifically, a market-driven education will affect mass schooling at the national level in terms of both equity and quality of education and pressure families to purchase privatized education despite the availability of publicly funded schools (UNESCO 2006).

A debate over the use of shadow education has been ignited. Some view the increase in shadow education use as a move towards privatization in response to market-based reforms in

light of “agency problems” within government run schools. The lack of efficiency at the national level, it is argued, propels market forces to supply shadow education in response to a demand for students to compete in a global economy. Others view shadow education as a potentially dangerous threat to equity (Bray 1999; Bray and Silova 2006). Given that the goal of mass education is to lessen inequality by providing educational access to all students - inequality will reemerge when families advantage certain students by purchasing extra schooling. This reproduction of inequality, then, disadvantages those whom mass education was designed to help.

The 1960s saw a global drive for mass education. Nations across the world sought to increase the education levels of all people. UNESCO championed this quest by sponsoring mass education and over the subsequent decades great strides have been made so that an increasing percentage of the world’s children now receive public education. UNESCO’s goal is to have compulsory primary education in all countries by 2015. While well-meaning, this goal has had an unforeseeable outcome: an increase in privatized supplemental education.

The increase of access to education has implications for inequality. Due to increasing competition within education and national variation in the oversight of private tutoring and formal classes outside of school, households with higher income and higher levels of parental education are utilizing more private education than are households with lower SES and lower parental education (Bray 1999; Buchmann 2002a; Tansel and Bircan 2004). This equates to a class bias in education driven by family-level investment. In other words, the inequality that UNESCO hopes to reduce might actually increase due to a heightening of competition for education increases.

The global phenomenon of shadow education has only recently caught the attention of researchers and therefore most prior research on this topic focuses on the national level variations in shadow education. In order to understand the scope and impact of shadow education on an international scale, UNESCO funded comparative sociologist Mark Bray (1999) to describe the various forms, use and impact of shadow education at national levels through case studies. He provides a rich description of variations in shadow education between nations. In addition to his cross-national study, other studies have provided country specific information. These studies have shown that the use of shadow education is growing, that it takes various forms from informal tutoring to highly institutionalized classes outside of school, it encompasses both professional as well as amateur teachers, and that data regarding its use are limited (Aurini and Davies 2004; Buchmann 2002a; Davies and Quirke 2002; Hua 1996; Stevenson and Baker 1992).

Policy makers across the world are concerned with the impact of shadow education. Case studies of Japan show students devoting the majority of their "free" time to studying in formal settings outside school (Bray 1999). The picture has evolved of an anxious youngster desperately competing with other students in a highly selective education system for the reward of admission to a prestigious university. Of students placed in prestigious universities, more than sixty percent have participated in a year of full time shadow education after secondary school (Ono 2007). Students spend a full day at school then attend afterschool programs and structured learning centers and often do not return home until late in the evening. They sacrifice free time in order to ensure academic success, for in Japan a tight link between education and occupational placement exists (Kerckhoff 1995). Attendance in a prestigious university correlates with a

desirable job. Students who are not admitted to prestigious schools are sifted out of the system altogether, destined to a lifelong lower ranked status. The pressure for children to succeed in Japan brought shadow education to the fore as it also shed light on one potential reason why Japanese students rank so highly on international comparisons of mathematic achievement.

Some nations encourage the use of tutors and learning centers, some nations regulate it and yet other nations have banned it (Bray 1999). Critics of shadow education cite its ability to exacerbate inequality as well as disrupt public school curricula. For example, one common reason for the use of shadow education has been found to be teachers withholding certain lessons needed to pass high stakes examinations. The manipulation of lesson delivery by teachers forces families to privately supplement state sponsored public schools (Bray 1999; 2003; Bray and Kwok 2003). Teachers argue they are under paid and need to supplement their income (Tansel and Bircan 2004). Once the teacher has received payment the lessons are then delivered. In response, some nations such as Mauritius and the Republic of Korea have tried, albeit unsuccessfully, to ban supplemental schooling at various times in their history.

Currently Mauritius bans private tutoring while a student is in the first three primary grades. A government study in 1988 showed teachers often under taught subjects so that they would be hired outside of school to supplement that which was not taught in class. By 1994, the government sent out a strong statement discouraging private tutoring as they feared socioeconomic status was driving education; failing students from low socioeconomic backgrounds often dropped out while more affluent failing students could hire tutors and remain in school. Regardless of the official policy, parents in Mauritius still utilize private tutors (Foondun 2002).

In 1994, a similar policy was enacted in Uganda where teachers were chastised for creating for-pay test days. Rather than allowing students to take exams as scheduled, teachers would withhold exams for holidays when students were not in school. If a student wanted to take the exam he or she would have to pay the teacher. The Ugandan government made a case of one set of teachers who continued this practice illegally; however private tutoring is still ongoing in Uganda (Ngare 2007).

The majority of nations, including the United States, have no official policy overseeing extra schooling. Proponents of shadow education view extra schooling as a way to build human capital which will provide more occupational opportunities through academic achievement. One such argument is made in support of learning centers that help prepare students to earn higher marks, learn study habits, and become better students. Learning centers such as Kaplan and Sylvan produce commercials showing unhappy families with struggling students. Families are soon relieved after their child attends the center and self actualizes into a high performing student.

Even when national regulations exist they often are not sufficiently enforced. Take, for example, Turkey. The formal education of Turkey is mainly provided by the government and both public and private schools (pre-primary, primary and secondary) are overseen by the Ministry of Education. During the 1960s, private tutoring centers grew in order to assist students in preparing for the university entrance examination. In response to the growth of profit oriented private tutoring centers (called *dersane*), a law passed in 1984 recognized them as part of the nation's educational activities. As a result the Ministry of Education has oversight of these programs (Tansel and Bircan 2004). While for-profit private education centers are under the rule

of the Ministry of Education, teachers who provide one-on-one instruction either before or after school are not.

Policy makers and social scientists alike seek to understand what forces have led to the emergence of shadow education at the national level. Research on this question is scant but growing. Most research consists of national level case studies. The description of the various forms has lead researchers to identify broad uses of extra schooling. This fact highlights a need for a cross-national approach as many nations differ on the use of shadow education.

Moreover, generalizability of previous findings is difficult given differing measures by nations. Many countries do not maintain current records on participation. Take for example the case of Mauritius where extra schooling exists despite the national policy against it. Due to the illegal nature of shadow education respondents on surveys would potentially underreport their participation in extra schooling. In other nations, such as the United States, participation in shadow education is not recorded by the National Center for Educational Statistics or even at the local school district.

Yet another reason findings generated from case studies cannot be applied across nations is the lack of data on how much participation occurs within nations. The rich description of the forms of learning centers and tutors does not shed light as to the quantity of use. How many students, and what percentage of all students within a nation, engage in extra schooling? Many of the participation numbers researchers have used previously are generated by learning centers and are not student counts. Finally, the data that are student level have limited use given many do not include information on family background, thus constraining comparisons. Policy makers and social scientists need a broader examination of the shadow education phenomenon,

particularly with large scale international surveys. This dissertation adds to the growing knowledge of shadow education through an analysis of the determinants of shadow education from a cross-national perspective. Importantly, both developed and developing nations are included.

Specifically, I address two primary research questions.

1. Does a national modal strategy exist? Prior research suggests, at the national level, participation in shadow education is driven by achievement. Extra schooling is purchased at the national level when state sponsored education leaves gaps for a supplemental education market to fill. This rationale assumes shadow education takes three forms: remediation; enrichment and mixed. The vast majority of countries employ a remediation strategy, implying that the primary use of shadow education is to assist failing students. Determining the modal strategy is important as nations with a remedial focus use extra schooling to provide academic support not given in school. This has serious consequences for educational equality. Those who are best suited to purchase extra schooling will do so; those who cannot purchase it will fall farther behind.

If the goal of public education is to provide an equitable education to all students, the growing industry of shadow education will threaten to dismantle equity by allowing those with economic advantages to some children but not others. The issue of equity, then, is broadly one of stratification. While education has traditionally been viewed as the great equalizer, the demand for extra-schooling may deepen educational divisions between the social classes.

2. How do individual- and family-level variations in family capital affect the use of shadow education? And, more narrowly, how do gender, socioeconomics, social capital and cultural capital relate to shadow education?

Extant research documents various forms of capital (Bourdieu 1986; Marks 2005; Roscigno, Tomaskovic-Devey, and Crowley 2005) that directly affect the education process (Bourdieu and Passeron 1977). These include economic (Coleman et al. 1966); (Charlick 1978) human (Becker 1964), social (Buchmann 2002a; Coleman 1988; Noguera 2004), and cultural capital (Bourdieu 1974). Cross-national analyses have shown these forms of capital act differently within national contexts. Examining the magnitude and direction of family-level capital on the use of shadow education will help explain micro-processes that determine who participates in extra schooling. While some research has shown more affluent families purchase shadow education more than less affluent ones (Bray and Kwok 2003; Tansel and Bircana 2006) it is not clear how other forms of capital affect how parents make decisions on educational investments. Specifically, how well does social and cultural capital predict the use of shadow education?

If failing students purchase additional schooling, national measures of achievement must consider this amount of extra schooling purchased. National variations in the quantity of shadow education have garnered considerable attention in single-country analyses but no cross-national comparisons exist due to previous data limitations. Understanding what determines quantitative differences will assist policy makers and educationalists concerned with equity at the national level.

To answer these questions, the dissertation focuses on the use of shadow education by 15 year old students in 36 nations. I empirically test national and family level determinants on the use and quantity of participation in shadow education to explain stratifying processes so well documented in stratification literature but not yet applied to the use of shadow education. This work begins with an overview of extant literature on shadow education in Chapter 2. A detailed description of the data and methods as well as the analytic strategy follows in Chapter 3. Then, Chapter 4 empirically tests the modal use theory and expands the literature by offering separate analyses for private tutoring and formal out-side-of-school classes. In Chapter 5, I examine the micro-processes of family capital on shadow education participation. This includes a discussion of human, social and cultural capital as well as how capital predicts whether a student participates in shadow education. Finally, in Chapter 6, I discuss the findings regarding national and family level determinants of shadow education and their implications for understanding stratification in education brought about by family decisions as well as national strategies. This discussion will focus on how families use shadow education to further the performance and opportunities for their children and whether it is best regulated at the national level.

This study is designed to provide much needed evidence on the use of education purchased outside of school in various countries. Policy makers have been challenged to make decisions regarding the impact of shadow education with a dearth of evidence. With little information at their disposal, some governments have forbid its use entirely while others regulate it and some nations have no policies on shadow education at all. Governments generally respond in one of four ways to supplemental schooling: ignore; prohibit; regulate; or, encourage (Bray

2003). This work is meant to help decision makers evaluate how shadow education affects equity in education through an examination of the factors that drive its use.

In sum, this study sets out to answer: Does shadow education exacerbate existing stratification by providing a market driven advantage to students from high-socioeconomic families? And, does its use help level the playing field for students by allowing families to obtain supplemental education not available in school?

Education literature has long documented the advantage some families gain through capital investment. Be it through human, social or cultural capital investments some families provide what other families cannot (Bourdieu 1977). The capital constraints placed on a family in turn affect children immediately in terms of achievement, but also in the long term through attainment and the transition to work. Subsequently, shadow education is an important area of research as it is yet another potential way inequality exists despite the aim of mass public education to reduce inequality.

CHAPTER 2

FORMS, COST, AND THE USE OF SHADOW EDUCATION

Tutoring is a function of education. To navigate a successful transition across the education system, students have long employed teachers and senior students for guidance. Some forms of supplemental educational support consist of students, teachers, and educationalists employed in learning centers outside of formal school. The supplemental privately funded education industry, termed shadow education, takes various forms yet appears in all nations. Moreover, shadow education is growing (Baker and LeTendre 2005; Bray 1999).

The term shadow education, coined by Baker and Stevenson (1992), emphasizes the almost invisible quality of extracurricular schooling. Like a shadow, it parallels features of public schooling such as curricula, mastery of core subjects, examinations and grades. And while public school is seen as responsible for student performance, the extra curricular schooling is, like a shadow, often unnoticed. This is particularly problematic given the potential influence of shadow schooling on public education outcomes and national assessments.

The use of shadow education is growing. What was once common in Asia has now spread throughout the world. Social scientists generally frame the use of shadow education using an economic supply and demand model. They argue the rise in the demand for shadow

education is due to a parental response to failing schools (Bray 1999; 2003) and time-constrained parents (Tansel 2002; Tansel and Bircan 2004). And it is supplied by various sources, such as teachers who supplement salaries (Bray 1999), and learning centers, particularly learning franchises (Aurini and Davies 2004).

FORMS OF SHADOW EDUCTION

All nations have some form of shadow education (Bray 1999), with at least 20 percent of students, usually more, participating in it (Baker and LeTendre 2005). Shadow education can include private tutoring, organized after-school cram sessions and professional tutorial centers used to advance academic performance in terms of both achievement and attainment. Shadow education does not include non-academic lessons such as music, the arts or athletics.

One noteworthy example of shadow education is found in Japan. According to Bray (1999; see also Stevenson and Baker 1992), shadow education in Japan is highly institutionalized with 80 percent of students involved, and more than 60 percent participating more than twice a week. In Japan there is a strong link between schools and occupational placement. Employers send lists of their openings to schools, the schools then match students to these specific jobs and return the lists to the employers who most often hire the students recommended by the school. The occupations listed by employers cannot be filled by any student, but only those who have graduated from top ranked prestigious schools. In this system, the school's reputation greatly impacts the stratification process that sorts students into the occupational hierarchy. This intensifies the need for students to be accepted into one of the top prestigious schools for occupational opportunities.

In Japan, highly structured formal classes are the norm for shadow education. Group classes, called *juku*, are conducted after formal school, resulting in students often sitting for lessons for more than ten hours a day. If a student is not chosen for one of the top prestigious schools after graduating from secondary school he or she may choose to attended *ronin*, a school designed to enhance the performance of the student and to increase her or his probability to gain acceptance into one of the prestigious schools. Every year about 200,000 high school students who were not accepted into a prestigious college enroll in *ronin* – which means, "masterless samurai" (Gordon 2002: 424). In addition to after school group classes, cram sessions assist students in passing high stakes tests that sort students into specific secondary schools at the secondary level. Studying the case of Japan, Bray (1999) hypothesizes shadow education is more prevalent in countries with high stakes testing and where there is a strong link between educational credential and occupational prestige.

The use of institutionalized private tutoring in Japan is an important distinction from other national uses of shadow education. As Bray (1999) argues, the increase in Japanese economic success in the 1990s caused many in the U.S. and elsewhere to find interest in all things Japanese, from business to learning models, in hopes of competing successfully with the Japanese. This ideological shift can be seen in the use of the Japanese learning model of Kumon Educational Institute, one of the largest global tutoring centers that assist students exclusively in mathematics. In 2006, the Kumon Educational Institute Corporate Report disclosed their consolidated net sales as US $ 592.68 million, and US $ 57.07 million dollars in profit from tutoring centers in seven geographic locations: Africa, Asia, Central and South America, Europe,

Middle East, North America and Australia (Kumon Educational Institute 2007). Clearly individualized outside of school mathematics supplemental education is in high demand.

Tutoring in mathematics is only one of the many services offered by institutionalized tutoring centers. Although, according to Baker et al. (2001), the United States and Canada do not show high levels of private tutoring in math, one form of institutionalized tutoring, the learning center (e.g. Sylvan Learning Centers), is the fastest growing franchise in North America (Aurini and Davies 2004). In comparison to the Kumon Educational Institutes, the Sylvan Learning Centers, for instance, provide many services to families to improve the academic performance of their children and do not limit their services to mathematics, but also offer content-specific courses in language, mathematics and science, test preparation, and general lessons on successful study habits for life-long learning.

In other countries shadow education serves more narrow populations. Ireson (2004) shows community level classes in Britain target immigrants and offer, in addition to language and various academic courses, cultural classes meant to help assimilate groups to the host country. These classes are often found in community centers sponsored by various ethnic groups.

In sum, shadow education can take many forms, from institutionalized learning centers to community centers that tailor lessons to specific ethnic and cultural populations, to students assisting other students, to more formal private tutoring that is sometimes regulated by governments (Ireson 2004). Regardless of the form of shadow education, education outside of formal school has become an important feature of the current epoch.

COSTS OF SHADOW EDUCATION

The use of shadow education is costly as participation requires resources in terms of both finances and time. The monetary cost of shadow education includes fees for teachers and agencies, and the cost increases as lessons are more individualized. There is national variation in the cost of shadow education, as well as in the national consumption figures. With limited data on family level investments in learning centers, a brief review of a major supplier of tutoring is helpful in understanding the prevalence of these services. In a recent study of the growth of private tutoring in Canada, a nation with relatively low levels of shadow education use, Aurini and Davies (2004) show that the learning center has institutionalized private education through franchise. In 2002, the Canadian province of Ontario alone has seen a 44 percent increase in learning centers, from 245 to just under 400 (Davies and Quirke 2002). The use of these tutoring institutes, the authors argue, allows parents to individualize their children's education and to provide them with tools in addition to content specific lessons (e.g. note-taking, learning habits, test taking relaxation strategies). These tools align with long term learning goals that are meant to help produce a "whole student," as opposed to short term, domain-specific learning.

In some nations, parental investment in shadow education is nearly comparable to the national per pupil expenditure on formal schooling. The Republic of Korea consumes the most shadow education, proportionally, with a ratio of parental investment in shadow education to the national education expenditure of 0.8:1. Parents in the Republic of Korea spent US $ 25,000 on shadow education for their children in 1996, equivalent to 150 percent of the national education budget (Asiaweek, 1997, p.20 cited in Bray 1999). During the mid-1990s, Japan is reported to have spent the equivalent of US $ 14,000 million, and Singapore US $ 200 million in 1992 (see

Bray 1999: 27 for additional costs). According to Ki-Bong Lee (2003), cited in Baker and Le Tendre (2005), nearly all primary and secondary students in South Korea have experienced some form of shadow education. Comparing the amount of monetary investment familes in South Korea have made in shadow education across 20 years reveals a great increase in investment. In 1977, South Korean families spent approximately US $ 386 million on all forms of shadow education. By 1998 this amount had increased forty times, to US $ 16.4 billion.

There is a difference between private tutoring and shadow education in general which has yet to be investigated. Due to the individualized nature of tutoring, which corresponds to industrialized notions of individualism, research has shown that wealthier nations use more tutoring, one specific form of shadow education, than do poorer nations (Baker and LeTendre 2005). Although many highly industrialized nations see less use of shadow education compared to developing nations, the demand is evident and rising.

Some studies have established that in nations with extensive use of shadow education wealthier families are more likely to purchase shadow education and to engage in more elaborate forms of it. In South Korea, families with a parent or guardian with a college education are also more likely to have children who participate in shadow education than families without a parent who had earned a college degree. And shadow education is more likely to occur in elite families who have resources and ones that value education (Stevenson and Baker 1992; Lee 2003, cited in Baker and LeTendre 2005:67). These findings are based upon use of shadow education in country level case studies. No cross national study has considered the relationship between family background and capital as a determinant of shadow education.

There are additional costs to the use of shadow education. Students who participate in shadow education face what Bray (1999) has termed "opportunity cost" in the form of time spent traveling to and from the education center, preparation for the lesson, time in the lesson, and time for administration tasks. This opportunity cost also varies cross nationally. One example of this variance can be seen in studies of shadow education which show a distinct geographical pattern between the student and the tutoring location. Students from rural areas are less likely to access a shadow education and students who live in urban areas are more likely to access a shadow education in developing and industrialized countries. For example, Buchmann (2002a) finds that Kenyan children who live near Nairobi are more likely to participate in shadow schooling compared with rural students. This pattern has been found in Egypt (Hua 1996), Cambodia, and in the Republic of Korea (Bray 1999).

As demand for individualized education increases, nations will face serious challenges to determine how much supplemental education exists. Governments will need to respond to an industry that can affect public schooling and potentially the organization of family life given the opportunity costs to invest in a child's education outside of formal school.

NATIONAL VARIATIONS IN SHADOW EDUCATION

According to the Global Education Digest (UNESCO 2005), four out of five of the world's children aged between 10 and 15 are enrolled in lower secondary education. Due to the increase in demand for education, enrollments increased between 1990 and 2002 from 321 million to 492 million. The demand for education has driven most nations to make secondary

education compulsory. And with this trend there is an accompanying rise of the use of shadow education.

Despite many national differences, Bray (1999) found shadow education to exist in all nations in various forms from casual tutoring to highly institutionalized lessons. Gleaning information from case studies, Bray suggests that the use of shadow education has been growing however he does not find evidence of a national effect of shadow education on student outcomes. Building upon Bray's findings through a cross-national analysis of tutoring in the TIMSS (1995) data, Baker et al. (2001) describe national-level variations in the use of tutoring. From the international sample of eighth grade students, all nations engage private math tutoring but the extent of its use varies greatly. Of the forty-one nations represented in the sample, eleven have fewer than 20 percent participation, thirteen have between 21 and 40 percent participation, eleven have between 41 and 60 percent, four have between 61 and 80 percent participation. And one country, Columbia, has more than 80 percent participation. When a majority of students are paying for extra schooling there is an implicit message that either the national education system is inadequate or competition among students is so fierce additional schooling is the only way a student can succeed.

A global value system has crystallized in tandem with educational expansion placing more emphasis on obtaining education. While inadequate education systems and student competition can exist simultaneously, the mechanisms for purchasing extra schooling still reside within the family. As more families place value on individualized educational services the market responds by supplying opportunities to capitalize on the demand.

But what determines if families access this resource and how does this affect the use of shadow education at the national level? Aside from clear socioeconomic advantages at the family level (Bray 2003; Smyth 2009), other considerations deserve investigation; yet no research to date has considered family and national determinants simultaneously.

In an examination of possible national determinants of shadow education use, Baker et al. (2001) test three hypotheses. The first is the enrichment theory, which posits the global use of shadow education is driven by the link between school and future occupational opportunities. This would account for the high use of shadow education in nations such as Japan, where there is a strong link between education and occupational opportunity (see Shavit and Mueller 1998). A second and related hypothesis is that shadow education is correlated with high stakes tests (Foondun 1992). Passing examinations that sort students into tracks which impact their life chances would logically place more pressure on a student to transition successfully into higher ranked institutions. The third hypothesis suggests some nations have developed systematic motivations for national achievement due to global competition. As discussed above, the economic boom in Japan sent a clear message to the citizens that economic prosperity of individuals is linked with national prosperity.

Baker et al (2001) tested the enrichment/remediation theory. As there is no direct measure for academic track in the TIMSS survey, the authors create a sophisticated measure that can be written as a logit regression on math scores, controlling for socioeconomic level, home language, sex, community, remedial teaching, and the interaction terms between socioeconomic status and math scores. From these results, they generate a classification of national modal strategy behind eighth grade shadow education use. It had been assumed that families use

tutoring to enhance their children's academic performance and that those families with more resources could better advantage their children compared to families with fewer resources. However, they find that the majority of countries in their sample show a remedial use of tutoring. They provide a caveat that this measure could also capture students' use of tutoring for test preparation. Moreover, findings are inconclusive as to the efficacy of shadow education on math scores.

According to Baker et al. (2001), Japan has a mixed strategy, using both remediation and enrichment strategies. And only three countries use shadow education for student enrichment of mathematics: Korea, Romania and Thailand. This is a curious finding given the literature regarding the use of institutionalized tutoring in Japan. We would expect to see more students suing an enrichment strategy in Japan given the tight links between secondary school, college and placement in an occupation. Though the classification of the modal use of shadow education has advanced the knowledge of variations in cross-national use of mathematics tutoring, it does not support the use of tutoring presented in case studies at the national level. Given that TIMSS assesses mathematics, the differences between the Baker (2001) and Bray (1999) findings could be slippage found in the measurement of shadow education. Perhaps lessons in mathematics tell only part of the shadow education story at the national level. This would seem logical given the tight linkage between academic attainment and occupational placement in Japan.

Baker et al. (2001) rejected Bray's (1999) hypothesis that shadow education would be utilized more in countries with high stakes testing. Though shadow education is often used to assist students in test taking, this is not a determinant on a national scale. Indeed, research shows national variations in the use of shadow education in relation to both age and transition across

grades. High stakes test are generally at grade transitions, particularly between primary and secondary, and secondary and tertiary grades. Researchers, then, would expect to see more use of shadow education at these transitions if high stakes tests were driving the use of shadow education. There is no evidence that shadow education is used more frequently at the intersection of grades.

Some nations do experience increases in shadow education with corresponding grade transitions, however others do not. For example, reviewing shadow education literature, Baker (1999) reports, in Malaysia, of the 8,420 lower secondary pupils queried in Forms 3, 5 and 6, when high stakes testing is given, 59 percent, 53 percent, and 31 percent experienced tutoring, respectively in 1990. These percentages increased to 83 percent of all students by the time they reached upper secondary level. This pattern of shadow education increasing at specific grade transitions, especially those in secondary school, is also seen in Egypt (Fergany 1994). On the other hand, other nations do not see a positive relationship between grade transition and the use of shadow education. For example, a survey in the city of Seoul, the Republic of Korea, showed a decrease in tutoring with grade transitions, from 82 percent of all elementary students to 59 percent of high school students (Paik 1998). And in Kenya, in 1995, age was not related to use of shadow education (Buchmann 2002a).

In further investigations as to the factors that determine shadow education at the national level, Baker et al. (2001) correlated the use of tutoring with national expenditures on education and found lower national education expenditures, in proportion to the number of students, to be correlated with the use of shadow education. Research focusing on developing countries supports this idea. For example, Buchmann (2002b) reports that in many developing countries

stunted wage employment is due to low levels of economic development combined with a weak position in the world system, and that limited occupational opportunities lead to increased competition for education credentials. Countries with poorly structured educational systems generally do show more use of shadow education than do countries with advanced educational systems. Baker and LeTendre (2005) suggest that instead of national variations in family values regarding education, there are international values that correlate with globalization and educational expansion.

One international value can be seen in the link between education and the occupational hierarchy, as competition for jobs become more acute, so too does the need for education. However education is much more than the acquisition of knowledge and includes institutional status. According to Collins (1979) rewards are unevenly distributed in society and one way this allocation processes occurs is through the link between schools and the occupational hierarchy. Collins argues it is not education per se that determines the placement of a student into a high paying, high status job, but that it is the credential, the legitimating document that links the student to a high status school. Credentials, therefore, become the primary route for upward mobility in industrialized societies. Furthering the credential theory, Baker and LeTendre (2005) argue the education process itself has become the sole institution legitimating the transition from childhood to adulthood. Not only do future job opportunities matter, but by failing to matriculate into secondary school students limit their opportunity to participate as adults in society. This fear of not navigating a successful school career could in turn affect the use of tutoring, and also account for the use of shadow education for remediation purposes in most countries.

In developing an answer to why most nations utilize shadow education for remediation, Baker and LeTendre (2005) take an institutional perspective. They argue two reasons exist: 1) children must participate in school, and 2) there are no other traditional paths left to adulthood, such as occupational heritance, therefore school is more important now than it has been historically. This rationale, they argue, drives the use of shadow education at the national level.

The case studies Bray (1999) cites is his discussion of shadow education show that the TIMSS (1995) data, used by Baker et al. (2001), actually underreport the use of shadow education. One reason for this could be the fact that TIMSS reports on mathematics achievement. And indeed, many students do use shadow education to enhance their mathematics skills. Drawing on academic business literature from the 1980s shows, the primary use of shadow education during first jobs was remediation in language and literacy (Craig and Evers 1981). Despite many years of schooling some graduates do not possess skills necessary to complete tasks and need further training in order to function at work. Language and literacy are two areas where students who transition to work often lack skills that should have been garnered in school. Shadow education is used in this instance to fill in the gaps left by schools.

The variation in the definition of shadow education to include either math or another domain has implications in possible determinants at the national level, as perhaps national variations could also be attributed to language acquisition. Bray (1999) provides examples of national uses of shadow education in three academic areas: mathematics, language and science. In nations with large populations of immigrants, or in nations where the national language differs from indigenous languages, the use of shadow education is called upon to remediate students in

order so that they can better participate in school, society and the global economy. National variations might be attributed to different uses of shadow education.

FAMILY STATUS

There is a dearth of micro level studies on the determinants of shadow education. To help understand what drives a family to invest in outside of school tutoring, I undertake a brief review of family level background variables in education studies. This body of work generally centers on economics, with a focus on future returns to schooling. The literature addresses resource constraints, including the resource dilution hypothesis (Blake 1981), and cultural considerations that include norms and values surrounding educational decisions such as social capital and cultural capital (Bourdieu 1986).

A debate over whether education reproduces existing patterns of inequality was fueled by the Coleman Report (1966) which shows in the U.S. the effects of family background matters more for student achievement than do school effects. The variance in student achievement across the nation could not be attributed to school level differences, but rather to the allocation process tied to residential segregation. Unlike nations with a centralized education system, school districts in the U.S. are funded locally through property taxes such that neighborhoods with high property values have more resources than do neighborhoods with low property values. Family background therefore was a major predictor of academic achievement as communities correlate with socioeconomic status. Contrary to the Coleman Report, recent research shows inequality is exacerbated by the uneven distribution of resources at the school district level (Roscigno and Ainsworth-Darnell 1999). Others have also challenged the generalizability of the

Coleman effect as research in developing nations show schools play a more important role in affecting student achievement than family background (Heyneman 1983; Heyneman and Loxley 1982). This difference is attributed to the uneven distribution of quality among schools at the national level arguing nations with less developed school systems experience more variance in quality at the school level whereas schools are more equal in quality in developed nations.

One result of mass educational expansion has been the leveling of school quality at the national level which heightens the effect of the family in student achievement (Goesling 2005). Given parents are altruistic and they give their children as many advantages as their resources allow (Becker 1964), families vary in terms of resources such as financial capital, educational levels of parents, and values and norms surrounding education.

Another possible determinant of shadow education which has received little attention can be understood using the theoretical frame of social reproduction. This theory was first advanced by Bourdieu (1973), which posits schools, as arenas of conflict, reward students unevenly as a result of the social and cultural capital they have accrued. Students with high-levels of social and cultural capital are able to "cash-in" this capital for a successful navigation of the educational experience. Students with low-levels of these forms of capital are therefore disadvantaged by the luck of birth.

Unlike economic theories of capital that reduce the concept to that which can be bought and sold, social theories take a much more comprehensive stance. To theorists using the conflict perspective in sociology, capital, "is a *vis insita*, a force inscribed in objective or subjective structures, but it is also a *lex insita*, the principle underlying the immanent regularities of the social world" (Bourdieu 1986:242). It is a complex nexus of social interactions.

Social capital is that which is acquired through the social interactions surrounding group membership. It is defined as, "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (Bourdieu 1986: 248). Capital is abstract until it is utilized. Unlike money which is clearly demarcated social capital often goes undetected. Take for example the case of public versus private schools. In the United States, private schools generally have higher achievement rates than public schools, net of student socioeconomic status once controls are in place for Catholic status this advantage disappears (Braun, Jenkins, and Grigg 2006). One reason for this Catholic school advantage is the social capital of the Catholic school community (Coleman and Hoffer 1987). Catholic schools have very closely linked social ties between members of the church and schools. These open networks allow students and parents to obtain support for a myriad of issues, particularly those that are academic. This social support reaps educational returns.

Another form of capital is cultural. The academic interest in culture in cross disciplinary – this makes defining culture and evaluating cultural studies difficult, at best. First, scientific subfields are socially constructed by the Academy, shown by Wuthnow and Witten (1988) in an analysis of studies of culture, to be plagued with politics (to include careerism) and that scientific fact indeed, "results from social processes of interpretation, demonstration, negotiation and decision-making rather than through correspondence with or reflection of 'nature'" (59). Fluid boundaries exist across disciplines but are sectioned off for area specialization, and are thus made essential by those who pursue scientific endeavors. Clearly culture as a field of study has suffered from these constructions (Wolff 1999). Secondly, culture can be theorized as both a

process and a product. This is problematic if one's mission is to isolate and prove causality between distinct variables, often the goal of scientific inquiry. Furthering the complexity of culture is locating its origin, a paradox of which came first, the chicken or the egg; as enacted culture is produced and consumed, stratifying, and aids in creating social boundaries simultaneously within a complex social system.

Culture is both material and nonmaterial. It describes the ways people think, how they act, and the material items that make up one's life. Material culture includes artifacts such as language, music, art, and dress. In education studies, for instance, scholars have considered the relationship between art and music and achievement (DiMaggio 1982; Southgate and Roscigno 2009). The study of nonmaterial culture in education has for example, investigated social taste and preferences (Bourdieu 1984) and ideology (Giroux 1981). The body of this work reveals culture to be a motivating factor for social action. And that, "culture influences action not by providing the ultimate values toward which action is oriented, but by shaping a repertoire or "tool kit" of habits, skills, and styles from which people construct "strategies of action" (Swidler 1986: 273).

The strategies of action include educational processes. Cultural capital theory explains how variations in culture between groups of people can advantage some while disadvantaging others. One way this happens is that students who exhibit behaviors associated with high-brow dominant culture academically surpass those students who do not exhibit this culture. DiMaggio (1982) found support for Bourdieu's theory in the U.S., in that students who participate in the high brow arts perform better academically than do students who do not participate in the high brow arts.

There have been great advances in measuring cultural capital (Bourdieu 1977, Bourdieu and Passeron 1977; Swidler 1986; and Lamont and Lareau 1988), and it is generally agreed that certain household items proxy for childrearing strategies that in turn advantage higher class students. For example, De Graff et al. (2000) find in the Netherlands that one consistent measure of cultural capital, the number of books in the home, is highly correlated to academic success. They suggest family values regarding academic performance matter even when participation of high brow culture does not, and show reading to one's child has a direct and positive effect on student achievement.

Researchers have found that cultural capital varies contextually and is therefore difficult to measure in developing nations. National context determines the resources available to families. Buchmann (2002b) cautions against universalistic assumptions by articulating the fact that in many developing countries the lack of educational resources, such as books, is extreme. Clearly a family cannot value reading to their children, what is taken for granted in most developed nations, if books are not available.

Using this line of reasoning, familial values vary according to their socioeconomic status and this may directly influence the use of shadow education at a national level. Parental attitudes and values affect how they structure their children's time outside of school (Lareau 1989; 2002b). This affects children's academic performance and reproduces social inequality as those families with low levels of socioeconomic status tend to follow a child-rearing logic of natural growth and families with high levels of socioeconomic status use a logic of consorted cultivation. Families with more resources not only can economically afford to provide extra-curricular activities for their children, they structure the lives of all family members around these

activities as they are seen as investments in their children's future. This reproduces social inequality as higher-socioeconomic students gain an advantage in the acquisition of cultural capital which "cashes out" in school as higher grades, a deeper understanding of substantive material, and more academic attainment, in comparison to their lower socioeconomic colleagues. Lareau did not measure tutoring or outside of school classes specifically in her comparison of working class with middle class families, though one may assume that consorted cultivation includes participation in shadow education, whereas natural growth does not.

By focusing on how the family influences national strategies of shadow education I will study micro-level processes on the macro-level structure while preserving the national context. Though shadow education is utilized in all nations its form, how it is utilized and what determines its use may not be similar. Indeed, variations in these must be understood before policy makers decide what they should or should not do about shadow education.

RESEARCH QUESTIONS

While the majority of scholars have focused on national determinants of shadow education, few have used international data to compare and contrast national use. None, to date, has considered family determinants within a cross-national context. This study moves forward the scholarly discussion on educational equity through the examination of shadow education in 36 countries. By examining empirically both macro and micro social processes that influence who purchases extracurricular schooling this work answers two research questions.

1. Does a national modal strategy exist? This question is of primary concern to both policy makers and educationalists as its answer foretells whether shadow education is being used

to supplement public education. If shadow education is being used for remediation then perhaps the move to grow mass education deserves review as public schools might indeed be failing students by not teaching what is expected of them. Providing more schooling is meant to create equality but an increase in shadow education by only some students corresponds to a potential bias toward those who can afford extra schooling. Secondly, class advantages in education are well documented. If remediation is in fact the motivation for the use of shadow education then policy makers will need to consider this when comparing national averages when the outcome of interest is school efficacy. The lurking variable of extra schooling will confound school-level assessments. On the other hand, if enrichment is the primary strategy at the national level, this would support the human capital argument, and policy makers should be less concerned with the shadow education industry's effect on public schooling.

2. How do individual- and family-level variations in family capital affect the use of shadow education? And, more narrowly, how do gender, socioeconomic status, social capital and cultural capital relate to shadow education?

Case studies have shown some predictors of supplemental education at the family-level include social capital, specifically, the age of the parent, household education levels, and mothers' education (Bray 199). Parents with more education and those who are older purchase more shadow education than comparable parents with less education and who are younger. Whether a mother works however is not a predictor (Tansel and Bircan 2004).

In addition to family resources gender has been shown to matter in the use of shadow education. The directions by which resources are allocated are patterned by gender. In Turkey, for example, boys are more likely to receive familial resources to help in educational attainment

whereas girls are less likely to receive the same support (Tansel 2002). Yet the increase of females into higher education would suggest that more girls are able to access extracurricular schooling, particularly in the face of credentialism. Gender is one area that requires particular attention as females are receiving more education and perhaps part of this phenomenon is to be found within the shadow education system. In addition to gender, other family-level predictors deserve study, particularly family capital (*i.e.*, socioeconomic status, social and cultural capital) as it has been shown to greatly impact the allocation of academic resources.

The results of this work will enhance the decision process of policy makers and educationalists that are charged with determining if shadow education within their national context is harmful or is only a vehicle for the acquisition of human capital – or perhaps both. If all students have equal probability of engaging shadow education then the concerns of naysayers will be quelled. If, on the other hand, the use of shadow education is linked with social reproduction then I assert its use ought to be monitored, if not regulated, in order to preserve educational equity.

The answers to these central questions will help weigh what Baker and LeTendre (2005) call the unknown consequences of shadow education upon the education systems of the world. The following chapter will describe the methods, data and analytic strategy of the study.

CHAPTER 3

ANALYTIC FRAME, DATA, AND MEASURES

This work creates a framework to articulate individual level mechanisms that predict participation in shadow education at the national level. I begin by discussing the rationale for this theoretical approach. After which I turn to the data and measures used in the study. I follow this with a discussion of the methods of analysis used in the dissertation.

National variations in education systems are well documented (Shavit and Blossfeld 1993; Kerckhoff 1995), yet the use of shadow education seems to be a commonality among divergent systems. While social scientists have noted variations in institutional arrangements that affect educational stratification at the student level, a dearth of information exists in regard to extra schooling provided outside the school day. This study, then, is to investigate and provide information on not only how much extra schooling exists but also what drives its use.

While the first empirical chapter of the dissertation will focus primarily on macro-determinants and look for evidence of a national modal strategy, the majority of the dissertation is interested in what drives individuals to use shadow education at the familial level. In other words, the study is theoretically informed by family-level variations that affect individual's educational experiences. Particularly important are socioeconomic status (Bourdieu and

Passeron 1977; Aschaffenburg and Maas 1997) and social and cultural capital (Bourdieu 1977; Coleman 1988; Lamont and Lareau 1988; DeGraaf, DeGraaf, and Kraaykamp 2000).

Socioeconomic status is linked to acquisition of capital. Those of higher-social classes generally have high levels of social and cultural capital (Bourdieu 1973). And it is capital itself that creates the social structure that makes up social life. Bourdieu (1973) explains,

> Capital, which, in its objectified or embodied forms, takes time to accumulate and which, as a potential capacity to produce profits and to reproduce itself in identical or expanded form, contains a tendency to persist in its being, is a force inscribed in the objectivity of things so that everything is not equally possible or impossible, And the structure of the distribution of the different types of subtypes of capital at a given moment in time represents the immanent structure of the social world, i.e., the set of constraints, inscribed in the very reality of that world, which govern its functioning in a durable way, determining the chances of success for practices (242).

It is then, the ways in which forms of capital are distributed that create social reality – and due to this stratifying distribution system, some profit while others do not. One way advantage occurs is in education.

Social capital is defined as, "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relations," (ibid. 248) and includes family structure, parental levels of education and occupation. Family structure predicts educational outcomes (Astone and McLanahan 1991; Buchmann 2000). Considerations of family structure most often include whether the family is a nuclear family with two parents and children, a single parent family or a blended family. One significant way family structure predicts a student's achievement is through the number of children in the home. A persistent phenomenon in the United States noted by social scientists is that each additional child added to the family corresponds to a decrease in achievement for each child (Blake 1981; 1989; Downey 1995). This effect has been explained through resource dilution theory which suggests a finite

amount of energy exists within a parent. As a parent can provide only so much time, support, and other resources, each additional child requires the parent to decrease the support from one child to give to another child. However, a counter argument has been made for non-Western societies, where an increase in family structure does not negatively affect educational achievement (Pong 1996; Shavit and Pierce 1991). For example, while comparing the achievement of students by their family structure in Israel to those in Palestine, Shavit and Pierce (1991) show that large kinship network of Arabic families, which can include the interactions of hundreds of close knit familial relations, actually helps further the achievement of students. The more familial relations one has under tribal organization the more likely one will have better opportunities for success, including education. How then does family structure affect the use of shadow education? Are families with more support, such as extended families, less likely to engage shadow education? Or do families with fewer members have more resources that extend to extra curricular schooling?

In general, the structure of the family is an important component to the predicted achievement of a child. In addition, the socioeconomic status of a family is important in that it structures quantities and forms of social and cultural capital. High social capital often indicates high educational and occupational levels (Portes 1998; Putnam 2002). These are a strong predictor of a child's education as better educated parents are more involved with their child in school (Lareau 1989; Stevenson and Baker 1987), have high educational aspirations and expectations of children (Sewell and Shah 1968), as well as provide more tangible resources - such as tuition which may lead to elite school admission (Cookson 1997).

In tandem with social capital is cultural capital. The family's disposition, preferences, ideology and expectations help determine how family resources are divided (Bourdieu 1977; Lareau 1987; Roscigno and Ainsworth-Darnell 1999). For example, in some rural areas educational outcomes are generally low as a result of limited family and school resources – however girls are more likely to receive familial support in academics as parents have high expectations for the girls to better their lives off the farm (Roscigno and Crowley 2001). This impacts the issue of shadow education as there could be divergent processes based on ideas surrounding gender, language, educational expectations and aspirations.

How do social and cultural capital structure parental investments in extra schooling? Stratification literature suggests there should be commonalities determined by family capital in resource distribution despite national contexts that mediate these relationships. A more comprehensive analysis of shadow education and family capital is needed.

In order to answer the questions posed, it is necessary to use cross-national data that include a comprehensive and comparable survey of students. They need to include achievement measures, whether students use remediation or enrichment in school, and provide background measures of gender, family structure, socioeconomic status, and social and cultural capital. And, they need to measure shadow education.

DATA

The Program for International Student Assessment (PISA) is ideal for the current study as it is comprehensive and provides for comparisons of diverse nations. It surveys a large number of students, over 250,000, from a variety of countries. PISA is a program of the Organization for

Economic Co-Operation and Development (OECD) and is mandated to contribute to the economic development expansion of its 30 member countries. To do this, PISA includes non-member nations in the survey to foster global cooperation and the sharing of information. The OECD has working relations with 20 non-member countries, 10 of which are included in PISA 2003. The dissertation treats nations as cases. These are public use data.

Previous international comparisons of shadow education used TIMSS, a mathematics survey. PISA 2003 is best suited to further the investigation of showdown education as it also focuses on mathematics. The 2003 survey consists of 276,165 students from 41 participating countries. Of these countries, 31 are OECD members and 10 are not. This is an advantage over prior research as the large sample includes both industrialized and developing countries. The data collection was carefully designed for ease of comparison across highly diverse cultures and offers country level variation for some items such as those that proxy for cultural capital and socioeconomic status.

Due to the goal of the OECD, PISA was designed specifically for cross-national comparisons of education in both industrialized and developing nations and includes measures of human capital which the OECD defines as, "knowledge, skills, competencies and other attributes embodied in individuals that are relevant to personal, social and economic well-being"(OECD 2005a:14). Measures include student academic behavior, expectations and aspirations, and habits associated with education. In addition the survey collects family background information most pertinent to a sociological analysis of education, such as home language, socioeconomic status, education levels of parents, level of parental occupation status, and cultural possessions.

PISA utilizes a two-stage, stratified clustered random sample survey of 15 year old public and private school students of between 4,500 and 10,000 students per country. As compulsory education often ends around age 15, the survey captures the efficacy of education in preparing youths to function in modern society. The survey is ongoing and currently includes a 3 cycle method where each cycle measures reading, mathematics and scientific literacy but also focuses more narrowly on one academic domain at each cycle. The first, administered in 2000, focuses on reading literacy, the second, in 2003, on mathematical literacy, and the third in 2006, on scientific literacy.

Large scale education surveys, such as PISA 2003, most often follow a two-stage sampling process to ensure enough students from various nations are included in the sample. This, however, results in a non-random sample. A simple random sample method would guarantee every child in the population an equal chance of being selected to participate in the survey. As the number of students attending school within nations varies, those nations with larger populations and more schools would be more likely to have students selected. Moreover, the number of students within schools also varies. Once again, the probability of selecting a student from a school with small student populations is lower than for schools with large populations. In addition to probability considerations, PISA allows nations to stratify the sample. Some nations opt for rural, suburban and urban strata, others chose regional divisions by geographical areas or subsections of politically variant regions and yet others divide students by academic tracks. Therefore a design that takes into account these variations is appropriate.

To even the probability of choosing students from any school within each participating nation and region, PISA utilizes a complex method of student selection that includes a school

sampling frame. It begins by generating a list of schools that contain students of interest from each region. The probabilities of schools are proportional to their size (PPS). This is computed as the ratio of the school size multiplied by the number of schools in the sample and divided by the total number of students in the population:

$$p_{1\_i} = \frac{N_i * n_{sc}}{N}$$

Schools are then listed by size and a system of selection is used that guarantees selecting schools with a variety of sizes[1]. A sampling interval is computed as a ratio of the number of students in the population and the number of schools in the sample. By using a random number generated from the ratio and applying it to the list of students this systematic selection procedure ensures an equal probability that a student from a small school will be included in the sample. Generally, 35 students from each school are asked to participate and if fewer than 35 students attend a school the entire school population is included. Due to the PPS and systematic selection procedure, the sampling variance is reduced on the sum of the school weights however this is not problematic as the sample consists not of schools, but rather students (OECD 2005a).

Given the sampling system, proper procedures must be used in order to use statistical methods. PISA 2003 includes both country and student level weights as well as macros that compute multiple iterations for calculations of standard errors. Each statistical computation (*e.g.*, descriptive, correlation, regression) includes 80 iterations for each variable in each nation. For example, while computing the population estimate of the use of shadow education within nations, the mean is established by 80 iterations of the measure within one nation and is then averaged. In order to estimate the standard error of the population parameter the national sample

[1] Please see PISA Sampling Method in PISA 2003 SPSS User Manual (OECD 2005a).

is divided into smaller units consisting of pairs of students. The iterations systematically remove some units, measure the specified mathematical relationship and then add the units back into the sample. Each statistic is computed using this method.

In addition to iterations and weights, the sampling design dictates using "plausible values for reporting population achievement estimates and replicate weights for the computation of their respective standard errors" (OECD 2005a:16). I include mathematics scores in one section of Chapter 4 and the study follows the recommendations of the OECD to compute 80 iterations of the five plausible values in math and not to average the values at the student level. The study employs the OECD calculated weights in all analyses.

The PISA 2003 survey is a paper and pencil test. Some questions require simple answers such as choosing one of multiple choices while others are more complex and encourage the student to provide a more complex answer. While the assessment provides deep access into student competencies, the current study is more interested in the backgrounds of the students and its effect on the use of extracurricular schooling. PISA 2003 queries multiple measures of family socioeconomics, parental education and occupation, cultural possessions, student aspirations and expectations, home language, and most importantly, participation in shadow education, which will be discussed in detail below.

Another benefit of PISA 2003 is that it includes multiple measures of shadow education. There are two separate sets of questions that ask how much time per week a student participates in extracurricular education. The first set asks how much time is spent on private tutors and on outside of school classes. The second asks how much time is spent on mathematics-specific private tutors and mathematics-specific outside of school classes. Separating shadow education

by general- and mathematics-use allows me to use the math-specific measure to test the Baker et al. (2001) theory given their study was mathematics-specific. Using the questions from the general set allows for a more comprehensive overview of the use of shadow education and is this general measure is used in the study with the exception of Chapter 4 where both measures are considered.

Being able to measure general- and mathematics-specific use of shadow education is an improvement on prior studies when considering the many forms of shadow education (see Ireson 2004). Differences in national levels of shadow education participation, in terms of the economic and opportunity costs, vary greatly between private tutors and after school classes. Private tutors are more costly and generally provide one-on-one services to a student. The high-degree of tailored education demands more effort on the part of the educator than do formal classes outside of school. Formal classes outside of school are similar in structure to in-school classes in that educators rely on lessons to drive the interaction. This is not to say that students do not get personalized attention, however tutors are better positioned to provide student-centered service and may charge more for their efforts. PISA provides a precise measure of each, tutoring and outside-school classes, and the opportunity to create a combined measure that captures both behaviors.

Another improvement upon prior research that is afforded through the use of PISA is a direct measure of hours per week in school a student spends in enrichment and remedial classes. Baker et al. (2001) constructed a measure based on ranked achievement as TIMSS did not include direct measures of enrichment and remediation hours. PISA allows for a more precise calibration of participation in remedial and enrichment lessons within school.

MISSING DATA

Variations in data collection require some nations be removed from further analyses. PISA 2003 surveys 41 countries. Not all of the countries collect data on shadow education and others have large numbers of missing cases on independent variables.

Notably, Indonesia does not include measures on enrichment/remediation or shadow education and is therefore removed from the sample. Due to the size of Liechtenstein, the PISA sample from this nation is quite small (n=216) and given the many invalid answers and missing cases on shadow education measures they are removed from the study. Similarly, the sample from Mexico is quite large (n=29,983) however only about 3,000 students answered questions regarding shadow education and once missing cases are removed the sample is further reduced to n=822. Therefore any results based on these data cannot be generalized to the entire population so they too are removed.

Tunisia provided information regarding remedial but not enrichment and outside of school classes but not tutoring, while the Netherlands only answered on tutoring and not outside of school classes. These inconsistent patterns disallow comparisons and therefore the two nations are excluded from the sample. Finally, Japan does not collect family level data and is therefore not included in Chapter 5.

Table 3.1 reports the OECD status, and corresponding sample size for all 36 nations included in the study. Among the countries, 43,508 individual cases, about 19 percent, are missing information on the outcome of interest: shadow education. These cases are removed from the study. I compared the average scores of mathematics and background characteristics of the entire PISA 2003 sample to the sub-sample used in the dissertation and found no significant

differences given the large number of cases removed due to missing data on the outcome of interest.

The independent variables for family and student background characteristics (*e.g.*, highest parental education level, the number of books in the home, index of socioeconomic and cultural possessions), have very low numbers of missing cases due to PISA's high response rate. Each of the predictive variables in the study has significantly fewer than 5 percent missing cases. As recommended by the OECD (2005a:178), cases with missing values are deleted.

Prior to deletion, I evaluated the effect of removing these cases and found no significant difference in descriptive, correlation or regression results. The concern with missing data is that the cases are not random, and by removing them the sample excludes a pattern of shared behavior. There is a possibility that some missing cases could be patterned. For example, students with low socioeconomic status could be less likely to report their parents' level of education compared with children of high socioeconomic status. In order to control for missing cases that might exhibit this bias, I created a dummy variable where 1= missing. This method allows the study to retain the largest number of cases without imputing misinformation and still capture any significant statistical patterns within the missing population. I detail the number of missing cases per measure of Chapters 4 and 5 in Table 3.2 and whether a dummy variable was used to test for patterned effects in the missing cases. A mark of *yes* denotes that a dummy variable was created and tested whereas *no* denotes no action was taken. Dummy variables were not constructed when there was a very small number of missing cases, under 5 percent, as per the OECD recommendation.

SAMPLE

As discussed above, there are 36 nations in the sample some of which are developing nations and others are in economic transition. PISA seeks to understand educational practices within highly diverse societies. Of the nations in the sample, 29 are OECD member nations and 7 are OECD partners. The sample size of students is 173,534 however this number varies slightly between chapters. In Chapter 4, where I compare the general use of shadow education with mathematics-specific use, the incomplete data on mathematics-specific shadow education reduce the sample to 168,453. In Chapter 5, while looking at family structure, Japan, which does not collect data on family structure, is removed and the sample is 169,342. Japan is included in the remaining sections of Chapter 5. I describe below each variable within the dissertation[2] and detail the measure.

MEASURES

Independent Variables

SHADOW EDUCATION. The outcome of interest in each of the analytic chapters is shadow education. PISA directly measures the number of hours per week a student is engaged in tutoring and formal classes outside of school which allows this study to use multiple constructions of the dependent variable. I describe below the rationale and construction of each of the shadow education variables. PISA provides two measures, tutoring and formal classes outside of school; I combine these and report the means and standard errors of the composite measures in Table 3.3.

[2] The variable names from PISA are listed in Appendix A.

In the first shadow education measure, SE_1, I combine the two types of shadow education, tutors and formal classes, and create a dichotomous measure. SE_1 is thus coded as a dummy variable of participation where 1=yes and 0=no. Scoring a 1 on SE_1 means the student is engaged in *either* tutoring or formal classes outside of school whereas scoring a 0 means the student participates in neither. The proportion of students participating in shadow education ranges from 8 percent in Norway to 75 percent in Greece.

In Chapter 4, to replicate the theory put forth by Baker et al. (2001), I compute a mathematics-specific dichotomous measure of shadow education using the mathematics-specific set of questions. These questions ask how many hours per week the student is engaged in math tutoring and math formal classes outside of school. As with SE_1 described above, SE_2 is dichotomous, where a 1 denotes the student is engaged with math tutoring *and*/*or* math classes outside of school. Between 7 and 45 percent of the sample engages in mathematics-specific shadow schooling, ranging in duration from half an hour to 20 hours per week, reported in Table 3.4.

The third construction of the shadow education variable, SE_3, computes the number of hours per week a student has tutoring and formal classes outside of school. This composite measure ranges between a low of 0.27 (Norway) and a high of 6.93 (Greece) hours per week.

Dependent Variables

NATIONAL VARIABLES

GINI INDEX. I use the 2003 GINI index compiled by the United Nations (World Bank 2004) to measure national levels of inequality. The Gini Index measures the distribution of wealth in a nation. Table 3.5 reports the scores range from 0 to 1, where 0 indicates perfect equality – that the nation's wealth is distributed evenly across the population – and a 1 indicates perfect inequality in that one person owns all the wealth.

OECD MEMBERSHIP. Educational processes vary greatly by national level of economic development. To test whether a difference exists between developing and industrialized nations the study will include OECD membership as a proxy for economic development: 0=partner country; 1=OECD country. Membership is reported in Table 3.1.

INDIVIDUAL VARIABLES

The dissertation first seeks to test the theory put forth by Baker et al. (2001) who posit that a national modal strategy affects the decision making process of whether or not a family will purchase shadow education. To test this theory I use direct measures of remediation and enrichment which are included in PISA 2003.

ENRICHMENT. PISA measures how many hours per week in school a student is involved with enrichment education. Enrichment education is given to those students who excel in a subject

and enrichment lessons often go into more depth than traditional lessons. I recode the continuous variable into a dummy variable where 1=enrichment time in school and 0=no enrichment in school. The nation with the most amount of enrichment is Turkey, with the average of 0.510, and the lowest is Denmark with a mean of 0.025. In other words more than half of the population in Turkey receives enrichment in school compared to Denmark with just over 2 percent.

REMEDIATION. PISA measures how many hours per week in school a student is involved with remediation education. Remediation is given to students who struggle with a subject. In general, remediation is provided to students who would fall behind the in-class average. I recode the continuous variable into a dummy where 1= remediation time in school and 0=no remediation time in school. More than half (65.8) of the student population in Korea receives remediation in school compared to under 5 percent (4.9) in Germany.

MATHEMATICS PERFORMANCE. PISA includes an examination of mathematics literacy using a paper and pencil test of 85 items meant to measure math knowledge and competency in applying this knowledge to common everyday problems. The data set includes a series of five plausible IRT scores on general mathematics literacy with a mean of 500 and a standard deviation of 100 (for a detailed description and benefit of using Item Response Theory please see, Lord 1980). Averaging the scores at the student level prior to computing the population statistic over estimates the coefficients and therefore produce a biased estimate (OECD 2005a:79). In adherence to the protocol outlined in the PISA manual, five separate correlation

coefficients are computed on the plausible values of math score and are then averaged to compute the population statistic.

INDIVIDUAL AND FAMILIAL VARIABLES

The present study includes other causal variables known to impact education outcomes. These independent variables are used to investigate the determinants of shadow education. PISA 2003 includes direct measures of sex, socioeconomic status, family structure, items that have been identified as proxies for cultural capital (e.g., number of books in the home; cultural items in the home, home language) and social capital (e.g., highest level of parental education and student educational expectations).

FEMALE. I control for sex with boys as the referent: male=0, female=1.

SOCIOECONOMIC STATUS. PISA includes a composite measure of socioeconomic status that can be used across nations. This measure includes educational attainment of parents, income, and wealth using a scale of country specific items. Given the difficulty comparing developing nations with industrial nations, PISA improves upon previous large scale surveys by indexing household items and including them in the SES measure. As nations vary in terms of what constitutes socioeconomic status, it is difficult to compare families cross-nationally. One can easily imagine the difficulty of comparing household investments such as DVDs in one country with other investments such as musical instruments in another country. Using scales that control for national variations in socioeconomic status, a measure is calculated for each student

that can be used in comparison to other students in other nations. The socioeconomic composite includes cultural possessions, parental highest levels of occupation and education, and home possessions which is an index of 13 questions asking the student about the availability of objects in the home such as a calculator, a desk, place to study, books to help with lessons, etc. For a complete list of items please see PISA Technical Report (OECD 2005b). Throughout the family level analyses in Chapter 5, I disaggregate the composite and use the highest occupational and educational level of either parent. The range of socioeconomic status, reported in Table 3.10, is between -1.165 in Thailand, and 0.710 in Iceland. These data are meant for comparisons. The scores represent a ranking based on socioeconomic status - in this case, Thailand has significantly less socioeconomic status when compared to Iceland and emphasizes the differences between developed and developing nations.

FAMILY STRUCTURE. I control for family size in the analyses. Students were asked the question: who usually lives at home with you? This allows students who live with brothers, sisters, cousins or grandparents to answer in the affirmative – though the exact number of people in the home is not available. Where 1=single parent family; 2=nuclear family; 3=mixed family; and, 4=other. The study will use a nuclear family as the referent. Table 3.11 reports the percentages of the four forms of family structure by nation. The majority of families in the sample are nuclear. This construction of the nuclear family includes adoptive, step and foster parents. The United States has the lowest percentage of nuclear families, 56.1, compared to the highest percentage, 85.4 in Poland. Single parents constitute the second most frequent family form, ranging from 11.4 in Poland to 35.3 in Turkey. Mixed families, those with grandparents,

aunts or uncles in the home, are generally the third most common family form ranging between a low of 1.1 in Hong Kong to a high of 13.3 in Iceland. The "other" family category captures families that do not fit in to one of the other categories. Some examples of this family form include homes where children stay but are not necessarily related to anyone. This is the least most common family type - all nations report fewer than 6 percent, with the exception of Thailand, an outlier at 12.8 percent.

In addition to socioeconomic and gender statuses, the study considers cultural influences of the family on educational processes. Proponents of cultural capital theory argue behaviors and attitudes associated with the dominant social class help navigate successful passage through the education system. While the literature on cultural capital has looked at art and music preferences and other family level habits that affect education (Bourdieu and Passeron 1977; DiMaggio 1982; Lareau 2002) a precise conceptualization of culture is difficult at best (for a discussion of the limitations of cultural capital theory, see Kingston 2001). This is particularly true regarding cross-national comparisons. The measures used in the present study include the following household educational investments:

CULTURAL POSSESSIONS. PISA constructs a scale of cultural possessions that can be used to compare students from different countries. The scale is computed classic literature, books of poetry and works of art (*e.g.* paintings*)*. A high number represents many cultural possessions and a low number indicates few possessions. The scale ranges from -.496 in Macao - China to .814 in Iceland.

NUMBER OF BOOKS IN THE HOME. One measure of cultural capital that has been shown to be durable across cultures is the number of books in the home (DeGraaf, DeGraaf, and Kraaykamp 2000). The range of books in the home used in the study is between 1 and 6 where 1=0-10; 2= 11-25; 3=26-100; 4=101-200; 5=201-500; and 6=over 500, books in the home. The range is between 2.162 in Brazil and 4.075 in Japan.

HOME LANGUAGE. One form of cultural capital includes language spoken at home. In general speaking the language used on examinations advantages students, I discuss this in more detail in Chapter 5. The item is coded as a dummy variable where 1=test language is spoken at home and 2=test language is not spoken in the home. The range is between .001 in Korea, where nearly everyone speaks Korean, and .248 in Luxemburg where schools require proficiency in three languages: Luxembourgish, German and French.

PARENTAL EDUCATION LEVEL. PISA 2003 includes various measures on the educational level of parents. In the dissertation I use the highest education level of either parent ranging from 0 to 6 on The International Standard Classification of Education (ISCED) scale (UNESCO 1997). The ISCED was designed by UNESCO in the 1970s and is a statistical framework that allows comparisons of education across national contexts. It is coded as a scale between 0 and 6 with each increment corresponding to an increase in level of education. 0=NONE; 1= ISCED 1; 2 = ISCED 2; 3= ISCED 3B, C; 4= ISCED 3A, ISCED 4; 5= ISCED 5B; 6= ISCED 5A, 6. The range of scores is between 2.414 in Thailand, where the average educational level is primary school, and 4.934 in Canada, which corresponds to some higher education. As the study is

concerned with the relationship between high education levels of the parents with the use of shadow education, I created a dichotomous dummy variable of high and low education levels. High education is any amount of college or above (ISCED = 4 or higher), low is completion of secondary school or lower (ISCED = 3 or lower). Low education level is the referent.

PARENTAL OCCUPATION LEVEL. The highest parental occupation status is a scale ranging from 37.29 in Thailand to 55.21 in Norway. The measure indicates the parent with the highest status occupation. PISA computes this measure by assigning occupations a ranked position on a continuum with blue collar jobs at the low and white collar jobs at the high ends of the distribution. The term is designed for comparison across diverse nations.

EXPECTED EDUCATIONAL LEVEL. PISA queries students as to the highest educational level they expect to reach. The data are reported using the ISCED scale (see above). 1= ISCED 1; 2 = ISCED 2; 3= ISCED 3B, C; 4= ISCED 3A, ISCED 4; 5= ISCED 5B; 6= ISCED 5A, 6. The range is between 2.660 in Germany and 4.698 in Korea. The low average in Germany is most likely due to its stratifying process where by students are tracked early on. This results in students having very clear expectations regarding their future education.

WEIGHTS. PISA requires the application of weights to obtain unbiased population parameters. PISA 2003 provides a student level weight as well as Balanced Repeated Replication (BRR) used to compute 80 iterations, as discussed above. These weights are employed in all analyses throughout the study.

ANALYTIC FRAME

The dissertation utilizes multiple methods. The first empirical analysis, found in Chapter 4, introduces a macro approach to study what determines national variations in the use of shadow education. Each nation within the sample is a case. Replicating Baker et al. (2001), I employ logistic regression analysis to analyze the determinants of two shadow education measures, the first being general shadow education and the second mathematics-specific. Regression analysis is the appropriate method as this study seeks to predict the dependent variable based upon a series of independent variables that are both continuous and dichotomous. As the outcome of interest is dichotomous, in this case whether or not shadow education occurs, and the independent variables are mixed - continuous and dichotomous - logistic regression is optimum given it has less stringent requirements compared to OLS regression. Specifically, logistic regression makes no assumptions regarding the linearity of the relationship between the dependant and independent variables or homoscedasticity. Observations are required to be independent so proper weights will be employed. Correlation tests also support that the independent variables are linearly related to the logit of the dependant variable (Allison 1999).

Chapter 4 replicates the Baker et al. (2001) study and tests for differences between math-specific and general shadow education use. Furthermore, it treats shadow education as tutoring and formal classes outside of school separately, and as a composite term that combines the two forms. It looks closely at remediation and enrichment time spent in school and how this affects the use of shadow schooling through logistic regression analysis.

Chapter 5 then seeks to answer how student background factors affect whether or not a student participates in shadow education. This analysis, driven by social and cultural capital

theories, first measures the strength of relationships between student background factors and the use of shadow education. The study employs correlation analysis to assess the magnitude and direction of the relationships. It then determines the predictive effect of the background variables on the use of shadow education through binary logistic regression. In addition, the quantity of shadow education use by gender is also evaluated.

National factors as well as family level decisions contribute to the scope and growth of shadow education. The overarching question posed in the study, what determines shadow education, can only be answered when both levels are considered. The following chapters will answer how much shadow education exists and what drives its use.

	N		N		N
Australia	9990	Hungary	3416	Portugal	3301
Austria	3938	Iceland	2933	Russian Federation**	3722
Belgium	7433	Ireland	2300	Slovak Republic	6168
Brazil**	2008	Italy	9941	Spain	8672
Canada	21894	Japan	4192	Sweden	3379
Czech Republic	5170	Korea	4028	Switzerland	5803
Denmark	3399	Latvia**	4066	Thailand**	5230
Finland	5530	Luxembourg	2292	Turkey	1358
France	3459	Macao - China**	1063	United Kingdom	7533
Germany	3243	New Zealand	3275	United States	4415
Greece	3243	Norway	2972	Uruguay**	2751
Hong Kong**	3998	Poland	4314	Yugoslavia	3105

Note: ** Denotes OECD Partner, other nations are OECD Members.

Table 3.1. Sampled Countries, OECD Status, and Sample Size.

	Number of Missing Cases		
Background Measure	**Chapter 4**	**Chapter 5**	**Dummy**
Sex	34	34	No
Number of books in the home	2607	2562	Yes
Family structure	6112	1920	Yes
Highest parental occupational status	6079	5649	Yes
Highest educational level of parents	3629	3627	Yes
Foreign language spoken at home	4500	2562	Yes
Expected educational level of student	1077	1024	Yes
Cultural possessions of the family	50	50	No
Index of socio-economic and cultural status	728	702	Yes

Table 3.2. Background Measures and Number of Missing Cases within Sample.

	Shadow Education Measures		
	SE_1	**SE_2**	**SE_3**
Australia	.206	.107	.555
	(.007)	(.006)	(.027)
Austria	.161	.060	.458
	(.008)	(.005)	(.031)
Belgium	.143	.045	.406
	(.006)	(.003)	(.403)
Brazil	.489	.130	2.332
	(.015)	(.010)	(.018)
Canada	.204	.076	.677
	(.006)	(.004)	(.027)
Czech Republic	.265	.070	.906
	(.010)	(.005)	(.042)
Denmark	.106	.028	.377
	(.006)	(.003)	(.027)
Finland	.142	.019	.409
	(.006)	(.002)	(.023)
France	.187	.115	.472
	(.009)	(.008)	(.028)
Germany	.218	.107	.543
	(.009)	(.007)	(.027)
Greece	.749	.499	6.933
	(.016)	(.020)	(.027)
Hong Kong	.365	.234	1.365
	(.012)	(.011)	(.060)
Hungary	.307	.136	.994
	(.010)	(.008)	(.043)
Iceland	.240	.119	.654
	(.007)	(.006)	(.026)
Ireland	.234	.103	.607
	(.014)	(.009)	(.050)
Italy	.306	.116	1.137
	(.007)	(.006)	(.039)
Japan	.172	.135	.610
	(.110)	(.012)	(.613)
Korea	.549	.442	4.731
	(.012)	(.013)	(.163)

Continued

Table 3.3. Means and Standard Errors of Each Shadow Education Measure by Country.

Table 3.3 continued

	Shadow Education		
	SE_1	**SE_2**	**SE_3**
Latvia	.483	.144	2.401
	(.011)	(.009)	(0.089)
Luxembourg	.273	.086	.961
	(.010)	(.007)	(.049)
Macao - China	.235	.142	1.206
	(.016)	(.012)	(.101)
New Zealand	.169	.063	.468
	(.007)	(.006)	(.025)
Norway	.082	.022	.269
	(.005)	(.003)	(.026)
Poland	.423	.172	1.487
	(.010)	(.009)	(.050)
Portugal	.359	.256	1.087
	(.012)	(.011)	(.049)
Russian Federation	.375	.124	1.744
	(.012)	(.008)	(.073)
Slovak Republic	.226	.072	.783
	(.007)	(.005)	(.031)
Spain	.437	.235	2.329
	(.009)	(.009)	(.068)
Sweden	.139	.026	.391
	(.008)	(.004)	(.032)
Switzerland	.235	.048	.672
	(.14)	(.005)	(.050)
Thailand	.330	.250	1.613
	(.013)	(.012)	(.095)
Turkey	.586	.412	4.482
	(.022)	(.032)	(.259)
United Kingdom	.267	.100	.627
	(.008)	(.006)	(.028)
USA	.175	.081	.591
	(.008)	(.005)	(.035)
Uruguay	.357	.089	1.809
	(.012)	(.007)	(.080)
Yugoslavia	.283	.163	1.009
	(.012)	(.008)	(.053)

	Instructional Hours Per Week Outside of School			
	General Use		Math-Specific	
	$\bar{X}$		$\bar{X}$	
	Tutor	Classes	Tutor	Classes
Australia	.333 (.021)	.301 (.015)	.193 (.011)	.058 (.007)
Austria	.193 (.022)	.295 (.0.19)	.137 (.012)	.024 (.003)
Belgium	.307 (.021)	.141 (.009)	.074 (.006)	.051 (.006)
Brazil	2.117 (.083)	.623 (.037)	.484 (.039)	.588 (.035)
Canada	.506 (.021)	.251 (.012)	.166 (.008)	.067 (.006)
Czech Republic	.704 (.036)	.277 (.017)	.133 (.011)	.066 (.006)
Denmark	.317 (.022)	.113 (.013)	.031 (.005)	.078 (.009)
Finland	.339 (.021)	.073 (.007)	.036 (.006)	.014 (.003)
France	.188 (.015)	.355 (.023)	.209 (.016)	.077 (.006)
Germany	.135 (.015)	.491 (.020)	.287 (.017)	.036 (.006)
Greece	5.289 (.218)	2.257 (.104)	.914 (.04)	1.706 (.092)
Hong Kong	.762 (.040)	.700 (.038)	.382 (.024)	.294 (.020)
Hungary	.584 (.027)	.562 (.023)	.222 (.013)	.257 (.015)
Iceland	.323 (.018)	.369 (.016)	.210 (.012)	.109 (.010)
Ireland	.493 (.044)	.341 (.021)	.210 (.012)	.120 (.014)
Italy	.697 (.028)	.580 (.029)	.322 (.019)	.059 (.006)
Japan	.547 (.058)	.115 (.010)	.073 (.008)	.290 (.032)
Korea	3.805 (.154)	1.250 (.055)	.718 (.035)	1.377 (.056)

Continued

Table 3.4. Means and Standard Errors of the Number of Hours per Week Students are engaged in General Use and Math-Specific Shadow Education by Country.

Table 3.4 continued

	Number of Hours Per Week Students Use Shadow Education			
	General Use		Math-Specific	
	$\bar{X}$		$\bar{X}$	
	Tutor	Classes	Tutor	Classes
Latvia	1.919 (.086)	.593 (.034)	.267 (.020)	.192 (.016)
Luxembourg	.834 (.038)	.480 (.021)	.294 (.016)	.134 (.013)
Macao - China	.635 (.065)	.638 (.072)	.322 (.036)	.230 (.029)
New Zealand	.310 (.193)	.273 (.015)	.014 (.009)	.090 (.010)
Norway	.222 (.020)	.114 (.013)	.056 (.007)	.046 (.008)
Poland	1.054 (.063)	.437 (.022)	.229 (.015)	.172 (.011)
Portugal	.396 (.029)	.890 (.042)	.542 (.030)	.0164 (.012)
Russian Federation	1.504 (.063)	.545 (.030)	.380 (.023)	.419 (.028)
Slovak Republic	.339 (.021)	.588 (.022)	.135 (.008)	.108 (.009)
Spain	1.473 (.047)	1.052 (.013)	.572 (.022)	.057 (.025)
Sweden	.235 (.019)	.203 (.028)	.092 (.012)	.027 (.006)
Switzerland	.684 (.054)	.185 (.010)	.100 (.006)	.043 (.006)
Thailand	1.069 (.075)	.545 (.032)	.304 (.018)	.561 (.037)
Turkey	4.058 (.203)	1.786 (.085)	1.068 (.065)	1.820 (.079)
United Kingdom	.515 (.023)	.196 (.013)	.108 (.009)	.0121 (.011)
USA	.410 (.029)	.262 (.019)	.181 (.012)	.082 (.009)
Uruguay	.850 (.052)	1.475 (.059)	.501 (.029)	.264 (.025)
Yugoslavia	.348 (.029)	.823 (.043)	.547 (.033)	.088 (.012)

	GINI COEFFICIENT (2003) (Low to High)
Denmark	24.7
Japan	24.9
Sweden	25
Czech Republic	25.4
Norway	25.8
Slovak Republic	25.8
Finland	26.9
Hungary	26.9
Germany	28.3
Austria	29.1
Korea	31.6
Canada	32.6
France	32.7
Belgium	33
Switzerland	33.7
Ireland	34.3
Greece	34.3
Poland	34.5
Spain	34.7
Australia	35.2
United Kingdom	36
Italy	36
New Zealand	36.2
Latvia	37.7
Portugal	38.5
Russian Federation	39.9
United States	40.8
Thailand	42
Hong Kong	43.4
Turkey	43.6
Uruguay	44.9
Macao - China	46.9

Note: data unavailable for Iceland and Yugoslavia.

Table 3.5. Gini Coefficients (2003) for Nations in Sample.

Average Enrichment In School - Hours per Week			
	$\bar{X}$		$\bar{X}$
Australia	.130 (.006)	Latvia	.347 (.015)
Austria	.195 (.009)	Luxembourg	.067 (.006)
Belgium	.101 (.005)	Macao - China	.279 (.017)
Brazil	.165 (.015)	New Zealand	.126 (.007)
Canada	.156 (.005)	Norway	.079 (.006)
Czech Republic	.168 (.010)	Poland	.440 (.013)
Denmark	**.025 (.003)**	Portugal	.039 (.005)
Finland	.412 (.013)	Russian Federation	.394 (.018)
France	.106 (.007)	Slovak Republic	.200 (.012)
Germany	.188 (.009)	Spain	.063 (.004)
Greece	.285 (.009)	Sweden	.033 (.003)
Hong Kong	.192 (.008)	Switzerland	.073 (.005)
Hungary	.129 (.008)	Thailand	.346 (.014)
Iceland	.249 (.008)	Turkey	**.510 (.021)**
Ireland	.084 (.007)	United Kingdom	.229 (.009)
Italy	.151 (.008)	USA	.272 (.010)
Japan	.258 (.010)	Uruguay	.067 (.006)
Korea	.403 (.022)	Yugoslavia	.110 (.010)

Note: Bolded numbers represent the upper and lower range and are referenced in the text.

Table 3.6. Average Enrichment Participation in School by Nation.

Average Remediation In School - Hours per Week			
	$\bar{X}$		$\bar{X}$
Australia	.099 (.004)	Latvia	.467 (.018)
Austria	.108 (.008)	Luxembourg	.104 (.007)
Belgium	.095 (.006)	Macao - China	.390 (.020)
Brazil	.187 (.014)	New Zealand	.145 (.007)
Canada	.0169 (.005)	Norway	.102 (.007)
Czech Republic	.118 (.008)	Poland	.277 (.012)
Denmark	.062 (.005)	Portugal	.192 (.016)
Finland	.093 (.007)	Russian Federation	.603 (.020)
France	.324 (.014)	Slovak Republic	.219 (.013)
Germany	**.049 (.005)**	Spain	.112 (.007)
Greece	.296 (.017)	Sweden	.098 (.005)
Hong Kong	.332 (.013)	Switzerland	.095 (.008)
Hungary	.202 (.013)	Thailand	.387 (.015)
Iceland	.218 (.008)	Turkey	.582 (.031)
Ireland	.102 (.006)	United Kingdom	.174 (.008)
Italy	.336 (.011)	USA	.216 (.009)
Japan	.327 (.017)	Uruguay	.107 (.011)
Korea	**.658 (.021)**	Yugoslavia	.115 (.009)

Note: Bolded numbers represent the upper and lower range and are referenced in the text.

Table 3.7. Average Remediation Participation in School by Nation.

	Average Math Score - Plausible Values				
	1	**2**	**3**	**4**	**5**
Australia	524.084 (2.042)	524.195 (2.203)	524.596 (2.077)	524.462 (2.112)	523.994 (2.206)
Austria	505.103 (3.314)	505.848 (3.116)	505.161 (3.259)	506.183 (3.160)	505.759 (3.278)
Belgium	529.089 (2.314)	528.966 (2.246)	529.579 (2.283)	529.513 (2.261)	529.285 (2.233)
Brazil	355.519 (4.686)	356.184 (4.826)	356.079 (4.897)	356.97 (4.724)	355.327 (4.766)
Canada	532.637 (1.769)	532.058 (1.810)	532.44 (1.751)	532.336 (1.774)	532.963 (1.795)
Czech Republic	516.056 (3.476)	517.206 (3.613)	516.241 (3.458)	516.037 (3.551)	516.735 (3.409)
Denmark	513.739 (2.585)	515.184 (2.736)	514.669 (2.647)	514.104 (2.685)	513.742 (2.625)
Finland	544.173 (1.771)	543.793 (1.806)	543.898 (1.822)	544.563 (1.725)	545.018 (1.761)
France	511.474 (2.496)	510.72 (2.425)	510.844 (2.443)	510.264 (2.464)	510.695 (2.458)
Germany	503.079 (3.335)	503.099 (3.266)	502.722 (3.361)	503.03 (3.283)	502.999 (3.319)
Greece	444.549 (3.933)	445.128 (3.840)	444.86 (3.977)	445.489 (3.833)	444.532 (3.791)
Hong Kong	549.427 (4.466)	549.73 (4.411)	551.625 (4.383)	550.287 (4.563)	550.847 (4.331)
Hungary	490.337 (2.742)	489.106 (2.826)	489.985 (2.707)	490.095 (2.758)	490.538 (2.830)
Iceland	514.714 (1.354)	515.045 (1.363)	515.664 (1.393)	515.007 (1.390)	515.114 (1.360)
Ireland	503.484 (2.451)	502.611 (2.332)	502.404 (2.333)	503.009 (2.456)	502.678 (2.445)
Italy	465.766 (2.965)	465.552 (3.019)	465.323 (3.025)	464.883 (2.933)	466.797 (2.928)
Japan	533.645 (3.983)	534.339 (3.899)	534.569 (4.0184)	533.762 (4.049)	534.368 (4.004)
Korea	541.629 (3.141)	541.84 (3.204)	542.726 (3.179)	542.846 (3.207)	542.096 (3.190)

Continued

Table 3.8. Average Plausible Math Values and Standard Errors by Nation.

Table 3.8 continued

	Average Math Score - Plausible Values				
	1	**2**	**3**	**4**	**5**
Latvia	483.026 (3.666)	484.228 (3.733)	483.217 (3.605)	483.014 (3.665)	483.390 (3.559)
Luxembourg	493.277 (0.937)	493.257 (0.895)	493.215 (1.056)	492.947 (0.950)	493.347 (0.940)
Macao - China	527.355 (2.834)	526.945 (2.762)	526.594 (2.685)	526.943 (2.913)	527.585 (2.953)
New Zealand	524.083 (2.152)	522.955 (2.206)	523.859 (2.146)	537.222 (2.220)	523.812 (2.057)
Norway	495.350 (2.373)	495.447 (2.339)	494.870 (2.349)	495.083 (2.383)	495.183 (2.057)
Poland	490.105 (2.443)	490.750 (2.481)	490.463 (2.429)	489.572 (2.441)	490.304 (2.491)
Portugal	466.139 (3.335)	466.025 (3.462)	466.165 (3.375)	465.963 (3.399)	465.791 (3.431)
Russian Federation	469.109 (4.180)	468.473 (4.031)	468.731 (4.162)	467.605 (4.159)	468.115 (4.217)
Slovak Republic	498.629 (3.182)	498.010 (3.251)	497.723 (3.437)	498.476 (3.412)	498.078 (3.328)
Spain	485.569 (2.355)	485.214 (2.411)	484.69 (2.323)	485.517 (2.329)	484.55 (2.352)
Sweden	509.591 (2.584)	508.935 (2.485)	508.993 (2.544)	508.905 (2.473)	508.808 (2.592)
Switzerland	525.094 (3.357)	526.159 (3.290)	526.729 (3.327)	527.358 (3.317)	526.426 (3.387)
Thailand	417.140 (3.000)	416.603 (2.912)	417.822 (2.935)	416.606 (2.960)	416.719 (2.909)
Turkey	423.797 (6.705)	422.806 (6.782)	423.372 (6.640)	422.764 (4.713)	424.358 (6.635)
United Kingdom	508.024 (2.404)	508.348 (2.358)	508.852 (2.332)	508.384 (2.369)	507.682 (2.432)
USA	483.489 (2.889)	482.006 (2.806)	483.239 (2.859)	483.442 (2.814)	482.239 (2.861)
Uruguay	421.849 (3.273)	422.829 (3.295)	422.035 (3.328)	422.220 (3.234)	422.066 (3.166)
Yugoslavia	436.530 (3.714)	437.627 (3.742)	436.495 (3.713)	437.454 (3.658)	436.251 (3.629)

Average Gender			
	$\bar{X}$		$\bar{X}$
Australia	.508 (.013)	Latvia	.480 (.012)
Austria	.501 (.016)	Luxembourg	.492 (.006)
Belgium	.521 (.014)	Macao - China	.486 (.015)
Brazil	.464 (.009)	New Zealand	.500 (.020)
Canada	.493 (.006)	Norway	.504 (.008)
Czech Republic	.507 (.018)	Poland	.499 (.007)
Denmark	.491 (.008)	Portugal	.476 (.009)
Finland	.499 (.007)	Russian Federation	.497 (.013)
France	.474 (.014)	Slovak Republic	.512 (.017)
Germany	.503 (.010)	Spain	.492 (.011)
Greece	.483 (.012)	Sweden	.501 (.009)
Hong Kong	.502 (.024)	Switzerland	.507 (.017)
Hungary	.527 (.016)	Thailand	.451 (.013)
Iceland	.516 (.008)	Turkey	.550 (.019)
Ireland	.504 (.009)	United Kingdom	.468 (.015)
Italy	.481 (.017)	USA	.504 (.008)
Japan	.483 (.023)	Uruguay	.488 (.012)
Korea	.595 (.030)	Yugoslavia	.494 (.023)

Table 3.9. Gender Means with Standard Errors by Country.

Social and Cultural Status			
	$\bar{X}$		$\bar{X}$
Australia	.227 (.018)	Latvia	.115 (.025)
Austria	.061 (.028)	Luxembourg	.185 (.014)
Belgium	.152 (.023)	Macao - China	-.902 (.023)
Brazil	-.949 (.045)	New Zealand	.214 (.017)
Canada	.453 (.016)	Norway	.098 (.0234)
Czech Republic	.164 (.021)	Poland	-.201 (.022)
Denmark	.202 (.028)	Portugal	-.630 (.043)
Finland	.247 (.018)	Russian Federation	-.095 (.023)
France	-.078 (.029)	Slovak Republic	-.083 (.026)
Germany	.160 (.024)	Spain	-.297 (.038)
Greece	-.150 (.047)	Sweden	.254 (.025)
Hong Kong	-.758 (.030)	Switzerland	-.058 (.025)
Hungary	-.068 (.022)	Thailand	**-1.183 (.031)**
Iceland	**.691 (.013)**	Turkey	-.980 (.061)
Ireland	-.082 (.030)	United Kingdom	.124 (.021)
Italy	-.111 (.024)	USA	.296 (.027)
Japan	-.076 (.019)	Uruguay	-.346 (.032)
Korea	-.099 (.025)	Yugoslavia	-.230 (.032)

Note: Bolded numbers represent the upper and lower range and are referenced in the text.

Table 3.10. Means and Standard Errors of Socioeconomic and Cultural Status by Nation.

	Family Structure			
	Nuclear	**Single-Parent**	**Mixed**	**Other**
	%	**%**	**%**	**%**
Australia	68.0	21.1	8.3	2.6
Austria	76.5	15.7	6.0	1.8
Belgium	73.2	16.2	8.4	2.2
Brazil	62.4	25.5	6.3	5.8
Canada	70.4	18.0	8.8	2.8
Czech Republic	75.3	12.3	11.2	1.2
Denmark	67.8	21.1	7.3	1.9
Finland	71.3	18.8	8.9	1.0
France	71.2	19.8	7.2	1.8
Germany	74.7	16.6	7.4	1.3
Greece	71.2	23.5	1.2	4.1
Hong Kong	75.0	19.5	**1.1**	4.4
Hungary	72.6	18.3	7.3	1.8
Iceland	71.5	13.5	**13.3**	1.7
Ireland	79.8	15.8	3.4	**1.0**
Italy	80.7	14.7	2.2	2.5
Korea	73.0	20.2	1.2	5.7
Latvia	61.6	24.7	10.2	3.4
Luxembourg	75.0	15.6	6.8	2.6
Macao - China	70.0	23.3	1.6	5.1
New Zealand	66.1	18.5	10.9	4.5
Norway	63.9	27.4	6.5	2.2
Poland	**85.4**	**11.4**	2.0	1.2
Portugal	77.8	15.9	3.2	3.1
Russian Federation	69.5	20.2	7.8	2.5
Slovak Republic	82.9	11.8	4.2	1.2
Spain	83.0	12.8	2.3	1.9
Sweden	66.7	23.5	6.6	3.2
Switzerland	70.6	22.4	4.9	2.1
Thailand	63.3	21.7	2.2	**12.8**
Turkey	58.2	**35.3**	0.9	5.6
United Kingdom	68.6	20.3	9.2	1.8
USA	**56.1**	28.6	11.0	4.3
Uruguay	66.5	23.0	7.1	3.4
Yugoslavia	80.5	14.5	1.8	3.2

Note: Bolded numbers represent the upper and lower range and are referenced in the text.

Table 3.11. Percentages of Family Forms by Nation.

Cultural Items			
	$\bar{X}$		$\bar{X}$
Australia	-.090 (.017)	Latvia	.429 (.023)
Austria	-.020 (.027)	Luxembourg	.051 (.023)
Belgium	-.246 (.024)	Macao - China	**-.496 (.027)**
Brazil	-.209 (.031)	New Zealand	-.111 (.020)
Canada	-.008 (.016)	Norway	.194 (.028)
Czech Republic	.265 (.023)	Poland	.255 (.022)
Denmark	.061 (.027)	Portugal	-.016 (.030)
Finland	.121 (.018)	Russian Federation	.585 (.019)
France	-.020 (.028)	Slovak Republic	.358 (.022)
Germany	.043 (.023)	Spain	.203 (.029)
Greece	.274 (.029)	Sweden	.159 (.024)
Hong Kong	-.426 (.026)	Switzerland	-.355 (.027)
Hungary	.361 (.021)	Thailand	-.189 (.020)
Iceland	**.814 (.015)**	Turkey	.120 (.063)
Ireland	-.238 (.027)	United Kingdom	.015 (.026)
Italy	.219 (.020)	USA	.002 (.023)
Japan	-.409 (.023)	Uruguay	.166 (.029)
Korea	.185 (.025)	Yugoslavia	.190 (.035)

Note: Bolded numbers represent the upper and lower range and are referenced in the text.

Table 3.12. Means and Standard Errors of Cultural Items Index Score.

The Number of Books in the Home			
	$\bar{X}$		$\bar{X}$
Australia	3.920 (.029)	Latvia	3.641 (.032)
Austria	3.437 (.035)	Luxembourg	3.550 (.031)
Belgium	3.407 (.030)	Macao - China	3.666 (.029)
Brazil	**2.162 (.046)**	New Zealand	2.316 (.037)
Canada	3.686 (.019)	Norway	3.958 (.035)
Czech Republic	4.057 (.030)	Poland	4.036 (.036)
Denmark	3.622 (.039)	Portugal	3.824 (.032)
Finland	3.544 (.023)	Russian Federation	3.402 (.032)
France	3.441 (.038)	Slovak Republic	3.175 (.042)
Germany	3.757 (.034)	Spain	3.760 (.042)
Greece	3.275 (.045)	Sweden	3.916 (.044)
Hong Kong	2.540 (.035)	Switzerland	3.453 (.038)
Hungary	4.050 (.033)	Thailand	3.485 (.036)
Iceland	3.437 (.035)	Turkey	3.995 (.032)
Ireland	3.920 (.029)	United Kingdom	3.619 (.045)
Italy	3.401 (.044)	USA	2.886 (.113)
Japan	**4.075 (.023)**	Uruguay	2.404 (.032)
Korea	3.417 (.027)	Yugoslavia	2.875 (.052)

Note: Bolded numbers represent the upper and lower range and are referenced in the text.

Table 3.13. Means and Standard Errors of the Number of Books in the Home.

Home Language			
	$\bar{X}$		$\bar{X}$
Australia	.080 (.006)	Latvia	.005 (.001)
Austria	.082 (.007)	Luxembourg	**.248 (.009)**
Belgium	.040 (.003)	Macao - China	.043 (.008)
Brazil	.003 (.001)	New Zealand	.086 (.007)
Canada	.103 (.008)	Norway	.040 (.005)
Czech Republic	.008 (.002)	Poland	.002 (.001)
Denmark	.031 (.004)	Portugal	.010 (.002)
Finland	.017 (.002)	Russian Federation	.032 (.010)
France	.054 (.008)	Slovak Republic	.013 (.004)
Germany	.056 (.005)	Spain	.016 (.003)
Greece	.030 (.004)	Sweden	.054 (.007)
Hong Kong	.038 (.004)	Switzerland	.090 (.008)
Hungary	.007 (.002)	Thailand	.030 (.011)
Iceland	.016 (.002)	Turkey	.005 (.002)
Ireland	.005 (.002)	United Kingdom	.033 (.005)
Italy	.016 (.002)	USA	.075 (.007)
Japan	.002 (.001)	Uruguay	.016 (.004)
Korea	**.001 (.001)**	Yugoslavia	.013 (.002)

Note: Bolded numbers represent the upper and lower range and are referenced in the text.

Table 3.14. Means and Standard Errors of Home Language.

Highest Parental Educational Level			
	$\bar{X}$		$\bar{X}$
Australia	4.656 (.026)	Latvia	4.829 (.034)
Austria	4.097 (.032)	Luxembourg	4.162 (.038)
Belgium	4.695 (.027)	Macao - China	2.566 (.054)
Brazil	3.969 (.079)	New Zealand	4.317 (.031)
Canada	**4.934 (.019)**	Norway	4.762 (.026)
Czech Republic	4.266 (.028)	Poland	4.112 (.023)
Denmark	4.534 (.038)	Portugal	2.850 (.068)
Finland	4.798 (.025)	Russian Federation	4.895 (.029)
France	4.034 (.045)	Slovak Republic	4.282 (.033)
Germany	4.101 (.039)	Spain	3.734 (.073)
Greece	4.214 (.065)	Sweden	4.709 (.030)
Hong Kong	2.581 (.046)	Switzerland	3.970 (.037)
Hungary	4.323 (.033)	Thailand	**2.414 (.046)**
Iceland	4.307 (.023)	Turkey	3.478 (.164)
Ireland	4.272 (.045)	United Kingdom	4.242 (.032)
Italy	3.935 (.032)	USA	4.752 (.031)
Japan	4.869 (.026)	Uruguay	4.094 (.070)
Korea	4.078 (.041)	Yugoslavia	4.251 (.045)

Note: Bolded numbers represent the upper and lower range and are referenced in the text.

Table 3.15. Means and Standard Errors of Highest Parental Educational Level.

Average and Standard Error of Highest Parental Occupation			
	53.361		51.187
Australia	(.013)	Latvia	(.022)
	47.897		49.721
Austria	(.020)	Luxembourg	(.025)
	51.785		39.850
Belgium	(.013)	Macao – China	(.033)
	43.923		53.283
Brazil	(.030)	New Zealand	(.021)
	51.174		**55.205**
Canada	(.013)	Norway	(.024)
	52.184		44.857
Czech Republic	(.018)	Poland	(.014)
	49.996		44.177
Denmark	(.018)	Portugal	(.023)
	51.088		51.710
Finland	(.015)	Russian Federation	(.021)
	49.962		49.789
France	(.027)	Slovak Republic	(.015)
	50.823		45.886
Germany	(.019)	Spain	(.017)
	47.480		51.648
Greece	(.020)	Sweden	(.022)
	41.064		48.699
Hong Kong	(.019)	Switzerland	(.024)
	49.154		**37.293**
Hungary	(.019)	Thailand	(.023)
	53.880		45.693
Iceland	(.018)	Turkey	(.054)
	49.130		50.063
Ireland	(.022)	United Kingdom	(.019)
	47.985		55.130
Italy	(.018)	United States	(.018)
	50.126		49.532
Japan	(.023)	Uruguay	(.029)
	46.144		49.150
Korea	(.021)	Yugoslavia	(.019)

Note: Bolded numbers represent the upper and lower range and are referenced in the text.

Table 3.16. Means and Standard Errors of Highest Parental Occupational Level.

Highest Educational Level Expected by Student			
	$\bar{X}$		$\bar{X}$
Australia	4.292 (.019)	Latvia	3.742 (.041)
Austria	3.351 (.037)	Luxembourg	3.790 (.026)
Belgium	3.783 (.027)	Macao - China	4.109 (.034)
Brazil	4.447 (.040)	New Zealand	3.865 (.024)
Canada	4.401 (.015)	Norway	3.565 (.026)
Czech Republic	3.782 (.028)	Poland	3.382 (.031)
Denmark	3.463 (.029)	Portugal	3.809 (.042)
Finland	3.989 (.021)	Russian Federation	4.350 (.048)
France	3.673 (.030)	Slovak Republic	3.786 (.039)
Germany	2.660 (.051)	Spain	3.827 (.043)
Greece	4.486 (.032)	Sweden	3.730 (.031)
Hong Kong	4.058 (.030)	Switzerland	2.827 (.048)
Hungary	4.149 (.032)	Thailand	4.008 (.029)
Iceland	3.800 (.018)	Turkey	4.693 (.054)
Ireland	4.125 (.032)	United Kingdom	3.441 (.038)
Italy	4.038 (.031)	USA	4.436 (.016)
Japan	4.134 (.030)	Uruguay	4.077 (.042)
Korea	4.698 (.015)	Yugoslavia	3.911 (.066)

Note: Bolded numbers represent the upper and lower range and are referenced in the text.

Table 3.17. Means and Standard Errors of Highest Expected Student Educational Level.

CHAPTER 4

NATIONAL DETERMINANTS

Research has shown the use of shadow education is growing and an industry has begun to form around it. Every nation in the world has some form of shadow education though the forms vary between nations (Bray 1999). Despite data constraints, single-nation case studies show that within some nations overall private investments in shadow education to be near national education expenditures. For example, in 1998, Korea spent 3.4 percent of the GDP on public education and families spent the equivalent of 2.9 of the GDP on shadow education (Kim and Lee 2004). 1994 household-level data for Turkey indicate that 80 to 87 percent of all households spend 1 to 15 percent of their monthly income on shadow education, and in 7 to 13 percent of all households across all income quartiles spend between 20 and 50 percent of the monthly income on shadow education (Tansel and Bircan 2004). Likewise, in Hong Kong, about one-third of all households spend 1 to 5 percent of their monthly income on shadow education (Bray and Kwok 2003). Clearly the shadow education system is a characteristic of modern education. Moreover families are willing to pay a good portion of their income to supplement formal schooling for their children.

The high percentage of household devoting some expenditure to shadow education shows the great demand for more schooling. This has fostered the institutionalization of formal extracurricular education (Bray 2003). The infamous *juku* and *ronin*, have garnered interest by scientists who sought to explain the extensive use of formal extracurricular schooling in Japan. Students engage an emerging culture created in extra schooling that include lecturers as pop stars (Bray 1995), wearing white headpieces that evoke warring samurai (Rohlen 1980), and indeed identify themselves as warriors (*ronin*).

The demand for more schooling and parents' willingness to pay for it reflects growing parental pressure on students to perform well. This pressure has even led some students to take extreme measures to avoid admitting failure. Recently, one 16 year old boy burned down his home, killing his step-mother and two younger siblings the day his father was to learn he had lied about the score on his English examination (Reuters News 2006). To avoid the meeting, the boy set fire to his house. This is an extreme case - but it points to the serious nature of the meaning of academic performance and family expectations.

GROWTH OF THE SHADOW EDUCATION INDUSTRY

The increase in formal outside of school classes is also occurring outside of Asia. For example, learning centers comprise the fastest growing industry in Canada (Aurini and Davies 2004). One corporation, Kumon, operates more than 22,000 learning centers in 46 countries with an enrollment of over 4.1 million as of June 2009 (Woodward 2009).

The industry of extra schooling is growing even in the United States, which has traditionally shown lower rates of shadow education compared to other nations (Baker et al.

2001). Over the last 8 years Kumon has been ranked number one in "Franchise 500," an American organization which recognizes exceptional examples of entrepreneurialism. In the United States, Kumon has increased its franchise by 41 percent between 2007 and 2008, and predicts an even greater increase between 2008 and 2009 (Business Wire 2009). Moreover, Kumon has seen enrollments grow by more than 55 percent annually which corresponds to an annual industry growth rate of 15 percent (Kumon, Educational Institute 2008).

And Kumon is only one type of learning center in the industry of shadow education; there are many more. Kaplan learning centers are one such example. Kaplan is an American company that has been tutoring students for 70 years but has, over the last 15 years, expanded into 36 countries (Kaplan 2009). Unlike Kumon which focuses primarily on mathematics, Kaplan has a broad curriculum and tutors students in kindergarten through graduate school and those working on professional degrees. Tutoring services include test preparation, English language courses and academic support.

Most recently during its global expansion, Kaplan shifted from a tutoring service to one of degree granting. In Singapore, for example, Kaplan partners with colleges and universities around the world (*e.g.*, University of South Australia, Northeastern University) to offer various diplomas and degrees, including MBAs and Ph.D.s. Programs include Business and Management, Accounting and Finance, Engineering, Information Technology, Communications, Education and Social Sciences. Shadow education is an industry that is quickly growing out of the shadow of formal schools and not only supplements formal education but also competes with it.

ANALYSIS FRAMEWORK

Given the enormous growth of shadow education it is important to understand the prevalence and determinants. Drawing upon 2003 survey data from the Program for International Student Assessment (PISA), this chapter describes the scope and use of shadow education in 36 countries. Then, I test existing theories put forth to explain national level determinants, specifically the modal use theory and credentialism. Lastly, because PISA 2003 contains data on private tutoring and formal classes outside of school, the subsequent section will test whether each form of shadow education, tutoring and formal classes outside of school, have similar determinants

To better understand the factors involved in engaging shadow education I examine if there is a difference between general and math-specific use. I expect to find (*Hypothesis 4.1a*) differences within the two sets of questions PISA poses, the first asks about students' general use of shadow education and the second that asks about students' use of shadow education in mathematics. This measurement assessment is important for further research as the reasons why families purchase shadow education could vary by what purpose shadow education is meant to serve. If, for example, students are expected to pass a high-stakes mathematics examination to gain entrance in a prestigious university it is reasonable to assume the educational need is different from those who need general year-long support in all academic subjects. This suggests the determinants of tutoring and formal outside of school classes could vary. National variations exist in the forms of shadow education (Bray 1999) and institutional arrangements of education systems (Kerckhoff 1995). While some nations do have formal classes outside of school such as *juku* in Japan, and Kaplan and Sylvan Learning Centers, one-on-one tutoring is available in all

nations as it has fewer structural constraints and can therefore be less formal. If both forms of shadow education are available then one might assume tutoring costs are higher and are subsequently more available to upper-class families. I test whether the determinants vary according to the form of shadow education, either tutoring or formal classes outside of school (*Hypothesis 4.1b*). In addition to the form of shadow education I examine if mathematics-specific and general use of shadow education differs, by computing the ratios of mathematics-specific to general use.

The study then proceeds to test whether there is an association between the use of shadow education and the national level of inequality. Credentialism points to the importance of obtaining diplomas from accredited and high status schools which in turn fosters competition between students (Bowles and Gintis 1976; Collins 1979). Credentialist ideas thus beg the question: Do nations with high levels of inequality use more shadow education compared to nations with low levels of inequality? If national levels of inequality are high then there should be more need for students to compete for high-achievement as high performance is linked to elite school placement (*Hypothesis 4.2*).

Next, I turn to the question of enrichment and remediation hours and shadow education. First, I use correlation analysis to measure the power and direction of the relationship between enrichment/remediation and math score. If enrichment and remediation are indeed related to ranking on mathematics I will specify a logistic regression model similar to Baker et al. (2001) using direct measures of both enrichment and remediation.

I expect to find support for Baker et al.'s (2001) theory of the modal use of shadow education, with the majority of students within nations using shadow education for remediation

(*Hypothesis 4.3a*) and not enrichment (*Hypothesis 4.3b*). The high cost of supplemental education coupled with the time investment of both student and parent would suggest that students who are at risk of failure would be most likely to obtain some form of shadow education. However the use of shadow education for remediation and for enrichment need not compete with each other; in some countries both strategies may be used simultaneously. The type of strategies used may be different for different populations of students within a country as well as for different forms of shadow education. For example, Baker et al. (2001) find both strategies are in use in a small number of countries in the TIMSS data. They term these "mixed" nations.

I then separate the composite term, shadow education, into 1) tutoring and 2) outside of school classes and replicate Baker et al. (2001). Are national strategies the same for tutoring as they are for formal classes outside of school? Is the growing availability of formal learning centers in some nations affecting the national strategy? I expect to find similar results as those posed by Baker et al. that a different modal strategy is utilized for tutoring (*Hypothesis 4.3c*) versus formal classes outside of school (*Hypothesis 4.3d*).

In addition to the student-level components that make up national variations in the use of shadow education, the study considers macro-level determinants. In countries with a long history of institutionalized educational system, the quality of mass schooling is less unequal than in countries that are developing education systems (Heyneman and Loxley 1982; 1983). Baker and LeTendre (2005) show that indeed, shadow education is more pronounced in countries with under-developed school systems. Therefore developing countries should be less susceptible to rewarding educational values and elite signals in the classroom, as there is more variance in the

quality of education at the national level. That is to say, if a nation has a newer educational system that is less developed compared to older educational systems, classes in the newer system would be more or less effective in lesson delivery. This fact would encourage the use of shadow education in classes where there is poor lesson delivery but less so in classes with strong lesson delivery. The high number of schools that provide poor lesson delivery would then drive the use of shadow education. Thus, OECD non-member countries are more inclined to engage in shadow education than are OECD member countries (*Hypothesis 4.4*).

Another possible reason for variations in the use of shadow education can be explained through the theory of credentialism. Educational systems with contest mobility[3] (Turner 1960) grow competition. Competition is structured by access to resources (Bowles 1976; Collins 1971) and shadow education can be used to hedge one's advantage in the contest. Therefore credentialism predicts competition will drive the use of shadow education.

There are no direct measures of national-levels of competition in academic achievement so the study uses levels of inequality as a proxy. If nations have high levels of equality in the levels of household wealth, the issue of access to resources becomes moot. The contest then rests on personal merit. If, on the other hand, a nation experiences high levels of inequality access to resources become terribly important which would affect the purchase of shadow education. Therefore the dissertation also considers national levels of inequality measured by the Gini Index[4], where nations with high levels of inequality have higher rates of shadow education compared to nations with low levels of inequality (*Hypothesis 4.5*).

[3] Contest mobility uses meritocracy to advance students through school as opposed to sponsored mobility which uses social connections to advance students.

[4] The Gini Index is a national measure of the distribution of household wealth and income. It is a mathematical computation of inequality based on the ratios of areas under the Lorenz curve. It is specified as

Understanding how much shadow education exists and what drives its use is important as the industry is expanding globally and has not yet received much attention from educationalists. To better understand this global phenomenon, I describe below how much shadow education currently exists and examine national patterns of use.

USE OF SHADOW EDUCATION

According to the population estimates from PISA 2003, shadow education is growing. Figure 4.1 shows every nation within the sample experiences moderate to extensive use of shadow education. Combing both tutoring and formal classes outside of school, on average, 30 percent of students across the entire sample engage in shadow education, up from 20 percent in the Bray (1999) study. Within four years the national average use has increased 50 percent.

The average use of shadow education, at the national level, ranges between 8.3 and 74.0 percent of students. The majority, twenty-two nations, report less than 30 percent participation, while eleven nations report between 30 and 50 percent of students participating, and three nations report more than half of their students engaged in shadow education. In one particular nation, Greece, the vast majority of students, 74 percent, purchase shadow education.

Table 4.1 reports the sample size, average and the upper range of shadow education use in hours per week by nation. Not only do students in all countries within the sample participate in shadow education, some students spend as much time in extracurricular education as they do in school, seen in the upper range report. Students with high participation range from 16 hours

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$G = 1 - 2 \int_0^1 L(X)dX.$ Two agencies report the Gini Index, The CIA and the UN. The UN indices are used in this work.

in Iceland to more than 30 hours per week in Latvia, Turkey and Canada. The average of the upper range is 24 hours per week. Although a minority of students in each nation participates at such high rates, the evidence shows extracurricular education is an essential component of modern education systems, albeit a component that is shadowed by formal schooling.

GENERAL AND MATHEMATICS-SPECIFIC USE

The use of shadow education has been estimated using mathematics-specific outcomes (Baker et al 2001; Baker and Stevenson 1992). Associating the high use of shadow education with Asian countries has led many to consider the impact of extracurricular education on national mathematics rankings, given that many of the highest ranked nations are Asian (*e.g.*, Hong Kong, Taiwan, South Korea). Could previous estimates of shadow education suffer from measurement error by neglecting general use of tutoring and formal classes outside of school? PISA 2003 surveys both the general and mathematics-specific use of shadow education. And Table 4.2 compares the ratios of general to mathematics-specific use of shadow education for tutoring and class outside of school and reveals, on average, students enroll in general shadow education more than twice as often as they do in mathematics-specific shadow education. This holds true for both private tutors and formal classes. Students are twice as likely to utilize general tutors over math tutors and six times more likely to use general classes outside school compared to mathematics-specific classes outside school. While national ratios of general tutoring to mathematics-specific tutoring range from 1.26 to 4.48, general outside of school classes to mathematics-specific outside of school classes range between 1.64 and 23.52.

Mathematics tutoring is much more likely to occur than is formal classes outside school in mathematics.

The consistency of general shadow education being accessed more than twice that of mathematic-specific shadow education across all nations within the sample shows shadow education is not primarily used for remediation or enrichment of mathematics skills. Instead, the vast majority of students enroll in additional schooling to garner skills outside the mathematics domain. The analyses through out the remainder of this study use the general and not the mathematics-specific measure of shadow education.

I begin by describing the sample. Establishing population parameters, I show what percentage of students in each country participates in shadow education and compare the current findings with previous cross-national investigations. Second, I test for variation between the general use of shadow education and shadow education used exclusively for mathematics. PISA 2003 has two sets of identical questions that will allow me to test the theory that there is an unmeasured use of shadow education not reported in the TIMSS (1995) data and case studies reported by Bray (1999). As discussed above, national level studies on the use shadow education report some countries, such as Japan and South Korea, as having more than 80 percent of secondary school students attending outside of school classes or tutoring. However cross-national studies report less usage at the national level. This could be due to the fact that TIMSS tests for mathematics shadow education and therefore the findings from these data are limited in their ability to explain national variations as some nations may use shadow education primarily for other subjects such as language, science, or test preparation.

After establishing the relationship between general and math-specific tutoring and classes outside of school, the study proceeds to look at the relationship between enrichment and remediation. First, I test whether enrichment and remediation are related to mathematics achievement by regression analysis. Then, I specify a binary logistic model to replicate Baker et al.'s (2001) analysis of modal use of shadow education and include direct measures of enrichment and remediation. In addition to testing if a national shadow education modal strategy exists, I test the relationship between national levels of inequality and the use of shadow education.

MODAL STRATEGY

Shadow education has clearly become a primary strategy to enhance the achievement of students in all nations. Why so many families within diverse nations engage in structured forms of education outside of school is still not fully understood. Two structural theories exist to explain this phenomenon. One is the modal use theory which posits shadow education is used either as an enrichment or remediation strategy at the national level. Students at either ends of the achievement distribution stimulate the perceived need to obtain additional education beyond that offered in public schools. The enrichment modal use is based on the theory of human capital (Becker 1964) in that parents of high performing students perceive schools as lacking in advanced skills necessary for competition between high performing students. The perceived need for shadow education is therefore to provide the high performing student with an advantage. Remediation modal use, on the other hand, suggests human capital is required by societies and some nations cannot supply the education needed to guarantee the success of failing

or struggling students through public schools. Instead, families must intervene by purchasing additional lessons outside of school.

The fact that students should not fail in secondary school has become an important feature of schooling in modernity. With the rise of compulsory primary education came the need for advancement in secondary education. Competition for scare jobs forced emphasis on credentials (Collins 1979) whereby students who do not matriculate secondary school do not, as suggested by Stevenson and Baker (1992), experience a modern right of passage. This group of adolescents is removed, and in some ways does not reach adulthood.

The second theory used to explain the use of shadow education internationally is that national expenditures are associated with the participation in shadow education. Nations with low educational expenditures have limited resources which are distributed across schools leaving some students requiring more resources than schools can offer. The supply of shadow education increases, according to this theory, because there is a lack of available education. Therefore demand is driven not only by students but instead by teachers and other educators. For example, in some nations Bray (1999) found teachers held back information in class in order to make monetary gains by offering lessons privately. In other words, if they know that a state-required exam includes material from specific textbooks, teachers intentionally will not cover the test material, instead, families must pay for the student to be taught the material outside class. The result is twofold: teachers profit from shadow education and families must invest in education outside of public schools.

Furthermore, institutional arrangements differ nationally (Kerckhoff 1995). Specifically, the degree of autonomy of education officials and degree of central control matter in the

allocation of educational expenditures. The U.S. education system, for example, with low degrees of centrality and autonomy, is driven by a mixture of funding. In the case of public schools, property taxes are combined with state and federal monies that are allocated by school districts to school sites. These variations of within district funding are linked to achievement as district wealth contributes to school quality (Condron and Roscigno 2003). Moreover, private schools are funded by tuition, and sometimes endowments, which adds to the unequal distribution of resources between schools and districts. Variations in expenditures therefore vary widely between schools and across school districts in the United States. This pattern of funding obscures the effect of national expenditures on educational achievement. Other nations, such as France, have a high degree of centrality and autonomy which suggests a more even distribution of educational expenditures across schools.

To date, three cross-national studies of shadow education exist (Baker et al. 2001; Baker and LeTendre 2005; Stevenson and Baker 1992). Each focuses specifically on the mathematics domain and offer possible country-level explanations for the use of shadow education. High stakes tests were once thought to compel parents to consume extracurricular schooling as a strong link exists between achievement and social destination. High stakes tests act as a sieve that removes low performing students and places them onto a lower track where they receive fewer rewards. Given the pressure on students to earn high scores on exams for placement in prestigious social positions, and the availability of structured classes that teach test-taking (*e.g.* Kaplan, Kumon, Princeton Review), one would assume shadow education is primarily used to assist in the process of creating advantage. Competition for scare resources drives those who are most able to create opportunities for advancement to do so. However this was not supported

through empirical evidence. Stevenson and Baker (1992) found, instead, on a national scale two macro processes determine participation in shadow education. Few nations utilize additional education for enrichment instead the majority of nations use it for remediation. And a small group of nations mixed both enrichment and remediation strategies.

Before testing the modal use theory, I compute correlation coefficients on the relationship between general math scores and the probability of taking enrichment and remedial hours in school. Are there national variations in what constitutes remediation and enrichment hours in class? Is math score relevant in determining enrichment and remediation? Table 4.3 reveals this is not the case. Enrichment and remediation are not necessarily related to achievement. Instead high-performing students take enrichment hours in class in only 5 nations. These countries are Austria, Canada, Czech Republic, Hungary and Poland. In five other nations (Australia, Germany, Portugal, Slovak Republic and Yugoslavia) the direction of the associations are similar but only one coefficient, remediation, is statistically significant. The vast majority of nations in the sample show a negative relationship between remediation and enrichment hours in class and math score. This suggests low-performing students take enrichment *or* remediation hours in most nations. These results disallow the use of these as direct measures to be used in the logistic regressions replicating Baker et al. (2001). Instead I replicate the model specifications of the original study.

Using binary logistic regression, Figure 4.2 shows the national strategies in the use of shadow education to that of Baker et al. (2001). I specify a logistic regression on the probability of using shadow education controlling for SES, home language, gender, an interaction term between SES and math score, and math score. As the direct measures of enrichment and

remediation do not correspond with students' mathematic rankings (a proxy for achievement rankings), I replicate the method used by Baker et al. (2001). Figure 4.2 reports the probability of using shadow education based on the mathematics coefficients where statistical significance and a positive coefficient denote enrichment, statistical significance and a negative coefficient denote remediation and no significance with either a positive or negative coefficient denotes a mixed strategy. Although a similar pattern of national modal use emerges from the PISA 2003 data, the number of nations utilizing a mixed modal use is more than previously reported. This discrepancy can most likely be attributed to the fact that TIMSS data surveyed the mathematics domain while PISA 2003 surveys three domains: mathematics, language and science. Therefore shadow education measures within TIMSS do not reflect general use of shadow education.

According to the PISA 2003 data, twenty-one nations primarily use a remediation strategy, twelve nations mix both remediation and enrichment, and three nations utilize shadow education primarily for enrichment. Two of the three countries that use an enrichment strategy are highly ranked in mathematics when compared to other PISA countries. Korea and the Czech Republic are ranked on mathematics in first and tenth place, respectively. The other country using an enrichment strategy, Thailand, is at the opposite end of the ranking at twenty-seventh place, the second to lowest position. By adopting an enrichment-strategy, nations at both ends of the distribution curve in mathematics seem to exhibit a particular motivation for high performing students. Students who do well will benefit more so from further education outside of school, whereas those students who are average, or below average, are not motivated to purchase education outside of what schools provide.

The following sections investigate individual-level factors as predictors of shadow education. They are included here as they pertain to the Baker et al. replication. While there are important to consider in this macro-investigation of shadow education, they are discussed in more detail in the Chapter 5 where the focus is entirely on individual level determinants.

SOCIOECONOMIC STATUS

One aspect of the debate as to the merits of a shadow education system is social reproduction. Does a system of shadow education exacerbate existing class divisions? To answer this I use logit regression of SES, home language, female status, an interaction term of the product of math score and SES, and math score on shadow education participation where 0 is no use and 1 is use. The coefficients and corresponding standard errors are reported in Table 4.4.

The effect of socioeconomic status (SES) on shadow education varies between countries. The reproduction of class through participation in shadow education occurs in 58 percent of the sampled countries. In 21 countries, every unit increase in the SES composite the probability of participation in shadow education also increases. The class effect on participation ranges from moderately- to highly-significant. At the low end of the range are Thailand, Australia and the Czech Republic where a one unit increase in SES increases the probability of participation in shadow education by 41, 45 and 48 percent, respectively. However, the majority of the 18 countries show much higher probabilities. At the upper range are Austria, France, Hong Kong, Russian Federation, Turkey and the United States, where every increase in the SES composite corresponds to more than a 100 but less than a 150 percent increase in the probability of participating in shadow education. The remaining countries in the sample, however, do not show

statistical significance of SES on participation in shadow education with the anomaly of Sweden, where SES is significant but negatively associated with participation. An increase in SES *decreases* the probability of participation by 88 percent.

In sum, social reproduction is a predictive factor of shadow education in the majority of countries within the sample: Australia, Austria, Belgium, Canada, Czech Republic, France, Germany, Greece, Hong Kong, Ireland, Korea, Norway, Poland, Russian Federation, Slovakia, Switzerland, Thailand, Turkey, United Kingdom, United States, Uruguay and Yugoslavia. However in some nations social reproduction is not: Australia, Brazil, Denmark, Finland, Hungary, Iceland, Italy, Japan, Latvia, Luxembourg, Macao, New Zealand, and Spain. And in one, Sweden, higher-SES corresponds to a lower use of shadow education. Chapter 5 will more closely look at how the use of shadow education is patterned by social class by unpacking *social class* and measuring the power of the relationship with the use of shadow education.

EDUCATIONAL EXPENDITURES

One theory Stevenson and Baker (1992) suggest determines the use of shadow education at the national level is the amount of educational expenditures. Drawing on primary, secondary and post-secondary non-tertiary education data from 2003 generated by UNESCO (2006), there is indeed a pattern of shadow education in relation to education expenditures. The 2003 data are not available for Korea, however the remaining enrichment-strategy nations show lower expenditures, as a percentage of GDP, compared to nations using either a mixed or remedial strategy of shadow education. One reason for this phenomenon could be that nations that provide low school funding necessarily focus on struggling students and do not have resources to

allocate to high- performing students. Thus, the burden falls upon families to provide this extra assistance.

Take for example the previously discussed incident of teacher salary and shadow education. Teachers receiving low pay report say they need to sell lessons to supplement their income (Bray 1999). Some even tell of withholding lessons in order to create this supplemental income. While this action is taken by the teacher, it is a structural social problem as required lessons are not being delivered in class. The level of funding, then, directly affects the educational experience of students. In this situation no arrangements are made to provide extra assistance to students who excel. The strategy for shadow education in this circumstance is to "make up" for a missing component in the formal school.

The allocation of educational expenditures also differs between nations. Language may function to make educational access easier for not only the individual student but also for the schools and nations. For example, the enrichment-strategy nations are generally small in size with homogenous populations. According to the CIA World Factbook (2009), in 2003, there were about 10 million people living in the Czech Republic, of which 90.4 percent (in 2001) were of Czech ethnicity. In Thailand, the population was 63 million, and 75 percent identified as Thai. And despite the larger population of Japan, 127 million in 2003, the majority 98.5 percent, consider themselves Japanese. Allocating resources to homogenous groups is easier compared to heterogeneous ones (Blau 1974). I will discuss in more detail how language affects the use of shadow education in Chapter 5.

CREDENTIALISM

In addition to national expenditures driving the national use of shadow education, credentialism theory posits social class reproduction is maintained through the education system (Collins 1971). The link between social location and social destination has garnered attention since the landmark study of Blau and Duncan (1967) which found the effect of education on social mobility to be larger than the effect of social location (father's income, education level and occupational status). This general view of education as a mechanism of upward mobility has faced challenges by sociologists who suggest that schools do not sort students equally (Sorokin and Lunden 1959; Weber 1946). Not only do schools vary in their power to place students into prestigious colleges and then jobs, but students have more or less access to education in school depending on their socioeconomic status. Instead of being the "great equalizer" schools serve to maintain social class relations, as some schools are endowed with prestige while others are not. This in turn creates a system by which the credentials from prestigious schools hold more weight than credentials from schools with less prestige. This line of research has been critical of the function of schools and has found credentialism to be an important aspect of U.S. schooling in particular (Collins 1979) by generally serving the needs of the ruling class (Bowles and Gintis 1976). Following this reasoning, students in nations with high levels of inequality would be more likely to use shadow education than those who have more equality at the national level, such as that found in socialist or welfare nations.

The amount of time students are engaged in shadow education per week varies greatly between countries. Eight countries, as shown in Table 4.5, report students engage in less than half an hour of extracurricular schooling per week. The majority of these nations are indeed

welfare states with national policies directed at decreasing class inequalities within state institutions and, more specific to this discussion, education. Given these policies target socioeconomic differences within the population, the organization of education is generally centralized ensuring a more even distribution of education. In response, students could be less likely to perceive a need to compete with other students by participating in extracurricular education. Twelve countries average more than half an hour but less than an hour of shadow education. The institutional arrangements of this group vary greatly so no inference can be made as to national policies and participation in shadow education. The middle group of countries, with more than one but less than two hours a week of shadow education, are generally nations in transition (Nee and Swedberg 2007); many are post-communist (*e.g.*, Czech Republic, Poland, Yugoslavia, Russian Federation) another, China, remains communist, albeit with economic policies aimed at global participation. As with the low frequency group of nations, this group has policies directed at equality in accessing resources.

Is national levels inequality a core determinant of shadow education? To test the credentialism theory I use the Gini Index to compare the nations in the PISA 2003 sample on participation in shadow education and national levels of inequality. The Gini Index is a measure of household income that compares the distribution of wealth across a nation. Currently the Gini Index ranges between the lowest inequality, 24, which is found in Denmark, to 74, high-inequality range found in Namibia. Of the nations included in the PISA 2003 sample, the range is between Denmark, 24 and Brazil, 57.

According to credentialism theory, nations with more inequality will be more likely to utilize shadow education than nations with low levels of inequality. Assuming schools

reproduce social class relations, those students in schools with less prestige will, by necessity, utilize shadow education in order to compete with students from the privileged class. As the majority of students do not come from the elite class the national average of shadow education participation will be driven up, while nations with low Gini indices will see students less likely to engage in shadow education as schools are more evenly distributing future opportunities.

Results show an association exists between participation in shadow education and national levels of inequality, also reported in Table 4.5. More than half of nations with less than a half an hour of shadow education participation per week are nations with a corresponding low Gini index. And nations with high levels of inequality have generally high participation in shadow education. This positive relationship holds true for the entire sample though specific cases are anomalies, such as Greece and Korea, with very high shadow education rates and medium levels of inequality.

PRIVATE TUTORS AND STRUCTURED CLASSES OUTSIDE OF SCHOOL

A particular strength of PISA is it separates forms of shadow education into private tutors and structured classes outside school. This allows for a separate evaluation of the determinants of shadow education using these parameters. Figure 4.3 shows the frequencies of tutoring and formal outside of school classes by nation. In the figure, tutoring is reported as a negative only for ease of comparing tutoring with classes outside of school. The tutoring scores are positive and not negative. These findings suggest a separate process occurs for each form of shadow education.

Indeed the logistic regression models on tutoring, reported in Table 4.5, and classes outside of school in Table 4.6, show differences in how shadow education is used. Of particular note is the modal use theory generally holds for outside of school classes, seen in Figure 4.4 however it does not hold for tutoring. The data show all students who engage in tutoring do so for remediation, reflected in Figure 4.5. This is an important consideration for future research as shadow education is broadly defined in the literature however two distinct forms exist, with clear differences. Formal classes outside of school are used in various ways at the national level, but tutoring is used for remediation and this is consistent across nations.

When separating the forms of shadow education into tutoring and classes outside of school, particular changes occur affecting the theory of national strategy. First, the three countries associated with an enrichment strategy (Korea, Czech Republic, and Thailand) remain the same; however five additional countries emerge, Greece, Hong Kong, Japan, Latvia, and Poland. Secondly, two nations that have been previously identified as using remedial strategies are now identified as mixed, Belgium and Finland. Thirdly, three countries associated with a mixed strategy when shadow education was measured as both tutoring and classes outside of school now identify as remedial, Australia, Yugoslavia, and Hungary, when only outside of school classes is considered.

The results are clear – tutoring and formal classes outside of school consist of two very separate processes. While Baker et al. (2001) showed a modal strategy exists at the national level, the pattern of results show the strategy varies by the form of shadow education. Tutoring is used exclusively for remediation in all nations included in the sample. The pattern for formal classes however is similar to that found by Baker et al. (2001). Some nations use shadow

education for enrichment but the majority of nations use it for remediation and a smaller number have a mixed strategy of both enrichment and remediation.

DISCUSSION

Despite variations in the sampled countries, many similarities emerged regarding shadow education and the reasons for its use. First, all nations show a difference in the general and mathematics use of shadow education and support H4.1a. General use is much more prolific than mathematic-specific use. This is an important finding as past comparative studies used mathematics surveys and therefore underestimated the actual amount of shadow education.

Moreover the determinants are not the same for tutoring and formal classes outside of school, supporting H4.1b. The evidence supports a modal strategy of remediation, H4.3d, for classes outside of school. Yet in every nation in the sample tutoring is exclusively purchased for remediation which does not support H4.3c. Familial socioeconomic status is highly correlated with tutoring and much less so for classes outside of school. This indicates tutoring is more expensive and parents purchase individually tailored one-on-one supplemental education for their children so they may avoid academic failure.

When shadow education is measured as both tutoring and classes outside of school, a national modal strategy does indeed exist (Baker et al. 2001). PISA 2003 shows the majority of students within nations use shadow education for remediation not enrichment, supporting H4.3a and H4.3b. The national strategies change however when shadow education is disaggregated into tutors and formal classes outside of school and support H4.3c and H4.3d. While the majority of nations utilize formal classes outside of school for remediation a larger number of

countries for enrichment. Three nations are identified as using an enrichment strategy with the composite measure of shadow education. Isolating only formal classes outside of schools reveals eight nations, more than double, use an enrichment strategy. And perhaps even more revealing is the fact that in all nations tutoring is used for remediation.

Inequality within nations could also affect the use of shadow education. The findings here used descriptive analysis to find associations between national inequality and shadow education; future research should test this relationship more thoroughly. The results broaden the discussion regarding extra schooling in developing and developed nations (see Buchmann and Hannum 2001). This finding suggests that it is not necessarily the economic status of the nation but instead the distribution of equality that helps regulate the use of shadow education. While there are some exceptions, in general, nations with high levels of inequality use much more shadow education than nations with low levels of inequality, which supports H4.2.

The development status of a nation is not directly related to the use of shadow education, H4.4. Instead, H4.5 is supported, national levels of inequality are related the use of shadow education. The theory of credentialism is useful in understanding why national variations in shadow education exist. It is not necessarily the economic development; rather, it is the levels of competition that drive the use of shadow education. This implies families could be using shadow education to maintain their social class. If indeed this is the case, then equity in education is at risk.

National determinants have been found to vary by the form of shadow education. Largely remediation drives its use. But how do families decide whether to participate in shadow education? Is it a simple issue of capital and resources allocation? Or are there patterns

associated with culture, economics and expectations of the future? To answer these questions Chapter 5 will explore family-level determinants, the next step in better understanding why shadow education is used so extensively and is growing so rapidly.

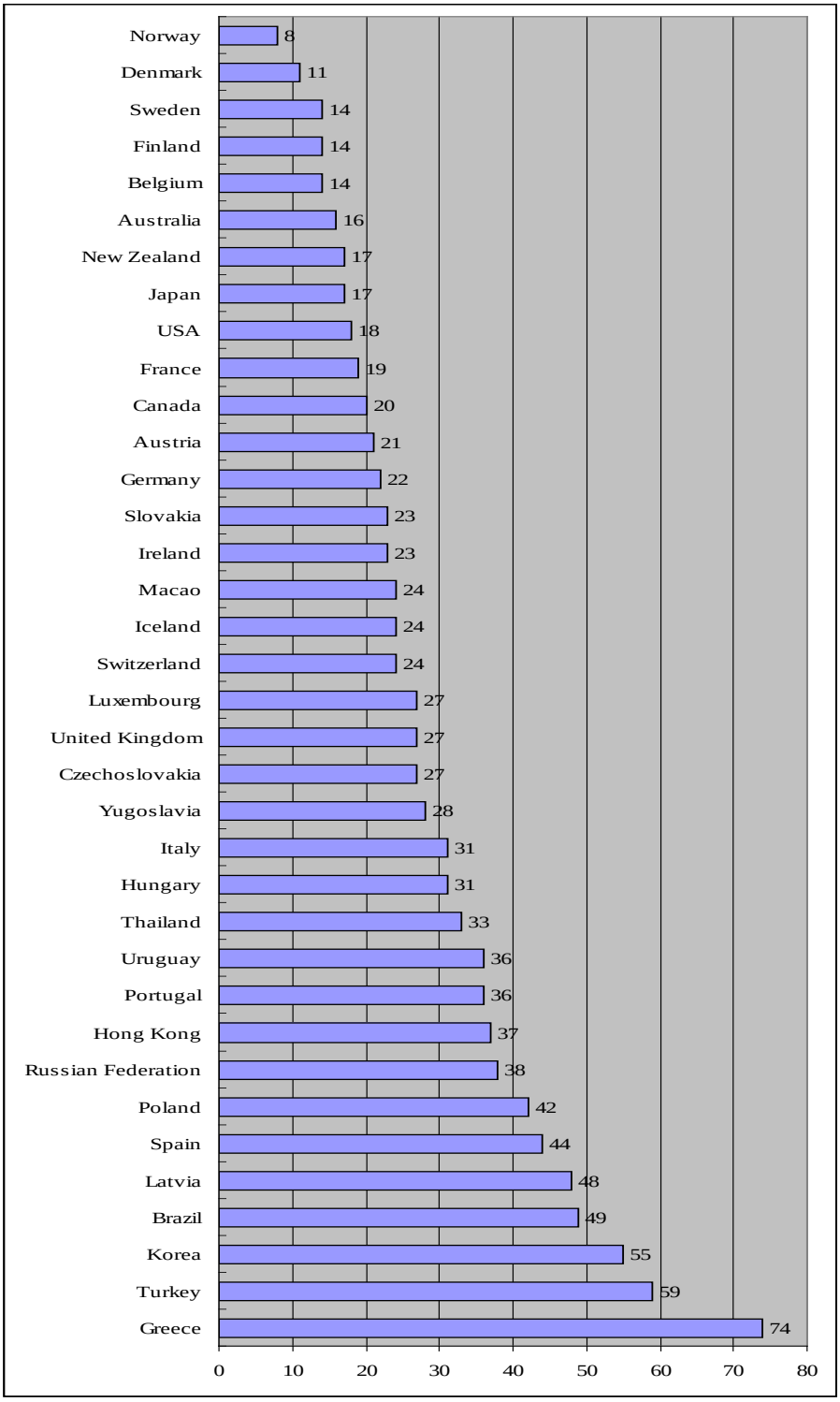


Figure 4.1. Percentage of National Participation in Shadow Education, PISA 2003.

Country	N	Average hours/week	Upper-range
Australia	9990	0.53	21
Austria	3938	0.47	20
Belgium	7433	0.43	20
Brazil	2009	2.35	30
Canada	21894	0.57	35
Czech Republic	5170	1.02	25
Denmark	3399	0.38	22
Finland	5530	0.41	20
France	3459	0.46	20
Germany	3275	0.54	20
Greece	3243	6.76	30
Hong Kong	3998	1.39	20
Hungary	3416	0.99	25
Iceland	2933	0.64	16
Ireland	2300	0.60	20
Italy	9941	1.02	30
Japan	4192	0.62	20
Korea	4028	4.62	30

Continued

Table 4.1. Sample Size, Average Hours per Week and Upper Range of Shadow Education by Nation.

Table 4.1 continued

Latvia	4066	2.46	31
Luxembourg	2292	0.95	24
Macao - China	1063	1.25	30
New Zealand	3275	0.47	24
Norway	2972	0.28	20
Poland	4314	1.48	30
Portugal	3301	1.08	21
Russian Federation	3722	1.84	20
Slovak Republic	6168	0.81	20
Spain	8672	2.42	30
Sweden	3379	0.37	16
Switzerland	5803	0.59	20
Thailand	5230	1.80	28
Turkey	1358	4.27	31
United Kingdom	7533	0.56	25
United States	4416	0.56	20
Uruguay	2751	1.72	30
Yugoslavia	3105	1.00	30

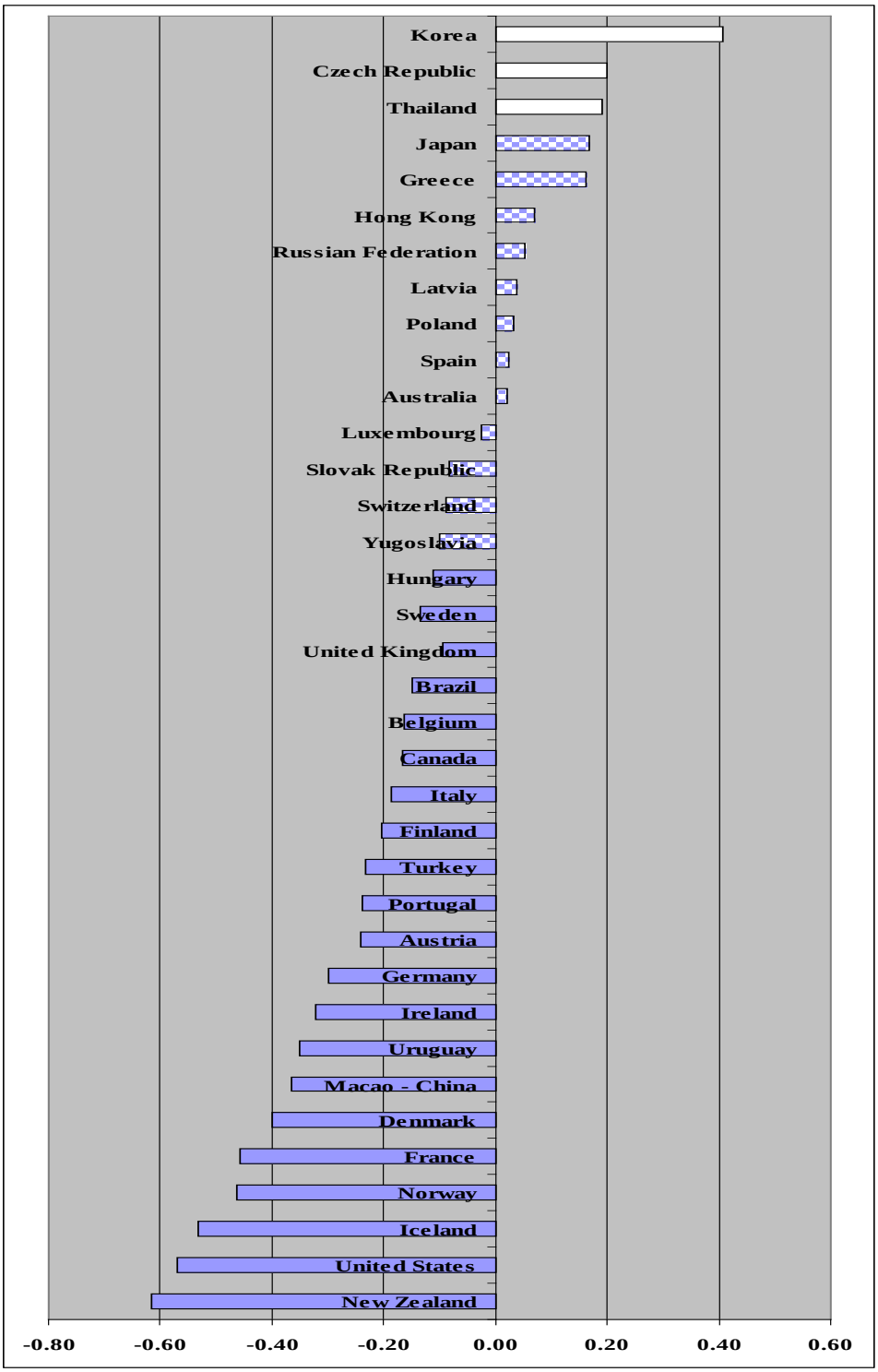
	General Tutor : Math Tutor	General Class : Math Class
Australia	1.64	6.18
Austria	2.13	8.32
Belgium	2.01	6.25
Brazil	1.34	3.80
Canada	1.49	8.49
Czech Republic	2.12	12.98
Denmark	3.70	4.11
Finland	2.13	23.52
France	1.69	2.47
Germany	1.75	3.76
Greece	2.47	3.12
Hong Kong	1.84	2.62
Hungary	2.50	2.24
Iceland	1.76	2.99
Ireland	1.52	4.05
Italy	1.88	12.61
Japan	1.59	1.88
Korea	1.74	2.77
Latvia	2.24	9.85
Luxembourg	1.63	6.23
Macao - China	1.95	2.73
New Zealand	1.95	3.45
Norway	2.09	4.98
Poland	1.89	6.00
Portugal	1.67	2.31
Russian Federation	1.50	3.73
Slovak Republic	4.48	3.21
Spain	1.80	2.84
Sweden	2.09	7.74
Switzerland	1.79	13.56
Thailand	1.77	1.95
Turkey	1.69	2.18
United Kingdom	1.84	4.39
United States	1.46	4.71
Uruguay	2.94	3.02
Yugoslavia	1.50	3.74
Mean	1.97	5.95

Table 4.2. Ratios of General to Mathematics-Specific Use of Shadow Education.

	Correlations and Significance	
	Math/Enrichment	**Math/Remediation**
Australia	+	-**
Austria	+*	-**
Canada	+**	-**
Czech Republic	+**	-**
Germany	+	-**
Hong Kong	+	-
Hungary	+**	-**
Poland	+**	-**
Portugal	+	-**
Slovak Republic	+	-**
Yugoslavia	+	-**
Belgium	-	-**
Brazil	-**	-**
Denmark	-*	-**
Spain	-**	-**
Finland	-**	-**
France	-	-
United Kingdom	-**	-**
Greece	-	-
Ireland	-**	-**
Iceland	-**	-**
Italy	-**	-**
Latvia	-**	-**
Luxembourg	-	-**
Macao - China	-**	-**
Norway	-**	-**
New Zealand	-	-
Sweden	-	-**
Thailand	-	-**
Turkey	-**	-**
Uruguay	-**	-**
USA	-**	-
Switzerland	-**	-**
Japan	+	+**
Korea	+**	+**
Russian Federation	+	+

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

Table 4.3. Direction and Significance of Correlation between Math Score and Enrichment and Remediation Hours by Nation.



Note: Bars denote national strategy: White is Enrichment; Checked is Mixed; Filled is Remediation.

Figure 4.2. Probability of Shadow Education by Nation - Modal Strategy.

	SES	Home Language	Female	Math*SES	Math Score	Constant
Australia	.45 * (.18)	.36 ** (.03)	.30 ** (.05)	.00 (.00)	.00 (.00)	-2.28 ** (.18)
Austria	1.49 ** (.33)	.05 (.06)	.23 * (.09)	-.00 ** (.00)	-.00 ** (.00)	-.66 * (.32)
Belgium	.62 ** (.22)	.02 (.04)	.36 ** (.07)	.00 (.00)	-.00 ** (.00)	-1.16 ** (.23)
Brazil	.30 (.21)	.54 * (.27)	.07 (.09)	.00 (.00)	-.00 ** (.00)	.30 (.38)
Canada	.41 ** (.13)	.30 ** (.02)	.38 ** (.04)	.00 (.00)	-.00 ** (.00)	-1.40 ** (.13)
Czech Republic	.48 * (.24)	.05 (.12)	1.11 ** (.07)	.00 (.00)	.00 ** (.00)	-2.99 ** (.27)
Denmark	-.57 (.35)	.21 * (.09)	.05 (.12)	.00 (.00)	-.00 ** (.00)	-.41 (.39)
Finland	.07 (.28)	.16 (.08)	.48 ** (.08)	.00 (.00)	-.00 ** (.00)	-1.20 ** (.31)
France	.59 (.31)	.27 ** (.07)	.23 ** (.09)	.00 (.00)	-.01 ** (.00)	.37 (.33)
Germany	1.25 ** (.30)	.12 (.07)	.24 ** (.09)	-.00 ** (.11)	-.00 ** (.00)	-.07 (.33)
Greece	.94 ** (.23)	-.05 (.07)	.61 ** (.09)	-.00 (.00)	.00 ** (.00)	.25 (.27)
Hong Kong	.86 ** (.26)	-.04 (.05)	.22 ** (.07)	.00 (.00)	.00 (.00)	-.51 (.30)
Hungary	1.09 ** (.29)	.22 (.15)	.55 ** (.08)	-.00 (.00)	-.00 ** (.00)	-.78 ** (.31)
Iceland	.46 (.29)	.13 (.11)	.34 ** (.09)	-.00 (.00)	-.00 ** (.00)	-1.19 ** (.34)
Ireland	.01 (.33)	.11 (.18)	.07 (.10)	.00 (.00)	-.00 ** (.00)	.28 (.41)
Italy	.70 ** (.14)	-.10 ** (.03)	.14 ** (.05)	.00 (.00)	-.00 ** (.00)	.13 (.15)
Japan	.20 (.37)	-.03 (.36)	.03 (.09)	.00 (.00)	.00 ** (.00)	-2.54 ** (.47)
Korea	.34 (.29)	.03 (.45)	-.09 (.07)	.00 (.00)	.00 ** (.00)	-2.28 ** (.51)

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed. Continued

Table 4.4. Logit Coefficients SES, Home Language, Female, Interaction Term SES and Math Score, Math Score, and Constant on Participation on Shadow Education.

Table 4.4 continued

	SES	Home Language	Female	Math*SES	Math Score	Constant
Latvia	.79 ** (.26)	.02 (.06)	.36 ** (.07)	.00 (.00)	.00 (.00)	-.53 * (.22)
Luxembourg	1.18 ** (.29)	-.01 (.06)	.37 ** (.10)	-.00 ** (.00)	.00 (.00)	-.98 ** (.37)
Macao (China)	.30 (.47)	.01 (.10)	-.16 (.15)	.00 (.00)	-.00 ** (.00)	1.23 * (.60)
New Zealand	.00 (.28)	.45 ** (.05)	-.01 (.10)	.00 (.00)	-.00 ** (.00)	.88 ** (.32)
Norway	-.45 (.39)	.21 * (.90)	-.14 (.14)	.00 (.00)	-.01 ** (.00)	-.49 (.46)
Poland	.88 ** (.25)	.27) (.28	.11 (.06)	.00 (.00)	.00 (.00)	-.66 (.35)
Portugal	.66 ** (.19)	-.17) (.13	.27 ** (.08)	.00 (.00)	-.00 ** (.00)	.85 ** (.31)
Russian Federation	.20 (.25)	-.04) (.07	.35 ** (.07)	.00 (.00)	.00 (.00)	-.89 ** (.23)
Slovakia	1.14 ** (.23)	-.03) (.11	-.39 ** (.06)	-.00 ** (.00)	-.00 * (.00)	-.90 ** (.24)
Spain	.89 ** (.15)	-.26 ** (.05)	.21 ** (.04)	-.00 ** (.00)	.00 (.00)	.12 (.17)
Sweden	-.88 ** (.30)	.21 ** (.07)	.07 (.11)	.00 ** (.00)	-.00 * (.00)	-1.59 ** (.36)
Switzerland	.23 (.23)	.45 (.04)	.43 ** (.07)	.00 (.00)	-.00 * (.00)	-1.11 ** (.24)
Thailand	.41 * (.16)	-.10 ** (.03)	.34 ** (.06)	.00 (.00)	.00 ** (.00)	-.77 ** (.22)
Turkey	.88 ** (.23)	-.34 ** (.16)	.39 ** (.12)	-.00 * (.00)	-.00 ** (.00)	1.91 ** (.39)
United Kingdom	1.16 ** (.20)	.17 ** (.06)	.25 ** (.06)	-.00 ** (.00)	-.00 ** (.00)	-.97** (.20)
United States	-.40 (.23)	.22 ** (.05)	.21 * (.08)	.00 ** (.00)	-.00 ** (.00)	.56 * (.27)
Uruguay	1.07 ** (.20)	-.04 (.12)	.38 ** (.09)	-.00 ** (.00)	-.00 ** (.00)	.89 ** (.26)
Yugoslavia	.99 ** (.26)	-.05 (.13)	.50 ** (.08)	-.00 (.00)	-.00 (.00)	-.62 * (.29)

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

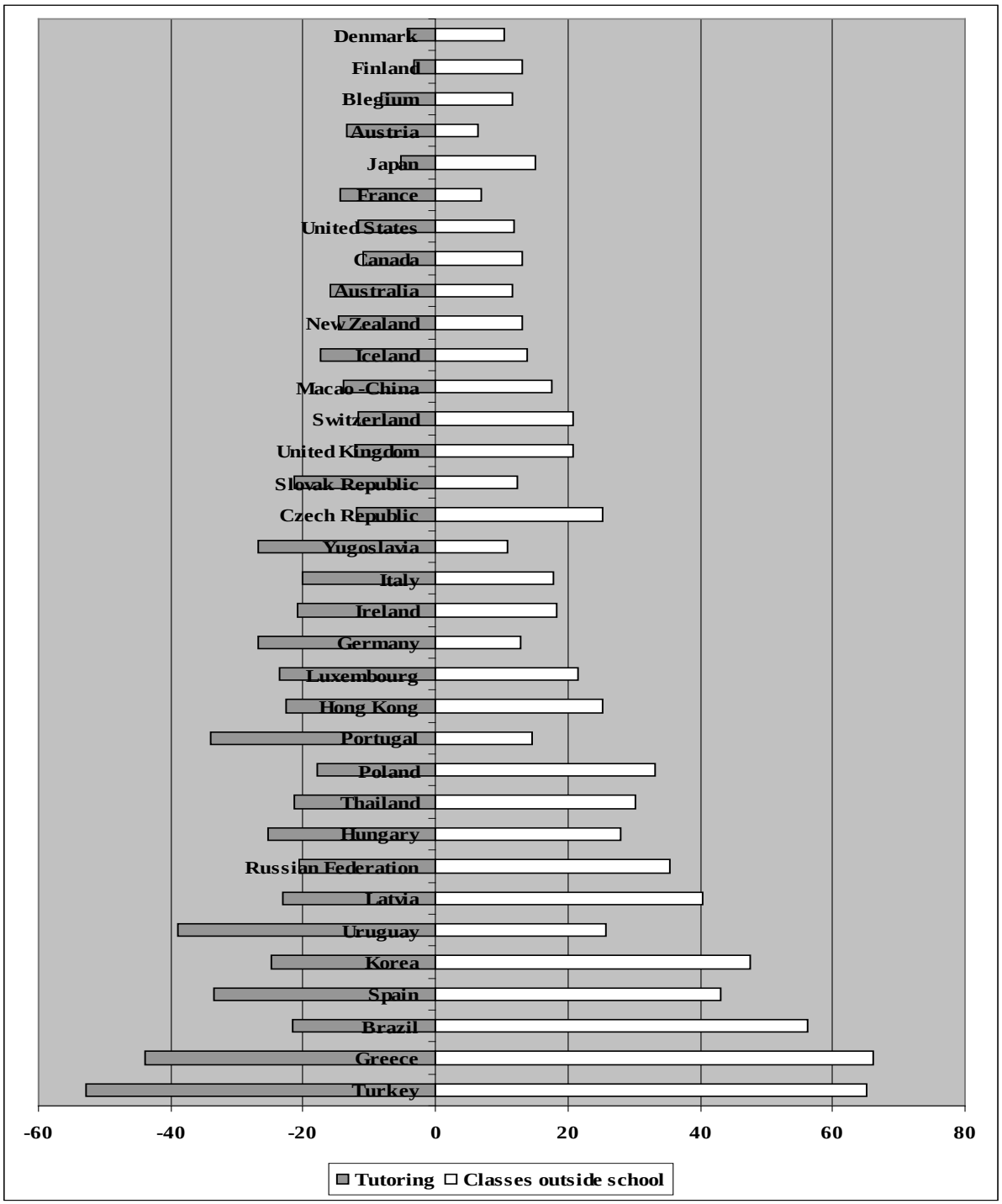


Figure 4.3. Tutoring and Classes Outside of School in Hours per Week by Nation.

	Shadow Education (hours /week)	GINI INDEX
		Low (>30)
Norway	.28	25.8
Sweden	.37	25
Denmark	.38	24.7
Finland	.41	26.9
Germany	.54	28.3
Austria	.47	29.1
Japan	.62	24.9
Slovak Republic	.81	25.8
Hungary	.99	26.9
Czech Republic	1.02	25.4
		Medium (31-41)
Belgium	.43	33
France	.46	32.7
New Zealand	.47	36.2
Australia	.53	35.2
United Kingdom	.56	36.0
United States	.56	40.8
Canada	.57	32.6
Switzerland	.59	33.7
Ireland	.60	34.3
Italy	1.02	36.0
Portugal	1.08	38.5
Poland	1.48	34.5
Russian Federation	1.84	39.9
Spain	2.42	34.7
Latvia	2.46	37.7
Korea	4.62	31.6
Greece	6.76	34.3
		High (>41)
Macao -China	1.25	46.9
Hong Kong	1.39	43.4
Uruguay	1.72	44.9
Thailand	1.80	42.0
Brazil	2.35	57.0
Turkey	4.27	43.6
Data Unavailable		
Iceland	.64	NA
Yugoslavia	1.00	NA

Table 4.5. Instructional Hours per Week Outside of School by Country Ranked by Gini Index Value.

	SES	Language	Female	Math*SES	Math Score	Constant
	.29	.41**	.09	.00	.00 **	-1.72 **
Australia	(.19)	(.03)	(.06)	(.00)	(.00)	(.18)
	1.36**	.04	.19 *	-.00 *	-.00 **	-.06
Austria	(.34)	(.06)	(.10)	(.00)	(.00)	(.34)
	.96**	-.15*	.26 **	-.00	-.01 **	.14
Belgium	(.28)	(.06)	(.09)	(.00)	(.00)	(.29)
	-.03	.62**	.05	.00	-.01 **	2.40 **
Brazil	(.24)	(.21)	(.11)	(.00)	(.00)	(.37)
	.75**	.31**	.20 **	-.00	-.01 **	.29
Canada	(.16)	(.02)	(.05)	(.00)	(.00)	(.16)
	1.02**	.16	.42 **	-.00	-.00 **	-.89 **
Czech Republic	(.29)	(.12)	(.09)	(.00)	(.00)	(.31)
	-1.38**	.19	-.17	.00 **	-.01 **	-.17
Denmark	(.45)	(.13)	(.18)	(.00)	(.00)	(.57)
	-1.3**	.28*	-.16	.00 **	-.01 **	.47
Finland	(.46)	(.12)	(.15)	(.00)	(.00)	(.56)
	.25	.30**	.37 **	.00	-.01 **	.66 *
France	(.30)	(.06)	(.09)	(.00)	(.00)	(.33)
	1.41**	.08	.24 **	-.00 **	-.00 **	.70 *
Germany	(.28)	(.07)	(.09)	(.00)	(.00)	(.31)
	.60**	-.08	.12	.00	-.00 **	.89 **
Greece	(.20)	(.07)	(.07)	(.00)	(.00)	(.22)
	.91**	.00	.10	.00	-.00 **	.17
Hong Kong	(.29)	(.06)	(.08)	(.00)	(.00)	(.32)
	.81**	.08	.48 **	.00	-.00 **	-.44
Hungary	(.28)	(.15)	(.08)	(.00)	(.00)	(.31)
	.80**	.23*	.11	-.00 *	-.01 **	1.38 **
Iceland	(.32)	(.11)	(.10)	(.00)	(.00)	(.38)
	.79*	-.21	.03	.00	-.01 **	1.88 **
Ireland	(.35)	(.19)	(.10)	(.00)	(.00)	(.42)
	.96**	-.12**	-.08	-.00 *	-.00 **	.83 **
Italy	(.15)	(.03)	(.05)	(.00)*	(.00)	(.17)
	.57	.07	-.04	.00	-.01 **	.46
Japan	(.52)	(.38)	(.14)	(.00)	(.00)	(.58)
	.46	-.12	.10	.00	.00 **	-.93
Korea	(.29)	(.41)	(.07)	(.00)	(.00)	(.48)

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed. Continued

Table 4.6. Logit Coefficients and Standard Errors of SES, Home Language, Female, Interaction Term SES with Math, Math Score and Constant on Tutoring.

Table 4.6 continued

	SES	Language	Female	Math*SES	Math Score	Constant
Latvia	1.47** (.30)	.06 (.07)	.20 ** (.08)	-.00 * (.00)	-.00 ** (.00)	-.41 (.26)
Luxembourg	1.51** (.29)	-.10 (.06)	.46 ** (.10)	-.00 ** (.00)	-.00 ** (.00)	.53 (.37)
Macao -China	.56 (.58)	.05 (.11)	-.37 * (.19)	.00 (.00)	-.01 ** (.00)	2.24 ** (.70)
New Zealand	.61* (.31)	.51 ** (.05)	.00 (.10)	.00 (.01))	-.01 ** (.00)	.37 (.33)
Norway	-.46 (.52)	.17 (.12)	-.17 (.19)	.00 (.00)	-.01 ** (.00)	2.22 ** (.58)
Poland	1.15** (.30)	.02 (.30)	-.06 (.08)	-.00 (.00)	-.01 ** (.00)	.94 * (.39)
Portugal	.75** (.18)	-.17 (.13)	.40 ** (.07)	-.00 (.00)	-.00 ** (.00)	1.13 ** (.29)
Russian Federation	.48 (.28)	-.01 (.08)	.43 ** (.08)	.00 (.00)	-.00 ** (.00)	-.89 ** (.26)
Slovakia	1.51** (.23)	-.01 (.10)	.27 ** (.06)	-.00 ** (.00)	-.00 ** (.00)	-.35 (.23)
Spain	.97** (.14)	-.22 ** (.06)	.05 (.05)	-.00 ** (.00)	-.00 ** (.00)	1.56 ** (.17)
Sweden	-1.34** (.34)	.17 * (.08)	.01 (.13)	.00 ** (.00)	-.01 ** (.00)	-.30 (.43)
Switzerland	.35 (.28)	.09 * (.04)	.38 ** (.09)	.00 (.00)	-.01 ** (.00)	.25 (.29)
Thailand	.35* (.17)	-.08 * (.04)	.06 (.07)	.00 (.00)	-.00 ** (.00)	.15 (.24)
Turkey	.51** (.20)	-.31 ** (.12)	.30 ** (.11)	.00 (-.01)	-.01 ** (.00)	3.58 ** (.35)
United Kingdom	1.01** (.25)	.23 ** (.07)	.28 ** (.07)	.00 (.00)	-.00 ** (.00)	-.27 (.26)
United States	-.14 (.27)	.15 ** (.05)	.19 (.10)	.00 ** (.00)	-.01 ** (.00)	1.78 ** (.30)
Uruguay	.90** (.17)	-.05 (.10)	.40 ** (.08)	-.00 ** (.00)	-.00 ** (.00)	1.42 ** (.23)
Yugoslavia	1.21** (.25)	.02 (.12)	.52 ** (.08)	-.00 * (.00)	-.00 ** (.00)	-.31 (.27)

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

	SES	Home Language	Female	Math/SES interaction	Math Score	Constant
Australia	.25	.34**	.41**	.00**	-.00**	-2.45**
	(.22)	(.03)	(.06)	(.00)	(.00)	(.21)
Austria	.37	.14	.01	.00**	-.00**	-1.81**
	(.44)	(.08)	(.13)	(.00)	(.00)	(.46)
Belgium	.34	.11**	.41**	.00**	-.00**	-2.29**
	(.24)	(.05)	(.08)	(.00)	(.00)	(.26)
Brazil	.16	.57*	.23**	.00**	-.00**	.89**
	(.18)	(.26)	(.08)	(.00)	(.00)	(.35)
Canada	.22	.30**	.44**	.00**	.00	-2.66**
	(.15)	(.02)	(.04)	(.00)	(.00)	(.15)
Czech Republic	.38	.09	1.32**	.00**	.00**	-4.03**
	(.26)	(.12)	(.07)	(.00)	(.00)	(.28)
Denmark	-.33	.31**	.17	.00**	-.01**	-.23
	(.35)	(.08)	(.12)	(.00)	(.00)	(.39)
Finland	.38	.12	.59**	.00**	-.00	-1.90**
	(.31)	(.09)	(.08)	(.00)	(.00)	(.33)
France	.55	.18*	.04	.00**	-.00**	-.57
	(.42)	(.09)	(.13)	(.00)	(.00)	(.45)
Germany	.25	.28**	.29	.00**	-.00**	-1.93**
	(.45)	(.10)	(.17)	(.00)	(.00)	(.58)
Greece	.83**	.02	.43**	-.00**	.00	.16
	(.19)	(.06)	(.07)	(.00)	(.00)	(.22)
Hong Kong	.46	-.03	.15*	.00**	.00*	-1.43**
	(.27)	(.06)	(.07)	(.00)	(.00)	(.31)
Hungary	1.47**	.16	.64**	-.00**	-.00**	-.09
	(.28)	(.14)	(.08)	(.00)	(.00)	(.30)
Iceland	-.02	-.04	.50**	.00**	-.01**	.27
	(.34)	(.14)	(.11)	(.00)	(.00)	(.41)
Ireland	-.35	.43**	.28**	.00*	-.00**	-.68
	(.33)	(.15)	(.11)	(.00)	(.00)	(.41)
Italy	-.02	-.05	.38**	.00*	-.00*	-1.34**
	(.15)	(.03)	(.006)	(.00)	(.00)	(.17)
Japan	-.15	.28	-.03	.00*	.00**	-3.22**
	(.39)	(.27)	(.09)	(.00)	(.00)	(.42)
Korea	.42	-.17	-.21**	.00**	.00**	-1.18*
	(.25)	(.45)	(.07)	(.00)	(.00)	(.05)

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed. Continued

Table 4.7. Logit Coefficients and Standard Errors of SES, Home Language, Female, Interaction Term SES with Math Score, Math Score and Constant on Outside School Classes.

Table 4.7 continued

	SES	Home Language	Female	Math/SES interaction	Math Score	Constant
Latvia	.38	-.02	.30 **	.00	.00	-.91 **
	(.25)	(.06)	(.06)	(.00)	(.00)	(.22)
Luxembourg	.36	.11	.44 **	.00	.00	-1.71 **
	(.28)	(.06)	(.10)	(.00)	(.00)	(.38)
Macao - China	-.38	.01	.10	.00	-.00 **	.15
	(.48)	(.10)	(.16)	(.00)	(.00)	(.64)
New Zealand	-.06	.33 **	.06	.00	-.01 **	1.90 **
	(.29)	(.05)	(.11)	(.00)	(.00)	(.34)
Norway	.09	.31 **	-.15	.00	-.00 *	-1.85 **
	(.44)	(.08)	(.14)	(.00)	(.00)	(.50)
Poland	.69 **	.44	.13 *	-.00	.00 **	-1.99 **
	(.25)	(.28)	(.07)	(.00)	(.00)	(.36)
Portugal	.10	.04	.08	.00	-.01 **	.54
	(.23)	(.14)	(.10)	(.00)	(.00)	(.37)
Russian Federation	-.08	.09	.27 **	.00	.00	-.96 **
	(.23)	(.06)	(.07)	(.00)	(.00)	(.22)
Slovak Republic	.65 *	-.05	.43 **	.00	-.00	-1.69 **
	(.28)	(.14)	(.08)	(.00)	(.00)	(.30)
Spain	.77 **	-.27 **	.30 **	-.00 **	.00	-.27
	(.14)	(.05)	(.04)	(.00)	(.00)	(.16)
Sweden	-.76 *	.40 **	.13	.00 **	.00	-3.08 **
	(.33)	(.06)	(.12)	(.00)	(.00)	(.41)
Switzerland	.05	.01	.47 **	.00	.00	-1.70 **
	(.22)	(.04)	(.07)	(.00)	(.00)	(.23)
Thailand	.26	-.12 **	.29 **	.00 *	.00 **	-.79 **
	(.17)	(.03)	(.07)	(.00)	(.00)	(.23)
Turkey	.89 **	-.08	.63 **	-.00 **	-.00 **	1.65 **
	(.20)	(.12)	(.10)	(.00)	(.00)	(.32)
United Kingdom	.83 **	.18 **	.23 **	-.00 **	-.00 **	-1.09 **
	(.20)	(.06)	(.06)	(.00)	(.00)	(.21)
United States	-.80 **	.26 **	.06	.00 **	-.01 **	.02
	(.25)	(.05)	(.09)	(.00)	(.00)	(.30)
Uruguay	.78 **	.05	.41 **	-.00 *	-.01 **	1.37 **
	(.20)	(.11)	(.09)	(.00)	(.00)	(.26)
Yugoslavia	.06	.01	.36 **	.00	-.00 *	-1.59 **
	(.32)	(.16)	(.11)	(.00)	(.00)	(.38)

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

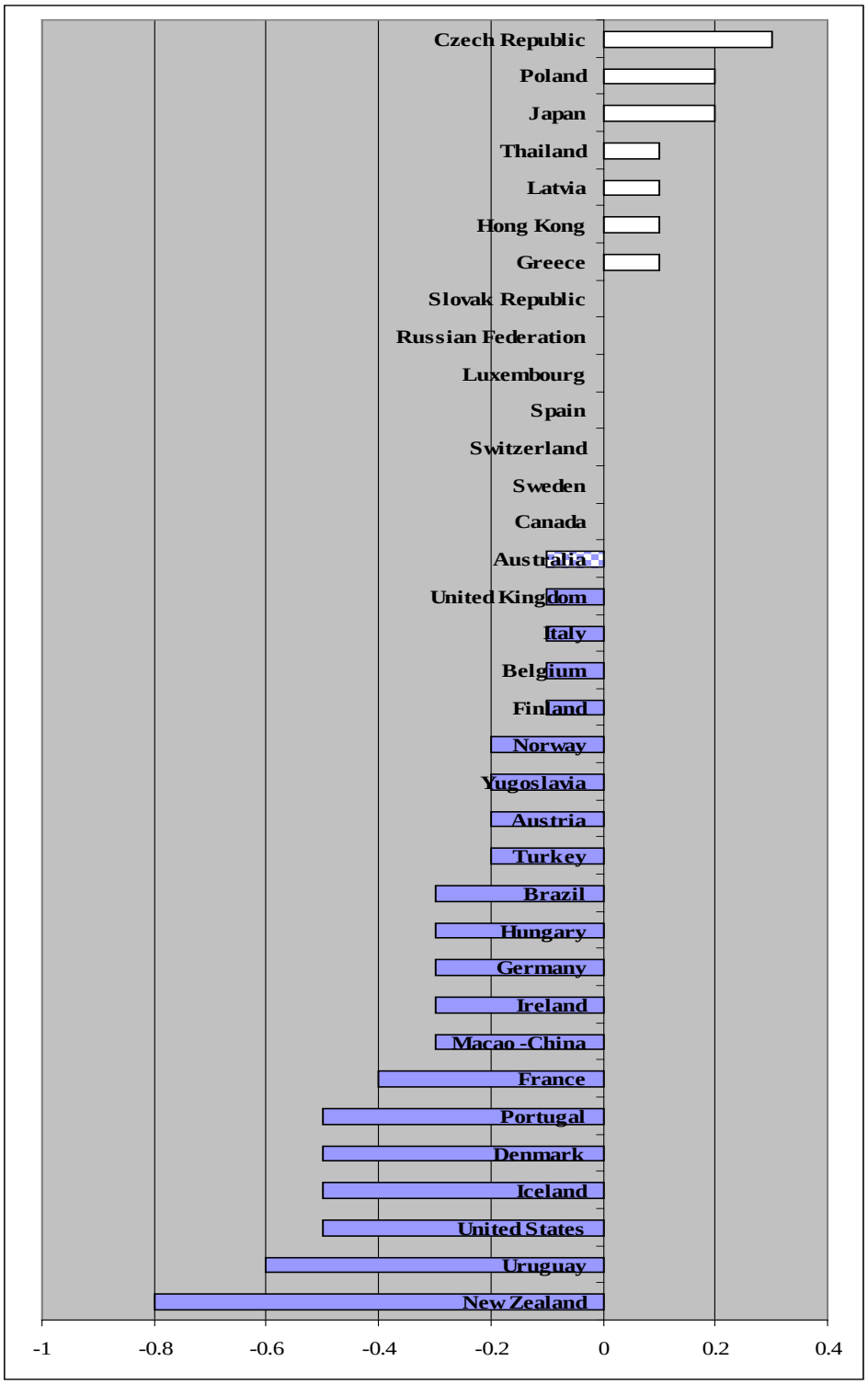


Figure 4.4. National Modal Use of Classes Outside of School.

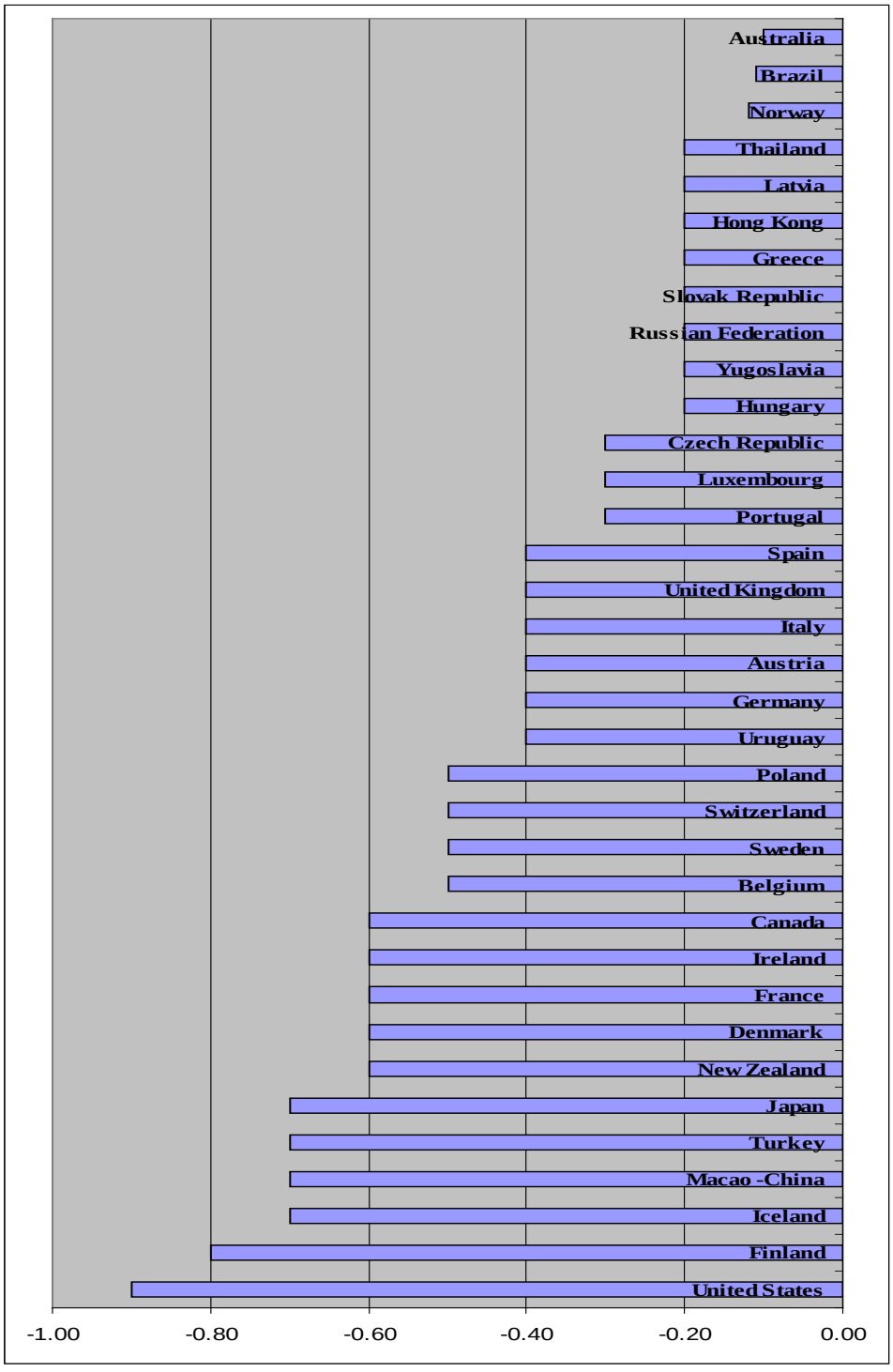


Figure 4.5. National Modal Use of Tutoring.

CHAPTER 5

FAMILY CAPITAL, GENDER AND SHADOW EDUCATION

The family, a primary social institution, is a rich field for the study of educational processes (Blau and Duncan 1967; Bourdieu 1977). For it is within the family that children are socialized, cultured and learn how to interact with both family members and those outside of the family (Parsons and Bales [1956] 1998). Family origin, in the United States, accounts for between 50 and 70 percent of the achievement variance in schooling (Hauser and Featherman 1976). The family determines social class membership which, in turn, orders the educational experience (Lareau 1987), and often class status positions endure throughout one's lifetime and even across generations (Erikson and Goldthorpe 2002; Solon 1992). Education can reduce background effects to some degree, but in almost all industrialized societies, family background remains an important predictor of social class destination in adulthood. The family provides the foundation upon which children build their lives and education sets the trajectory for their potential success (Blau and Duncan. 1967). Educational attainment is the best predictor of economic success (Sewell and Hauser 1975) and academic failure often leads to limited opportunities, even poverty later in life (Wilson 1999). And it is within the family that the decision is made whether or not to purchase shadow education.

This chapter is primarily concerned with the relationship between family levels of capital and shadow education as the decision of whether or not to purchase shadow education is one made within the family. Additionally, the chapter also examines gendered patterns of shadow education. As discussed in Chapter 2, case studies of national shadow education have tested some of these relationships but to date there has been no comprehensive and comparative study which examines the effects of gender and family capital on the use of shadow education. In response to this gap in knowledge, this chapter tests the effects of gender, socioeconomic status, and different forms of social and cultural capital on the participation in shadow education through correlation and binary logistic regressions.

I begin by laying the theoretical foundation through reviewing concepts of capital. Thereafter I discuss, in more detail, the dependent variables of gender, parental educational level and occupation, language, student expectations and cultural capital. Within this discussion I address how each of these factors may contribute to the family decision to purchase shadow education. I then specify two regressions, the first a baseline and the second a cultural model, specifying the probability of purchasing shadow education. The chapter concludes with a discussion of the findings.

CAPITAL

The concept of *capital* is often used to explain the relationship between family background and education. Unlike economic theory which reduces capital to a balance between assets, losses and profit, sociological theory of capital (see Marx [1867] 1992), takes into account intangibles, which cannot be seen but can be empirically measured. Sociologists argue

against an economic theory of capital because it is disinterested in the complex ways power moves throughout society, in particular,

> [Economic theory of capital] defines as disinterested those forms of exchange that ensure the *transubstantiation* whereby the most material types of capital – those that are economic in the restricted sense – can present themselves in the immaterial form of cultural capital or social capital and vice versa…A general science of the economy of practices…must endeavor to grasp capital and profit in all their forms and establish the laws whereby the different types of capital (or power, which amounts to the same thing) change into one another (Bourdieu 1986: 242).

Grasping capital and establishing the laws whereby capital changes into other forms of capital is the work of sociologists. And from this work, it is generally agreed there are three forms of capital: economic, social and cultural.

Economic capital is that which can be transferred into money and property. Economist Gary Becker (1975) extended the concept of economic capital to include human capital, defined as skills and knowledge which can be traded for profit on the job market. He showed that investing in education and building valued skills returns profit through income. Sociologists criticize economic theory as it fails to consider power inherent in all social relations (Collins 1971). For example, how are "valued skills" determined, and is the possibility for learning available to all? And more pertinent to this discussion, do all learning centers provide the same education? Social relations surrounding education are quite complex and not as simple as the reification: investment in education will see future returns. Instead, a more comprehensive social theory that includes the allocation of resources is needed. An alternate theory - much more agreeable to sociologists - is that of social capital (Bourdieu 1986).

SOCIAL CAPITAL

Social capital explains the social relations involved in what Becker (1975) termed human capital. It is defined as, "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (Bourdieu 1986: 248). Social capital has four possible sources: value interjection, bounded solidarity, reciprocity exchanges, and enforceable trust; and must contain three elements: a possessor of social capital, those agreeing to the social capital and the resources themselves (Portes 1998).

The social capital of the family as it relates to educational outcomes of children is one area that has garnered considerable attention (Coleman 1988; Lockheed, Fuller, and Nyirongo 1989; Portes 1998; Putnam 2002; Straková 2007). Interactions within the family create all four sources of social capital detailed above: value interjection, bounded solidarity, reciprocity exchanges, and enforceable trust. For example, a family is generally a group of individuals with a shared value system. Parents deliberately rear children to follow family traditions of morality and behavioral norms. Children most often grow up to internalize these norms and act similarly to parents. One such way this is process occurs is in educational expectations – parents with college degrees interject a valued view of education which children often adopt. Families also create, over time, ties between and among the members due to interactions. This can be seen in a family's tradition to attend a specific college – they are in solidarity bounded by family-membership. Social capital also comes as a response to previously taken actions; the reciprocity between, for instance, a mother and child. The many selfless actions of the mother throughout the child's life are heralded when individuals are caught on television during a college football

game and say into the camera, “Hi Mom!” Another source of social capital is enforceable trust which is a result of the power of community. A child is taught to behave in a particular way and if she does not the family most probably does not notify the police instead, the family decides what sanction to place on the child. Establishing discipline is one way families create trust. Families also constitute the three elements: a possessor of social capital – parental authority, those agreeing to the social capital – children, and the resources themselves – education. In this body of work, social capital is conceived of as parental and kin support.

Family structure is a type of social capital (Sewell and Hauser 1977). It describes various family forms including family size and whether parents are married, single or if a child is reared in an alternative home, such as a foster home or by people entirely outside the family, and structure has been shown to pattern educational outcomes (Coleman 1988). Take for example the partnership status of parents. Children from two-parent families are educationally advantaged when compared to children of other family forms. Children from single-parent homes and those who live with a step-parent have lower levels of education compared to children from two-parent homes (Astone and McLanahan 1991). They also have lower standardized test scores even when other family background factors are controlled (Pong 1997). Children who come from alternative family forms do even more poorly than those from single-parent homes. These children earn lower grades and lower scores on standardized exams, drop out of high school more than other groups and complete less schooling (Astone and McLanahan 1991; Coleman 1988; Hill, Yeung, and Duncan 2001; McLanahan and Sandefur 1994).

Family structure studies also focus on the size of the family (Blake 1989). Sibship size relates to the number of children in the home and an increase in sibship size corresponds to a

decrease in academic achievement (Downey 2001). This durable effect is explained through resource dilution theory which posits a finite amount of capital exists in the family and must be further divided with addition children. It is argued that parents have a limited amount of resources in terms of economics, time to help children with homework, and energy in general to assist and supervise their children. As a family grows larger with additional children, the amount of resources allotted to each child diminishes. This in turn causes lower student outcomes. And when there is only one parent in the home the resources a parent can give to a child is reduced by one half. Some have suggested that lower performance by these children might also be attributed to psychological stress caused by the disruption of the family unit in general (Roscigno and Ainsworth-Darnell 1998)

The family structure effect has been consistent in U.S. studies leading many sociologists to believe that it could be generalized to all societies. However this has not been supported by comparative studies. Comparisons of Africa to the U.S. reveal stark differences. One difference is in many African societies children are often sent to relatives' homes to receive a better education. This could be due to the fact that relative homes are physically closer to schools and, given the infrastructure of many African nations, transportation is difficult for young children (Buchmann 2000). Due to high rates of HIV/AIDS many families distribute children to relatives as they themselves cannot care for them. Take the case of Tanzania in 2004. Just over a third, 34 percent, of children lived with one parent, 12 percent were not living with either parent, and 8 percent had been orphaned (Urassa et al. 2004). In these situations, children could fare better due to the lack of disruption in a home with a chronically ill parent as well as avoid social stigma from locals who could disparage children with parents with HIV/AIDS. Given the poor

occupational opportunities in most African nations, having a father in the home might also be a disruption to student educational opportunity and indeed, Buchmann (2001) found children were more likely to attend school when fathers were not present in the home in some African societies. In these instances fathers are a distraction to the educational process of children as they often are not employed and divert resources away from the children.

Comparative studies have also informed our understanding of sibship size and the ways in which it influences educational outcomes. As noted above, sibship size has shown to be negatively correlated with student outcomes in general. However, this is not the case in all societies. In Malaysia widowhood does not deplete resources, but divorce does (Pong 1986). This could be due to the social stigma associated with divorce, though Pong argues that in fact Malaysians have a very high rate of divorce, but people remarry soon after a divorce is initiated. Children from widowed mothers do not see a reduction in their educational outcomes which implies that the families of the father are still active in the transmission of resources to the child. Pong (1987) also shows that increasing sibship size does not negatively affect children. This could be due to the nature of the Malaysian family, which is not nuclear but extended. Other adults can help disseminate resources which in the U.S. can only be found in the immediate nuclear family. In the U.S., middle-class families have fewer ties with extended families, and indeed value these ties less than their own activities such as soccer practice and music classes (Lareau 1989).

Extended families in Israel have also been show to disperse resources in a comparison of Jews and Arabs (Shavit and Pierce 1999). The sibship relation with educational outcomes is supported in the Jewish sample, however it is not supported in the Arab sample. The family

structure of Arabs includes a large extended network that can include hundreds and even thousands of people. Shavit and Pierce show that these larger networks not only can help transmit resources to any particular child but that these large familiar structures also have political power that can in turn influence a positive affect on their children as a group.

Educational expectations comprise another form of social capital. Students who are reared in homes with high educational expectations outperform students in homes with low expectations (Hao and Bonstead-Bruns 1998). Family characteristics shape the interactions that create expectations (Kohn 1959). Having low aspirations and expectations despite academic competence has been shown to create "lost talent." Drawing on data from High School and Beyond[5] researchers identified high performing students with mismatched expectations (Hanson 1994). Nearly one third of these students had reduced expectations and social class accounted for this reduction. In German families with students on secondary school tracks, social class patterns educational expectations through the motivation of families to maintain family status (Stocké 2007). Student expectation is a form of capital, garnered in the home that directly influences the academic success of students.

Social capital is a useful theory as it helps to explain the educational process as a series of social interactions that order and galvanize social resources which in turn influence attainment, achievement and educational expectations. Factors of social capital such as family structure, parental educational level, occupational level, and student educational expectation, impact the educational process and should therefore affect the use of shadow education.

[5] High School and Beyond (HS&B) is a longitudinal study of students in high school and those recently graduated. It is collected by the National Center for Educational Statistics in the United States and is part of a larger framework interested in the transition into adulthood. The HS&B surveys student who were sophomores and seniors in 1980.

A cross-national analysis will best describe the impact of social capital on the use of shadow education as it provides the opportunity to measure how social capital functions in various national contexts. One cannot generalize that social capital behaves in a similarly across societies. As discussed in Chapter 2, studies have found great differences in the family structure effect on education. Similarly, parental levels of prestige and socioeconomic factors act differently in welfare-states compared with other industrialized nations (Blossfeld and Shavit 1993). Welfare-states have decreased levels of inequality and loose links between social location and destination. A comparative study ought to consider nations separately to measure the effect of social capital on shadow education.

CULTURAL CAPITAL

Defining power as resting solely within people denies the power of symbols. Symbolic power, and the social relations associated with it, need to be considered. Cultural capital theory links the symbolic power of culture with educational advantage. This relationship is of primary interest in the discussion of shadow education as family decision making determines whether or not, and for whom, to purchase extra education. These decisions are structured by *habitus*, the preferences, thoughts, habits and tastes of the family, which are, indeed, cultural.

The theory of cultural capital was developed by Pierre Bourdieu during his research on the relationship between social class and academic performance (Bourdieu 1973). At the time, and even today, popular thought on the divergent academic performances of children of different social classes put the onus of performance – and particularly of failure – on the individual. Biological determinist theories claim the poor are somehow less able – or less fit - than those of

more moderate means (Herrnstein and Murray 1996). Bourdieu noted the improbability of class-based ability and instead began to investigate various forms of capital to explain achievement gaps between the classes. One factor which drew his attention is culture, particularly the usefulness of culture to mediate the educational experience.

Cultural capital can take three forms: embodied, objectified and institutionalized (Bourdieu 1986). Embodied capital is defined as, "long-lasting dispositions of the body and the mind" (98); objectified capital is found in cultural goods such as books, pictures, music, artwork, instruments; and, institutionalized capital, a type of objectified capital, has the ability to bestow legitimation of objects such as an academic credential.

Symbolic power can be exchanged into capital that results in educational benefits. Take for example how music participation in the U.S. influences academic achievement. Low-socioeconomic groups and people of color are disadvantaged in general music participation compared to high-socioeconomic groups and whites and Asians. Moreover, music participation has a positive effect on math and reading scores in early childhood and more so in secondary school (Southgate and Roscigno 2009). Cultural participation has a positive effect on achievement, seen in the above example, attainment (DiMaggio 1982) and generally assists in the navigation of a successful educational experience (Bourdieu and Passeron 1977).

Social scientists who employ cultural capital theory have measured attendance and participation in cultural events, such as music and museums, to show how cultural participation in the culture of the dominant-class advantages students. But the most popular measure has been the number of books in the home as it is most often included in large scale surveys and is comparable across societies. This objectified form of cultural capital has been shown to be a

major determinant of educational success. One study in the Netherlands, for instance, reports the behavior of parents reading to children strongly predicts educational attainment net of social class (De Graaf, De Graaf, and Kraaykamp 2000).

Reading to children is one aspect in a nexus of behaviors that influence educational success. The academic advantage of reading to a child or using the number of books in the home as a proxy of this behavior supports recent research on the production logic of childrearing by social class. Observing families in their homes as well as accompanying some of them on routine tasks such as attending medical appointments and extracurricular activities, Lareau (2002) shows social class is the primary force behind how parents interact with their children. Families of high-socioeconomic status utilize concerted cultivation while families of low-socioeconomic status utilize, instead, natural growth. These distinctions have their bases in cultural capital.

GENDER

In addition to family capital, the study examines how gender affects the use of shadow education. Boys, at one time, were advantaged in education. In many societies men were expected to be the primary source of income for a family and were therefore more likely to attend school, particularly higher education but this fact has changed dramatically over the last 30 years. Global mandatory primary education opened up opportunities for girls as the global economy opened up opportunities for women in the workplace. Today, in many societies, girls outperform boys in achievement and attainment (for a review of gender inequality in education, please see Buchmann, DiPrete and McDaniel 2008.)

The shift in educational achievement between the sexes has moved the sexes towards parity in education yet women still lag behind men in certain subject areas of college, particularly the natural sciences and math. This fact has been offered to explain wage differentials between men and women, after graduation. Most recently one study examined the majors of college students in the United States and found women were more likely to major in feminized disciplines (e.g., education, social sciences, arts, humanities) and avoid majoring in of disciplines of math, science and engineering – where men are concentrated (Bobbitt-Zeher 2007). Women excel in education but follow gendered patterns of inequality through their choices in majors. How these decisions are made are not well understood, however the family is an important source of direction for students. Differences exist in the ways that families pattern educational decision making around sex (Hannum, Kong, and Zhang 2008), though this has not as of yet been examined cross-nationally.

How then does gender affect the use of shadow education? Girls are more likely to perform better in school compared to boys but boys are more likely to take rigorous courses in math and science. If gendered patterns exist, shadow education could be used to further girls' advancement or to support boys in math and science or to assure college placement for both sexes. To answer if gendered patterns exist, the study includes the measure of sex in the regression analysis.

STUDENT ASPIRATIONS

Prior research on developing countries has suggested that school factors are more important than family background factors in determining academic achievement (Heyneman and

Loxley 1983). This is in part due to poor living conditions in underdeveloped nations and partly due to the effect of schools themselves on children. One study that challenged this assumption showed student aspirations directly affect achievement in Thailand and Malawi (Lockheed, Fuller, and Nyirongo 1989). Subsequent studies have also supported the idea that aspirations of children in developing nations could be a larger factor in achievement and attainment (Buchmann and Hannum 2001; Buchmann and Dalton 2002).

In developed nations, student aspirations have been shown to have a direct effect on academic achievement and attainment (Sewell and Shaw 1968). In one recent study, two groups of students within the same high school were observed over time (MacLeod 1995; 2008). One group, called the Brothers, is African American with deep ties to the school through their peers and extra curricular activities. The second group, called the Hallway Hangers, is white and much less connected to school, preferring to "hang out and party" instead of attending class. The major difference between these groups was found in their cultural dispositions, particularly their aspirations. The Brothers assumed they would attend college whereas the Hallway Hangers did not. This fact contributed to the divergent academic paths of the two groups – the Brothers performed at higher levels than the Hallway Hangers. In a follow up study, eight years later, little difference is found between the two groups as structural forces inhibit gainful employment for both groups. Instead, the study highlights the importance of aspirations to directly affect academic performance.

In sum, student aspirations are influenced by family and peers as well as the institutional arrangements of schools. Family background influences a student's aspirations, which in turn affects his or her academic performance. The current study controls for student aspirations in the

model.

FAMILY CAPITAL ON THE USE OF SHADOW EDUCATION

How parents allocate family resources, be they economic, social or cultural, directly affects the use of shadow education. Below, I identify which forms of family capital (Archer and Francis 2006) are associated with participation in shadow education, cross-nationally. I consider how these relationships are patterned by social class and gender. To do so, I first employ correlation analysis to assess the power and direction of the relationship between the measures of capital and shadow education. I then specify logistic regression analysis of family capital on shadow education and discuss implications of my findings.

While there is an abundance of research on the U.S. education system and patterns of stratification within it, less research exists on other nations, most notably countries with economies in transition (Gerber and Schaefer 2004). PISA 2003 allows for a comparison of many different types of countries, including the amount of shadow education students use and how it relates to the social and cultural capital of their families.

RESULTS

Chapter 4 revealed national variations in the patterns of shadow education use – some nations showed very high usage with more than 40 percent of 15 year old students engaged, other nations very low usage, less than 20 percent, and the majority of nations fell someplace in between low and high, as listed in Table 5.1. I turn now to the question of how family capital affects the use of shadow education by comparing regression results across the three levels of

national use (low, medium and high). The outcome of interest is whether or not a student participates in shadow education. The results from the logistic regressions are reported in 2 panels. Panel 1 reports the coefficients and standard errors of gender, family structure, parental levels of education and occupation, language and student educational expectation on the probability of taking shadow education. Panel 2 adds the measures of cultural capital – cultural possessions and the number of books in the home as independent variables. I report the results separately for each nation grouped in categories that correspond to the national use of shadow education (low, medium and high). Tables 5.2, 5.3 and 5.4 report logistic regression coefficients and standard errors of low, medium and high use nations, respectively. I compare nations by the amount of shadow education because what propels a family to use shadow education in a low use nation may not be the same for families in a nation where the majority of children take extra schooling. The mechanisms are probably different when we compare nations with fewer than 20 percent of 15 year olds who purchase extra schooling to a nation with a majority of students in extra schooling. To aid in the interpretation of the logistic regression coefficients, I also compute the log odds ratios and report them throughout the text. When interpreting coefficients in national comparisons the reader is cautioned not to interpret the effect size as comparable across nations since each national sample is separate from the other samples. In other words, a larger coefficient in one nation does not mean there is a larger effect in comparison to another country with a smaller coefficient. No claims can be made regarding the effect size in comparison across nations.

GENDERED PATTERNS

Does the gender of a student affect how shadow education is distributed? We know that educational processes are deeply tied to gender in that boys and girls have very different educational experiences. For example, in the U.S., up until the 1980s, males graduated college at higher rates compared to females. From 1982 until present, female graduation rates have steadily increased and now more females graduate compared to males (Buchmann and DiPrete 2006). In developing countries a similar pattern emerges – females enrollment rates are increasing as political and occupational opportunities for females also increase (Paxton and Hughes 2007). Indeed, some of the differences in school enrollment rates between boys and girls, when comparing Thailand and Kenya for instance, are due to increasing employment opportunities (Buchmann and Brakewood 2000). As females are more integrated with the economy their educational participation increases.

Shadow education may play a significant role in the increase of female participation in education. Correlation analysis, reported in Appendix B, reveals females are more likely to use shadow education compared to males in twenty-five of the thirty-five sampled countries. The average effect is .049, ranging between -.087 in Macao - China and .018 in the Czech Republic. In some nations, being females decreases the likelihood of taking shadow education.

How much of an effect does being female have on the use of shadow education? The regressions in panel 1 reveal in all three national shadow education usage categories the majority of nations report a female advantage, 71 percent of high-use, 78 percent of medium-use and 56 percent of low-use. Four low-use nations with no female advantage include Denmark, New Zealand, Norway and Sweden. Three out of four of these nations, Denmark, Norway and

Sweden, are welfare-states with a history of enacting policy to decrease gender inequality. In 14 of the 18 medium-use nations, females are advantaged in the use of shadow education. Five out of 7 of the high-usage nations show a female advantage with the exception of Brazil and Poland. Being female more than doubles the odds of taking shadow education in the Czech Republic however the odds generally increase by less than two times.

A more complex relationship between female, cultural possessions (ownership of art, poetry or other art objects in the home) and shadow education exists in Hong Kong and Uruguay. The female advantage in Hong Kong is clearly associated with cultural capital. When cultural possessions are excluded in the model, no advantage exists however once cultural capital is introduced, in panel 2, the female advantage becomes apparent. The opposite is true in Uruguay where female is significant until cultural capital is introduced; part of the decision making process regarding to whom family resources are allocated brings parity between the sexes once cultural possessions is controlled. These findings suggest cultural possessions mediate the relationship between gender and extra curricular schooling.

The exception to the female advantage is found in two countries, Ireland and Macao – China, where being female is not significantly associated with the probability of taking shadow education net of other factors. In both nations, females have less power and prestige than males. Ireland is well documented as a male privileging society (Ferguson 2002; Pease and Pringle 2001) and in China males are more valued than females seen in the one-child policy which forces many families to use abortion on female fetuses to be in compliance of federal law and to have a male child (Banister 2004). Modern science allows families to know the sex of an unborn child which in turn has motivated many Chinese families to abort daughters, as sons are more

desirable due to traditional values and inheritance (Johansson and Nygren 1991; Zhu, Lu and Hesketh 2009). It is understandable, then, that girls will receive less shadow education when compared to boys in nations where females are less valued than males.

In nearly all nations, the baseline coefficients of female are reduced in panel 2 when family levels of cultural capital are introduced. Part of the driving force of the female educational advantage can be explained in terms of culture; families take different actions based on cultural norms regarding gender. As noted earlier, females are more likely to major in feminized subjects in college such as Language, Arts and Humanities. Families that value cultural possessions are likely steering females towards these disciplines which reduce the gender gap in shadow education as once cultural possessions are added to the model, these differences are reduced.

Logistic regressions show girls are more likely to participate in shadow education than boys in most countries but do girls also engage in more hours of instruction outside of school? Figure 5.1 provides a visual comparison of hours per week for males and females by nation. Table 5.5 reports that in the majority of nations, girls are on par with boys in terms of the quantity of hours of instruction in outside schooling. The second panel of the table reports the female to male ratio of the quantity of hours of instruction in outside schooling. In 4 countries, Korea, Macao – China, Norway, and Sweden, boys spend significantly more time in extracurricular schooling; and in 4 nations, Czech Republic, Hungary, Switzerland and Yugoslavia, girls spend significantly more time. While girls are more likely to participate in shadow education, they are not generally taking more hours of instruction outside of school.

FAMILY STRUCTURE

How does family structure affect the use of shadow education? As noted above, resource dilution theory explains why large families produce children with lower academic outcomes. It also helps explain why single-parent and mixed families have children with lower success rates than do nuclear families. Comparative research however provides a caveat – in some societies children in large families have more opportunities for academic support. Responsibility for childrearing is more dispersed among other people in the family network. If resources dilution is the force behind variations in the allocation of resources such as shadow education, then one would expect to see an increase in the use of shadow education in nuclear families and a decrease in shadow education in non-nuclear family forms.

Appendix B reports the correlation coefficients of capital measures and shadow education and shows resource dilution theory helps explain variations in the use of shadow education for one-third of the sample. For this group there is a positive and statistically significant relationship between the nuclear family and shadow education. The average magnitude is .049; notably, Korea stands out as the nation where the relationship is double the average magnitude, .091. In no nation is the nuclear family form related to a decrease in shadow education.

According to resource dilution theory, living in a single-parent or mixed family home will reduce extracurricular investments, as it cuts in half the amount of available resources. I measure the effect of family structure on the odds of participating in shadow education in the baseline regression models, summarized in Tables 5.2, 5.3 and 5.4. In general, family structure is not a strong predictor of the use of shadow education. There is little variation in family structure effects on the use of shadow education across the three national usage levels. The

coefficients, when significant, do however perform as expected – in single-parent and mixed-family homes there is a reduction in the probability of using shadow education. In two high-usage cases, Greece and Korea, once student educational expectations are introduced, the negative effect of single parent on shadow education disappears altogether. Comparing groups of nations by shadow education use (low, medium and high) shows single-parenthood reduces the probability of taking shadow education in 11, 17 and 14 percent, respectively, and mixed-family reduces the probability of taking shadow education in 14, 22, and 11 percent, respectively. These results provide some support for dilution theory yet emphasize the importance of national context. In less than a third of the sampled nations, single-parent status or additional people in the home correspond with a reduced likelihood of shadow education. And in some nations, living in a single parent home increases the odds of attending some form of shadow education. For example, in Macao – China, living in a single parent home increases the odds of participating in shadow education one and half times.

One possible explanation for these mixed findings across nations is found in the relationship between socioeconomic status, sibship size and educational achievement. Having a large family does not mean the same thing for all socioeconomic groups. Families with more resources may offer more academic support to children. To illustrate this point, researchers have found two sibship size effects - one positive and one negative - coexist in Switzerland (Wolter and Vellacott 2002). A positive relationship between family size and academic achievement is found within families of high-socioeconomic status and a negative sibship effect on achievement is found in families with low-socioeconomic status. They point out that subgroups within Switzerland are still constrained by resources despite the fact that education is free. Family

forms affect how resources are distributed. From this analysis it seems a persistent effect on shadow education is less common once socioeconomic status is controlled. In other words, when there are more resources available, it matters less if family or society provides it.

PARENTAL SOCIOECONOMIC STATUS

Parental educational level is a strong predictor of shadow education in high- and medium-use nations, 57 and 78 percent, respectively, but less so in low-use nations, 33 percent. And similarly, parental occupation level predicts shadow education in high-, medium-, and low-use nations, 86, 72, and 33 percent, respectively. In general, when significant, an increase in parental education and occupation levels correspond to one times the odds of using shadow education.

Once cultural capital is introduced in panel 2, the effect of parental occupational level on the use of shadow education is reduced to non-significance in Poland and Turkey, (high-usage nations), and Ireland, Switzerland and Uruguay (medium use nations). The addition of cultural capital to the models also reduces the effect of parental education levels on shadow education in Hong Kong, a medium-use nation, and France, a low-use nation.

These results show the integral relationship between cultural capital and socioeconomic status. As status increases, so too do the odds of taking shadow education. This finding is inline with cultural studies of family child rearing logics. Families with higher cultural levels will most likely engage in extracurricular activities of various forms, certainly shadow education is one such activity. And in a small number of nations, once cultural capital is controlled, socioeconomic status is less of a factor in determining whether or not to use shadow education.

This finding suggests that it is cultural (and not necessarily just economic) capital that shapes family decisions about extra curricular schooling.

CULTURAL FACTORS

Gender, family structure and socioeconomic status each influence family decision making regarding shadow education. But academic success can also be explained in terms of factors related to the cultures of various ethnic groups (Feagin and Sikes 1995; Ogbu 1992; Rumberger and Larson 1998; Zhou and Bankston 1998). One such cultural artifact is language. Research on language use centers on immigration and assumes that language differences exist as a result of migration patterns where language mediates the process of assimilation. From this migration perspective, students who speak a language at home than is different from the language that is on school exams generally perform below those who speak the test language at home (Kao and Tienda 1995). Examples of differences between home and school language include speaking the language of nativity at home when at school the language of the host country is used. In this vein, academic achievement is related to the human and economic capital brought by parents and is tethered to the "context of the reception" (Rumbaut 1995:49).

Social scientists, using demographic and historical data to discuss different paths to assimilation in the United States, (Lieberson 2001; Portes and Stepick 1985), show subgroups do well socially where the climate of reception is positive, for example that of Asians. Groups with less supportive or hostile reception, such as Mexicans, may have a more difficult assimilation process and, as a result, their children do more poorly in school compared to Asians (Kao and

Tienda 1995; see also Buchmann and Parado 2006). The "context of reception" similarly affects the educational process of immigrant children.

In an attempt to understand achievement gaps between ethnic groups in the United States, Ogbu (1992) classified migration as either voluntary or involuntary. He showed through qualitative analysis of black students that involuntary migrant children, albeit over 400 years ago, retain an opposition to dominant social structures, such as education. While this theory is well debated (Downey 2008; Farkas 2008; Farkas, Lleras, and Maczuga 2002), it does link achievement to migration status.

Some immigrant groups do very well in the education arena. Take for instance the U.S.-born Punjabi children. Despite the parents' low socioeconomic status their aspirations for their children included high educational achievement. This cultural value aided in what Gibson (1988) terms, "accommodation and acculturation without assimilation." Being a language minority did not dissuade these children from high academic achievement. While some immigrant groups perform at high levels, generally, immigrant students drop out of school more compared to native born, and adding social capital to the models greatly reduces this effect (White and Kaufman 1997).

Despite the wealth of research treating minority language from a migration perspective, minority language can be that of natives and not as a result of migration. In other words, speaking a minority language can occur from native-born subgroups that have experienced colonization or domination from another group who speaks a different language. Consider, for instance, the Baltic countries. While lessons in the official state language are mandatory, there is no set requirement as to the amount of state language to be used in schools in Estonia or Latvia.

In Latvia, a law requesting 60 percent of the teaching in upper secondary school to be in the official language was met with great resistance, primary from Russian speakers. Currently, Latvia has more minority Russian language schools compared to Lithuania or Estonia, "where children from minority communities are increasingly opting for mainstream schooling. This points to perceived differences by parents in the value of the linguistic market for their offspring" (Hogan-Brun 2006). Even Switzerland, a nation that has managed to have multiple official languages for generations, has experienced the growing importance of English; a fact which is threatening the Swiss core-value of multilingualism (Grin and Korth 2005).

Yet another issue in school versus home language is what some have termed the mother tongue. As opposed to minority language, there are some languages that often predate colonization. In Scotland, for example, Gaelic and Scots has reemerged as important cultural artifacts. A recent move by academics to include the language Scots in the annual Scottish census required baseline information on languages - so they surveyed households in Scotland and asked about language use. They found Scots is used as frequently as English, about 47 and 49 percent respectively, while Gaelic is used much less frequently, in about 2 percent of homes (Murdoch 1996). In Iceland, parents of bilingual children were surveyed to ascertain the importance of teaching the mother tongue. While attitudes varied among four different language groups, they all agreed teaching the mother tongue was an important feature that should be required in all schools (Shukurova 2009).

Sociology has a rich history of examining language, codes and meaning (Bourdieu 1991; Garfinkel 1967; Saussure [1964] 1990; Wells 1999). Saussure (1964) argues language as a cultural symbol is the impetus of social action. Words are used to organize meaning yet function

simultaneously as both signifier and signified. Every individual is born into a culture using a language which pre-exists current social configurations and that this language determines cognition.

Not only is language associated with ethnicity, it also signifies one's social identity and social class (Bernstein 2003). Bernstein compares working class with middle class students and shows two forms of codes exist: restricted and elaborated. Restricted codes are short and used by insiders who understand the meaning and assumptions to be made, while elaborated codes need to be explained for outsiders to understand. Moreover he argues restricted codes are used by the working class due to their living conditions and socialization process, compared with the middle class which uses both restricted and elaborated codes. Each of these socialization processes happen during the education process. Inequality is therefore activated at the school through the use of language which is interpreted differently, according to one's social class.

The PISA data show language has a strong statistically significant association to shadow education in 15 nations, seen in Appendix B. Of these 15 nations, 11 have positive and 4 negative associations. The eleven nations where language and shadow education have positive and significant associations are Australia, Brazil, Canada, Denmark, Finland, France, New Zealand, Norway, Sweden, United Kingdom and Uruguay. Speaking the test language at home is associated with participation in shadow education which means those who do not speak the test language at home are less likely to engage in shadow education. Speaking the test language at home is associated with a decrease in the use of shadow education in four nations: Turkey, Thailand, Slovak Republic and Luxembourg. A large percentage of the population in each of these nations speaks a mother tongue language. For instance, the official language in Turkey is

Turkish but there are many ethnic groups that maintain a mother tongue language. The most popular of which are Kurdish – about 18 percent of the population (CIA 2009), Zaza, Arabic, Laz, Armenian and Georgian (Andrews and Benninghaus 1989). In Luxembourg, the official languages are German and French however the majority of people speak Letzeburgesch in the home (Baker and Jones 1998). In the Slovak Republic, as noted above, Russian competes with mother tongue languages. Languages hold symbolic power which signals differentiation among ethnic groups. Take for example, Thailand where there are several languages as a result of indigenous groups competing with imperialist groups for power, and each language is linked to social status. Sanskrit, English, Pali, Japanese, Russian, Kannuang, Paktay, Lao, Teochiu and Standard Thai each hold high status, whereas other mother tongue languages hold low status, for example, Phu Thai, Lavua languages, Kuy Mal, Urak Lawoi (Smalley 1994).

Regression analysis reveals that in nations with low levels of shadow education use, language is significantly related to a decrease in the use of shadow education. In the countries where language decreases the use of shadow education, speaking a different language in the home only slightly decreases the odds of taking shadow education. Language is not statistically significant in any of the high-use nations and is only significant in one medium-use nation. This is most likely due to the fact that by definition high-use nations engage regularly with shadow education regardless of external factors. The findings show that nations with significant language coefficients tend to have high levels of immigration and therefore the effect of language on shadow education is not the result of speaking a mother-tongue.

The strength of cultural capital to mediate family background effects on shadow education is pronounced in the second panel. In all countries, cultural items and the number of books in the home shows a robust positive effect on the use of shadow education. Cultural possessions are a stronger predictor of participation in shadow education than books in the home. An increase in cultural items corresponds to a statistical increase in the use of shadow education in each of the three national groupings, high, medium and low, 86, 72, and 78 percent, respectively. The odds of participating in shadow education increases as much as one and one half times with each corresponding increase in the number of cultural possessions. Families with high levels of cultural capital, therefore, are much more likely to allocate this resource to their children.

The data show the best predictor of shadow education is cultural items in the home as it is consistent across national groupings. And in some cases, discussed above, the addition of cultural measures to the model decreases other effects such as gender, family structure, parental levels of education and occupation, and student expectations. The data also reveal the number of books in the home increases the odds of using shadow education in high-usage nations while it is significant in half of the medium-use nations and in only a third of the low-usage nations. The number of books in the home is a good indicator that educational interactions between parents and children exist in the home, however the possession of cultural items tells a more complete story. The majority of families have many books in the home, even in developing nations and OECD partner countries. Yet it is the addition of cultural items that more thoroughly explains the educational investments made by parents.

CONTROLS

My analysis of PISA data reveal as educational expectation of students increases so too does the odds of using shadow education in high- and medium-use nations, 86 and 83 percent respectively, but less so in low-use nations, 22 percent. Adding cultural capital to the models slightly decreases the odds of participating in shadow education. Indeed, in 2 countries, Belgium and Sweden, once cultural possessions are added to the model, the significance of student expectations is negated altogether.

DISCUSSION

Three types of capital - economic, social and cultural - are intrinsically linked to the educational process. Part of the process that has received little attention, until most recently, is shadow education. Using three broad theories of capital, this chapter has examined the relationships between shadow education and family capital and found cultural capital to have a strong positive effect upon the use of shadow education. Despite national variations in institutional arrangements of educational systems and deep differences in what culture means to groups and subgroups within nations, the use of shadow education has been shown to be patterned by family decisions which are in turn structured by cultural predilections driven by social class.

Social reproduction literature (Bourdieu 1977) points to the ways that social class functions to structure interactions. Specifically, cultural characteristics of the family directly affect the educational experiences of children. It is not only the amount of money that predicts

how much parental investment will be made; it is the social and cultural capital. One aspect of parental investments that can be quantified is shadow education.

This chapter examined various forms of social and cultural capital and found family structure is not driving the use of shadow education. Instead, it is primarily driven by cultural capital. One major finding is regarding language. Language use is found to be significantly related to a decrease in the use of shadow education only in nations with low rates of shadow education use. While majority language use often corresponds with a higher rate of shadow education, the effects of minority language use are more complex. Minority languages act as a stratifying mechanism – the status associated with the language helps shape parental decisions on shadow education. Speaking a different language at home than that which is spoken in school does not generally affect family decisions about shadow education. However this is not the case in low-usage nations. These nations have high immigration rates and immigrants generally have lower socioeconomic status than do natives. It is therefore not necessarily language that dictates behaviors regarding the use of shadow education but socioeconomic status tied to language use.

Family structure helps organize the ways in which resources are delivered to family members. Shadow education is linked to the family form in about a third of the sampled nations. In these, nuclear families are much more likely to use shadow education compared with families of other forms, and children from single-parent homes are significantly disadvantaged in the use of shadow education. One can imagine the opposite to be true, that a reduction in the number of parents would increase the need to seek help for children outside the family thus increasing the use of shadow education. These results suggest – even when considering other forms of family capital – that single-parent families are constrained. Parents with less energy, tangible and

intangible, purchase less shadow education. The majority of nations however do not show significant associations between family form and shadow education once family capital is controlled. This suggests more complex interactions, such as those of extended families, are at work.

The findings strongly support cultural capital theory. In fact, the strongest predictor of whether a family invests in shadow education across nations is the level of cultural possessions. The more cultural objects in the home both in terms of general possessions as well as the number of books, the better the chances are of a family purchasing shadow education. Research has shown families make decisions regarding educational investments based on their social class. One such way is through a childrearing production logic which dictates how resources are allocated. Parents with higher levels of cultural capital provide more activities for their children, especially outside of school. Shadow education is possibly an extension of these extra-curricular activities that emphasizes the importance of educational success.

Another important finding of this chapter is the relationship between shadow education and gender. Nearly one-third of the nations in the sample show females are significantly more likely to engage shadow education compared to males. Regressions showed that being female is highly associated with an increase in the use of shadow education in probability and somewhat in the quantity of use; though in a small number of nations boys do take significantly more hours of shadow education than girls. The rise in female investments in education seems to correspond to opportunities in the workplace (Buchmann and DiPrete 2006; Shavit and Mueller 1998) and political representation of women in general (Paxton and Hughes 2007). Shadow education is one such investment made by the family. While this finding helps identify who receives shadow

education, it leaves unanswered why fewer than half of the sampled nations report a significant relationship between being female and participating in shadow education given the advances made by females in education. This further supports the cultural capital argument. Despite the increase in female participation in education, boys are generally more likely to take shadow education in two-thirds of the sampled nations.

In sum, family decisions regarding shadow education are formed by stratifying structures of social class. The family is structurally constrained yet has autonomy over how to allocate resources. The family decides whether or not to purchase shadow education, for whom, and how much to buy. The family's culture drives the demand for shadow education as parental childrearing production logic, tastes, and preferences all contribute to how a family interacts. Families with more social and cultural capital purchase more education for their children.

Social class structures how parents make educational investments such as shadow education. Comparisons across the 35 nations in the sample reveal the importance of social and cultural capital compared to human capital. In nearly every nation cultural items bettered the odds of purchasing shadow education, net of human and social capital. And cultural capital is developed through social class membership. It is not the case that parents who can pay for extra-schooling do so. Instead, families decide to purchase shadow education to invest in their children's future success only when they believe extracurricular education is the path to that success. Those who buy into this ideology are generally those who have themselves benefitted from education, thus shadow education is indeed one form of social reproduction.

Low	Medium	High
Austria	Australia	Brazil
Belgium	Czech Republic	Greece
Canada	Germany	Korea
Denmark	Hong Kong	Latvia
Finland	Hungary	Poland
France	Iceland	Spain
New Zealand	Ireland	Turkey
Norway	Italy	
Sweden	Luxembourg	
United States	Macao - China	
	Portugal	
	Russian Federation	
	Slovak Republic	
	Switzerland	
	Thailand	
	United Kingdom	
	Uruguay	
	Yugoslavia	

Table 5.1. List of Nations by Amount of Shadow Education Use.

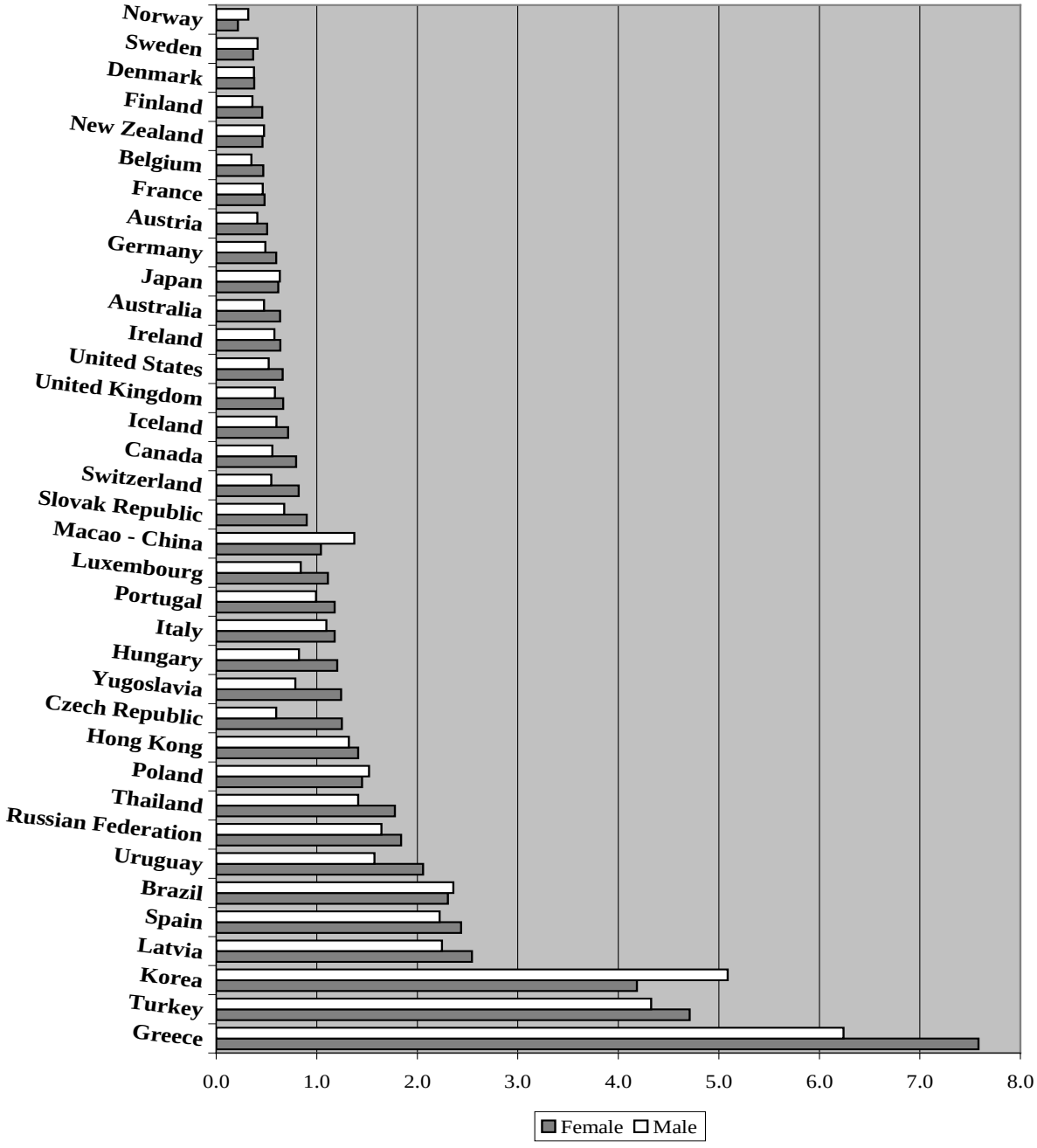


Figure 5.1. Sex Differences in the Use of Shadow Education Number of Hours Per Week by Nation.

	Austria		Belgium		Canada		Denmark	
	(I)	(II)	(I)	(II)	(I)	(II)	(I)	(II)
Female	.288**	.245**	.290**	.257**	.386**	.345**	.097	.085
	(.093)	(.094)	(.076)	(.076)	(.041)	(.042)	(.127)	(.128)
Single parent	-.038	-.011	.169	.208*	-.051	-.032	.172	.180
	(.131)	(.132)	(.104)	(.104)	(.055)	(.056)	(.148)	(.149)
Mixed	-.253	-.222	-.131	-.084	-.258**	-.240**	-.201	-.196
	(.211)	(.212)	(.150)	(.151)	(.079)	(.079)	(.274)	(.274)
Other	.933**	.931**	.242	.248	-.116	-.119	.630	.624
	(.303)	(.304)	(.273)	(.274)	(.132)	(.133)	(.374)	(.374)
Parent Education	.178**	.141**	.101**	.065	.151**	.121**	-.040	-.047
	(.044)	(.045)	(.037)	(.037)	(.023	(.023)	(.057)	(.058)
Parent Occupation	.013**	.010**	.007**	.003	.005**	.004**	-.002	-.002
	(.003)	(.003)	(.003)	(.003)	(.001)	(.001)	(.005)	(.005)
Language	-.005	-.100	-.517**	-.517**	-.795**	-.789**	-.909**	-.927**
	(.188)	(.191)	(.176)	(.177)	(.073)	(.074)	(.281)	(.283)
Student Ed.Expect	.030	-.012	.096**	.044	.135**	.103**	-.013	-.023
	(.041)	(.043)	(.037)	(.037)	(.024)	(.025)	(.055)	(.056)
Books at Home		.105**		.092**		.011		-.017
		(.043)		(.031)		(.017)		(.056)
Cultural Possessions		.101		.216**		.194**		.082
		(.057)		(.044)		(.023)		(.077)
B	-3.314**	-3.151**	-2.668**	-2.332**	-2.635**	-2.291**	-1.122**	-.943*
	(.263)	(.285)	(.240)	(.260)	(.155)	(.162)	(.393)	(.430)
N	3938		7433		21894		3399	

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed. Continued

Table 5.2. Logistics Regression Coefficients and Standard Errors of Family Capital on Shadow Education in Low-Use Nations.

Table 5.2 continued

	Finland		France		New Zealand		Norway	
	(I)	**(II)**	**(I)**	**(II)**	**(I)**	**(II)**	**(I)**	**(II)**
Female	.519**	.458**	.239*	.204	-.022	-.072	-.169	-.180
	(.082)	(.083)	(.111)	(.112)	(.125)	(.126)	(.159)	(.160)
Single parent	-.067	-.018	.106	.110	.213	.245	.060	.072
	(.105)	(.106)	(.139)	(.140)	(.164)	(.166)	(.179)	(.179)
Mixed	-.075	-.033	-.353	-.371	-.001	.048	.026	.049
	(.148)	(.148)	(.243)	(.244)	(.214)	(.216)	(.329)	(.329)
Other	.307	.289	.282	.302	.653**	.720**	.564	.598
	(.402)	(.402)	(.389)	(.390)	(.269)	(.271)	(.419)	(.420)
Parent Education	.063	.036	.088*	.081	.079	.044	.115	.098
	(.037)	(.038)	(.046)	(.046)	(.050)	(.051)	(.090)	(.091)
Parent Occupation	.003	.000	.021**	.019**	-.004	-.006	-.002	-.004
	(.003)	(.003)	(.004)	(.004)	(.004)	(.004)	(.006)	(.006)
Language	-.564*	-.647*	-.858**	-.849**	-1.158**	-1.240**	-.536	-.576
	(.283)	(.286)	(.240)	(.241)	(.192)	(.196)	(.334)	(.337)
Student Ed.Expect	.128**	.096**	-.027	-.044	.053	.014	.001	-.027
	(.038)	(.039)	(.050)	(.051)	(.060)	(.061)	(.073)	(.076)
Books at Home		.075*		-.040		.028		-.009
		(.037)		(.050)		(.053)		(.069)
Cultural Possessions		.183**		.168**		.220**		.136
		(.046)		(.070)		(.074)		(.089)
B	-2.470**	-2.252**	-2.298**	-1.996**	-1.096**	-.711	-2.441**	-2.143**
	(.359)	(.373)	(.312)	(.338)	(.355)	(.396)	(.534)	(.576)
N	5530		3459		3275		2972	

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

Continued

Table 5.2 continued

	Sweden		United States	
	(I)	**(II)**	**(I)**	**(II)**
Female	.104	.095	.314**	.264**
	(.114)	(.115)	(.095)	(.096)
Single parent	-.031	.030	.146	.202
	(.140)	(.141)	(.109)	(.112)
Mixed	-.141	-.119	-.016	.026
	(.248)	(.249)	(.159)	(.160)
Other	.218	.301	.509*	.550**
	(.309)	(.312)	(.225)	(.226)
Parent Education	.013	-.018	.162**	.121**
	(.047)	(.047)	(.047)	(.048)
Parent Occupation	.001	-.003	.000	-.002
	(.004)	(.004)	(.003)	(.003)
Language	-.639**	-.759**	-.648**	-.691**
	(.217)	(.224)	(.166)	(.168)
Student Ed.Expect	.113*	.075	-.019	-.062
	(.053)	(.054)	(.058)	(.059)
Books at Home		.032		.039
		(.052)		(.040)
Cultural Possessions		.236**		.188**
		(.070)		(.053)
B	-1.907**	-1.526**	-2.024**	-1.624**
	(.344)	(.373)	(.328)	(.348)
N	3379		4415	

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

	Australia		Czech Republic		Germany		Hong Kong	
	(I)	(II)	(I)	(II)	(I)	(II)	(I)	(II)
Female	.240**	.220**	.986**	.942**	.347**	.352**	.159	.145*
	(.059)	(.059)	(.071)	(.072)	(.098)	(.098)	(.073)	(.074)
Single parent	-.235**	-.219**	-.113	-.099	-.155	-.154	-.034	-.036
	(.077)	(.078)	(.110)	(.111)	(.139)	(.140)	(.095)	(.095)
Mixed	-.230*	-.219	-.121	-.090	-.453*	-.439*	-.861*	-.882*
	(.115)	(.115)	(.117)	(.118)	(.214)	(.214)	(.395)	(.398)
Other	.135	.143	-.334	-.284	.983**	.980**	-.009	-.045
	(.184)	(.184)	(.358)	(.360)	(.385)	(.387)	(.182)	(.183)
Parent Education	.108**	.082**	.255**	.195**	.115**	.098**	.087**	.056
	(.025)	(.025)	(.041)	(.042)	(.039)	(.040)	(.030	(.030)
Parent Occupation	.007**	.005**	.012**	.010**	.010**	.009**	.026**	.024**
	(.002)	(.002)	(.003)	(.003)	(.004)	(.004)	(.003)	(.003)
Language	-.886**	-.955**	.209	.204	-.162	-.112	-.095	-.095
	(.094)	(.097)	(.390)	(.395)	(.237)	(.239)	(.196)	(.198)
Student Ed.Expect	.289**	.258**	.354**	.274**	-.031	-.050	.263**	.221**
	(.035)	(.036)	(.038)	(.039)	(.035)	(.036)	(.035)	(.036)
Books at Home		.015		.214**		-.076		.039
		(.025)		(.036)		(.045)		(.033)
Cultural Possessions		.173**		.170**		.271**		.223**
		(.032)		(.043)		(.058)		(.047)
B	-2.900**	-2.542**	-4.819**	-5.040**	-2.231**	-1.850**	-2.912**	-2.568**
	(.205)	(.219)	(.436)	(.451)	(.276)	(.290)	(.257)	(.272)
N	9990		5170		3243		3998	

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed. Continued

Table 5.3. Logistics Regression Coefficients and Standard Errors of Family Capital on Shadow Education in Medium-Use Nations.

Table 5.3 continued

	Hungary		Iceland		Ireland		Italy	
	(I)	(II)	(I)	(II)	(I)	(II)	(I)	(II)
Female	.445**	.401**	.328**	.332**	.080	.063	.116*	.103*
	(.089)	(.090)	(.093)	(.093)	(.115)	(.115)	(.050)	(.050)
Single parent	-.161	-.131	-.073	-.098	-.100	-.088	-.049	-.045
	(.117)	(.118)	(.138)	(.140)	(.165)	(.165)	(.071)	(.071)
Mixed	-.003	.012	.120	.107	-.362	-.321	-.017	-.014
	(.173)	(.173)	(.134)	(.134)	(.341)	(.342)	(.169)	(.170)
Other	-.224	-.239	.122	.114	.439	.505	.141	.142
	(.394)	(.394)	(.350)	(.351)	(.557)	(.558)	(.158)	(.159)
Parent Education	.236**	.181**	.043	.051	.149**	.127*	.110**	.092**
	(.048)	(.050)	(.039)	(.039)	(.053)	(.054)	(.022)	(.022)
Parent Occupation	.013**	.011**	.001	.001	.009*	.007	.015**	.013**
	(.004)	(.004)	(.003)	(.003)	(.004)	(.004)	(.002)	(.002)
Language	-.833	-.867	-.498	-.491	-1.221	-1.176	.110	.056
	(.449)	(.459)	(.340)	(.342)	(.654)	(.655)	(.207)	(.208)
Student Ed.Expect	.337**	.255**	-.186**	-.177**	.089	.063	.159**	.120**
	(.053)	(.056)	(.046)	(.047)	(.055)	(.057)	(.024)	(.025)
Books at Home		.081*		-.052		.066		.053**
		(.042)		(.040)		(.048)		(.022)
Cultural Possessions		.236**		-.003		.053		.118
		(.062)		(.064)		(.064)		(.029)
B	-3.427**	-3.140**	-.417	-.293	-1.615**	-1.609*	-2.853**	-2.684**
	(.505)	(.523)	(.398)	(.416)	(.721)	(.734)	(.233)	(.238)
N	3416		2933		2300		9941	

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

Continued

Table 5.3 continued

	Luxembourg		**Macao - China**		**Portugal**		**Russian Federation**	
	(I)	**(II)**	**(I)**	**(II)**	**(I)**	**(II)**	**(I)**	**(II)**
Female	.378**	.337**	-.200	-.208	.239**	.237**	.308**	.290**
	(.111)	(.112)	(.166)	(.167)	(.085)	(.085)	(.079)	(.080)
Single parent	-.124	-.094	.328	.342	-.332**	-.328**	-.067	-.074
	(.160)	(.161)	(.186)	(.186)	(.119)	(.119)	(.100)	(.101)
Mixed	-.142	-.098	.234	.276	-.175	-.174	-.346*	-.341*
	(.233)	(.234)	(.620)	(.627)	(.234)	(.233)	(.153)	(.154
Other	-.702	-.682	.278	.368	-.002	.016	-.267	-.239
	(.451)	(.451)	(.378)	(.381)	(.263)	(.263)	(.273)	(.274)
Parent Education	.061	.043	.085	.055	.135**	.120**	.177**	.151**
	(.044)	(.045)	(.057)	(.058)	(.025)	(.025)	(.046)	(.047)
Parent Occupation	.004	.001	.024**	.021**	.010**	.008**	.003	.002
	(.004)	(.004)	(.007)	(.007)	(.003)	(.003)	(.003)	(.003)
Language	.131	.110	-.093	-.111	.879	.855	.284	.187
	(.143)	(.144)	(.379)	(.384)	(.497)	(.498)	(.249)	(.251)
Student Ed.Expect	.068	.041	-.144*	-.180*	.095**	.077*	.282**	.250**
	(.045)	(.045)	(.076)	(.078)	(.032)	(.033)	(.044)	(.045)
Books at Home		.097*		.036		.082*		.052
		(.045)		(.073)		(.038)		(.035)
Cultural Possessions		.074		.238*		.014		.195**
		(.063)		(.102)		(.051)		(.058)
B	-1.972**	-1.975**	-1.718**	-1.348*	-2.800**	-2.844**	-3.236**	-3.106**
	(.229)	(.254)	(.515)	(.553)	(.510)	(.524)	(.337)	(.342)
N	2292		1063		3310		3722	

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

Continued

Table 5.3 continued

	Slovak Republic		Switzerland		Thailand		United Kingdom	
	(I)	(II)	(I)	(II)	(I)	(II)	(I)	(II)
Female	.390**	.367**	.443**	.402**	.287**	.302**	.183**	.170**
	(.068)	(.069)	(.072)	(.073)	(.066)	(.067)	(.062)	(.062)
Single parent	-.013	-.015	-.216*	-.199*	-.048	-.051	-.164*	-.158*
	(.107)	(.107)	(.092)	(.093)	(.079)	(.080)	(.082)	(.082)
Mixed	.016	.018	.089	.119	-.235	-.206	-.142	-.135
	(.171)	(.171)	(.164)	(.165)	(.220)	(.224)	(.110)	(.110)
Other	.076	.088	.415	.369	-.268**	-.247*	.120	.145
	(.334)	(.335)	(.236)	(.237)	(.101)	(.102)	(.241)	(.241)
Parent Education	.151**	.139**	.103**	.076**	.223**	.186**	.095**	.082**
	(.038)	(.039)	(.028)	(.029)	(.022)	(.023)	(.026)	(.027)
Parent Occupation	.005	.004	.006*	.003	.013**	.011**	.003	.002
	(.003)	(.003)	(.003)	(.003)	(.003)	(.003)	(.002)	(.002)
Language	.065	.060	-.008	-.071	.342	.291	-.321	-.326
	(.401)	(.402)	(.127)	(.129)	(.226)	(.226)	(.217)	(.217)
Student Ed.Expect	.200**	.175**	.112**	.068*	.155**	.113**	.172**	.158**
	(.034)	(.035)	(.030)	(.031)	(.029)	(.030)	(.027)	(.028)
Books at Home		.008		.091**		.175**		.005
		(.034)		(.031)		(.030)		(.027)
Cultural Possessions		.153**		.163**		.169**		.090**
		(.040)		(.041)		(.037)		(.034)
B	-3.207**	-3.114**	-2.537**	-2.340**	-2.698**	-2.723**	-2.166**	-2.010**
	(.428)	(.431)	(.169)	(.186)	(.257)	(.263)	(.255)	(.265)
N	6168		5803		5230		7533	

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed. Continued

Table 5.3 continued

	Uruguay		Yugoslavia	
	(I)	**(II)**	**(I)**	**(II)**
Female	.192*	.187	.402**	.343**
	(.100)	(.100)	(.093)	(.095)
Single parent	-.081	-.072	-.076	-.101
	(.119)	(.119)	(.133)	(.134)
Mixed	-.077	-.065	-.098	-.072
	(.194)	(.195)	(.392)	(.397)
Other	-.435	-.411	.151	.136
	(.323)	(.324)	(.262)	(.263)
Parent Education	.129**	.117**	.169**	.136**
	(.034)	(.035)	(.042)	(.042)
Parent Occupation	.006*	.005	.010**	.006
	(.003)	(.003)	(.003)	(.003)
Language	.070	.051	.060	.083
	(.420)	(.421)	(.481)	(.485)
Student Ed.Expect	.096**	.085*	.204**	.148**
	(.039)	(.040)	(.042)	(.043)
Books at Home		.021		.104**
		(.044)		(.042)
Cultural Possessions		.065		.213**
		(.063)		(.053)
B	-2.225**	-2.145**	-3.259**	-3.023**
	(.450)	(.460)	(.516)	(.526)
N	2751		3105	

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

	Brazil		Greece		Korea		Latvia	
	(I)	**(II)**	**(I)**	**(II)**	**(I)**	**(II)**	**(I)**	**(II)**
Female	.092	.021	.365**	.354**	-.215**	-.231**	.267**	.244**
	(.105)	(.107)	(.102)	(.103)	(.075)	(.075)	(.074)	(.074)
Single parent	-.049	-.003	-.129	-.146	-.228**	-.177*	-.182*	-.185*
	(.123)	(.125)	(.119)	(.119)	(.092)	(.093)	(.088)	(.088)
Mixed	-.073	-.035	1.039	1.076	-.450	-.319	-.144	-.127
	(.211)	(.213)	(.665)	(.667)	(.333)	(.337)	(.123)	(.123)
Other	-.077	-.052	-.486*	-.463*	-.318*	-.263	.084	.088
	(.234)	(.236)	(.230)	(.232)	(.168)	(.169)	(.208)	(.208)
Parent Education	.174**	.150**	.103**	.099**	.213**	.165**	.128**	.107**
	(.031)	(.031)	(.038)	(.039)	(.025)	(.026)	(.043)	(.043)
Parent Occupation	.007	.004	.010**	.010**	.020**	.017**	.012**	.011**
	(.004)	(.004)	(.004)	(.004)	(.003)	(.003)	(.002)	(.002)
Language	-1.225	-1.095	.019	.030	-1.097	-1.137	-.546	-.558
	(1.198)	(1.208)	(.265)	(.266)	(1.329)	(1.355)	(.540)	(.543)
Student Ed.Expect	.068	.030	.516**	.507**	.668**	.593**	.276**	.252**
	(.057)	(.058)	(.054)	(.056)	(.067)	(.068)	(.036)	(.037)
Books at Home		-.005		-.098*		.205**		.029
		(.054)		(.046)		(.036)		(.032)
Cultural Possessions		.348**		.169**		.073		.113**
		(.064)		(.066)		(.044)		(.045)
B	-.237	.106	-2.303**	-1.966**	-3.542**	-3.569**	-1.882**	-1.800**
	(1.224)	(1.236)	(.344)	(.364)	(1.360)	(1.386)	(.583)	(.594)
N	2008		3243		4028		4066	

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed. Continued

Table 5.4. Logistics Regression Coefficients and Standard Errors of Family Capital on Shadow Education in High-Use Nations.

Table 5.4 continued

	Poland		Spain		Turkey	
	(I)	**(II)**	**(I)**	**(II)**	**(I)**	**(II)**
Female	-.003	-.046	.123**	.124**	.348**	.317*
	(.066)	(.067)	(.049)	(.050)	(.145)	(.147)
Single parent	-.045	-.042	-.190**	-.180**	-.075	-.062
	(.106)	(.106)	(.074	(.074)	(.147)	(.149)
Mixed	.037	-.007	-.811**	-.800**	-.459	-.479
	(.235)	(.235)	(.173)	(.173)	(.780)	(.787)
Other	.147	.140	-.453**	-.447*	.014	-.012
	(.309)	(.311)	(.196)	(.196)	(.295)	(.297)
Parent Education	.231**	.195**	.081**	.075**	.161**	.094*
	(.042)	(.043)	(.015)	(.016)	(.045)	(.049)
Parent Occupation	.007**	.004	.006**	.005**	.000	-.003
	(.003)	(.003)	(.002)	(.002)	(.005)	(.005)
Language	-1.364	-1.383	.459	.441	-.003	-.219
	(1.107)	(1.106)	(.262)	(.263)	(.785)	(.788)
Student Ed.Expect	.224**	.169**	.212**	.202**	.314**	.278*
	(.028)	(.030)	(.019)	(.020)	(.123)	(.124)
Books at Home		.046		.044*		.116
		(.030)		(.023)		(.063)
Cultural Possessions		.256**		.014		.197**
		(.044)		(.029)		(.083)
B	-.966	-.690	-2.009**	-2.064**	-2.097*	-1.702
	(1.118)	(1.120)	(.277)	(.283)	(.979)	(.995)
N	4314		8672		1358	

Average Instructional Hours Outside of School by Sex		
	Female	**Male**
Australia	.635	.476
Austria	.507	.408
Belgium	.469	.350
Brazil	2.305	2.360
Canada	.796	.557
Czech Republic	1.251	.596
Denmark	.379	.376
Finland	.458	.360
France	.482	.462
Germany	.598	.489
Greece	7.582	6.241
Hong Kong	1.411	1.320
Hungary	1.204	.823
Iceland	.714	.599
Ireland	.637	.579
Italy	1.179	1.095
Japan	.617	.633
Korea	4.184	5.088
Latvia	2.543	2.245
Luxembourg	1.110	.840
Macao – China	1.043	1.374
New Zealand	.460	.477
Norway	.217	.320
Poland	1.452	1.521
Portugal	1.177	.994
Russian Federation	1.838	1.644
Slovak Republic	.900	.676
Spain	2.435	2.223
Sweden	.369	.411
Switzerland	.821	.549
Thailand	1.777	1.413
Turkey	4.711	4.326
United Kingdom	.665	.585
United States	.662	.522
Uruguay	2.058	1.573
Yugoslavia	1.243	.787

Table 5.5. Instructional Hours Outside of School by Sex.

Average Instructional Hours Outside	
	Female to Male Ratio
Norway	.678**
Macao - China	.759**
Korea	.822**
Sweden	.898**
Poland	.955
New Zealand	.964
Japan	.975
Brazil	.977
Denmark	1.008
France	1.043
Hong Kong	1.069
Italy	1.077
Turkey	1.089
Spain	1.095
Ireland	1.100
Russian Federation	1.118
Latvia	1.133
United Kingdom	1.137
Portugal	1.184
Iceland	1.192
Greece	1.215
Germany	1.223
Austria	1.243
Thailand	1.258
United States	1.268
Finland	1.272
Uruguay	1.308
Luxembourg	1.321
Slovak Republic	1.331
Australia	1.334
Belgium	1.340
Canada	1.429
Hungary	1.463*
Switzerland	1.495*
Yugoslavia	1.579*

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

Table 5.6. Female to Male Ratios of Instructional Hours Outside of School.

CHAPTER 6

DISCUSSION AND CONCLUSION

Shadow education is growing at an impressive rate – yet it still remains generally unnoticed by educationalists and policy makers. In every nation and at all levels of education, at least 20 percent and as much as 80 percent of the student population engages in extracurricular private education in addition to attending formal school. Of those scholars who have studied shadow education, most show concern over the stratifying ability of this form of education. Extracurricular schooling is expensive and requires monetary and time investments by families. This fact suggests only certain types of families will be able to make this investment – those of the middle and upper classes. Others argue shadow education is innocuous, that it is merely one of many paths to acquire human capital (Bray 1999; Tansel and Bircan 2006). This dissertation set out to assess this issue. In so doing, I considered both macro and micro level determinants of shadow education. I began by assessing national strategies regarding the use of shadow education. I then introduced national inequality measures to test whether the use of shadow education can be explained by competition within nations in accordance with

Credentialist theory. Next, I turned to family capital to explain family level decisions about whether to purchase shadow education. I turn now to discuss specifically the central questions posed at the start of this work, and their related findings.

1. Does a national modal strategy exist?

Yes, a national modal strategy exists, however the form of shadow education directly affects the national strategy. The PISA data allowed for a separation of tutoring and learning centers as two different kinds of shadow education. The study shows learning centers are used for enrichment whereas tutoring is not. Instead, tutoring is reserved exclusively for struggling students in all of the sampled nations. This may be due to the higher cost of private tutoring compared with learning centers and the fact that learning centers are a highly formalized type of organization which can keep tuition lower by standardizing lessons and putting in place competition for instructors.

The majority of sampled nations use shadow education for remediation. Struggling students are under pressure to perform better and one way parents can aid in this effort is to purchase extra-schooling for their children. To an adolescent in any developed country, and many developing nations today, failing school means a future filled with constraints. In modern societies there is great value placed on education as well as educational credentials. Completing educational benchmarks serves as a badge of competence; to fail or drop out of school is interpreted as individual incompetence which results in limited job opportunities and a life trajectory of exclusion. Struggling students

are under immense pressure to keep up with the standards put in place at school and the shadow education industry assists students in this goal.

Competition among high performing nations also drives shadow education though this is not the primary strategy for most nations. A very small number of nations use shadow education for enrichment – in these nations, which are primarily high-ranking in mathematic scores in PISA – shadow education is purchased to push forward high-performing students. Not all the top ranked nations in mathematics consume high volumes of shadow education but many do. Of the top ranking nations in mathematics, most are Asian. Asian cultures, associated with Confucius (Tu 1996), value the relationship between effort and ability. From this perspective, the harder one works, the better one performs. Cultural values in other nations work differently - many other cultures consider ability a biological fact; a student is either good or bad at mathematics as seen in the work of Herrnstein and Murray (1996). This difference in cultural assumptions regarding effort helps explain national variations in the volume of shadow education. If a child suffers from low ability in a subject area, additional schooling could be viewed as providing a limited effect.

Another explanation for the variations found in shadow education use between nations is the stratification processes of educational institutions. In nations, such as Germany, where students are sorted into different kinds of schools at an early age and where the type of school one attends determines the occupational and educational opportunities one can pursue later in life. Shadow education is most likely used by those

who intend to go on to higher education. As many students do not intend to continue in an academic track these students would seemingly use less shadow education.

In other nations, such as the United States and Canada, students are not stratified by schools, rather they are sorted by residential location and, therefore, socioeconomic status. One attends schools closest to the home and being schooled in urban and rural areas as opposed to suburban areas is associated with low performance. Canadian high-school students living in small towns or in rural areas are more than twice as likely to drop-out compared with students in large cities (CCL 2009). Drop-out rates are even higher in the U.S. where more than a half of urban and rural high school students fail to graduate (Swanson 2008). Social class determines residency which affects educational performance through peers and family. Living in an urban or rural area, therefore, constrains educational expectations. Shadow education is one path by which families may overcome this environmental limitation but due to limited economic resources many families cannot afford this extra help. One can imagine how this formula of need and lack of resources extends to the nation – those who need the most assistance cannot afford it.

2. How do individual- and family-level variations in family capital affect the use of shadow education? And, more narrowly, how do gender, socioeconomic status, social capital and cultural capital relate to shadow education?

An increase in family capital generally corresponds to an increase in the likelihood of purchasing some form of shadow education. Individual educational

expectations positively affect the likelihood of engaging shadow education, but more consistently high levels of family capital drive the demand for more schooling. While student educational expectation shows a modest effect on the probability of using shadow education, a more robust effect is found in cultural capital. Individual and family level decision making is deeply tied to national contexts, yet cultural capital stands out as a strong determinant. Coming from a home with high levels of cultural capital in nearly all the sampled nations greatly increases the likelihood of participating in shadow education net of gender, socioeconomic status, educational expectations and family structure.

The relationships between family background and shadow education were mixed and heavily dependent on national characteristics. For instance, speaking a language at home that is different from the language on school examinations is only significantly associated with shadow education in nations using very little shadow education. These countries have high rates of immigration and home language is a form of culture that disadvantages students in school. In other nations where more shadow education use is common, language at home is not associated with shadow education. Speaking a mother tongue language at home also has no significant relationship with shadow education.

A similar pattern of national contexts on shadow education is found between parental levels of occupational prestige and education. There are mixed findings when measuring the effect of parental status and whether or not a family chooses to purchase shadow education. Both occupation and education of parents has a modest positive effect yet these finds are not generalizable to students in all nations. In many welfare-states, parental prestige has a negligible effect on extra schooling. In other nations, these forms

of socioeconomic status greatly increase the odds of providing tutors or formal classes to children. In no country did high levels of parental education and occupation correspond to a lower likelihood of shadow education use.

Taken together, national contexts weigh heavily on family decision-making, yet discretion exists within families on how to distribute available resources. One such path for the allocation of resources is the use of shadow education. The study has shown the majority of formal classes outside of school are purchased when a student is either a high- or low-performer. Tutoring is reserved exclusively for low-performers. Families invest in their children's education due to the growing importance of education in a global economy. Passing classes, graduating from school and even performing well on college entrance examinations has indeed become a rite of passage. Failure in school equates to a failure at social integration. Moreover, national levels of shadow education are associated with levels of inequality. As inequality rises, so too does the enrollment of children in extra-curricular schooling. Competition for success drives the use of shadow education at both the national and family levels.

Given the cost of participating in shadow education families with more resources are better able to purchase it. But levels of socioeconomics are not the best predictors of shadow education; rather, family decisions are driven by *habitus* - the culture of the family. Families that value education are more likely to make this investment than are families with little knowledge of education. Families that surround themselves with artifacts of culture, in keeping with the dominant society's culture, are much more likely to buy more schooling for their children.

INEQUALITY AND SHADOW EDUCATION

Education has traditionally been viewed as a path to equality. As discussed at the onset of this work, one major concern voiced by those who study shadow education is whether or not extra schooling functions to increase inequality. In nations with a high volume of shadow education consumption, the vast majority of students engage in extra schooling. In Korea, for example, if 80 percent of 15 years old students take extra schooling the 20 percent who do not are excluded from not only academic activities but also social ones. The disadvantage experienced by the 20 percent of adolescents not taking lessons outside of school is palpable in terms of social integration and cultural expectations (Bray 1999). In Chapter 4, I discussed the cultural norm of Japanese shadow education (despite the low participation rates reported n PISA). The formalized industry of extra schooling has grown to be so extensive that a pop culture has formed around it. Students attend lectures that are often pre-recorded, allowing for particular lecturers to be viewed simultaneously at multiple locations. Some of these instructors rise to pop stardom – students create affectionate associations for these teachers, albeit it a virtual relationship, which connect students to the learning processes. Students who do not attend these lectures cannot experience this adolescent fad, share common educational experiences with their peers or communicate with one another going to and from the learning center. Not only are students excluded from the formal interactions of shadow education, they also miss out on the informal ones which have been shown to contribute to student culture (Willis 1981).

How important are these informal interactions for academic success? Social reproduction theorists argue that it is these informal predispositions that galvanize and maintain class divisions. The very culture of the dominant class is perpetuated through formal and informal avenues then is produced in the structures of society: material formation of the idealized. In education systems, the idealized becomes the legitimized knowledge and behaviors of which students are expected to demonstrate proficiency, which are not necessarily taught in school. Holding students to demonstrate competence in something which is not taught in the classroom only serves to reproduce class structure. A legitimation of this practice is seen in the formalization of the shadow education industry. Students come to school armed with knowledge they did not learn in school and are advantaged over other students without this benefit of extra-education. Only some students benefits from the formal and informal interactions associated with participation in shadow education. In addition to the family, shadow education can be seen as an institution that responds to cultural capital through the inculcation of dominant values that result in higher educational performance. Schools require students to show competency in particular activities yet often these competencies are not learned in school.

> An educational system which puts into practice an implicit pedagogic action, requiring initial familiarity with the dominant culture, and which proceeds by imperceptible familiarization, offers information and training which can be received and acquired only by subjects endowed with the system of predispositions that is the condition for the success of the transmission and the inculcation of the culture. By doing away with giving explicitly to everyone what it implicitly demands of everyone, the educational system demands of everyone alike that they have what it does not give (Bourdieu 1973: 80).

The very culture of the dominant class re-creates itself during the process of extracurricular schooling. Social actors produce culture when students learn not only academic lessons but also cultural and social ones.

In addition to the social reproduction that is formed through student exclusion, parents also miss out on common experiences of their peers. In Coleman's (1987) discussion of social capital, he notes the importance of parental involvement to the academic success of children. Explaining the advantage of Catholic school systems he shows parental involvement as integral to student success. Parents who have the support of and share knowledge with other parents are better able to mobilize resources for their children. In cases where the majority of parents use shadow education, those who do not are socially isolated from other parents, thus disadvantaging their children. Again, social reproduction theorists will point to this as a matter of cultural dispositions. Parents will produce cultural norms through interactions surrounding the coming and goings of extra-curricular schooling. These meetings not only re-create dominant culture but also open avenues for parent / teacher and parent / school relationships. Those who miss out on these interactions will not be abreast of the emerging culture.

The foundational work of sociologist Emile Durkheim ([1897] 1951) shows the importance of the social integration. In the most extreme case, he found people with little social integration are most likely to commit suicide. In the educational realm Durkheim ([1925] 1961) shows schools function as a source of cultural production. It is in school that children learn how to be social creatures, which habits to adopt, what are societal expectations, and what is considered moral: what is socially acceptable. Indeed, many

policy makers even today tout the importance of creating well-rounded, good citizens to ensure the advancement and maintenance of a democracy. Schools themselves implicitly teach these cultural values and norms and explicitly offer courses in civic duty, citizenship and other formative lessons on how to be civically-minded. The question of what is community and how one interacts within a community all are learned and lived through the school experience (Waller 1961).

Engaging in shadow education, then, is not only about raising test scores or passing college entrance examinations; it is also about creating a culture that is separate and above that of the students who do not take extra schooling outside of formal school. This is precisely what Bourdieu (1973: 72) meant when he articulated the theory of social reproduction, of which he wrote:

> This means that [sociologists'] object becomes the production of the *habitus*, that system of dispositions which act as a mediation between structures and practice; more specifically, it becomes necessary to study the laws that determine the tendency of structures to reproduce themselves by *producing agents endowed with the system of predispositions which is capable of engendering practices adapted to the structures* and thereby contributing to the reproduction of the structures (italics added).

Educational structures reproduce themselves through the cultural production agent of the shadow education system. Regardless of which nation is in question, the dominant social class determines the structure of education and subsequently the forms of shadow education.

The fact that in most nations shadow education is not monitored, or even noticed, speaks loudly to its social reproductive nature. Given the great attention achievement and comparative studies of international rankings receive, one must ask why shadow

education has not been acknowledged for its integral impact on students throughout the world. Even when nations see this practice as a perpetuating inequality and ban it some families continue to pursue it, albeit illegally. Why? Simply put, the answer is social reproduction. Families are willing to take the risk of legal prosecution to advantage their children above others.

What advantage, then, does shadow education provide to families? While research is equivocal regarding the efficacy of shadow education – some says participation in shadow education does not necessarily increase the test scores of individual students (Smyth 2008) or national averages (Bray 1999). By studying the determinants of shadow education we know it contributes to a structure of social reproduction.

One could argue parents are attempting to level the playing field by having students participate in shadow education. But is this indeed what is happening? Is it the case that only students who are struggling in school receive time in the shadow education system? Or are the determinants somehow patterned? Indeed, as seen in Chapter 5, patterns exist – families with higher levels of cultural capital and socioeconomic status are more likely to purchase extra schooling than are families with lower levels of cultural capital and socioeconomic status. It is used, therefore, not as competition to ensure upward mobility of a failing student; rather, it is a form of social reproduction. Those in higher ranked social positions, those with economic, social and cultural capital, maintain their advantage through the use of shadow education.

Despite shadow education's ability to support social reproduction, the findings regarding gender imply that it is also being used to lessen some forms of inequality – that social reproduction of male dominance is not supported through parental purchase of shadow education. There is clear evidence that shadow education provides a social class advantage through social and cultural capital but parents are, in most cases, more likely to purchase it for girls rather than boys. This suggests the conversation about domination and subordination and cultural capital should focus more on how cultural capital is distributed differently to boys and girls, specifically, how families of various social classes distribute resources by gender.

LIMITATIONS OF THE STUDY

Despite the advantages of using a large, comprehensive and comparable survey of many nations to study the determinants of shadow education, this study has limitations. The aim of this work was to examine the relationship between shadow education and a host of factors at the national level as well as those at the individual and family level, and ascertain what factors determine which children will participate in shadow education. Though the study empirically evaluated these relationships, it is problematic to state definitively, through secondary data, the processes associated with these larger relationships. The study used traditional conflict theories to test the theory of cultural capital, however only interviews and direct observations can provide the data needed to answer questions regarding process with precision. For instance, why are girls in some nations receiving more extra schooling compared to boys? We know in the United States

that some parents from rural areas believe girls are more likely to go on to do something great with their lives compared to boys (Crowley and Roscigno 2001) – that getting off the farm is seen as a desirable strategy for intergenerational mobility. Other studies point to boys' behavioral problems as one factor for why girls are generally perceived as better students (Jencks et al. 1972; 2001; Downey and Powell 1993). If boys have more behavior problems or academic struggles, then parents may be more inclined to provide extra educational resources to girls. Clearly, parents feel the need to provide more schooling but how they determine what to purchase, how much to spend, and how to allocate to this assistance cannot be answered here. The current study builds upon prior knowledge and provides a bridge to future studies that may be better able to explicate the micro-processes of family-level decision making. The next step will be to undertake a study using hierarchical linear modeling that includes socioeconomic status, gender and cultural capital.

In addition to the limitation of the scope of this work, the analysis was limited to 15 year olds. According to a scan of U.S. learning centers the fastest growing student segment for which extra schooling is purchased is elementary school children (Media Center 2009). This means the findings of the present study are conservative. By age 15 some students have already left the formal educational system through attrition or dropout. Those who will drop out in secondary school are most likely those who perform poorly, thus, the best candidates for shadow education given what we know about national strategies, discussed in Chapter 4. The rates of extra schooling could indeed be higher than reported in PISA. More broadly, the advertising of learning centers suggests

competition for academic success is reaching far into the lower grades. No longer do families wait to prepare their children for college or test preparation – they begin a regime of extra schooling early in the child's academic career.

Another question regarding the growth of the shadow education industry – and its reach into the lower grades – which cannot be answered in the study regards parental concerns about school efficacy. If parents feel that schools do not provide what children need (or as in the case in some nations, where teachers do not teach what is required on examinations) motivated parents with resources will find ways to fulfill those educational needs for their children elsewhere. Modernity has placed a growing importance on education and families have responded by providing more privately-funded education to their children. The current study however cannot assess school efficacy or parental attitudes regarding schools or teachers. Future research could focus on these questions. How do parental attitudes about schools affect the use of shadow education? Moreover, do institutional arrangements of national educational systems contribute to this relationship?

Additionally, future research ought to consider the demand side of the shadow education industry, not addressed in this work. How does the availability of learning centers affect parental decisions? Does advertising skew parental perceptions of school efficacy, or student performance? If competition drives the demand, how do suppliers of shadow education capitalize on such demand? These questions will help provide a more comprehensive understanding of the growth of the shadow education industry.

One further limitation of the study is related to the measure of shadow education. Prior research has pointed to the high use of shadow education in Japan yet according to PISA 2003 the rate is much lower – about 20 percent. This challenges the reliability of the measure. Other nations also known for high shadow education use, such as Korea and Thailand, report high levels of use in PISA. This limitation suggests the respondents in Japan are unique in how they answer the question of their participation in extracurricular schooling. Future research ought to further investigate this fact.

The limitations outlined above do not decrease the value of the current study. Survey data in general cannot provide direct measures of micro-level processes. Additionally the findings within the study cannot be generalized to all student populations as this study only provides information on 15 year olds. Despite these limitations, the study articulated the social reproductive nature of shadow education. Below I discuss recommendations for policy makers in light of the findings.

RECOMMENDATIONS

The success of global efforts to make primary school mandatory and free of charge to children everywhere has given rise to the hope of lessening inequality. By providing education at the national level it is hoped individuals will be more able to compete in a global economy. The rising use of shadow education threatens to exacerbate educational inequalities. Policy-makers and educationalists must be aware of this growing phenomenon and the possibility it has to create greater divisions within society. Education is valued as a path to mobility – a way for those who work hard to

secure a life filled with prospects and opportunities. If education is given over to private industry (even in small increments), but performance is still assessed at the school site, then students who cannot participate in extra-schooling are disadvantaged. It is not enough to claim this is a simple issue of human capital, whereby families assist children in acquiring skills for their future. Instead this is an example of social reproduction. In light of this fact I make three recommendations: 1) to increase the public awareness of the shadow education phenomenon; 2) to monitor its use; and, 3) to regulate shadow education.

Increasing the public's awareness of shadow education will serve multiple functions. Schools are often assessed for efficacy by the scores of their students but rarely do schools measure if and how much extra-schooling students receive. By increasing the awareness of shadow education, stake-holders will be more attentive and potentially more demanding that school efficacy be measured more precisely. For instance, parents, teachers and educationalists should know what percentage of children are acquiring knowledge outside of school that are being compared to children who do not get this assistance. Armed with this information these groups might lobby policy makers to align what is taught at learning centers with lessons from school. This could potentially lessen the learning gap between those who do and those who do not receive extra schooling.

Monitoring the use of shadow education will allow social scientists to measure important factors that are now difficult to know. What happens when one participates in shadow education? There is no simple answer as there are many different forms of

shadow education. While scientists have yet to determine whether more schooling actually increases scores, learning center literature claims to greatly increase student performance and provide skills to obtain any educational goal (see Kaplan 2009). All schools are not the same and indeed the same can be said of learning centers and tutors. Monitoring shadow education will help us locate best practices for both schools and the shadow education industry and associate particular lessons with student need.

Finally, I recommend that governments mandate national educational offices to regulate shadow education. In the worst case, teachers extort pay for lessons and in the best case the vast majority of students in a nation take extra schooling. In all cases this means those who cannot afford the extra lessons are disadvantaged. This type of disadvantage is life-long. Education is one route for equality and the chance for upward mobility. Meritocracy is challenged by the industry of shadow education – students who have more family resources are better able to secure more schooling. Students with fewer resources are more likely to drop out without the safety net provided more affluent students. As globalization creates a highly specialized occupational hierarchy with the information industry ranked at the top, education, especially to those in developing nations, becomes more important then ever. Convincing children that education is the path by which they will succeed then allowing some to engage more schooling, net of formal school, is like placing the carrot before the mule: at some point the fact becomes obvious; there is no pay-off for hard work when schools cannot provide a safety net that is given to other, more affluent, students. Educational offices are best suited to collect

data on shadow education and decide how to advance their agendas given their national context.

Shadow education is more than a path to skill-building as human capital theorists argue; it is a structure of social reproduction. Students who are traditionally disadvantaged in education are underserved by this form of schooling. Parental influences of social background and particularly cultural capital widen the division between the classes. Nations that do not understand how shadow education reproduces social class divisions and those that take a laissez-faire political stance will suffer from private industry controlling the stratification process. Instead, those who already benefit from cultural and economic advances will control the sorting process. Educational meritocracy is challenged by shadow education. Therefore it is important to be aware of, monitor and regulate shadow education to ensure an equitable education among all children.

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APPENDIX A

PISA 2003 VARIABLE NAMES

Pisa 2003 variable names in the analysis.

ST29Q04	TUTOR
ST33Q04	TUTOR – MATHEMATICS SPECIFIC
ST29Q05	CLASSES OUT OF SCHOOL
ST33Q05	CLASSES OUT OF SCHOOL – MATHEMATICS SPECIFIC
OECD	MEMBERSHIP
ST29Q03	ENRICHMENT
ST29Q02	REMEDIATION
PV1MATH	MATHEMATICS PERFORMANCE PLAUSIBLE VALUE 1
PV2MATH	MATHEMATICS PERFORMANCE PLAUSIBLE VALUE 2
PV3MATH	MATHEMATICS PERFORMANCE PLAUSIBLE VALUE 3
PV4MATH	MATHEMATICS PERFORMANCE PLAUSIBLE VALUE 4
PV5MATH	MATHEMATICS PERFORMANCE PLAUSIBLE VALUE 5
ST03Q01	FEMALE
ESCS	SOCIOECONOMIC STATUS
FAMSTRUCT	FAMILY STRUCTURE
CULTPOSS	CULTURAL POSSESSIONS
HEDRES	HOME EDUCATIONAL RESOURCES
ST19Q01	NUMBER OF BOOKS IN THE HOME
ST16Q01	HOME LANGUAGE
HISCED	PARENTAL EDUCATION LEVEL
SISCED	EXPECTED EDUCATIONAL LEVEL
W_FSTUWT	FULL STUDENT WEIGHT
CNTFAC1	COUNTRY WEIGHT FACTOR FOR EQUAL WEIGHTS
W_FSTR01-W_FSTR80	BRR REPLICATES

APPENDIX B

CORRELATION COEFFICIENTS AND STANDARD ERRORS OF FAMILY STRUCTURE AND SHADOW EDUCATION

Country	Nuclear	Single-Parent	Mixed	Other	Gender
Australia	.059**	-.051**	-.036**	.019	.067**
	(.012)	(.012)	(.11)	(.017)	(.017)
Austria	-.006	-.007	-.014	.063	.006
	.019)	(.015)	(.018)	(.019)	(.016)
Belgium	.007	.004	-.017	.016	.051*
	(.014)	(.016)	(.014)	(.013)	(.013)
Brazil	-.001	.01	.005	-.020	.018
	(.025)	(.027)	(.022)	(.029)	(.029)
Canada	.047**	-.021**	-.048**	-.005	.086**
	(.011)	(.010)	(.010)	(.011)	(.014)
Czech Republic	.055*	-.03**	-.041**	-.007	.214**
	(.016)	(.016)	(.015)	(.013)	(.018)
Denmark	-.017	.016	-.016	.047	.008
	(.018)	(.017)	(.016)	(.028)	(.017)
Finland	.002	-.014	.012	.016	.088**
	(.014)	(.013)	(.014)	(.021)	(.014)
France	-.003	.022	-.036*	.017	.031**
	(.017)	(.013)	(.017)	(.019)	(.020)
Germany	.028*	-.02	-.032*	.049	.077**
	(.018)	(.019)	(.019)	(.023)	(.019)
Greece	.048**	-.029	.031*	-.069	.098**
	(.020)	(.022)	(.014)	(.022)	(.022)
Hong Kong	.018	-.013	-.021*	-.007	.046*
	(.015)	(.014)	(.011)	(.015)	(.026)
Hungary	.055**	-.040**	-.02	-.019	.109**
	(.019)	(.018)	(.017)	(.016)	(.017)
Iceland	-.003	-.013	.013	.012	.052**
	(.020)	(.020)	(.019)	(.018)	(.019)
Ireland	.025	-.021	-.025	.016	.007
	(.022)	(.020)	(.019)	(.016)	(.013)
Italy	-.009	-.002	.015	.017	.015
	(.018)	(.016)	(.016)	(.032)	(.016)
Korea	.091**	-.061**	-.022	-.048	-.065**
	(.017)	(.017)	(.014)	(.017)	(.029)
Latvia	.034*	-.026	-.017	-.033	.085**
	(.020)	(.022)	(.017)	(.023)	(.020)

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed. Continued

Appendix B-1. Correlation Coefficients and Standard Errors of Family Structure and Gender with Shadow Education.

Appendix B-1 continued

Country	Nuclear	Single-Parent	Mixed	Other	Gender
Luxembourg	.045*	-.033*	-.015	.001	.089**
	(.020)	(.020)	(.020)	(.017)	(.023)
Macao - China	-.06	.061*	.025	.043	-.087**
	(.040)	(.036)	(.038)	(.026)	(.036)
New Zealand	-.013	.009	-.019	-.007	.004
	(.019)	(.018)	(.017)	(.016)	(.020)
Norway	-.014	.004	-.004	.043	-.029*
	(.020)	(.020)	(.018)	(.023)	(.017)
Poland	.015	-.018	.009	-.006	.017
	(.016)	(.017)	(.016)	(.021)	(.017)
Portugal	.044*	-.046**	-.004	-.065	.049**
	(.020)	(.019)	(.018)	(.016)	(.021)
Russian Federation	.039**	-.025	-.011	-.006	.080**
	(.016)	(.018)	(.016)	(.014)	(.017)
Slovak Republic	-.004	.011	-.006	.018	.085**
	(.012)	(.011)	(.014)	(.025)	(.018)
Spain	.060**	-.029**	-.054**	-.023	.015**
	(.014)	(.015)	(.013)	(.013)	(.015)
Sweden	.005	.00	-.020	-.037	.017
	(.023)	(.020)	(.016)	(.015)	(.019)
Switzerland	-.016	-.006	.017	.045	.105**
	(.018)	(.019)	(.018)	(.020)	(.020)
Thailand	.035*	-.008	-.002	.034	.081**
	(.015)	(.014)	(.013)	(.046)	(.021)
Turkey	-.004	-.004	.024	-.034	.021
	(.034)	(.035)	(.024)	(.028)	(.038)
United Kingdom	.042**	-.015	-.039**	-.004	.060
	(.015)	(.017)	(.013)	(.018)	(.021)
United States	-.025	.009	-.004	.005	.046**
	(.016)	(.018)	(.018)	(.022)	(.014)
Uruguay	.023	-.006	-.018	.035	.047
	(.020)	(.022)	(.024)	(.020)	(.033)
Yugoslavia	.004	-.008	-.003	.001	.122**
	(.022)	(.021)	(.021)	(.021)	(.021)

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed.

Country	Number of Books In the Home	Cultural Possessions	Home Language	Highest Parental Educational Level	Student's Expected Educational Level
Australia	.076**	.112**	.124**	.101**	.116**
	(.013)	.017)	(.019)	(.012)	(.016)
Austria	.114**	.118**	-.014	.123**	.087**
	(.019)	.019)	(.016)	(.020)	(.017)
Belgium	.094**	.105**	.019	.065**	.074**
	(.013)	.013)	(.013)	(.015)	(.013)
Brazil	.118**	.193**	.061**	.185**	.108**
	(.026)	.022)	(.018)	(.026)	(.031)
Canada	.064**	.116**	.119**	.091**	.103**
	(.011)	.012)	(.017)	(.013)	(.011)
Czech Republic	.226**	.182**	.001	.212**	.249**
	(.017)	.032)	(.017)	(.017)	(.016)
Denmark	-.014	-.005	.053*	-.019	-.01
	(.020)	.007)	(.025)	(.027)	(.020)
Finland	.075**	.096**	.037**	.038	.053**
	(.013)	.014)	(.015)	(.014)	(.016)
France	.057**	.074**	.039*	.095**	.035
	(.021)	(.022)	(.021)	(.026)	(.020)
Germany	.055**	.108**	-.003	.076**	.024
	(.018)	(.020)	(.016)	(.019)	(.017)
Greece	.076**	.148**	-.027	.162**	.283**
	(.023)	(.020)	(.023)	(.021)	(.026)
Hong Kong	.141**	.168**	-.013	.180**	.178**
	(.017)	(.017)	(.015)	(.020)	(.015)
Hungary	.194**	.186**	.028	.237**	.247**
	(.019)	.016)	(.018)	(.018)	(.017)
Iceland	-.035**	-.016	.033	-.006	-.065**
	(.018)	.019)	(.021)	(.017)	(.017)
Ireland	.100**	.065**	.015	.122**	.068
	(.024)	(.023)	(.022)	(.022)	(.023)
Italy	.140**	.014**	-.025*	.171**	.138**
	(.016)	(.016)	(.016)	(.016)	(.016)
Japan	.101**	.146**	-.008	.150**	.181**
	(.020)	.016	(.012)	(.022)	(.021)
Korea	.254**	.183**	.008	.262**	.25**
	(.020)	.019)	(.016)	(.022)	(.015)
Latvia	.073**	.112**	.002	.098**	.18**
	(.022)	.019)	(.015)	(.023)	(.023)

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed. Continued

Appendix B-2. Correlation Coefficients and Standard Errors of Family Capital with Shadow Education.

Appendix B-2 continued

Country	Number of Books In the Home	Cultural Possessions	Home Language	Highest Parental Educational Level	Student's Expected Educational Level
Luxembourg	.133 **	.089 **	-.060 **	.094 **	.08 **
	(.022)	.020)	(.021)	(.022)	(.023)
Macao - China	.032	.099 **	-.005	.112 **	-.091 **
	(.033)	.030)	(.036)	(.035)	(.043)
New Zealand	-.004	.050 **	.176 **	.045	.038
	(.018)	.018)	(.023)	(.019)	(.022)
Norway	-.001	.017	.046 *	.026	-.002
	(.020)	.019)	(.025)	(.022)	(.020)
Poland	.176 **	.193 **	.023	.200 **	.200 **
	(.016)	.016)	(.015)	(.013)	(.015)
Portugal	.163 **	.145 **	-.022	.209 **	.143 **
	(.019)	.021)	(.019)	(.022)	(.019)
Russian	.102 **	.116 **	-.033	.113 **	.168 **
Federation	(.018)	.019)	(.021)	(.020)	(.022)
Slovak Republic	.100 **	.120 **	-.035 **	.109 **	.134 **
	(.017)	.013)	(.015)	(.015)	(.021)
Spain	.129 **	.110 **	-.010	.128 **	.185 **
	(.019)	.016)	(.015)	(.014)	(.018)
Sweden	.028	.074 **	.088 **	.014	.046
	(.023)	.020)	(.028)	(.022)	(.020)
Switzerland	.131 **	.162 **	-.012	.119 **	.149 **
	(.018)	.032)	(.019)	(.028)	(.020)
Thailand	.198 **	.163 **	-.038 **	.253 **	.155 **
	(.023)	.018)	(.014)	(.021)	(.020)
Turkey	.133 **	.143 **	-.062 *	.131	.113 **
	(.046)	.043)	(.030)	(.047)	(.030)
United Kingdom	.063 **	.112 **	.055 **	.091 **	.116 **
	(.013)	.016)	(.020)	(.018)	(.016)
United States	.028	.057 **	.070	.037	.010
	(.019)	.021)	(.021)	(.019)	(.018)
Uruguay	.116 **	.120 **	.004 **	.172 **	.076 **
	(.027)	.022)	(.026)	(.024)	(.024)
Yugoslavia	.165 **	.190 **	-.014	.156 **	.165 **
	(.017)	.018)	(.016)	(.022)	(.020)

* Significant at p<.05, two-tailed; ** Significant at p<.01, two-tailed