

DISSERTATION

WHAT FACTORS AFFECT SCHOOL ATTENDANCE?
QUANTITATIVE AND QUALITATIVE STUDY OF EVIDENCE FROM NEPAL

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ABSTRACT

WHAT FACTORS AFFECT SCHOOL ATTENDANCE?

QUANTITATIVE AND QUALITATIVE STUDY OF EVIDENCE FROM NEPAL

There exist many factors that impact school attendance of students in developing countries. Factors range from the distance to school from a student's home to the availability of gender-specific restrooms. A project in the south east part of Nepal that built gender-specific restrooms and brought running water to the school increased enrollment and attendance of the students, particularly of girls. To study what other factors impact attendance, a survey was conducted in and around Kathmandu Valley, Nepal. An econometric study of the data generated by the survey showed that time spent studying at home, having an educated mother and an employed mother, all had positive effect on students' attendance. Distance to school, presence of siblings, and lack of computers had negative effects on attendance. The data also demonstrated gender differences in what and how various factors affected attendance at the secondary level of education in Nepal.

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DEDICATION

This research is dedicated to my family and friends.

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CHAPTER 1

Introduction

It is no secret that educational attainment impacts one's standard of living and the labor market conditions. It is also true that many in the developing world have been able to escape the asphyxiating hold of poverty by latching on to the path of education. Stories like mine, where an individual is able to reach economic stability with the help of academic achievement, are common in the West, especially in the United States. A lot of these stories start in very dire economic situations and countries. However, with persistent focus on education, individuals are successful in achieving new financial heights and are able to pull their families out of poverty.

There has been a lot of focus on understanding the factors that impact a student's academic performance. Some of the factors discussed in the literature are school quality, teacher quality, students' ability, parents' education level, and regular school attendance. In this dissertation, I will look into what factors affect one of these variables. In particular, I will look at what impacts a student's school attendance. The factors might be different in different parts of the world depending on the local circumstance, including, but not limited to, the wealth level of the community. My work in this dissertation attempts to find the factors that impact the school attendance of students in grades eight, nine, and ten in Nepal.

This dissertation is organized in 8 chapters. This chapter will introduce the reader to the topic of absenteeism, the structure of the dissertation, and the structure of the educational system in Nepal. Chapter 2 will discuss the literature and elaborate on the gaps that exist in it, where this work will attempt to add to the knowledge as it relates to the factors that impact a student's attendance. This chapter will also present the economic theoretical model that will provide the

framework for the research that is conducted in order to identify the reasons as to why students miss school. Chapter 3 presents, in detail, the project of building gender specific restrooms in Dhankutta, Nepal, and the impact of this intervention on school attendance and enrollment. This chapter also presents the motivation for the further research conducted, which is presented in subsequent chapters.

To understand the reasons for absenteeism in order to help guide schools and their policy, it is important to conduct a robust, rigorous econometric study, which can control for various effects that impact one's ability to attend school regularly. Chapter 4 presents the methodologies adopted to gather the data to help conduct the econometric study. Chapter 5, on descriptive statistics, provides a discussion on the data collected and their relationship, in general, with attendance.

Chapter 6 presents the various econometric models that were used to study the underlying relationships between various factors included based on the theoretical framework presented in Chapter 2, and attendance. Chapter 7 provides a detailed discussion of the results from the various econometric models, and the findings from the focus group conducted after the econometric results were obtained. Finally, Chapter 8 discusses the caveats to this research project while identifying areas for further research, and it provides concluding remarks.

Nepal Education System

Nepal is a very diverse country, not only in terms of physical geography, where it spans from about a hundred feet above sea level in the Terai region to the top of the world at Mount Everest, but also in terms of its people. According to Nepal's Ministry of Education, in 2015 there were 125 different groups based on caste and ethnicity, 123 languages spoken, and 10 forms of religion (Education in Figures, 2016). With such diversity and topological differences,

it is not surprising that the access of public services, including education, varies among different groups and locations. The literacy rate for the entire population over five years of age is at 65.9 percent, with 57.4 percent for females and 75.1 percent for males. However, the Ministry's data does indicate that the literacy rates for all age groups have increased in the last ten to fifteen years (Education in Figures, 2016).

To understand the context in which the research work is presented in this dissertation, one needs to be aware of the education system. The system in Nepal is poorly developed and is not accessible to all, even though the country spends around 4 percent of its GDP on education (Dahal, 2016). According to the World Education Services, up until 1951 educational services were typically provided only for the urban elites and the members of the royal family. Since then, with the establishment of the Ministry of Education in 1952, government has opened the sector up to the public. However, the participation rate “still remains low relative to other countries in the region and globally” (Clark, 2013). This commitment of the government to achieve UNESCO's Education for All by 2015 initiatives to provide access to quality education has “created more than 34,000 schools of all types around the country” (Clark, 2013). UNICEF and UNESCO also report that aid to education in Nepal fell by 29 percent between 2009 and 2013 (Dahal, 2016).

According to the report titled “Education Beyond 2015” put out by a collaboration of UNICEF, UNESCO, NCE Nepal, and the Government of Nepal, “Nepal, with an HDI of 0.463, is categorized among low human development countries and is ranked at 157 among 187 countries” and the “mean years of schooling are merely 3.2 years against 8.9 years of expected schooling years” (Dahal, 2016). It is clear then that the education attainment, on average, is extremely poor in Nepal. Education, which is one of the most important factors that could

potentially alleviate the problems of poverty in Nepal, is below par whether measured by number of years in school or by the quality of delivery.

The structure of educational system as shown in Table 1 below is similar to most countries around South Asia with children below four years of age attending a pre-primary school. A typical Nepali pre-primary school would include a “nursery” grade and a “kindergarten” grade (KG) and an “upper kindergarten” grade, or UKG. Once the student successfully passes UKG, he or she starts the primary education in grade one.

Table 1: Education System in Nepal

Level	Grades/Age
Pre-Primary Education	Children below 4 years
Primary Education	Grades 1 to 5
Basic Education	Grades 6 to 8
Secondary Level	Grades 9 and 10
Higher Secondary Level	Grades 11 and 12
Bachelor Degree/Masters/PhD	Not available in all programs. Depends on programs, grants, etc.

The student then moves from grades one through ten, passing a yearly exam which is conducted at the end of the year in all schools. Other than some electives, most of the curriculum is pre-set, and all students follow it throughout the country. Some schools go as far as to pick the electives for all students and make it compulsory for all students in their school. In other words, even though a student could choose between woodwork and agriculture, the school may decide to pick agriculture as its offering and all students attending that school would have to take agriculture. It is not until students finish the secondary level of grades nine and ten that they get to pick their track in science, commerce, arts, and other subjects.

The constitution of Nepal (2015), in Article 31, titled, “Right relating to education,” clearly states that, “Every citizen shall have the right of access to basic education,” and that, “Every citizen shall have the right to get compulsory and free education up to the basic level and

free education up to the secondary level from the State.” Even though the constitution legally provides for access, the reality on the ground, particularly for individuals in remote areas and individuals of lower societal class/caste, is quite different. A scarcity of schools or grade levels in rural areas due to overt discrimination against the marginalized groups could hinder one’s ability to have access to school. Even in the event of having access, the quality of education might be sub-par as compared to schools in urban areas and the ones that cater to the privileged class.

There is much more for Nepal to do to improve the quality of education. This also means that there are many opportunities for NGOs, INGOs, and the government of Nepal to work toward the betterment of educational access and achievement in the country. Access to education remains a big issue there. According to the UN, “39.1 percent in the age group 6 years and above and 43.5 percent of people in the age group 15 years and above were deprived to be literate” in Nepal (Dahal, 2016). The problem is magnified especially for marginalized ethnic groups, females, Dalits, and the poor. This provides for these agencies to cater their funding and design projects to address these issues, not just in the quality of the education delivered, but also to address the access problem, which only exacerbates the issues of inequities in the Nepali society.

Dr. Sushan Acharya (2007) pointed out in the report presented by the UN and the government of Nepal that, “Although significant progress has been observed in school education from an equity perspective with considerable increase in the access, the progress is not evenly distributed across the nation.” She goes on to point out that she has concerns with the improvement data regularly cited, and explains that the issue lies in the way the data are gathered by the Ministry of Education. For example, if a student is enrolled into a school, the data reflect that there is access. However, subsequent absenteeism due to various factors affecting the

marginalized groups is ignored by the enrollment numbers. This issue is of particular importance as it is related to the research presented in this dissertation. It is essential to remember that enrollment is a one-time decision, whereas attendance is a decision that one has to make throughout the year. As research shows, it has a direct impact on one's educational attainment, and ultimately one's standard of living (Acharya, 2007).

Therefore, as one attempts to improve the educational attainment of individuals as an effort to improve the human capital stock of a developing country, it is important to focus on the factors that help a student succeed. One important factor for student success is school attendance. Naturally, the question becomes: What factors impact school attendance? In particular, do gender differences impact it? My own work in building gender-specific restrooms at Sri Kaushika School in Dhankutta, Nepal, discussed in Chapter 3, demonstrated a positive impact of the intervention not only on enrollment, but also on attendance. This motivates the rest of this dissertation. The next chapter presents the literature review related to these questions and presents a theoretical framework to study factors that impact school attendance, and to identify forces that have different effects based on gender in the Nepalese context.

CHAPTER 2

Literature Review and Theoretical Framework

In this chapter, a theoretical framework will be presented to provide a foundation for the development of the questions in the survey to garner the information necessary to establish the relationships between student, household, community and school characteristics and school attendance. The discussion that follows is based on theoretical priors and cultural knowledge of Nepal.

We know from the Solow model, the foundational and “basic reference point for almost all analyses of growth,” that gross domestic product of a nation is dependent on factors such as physical capital, labor, human capital, and knowledge or “the effectiveness of labor” that impacts innovation and ultimately growth (Romer, 2001). These factors have a positive impact on a nation’s productivity. The relationship can be expressed mathematically in the following form:

$$Y = A f(K, L, H, N)$$

where output (Y), is a function of physical capital (K), labor (L), human capital (H), natural resources (N), and factor productivity (A). Assuming constant returns to scale, we can rewrite the above equation as:

$$\frac{Y}{L} = A f\left(\frac{K}{L}, \frac{H}{L}, \frac{N}{L}\right)$$

where Y/L is the output per worker (y), K/L is the physical capital per worker (k), H/L is the human capital per worker (h), and N/L is the natural resources per worker (n). Therefore, we can present the per-worker relationship as:

$$y = Af(k, h, n)$$

It is clear from the equation above that human capital per worker is directly related to output per worker. In other words, there exists a positive relationship between human capital per worker and the output per worker of a nation.

Human capital can be measured with academic achievement and/or experience. The level of education, usually measured by the number of years in school, can act as a proxy for the level of human capital for a nation. In fact, most of the research done during the last few decades has done just that. Researchers have become more sophisticated in using other variables to measure and assess human capital over time. Although literature is not unanimous in the actual magnitude of human capital's impact on growth, there is a general acknowledgement that human capital plays a major role on a nation's income (see Hall and Jones (1999), Borjas (1987), and Klenow and Rodriguez-Clare (1997)).

Authors argue that a significant portion of the cross country differences in income can be explained by the differences in human capital per worker between countries. For example, why is it that a person living in Berlin earns more than someone living in Kathmandu? These works suggest that a significant difference at the macro level can be explained, among other things, by the difference in human capital, which is obtained for the most part in a country like Nepal through schooling. Mark Bills and Peter J.Klenow (2000), in a cross-country study, show that, "Greater schooling enrollment in 1960 consistent with one more year of attainment is associated with 0.30-percent faster annual growth over 1960-1990." Robert J. Barro (1991), Jess Benhabib and Mark M. Spiegel (1994) and Barro and Xavier (1995) also find education and attending school to be positively correlated with the growth rate of per capita GDP across different countries.

Conventional wisdom is that the impact on a nation's growth is positively impacted by the stock of human capital, and that the education of its workforce plays a significant role in that process. However, it is important to note that at a micro level, the impact of education on an individual's economic attainment, career advancement, and ultimately the standard of living is also well established. Todaro and Smith (2015), in their book "Economic Development," point out the importance of education in improving economic status in various regions and countries around the world, including south Asian countries. Using literacy rate as the proxy to measure education level, Thapa (2013) finds that the "literacy rate appears lower among the poor and higher among the richer." Thapa concludes that the literacy rate and household income are inversely related in Nepal. Moreover, the report suggests that the "Mean years of schooling are positively associated with consumption quintile." This is used as a proxy to measure the economic status of a household.

Therefore, it is not a secret that access to quality education, satisfactory progress, and completion makes a significant impact on an individual's social and economic mobility, not only in the West, but especially in the developing world. My own experience highlights an example of access to education, good academic progress, and completion that could provide one a path out of poverty. Access and enrollment, as mentioned earlier, focus on a one-time decision that someone makes to "enroll" in to an academic institution. However, how students perform once they are admitted into a school depends on many factors. In other words, once the access problem is solved, their human capital attainment is a function of their ability, quality of schools and teachers and, increasingly, access to technology, and attendance—how often they attend school, and so on. This relationship can be expressed in an education production function framework in the following form:

$$Performance = f(IQ, GPA, Teacher\ Quality, School\ Quality, Attendance, etc.)$$

One of the main factors that positively impacts a student's performance in school, which then improves the student's educational attainment, productivity, and ultimately income, is school attendance. Devadoss and Foltz (1996), in their article titled "Evaluation of Factors Influencing Student Class Attendance and Performance," find a strong positive relationship between class attendance and student performance. In establishing the importance of school and class attendance, most of the literature focuses on data from Western countries. But, El-Shaarawi and Harb (2007), in their work in analyzing students in United Arab Emirates University, find that students there also perform better if they "participate in class discussion" and perform poorly if the students miss "too many lectures." This suggests that the importance of school attendance is relevant beyond the western context.

How often a student attends school is directly related to the student's academic performance. The importance of attendance has already been established over the years through research. In fact, economists and policymakers have suggested and implemented various incentive programs to increase school attendance: Cash transfers for attending school in New York City through the NYC Center for Economic Opportunity (2011) and in Morocco increased attendance (Benhassine, Devoto, Duflo, Dupas, & Pouliquen, 2015). School meals in rural Kenya improved school participation in children in primary schools (Vermeersch and Kremer, 2004). These programs were identified as the specific reasons as to why students were absent and ultimately dropped out, and the intervention was made. It is encouraging that these interventions had a successful impact on school attendance, as they encourage us to identify other factors that impact school attendance around the world.

In the next chapter, a case study from Nepal will be presented, and the impact of building gender specific restrooms and bringing running water to a rural school will be discussed. From these various projects in different parts of the world, one could infer that there exists a problem of absenteeism in the developing world, especially among girls, that could lead to students dropping out—a much larger problem. Thapa (2013) finds that the “main reason for the dropout” for students in the range of 6-24 years of age to be “poor academic progress,” which, as discussed before, could be a result of regular absenteeism.

Thapa (2013) also finds that providing “help to family” toward household work as another substantial reason for students dropping out of school, which demonstrates that there may be various competing factors that pull a student out of the school. All of these activities have a very high opportunity cost—the student missing school, poor academic performance and advancement, and worse, dropping out. LeVine (2006), in an ethnographic research focused on women in the Kathmandu Valley, finds that various factors such as “gender, caste, poverty, cultural prejudice, and rural residence prevented a majority from going to school.” Therefore, it is important to establish, empirically, the relationship between the factors that impact students’ ability to go to school. The next section presents an economic model based on the concept of the opportunity cost in the cultural context of Nepal, and sets up an empirical model that will be applied to the collected data.

The impact on school attendance at the microeconomic level caused by different factors can be expressed as follows:

$$\text{Attendance} = f(\text{student characteristics, household characteristics,} \\ \text{community characteristics, school characteristics})$$

Model: Theoretical Framework

As is the case in many developing countries, Nepal's GDP used to be heavily agriculture-based, but the service industry is taking its share as the population centers grow and the country's urban sectors pull individuals away from farming. The World Bank report for Nepal shows that the agriculture's share of the GDP has shrunk from 52 percent in 1990 to 33 percent in 2016, while the share of the service sector has increased, during the same period, from 32 to 52 percent, while industry's share has virtually remained unchanged. As pointed out in the report, most of the work performed by women and children in the agriculture and service sector is not captured by the formal data. As the individuals in the household do provide the labor for various activities in the formal or the informal economy, the following household utility maximization model, built on the assumption presented in the "Agricultural Household Models," can be used to demonstrate the various factors pulling on the time of Nepali household members, including the students, that could potentially impact students' school attendance (Singh, Squire, and Strauss, 1986).

The price taker household derives utility from the consumption of private goods purchased from the market, goods produced by the household itself, and leisure¹. Let U be the total utility derived by the household, and let X_a , X_m , and X_L be the produced good, market good, and leisure, respectively. The relationship can then be written as:

$$U(X_a, X_m, X_L)$$

The household maximizes the utility subject to a budget constraint:

$$Y = \sum_{i=1}^L p_i X_i$$

¹ As pointed out by Singh, et.al, these 3 goods could easily be thought about as vectors.

where the prices of all of the consumption goods are represented by p_i with p_L as the price of leisure. Y represents the full income of the consumer. As pointed out by Singh et. al., an agricultural household's income equals “the value of its time endowment, plus the value of its time endowment, plus the value of the household's production less the value of variable inputs required for production of outputs, plus any nonwage, non-household production income such as remittances” (1986). The income of the household can be expanded in the following way:

$$Y = p_L T + \sum_{j=1}^M q_j Q_j - \sum_{i=1}^N q_i V_i - p_L L + E$$

where T is the time endowment, Q is the output of the household's production, V is variable inputs, L is labor, q_j is the price of Q_j , q_i is the price for V_i , and E is outside income.

The household as a unit has to decide how best to allocate the labor hours of various individuals that are available to it. For example, does the father or the son go to the labor market to look for employment either locally or in a different location? Does the mother participate in the labor market or stay at home as a homemaker—providing labor in an informal setting, as she raises a child? These are the types of questions that the household has to answer to optimize its intergenerational economic well-being or utility, and notably these questions may vary with the gender composition of the household depending on the cultural context. Let us look at these decisions in detail to establish the pull factors on the student's time, which impacts the representative student's school attendance.

This optimization problem of allocation of labor hours for household production is faced by the household every year and through time. In other words, this problem is a repeated over time, and the household has to decide how best to allocate its available labor hours. As the labor hour of the household also includes the labor hours that can be provided by our representative

student, there exists a real tradeoff between allocated labor hours and school attendance. In other words, if the student goes to school every day, then fewer labor hours are available to put toward the household production, and if the child is pulled out for household production, then he or she would miss school, lowering the attendance rate.

Bardhan and Udry (1999) discuss the concept of the separation property of the household model in detail. The discussion is mostly focused around the question of whether households maximize their profit or consumption bundle (utility) first. It is important for us to point this out to establish that there is always an opportunity cost of pulling labor away from farm or household activities. The household, when there exists complete and efficiently functioning markets, chooses the labor hours and land inputs to maximize its profit, and its production decisions are dependent only on market prices and not on its preferences (Bardhan and Udry, 1999). In this theoretical framework, this could potentially have a negative impact on a family's decision to initially enroll their kids in school, and, if enrolled, on their attendance during school terms to help in the farm or household activities. It is also important to understand that even if the student is not used as labor in the farm, he or she might be used to help in the household activities such as cooking, cleaning, taking care of younger siblings, and taking care of elderly or sick grandparents or relatives, so as to relieve a member of the family to work in the farm or in the service sector.

If one visits a rural part in South Asia, for example, it becomes clear that the markets, whether they be land, loanable funds, etc., are not complete. In fact, Bardhan and Udry point out that the separation property is questioned and has not held up in multiple research studies. In particular, "Everywhere in Africa, Latin America, and most of Asia where the hypothesis has been examined, it has decisively been rejected" (as cited by Bardhan and Udry). However, even

if the separation property of the household model does not hold, which is very likely in rural parts of a developing country like Nepal, the pull on labor-hours forces households to make labor allocation decisions, depending on production and consumption. This, too, can lead to a negative impact on a student's attendance, especially in the short run.

Extensions to the Model

Intergenerational Considerations

As the household tries to optimize the labor-hour allocation of the young student, it has to weigh not only the short-term gains in terms of production as presented in the agricultural household model earlier but also a potential loss in the future if the child is not successful in his or her educational endeavor. In Nepal, particularly in my research area of Kathmandu Valley, large extended families with grandparents, uncles, and others, though declining, are still common. Members of the family live jointly, and typically the “patriarch lives with his wife, his sons, and their wives and children in a household in which the women take turns to cook at the same hearth” (LeVine, 2006). The patriarch and the matriarch depend on their children, particularly sons as “daughters are married ‘out’ to unrelated husbands” (LeVine, 2006) for the support during older age. Therefore, it is imperative that they help their children, particularly sons, do well in education and get prosperous careers, which would improve the overall economic status of the family. This could lead to favoring sons over daughters, if the family is forced to choose between which labor hours are expendable in the short run, especially because the daughter leaves the family after marriage and would not provide any economic contribution to her birth family.

The family, while having to optimize the labor hours of the members to maintain a certain standard of living today via production, has to first decide whether the child needs to go

to school or not. If the child attends school, the opportunity cost would be the labor earnings in the short term. In addition, if the family decides to pull the child out of school to make him or her participate in either income-earning activity or to help in the household activity, the opportunity cost would be a potential loss of future earnings, as the student would not be able to hold a successful career that an educated individual could. Therefore, a family's belief that education is important and that it leads to better economic status and higher living standard is important, as that would impact the decision to send children to school.

If the family is not aware of such benefits and does not see the value in education and its ability to propel someone out of poverty, then it would be focused more on the short-term gains and, therefore, would be less likely to enroll a child into school. Or, if it did enroll the child, which is the distinction that this dissertation is presenting, the family would be less likely to value daily attendance, and therefore may impact attendance, performance, and ultimately the lifetime standard of living. This issue, in the Nepali context of retirement, could exacerbate the problem with low enrollment and absenteeism, especially for girls, as they are seen as temporary members of the family. LeVine (2006) reported various socio-economic factors prevented women in Kathmandu Valley from attending school, but even for "those who went, most, regardless of academic talent, were pulled out in order to work at home, as wage laborers and domestic servants, or to enter arranged marriages."

Gender Considerations

As mentioned earlier, some non-governmental organizations, both local and international, have been successful in increasing the enrollment of girls into school. However, it is important to reiterate that enrollment, definitely for boys but particularly for girls, is a one-time decision, and has become a socially accepted and expected action in Nepal, especially in the areas around the

Kathmandu Valley. However, given all of the previously discussed pull on a household's collective time, a girl's attendance could suffer. Holding everything else constant, if a situation presented itself where the family had to pull either the girl or a boy out of school for a day, given the long-term benefits and costs compared to the short-term benefits, it is very likely that the girl would be pulled out of school for that day. This implies that we would expect a lower attendance for girls compared to boys, all else equal, especially if the families placed a lower value on girls' educational attainment, and it would not be surprising to see worse values in rural areas.

If the "marrying off" of a daughter were part of the equation in a family deciding on whether to first enroll the daughter into school and second to help her make progress through various stages of the educational ladder, then it would depend on the perceived long-term benefit of the daughter being educated. If the family perceives that educating girls does not have an impact on their or on their daughter's life, as she would be "married off" and would spend her life being involved in the unpaid labor in the new household, then the parents would be more likely to pull their daughters out of school more often, even if they send them, lowering the daughter's attendance. However, as urban Nepal goes through modernization, and as more liberal values are adopted, it is not uncommon to see middle- and upper-caste households "look to unmarried daughters to generate an income (LeVine, 2006). This would mean that we could potentially see higher attendance in girls who belong to such households.

Enrollment of a child into a school could show a family's acknowledgement of the long-term benefits of education. However, it is important to evaluate the school attendance of the child to truly understand the importance that the family places on education. The main economic reason for a child to miss school would be the pull on his or her time, either for labor or leisure. Therefore, household activities such as cleaning, cooking, and taking care of family members do

become important and relevant in serving to keep a student away from school. This effect could be magnified for girls given the marriage traditions, the labor-market realities of lower opportunities and pay, and the roles that women play in a typical household in Nepal.

The various household activities (e.g. cleaning, cooking, and farming) do compete for the student's time in any type of a setting, rural or urban. If the household size is large and the student is needed for work around the house, it could have a negative impact on the student's attendance. Moreover, if the household has younger children needing constant care, then this would create a stronger demand on an older student. Furthermore, if the household has elderly grandparents needing care, this too would increase the demand on the student's time. However, if the household size is large but there are multiple individuals available at home to perform the needed work, then the student would most likely have better attendance, as there would be very little, if any, demand for his or her time. Given the cultural framework, we might see a difference in the expectation for housework on boys and girls, impacting their attendance differently.

Countries around the world, and even regions within countries, have different factors that play a role in its economy and values systems, and, therefore, impact the myriad of decisions that individuals make daily. To better understand the decisions that students and families make related to school attendance, it is important to provide context as it relates to cultural, and both formal and informal rules that exist in any given economy. In this research, to better understand and isolate the factors that impact household decisions related to education, it was important to collect economic, educational, and social data from the location itself.

Given the lack of availability of such information, it became necessary to conduct field research. Therefore, a survey based on the theoretical framework presented in this chapter was designed to collect data on various factors related to the characteristics of the student, household,

schools, and community. The survey, which is discussed in the forthcoming chapter on methodology, was conducted in and around the Kathmandu Valley, and the data that was gathered was analyzed to study the relationships between the aforementioned variables and school attendance, overall, and separated by gender.

CHAPTER 3

Motivation: Dhankutta Project

This chapter is based on fieldwork conducted from 2011 through 2015 in the eastern part of Nepal in the town of Mulghat, Dhankutta, district, in the Koshi zone of Nepal. The project had many stakeholders, both in Nepal and in the United States. The partnerships between various institutions was critical for the success of this project, which helped many Nepali students, including two distinct marginalized groups in the region, females and disabled students. The partnerships and field observations were critical motivating factors of the continued research which is detailed in the chapters of this dissertation to come. In addition, the project in this chapter demonstrates the impact of applied economic development research, engaged scholarship, and intervention.

Mulghat, Dhankutta



Figure 1: Dhankutta, Nepal- Personal Photo of Map

Mulghat, Dhankutta, is in the south eastern part of Nepal in the foothills of the Himalayas. It is about 3 hours' drive from Biratnagar, the industrial town that lies on the border of Nepal with India. Despite its closeness to the industrialized city of Biratnagar and other urban

areas like Dharan and Ithahari, Mulghat is quite rural. The town, despite its location by the Tamor River, one of the tributaries of the Koshi River, does not have a good system of running water in the village. People regularly have to carry water to their homes in water pots (*Gagri*, in Nepali) for their daily use.

The access to major urban areas does provide it with opportunity to import material goods and other supplies. However, because of the location, high prices exclude many from accessing the various amenities that seem very close by road that connects them to Dharan and Ithahari. The road was built by the British, and the maintenance is still partially funded by them, and it shows. While other roads in Nepal are not well-paved and are full of potholes, this one is well-paved, clean, and maintained, despite the constant flow of heavy vehicles.

The School

The Sri Kaushika Primary school is situated right next to a creek, which floods every monsoon, and is on the lower slope of the mountain. At the bottom of the mountain, one of the Koshi tributaries run—a major river for the eastern part of the country. The school is funded by the Nepali government and the headmaster and other officials are assigned by the government. It caters mostly to the local villagers, who cannot afford to send their kids to private schools in the nearby towns of Dharan, Dhankutta, and Ithahari. What makes this school unique is the fact that it houses deaf students on its properties and has a full-time teacher who teaches them local sign language. The student body fluctuates around 120, including the deaf students.

Summary of Personal Background and the Intervention Detailed in this Chapter

I became involved with the school in early 2008, when I started to donate a few hundred dollars to buy warm jackets, gloves, and blankets for the deaf students through the Kasthamandap Rotary Club, Kathmandu's program. However, it was not until a few years later

that I decided to get involved in a much more impactful way—not only to help the deaf students but also the entire school, and the village, if possible. One day a student approached me to ask if the Pi Theta Kappa (PTK), the two-year honor society at Front Range Community College (FRCC), where I teach economics, could help raise money to help this school with pencils, notebooks, blankets, and other supplies. Thinking it would be a few hundred dollars, I said OK.

Amazingly, the students were able to raise over a thousand dollars through their fundraising program at FRCC. The sum was such that it was going to allow us to buy many supplies that could be provided to the school in Mulghat, Nepal. However, during the conversation with the principal to inform him of the funds and to discuss the logistics of how best to send the supplies, he said that more than the school supplies, the school desperately needed a clean restroom. He informed me that the lack of a restroom was having a negative impact on enrollment and attendance, particularly of girls. This came as a shock to us all, as we take these amenities for granted in the West. However, the impact that restrooms would have on students is real, as research, in particular from India and various parts of Africa, have demonstrated (see Chernichovsky (1985) and Rana et. al. (2015)).

With this new information, my students and I wanted to make sure that we provided them with what they needed to improve the enrollment and attendance, especially of girls, given the lack of access to education that they have in Nepal. However, the amount of money that we had raised would not be enough to build a restroom. So, we started to look around for other funding. Since my experience with the Rotary Club in Nepal was positive, I decided to approach the Fort Collins Rotary Club to see if members would be interested in donating anything. After their review, they decided to match our amount and also work with us to write a grant to get the Rotary District 5440 to match our amount.

While we were working on the grant application, I travelled to Nepal to visit the school in person and to survey the area and its needs. In this process, I flew to Kathmandu, Nepal, and then took a 45 minute domestic-flight to Biratnagar, the southern industrial city in Nepal. A reserved car then took us through the bustling highway intersection city of Itahari, then through the hill city of Dharan, finally arriving at Mulghat, where the school is located.

Upon arrival and the introduction with the headmaster and the teachers, I interacted with the students and was happy to see that they were all very excited to see our group, which included a couple of folks from the Kasthamandap Rotary Club in Kathmandu, Nepal. The reason for their excitement was because they were expecting gifts, as the Rotary crowd typically brought gifts when they visited—blankets, sports and educational supplies. The students, particularly the deaf ones, were very much eager to interact with us. One could also see that a couple of the deaf students were autistic.

After the quick interactions, we took a tour. The school had one-story buildings with tin roofs that were all built facing in on the perimeter of the school compound. One of the buildings was used for dorms for the deaf students, another as the kitchen, and the rest of the space as classrooms and administrative offices. The building, made from bricks, showed wear and tear, mostly water damage from the intense monsoon that this part of Nepal gets.

The sight that I was appalled to see, however, was the outhouse that the school had for the students and teachers. It was very old and tin-roofed, with big holes rusted on the sides, wear and tear which was clearly visible from afar. As one approached this “shed,” a smell filled the air, foul enough to get anyone sick to his stomach. I learned that the school had no running water, which was part of the problem for this outhouse. Now, it was clear to us what the headmaster meant when he had told me over the phone that students, particularly girls, were not

coming to school because of the lack of restrooms. Even the boys who were following me around told me that they would rather go to the nearby field on the back side of the school buildings, which could be another public health issue, especially for a country where many people die every year from cholera.

So, the need for a restroom was very apparent. However, what was also becoming clear from our visit was that the school needed running water as well. The headmaster shared that the older of the deaf students, who were 14 or 15 years of age, would carry water for the kitchen from the river, which was about 15 minutes by foot down the hill from the school. In fact, we did see a couple of students do that as we were about ready to leave the school for the day. We were going to be back the next day for a gift hand-out program with some cultural dance performances by the students for us.

The next day, after the conclusion of the program, we spoke with some of the construction workers whom the headmaster had invited to provide us with some costs estimates to build the restroom. It became clear that the amount we had already raised was going to be barely enough to build gender specific restrooms. The grant from the District Rotary was going to be a must if we were to provide this school with a gender-specific restrooms with running water. What was a good revelation before we left was a water collection tank that the United Nations Development Program built in the early '90s. It had collected dirt and had grass and weeds growing in it. This was something that could be re-used as a water collection tank, if needed.

Project Stages and Details

The Fundraising

As mentioned earlier, most of the initial funding that was going to the school was to provide students with warm blankets, jackets, and other clothing to help them stay warm through the brutal winters in the hills. The donations were personal, and individuals would donate small amounts that we used to purchase the aforementioned items. So, when I started discussing possible projects, I also started to think about different forms of fundraising in which I could get involved. As some of my undergraduate students were interested in participating, they brought up the idea of getting PTK, the two-year schools' honors society, which was involved with the initial donations involved once again.

In partnership with PTK, we planned a fundraising event called the "Kiss the Pig," and we agreed that the donations would be used to help Sri Kaushika School in Mulghat, Dhankutta, Nepal. The PTK is comprised of students who have a 3.5 GPA and are led by student leaders whom I have found to be highly driven and interested in getting involved in projects that have a positive impact on people's lives, whether it be at home or abroad. Just to note, in previous years our group of students had done fundraising to help Crossroads, a local help center for battered women. Now they were about to embark on a journey to help girls all the way across the world in Nepal.

"Kiss the Pig" was designed as a competition among faculty and staff at our college. Faculty and staff who volunteered had their pictures pasted each on a piggy bank. All of the piggybanks were kept at the student center with the daily updated dollar amounts that individuals placed in each, clearly demonstrated on a poster board in a form of a bar chart. The person who raised the most and the least would have to kiss a live pig.

We kept the piggy banks at the student center for an entire week. The amounts in each individual's piggybank was updated each evening before the money was deposited with the FRCC Cashier's office. The constant ups and downs of the tally placement of individuals provided for an interesting competitive environment throughout the week. Students, faculty, and staff were all starting to strategize how and in which piggybank they would place their dollars.



Figure 2: PTK Students FRCC, Personal Photo



Figure 3: Fundraising, Personal Photo

At the end of the collection event, the count revealed that we raised \$ 1,122.00. This was exciting, as it would have been enough to provide plenty of stationeries and clothes for the children at the school. With much happiness and excitement to share the news, I called the headmaster in Nepal. I informed him that we had raised enough money to buy plenty of notebooks, pencils, pens, and, possibly, warm clothes and beddings for the deaf kids housed there. However, what he said was not only unexpected but also very humbling. He said that they could do without the stationeries. Instead, they would prefer that we help them build gender-specific restrooms. He pointed out that girls were not coming to school and had a poor enrollment and attendance because there was not a functioning bathroom at the school.

It was hard for me to believe that they did not have a bathroom. So, after some discussion, I asked him to work on the cost of building these gender-specific restrooms for the

students and a separate one for the staff. I informed him that what we had raised thus far might not be adequate, but that I would see if we could get another organization to partner with us and possibly match the amount. I shared this information with my students. I planned to go to Nepal and visit the school and assess the situation on the ground. In the meantime, we approached the Rotary Club of Fort Collins as a partner.

Local Partnership

We decided to approach the Rotary Club of Fort Collins for a possible partnership in this project to build gender-specific restrooms. Dr. Phyllis Abt, then president of the club, was very supportive, especially because it was going to be a partnership with Front Range Community College students in their action to help students all the way across the world in Nepal. Dr. Abt. had been the Dean of Students at Front Range Community College previously and was excited for this partnership.

I, along with our PTK student leader Emily Thomas, worked on a grant application with Dr. Abt to request additional funding to build the restrooms in Nepal. Once we submitted the application, we heard that the Rotary Club of Fort Collins would be willing to match the amount we had raised at FRCC. This was good news, as it would mean that now we had a total of \$2,244.00. I quickly informed the headmaster that we were able to double the amount and might be able to cover the cost of building the gender specific restrooms at the school.

The Rotary Club of Fort Collins was excited to help us achieve our goal of building these restrooms and to provide a decent environment for the students in Nepal. After we learned that the club was going to match our funds, Dr. Abt. informed us that they would like to work with us to apply for a matching grant from local Rotary District 5440. We were delighted to receive such strong support from the local Rotary club. Again, my honors student Emily Thomas from PTK,

myself, and Dr. Abt. worked on the new grant application to get the dollar amount matched by the district Rotary. Our request was approved, and we had Rotary District 5440 match our initial amount. This meant that now we had a total of \$3,366.00 and would be able to help the school build the restrooms and also provide other items as needed.

Field Trip

Now that we had the amount necessary to build the gender-specific restrooms, I wanted to make sure that I had the full picture of the needs of the school. I decided to fly out to Nepal and visit the school to learn about the school, the community, its needs, and meet the students. After a 38-hour flight, I finally arrived in Kathmandu. I used a few days to get over the jet lag and then took a flight to Biratnagar, Nepal, the closest airport to the village of Mulghat. I reserved a small taxi to take me to the school. After about 4.5 hours of driving and a few stops for food, we arrived.

The school is located in a valley that lies between two popular and populous towns of Dharan in the Terai (flatlands) and Dhankutta, which is located in the foothills of the Himalayas. It is just off of the Koshi Highway, also known as the Dharan Dhankutta Highway, connecting these two namesake towns. It is set on the mountain slope that faces the Tamor River that runs through the valley, which is a tributary of the much bigger Koshi River. The location is beautiful, with big mountains towering over this green valley. However, it also seems sparsely populated and remote.

I was welcomed by the teachers and the headmaster. After a few minutes of introductions and pleasantries, the headmaster took me on a tour. The school had a few buildings built on the slope of the mountain with a sloped quad of sorts in the middle, which was shaved off to make a flat playground. The buildings, except for one, looked like they had suffered from water damage

over the years and were in an immediate need of improvements. The headmaster noted that the monsoon rains had been particularly heavy, and the runoff from the surrounding mountains had brought flash floods through the school ground on their way to the river down the slope.



Figure 4: Damaged Doors,
Personal Photo



Figure 5: Damaged Walls, Personal Photo

I also saw that not all classroom buildings had windows or doors. In the classrooms that did have them, the doors and the windows were badly damaged. The wood was warped from the repeated water damage during monsoon seasons and did not close properly to allow for any protection from the elements. The roofs of the building were galvanized metal sheets, which one can imagine would be very loud during the monsoon rainfall. The walls for the most part looked fine, although in parts where the plaster was falling off.

The classrooms were in dire situation. The desks and benches were barely holding together. I saw desks with broken legs propped up by stacked bricks. Wood planks were placed inside a metal frame designed to hold the desks steady. The desk planks were deteriorating and had splinters sticking out. The benches showed similar wear and tear. The legs of the furniture and the lower parts of the classroom walls both showed excessive water damage. I asked the headmaster what had happened. He replied that the monsoon flash floods come in and flood the

classrooms every summer, when classes are in session. This was because the old flood protection wall was washed away a few years back. The school desperately needed one to protect the property, but most importantly, the lives of the children and staff during such an event.



Figure 6: Damaged Benches, Personal Photo

There were a lot of improvements from which the school could benefit. However, I wanted to learn about the main reason why I was there, which was to learn about the restroom situation. The headmaster reiterated to me that the school did not have a gender specific restroom. All it had was one outhouse, which he said even the boys were skipping and heading to a nearby field as a better option for defecation. This, he pointed out, was a major hygienic and public health concern, especially where the outbreak of cholera in the western parts of the country seemed routine every summer.

As I walked over to the outhouse, I could see and smell why the students were hesitant in using it. The distinct and powerful smell of ammonia filled the air. I mustered up the courage to approach it and open the door to look inside. I was not surprised why no one wanted to use it, and I am glad they were not, as it could easily make one sick. With eyes burning, I quickly

turned around and walked away from the structure. What was particularly disturbing was that the outhouse stood in between the teachers' office building and the kitchen!

I learned that the outhouse was the only available one and it was for use by the teachers, staff, and the students alike, although most avoided using it. The outhouse structure did not have any visible plumbing, so I asked if there was any water supplied to the structure. The headmaster said no running water was available. He went on to say that even the water used in the kitchen for drinking, cooking and cleaning was carried by resident students, who are deaf, from the Tamor River down the valley. In fact, I did see some students hauling water up the mountain. So needless to say, it was a scarce commodity.



Figure 7: Students Carrying Water from Tamor River, Personal Photo

This presented a particular problem for our plans. It would not be sustainable to build gender-specific restrooms and not provide water, both from a usefulness and from a hygienic point of view. One could imagine the impact on students' health of a lack of water, not just for drinking, but also for washing hands, cleaning the toilets, and so on. So, I asked the headmaster about the possibilities of bringing running water to the school. He then pointed me to a structure: a water collection tank built in July of 1992 by the United Nations Development Program (UNDP).

The UNDP built water collection tank had not been in use for years, nor was it maintained. The school officials told me that the UNDP built it to supply the water to the school from some aquifer. However, once the brick-and-cement tank was built, the UNDP abandoned the project. The officials were not aware of why the project was not completed. The structure seemed to be in a good shape for the most part. It had grass growing around it and on the inside, where the plaster had peeled off due to weather exposure over time. However, it could easily be salvaged with some re-plastering of the inside and clearing out of the vegetation growth.

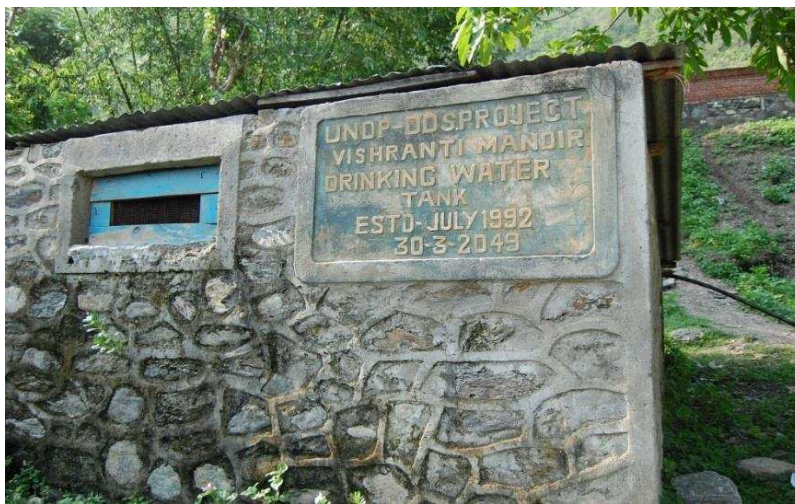


Figure 8: UNDP Water Tank at School, Personal Photo

The location of the tank was ideal. It was situated on the top part of the mountain slope where the school was located. This would allow for collection of water from the source, and then siphoning it off to the various buildings, including the toilets in the school, with the gravitational force helping in providing the pressure for it to flow to these buildings. This possibility of having running water, with the bonus of having the aquifer identified and a water collection tank already built, was exciting, not just from the ease of the project standpoint, but also from the financial viability standpoint. It was clear that the running water had to simultaneously accompany the construction of the toilets for it to be both effective and sustainable. I asked the headmaster to study the cost of this additional project and to submit to me.

The money we had from the fundraising and the matching grants from the Rotary Club of Fort Collins and the District Rotary was going to be enough for the construction, as the headmaster said that he was also able to get the education ministry to fill any gaps. So, the project was a go. However, the question of fund transfers, allocation, distribution, and most importantly, corruption still remained, especially now that the sum had become that large. For context, in 2016 Transparency International ranked Nepal 131st out of 176 nations in the corruption index, alongside Iran and Russia. The index for Nepal in 2016 was 29, with 0 being highly corrupt and 100 being very clean in the Transparency International's Corruption Perception Index.

International Partnership

It was imperative that every penny that we raised and matched by the Rotary was spent to benefit the students, including the deaf students housed at the school. This presented a few logistical issues. First, how would we transfer the money to Nepal and ultimately to the school to construct the restrooms and the water line? Second, whom could we trust to receive the money in Nepal and dispense it for the school to use? Third, how would we make sure that we minimized the corruption at the local school level to make sure that all of the monies were used in the said project and that there was minimal, if any, leakage? These were important questions to answer if we wanted the project to be successful.

After consultation with Dr. Phyllis Abt. from the Rotary Club in Fort Collins, I reached out to the Rotary Club of Kasthamandap in Kathmandu, Nepal, to see if it would partner with us in the project. The Kasthamandap Rotary Club in Nepal was open to the idea as it had previously donated blankets, clothes, etc. to the students in Dhankutta. This allowed the club to add to the

existing relationship it had with the school. It also provided us with a local partner we could trust and help us keep our administrative costs at zero.

I then articulated an agreement with the three partners involved to get the funds to flow to Nepal. We agreed that Phi Theta Kappa at Front Range Community College in Fort Collins would transfer the funds to the Rotary Club of Fort Collins, which would then collect the matching funds and wire the money to Kasthamandap Rotary Club in Kathmandu, Nepal. The Kasthamandap Rotary would then hand over the check to the headmaster of Sri Kaushika Primary School in Mulghat, Nepal, during one of its functions at the school. This process ensured that the administrative cost would be kept near zero, as the Rotary Club of Fort Collins covered the transfer costs, and the Kasthamandap Rotary Club was including our check handover during its clothes drive at the school. Now, the only issue left to address was the proper use of funds at the school level.

To minimize the corruption at the school level, we focused on two different approaches. First, we provided the headmaster with a carrot: Successful completion of this project without corruption could lead to additional future projects for the school, as the school still needed improvements to their buildings and furniture, and the PTK at FRCC was planning on working on raising funds in the future to help with that. Second, in partnership with the Kasthamandap Rotary Club, we asked the school to set up a community board that would oversee the progress of the project. The board would be comprised of parents, village elders, and community leaders, along with the school officials. The board was set up and invited to the check handover ceremony at the school, organized by the Kasthamandap Rotary Club.

I collaborated with the leadership team at the Kasthamandap Rotary Club in Kathmandu to plan for the check hand-over ceremony to be held at the school in Mulghat, Nepal. We

planned inviting students, parents, school officials and the community board members to the event, where the Rotary members would announce the award and its purpose. We also agreed to hand out a big paper check so that people would remember it. We believed that all of the fanfare, oversight by the community board, and the incentive of possibility of future projects would reduce corruption and would see a timely completion of the project. The results proved us right. Once the community board and the leadership team from Kasthamandap Rotary Club approved the proposal put together by the headmaster in consultation with other school staff, we quickly approved the project from Fort Collins, and dispatched the money to Kasthamandap Rotary. The construction was completed on time and within budget with additional funds provided by the local governmental bodies that support community schools in Nepal.

Construction

Once the money was received, the work started in Mulghat, Nepal. The headmaster hired local construction workers to plan for the construction, and all of the materials were bought from local businesses to provide a boost to the local economy. Some of the materials like brick, sand, and cement were brought to the school site on trucks and local tractors. However, since the building site for the restrooms and the water collection tanks was located on a higher terrace, the school had to hire additional help from the locals to carry these heavy materials to the construction site. Building the restroom also meant they had to shave part of a terrace to make a flat space.

When the construction was complete, the school had two gender-specific restrooms, one to be used by the boys and one for girls. We were also able to construct a separate restroom for the teachers and other staff at the school. The boys' restroom had a common local squatting toilet, a bucket for water collection, a plastic water scooper, and a tap with running water. The

girls' restroom had the similar set-up, except it also had some space for a changing room closed off for privacy. This would provide adequate space for both boys and girls at the school to use the restroom, as well as to make sure that they maintain a clean hygiene, thus reducing incidents of diseases



Figure 10: Gender-Specific Toilets, Personal Photo



Figure 9: Students in front of Toilets, Personal Photo

The construction project also involved tapping the aquifer up the mountain that they had previously discovered while planning for the UNDP project for clean drinking water. As part of this project, the school ran a pipe from the aquifer on top of the mountain down to the school and into the water collection tank. The school then built other pipelines to the kitchen, plus newly constructed toilets and the changing room for girls.

It was clear that there was enough demand for running water from the adjacent village where people had to carry water up the mountain just like the students at the school. So, in order to help the community and to foster a positive relationship, the headmaster also ran a pipe from the collection tank to the village. He added a tap so that locals could easily access clean running water, but most importantly, so they would not have to make multiple trips down to the river to fetch water. The school decided to charge a minimal fee of 35 rupees per month per household, which would be just enough to hire one individual to check all of the pipes up to the aquifer and

replace any faulty lines or taps. This arrangement allowed for a continuous stream of funds over time, which would make it sustainable.



Figure 11: Water in Village, Personal Photo

Analysis of Project and its Impacts

Short-Term Impacts

The construction was complete within the year, and the students, staff, and the village community benefitted from the running water that was now easily available, both at the school and in the village of Mulghat. This removed the burden on the villagers and the students from having to haul pails of water from the Tamor River, which used to take about 20 minutes, round trip up and down a steep slope. Having to haul water meant that water was always scarce.

However, once the water lines were put in, the scarcity problem was alleviated. Moreover, the students now had toilets that had running water, which is a major contrast to the smelly and filthy

outhouse they had before our intervention. The new facility allows them to maintain a clean environment and improve their overall experience at the school.



Figure 12: Running Water at School, Personal Photo

The new facility was especially beneficial to the female students and teachers who now had access to not only to the gender-specific restrooms but also a clean changing room, and to clean running water. On my follow-up visit, the headmaster and the teachers informed me that the girls were very happy and excited to be at the school—a stark difference from what the headmaster had told me over the phone during our first conversation. He also mentioned that the village community now looked at the school in a favorable manner and was eager to send kids to the school rather than send them to schools in Dhankutta or Dharan, the towns nearby.

Long-Run Impacts

The immediate impact on the status of the school in the village now that it now had gender-specific restrooms and running water could be seen from the anecdotes shared by the headmaster. However, we had to collect the data from the school to see if we made any major impact on the lives of the students. Not only was I interested in finding out about the impact that

we had made, the Rotary Club of Fort Collins was also interested. In fact, we made additional donation drives to help the school alleviate issues with which the school was dealing with so that most of its time and energy could be spent on teaching and learning. Through additional fund-raising, matching grants by the Fort Collins Rotary Club Fort Collins Downtown Rotary, and the district Rotary, we were able to raise \$15,000.



Figure 13: Kasthamandap Rotary Meeting, Personal Photo

This new sum was enough to make a lasting impact on the school to help with the various infrastructure improvements that the headmaster had identified as crucial needs. With the approval from the Rotary, I decided to travel to Nepal again in May of 2013 to do a survey of the needs to present to the Rotary and to observe the impact of the restrooms and running water. Fort Collins Rotary Club donated 80,000 United Airlines miles to send one of my students, Emily Thomas, with me to do the study at the school. I covered other expenses related to internal travel and hotel while we were in Nepal, so that not a single penny from the raised amount was used, allowing us to keep the administrative costs at zero.

Once in Kathmandu, Emily and I attended one of the meetings of the Kasthamandap Rotary Club and met with its members. I provided the club with the update in terms of additional funding that would be available for additional improvements at the school. They thanked us for our continued support of the school, and we thanked them for being an important partner in this project, especially in their efforts in oversight and money transfers. They assured us that they would continue to work with us in our future projects to help the school and the students.



Figure 14: Flag Exchange, Kasthamandap Rotary, Personal Photo

After the flight to Biratnagar and the drive up the mountains, we arrived at Sri Kaushika Primary School in Mulghat School. After meeting with the students, who welcomed us by lining up on both sides of the gate into the school, we surveyed the school grounds and made notes of the various improvements that needed to be made at the school. Once that was complete, we started to collect information on the progress that the school had made since we built the restrooms and brought running water to the school.



Figure 15: Welcomed by Students, Personal Photo

The headmaster informed us that since our intervention, the school had been able to open a new kindergarten class called the Child Development Center, and the school had since added two additional deaf students. One of them was the first deaf female student that the school has ever had. Like other deaf students, she came from a hill village hours away from the school. The fact that the family felt comfortable to send its little girl, who was 8 years of age, spoke volumes of the reputation that the school now had in terms of having facilities that was friendly to girls.



Figure 16: Data Collection with Headmaster (right), Personal Photo

Additionally, the headmaster mentioned that the school was now growing and that the parents felt comfortable sending their children to this school instead of sending them to other nearby towns. He also mentioned that overall absenteeism had decreased. He said that the girls were coming to school more and, in general, he was having to contact students and their parents less frequently due to attendance. Since the school had spotty data on attendance, I asked the headmaster to provide me with the enrollment data for students since the 2008-2009 academic year on. What the data revealed was fascinating.

Based on the enrollment data, it is clear that the school suffered from declining enrollment from 2009 until 2011, dropping from 143 to 118. This is also true for female students, where they went from 68 in the 2008-2009 academic year to 56 in 2009-2010 and to 52 in 2010-2011. The decline in the enrollment for boys from 47 to 42, although present, is not as drastic during the same time period.

Table 2: Enrollment at Sri Kaushika Primary School, Nepal

Academic Calendar		Students		Deaf Students		Child Development		Total
Year	Nepali	Male	Female	Male	Female	Male	Female	
08/09	2065	47	68	10	0	8	10	143
09/10	2066	42	56	10	0	5	6	119
10/11	2067	42	52	10	0	5	9	118
11/12	2068	39	55	10	0	8	10	122
12/13	2069	41	49	10	0	14	9	123
13/14	2070	53	84	11	1	7	10	166

The restrooms and the running water funds were approved in 2010 and the construction completed during the 2010/2011 academic year. Since that time one can see a consistent increase in overall enrollment, rising from 118 to 166, a 40.7 percent increase. During the same period the enrollment numbers for boys rose from 42 to 53, a 26.2 percent growth. The change in female enrollment during the same period was much more drastic, increasing from 52 to 84, a 61.5 percent increase! Although many factors, such as population and demographic change, could impact enrollment numbers, such drastic changes around the intervention are hardly coincidental.

During the same time, the school was also able to make some improvements in the room used for its Child Development Center, and the enrollment into that program has increased as well. It is also worth noting that the number of deaf students housed at the school remained constant until 2014, when it added one boy and one girl to the group. This was the first time a deaf girl was admitted into the school, which had primarily served the boys population. This was not because the school was opposed to it, but just because the families of deaf girls from the villages did not send them to the school. So, the addition of this student, along with the increase in the enrollment of girls overall, demonstrated the improvement in the school's dedication to female students. The data seem to support the claim made by the headmaster that the enrollment had increased and that absenteeism declined.

It is not every day one thinks about restrooms and running water as making a difference in children's school enrollment, attendance, and participation. However, this project and the lessons that we have learned from this intervention have shed some light on various factors that play a role in a child's education. These factors will be different in different parts of the world. For example, researchers at the Abdul Latif Jameel Poverty Action Lab discovered that deworming school aged children in western Kenya and Bihar, India, improved attendance rates

(J-PAL, 2012). In other places, a big factor might be the time it takes to get to school. Or, it might be hunger, as No Kid Hungry in the United States finds that students who eat school breakfast “miss less school” (No Kid Hungry, 2017). Therefore, whatever the reason, we should study the reality on the ground and design policies to help alleviate such constraints, which will improve attendance in the short run, and productivity and living standards in the long run, as in the case of Sri Kausika Primary School in Mulghat, Nepal.



Figure 17: Deaf Students-Goodbye, Personal Photo

CHAPTER 4

Research Methodology

The field work and intervention project detailed in the previous chapter suggests substantial educational and economic value associated with basic resources and the availability of sanitation in schools in Nepal. As such, this work motivated continued economic research taking the form of original sample surveying of students and their experiences in the context of Nepal's school system and economic and cultural context.

The goal of this research was to identify the factors, both economic and social, that impact school attendance of students in grades eight, nine, and ten, in rural and urban areas in Nepal. Since the decision of whether to attend school or not on a daily basis is dependent on various social, economic, personal, and institutional factors, it was important to collect specific information on students' characteristics, household characteristics, and school characteristics. Therefore, a survey was created to collect this information directly from the students. Econometric analysis using the ordinary least squared (OLS) method was then performed on the data collected from the survey to identify the factors that impact attendance.

Survey

The survey questions (see Appendix A) were designed to collect relevant information related to students themselves, their household characteristics, and the characteristics of the school that they attend. The 51 questions created to draw out the economic status of each student's family was consistent with economic theories presented in this dissertation that draw on the Agricultural Household Model, and the Principal Component Analysis (PCA) method that utilizes the asset valuation method to create an index that can be used to assign students into

various wealth groups. The questions generated to develop the value index are consistent with anthropological theories and principles. Both set of questions were discussed with Dr. Bernasek (Economics) and Dr. Kent (Anthropology), both at Colorado State University, before finalizing the survey.

Student Characteristics

In order to control for the difference in student characteristics, it was vital that we got information on each and every student's personal characteristics. We needed to collect some standard information on the student's gender, age, ethnicity, and other demographics. In addition, we needed to collect information on the student's study habits, work habits, and other time use patterns. Thus, we designed questions in the survey to garner the information.

We asked students to simply put down their full name, which would reveal not only the gender of the student but also the specific caste group to which they belonged. The survey also asked the students to explicitly write their gender and their age in years and months. Obtaining the age in years and months allowed for us to create a continuous variable, which allowed for us to better study the behavior of age's impact on attendance.

Household Characteristics

The survey also included questions designed to obtain the information on students' household characteristics. Knowing how much time a student spent on household activities such as cleaning and cooking would be important to establish a pull on their time. Therefore, we asked the students to state how much time they spent daily on those activities. To identify on which household activity students were spending most of their time, we asked them to pick from a list provided with an "other" option where the student could write an activity that did not appear on the list.

Other factors that would have a pull on their time, as discussed in earlier chapters, included having siblings and grandparents. Therefore, we asked the students how many younger and older sisters and brothers they had. Some of the questions asked the students to say whether their grandfathers or grandmothers lived with them, and if they did, to identify if they were sick or healthy. This would provide the information to control for sick grandparents, who would require attention and could potentially take time away from the student that he or she could use toward school work. One of the questions also asked the student to write down the number of people who lived in his or her household to provide us with the information on the household size, which would have either negative or positive impact on the student's time.

As discussed in the previous chapters, parents' educational attainment is also important information that could potentially impact a student's school attendance. The students were asked to state the highest level of education that their mothers and fathers had completed. This information was used to divide the parents into either an "educated" or "uneducated" category based on whether or not they had completed the School Leaving Certificate (SLC).

We determined that it would be difficult to get the income- or wealth-level information from the students, as they are not likely to know the details of their household wealth situations. So, in order to ascertain this information, questions were designed to obtain information on asset possession by the household that the students would easily know. For example, the students were asked if the family owned or rented their homes, how tall the houses were, whether they rented to others, what the employment status of the mother and the father were, and if and how many cars, refrigerators, microwaves, and other capital items that the family owned. This information would be used to generate the "Wealth Index" using the PCA and this index would be used to control for wealth differences between students.

Attendance would also depend on the value system of the students themselves and their families and how they view the importance of education. For that reason, questions were designed to ask if they thought it was important for a woman to cook to be a good wife, if sending girls to school and college was important, if it was more important to educate boys than girls, and what their parents thought about similar options. The information obtained from this set of questions would allow for us to create a “Values Index” using the Primary Component Analysis method, similar to the one used in generating the “Wealth Index.”

School Characteristics

To isolate the factors impacting attendance, it is also important to control for the characteristics of the schools that students might attend. And so, a few questions were designed to collect information on the school that the student was attending. Distance to the school would be an important variable that could potentially impact a student’s attendance. However, a student might not have a good command of the measurement of distance from his or her house. It would be more likely that students would be aware of the time it typically takes them to get to the school from their homes. So, we asked the students to provide us the time, in minutes, that it would take them to get to school from their homes.

In addition to the questions on the survey that were designed to collect school characteristics data, a separate questionnaire was prepared for the school administrator to answer. It had questions designed to obtain some standard information such as total enrollment at the school and the number of computers it had to information such as female-to-male teacher ratio and whether or not the school had gender-specific restrooms. There were also questions to obtain information on after school programs and if the school had any absenteeism- and attendance-related policies such as fines or rewards.

Colorado State University IRB Approval

In order to answer the research question posed, we had to conduct the aforementioned survey to collect data from students in and around the Kathmandu Valley in Nepal. As the research involved collecting information on human subjects, we had to follow the approval process set by the Colorado State University (CSU)'s Institutional Review Board (IRB) for Social, Behavioral and Education Research. As part of this process, both Dr. Bernasek and Niroj Bhattarai, as the principal investigator and co-principal investigator, respectively, went through the training module provided by the IRB. Once the training module was completed, the application for approval was submitted to CSU IRB through its website, eProtocol, on October 20, 2015, and the protocol ID of 15-6143H was assigned to the project.

As part of the application process, the consent form (see Appendix B) to administer the survey in the 7 identified schools in Nepal was created and uploaded to the IRB portal. Along with the consent form, the survey to be administered to obtain the data and the methodology chapter was submitted for the IRB's review. The IRB, upon review of the initial submission, requested some clarification on the process. In particular, the board wanted to make sure that we first contact administrators, guidance counselors, and/or teachers to explain the project and answer any questions that they might have. The board also wanted me to make sure that the adolescent children, the subject in the study, were protected and that isolating students if they take longer than other students was avoided. All of the questions posed by the IRB were answered, and the board was assured that I would inform the school officials of the project, get the principal's approval in writing, and avoid any situation where any student would be alone by asking all students to be present until everyone was done with the survey.

The IRB approved the project as submitted on February 23, 2016. I travelled to Kathmandu, Nepal on March 11, 2016 to administer the survey. The physical copy of the survey was administered in all 7 schools from March 13, 2016 to March 18, 2016. All of the requirements and guidelines set out by CSU IRB were followed, and the process went very smoothly. Once the field work was complete I, along with all of the physical copies of the survey for all 365 participants from seven schools, returned to the United States on March 21, 2016, concluding the survey phase of the research.

Sample Selection

As the purpose of this study was to identify the factors that play a role in a student's decision of whether to attend school or not, in both rural and urban Nepal, schools were selected to represent both areas. Four schools in the Kathmandu Valley (representing urban settings) and 4 schools in the outskirts of the Kathmandu Valley (representing rural setting) were selected. The schools that we picked were located in various parts of the city for the urban locations, and the rural ones were in the West, South and East of the Kathmandu Valley, some at a two to three hour drive from the Valley. It was important to make sure that the schools were co-ed for the purpose of the study. Therefore, the schools and their headmasters were contacted ahead of time to make sure that the schools were in fact co-ed. This was particularly important as one of the goals of the study was to explore any significant differences that may exist in attendance between the two genders, as argued in the theoretical framework chapter.

Schools

School 1

School 1 is located in Kathmandu near the old city center of Kathmandu Durbar Square, a world heritage site that houses old palaces of the monarchs who ruled Nepal until it recently became a republic. The location is heavily populated and is surrounded by the urban hustle and

bustle of the city. The school serves to mostly the locals in the area, which is most heavily populated by the Newari people.

The school is described as a “boarding school” even though it does not provide dormitory service. This is quite common in Nepal. The term “boarding school” has been synonymous with a private school that conducts its education primarily in English. The school had 46 students in grades eight, nine, and ten at the time of my visit. There were 11 male and two female teachers. It had whiteboards in every classroom. The school did not have much land in the form of a playground, mainly because of its location in the heart of Kathmandu.

School 2

The school is located outside the perimeter of the “ring road” that encloses the urban area of the Kathmandu Valley in the Patan District. The location is rural, and one has to pass through paddy fields and other farming community. However, it is clear that urbanization has started to creep up to the edge of the community, mainly because of the population growth in the valley, particularly inside the “ring road.”

The school reported 132 students enrolled in grades eight, nine, and ten. It had five male and four female teachers who taught all of the classes for the said grades. The school had a quad in the middle of the building that made a rectangle that the students used to stand in groups and chit-chat during breaks. It seemed that the school was tight on playground space, as there would be no room to play when all grades are out on the quad during breaks.

School 3

Located in the heart of the Patan District in the Kathmandu Valley, this school was surrounded by all of the urban amenities that the city had to offer. The school building stood on top of a small hill, connected by a brick road lined with urban homes on both sides with small

retail shops on the ground floor, a typical Kathmandu style. This school catered primarily to the children of day laborers who reside in the neighborhood, but did have some local children whose parents were not day laborers.

The school had 35 students in the three grades. However, we were only able to administer the survey to 20 students in grade eight. It had eight teachers, four men and four women. Despite being located in an urban setting, the school did not have running water, but drew water from a local water well. There was not a lot of space for the kids to play any major sports, but had enough for them to kick around a ball in small groups or play marbles.

School 4

School 4 was located in Panchkhal District outside the Kathmandu Valley. The district is well known for its farming, and the school is located in the rural village in the district next to large fields used to grow potatoes, and other crops to supply to the population centers of the Kathmandu Valley. Even though the school is in a rural setting, the building of the school was in very good shape, being built with bricks and cement, and the classrooms were well-equipped with whiteboards, decent desks and benches. The fact that it had received support from foreign non-governmental organizations like the Rotary was apparent from the posters that hung around the buildings and in the principal's office.

This school had 62 students in grades eight, nine, and ten, and ten computers on site for the students to use, despite being a public school. It had seven teachers who taught all of the classes for the three grades mentioned. What was interesting was that all seven of the teachers were male. No female teachers taught the three grades selected for our survey. The school had open spaces next to it, which allowed students to run around, play soccer, or just hang out with their friends during breaks and recess.

School 5

School 5 was also located in the Panchkhal District, about 20 minutes away from school 4. Similar to school 4, it was also located in a rural setting on top of a small rolling hill. The school was a two-story building and was made of bricks and plastered with cement. It also had received help in some form or another from foreign charity groups, demonstrated by the educational posters hanging around the building.

The school had 87 students in the three grades that participated in the survey. It had eight teachers assigned to teach the classes. However, all eight, similar to school 4, were men. The school had clearly marked gender-specific restrooms. However, it did not have running water. It did have access to water, but it was about 1000 feet away, and had to be hauled in buckets. The school had plenty of open space for students to run around and play. The principal reported that it had sports activities on a bi-monthly basis.

School 6

School 6 was located in Thankot, the entry point town off of the main highway that exits the Kathmandu Valley to the west. This is the first settlement as one enters the Kathmandu Valley after a long and steep climb up the mountain from the western part of the country. The school is counted as an urban school, as most of the urban amenities are available within a few kilometers, if not in the immediate vicinity. The school buildings were at least two stories, and some of the buildings seemed to be new construction. The school had a canteen on site and also had a large quad used for morning assembly and for student play area.

The school had 300 students in grades 8, 9, and 10 and served the urban community around it, which has been growing in population for a number of years, according to the headmaster. There were multiple sections for each grade to accommodate all of the students. The

eighth grade has two sections, and the ninth and the tenth grades had three sections each. There were 15 teachers, 12 males and three females assigned to these three grades. The school had gender-specific restrooms with running water in all. This school also had after-school sports programs for the students. It had 40 computers, and all of the students in grades eight, nine, and ten had access to them.

School 7

School 7 was located in the heart of Kathmandu. It was the only school in our sample that had its own boarding facility if the students needed it. It also had one school bus, but it did not seem to be in use all that often, not for students. The school, because of its location, served lower-middle-class children. It was in the planning phase in the process of merging with two other schools in the area to become one large school, with an American expat from Colorado, as it turns out, as its new principal.

The school had 60 students in the three grades who were part of our study with 20 students in each. Eight teachers were assigned to these three grades to teach all of the subjects. Out of the eight teachers, five were male and three were females. The school did have gender-specific restrooms with running water. However, the principal said that the students had to bring their own drinking water. There were extra-curricular activities only during the school hours of 9 a.m. – 4 p.m. and the school had some sort of sports activity once a week. The school did have a cemented basketball court.

Data Collection

The schools were contacted in October, November and December of 2015 and informed of our interest in conducting research with their students. They were provided with the explanation of the purpose of the study, without providing the details of the study or the types of

questions to be included in the survey, so as not to generate a bias. Detailed information about the survey and the study itself was provided to each school after the completion of the study.

The schools were asked to provide the attendance records of all of the students who were included in the survey. I explained that the information collected would be kept confidential for a required timeframe and then destroyed. They were also informed of the fact that the research process, specifically the survey development and administration, was vetted by the IRB at Colorado State University, Fort Collins, CO.

I travelled to Nepal in March of 2016 to conduct the survey at all of the seven schools. The survey times were set in advance with the school officials. Once at the school, the disclosure statement was read to the principal, and his/her signature was obtained, allowing me to conduct the survey in the designated grades. Once in the classrooms, the survey was handed out with 4-digit unique codes on each survey, where the first digit was for the school, the second was for the grade that the student was in (1 for grade eight, 2 for grade nine, and 3 for grade ten), and the third and the fourth was the headcount in that classroom. So, for example, 3119 would mean that that questionnaire belonged to the 19th student in grade 8 of the third school where the survey was conducted.

Since the survey was in English and all of the schools that were selected taught English starting from earlier grades (typically primary level), the expectation was that the students would understand the survey questions comfortably. The words used in the questions were straightforward and sensitive to cultural differences, especially to the meanings of certain words. For example, instead of using, “How many floors does your house have?” we used, “How many stories does your house have?” However, wherever there was a confusion, or if a question arose, I, being fluent in both English and Nepali, explained the question and the answers to the

students. This was done very carefully, so as not to introduce any bias in the answers selected by the students.

Analysis Method

The survey information collected was coded and combined with the attendance data provided by the school for each student. The data were then entered into Microsoft Excel format for ease of sorting and importing into the statistical tool Gretl. Descriptive statistics were generated to be included in the presentation and discussion of the data. Using Gretl, the data were imported and econometric analysis, based on the regression framework, was performed. The econometric method used in this study was ordinary least squares, or OLS. The regression analysis was performed to identify the factors that impact school attendance in rural and urban Nepal; the results are presented and discussed in the econometric analysis chapter of this dissertation.

The data collected from the questions designed to create the “wealth index” and the “values index” were used in a manner consistent with the process described in the paper *Methodological Note: Measuring Relative Wealth using Household Asset Indicators* (Cordova, 2008) from Vanderbilt University. The process involves using the PCA method. This method takes into account the regional differences that exist while being “sensitive to contextual variation” in terms of urban/rural differences (Cordova, 2008). Once the “wealth index” and the “values index” were created using the PCA method, they were imported into Gretl and used in the econometric study, including some parts of the regression analysis.

The regression analysis revealed some interesting results discussed in this research, and gave rise to some follow-up questions. As a result, and in order to get a better understanding of the results, I travelled back to Nepal in May of 2017 and conducted focus groups in 3 of the 7

schools that had participated in the original study. The focus groups were divided into two groups by gender, so as to make sure that the girls, in particular, answered the questions related to menstrual cycle and its impact on school attendance. The results from the overall research project and the supporting findings from the focus groups are discussed in the discussion and focus group findings chapter of this dissertation.

CHAPTER 5

Descriptive Statistics

The goal of this research project was to identify factors that impact school attendance in rural and urban settings around Kathmandu Valley. In that effort, as mentioned in earlier chapters, seven schools were identified and approached for permission to conduct the survey. All seven schools agreed and granted the researcher permission to have the students in grades eight, nine, and ten participate. The survey, as mentioned before, had 51 questions that aimed to collect information to help understand the student population being studied and to isolate the factors that either positively or negatively impacted school attendance.

The questions were designed to collect information on three main characteristics tied to the student. The first set of questions was aimed at getting information on the student's personal characteristics: gender, age, ethnicity, time spent studying at home, etc. The second set of questions attempted to garner information about the students' household characteristics: parents' education, number of siblings, presence of grandparents, family's asset ownership, and other information. Finally, the last set of questions, including the questions posed to the school officials, assessed the characteristics of the school itself: distance to school, availability of gender-specific restrooms, computers-per-student, students-per-teacher, etc.

This chapter describes, in detail, the sample size and characteristics as well as the findings for the various cluster of questions attempting to garner information on various characteristics of the students, their households, and the schools that they attend. In the following pages, I present the descriptive statistics for the overall sample size, and for each individual

questions, although some of the data is combined where appropriate to better understand some of the information that the students revealed about these factors.

Sample Size

As mentioned above, the survey was conducted in 7 different schools in and around the Kathmandu Valley in Nepal. The survey was conducted during March of 2016 as the school year was coming to an end in the Nepali academic calendar. Students from grades eight, nine and ten were invited to participate in the survey (see Appendix A for the complete survey), which took about an hour to complete for each group. The students were provided the consent information (see Appendix B) and, in accordance with the Colorado State University's IRB requirement, were allowed to stop their participation at any given point during the administration of the survey. There were 365 students who agreed to participate in the survey, and the school principals agreed to inform their parents, as was the practice in Nepal to conduct research that involved human subjects, particularly minors.

A basic division between the various groups showed differences in attendance in between some groups, but not as much in others, as presented in the chart below. It was revealing that the overall attendance rate was not very different between the two genders. However, there was a distinct difference between rural and urban schools, with urban school having a much higher attendance rate than the rural schools. The gap in attendance rates between the boys and girls in an urban setting was the opposite of the one that existed in the rural setting, where the boys had a slightly higher school attendance than girls.

Student Characteristics

The individual characteristics of a student have an impact on his or her behavior and tendencies, and could help explain some of the differences in attendance. To obtain the data on

these individualized characteristics, the survey asked the students to provide information that was then used to obtain the information on the students such as their gender, age, and ethnic affiliation. Let us look at all of the individual characters and how the attendance rate differs between students in different groups.

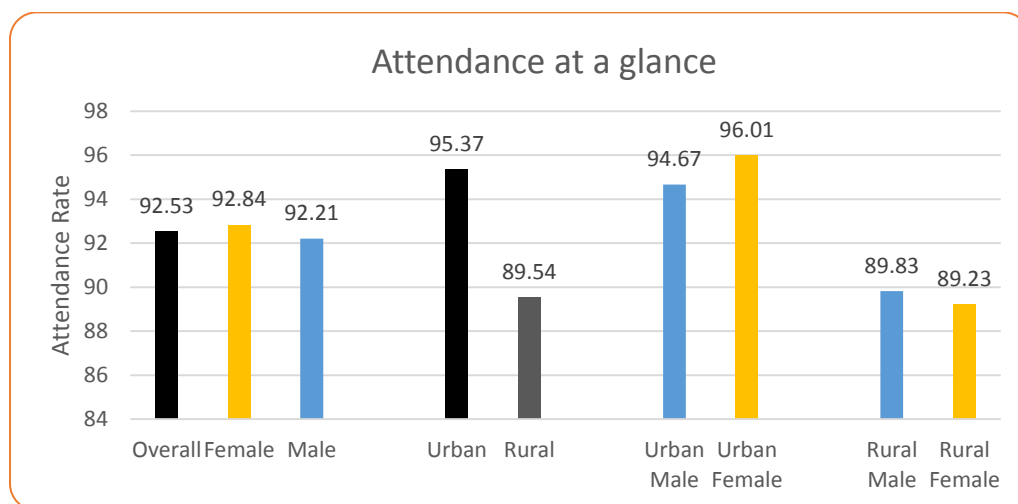


Figure 18: Attendance Rates by Gender and Urban/Rural Status

Gender

Out of the 365 students, 184 were female and 181 were male. Out of the 184 female students, 86 were from rural schools and 98 were in urban schools. Similarly, out of the 181 male students, 92 were in the rural schools and 89 were in the urban schools. The gender breakdown of the sample was, for all practical purposes, evenly split between the two genders and between the urban and rural regions. However, it was noticeable that there were more female students in the urban areas overall and in comparison with the females in the rural areas. This could be a reflection of the success of enrollment campaigns for female students over the years by government agencies, local non-governmental organizations, and international non-governmental organizations, especially in the urban sector. Without knowing the overall population of the areas, it is difficult to speculate on the very slight difference that existed between the students in

different areas. However, the lower female numbers in rural areas are consistent with what other organization such as the World Bank and Human Rights Watch have reported (Barr, 2016).

A quick review of the attendance rate of the students by gender revealed that, on average, girls had a slightly higher attendance rate than boys. Attendance is defined as fraction of time that a student who is enrolled actually attends class. Therefore, this statistic is conditional on enrollment. The gender difference became much more pronounced in the urban schools, where the girls had a 96 percent attendance rate compared to 94.7 percent for boys. The t-test results, in Table 3 below, show that the difference between the means was not statistically significant. In other words, we failed to reject the null hypothesis that the averages for the boys and the girls were the same. The difference in the attendance rate between rural boys and girls was nearly identical, with 89.8 and 89.2 percent respectively.

Table 3: Difference in Means of Attendance by Gender

	<i>Urban Girls Attendance</i>	<i>Urban Boys Attendance</i>
Mean	0.960116218	0.946661581
Variance	0.003479266	0.00450486
Observations	98	89
Hypothesized Mean Difference	0	
df	176	
t Stat	1.4498471	
P(T<=t) one-tail	0.074440401	
t Critical one-tail	1.653557435	
P(T<=t) two-tail	0.148880801	
t Critical two-tail	1.973534388	

Age

Most of the students, a total of 287, which is 78.6 percent of the sample size, were between the ages of 14 and 16, and the youngest was 12, whereas the oldest was 20. This is typical of what could be expected in Nepal for grades eight, nine, and ten. The age breakdown

was almost identical between the gender breakdowns as well. There was a slight drop in the number of girls in the higher age groups above 17.

This was not surprising given that the Human Rights Watch's report from 2016 finds that "thirty-seven percent of girls in Nepal marry before age 18 and ten percent are married by age 15, in spite of the fact that the minimum age of marriage under Nepali law is 20 years of age" (Barr, 2016). The Kathmandu Post, citing the Examination Controller Bishnu Bahadur Daware, reported that "for the first time in 80-year history of the School Leaving Certificate test, there were more girl students than boys" participating in the exams, however, "53.94 percent of the total male examinees secured the passing grades against 40.96 percent for the girl students" (Ghimire, 2015). This shows that the enrollment of girls has increased. However, there is a lot of work to be done to help female students succeed.

The HRW report finds "deeply harmful" impact of child marriage among the individuals they interviewed. One such consequence of child marriage that has a lasting affect they find is that the "married children usually dropped out of school." Our data also showed that the students from the privileged class, those who fell into Brahmins, Chettrias, and Newars, had a higher enrollment than the non-privileged group, consistent with HRW's finding that "child marriage is more prevalent in marginalized and lower caste communities."

Ethnic Groups

The students who took the survey came from different ethnic groups in Nepal. The World FactBook from the Central Intelligence Agency points out that Nepal is very diverse and has many ethnic and caste groups. The CIA points out that "125 caste/ethnic groups were reported in the 2011 national census" (The World FactBook, 2017). Out of these many groups, there are a few that are successful in terms of economic, political, and social power. Based on the World

Bank's classification, for the purpose of this research, Brahman (12.2 percent of overall population), Chhettri (16.6 percent of overall population) and Newars (5 percent of overall population) were classified as the privileged group and all of the others were classified as non-privileged groups (World Bank, 2016).

Based on the methodology of classification described above, our sample population had 134 students who belonged to the non-privileged group and 231 who belonged to the privileged group. Out of the 134 in the non-privileged group, 74 were female and 60 were male. Similarly, in the privileged group, 110 were girls and 121 were boys, out of the 231 in the privileged class. The gap between the numbers of privileged students and non-privileged students was higher in the urban schools (133 to 54) than in rural schools (98 to 80), although the gap did exist in rural schools, as well. This should not be a surprise, as Kathmandu is the largest and most advanced city in Nepal, and it is likely to have a higher concentration of the privileged class.

Students who belonged to the privileged group (Brahmins, Chhetrias, and Newars) had a higher average attendance rate compared to students who belonged to the non-privileged group—the Dalits and other ethnic groups. The 93.6 percent attendance rate for the privileged and the 90.7 percent for the non-privileged group should not be surprising, as the realities faced by these groups are different in the Nepali system, which is controlled mostly by the privileged groups, from economic institutions to political and social ones. Despite the changes that were recently made to the Nepali constitution to ensure that all of the marginalized groups had opportunities to succeed, the informal rules that are sewn into the cultural fabric will take some time to come undone. The t-test, shown in the table below, revealed that the difference between the average attendance rates between these two groups is statistically significant.

Table 4: Difference in Means Rates of Attendance by Ethnicity

	<i>Attendance Not Privileged Group</i>	<i>Attendance Privileged Group</i>
Mean	0.906796736	0.93599708
Variance	0.005379287	0.003835577
Observations	134	231
Hypothesized Mean Difference	0	
df	242	
t Stat	-3.876252731	
P(T<=t) one-tail	6.83385E-05	
t Critical one-tail	1.651174514	
P(T<=t) two-tail	0.000136677	
t Critical two-tail	1.969815134	

Household Characteristics

To understand why a student might have a low attendance, it is also important to understand his or her household's characteristics. The questions in the survey were designed to develop a full picture of the students' household characteristics. These questions attempted to get information such as the household size, mother and father's presence, decision making individuals and processes when it comes to the student's education, etc. In this section and the following paragraphs, the information collected and the discussion on data will be presented.

Household Size

The median household size of the students who participated in this survey from all seven schools was five. The household size ranged from just two to 17, where all of the siblings of the father and their children lived together, as is the custom in Nepal. Both the rural and the urban area household sizes ranged from two individuals in a household to 17. The average household size overall was 5.5. However, the household size was higher in the rural areas than in the urban areas. The average household of the students in the urban area had 5.2 individuals, whereas the average household size for students in rural areas was 5.8. As demonstrated by the table below of the two tailed t-test, the difference in the means are statistically significant.

Table 5: Difference in Means Rates of Attendance by Household Size

	<i>Rural Household Size</i>	<i>Urban Household Size</i>
Mean	5.820224719	5.171122995
Variance	5.899701644	4.680236904
Observations	178	187
Hypothesized Mean Difference	0	
Degrees of Freedom	353	
t Stat	2.691251511	
P(T<=t) one-tail	0.003728605	
t Critical one-tail	1.649181673	
P(T<=t) two-tail	0.00745721	
t Critical two-tail	1.966707009	

The household size could help or hinder a student's ability to go to school. On the one hand, more individuals in the household would mean that the student's time would not be needed for any household chores, so he or she can concentrate on studies and attend school regularly. On the other hand, the pull on one's time could be higher, resulting in less time for homework, and possibly lower attendance. On average, we see that the students who have 5 members or lower in their household have a slightly higher attendance rate (93.3 percent) than students who have 6 members or higher (91.2 percent) in their household. The two tailed t-test, as shown in the table below demonstrates that this difference in the averages is statistically significant.

Table 6: Difference in Means Rates of Attendance by Household Size

	<i>Attendance for HH<=5</i>	<i>Attendance for HH >5</i>
Mean	0.93285059	0.911748473
Variance	0.004123425	0.005167556
Observations	234	131
Pooled Variance	0.004497356	
Hypothesized Mean Difference	0	
Degree of Freedom	363	
t Stat	2.883663224	
P(T<=t) one-tail	0.002082545	
t Critical one-tail	1.649062137	
P(T<=t) two-tail	0.004165089	
t Critical two-tail	1.966520641	

If the data were divided by gender and sorted by household size, then we find that girls in big households have similar attendance rates as girls in smaller households. However, boys in smaller households have a slightly higher attendance rate (92.7 percent) than boys in larger households (91.3 percent). This difference in the mean is not statistically significant when checked with a t-test.

Parents

Having role models and guardians at home should help a student succeed in school, especially if they are educated themselves. If both parents are present as opposed to the father or mother being absent, either for labor opportunities or some other reason, it could have a positive or negative impact on the student. As discussed above, having enough members in the household to help with household chores should have a lower demand on the student's labor, and thus help the student attend school more, increasing his or her attendance.

The education level of the parents could also have an impact on attendance. Educated parents would have most likely enjoyed the benefits of being educated and therefore would place a higher value in education, which would cause them to ensure that their children are attending school regularly. On the other hand, parents with little or no education lack the direct benefit of education, and therefore, likely would place a lower value on education. Moreover, they might need help with labor hours for household production, which could reduce the attendance for the student, as that would compete directly with the household's short-term economic outlook. This would imply that students who have educated parents would have better attendance compared to those without.

In our sample, most of the households had a father and/or a mother present. In fact, 73 percent of the students indicated that their fathers were present in their households, and 85

percent of the students responded that they had their mothers present in their households. It was interesting to see that most, 64.7 percent, of fathers were engaged in the local labor market, 14.0 percent of them were employed in another town in Nepal, and 10.7 percent of the fathers had migrated to another country for employment. By contrast, 42.2 percent of mothers did not participate in the formal labor market, either at home or abroad. There has been a rise in foreign employment in Nepal. International Labor Organization reported that in 2014 “more than 520,000 labor permits were issued to Nepalis (sic) planning to work abroad” (International Labour Organization, n.d.). However, as ILO points out, the foreign employment is dominated by men, and women only constitute about “12 percent of the total workforce abroad.” Our survey mirrors this reality. Only 1.9 percent of the students’ mothers were employed overseas.

The employment picture of both mothers and fathers seems to reflect not only the cultural norm in the country but also the educational attainment. A dichotomous division was created to measure the education level of the parents. Those who had completed the School Leaving Certificate (SLC) or higher were counted as “educated,” and those with less than SLC were counted as “non-educated.” SLC attainment is quite an accomplishment in Nepal, with a pass rate that has been consistently below 50 percent for decades (Ghimire, 2015).

The data from these seven schools indicated that 51 percent of the fathers were educated whereas only 26 percent of the mothers had a SLC or higher level of academic achievement. The average data indicated that the students who had an educated mother had a higher school attendance rate of 94.9 percent compared to 91.7 percent for those whose mothers were classified as having no education (no or less than SLC). To see if this difference in the average attendance rate between students with educated mother and students with a not-educated mother, a t-test was

performed. The results, shown in the table below, indicate that the difference in attendance due to a mother's education is statistically significant.

Table 7: Difference in Means Rates of Attendance by Mother's Education

	<i>Not-Educated Mothers</i>	<i>Educated Mothers</i>
Mean	0.916813472	0.94933106
Variance	0.005163546	0.002198266
Observations	270	95
Hypothesized Mean Difference	0	
Degrees of Freedom	253	
t Stat	-5.001884199	
P(T<=t) one-tail	5.31362E-07	
t Critical one-tail	1.650898678	
P(T<=t) two-tail	1.06272E-06	
t Critical two-tail	1.969384804	

Table 8: Difference in Means Rates of Attendance by Parent's Education Level

	<i>At least one not-educated parent</i>	<i>Both Parents Educated</i>
Mean	0.91770216	0.950229217
Variance	0.005059924	0.002252753
Observations	280	85
Hypothesized Mean Difference	0	
Degrees of Freedom	208	
t Stat	-4.871955523	
P(T<=t) one-tail	1.09363E-06	
t Critical one-tail	1.652212376	
P(T<=t) two-tail	2.18727E-06	
t Critical two-tail	1.971434659	

Similarly, students with educated fathers, compared to students without, had a higher attendance rate of 93.7 percent compared to 91.4 percent. Students with both parents who were educated had an attendance rate of 95.0 percent compared to 91.2 percent for students with neither parents educated. This is a big difference in attendance, as it amounts to a difference of 7.7 days in an academic year, and the t-test, shown in the table below, demonstrates that it is statistically significant. This is similar to what we find in the West. However, there may be other

factors at play, and the econometric study that analyzes the correlation will be discussed in the econometric chapter.

Siblings

Siblings could have an impact on an individual's performance in school. They could also have an impact on a student's desire or ability to go to school. For example, an older brother or sister who is a good student could have a positive impact on his or her siblings, which might inspire the younger siblings to imitate that behavior, and therefore do better in school. However, a sibling who is not a good role model could have a negative impact on the younger siblings. Moreover, if there are younger siblings present in the household, there may be demand on the student's time to take care of the younger siblings, depending on the circumstances of the family. To study how strong of an impact, if any, the mere presence of siblings had on a students' attendance, we asked the students to provide us with the information about their siblings.

As presented in the table below, we found that some students had no younger brothers, whereas others had as many as four. Similarly, the number of older brothers varied from none to five. The number of younger sisters ranged from zero to four, and the older sisters went from none to six. It is also important to note that in the Nepali context, if one has an older sister present at home, then there is less demand on that student's time, as most of the burden of the household work most likely falls on the older sister. This will allow our student to be able to dedicate more time to school work, and the student will face fewer instances where he or she would have to miss school, thus improving attendance.

Grandparents

Grandparents and their health could also impact a student's ability to attend school. If the grandparents are present and healthy, then they would help with the household activities,

reducing the demand on the student's time. The grandparents, based on their health and education level, help the student with school work. However, if the grandparents are absent, then this possibility will not exist. If the grandparents are present but sick, this could possibly have a strong pull on the student's time drawn toward their care, especially if the student is slightly older and female.

In our sample population 13 percent of the students reported to having their grandfather present and living with them, as is the custom in Nepal. A higher percentage of the students, 29 percent, reported having grandmothers who lived in their homes with them. Some reported that their grandparents had passed, and some of the students did not have grandparents living with them, even though they were alive. They were either living with their uncles, as grandparents typically live with the eldest son, or, in the urban school students' cases, it was because they had migrated to Kathmandu from other parts of the country and had left their grandparents back in the village.

For the small percentage of the students who had grandparents present, most seemed healthy. Out of these students, 14 percent reported having a sick grandfather, and another 18 percent reported having a sick grandmother. The impact of the sick grandparents on these students' time spent on school activities and on household activities, as reflected by their attendance rate, was analyzed in the econometric study presented in the next chapter. The survey did not specify the severity of the sickness, and there is potentially an issue of younger teens viewing their older grandparents as sick, even though the grandparents could be independent and still be providing household labor services.

School Characteristics

Seven schools participated in this research project. Two of the schools were in the Kathmandu, one was in Thankot, two were in Patan district, and two were in Panchkhal. The two in Panchkhal and one in the outskirts of Patan district were designated as rural, and the other four schools were designated urban. Out of all seven, two were private schools, and the other five were all government or community schools. Even though two were private, they catered mostly to the low-income families and should not be thought of as fancy private schools. They were private only because they were not government-run. They were not, in Nepali terms, “boarding schools.”

Opportunity Cost of Time

The opportunity cost of a student spending time in taking care of younger siblings and sick grandparents, spending time in household activities such as cleaning and cooking, and spending time in participating in farming or other household business, is the time that the student could be spending on school work or attending school. Therefore, in order to understand the impact that these activities could have on a student’s school attendance, there were a few questions designed to ask the student about his or her daily routine.

Household Activities

First, to understand how much time the students are spending on household activities, the survey asked the students to provide the number of hours that they typically spend every day in household activities. The amount of time that the students reported spending on household activities ranged from zero hours to one student mentioning eighteen hours. The eighteen hours were mentioned by a student who is from a rural school and has an attendance rate that is at 82

percent. This does imply, at least for this student, that the household activities are impacting his ability to attend school.

We need to recognize that there are different forms of household activities and that the allocation of labor between these activities may differ between boys and girls, reflecting the cultural norms that exist in Nepal. To determine which activity students were spending most of their time on at home, the survey asked them to pick the household activity that they spent most of their time on. The results revealed that most of the students, 40 percent, spent their time in cleaning while 27.7 percent spent their time cooking. Surprisingly, very few students spent their time taking care of siblings and grandparents. The third highest answer was “other,” which was mostly picked by boys. These could be other activities that the men of the household might be expected to perform, such as shopping for the household, paying bills, and taking family members to hospitals, which our list did not include.

As in the “other” category, the difference in gender roles was quite clear from the different percentage of girls and boys who picked a certain answer. Girls outnumbered boys in cooking, cleaning, and taking care of siblings. However, boys outnumbered girls in farming, taking care of grandparents, and the “other” category. This seems to fit well in the patriarchal societal context of Nepal, where men are expected to take a lead role in “manly” jobs such as farming, and business-related activities. As discussed earlier, this may explain why the boys picked “other” more than girls.

Overall, the average amount of time that a student spent on household activities was 2.2 hours. And, on average, students who spent two hours or less on household activities had an attendance rate of 93.2 percent compared to 91.9 percent for students who spent more than two hours on household activities. The difference between these two means is statistically significant

at the ten percent confidence interval. The average time spent on household activities for girls was 2.5 hours compared to 2.0 hours for boys, where the difference between the means is statistically significant at the ten percent confidence interval. In a patriarchal society like Nepal, this finding should not come as a surprise.

Table 9: Difference in Means Rates of Attendance for Girls by Time Spent on HH Activity

	<i>Girls: less than 2 hours on Household Activities</i>	<i>Girls: more than 2 hours on Household Activities</i>
Mean	0.94368079	0.918410817
Variance	0.00303619	0.005110494
Observations	73	111
Hypothesized Mean Difference	0	
Degrees of Freedom	177	
t Stat	2.699436343	
P(T<=t) one-tail	0.003809575	
t Critical one-tail	1.653508002	
P(T<=t) two-tail	0.00761915	
t Critical two-tail	1.973457202	

If we dig a bit deeper to see how school attendance differs between girls who spend more time on household activity and the girls who spend less time on household activities, we find that there is a difference, as one would expect. In fact, the data demonstrated that girls who spent two hours or higher on household activities had, on average, 91.8 percent of school attendance, compared to 94.4 percent for girls who spent less than two hours on household activities. This difference, as demonstrated in the table below, is statistically significant at the five percent confidence interval.

Time Spent Studying

If there is very little or no demand on a student's time for daily household activities and other family needs, then the student is more likely to attend school, as demonstrated by the data presented in other sections in this chapter. The other benefit of students not having to spend their time on household activities is that students can then spend their time on school-related

activities. We did see a higher school attendance for students who reported spending less time on household activities, but these students would also have more time available to put toward homework and other school-related activity, and would be better prepared for school, improving attendance. For example, if a student did not have time to complete his or her homework and was not prepared to go to school, he or she would be more likely to miss school, either to avoid being punished or to set aside more time to complete the expected work, thereby decreasing attendance.

Table 10: Difference in Means Rates of Attendance by Time Spent Studying

	<i>Studying less than two hours</i>	<i>Studying more than two hours</i>
Mean	0.910023987	0.93872158
Variance	0.004909029	0.003940686
Observations	171	194
Hypothesized Mean Difference	0	
Degrees of Freedom	344	
t Stat	-4.098795176	
P(T<=t) one-tail	2.59277E-05	
t Critical one-tail	1.649295214	
P(T<=t) two-tail	5.18555E-05	
t Critical two-tail	1.966884036	

The survey of the students in the seven schools in and around the Kathmandu Valley revealed that, on average, students spent two hours on studying at home each day. Some reported that they did not spend any time studying at home, while others reported spending as much as five hours each day on homework and additional studying. Students who spent no time studying at home had an attendance of 88.7 percent, which is lower than the population average of 92.5 percent. Also, when a student spent less than the average time of two hours studying at home and spent more, we saw similar results. Students who spent two hours or more studying at home had an average attendance rate of 93.9 percent compared to only 91 percent for those who spent less

than two hours studying at home. This difference in the mean is statistically significant at the 5 percent confidence interval, as shown in Table 10.

Distance to School

The distance between the school and a student's house could influence whether the he or she will attend regularly, especially if there are no transportation options provided by the school. None of the schools we surveyed had transportation to school, except for one, but even for that particular school the school bus seemed to be in use only for teachers and staff, as most of the students lived close by the school or elected not to use the bus. The problem in assessing the distance of the school to a student's home was to get an accurate value for the distance. Even though students probably would not have a good idea of the distance in kilometers, they are likely to know how long it takes them to get to school. Therefore, time could be used as a proxy for distance, which is why the survey asked students about the time it takes them to get to the school from their home.

How long it takes for a student to get to school would impact the student's desire to go to school. If it takes longer to get to school, one would be less likely to attend, especially if one woke up late or if the weather was particularly bad. Moreover, if one lived farther from the school, one is more likely to rely on others for transportation, including public transportation. So, exogenous changes to these outside services could have a distinct impact on the student's ability to attend school. Our survey revealed that the average time for students to get to school was 15.92 minutes, with a median time of 15 minutes. For some students it took as little as one minute, but for a few, especially in the rural areas, it took much longer and up to 2 hours one-way, in one case.

Reasons for Absence

Econometric studies are an effective way to learn about the direction and magnitudes of the impact of various socio-economic factors on school attendance. One could also directly ask the students why they miss school. In other words, asking the students to identify the reason as to why they miss school could provide valuable information as one works to isolate the factors that impact attendance. Therefore, there were two questions in the survey that asked the students directly to identify the reason for missing school from a list provided. The first list consisted of broad categories, and on purpose, left out health issues. The second question consisted of the list of health reasons only.

Non-Health Reasons

The students were asked to pick the activity that made them miss school the most (question 43, see Appendix A) from a list that included income-earning activities, housekeeping activities, leisure, and farm work. Or the student could self-identify “other” and list the activity. The answer revealed that being sick was the most common reason that the students identified as causing them to miss school. What was particularly powerful about this answer was that the students picked the “other” category and identified as being sick. In fact, 72 percent of the students picked “other,” while the second highest answer was housekeeping activities, which only 11.5 percent of the students picked. Farm work and income-earning activities ranked lower with 5.9 percent and 7.7 percent, respectively.

Health Reasons

The second question of the two (question 44, see Appendix A) asked the student to pick a health reason that made them absent from school the most. Fever was identified as the most common reason to make a student miss school, with 155 students picking it, 42.5 percent of the

sample. However, the answer that came in second place was most surprising: 21.6 percent of the students picked menstrual pain as the main reason why they miss school, with headache following at 21.1 percent, and stomach ache at 11.2 percent. Fever and headache were the top two reasons that the boys reported as making them absent from school, with about 80 percent of the boys picking these reasons.

For girls, the reasons were different, even though fever was still one of the top answers, with 32 percent of the girls picking it. Menstrual pain was the number one answer, with 77 girls, 41.8 percent, picking it as the main reason why they miss school. This would indicate that menstrual pain might be a problem for girls in addition to all other health issues from which all students suffer. The table below demonstrates that the average attendance for girls identifying menstrual pain as the main reason why they miss school is 93.2 percent, and the average attendance for girls identifying any reason other than menstrual pain is 92.3 percent. Even though the average seems higher for the student identifying menstrual pain as the main reason, the t-test reveals that the difference between the mean of attendance between these two groups is not statistically significant.

Table 11: Difference in Means Rates of Attendance by Absence Reason

	<i>Girls: Main reason other than Menstrual Pain</i>	<i>Girls: Menstrual Pain as the main reason</i>
Mean	0.926206846	0.931604724
Variance	0.004900893	0.003775815
Observations	108	76
Hypothesized Mean Difference	0	
Degrees of Freedom	173	
t Stat	-0.553634597	
P(T<=t) one-tail	0.290271886	
t Critical one-tail	1.653709184	
P(T<=t) two-tail	0.580543772	
t Critical two-tail	1.973771337	

It is clear from the survey results and the descriptive analysis presented in this chapter that there are many reasons as to why students miss school. Some of the findings of the survey have been consistent with the theoretical framework, cultural context, and the findings of other research in this area, while others seem to be inconclusive. Expanded descriptive statistics are presented in Table 12. To better understand how different factors impact a student's school attendance, one has to conduct a robust econometric analysis. The next chapter of this dissertation provides the econometric analysis framework, model development, and analysis of the regression analysis to establish the direction and the magnitudes of the effect of various factors that impact students' school attendance.

Table 12: Descriptive Statistics for all Survey Questions

Question	Variable	Mean	Std. Dev	Minimum	Maximum
	Attendance (in days) (avg school days = 192)	192.41	26.02	111.00	220.00
	Attendance as a proportion of total school days	0.93	0.07	0.53	1.00
	Urban Dummy = 1 if school is in urban setting	0.51	0.50	0.00	1.00
Question 2	Female Dummy = 1 if student is female	0.50	0.50	0.00	1.00
Question 3	Age of the student	15.18	1.19	12.00	20.00
	Square of the student's age	231.95	36.41	144.00	400.00
Question 4	Household Size	5.49	2.32	2.00	17.00
Question 5	Is the father present at home? 1 if yes.	0.73	0.44	0.00	1.00
Question 6	Is the mother present at home? 1 if yes.	0.85	0.36	0.00	1.00
Question 7	Does your father have a job/paid work?				
	Yes, he works locally	0.65			
	Yes, he works in a different town in Nepal	0.14			
	Yes, he works in another country	0.11			
	No, he does not have a job	0.05			
	Other	0.05			

Table 12: Descriptive Statistics for all Survey Questions (continued)

Question	Variable	Mean	Std. Dev	Minimum	Maximum
Question 8	Does your mother have a job/paid work?				
	Yes, she works locally	0.49			
	Yes, she works in a different town in Nepal	0.03			
	Yes, she works in another country	0.02			
	No, she is a homemaker	0.42			
	Other (please specify)	0.04			
Question 9	Who makes decisions about your education?				
	Father	0.41			
	Mother	0.20			
	Grandfather	0.02			
	Grandmother	0.00			
	Other	0.37			
Question 10	How important is it for a girl to know how to cook to be a good wife?				
	Very important	0.36			
	Somewhat important	0.54			
	Not important	0.10			
Question 11	Do you think it is important for girls to go to school?	1.00	0.00	1.00	1.00
Question 12	Do you think it is important for girls to go to college?	0.99	0.09	0.00	1.00
Question 13	What do your parents think about educating girls?				
	Very important	0.90			
	somewhat important	0.09			
	not important	0.00			
	Other	0.01			
Question 14	Do you think it is important for boys to go to school?	1.00	0.00	1.00	1.00
Question 15	Do you think it is important for boys to go to college?	1.00	0.00	1.00	1.00
Question 16	What do your parents think about educating boys?				
	Very important	0.97			
	somewhat important	0.03			
	not important	0.00			
	Other	0.00			

Table 12: Descriptive Statistics for all Survey Questions (continued)

Question	Variable	Mean	Std. Dev	Minimum	Maximum
Question 17	Which one is more important?				
	Educating boys	0.01			
	Educating girls	0.01			
	equally important	0.98			
	Other	0.01			
Question 18	Mother has completed at least SLC or higher level of education	0.26	0.44	0.00	1.00
Question 19	Father has completed at least SLC or higher level of education	0.51	0.50	0.00	1.00
Question 20	Do you identify with any of the following religions?				
	Christianity	0.08			
	Islam	0.01			
	Buddhism	0.09			
	Hinduism	0.79			
	Other	0.02			
Question 21	In a typical week, how often does your family eat meat?				
	We do not eat meat	0.08			
	One day a week	0.45			
	2 days a week	0.24			
	3 days a week	0.10			
	4 days a week	0.06			
	every day	0.07			
Question 22	Does your family own or rent the home where you live? Own = 1	0.55	0.50	0.00	1.00
Question 23	Does your family rent rooms to other people?				
	Yes	0.20			
	No	0.79			
	Other	0.01			
Question 24	How many rooms does your house have?	4.20	3.14	1.00	22.00
Question 25	How many stories does your house have?	2.74	1.61	0.00	8.00
Question 26	Does your family have a microwave at home?	0.15	0.36	0.00	1.00
Question 27	Does your family have a refrigerator at home?	0.47	0.50	0.00	1.00
Question 28	How many cars does your family own?	0.14	0.55	0.00	7.00

Table 12: Descriptive Statistics for all Survey Questions (continued)

Question	Variable	Mean	Std. Dev	Minimum	Maximum
Question 29	How many motorcycles does your family own?	0.62	0.87	0.00	4.00
Question 30	How many bicycles does your family own?	0.51	0.79	0.00	5.00
Question 31	How many younger brothers do you have?	0.55	0.68	0.00	4.00
Question 32	How many older brothers do you have?	0.50	0.74	0.00	5.00
Question 33	How many younger sisters do you have?	0.47	0.74	0.00	4.00
Question 34	How many older sisters do you have?	0.74	1.00	0.00	6.00
Question 35	Does your grandfather live with your family?	0.13	0.34	0.00	1.00
Question 36	Is your grandfather sick? Yes =1, No = 0	0.14	0.35	0.00	1.00
Question 37	Does your grandmother live with your family?	0.29	0.45	0.00	1.00
Question 38	Is your grandmother sick? Yes =1, No = 0	0.18	0.39	0.00	1.00
Question 39	My family owns:				
	no farm land	0.35			
	some farm land	0.53			
	large farm land	0.13			
Question 40	Animals				
	No cows, buffalo, goats	0.58			
	Few cows, buffalo, goats	0.32			
	Many cows, buffalo, goats	0.03			
	Other	0.08			
Question 41	How do you get to school?				
	Walk	0.95			
	School Bus	0.00			
	Bicycle	0.01			
	Private Motorcycle / Car	0.01			
	Public Transportation (Bus/ Tampoo / Micro / etc.)	0.03			
	Other	0.00			
Question 42	How many minutes does it take for you to get to school from your house?	15.92	13.17	1.00	120.00

Table 12: Descriptive Statistics for all Survey Questions (continued)

Question	Variable	Mean	Std. Dev	Minimum	Maximum
Question 43	Which of the following makes your absent from school the most?				
	Income-earning activities	0.03			
	Housekeeping Activities (cleaning, cooking, washing clothes)	0.12			
	Leisure (movies, travel, play, etc.)	0.08			
	Farm work	0.05			
	Other (almost all wrote sick)	0.72			
Question 44	What health reason makes you absent from school the most?				
	Fever	0.42			
	Headache	0.21			
	Stomach ache	0.11			
	Menstrual Pain	0.22			
	Other	0.04			
Question 45	How many hours do you spend each day on household activities?	2.20	2.33	0.00	18.00
Question 46	Which household activity do you spend most of your time on?				
	cooking	0.28			
	cleaning	0.41			
	farming	0.07			
	taking care of grandparents	0.03			
	taking care of younger siblings	0.07			
	Other	0.15			
Question 47	In a typical day, how many hours do you spend studying?	1.98	1.64	0.00	5.00
Question 48	How much do you like your school?				
	I love it	0.35			
	I like it	0.39			
	I am OK with it	0.19			
	I don't like it	0.03			
	I hate it	0.03			
Question 49	Do you like your teachers?				
	I love them	0.22			
	I like them	0.31			
	I like some but not all	0.44			
	I don't like them	0.03			
Question 50	Do you get excited about coming to school every day?				

Table 12: Descriptive Statistics for all Survey Questions (continued)

Question	Variable	Mean	Std. Dev	Minimum	Maximum
	yes	0.73			
	no	0.08			
	Other	0.19			

CHAPTER 6

Econometric Analysis

The goal of this econometric study was to identify the factors that had an impact, either positive or negative, on secondary school students' school attendance in urban and rural Nepal. Literature, as discussed in earlier chapters, had identified attendance as one of the major factors that impacted a student's academic performance, both in the East and the West. Most of the literature focused either on students' academic performance in school or whether or not a student participated (or enrolled) in school. Enrollment, although important, is a one-time decision that a student or the family of the student makes based on various socio-economic reasons, as pointed out by many including the study by Gumus (2014) in Turkey.

However, other than a study in Tanzania (Berke and Beegle, 2004) in partnership with the World Bank and a study in rural Botswana (Chernichovsky, 1985), there is not much econometric research conducted to understand the factors that influence a student's attendance, a repeated decision that the student and the family make based on many factors. The study from Turkey focused mostly on participation, which was a dichotomous decision. Did the student participate in school or not? However, it is important for one to understand what happens to the daily participation, as measured by attendance, once the student is enrolled. Do these same socio-economic factors play a role, at the margin, on a daily basis, which either encourages attendance or hinders it? This was an area where there clearly was a gap in research and provided an opportunity for me to contribute, via research, to help guide policies to improve student attendance with the ultimate goal of positively impacting academic performance.

The theoretical framework based on the agricultural household model argued that the biggest hurdle to a student's school attendance was the opportunity cost of the household work, whether it be at home, farm, or the family business. If there was a demand for labor coming from any of the household activities, income-generating or not, it would tend to pull the student away from school and into those activities, thus lowering the attendance rate of the student, even though the student was enrolled. The fact that the student was enrolled, even though the family knew about some of these opportunity costs up front, tells us that the parents are aware of the long-term benefits of educating their children. However, once the student starts to attend school, the daily opportunity cost of missing school could seem minor, and its impact on academic performance and its compounding impact on overall academic achievement, and ultimately income level, may be difficult to comprehend, not well understood, and ultimately dismissed.

The reasons as to why a student misses school not only come from socio-economic factors, but could also be related to the student's characteristics, household characteristics, community characteristics, and last but not the least, school characteristics. As discussed in earlier chapters, to understand the correlations and the causal relationship of these factors to the attendance, we designed a survey to be able to collect all of the information that would allow us to control for the individual characteristics, household characteristics, community characteristics, and school characteristics. All of these characteristics included in the econometric model and their expected relationship with attendance are discussed in what follows.

Students Characteristics

Age and Age Squared

One of the things we controlled for was the students' age. We wanted to know if it had a positive or negative impact on attendance. For example, do older students miss more school than

younger ones, as they are more likely to be daring and able to bunk school and head to the movies, etc.? Or, is the opposite true? Are the younger ones more likely to get sick or scared of going to school, therefore, missing more days? The variable “Age Squared” (the square of the value for a student’s age) was used to see if the relationship was a constant change or had any increasing or decreasing characteristics.

Gender

Given the cultural norms in Nepal, it is reasonable to assume that there would be some differences in the factors that impact school attendance for boys and for girls. Typically girls are expected to do household chores, whether it be cooking, cleaning, or taking care of siblings. Boys in Nepal, which is a patriarchal society, have less expected of them when it comes to these activities. However, they may be expected to be involved in more “manly” activities such as taking a sick family member to the hospital, travelling for family business, etc. Girls, unlike boys, also suffer from menstruation every month. During this time, they are likely to miss school due to pain, lack of proper facilities at school, or the fear of getting teased at school if there is an accident. In fact, menstrual pain was the number one reason that girls cited for missing school.

Not only are the girls likely to miss school during their own periods, they are also likely to miss school when their mother has her period. This is because in the Nepali society, the women during their periods are not allowed to cook and clean, among other things. It is not true that all of the ethnic groups and families abide by this rule, but it can range, as a recent report by the BBC showed, from the women being banished from the house to an outside shed for four-to-five days to just being banished from the kitchen. In any case, if the mother is not cooking, it is very likely that the daughter is taking her place (Jolly and Venema, 2017).

Ethnic Groups

Nepal is a very diverse country with many ethnic groups and castes based on the Hindu culture, and the Kathmandu Valley is no different. Even though the country is very diverse, the social, economic, and political power is not equally distributed. Therefore, some groups enjoy the benefits of being the privileged class, whereas others still suffer from the historical classification of their group as “untouchables” or “lower caste.” This would very likely have an impact on a students’ ability, first in terms of access to schools, which is not the focus of this study, but also in their ability to attend schools without any distractions, whether it be coming from income generating activities or from social discrimination, both in and out of school.

One of the difficulties was deciding how to classify the various groups into two distinct groups to be included in the regression analysis. The way this variable was created is as follows: First, the students were organized based on last name and assigned to Brahmins, Chettrias, Newars, Dalits, Janajatis, and Muslims. Second, the file was sent to a previous parliamentarian of Nepal and a legal scholar, Benup Raj Prasai, who agreed to verify the list for accuracy. Finally, once verified, all of the Brahmins, Chettrias, and Newars were designated as the “privileged” class, and all of the others as “non-privileged” class. This is consistent with the rights and classifications given by the current Nepali constitution, even though the classification of students is based on the report *Gender, Caste and Ethnic Exclusion in Nepal: Following the Policy Process from Analysis to Action* by Lynn Bennett, which was presented at the World Bank’s Arusha Conference: New Frontiers of Social Policy (Bennett, 2005).

The descriptive statistics pointed to a big gap in attendance between the privileged group and the non-privileged group. The Brahmins, Chettrias, and the Newars had a higher attendance rate of 93.60 percent compared to the students classified as the non-privileged class, who had an

average attendance rate of 90.68 percent. This difference in the average attendance rate between the two groups was statistically significant. This result from the descriptive analysis would imply that, all else equal, we should see a negative coefficient for the dummy for ethnicity. That is to say that if a student belongs to the lower caste, he or she would likely have a lower attendance rate compared to the students who belong to the privileged class.

Studying at Home

A student who completes his or her homework regularly and is prepared for school might be more likely to attend school regularly compared to a student who has not completed the required assignments, reading, etc. This may be because the student is worried that he or she would be called out by the teacher in front of the class, reprimanded for not completing the homework, or worse, beaten, which is not something that is unheard of in Nepali schools. I myself was a victim of such beatings throughout my school days, including when I transferred to Budhanilkantha School, a prestigious British school in the northern part of the Kathmandu Valley. So, the hypothesis is that the student who spends some time at home studying and preparing for school is more likely to attend school, and the one who does not study or complete their homework will miss school to avoid any negative consequences in the short run.

Household Characteristics

Students' academic performance could be affected by their household situation, but so could their attendance. Based on the economic theory presented earlier, we could expect that various factors at home could either help or hinder a student's ability to attend school. Based on the theoretical framework these factors were identified, and the survey attempted to collect the information on each student's household characteristics.

Household Size

How big or small a student's family is could have either a positive or negative impact on his or her attendance. For example, if there are many individuals in the family and they are all older and able bodied, then they could assist the student with his or her work, academic and household. However, having a bigger family could also have distracting affect due to various social and religious celebrations, which is quite common in Nepal.

Siblings

Presence of siblings can also impact a student's school attendance. Having an older sibling who is also attending school might have a positive impact on the student's desire to attend school. However, the presence of younger siblings present, it could possibly have a negative impact on the student's attendance, as the student's help may be demanded if the younger sibling is sick or if the parents are not available to take care of the younger child. In order to control for this, we first controlled for both younger siblings and older siblings. However, since we did not have the information on the age of the siblings, we also simulated a model that controlled for just having siblings.

Parents' Education Level

Literature is full of research, both in the East and the West, that parents' education level impacts a student's academic performance and achievement, and ultimately his or her lifelong earnings. See, for example, the longitudinal study by Boxer, Dubow, and Huesmann (2009), the annotated bibliography of research findings showing this relationship by Anne T. Henderson (1987), and the study by Khan, Iqbal, and Tasneem (2015) establishing a "significant positive relationship between parents' education level and academic achievements of students."

Therefore, it is important for us to see if the parents' education has an impact on a student's school attendance.

For the purpose of this study, as explained in the descriptive analysis, parents were placed in the "educated" group if they had completed the School Leaving Certificate (SLC) or higher, and in the "non-educated" group if they had anything less than the SLC. The descriptive analysis showed a significant difference in the attendance rate between students whose both parents were educated versus those with only one parent classified as "educated." In fact, the analysis of the data showed that the students with an educated father compared to a non-educated one, and the students with an educated mother compared to non-educated one, and students with both educated parents compared to students with only one parent educated, all had a higher attendance rate. Thus, this control was necessary to establish any relationship if it existed in order to not bias the final results.

Parents' Employment

The employment status of the father and the mother could impact the ability of a student to attend school. If both parents are employed, then it might mean that the student would be expected to cook, clean, or take care of siblings, and other household work which may have a pull on the student's time that he or she can dedicate toward school. Moreover, if one of them is employed overseas or in a different town, then because of the lack of support or supervision, the student might miss school. On the other hand, if the parents are both working and adding to the household income, it might be possible for them to provide the necessary resources for the student to succeed in school, which might have a positive impact on attendance.

It is very common in Nepal for men to participate in the labor market. However, the labor force participation rate for women, although increasing, is still less than men. The World Bank

graph shows that for men and women over the age of 15, the ratio of women to men labor participation was 92 in 2016 (Modeled ILO Estimate, 2016). If both of the parents are participating in the labor market, it might be an indication of the progressiveness of the family to have the mother working, which might mean the family might also be inclined to put a higher value on education, particularly for girls. Therefore, such parents are more likely to emphasize the importance of education and attendance, improving the attendance rate for their children.

Family Wealth

If a family is wealthy, it is likely that the parents are able to provide all of the necessary resources for the student to succeed in school, including private tutoring. It is also likely that wealthier families can afford to hire help for household chores, reducing the time required for the student to spend on those chores, and alternatively increasing the time that the student can dedicate toward school work, hence improving the student's attendance rate. By contrast, a poorer family would not be able to afford hired help or resources to help the student with the school work, therefore most likely having a negative impact on the student's attendance.

One of the problems in identifying the wealth level of each family was that the students who participated in our survey would not be aware of their family's wealth. Therefore, we had to come up with questions that got us the information on the assets owned by the family, which was then used to calculate the wealth index using the Principal Component Analysis method, used in such situations. The questions in the survey to get this asset information inquired about the family's ownership of a house, a microwave, a refrigerator, cars, motorcycles, and their quantity. We expected to get a positive relationship between the wealth index and attendance.

Values Index

The attitude one's family has toward education could influence the support that a student gets in his or her academic endeavors. This is of particular importance when it comes to educating girls. In Nepal, as mentioned in earlier chapters, the work of NGOs and the government has been successful in increasing the enrollment of girls in school. However, if the family's commitment toward educating girls is not strong, then when circumstances demand the daughter's time, parents might be more likely to dismiss school, and keep the daughter at home. This would result in a negative impact on her attendance, then poor academic performance and, ultimately in lower academic achievement. In addition, if the parents expect to marry their daughter off to another family and feel that educating their daughter has no benefit in the long run, then they are unlikely to place high importance in her attending school, especially as she ages.

Creating a values index presented a calculation problem similar to the one faced in creating the wealth index, but the values index also provided a different challenge because of it being subjective in nature, as opposed to the wealth index where questions about the quantity of assets owned were more precise and numeric. The questions were carefully designed to ask what the student thought about educating boys and girls and, to what level—high school or college—and also what her parents thought about educating boys contrasted with educating girls. The students were also asked what it meant to be a good wife, for example, to understand the overall importance that the family had put on a girl's education, or if they thought it was a mistake, as she would just get married anyways. Using the answers to these questions and using the Principal Component Analysis method, I created the values index. One would expect the values index to be positively related to attendance. If the family was progressive (higher index value) then it

would be more likely to send children, especially girls, to school, versus if the family was conservative (lower index value). The expectation was that the values index would be positively related to attendance.

School Characteristics

Whether a student is excited to attend school or not also depends on the characteristics of the school. There are various factors that are related to the characteristics of a school, which could either make a student attend or skip school. We took two different approaches to controlling for these differences in schools in the data set. First, we controlled for the fixed effects by including a dummy variable for each school, and comparing them all to School 1. Second, we dropped the dummy and controlled for the following factors discussed below.

Time to School

Ninety-five percent of the students in our survey, from all seven schools, mentioned that they walked to school. Another three percent used some form of public transportation to get there. Since most of the students were walking, the time to school could matter in either making it easier for one to decide to go to school or not. For example, if the weather is bad, someone living close could hurry and get to school. However, someone who lives farther away might decide to not go to school that day. As discussed in earlier chapters, the average time it took for someone to get to school was 15.92 minutes, with the median being 15 minutes. Some students lived as close as one minute away from the school compared to some living as far out as two hours. One would expect a negative relationship between how long it takes to get to school and attendance.

Running Water

The project in Dhankutta, as mentioned earlier in that chapter, brought to light the importance of having a gender-specific restrooms at school. We learned that having such facilities increased enrollment and attendance, particularly for girls, as it provided them a safe and private space. However, since all seven schools that we surveyed had gender-specific restrooms, but not all had running water, we decided to control for running water as a proxy to measure the quality of the facilities. For example, if the restroom was available but did not have good sanitation due to lack of water, we would expect a negative impact on a student's desire to attend. This would be true especially for girls having their periods, as they would not have a safe and clean space for them to change pads. This could increase absenteeism.

Student per Computer

In my interview with the principals, one of them told me that there were some instances of students missing school to go and spend time at a cyber café, where they would have access to computers and would be able to browse the internet or play games. The new generation is curious about computers and the technology that they find around them in the city or see on television. So, if the school has computers and is teaching students how to use them, or using the computers to teach a certain subject, the students might find those activities exciting. This could potentially lead to an increase in the student's desire to attend school regularly. On the other hand, as indicated by the anecdote earlier, if the school lacks computers, or if there are just a few computers, the student might decide to skip school and go elsewhere to use computers. He or she may find the typical style of teaching boring in the age of YouTube and the likes. This would imply that one would see a negative relationship between attendance and the student-per-computer ratio.

Students per Teacher

The quality of education and the atmosphere in the school also depends on the attention that the students get from their teachers. If one is lost at school because there are just too few teachers to build relationships with students, then students are more likely to not get drawn to school. However, if the class sizes are small, and if the student-to-teacher ratio is small, then the students are more likely to develop meaningful relationships with teachers. This could not only inspire the students but could also act as a draw to school. Also, if a student is struggling and if no attention is given to him or her, that student is likely to fall behind, lose interest in attending school regularly, and worse, drop out. So, the relationship between students per teacher and attendance should be negative. In other words, if the ratio is small, then the attendance should be high, and if the ratio is large, then attendance should be low.

Attendance Policy

At the time of the survey, six of the schools reported to having some sort of attendance policy. The policy ranged from contacting parents and counselling them on the importance of education and attendance to providing rewards to students for good attendance. Some even had rewards for teachers with low absenteeism. The most common form of policy included rewards for students with perfect attendance, both in the form of a prize and also a communal recognition with some form of ranking in school. Four out of the seven schools had rewards. However, two of the schools surveyed also had fines imposed on students if they were absent. So, in order to control for these policies directly tied to absenteeism and attendance, the final econometric model includes the dummy for rewards and fines. Since the rewards provide a student with an incentive to improve his or her financial and social outcome, it should have a positive impact on attendance. And the punitive impact of the fines should have a positive impact on attendance, as

it increases the opportunity cost of being absent from zero to the value of the fine. Also, it could force the parents to internalize the cost of being absent, and therefore encourage, or force, their children to attend school regularly.

Econometric Model

Empirical Analysis Setup

Given the theoretical framework presented above, one can see that many competing factors either help or hinder a student's ability to attend school. To reiterate, families and students have to first decide whether to enroll in a school or not. Once the decision is made to enroll, then a family and the student's goal will be focused on the student's academic performance. That performance is impacted by various important factors, of which attendance is one. The natural question then becomes: What factors impact this? The theoretical framework and the literature review presented above sets up the foundation to conduct an empirical analysis to attempt to answer this question. The empirical model used in this project can be presented in the following forms:

$$A_{is} = \alpha + P_{is}\beta_P + H_{is}\beta_H + C_s\beta_C + \epsilon_{is}$$

$$A_{is} = \alpha + P_{is}\beta_P + H_{is}\beta_H + \gamma_s + \epsilon_{is}$$

Where, i represents each individual student, s represents each school in the study. A reflects the number of days attended in a given time period, expressed as a proportion of the total school days, and P is a vector of "pupil" or student characteristics. H is the vector of household characteristics, corresponding to the individual student's household information. C is the vector of school and community characteristics, and ϵ is the error term (i.e. factors not captured by the stated characteristics). This model would account for all of the differences in individual students, households, schools, and communities to help us better understand the reasons why

students miss school. In some specifications $C_s\beta_C$ is replaced by γ_s —fixed effects for each school.

Attendance is used in the regression analysis as the dependent variable. The seven schools surveyed had different numbers of days in which they were open. There was also a difference between the school days for different grades in the same school. The difference in school days was not that big. However, in order to get a more accurate assessment of the attendance, it was important to change them into the percentage form. The students' number of attended days for each grade was divided by their respective school days to obtain the value used for the dependent variable. This proportional data was now consistent across all grades and schools, and allowed for a more consistent analysis.

Models

Eight different models with various controls were analyzed. Model 1, for example, only controlled for the students' personal characteristics, such as age, gender, and time spent studying. Model 2 added additional household characteristics controls, and Model 7 controlled for school characteristics by adding dummies for each school and therefore provides a fixed effects specification for comparison to models controlling for observed community and school variables directly. Overall, the models controlled for student characteristics, household characteristics, community characteristics, and the school characteristics, as presented above.

Results

The results are presented below in a table format and the analysis of the results follow.

Table 13: Econometric Models and Results (All Sample)								
Variables	Model1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	0.795 ***	0.781 ***	0.091 ***	0.9043 ***	0.9286 ***	0.9149* **	1.3580 ***	1.3513 ***
Female	0.12 *	0.006	0.005	0.0048	0.0047	0.0039	0.0056	0.0056

Table 13: Econometric Models and Results (All Sample) cont'd								
Variables	Model1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Age	0.024	0.023	0.0003	0.0011	-0.0032	-0.0005	-0.0515 **	-0.0515 **
Age Squared	-0.0011	-0.001	-0.0002	-0.0002	0.0000	-0.0001	0.0016 **	0.0016 **
Time Spent Studying	0.011 ***	0.011 ***	0.0098 ***	0.0099 ***	0.0096 ***	0.0092 ***	0.0051 ***	0.0051 ***
Time on Household Activity	-0.004 ***	-0.001	0.0001	0.0001	0.0000	0.0002	0.0005	0.0005
Privileged Castes	0.021 ***	0.015 **	0.009	0.0088	0.0084	0.0084	0.0050	0.0050
Urban		0.045 ***	0.056 ***	0.0562 ***	0.0560 ***	0.0592 ***		-0.0002
Vehicle Ownership			-0.0136 **	-0.0135 **	-0.0151 **	-0.0142 ***	-0.0107 **	-0.0107 **
Appliance Ownership			-0.0301 ***	-0.0298 ***	-0.0304 ***	-0.0288 ***	-0.0112 *	-0.0112 *
Owned House			0.0313 ***	0.0311 ***	0.0298 ***	0.0299 ***	0.0074	0.0074
Wealth Index		-0.008						
Values Index		-0.006						
Educated Mother		0.013	0.012	0.0120	0.0133	0.0137	0.0152 *	0.0152 *
Educated Father		0.003	1.9E-05	-0.0003	-0.0008	-0.0023	-0.0032	-0.0032
Younger Siblings		-0.005 *	-0.003					
Older Siblings		-0.006 *	-0.0048 **					
Siblings				-0.004 ***	-0.0060 ***	-0.0060 ***	-0.0028	-0.0028
Household Size					0.0025	0.0026 *	0.0015	0.0015
Father Not Working						-0.0030	0.0064	0.0064
Mother not Working						-0.0156 ***	-0.0101 *	-0.0101 *
School 2							-0.0852 ***	
School 3							-0.0124	
School 4							-0.0237 **	
School 5							0.0086	
School 6							0.0333 ***	
School 7							-0.0145	
Time taken to School							-0.0005 *	-0.0005 *
Students per Teacher								-0.0022
Students per Computer								-0.0034 ***

Table 13: Econometric Models and Results (All Sample) cont'd								
Variables	Model1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Reward for Attendance								0.0059
Fine for Absence								0.0921 ***
School with running water								0.0175

* Statistically significant at the 10% significance level

** Statistically significant at the 5% significance level

*** Statistically significant at the 1% significance level

Model 1

When only the students' personal characteristics were controlled, as described in Model 1, we saw that girls had a 12 percent higher attendance than boys overall, and it was significant at the 10 percent significance level. However, this impact falls off as we start controlling for other factors related to household, community, and school characteristics. Model 1 also revealed a strong statistically significant relationship between how many hours a student spends studying at home and its impact on attendance. For every hour that the student spends studying at home, he or she will attend school more by 2-3 days in a school year. I also found a negative relationship between the time a student spends on household activities such as cleaning, cooking and washing, and school attendance. However, the impact seems to go away once you start controlling for students' community (urban or rural), and other characteristics. Model 1 also revealed a positive correlation between the student's social status and attendance. Students in Brahmins, Newars, and Chettrias, the privileged class, were likely to have a higher school attendance as compared to their downtrodden classmates from the lower castes and social groups.

Model 2

In order to control for the location and the various factors that may be tied to it, I added the urban and rural dummy in Model 2. In this model I also added more variables to account for

the household characteristics. I controlled for the household wealth and values measured by the wealth index and the values index, respectively, created using the principal component model discussed earlier. This model also controlled for the educational status of both the mother and the father of the student. In addition, Model 2 controlled for the presence of younger and older siblings.

Compared to the results from Model 1, there were a couple differences in the results. First, after controlling for the household characteristics, the gender difference in attendance fell off. In other words, I found that gender did not play a significant role in one's attendance. Note that the first model had indicated that girls, compared to boys, were likely to have about 12 percent higher attendance during a school year, which would amount to about 23 days in an academic year. However, this difference disappeared once the household characteristics and the urban-rural setting of the household and school were taken into account. The time spent on household activity also went away in the second model. However, the time spent studying and the privileged status of the student remained statistically significant.

The model showed that students in urban settings were more likely to attend school than students in rural settings. A student living in the urban areas of Kathmandu was likely to have 4.5 percentage point higher attendance than students living in the rural areas around Kathmandu Valley. This implied that the students living in the rural areas were missing about eight to nine days in a year as compared to their urban counterparts. Regardless of the community setting, the father's and mother's education did not have any impact on the student's attendance. However, the presence of younger and older siblings both, independently, had negative impact on a student's school attendance. The siblings would reduce the attendance by half a percent in a year, which is about one to two days in a school year.

Model 3

The calculation process using the principal component analysis and the difficulty in the interpretation of the index and its relationship with attendance added some complication in controlling for the wealth of the families. Therefore, to simplify the controls, I used “appliance” “vehicle” and home ownership as proxies to control for the family’s wealth level. For example, if a student reported his family’s owning at least one appliance such as a refrigerator or a microwave, he would be coded as a 1 in the dummy. Similarly, if the student reported the family’s owning a motorcycle or a car, he would have a value of 1 in the dummy for vehicle. Also, there were some students whose family owned the homes in which they lived and others who were renting, and the homeownership dummy controlled for that in Model 3, In addition to the other controls discussed earlier and in place of the constructed wealth and values indices.

The results were fascinating. I found that the time spent studying at home, the urban setting, and having an older sibling were statistically significant, and of the same sign. However, the difference in attendance due to caste and ethnic groups fell off after accounting for vehicle, appliances, and home ownership. Moreover, I found a statistically significant correlation between the wealth proxies and attendance, which was expected. However, the signs were interesting. I found that having a vehicle and an appliance had a negative impact on students’ school attendance, which was puzzling. The ownership of the home, however, had a positive impact on a student’s school attendance, as expected.

The magnitude of the vehicle, although significant at the five percent significance level, was smaller than that of the appliance, which had a three percent negative impact on school attendance, and was statistically significant at the one percent significance level. This would meant that a student from a home that owned any appliance such as a microwave and or a

refrigerator would miss 6 to 7 days in a school year. Since the appliance itself is not hypothesized to cause missed school, this indicates that the appliance is correlated with something else that is impacting the students' attendance. This was therefore explored in the follow up focus groups which is documented later in the discussion.

Owning the home that the family lived in also had a positive impact on a student's attendance. Ownership of a home, especially in the Kathmandu Valley, acted as a strong proxy of a family's wealth. The ownership of a home showed a strong and stable financial stock, whereas the ownership of appliances and vehicles reflected income flows, and not the stock of wealth or economic class. Therefore, the positive correlation between home ownership and school attendance is consistent with our expectation of wealthier children having better attendance.

Model 4

The data on siblings were aggregated from the question that asked the students how many younger and older sisters and brothers they had. I combined the younger sisters and brothers to get the younger siblings variable, and the older brothers and sisters were combined to get the older siblings variable. However, since the survey did not ask the ages of the siblings, we could not account for how old the siblings were. For example, one's older sister could be just a few months old or much older, married, and income generating. In the absence of this information, I combined all of the sibling information into one variable called "siblings" and used that as a control in Model 4 and did a sensitivity check. The results were more or less identical to that of Model 3, and there was still a negative impact on attendance of having a sibling.

Model 5

In model 5, I controlled for the household size. How many individuals live in the home with you could have a positive impact or a negative impact on one's education measured via attendance. If, for example, a family has few people, then it could mean more resources for the student, or it could mean that there is a higher opportunity cost of the student attending school, as there may be need for help with the household activities. On the other hand, having a large family could mean that there is no pull on the student's time and that he or she could concentrate on academics; however, it could also mean that there are other distractions and fewer resources for the student on a per capita basis.

This indicates that these are empirical questions which should be addressed with data. The results showed that the household size itself had no impact on the attendance of the student directly. However, it did make the magnitude of the negative impact from siblings stronger, which was significant at the 1 percent significance level. Other factors and their effect on the school attendance remained very similar with the household size control.

Model 6

A father's and mother's employment statuses could also impact a student's attendance and academic performance. The presence of the father and or the mother has an impact on daily decision-making on many things, including academics. From the descriptive data, I saw that 73 percent of the children had their fathers present at home and 85 percent of them had their mothers present at home. So, I looked at daily employment as the proxy to assess the daily presence of the parents at home to provide guidance to the students. I also saw that only about five percent of the fathers were not involved in some form of wage-earning activity, whereas 42 to 46 percent of the mothers were not involved in any wage earning activity and, therefore, were homemakers.

After controlling for the employment status of the parents and allowing father and mother work activity to vary independently, the results from earlier model did not change much. The only change was that the household size become significant at the ten percent significance level, although the magnitude was small. Students from a large household had half a day higher school attendance in a year than students from smaller households. The most interesting revelation was while the father's employment status did not have any impact on a student's school attendance, the mother's employment status had a positive effect on attendance. In other words, the students whose mothers were not working, compared to the students whose were, had a 1.6 percent lower school attendance. This meant that the students whose mothers were employed would have three days higher attendance in a school year than those whose mothers were homemakers.

Model 7

Models 1 through 6 accounted for the student, community, and the household characteristics. Models 7 and 8 controlled for the school characteristics to see if any of the effects change. Model 7, in particular, created the dummy for each of the seven schools in the data and simulated the econometric analysis by omitting the dummy for school 1. The model therefore is a fixed effects model which controls for unobserved school characteristics which may be correlated with some regressors and determinants of school attendance. After controlling for the school's characteristics, via fixed effects the positive effect of the household size and the negative effect of siblings on school attendance disappeared. This suggests that urban-rural status alone may have been insufficient as characteristic capturing variations across schools.

Introducing the control for the school characteristics also made the education of the mother statistically significant at the ten percent significance level. Compared to the students with an uneducated mother who had less than the School Leaving Certificate (10th grade) level of

education in Nepal, a student of an educated mother had a 1.5 percent higher school attendance. This is not surprising, as similar results, especially when it comes to success rates, find similar relationships with parents' education level. In our sample, I find that the student with an educated mother will have almost three more days of attendance in a school year.

The effect of the ownership of home falls out once you control for the characteristics of the school. This is significant, as the ownership of the home added close to six more school days to attendance, and was statistically significant at the one percent significance level. However, the regressions controlling for homeownership as a proxy for wealth may have been picking up the feature that households sending children to a common school may be similar. The negative effects of the appliance and vehicle are still significant, however, at a lower confidence level, and their magnitude falls to 1.1 percent and 1.07 percent, respectively. The time spent studying at home relationship to school attendance was still statistically significant at the one percent significance level, but the magnitude did drop from 0.9 percent to 0.5 percent.

After all of the student, household, and the school characteristics are controlled for, I find that the age has a negative impact on attendance as the student gets older, and is statistically significant at the five percent significance level. So, students who are older are absent more than students who are younger. In fact, one year's increase in the age of the student showed a 5.5 percent decrease in attendance, which is roughly about 10-11 days in a school year. To test the non-linearity of this relationship, I looked at the square of the age variable, and it showed a positive relationship, which indicates that this relationship between age and school attendance is increasing at a decreasing rate or concave. Taking the derivative and setting it equal to zero gives 16.1 years as the age where the absence would be the highest, and therefore illustrates the nature of the nonlinearity.

Model 8

While Model 7 used the dummy for each school to control for school characteristics, Model 8 dropped the dummies, and I controlled for the differences in schools by including the variables that measured (1) the time it took students to get to school; (2) students per teacher; (3) students per computer; (4) if the school had running water and; (5) whether the schools had any attendance policy such as rewards for high attendance or fine for absenteeism. The goal is to isolate school characteristics which may be relevant to policymaking. There was no statistically significant correlation between school attendance and students per teacher, rewards for perfect attendance, and having running water. However, the results for time to school, students per computer, and the penalty for absence were all statistically significant.

I find that the time it takes to get to school is negatively related to attendance. This result was expected. However, since most of the students, in both the urban and the rural settings, lived in the immediate vicinity of the school, the statistically significant result does underscore the importance of distance to school, no matter how small. The results suggest that for every minute it takes the student to get to the school from home, his or her attendance decreases by 0.1 percentage points of school year. So, a student who lives half-an-hour away will miss 2.9 days of school, and someone who lives an hour away will miss 5.8 school days in an academic year, assuming a constant rate of change.

The results demonstrate a negative relationship between school attendance and the ratio of students to computers. In other words, if there are few computers in a school relative to their student population, it causes students to miss school. In fact a one percent increase in the ratio would decrease the attendance in a school year by 0.3 percentage points, or 0.7 school days. This is consistent with what a couple of the principals alluded to as a reason students were missing

school. The students are missing school to “go to cyber cafes, where they get to use the computers to play games or browse the internet.” Therefore, it should be expected that if the schools are able to provide this service and teach students on how to use the computer, then the students are more likely to attend school.

Schools with attendance policies had higher attendance than schools without. However, the results demonstrated that having a reward system for perfect attendance did not have a statistically significant impact on school attendance. However, schools with fines for being absent had higher attendance than schools without. The result showed that students in a school with a fine for absenteeism had 9.2 percentage points higher attendance than the schools that did not have such punitive policy toward absenteeism. In other words, the students in a school who faced a fine for absenteeism were present for 17.7 more school days than the students in a school without a similar policy.

Girls versus Boys

To understand if there are any gender differences when it comes to school attendance, I repeated models 7 and 8 for each gender, without including the other gender. The results follow:

Table 14: Gender Specific Econometric Models and Results				
Variables	Boys Model 1	Girls Model 1	Boys Model 2	Girls Model 2
Constant	1.3410 ***	1.6177 ***	1.3199 ***	1.6480 ***
Female	--	--	--	--
Age	-0.0498	-0.0866 *	-0.0498	-0.0866 *
Age_Sq	0.0015	0.0027 *	0.0015	0.0028 *
Time_Spent_Studying	0.0068 ***	0.0019	0.0068 ***	0.0019
Time_on_HH_Activity	0.0005	0.0005	0.0005	0.0005
Priv_Caste	-0.0059	0.0127	-0.0059	0.0127
Urban	-0.0020	0.0018		
Vehicle	-0.0175 **	-0.0029	-0.0175 **	-0.0029
Appliance	-0.0102	-0.0139	-0.0102	-0.0139
Own_House	0.0173 **	-0.0008	0.0173 **	-0.0008
Educated_Mother	0.0205 *	0.0080	0.0205 *	0.0080
Educated_Father	0.0058	-0.0119	0.0058	-0.0119
Siblings	-0.0067 **	0.0000	-0.0067 **	0.0000
HH_Size	0.0033 *	-0.0003	0.0033 *	-0.0003

Table 14: Gender Specific Econometric Models and Results (cont'd)

Variables	Boys Model 1	Girls Model 1	Boys Model 2	Girls Model 2
FNotWorking	0.0123	0.0084	0.0123	0.0084
MnotWorking	-0.0099	-0.0087	-0.0099	-0.0087
School_2			-0.0680 ***	-0.1053 ***
School_3			0.0191	-0.0367 ***
School_4			-0.0139	-0.0300 *
School_5			0.0183	0.0070
School_6			0.0545 ***	0.0182
School_7			-0.0075	-0.0181
Time_to_School	0.0000	-0.0008 **	0.0000	-0.0008 **
Students-per_Teachers	0.0000	-0.0033		
Student_Per_Computers	-0.0044 ***	-0.0030 ***		
Rewards_for_Attn	-0.0013	0.0188		
Fine_for_Absence	0.0748 **	0.1057 *		
School_w_Water	-0.0065	0.0289		

* Statistically significant at the .1 significance level

** Statistically significant at the .05 significance level

*** Statistically significant at the .01 significance level

I found that age had an impact on a girl's attendance but had no effect on the attendance for boys. Each year increase in a girl's age would reduce attendance by 8.7 percent, which would mean about 16.6 days during a school year. This implies that older girls are more likely to miss school than younger girls.

The first derivative of the results can be expressed as follows:

$$\frac{dAttendance\ Rate}{dAge} = -0.0866 + 2 \times 0.0027 Age^{2-1}$$

Setting the derivative equal to zero yields the following:

$$-0.0866 + 0.0054 Age = 0$$

$$or, Age = \frac{0.0866}{0.0054}$$

$$or, Age = 16.04\ years$$

The absenteeism will maximize at the age of 16 for girls. It is important to note that age had no effect on the school attendance for boys in either model that was run for the two genders.

This could potentially indicate a drop in interest in attending school that may be coming from any family discussion related to possible marriage, or a stronger pull on girls' time from various other household activities.

How much time a student spends studying at home seems to matter only for boys and not for girls. For every hour that the boys spend studying at home, their attendance increases by 0.7 percent of the overall school days in an academic year. Boys also seem to be affected negatively by the family owning a vehicle, which was not the case for the girls. A family's ownership of a vehicle reduced boys' attendance by 1.8 percent in an academic year. Boys from families who owned homes had a higher attendance compared to boys from families who were renting their home. There was no statistically significant difference between girls whose families owned their homes compared to girls whose families rented their homes.

The education level of the mother was significant and impactful for the boys, but the level of the mother's education had no effect on the attendance for girls. Sons of mothers who were educated compared to those who were not educated had a 2.1 percentage point difference, or 3.9 days of higher attendance. The difference in education level of the fathers had no effect on the attendance for either gender. Also, while the household size had a positive impact on boys, it had no impact on girls. Having higher siblings meant lower attendance for boys. However, surprisingly, it did not lower the attendance of the girls. This represents a policy avenue for which outcomes may be gendered, and therefore is something that could be associated with increasing attendance of girls specifically if this a policy goal.

The school level characteristics had similar results for the two genders as the ones obtained for all students in model 8. The effects of the time taken to get to school dropped out for the boys, but became stronger in magnitude and in significance level for the girls. The negative

impact of the time on a girl's attendance increased to 0.1 percent of school days for every minute increase in time, compared to 0.1 percent for the entire sample population, and the statistical significance increased from ten percent to five percent. The impact of the ratio of students to computers remained negative for both genders at the one percent significance level, and the magnitude remained similar. The fine for absences, which had a positive effect of 9.2 percent for the entire population, remained significant but dropped to 7.5 percent for the boys and increased to 10.6 percent for the girls.

CHAPTER 7

Discussion and Focus Group Findings

To answer some of the questions raised by the econometric study and to help provide contextual framework, it was decided that a focus group could be helpful. Three schools out of the seven that participated in the original survey were contacted to allow me to conduct a focus group interaction at their school with some of the students who had participated in the original survey. All three schools agreed to let me meet with the students. The students in each school were divided into two groups by their gender, and I met with the boys and the girls separately. This was done to minimize any cultural, social, and gender awkwardness while discussing some sensitive issues such as menstruation.

The format of the focus group was of a free flow nature, where the students and I interacted in a conversation, usually prompted by some of the questions that had been prepared with the help from the advisory committee. However, if the students brought up something that seemed relevant to the study, I followed up with them and had other students share their experiences as well. It was quickly obvious that the prepared questions were easily answered by the students. However, the impromptu conversations with the students revealed a lot more and to helped shed light on some of the lingering questions about some of the results from the econometric study.

Some of the findings that needed more clarification from the students were the negative impact of owning a refrigerator on their attendance, the negative impact of household's ownership of vehicles on students' school attendance, and the positive impact of a mother's labor market participation on students' school attendance, to name a few. After speaking with six

groups of students in three different schools, which incorporated both urban and rural schools, I was able to provide anecdotes and qualitative analysis to some of the findings from the quantitative analysis.

In trying to establish the relationship between owning a refrigerator or microwave, each group was asked if each student's families owned a refrigerator and/or a microwave. After identifying the individuals who said that their families owned at least one of the appliances mentioned, they were asked to identify what the appliance was used for. The answers were mundane and expected. The appliances were used to store food, vegetables, and meat, and to heat beverages and food, in the case of a microwave.

These answers were not of particular value in explaining the negative relationship. If anything, storing food properly in a refrigerator, for example, should reduce the incident of the student getting sick from spoiled food. Moreover, microwaves would allow for a quick fixing of food, reducing the time that a girl student, for example, would have to spend in preparing lunch/dinner, again, improving the time available for studying at home—which showed a statistically significant positive impact on attendance in the econometric study.

As the conversation continued, however, an interesting relationship presented itself. It became clear that the students whose families owned refrigerators and or microwaves also owned televisions, and their families could subscribe to cable services. And, the students, in all three schools, pointed out that they either missed school or arrived late on days when they ended up watching television late into the night. This would translate into a lower attendance, even for tardy students, as in all school the attendance is taken during the first period.

When the survey questions were developed, we decided to ask students about the ownership of refrigerators, microwaves, and houses to develop a wealth index. Since TV is

something that is more common, we decided to ignore it, as it would not be helpful in helping us separate families in different wealth group based on its ownership. However, what was revealed from the interactions with the students is that not all families in the schools that were surveyed owned televisions, or if they did, it was not common for all to be able to afford a monthly cable subscription cost. The ability of a family to own a refrigerator, microwave, and a vehicle seemed to correlate with its ability to own a TV and have a subscription to cable. And, it might be the late night TV watching that is causing the student to miss school, not the refrigerator, microwave, or a motorcycle.

Also, in two of the schools where the focus group was conducted (School 1 and School 6), some students reported that they did not have a refrigerator at home. However, they had answered in the survey that they had. So, when questioned as to why that was, they reported having one (or even two) at the retail shop that the family owned. This would suggest that the appliance variable in the econometric model might be capturing the labor demand of a family business that is preventing a student from attending school regularly. When asked directly if they ever had to work in the shop and miss school, the answers were unanimously in the affirmative.

The students were also asked what they would point to, based on their experience, as the main factor that kept them away from school. The answers in all six focus groups ranged from some interesting answers such as being “concerned about getting beaten up” to more generic responses such as “catching the cold.” The boys reported having to take care of their families, especially in a medical emergency in the family, or if the patriarch was not available, as was the case with one of the students whose father had travelled overseas for better labor opportunities.

Students also identified celebrations, festivals, and social functions as the main reasons why they missed school. Local students would miss some part of the day or the entire day at a

time for these celebrations. However, some students responded that they had to go back to their village for their ethnic festivals, therefore missing multiple days of school. This seemed true especially for ethnic groups from the south of the country, because their specific celebrations were not common in the hill country, including Kathmandu. Or, the social functions such as marriages were all conducted in their ancestral villages, as most of the extended family was still there. This caused these particular students to miss school for an extended amount of time, as the schools in Kathmandu Valley do not cater much to the cultures or traditions of the ethnic groups other than the three major privileged groups, the Brahmins, the Chhetrias, and the Newars.

The 10-year-long Maoist war in Nepal pushed many families from around the country into the Kathmandu Valley, which was considered the safest place in the country at the time, as Maoist activities were minimal and of little consequence in terms of physical harm. Most of the fighting between the Maoist guerrillas and the Nepalese military was in other parts of the country (Baral, 2003). These displaced families rented rooms or bought small pieces of land in Kathmandu Valley, mostly in the surrounding areas that were significantly cheaper. These migrants eventually settled in Kathmandu. So, some of the students who were in Schools 6 and 2 reported that they would miss school to go back to their villages. Students reported that they were pulled from school to entertain and cater to the needs of their relatives, who would visit from their previous villages from time to time. Additionally, boys in particular were pulled from school to show the visiting relatives around town and take them to touristic places. This and the story of smaller ethnic groups travelling to their previous villages demonstrated the negative impact on attendance that migrant groups face.

The econometric analysis of the survey data found that the students with mothers who work had better attendance than those whose mothers were homemakers. This finding was

particularly interesting, as the theoretical framework for this research was based on the agricultural household model, and the argument was presented that the increase in the pull on a student's time for household activities (cleaning, cooking, etc.) would decrease school attendance, especially for girls given existence of patriarchal society in Nepal. However, speaking with the students about this finding validated our explanation for the reason.

It was clear that the mother who participated in the labor market and had a paid job saw being with the student and not going to work as having a high opportunity cost. And, since the school provided the cheapest "day care" for the student, she would send the student to school for any minor health issues, such as common cold, slight headache, and low fever. The students in all three schools whose mothers has paid jobs outside the home said that their mothers would ask them to go to school, and in some cases, give them medicine and send them to school.

In addition, the students also mentioned that they themselves did not want to stay home, as being alone at home was "boring," and they would rather be at school with their friends, even if they did not feel well. They pointed out that being in school with their friends was enjoyable and it got their minds off of the health issue. The students whose mothers were present at home had a slightly different take. They reported that their mothers also asked them to go to school. However, if they stayed at home, they would take good care of them, feed them, and otherwise take care of them. Also, they did not find it "boring" to be at home, as their mothers would be there. They said that if their siblings stayed home sick, that they were very likely to stay home as well.

The descriptive statistics showed that over forty percent of the girls had reported menstrual pain as the main reason why they would miss school. However, the econometric analysis found no statistical significant difference in attendance between girls who pointed to

menstrual pain as the main reason for absenteeism and others who picked other reasons. Therefore, during the focus group interaction, girls in all three schools were asked directly if menstrual pain was a reason why they would miss school. They pointed out that it was. However, they also went on to say that they had gotten used to it as they grew older. In other words, they reported to being concerned and wanting to stay home during their periods when they were younger and experiencing the change for the first time. However, they mentioned that they became used to it and planned for it by bringing pads or homemade sanitary napkins.

They reported that they did come to school with the pain, even the ones who typically have severely painful periods. The girls in School 2 pointed out that if they told their teachers about the pain then their teachers would allow them to rest in the nursery room, where there were beddings on the floor for children in kindergarten. In addition, they pointed out that if the pain was unbearable, they would let the teachers know and that they would be sent home. Girls at schools 1 and 6 also reported leaving if the pain was unbearable. This was an interesting revelation. It meant that the attendance data did not capture the full impact of menstrual pain on girls' attendance because they would be counted as being present even if they rested at the school or left for the day, as long as they were present during roll call in the first class period. This could possibly explain why menstrual pain was the number one reason reported by girls in our survey even though we did not see any statistically significant impact on the attendance data provided to us by the school.

On the topic of pain management, one of the students in School 1 mentioned that she had taken pain medication once and that it had helped her a lot. The other girls, however, all said that they had never taken any pain killers, regardless of having painful periods. Naturally, the question arose as to why that was. When confronted with that follow-up question, the answer

from the students was jaw-dropping. They said that they did not want to take pain medication because of the side effects—that it would negatively impact their ability to have children! When asked where they had heard that, they all reported some family members or relatives as the primary sources. Since this was revealed at the first school, same line of questioning was repeated in the other two schools that followed, and the answers were alarmingly identical. This demonstrated the lack of menstrual hygiene management knowledge among the students and their families, and the lack of or ineffectiveness of training about such subjects at the schools.

In the process of the quantitative analysis, it was identified that the mother's menstrual cycle could potentially impact a student's attendance, as in the Nepali society women are not allowed to cook, clean, or participate in any household activity during their periods. Therefore, it would be safe in the context of the Nepali society to assume that the daughters would then be expected to fill in while the mothers are “untouchable.” The focus group did not support this argument. The girls pointed out that not all families were as strict. It seemed to be less of an issue in some ethnic groups such as the Tamangs, according to one of the student who identified herself as a Tamang. Even in households where this tradition was followed, the students reported that it did not cause a disruption in their attendance because they planned for the expected increase in household activities, which according to them, was not a lot, as they performed these tasks regularly anyway.

One issue that seemed to be common to all schools was the lack of facilities to help girls practice safe and effective menstrual hygiene management. All girls, in all of the schools where the focus groups were from, pointed to the lack of changing rooms. From the initial survey of these schools, and from the follow up visit, I found that all of these schools had regular gender-specific toilets. However, these facilities were the typical Nepali squat toilets with no room or

space for anything else. This, as the girls explained, made it challenging for them to change their pads among other things, as there was no clean space in these restrooms for them to set their belongings, pads, etc.

I visited all of the toilets in these schools after conducting the focus-group interviews, and found the girls' report to be accurate. In fact, in some schools there was not even a trash can to throw away their used pads. One of the principals, upon me bringing this issue forward, was genuinely surprised that this was an issue and expressed that *she* had not thought about it until I brought it up! She did say, however, that she would work with other staff at the school to address the issue.

When I brought up the concerns of the girls at the school, the principal at another school informed me that they actually removed the trash can on purpose because “no one wanted to touch that bag!” Since there were no trash cans in the bathrooms, in the focus group the girls had said that they put it in their bags and carried it downstairs to the school yard where there was a big “catch it all” trash bag. The headmaster, after mentioning that they removed the trash can because they could not find anyone to clean it daily, complained that one of the girls flushed a used pad down the toilet, which caused the sewer to back up, and cost the school 10, 000 rupees. The school, he said, is now thinking about adding a chute from one of the girl's toilets to a collection pit below where periodically all of the pads would be burned. It was horrifying to hear such a plan, so I suggested that the shaft idea was good. However, rather than burning the trash, I suggested that the school think about collecting it in a trash bag and disposing it properly.

It was not all bad. At another school, one could see some improvements. This school, School 6, had one of the best attendance among all of the schools in the study. The girls had fewer complaints, and the school seemed to have embraced the importance of drinking water and

washing hands promoted by Splash, a Seattle-based INGO. The school actually announced the importance of hydration and clean hygiene at its morning school assembly. However, the school toilets did not have the changing rooms or tables that the students had asked for. When these issues were mentioned to the headmaster, he was very receptive of the suggestion. He went on to point out that the school had been bringing different INGOs to train the students on menstruation hygiene management, had placed trash cans in the bathrooms, and now would look into building or expanding the school facilities to include a changing room to address the students' concerns.

As mentioned above, the intervention of Splash, especially in terms of drinking water, etc., was clear in two of the schools visited. I met with Kate Galloway, the program director of the organization, in Nepal and learned about their project in the Kathmandu Valley. Splash is active in many schools in the Kathmandu Valley where it has been providing clean drinking water for community schools by installing and maintaining water filtration systems. The director pointed out that the plan was to help schools with the maintenance for a few years and then to have schools take over the system and maintenance (Personal Communication, Kate Galloway, June 5, 2017). The program, she said, started by helping community schools to target low income families, however, they have learned that there are many “private” schools in Kathmandu that cater to the low income families and their children, who also need help with having access to clean drinking water. Splash is now planning to focus on menstrual hygiene management, which was also clearly the finding from the focus groups.

CHAPTER 8

Conclusion

This research has been successful in presenting and identifying the various issues faced by students in Nepal that cause them to miss school. There were factors related to students' characteristics such as gender, age and ethnicity, and factors related to students' household characteristics such as their wealth level, family size and parents' education attainment that were analyzed to better understand their impact on school attendance in urban and rural areas around Kathmandu Valley. School characteristics such as student-to-teacher ratio, computer-to-student ratio, gender-specific restrooms, and attendance policies were analyzed to see if any had positive or negative impacts on student attendance.

Some of the findings were as one would expect: Time spent studying at home, for example, was highly significant and had a positive impact on attendance. In other words, students who were well-prepared and had completed their homework were less likely to miss school. This was also supported by the reasons presented by students who later participated in the focus groups. This would suggest that schools should give manageable amount of homework, and parents should encourage their children to study and check that they had completed their homework. This would have significant impact on the student's attendance and ultimately their performance.

Age, when controlled for student, household, and school characteristics, showed a negative impact on attendance, implying that students missed school as they grew older. This would suggest that schools should be especially vigilant with students in higher grades and should have stricter policies to make sure that they attend. This suggestion is supported by the

finding that schools with fines for absences had better attendance rates than schools without. In fact, having such a monetary punitive policy increased the attendance by 9.2 percent. Rewards, on the other hand, were not as successful. It was not that the reward amounts themselves were not enticing, but rather how they were set up. Focus group students identified that they would have to maintain a 100 percent attendance to receive the reward, and that it was no longer an incentive if they missed just one day for being sick. They argued that the 100 percent attendance was not a realistic expectation, and that if that requirement was lowered a bit, it would still provide an incentive for students to maintain a higher level of attendance.

Other findings were that the students with more siblings would have lower attendance rates than those without. Focus-group students explained that this had to do with not being bored at home. Student after student in our survey indicated that they like or love to go to school to be with their friends and that they enjoy the social interactions. Although some students mentioned learning new things as the reason they go to school, an overwhelming majority identified being able to interact with their friends as the main reason. This would suggest that if schools add or increase extra-curricular activities, including sports, school attendance would increase, as it would help facilitate social interactions.

Although educated fathers did not have a statistically significant impact on attendance, educated mothers did. The results indicated that having educated mothers would have a positive impact on school attendance. It was unexpected and interesting to see that having a mother who did not participate in the formal labor market had a negative impact on attendance. In other words, a student who had a mother who was a homemaker would have a lower attendance rate than the student whose mother worked in the formal sector. Since most of the survey participants belonged to a lower-income household, the opportunity cost of the mother having to stay home if

the child had to stay home seems to be the reason. Also, based on the focus group discussions, this could also be because of the entertainment factor. A student did not want to be left alone at home, as he or she would be bored, as opposed to having the mother present to interact with.

There were some stark differences between boys and girls on factors impacting their school attendance. Age had a negative and significant impact for girls, whereas it had no impact on boys, suggesting that even if you enroll the girls into school, the family, and possibly the girls herself, did not put a high value on her educational performance. Time spent studying was statistically significant for boys but not for girls, while time to school was significant for girls but not boys. The focus group discussions revealed that the distance to school might be a factor at the margin in the student deciding whether to go to school that day or not, especially when he or she had household activity to complete.

One of the biggest revelations of this project was that the Nepali society, with the help of NGOs, INGOs, and the government, has been successful in increasing the enrollment of girls into primary and secondary schools. However, there has not been much thought provided to the services that are needed by girls to be successful in academics. Girls pointed out that they have learned to adapt to the realities that exist. However, it is clear that they are in need of some basic facilities—clean toilets, changing rooms, pain medication, menstrual pads, and, at the very least, a menstrual pad disposal bin.

To improve the school attendance of all students in and around the Kathmandu Valley, one has to focus on the obvious—adding extracurricular activities, adding more computers to increase access, providing gender specific restrooms, and providing clean drinking water to reduce absenteeism due to health issues. However, in terms of gender differences, to not only improve the school attendance of girls but also to allow them to learn in a safe environment and

in a dignified manner, schools, government, NGOs, INGOs and parents have to focus their resources on needs specific to girls who have traditionally had lower attendance rates than boys. This can start with providing gender-specific restrooms with running water, disposal bins, pain medication, rest space, and menstrual pads, to name a few.

Some of these issues are easily solved by schools and various agencies. However, others like the social informal beliefs and rules will take time to change. To tackle these informal rules that inhibit a student's ability to attend school, there needs to be public service announcements. Educating parents on the value of education as a medium of escape from poverty and a path for prosperity is important. Moreover, educating school officials on various needs for students, specifically needs for girls, would also help improve the learning environment and foster academic excellence. If governments, schools, NGOs and INGOs dedicate their efforts in addressing these issues, it would reduce school absenteeism, improve school performance, and help put students on a path for educational and economic success for them and for their families.

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APPENDIX A

Survey

SURVEY

Please answer all of the following questions as accurately as possible.

Colorado State University

Fort Collins, Colorado

USA

Nepal Survey March 2016

1. Please write down your full name.
2. What is your gender?
 - Female
 - Male
3. How old are you?
4. How many people in your family, including you, live together?
5. Does your father live with you?
 - Yes
 - No
6. Does your mother live with you?
 - Yes
 - No
7. Does your father have a job /paid work?
 - Yes, he works locally
 - Yes, he works in a different town in Nepal
 - Yes, he works in another country
 - No, he does not have a job
 - Other (please specify)
8. Does your mother have a job / paid work?
 - Yes, she works locally
 - Yes, she works in a different town in Nepal
 - Yes, she works in another country
 - No, she is a homemaker
 - Other (please specify)
9. Who makes decisions about your education in your home?
 - Father
 - Mother
 - Grandfather
 - Grandmother

- Other (please specify)
10. How important is it for a girl to know how to cook to be a good wife?
- Very important
 - Somewhat important
 - Not important
11. Do you think it is important for girls to go to school?
- Yes
 - No
12. Do you think it is important for girls to go to college?
- Yes
 - No
13. What do your parents think about educating girls?
- Very important
 - somewhat important
 - not important
 - Other (please specify)
14. Do you think it is important for boys to go to school?
- Yes
 - No
15. Do you think it is important for boys to go to college?
- Yes
 - No
16. What do your parents think about educating boys?
- Very important
 - somewhat important
 - not important
 - Other (please specify)
17. Which one is more important?
- Educating boys
 - Educating girls
 - equally important
 - Other (please specify)

18. What is the highest level of school your mother completed or the highest degree she received?

- No School
- Less than SLC
- SLC
- Intermediate Degree (ISc, ICom, etc.)
- Bachelor degree (B.A., B.Com., etc)
- Master's degree or higher (M.A., M.Sc., PhD, etc.)

19. What is the highest level of school your father completed or the highest degree he received?

- No School
- Less than SLC
- SLC
- Intermediate Degree (ISc, ICom, etc.)
- Bachelor degree (B.A., B.Com., etc)
- Master's degree or higher (M.A., M.Sc., PhD, etc.)

20. Do you identify with any of the following religions? (Please select all that apply.)

- Christianity
- Islam
- Buddhism
- Hinduism
- Other (please specify)

21. In a typical week, how often does your family eat meat?

- We do not eat meat
- One day a week
- 2 days a week
- 3 days a week
- 4 days a week

22. Does your family own or rent the home where you live?

- Own
- Rent

23. If your family owns their house, do they rent rooms to other people?

- Yes
- No
- Other (please specify)

24. How many rooms does your house have?

25. How many stories does your house have?

26. Does your family have a microwave at home?

Yes

No

27. Does your family have a refrigerator at home?

Yes

No

28. How many cars does your family own?

29. How many motorcycles does your family own?

30. How many bicycles does your family own?

31. How many younger brothers do you have?

32. How many older brothers do you have?

33. How many younger sisters do you have?

34. How many older sisters do you have?

35. Does your grandfather live with your family?

Yes

No

36. My grandfather is

sick

healthy

37. Does your grandmother live with your family?

Yes

No

38. My grandmother is

Sick

Healthy

39. My family owns

no farm land

some farm land

large farm land

40. My family owns
no cows, buffalo, goats
few cows, buffalo, goats
many cows, buffalo, goats
Other (please specify)
41. How do you get to school?
Walk
School Bus
Bicycle
Private Motorcycle / Car
Public Transportation (Bus/ Tampoo / Micro / etc.)
Other (please specify)
42. How many minutes does it take for you to get to school from your house?
43. Which of the following makes you absent from school the most?
Income-earning activities
Housekeeping Activities (cleaning, cooking, washing clothes)
Leisure (movies, travel, play, etc.)
Farm work
Other (please specify)
44. What health reason makes you absent from school the most?
Fever
Headache
Stomach ache
Menstrual Pain
Other (please specify)
45. How many hours do you spend each day on household activities such as cleaning, cooking, farming, taking care of younger siblings, taking care of elderly grandparents?
46. Which household activity do you spend most of your time on?
cooking
cleaning
farming
taking care of grandparents
taking care of younger siblings
Other (please specify)
47. In a typical day, how many hours do you spend studying at home?
none
1/2 hour
1 hour
2 hours

- Other (please specify)
48. How much do you like your school?
- I love it
 - I like it
 - I am OK with it
 - I don't like it
 - I hate it
49. Do you like your teachers?
- I love them
 - I like them
 - I like some but not all
 - I don't like them
50. Do you get excited about coming to school every day?
- yes
 - no
 - Other (please specify)
51. Please explain the reason for your answer in the previous question.

APPENDIX B

SURVEY CONSENT

Hello everyone,

My name is Niroj Bhattarai, and I am studying the factors that impact student attendance in Nepal, as a part of my dissertation for the completion of my doctorate in economics at Colorado State University in Fort Collins, CO, USA. In other words, my study attempts to identify the variables that influences the school attendance of students in Nepal.

One part of this study is to collect the data from students in various schools in urban and rural communities in Nepal. The final study will involve studying the data gathered from the surveys to improve understanding of the variables that influence the decision to go to school.

This survey is being conducted in 8 schools, 4 in rural Nepal and 4 in the urban Nepal. The survey is going to be taken by students in grades 8, 9, and 10. The questions will ask you for information about your home, school, activities at home and school, etc.

You are requested to take this survey, which should last no more than 1 hour. You will be handed out the survey and a pencil. You will be asked to complete the survey using this pencil.

If at any time, you feel uncomfortable taking the survey, you can stop taking it. If you would like to discuss the survey, please contact me ((970) 581-9870; niroj@colostate.edu).

Your participation or non-participation in this survey will not impact your academic record at this school. None of the collected data will be provided to the school authority. All of the data collected will stay with me and any personal information collected to identify you will be destroyed at the completion of the study.

There is no compensation associated with this survey. Completing this survey may not benefit you, but this research may benefit the Nepali community by revealing answers that may have a positive impact on policy designed to improve the nation's education.

If you have any questions about your rights as a volunteer in this research, you can contact your guidance counselor at your school or CSU IRB at: RICRO_IRB@mail.colostate.edu; 970-491-1553.

I hereby acknowledge the above and give my voluntary consent

Student Name, Signature, Date

Niroj Bhattarai
Researcher
Colorado State University
Fort Collins, CO 80521
niroj@colostate.edu
(970) 581-9870

Principal Investigator: Alexandra Bernasek, Professor, Niroj Bhattarai, Colorado State University, Fort Collins, CO, USA

APPENDIX C

CSU NOTICE OF APPROVAL OF PROTOCOL NUMBER 15-6143H FOR HUMAN RESEARCH

NOTICE OF APPROVAL FOR HUMAN RESEARCH

DATE: February 25, 2016

TO: Bernasek, Alexandra, Economics

Bhattarai, Niroj, Economics, Shulman, Steven, Economics

FROM: Swiss, Evelyn, Coordinator, CSU IRB 2

PROTOCOL TITLE: Factors affecting school attendance in rural and urban Nepal.

FUNDING SOURCE: NONE

PROTOCOL NUMBER: 15-6143H

APPROVAL PERIOD: Approval Date: February 23, 2016 Expiration Date: December 06, 2016

The CSU Institutional Review Board (IRB) for the protection of human subjects has reviewed the protocol entitled: Factors affecting school attendance in rural and urban Nepal.. The project has been approved for the procedures and subjects described in the protocol. This protocol must be reviewed for renewal on a yearly basis for as long as the research remains active. Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.

Important Reminder: If you will consent your participants with a signed consent document, it is your responsibility to use the consent form that has been finalized and uploaded into the consent section of eProtocol by the IRB coordinators. Failure to use the finalized consent form available to you in eProtocol is a reportable protocol violation.

If approval did not accompany a proposal when it was submitted to a sponsor, it is the PI's responsibility to provide the sponsor with the approval notice.

This approval is issued under Colorado State University's Federal Wide Assurance 00000647 with the Office for Human Research Protections (OHRP). If you have any questions regarding your obligations under CSU's Assurance, please do not hesitate to contact us.

Please direct any questions about the IRB's actions on this project to:

IRB Office - (970) 491-1553; RICRO_IRB@mail.Colostate.edu

Evelyn Swiss, Senior IRB Coordinator - (970) 491-1381; Evelyn.Swiss@Colostate.edu

Tammy Felton-Noyle, Assistant IRB Coordinator - (970) 491-1655; Tammy.Felton-Noyle@Colostate.edu

Swiss, Evelyn

Approval is to recruit a total of 520 students from 8 schools (4 schools in Kathmandu and 4 schools in the southern plains: 65 students per school - $8 \times 65 = 520$) with the approved recruitment and assent. The above-referenced project was approved by the Institutional Review Board with the condition without first obtaining the approval of the IRB. Per the local cultural norms, the requirement to obtain signed parental permission has been waived; however, parents are to be informed of the survey. NOTE: Please submit an amendment to add all letters/emails of support from the 8 schools. In addition, please submit the letters that will be provided to the parents (we acknowledge that these will not be in English, but this complete documentation should be included with your protocol file).

Approval Period: February 23, 2016 through December 06, 2016

Review Type: EXPEDITED

IRB Number: 00000202