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The Educational Gender Gap in Latin America: Why Some Girls Do Not Attend School

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Abstract

Girl's education is universally recognized in the International Development community as an important aspect of development. Educating a woman has a significant impact on her opportunities and her community as a whole. Despite the many positive effects of educating girls, girls attend school at a lower rate than boys, creating a gender gap in education. My question is, what causes this gender gap in education? To study this phenomenon, I created four categories of causes: patriarchal factors, family factors, structural factors and governmental financial investment. A number of proxy variables were used to study these qualitative variables in a quantitative manner. I analyzed these variables through four case studies in Latin America: Guatemala, Belize, Mexico and Peru. Using Mill's Indirect Method of Difference, I evaluate which variables show significant causation of the educational gender gap. After this analysis, I conclude that patriarchal society and family factors have the biggest causational effect on the gender gap, while governmental financial investment and structural factors do not cause the gap. This has significant policy implications in the international education world, as many international organizations firmly believe that an increase in financial investment in education is the answer to closing the educational gender gap.

Introduction

The Educational Gender Gap in Latin America: Why Some Girls Do Not Attend School

International Organizations, NGOs, and governments worldwide are questioning why girls attend school at a lower rate than boys in some countries. Education of both girls and boys is universally acknowledged in the development community as a "driver of economic growth and social well-being" (VanBalkom 2011) and is viewed by many as "a basic human right" (Leach 1998). The effect of educating girls, in particular, who have historically been denied access to formal education, has staggeringly positive effects for the individuals, their families, and society as a whole. As argued by Rankin and Aytac, "educating girls boosts family income and social status, and leads to women's higher earnings and occupational mobility"(Rankin 2006). Educating a woman even affects her overall health, giving her "greater fertility control and life expectancy and lower levels of infant mortality"(Rankin 2006). This positive outcome from educating a woman encourages countries to close the educational gender gap.

Since the first International Conference on Public Education in 1934, governments have come together to make international commitments to increase the accessibility of education (Vaishnav 2005). The most recent international commitments to be established were the Millennium Development Goals [MDGs], which placed both universal primary education and gender equality as the two top priorities for the development world to be attained by 2015. In order to achieve these goals, the MDGs "have singled out investments in schooling as a top priority for developing-country governments as well as for international

donor assistance" (Blanc 1996). The general consensus made at these conferences is that developing countries and donor countries need to financially invest in the education system in order to close the educational gender gap (Blanc 1996).

Governmental financial investment may be what the numerous international governmental conferences on education have concluded can close the gender gap, but it does not tell the whole story. On a more micro level, there are several aspects that governmental financial investment in education does not affect. For instance, some factors that could possibly inhibit a girl from attending school include the size of her family, educational attainment of her mother and the amount of patriarchy in society. Additionally, factors such as the adolescent fertility rate, indigenous identification, and living in a rural setting could also affect a girl's likelihood of attending school. This paper seeks to analyze which factors are the most significant causes of the educational gender gap in Latin America.

Literature Review on the Causes of the Educational Gender Gap

After reviewing the literature, I found there are four major factors that keep girls out of the classroom in developing countries, the first and most influential of which is family influence. A girl's education can be hindered by a variety of familial factors, including: low socio-economic status, birth order, familial allocation of resources, the number of children in the family, and low education level of the mother. Second, patriarchal ideals, religion, and traditional family values all discourage families from valuing a daughter's education. In addition, the structural factors of fear of ethnic and gender violence keep girls from attending school. Indigenous women are particularly vulnerable to this type of violence, which further limits their ability to attend school. Third are additional structural factors, such as division of labor and lack of schools, which also have a profound influence on girl's education. Finally, tied to the idea of lack of schools is low governmental financial investment is considered a hindrance to girl's education.

Poverty is the most serious barrier to a girl's education (Leach 1998). Almost every research project I came across cited socio-economic status and other factors within the family structure that inhibit girl's attendance in school. A current phenomenon that particularly prevents educational gender equality is the common family practice of selective education (Rankin 2006). Leach describes this phenomenon in families of low socio-economic status,

Where parents cannot afford to send all of their children to school, boys are inevitably given priority, as future breadwinners. Girls are kept at home to look after younger children, cook and clean, and sometimes help the mother in farming or market trading. (Leach 1998)

This is a frequent occurrence all over the globe, and is most common in large families living in poverty. Older girls are particularly vulnerable to selective education, as being at the top of the birth order depletes family resources due to the presence of younger siblings (Rankin 2006). Families that do not have adequate access to childcare force older girls to stay home from school to care for their younger siblings.

The number of children in a family, or sibsize, is a big determinant of educational attainment. In Steelman's review of literature on educational attainment, he concluded that "the overall effect of sibling size on educational attainment was larger than that of other family characteristics, for example, paternal occupational characteristics" (Steelman 2002). Naturally, "large families must stretch resources – both material and nonmaterial – across more children, thus reducing the overall amount of schooling that children receive" (Rankin 2006). However, Ono argues that the decision of who goes to school is not only based on the number of children in a family, but also the gender composition of the children. If a family structure places a higher value on the education of sons, "then family resources will likewise be allocated" towards sons (Ono 2004). Therefore, if a family is large and has several sons, then it is unlikely that the daughters will reach a high level of educational attainment.

In addition to the number of children in a family, the education level of the mother also determines the level of educational attainment the daughter receives. As women advance through their life cycle in their

social environment, particularly in patriarchal cultures, their educational aspirations are downgraded. Ono argues "this downward adjustment in educational aspirations is transferred across generations as mothers come to hold lower educational aspirations for their daughters" (Ono 2004). Low educational aspirations for the daughter will discourage the family from investing in her education past the level of her mother. From an economic standpoint, Dussaillant argues "more educated mothers produce children with higher levels of human capital" (Dussaillant 2011). Furthermore, economists find "the effect of mother's education is larger than that of father's, which may reflect that mothers have a greater influence on children or that mother's education is in part proxying for the wealth of the household" (Case 1994). Therefore, if a mother did not attend secondary school, then she will not see the value of sending her daughter to secondary school when she could be at home, helping with household chores. However, there is a lot of variability in how and why families make decisions on who will go to school, which could be considered a weakness of the theories regarding familial factors.

Closely tied to the value that a family places on education are the socio-cultural factors of the family and the community. In patriarchal communities, women are socialized to accept that "the masculine man is one who achieves, who is masterful; the feminine woman is one who underachieves, who defers" (Arnot 1994). Patriarchal societies maintain the idea that women are subordinate to men in every way. An unfortunate result of these "environments can be that daughters become the siblings from whom resources are drained" (Ono 2004). As Ono describes, it is highly likely in patriarchal cultures that families will choose to selectively educate their children in favor of boys. Unfortunately, instead of combating the ideology of female inferiority, schools actually perpetuate it. Schools are "replicating the values of the home and community in terms of undervaluing girl's potential and abilities compared to boys" (Swainson 1995). As a fundamental institution of society, it should not be surprising that schools perpetuate societal norms.

In Islamic countries, religion and traditional family values play a key role in the educational gender gap. "To many religious families in Islamic societies, schools pose a threat to the safety and modesty of their daughters and thus to family honor" (Rankin 2006). Leaving the protection of the home is inherently implied in education, which poses potential threats to a girl's well being. "Also, there is a fear of her getting influenced by the "modern" thoughts that can be taught in the schools and thus becoming rebellious towards the social status quo" (Raza 2010). Families worry that if they send their daughters to school, they will become corrupted by the outside world and give up their traditional family values.

Families also fear that sending their daughters to school could put them at risk of ethnic or gender discrimination. Indigenous women have historically been, and are still today, discriminated against both in denying them access to education and perceived status in society. Not only do these women face discrimination by the government, but the institutionalized inferiority of indigenous women has also translated into prejudice from other ethnic groups.

"Ethnic identity then, which is more symbolically apparent and visible amongst women, is a feature of the structural violence, which does not allow them to participate in the education system for fear of physical attack and/or sexual violence." (King 1999)

The discrimination faced by an indigenous woman based on her ethnicity is compounded by her gender, which makes her more vulnerable to this type of discrimination (King 1999). Women are often subjected to certain types of gendered violence, specifically sexual violence. Indigenous women are particularly vulnerable to sexual violence because "firstly, they do not have recourse to the protection of the legal system and secondly, patriarchal society accepts that as normal" (King 1999). Because of this, it is particularly dangerous to send indigenous daughters to school, leading families to keep their daughters at home in order to protect them. Indigenous discrimination and violence is a profound barrier to education, but this only is relevant if a girl is indigenous, which is a weakness of the theory when generalizing it to all girls.

Fear of structural, cultural and sexual violence against daughters forces the family to create a system of

inequality and selectively educate their children. According to research done in Honduras by Centro de Capacitacion Integral de la Mujer Campesina, language barriers and the risks of traveling to school also make girls vulnerable to violence.

"In rural areas the cultural violence that threatens children who do not speak Spanish, the frequent cases of assault and rape perpetuated against women, and the distances that girls have to walk to school, are reasons why parents fail to register them in school." (King 1999)

It is the fear of what could happen to a girl when she walks to school that holds her back from receiving an education. Structural violence can also indirectly affect girls via the death of her parents, leaving her as the head of the household while still a child (King 1999). El Centro de Promocion y Dessarrollo Poblacional reports that in Peru, there are approximately 3,900 female-run households that are run by women under the age of 15 (King 1999). Having the responsibility of taking care of the household denies girls the opportunity to continue their education. The risks of violence stated here are at the extreme end of the spectrum and is not the case for most families in the world, which is a weakness of this theory.

Along with socio-cultural factors in the girl's environment, economic and structural factors in her community could also affect her attendance in school. Some scholars point "to a new global division of labor that limits job opportunities for women, often relegating them to unskilled and low-paying jobs in the informal sector" (Rankin 2006). These new job opportunities for women do not require a high level of formal education to succeed. In turn, this restricts job opportunities and discourages parents from investing in their daughters' education (Rankin 2006). What this theory does not take into account, however, is the maintenance of local industries at the community level.

An important structural factor that is not to be overlooked is the lack of access to schools. A common phenomenon is that "lack of secondary schools in many developing countries contributes to high drop-out rates at the end of primary school"(Rankin 2006). Rural communities where there is little educational provision consequently also have the lowest school enrollment rates and largest gender gaps in educational attainment (Leach 1998). In contrast, there is also research that shows "for girls, residence in an urban area increases the likelihood of post primary education" (Rankin 2006). Therefore, it is more likely that a girl in an urban setting will have greater access to school than a girl in a rural setting.

The theory of lack of schools leads to the idea that low governmental financial investment in school infrastructure contributes to the educational gender gap. Therefore, in order to close the educational gender gap, the government should increase investment in the education sector. As argued by education researcher and activist Khandaker Lutful Khaled, "achieving quality education for all will require massive new investment i.e. new teachers, new classrooms and more textbooks, mid day meal, stipend etc. Increased investments from domestic budgets are crucial in this regard" (Khaled 2011). Providing the necessary infrastructure for school to take place requires massive financial investment by governments.

If governmental financial investments were to increase, it is important to know where this money is being spent. A government could show figures that suggest increases in governmental spending in education, but the transparency of where the additional funds were spent may not be shared. Khaled argues that the government "should demystify all allocations in education and should clearly spell out the budgetary linkages/share with education and other departments" (Khaled 2011). This would put pressure on the government to ensure that it is spending the money in a productive way and not simply increasing the salaries of education ministers. A weakness of this theory is that Khaled comes from the position of an education activist and is biased in this regard.

While all of these arguments have validity, some are not applicable to every country in the world. Countries with deeply rooted Islamic traditions are mainly concentrated in the Middle East and North Africa. Familial factors are the most common factors cited in the research across all countries that were studied in the literature. Latin America maintains a highly patriarchal society, which could possibly affect the educational gender gap. The structural variable of indigenous and rural populations lacking of access to school is frequently cited as a significant inhibitor for girl's education all over the world. Finally,

governmental financial investment in education directly affects the amount of physical infrastructure available for education. Therefore, I argue that these four factors are the most worthy variables to pursue for this research project.

Research Design

As concluded in the literature review, I found four main categories of factors that affect the educational gender gap: familial factors, patriarchal society, structural factors and governmental financial investment. In comparing these four independent variables, I will determine which factors have the largest effect on the dependent variable, the size of the educational gender gap. The following plan outlines how I will answer my research question of what causes the educational gender gap in Latin America.

Choosing the Case Study Countries

I will evaluate four countries from North, Central and South America and compare how each of the independent variables of familial factors, patriarchal society, structural factors and governmental financial investment differ between the cases. The four countries I have chosen are: Mexico, Guatemala, Belize and Peru. I chose these countries based on their values on the Gender Inequality Index and their percentage of indigenous population:

	High % of Inigenous Population	Low % of Indigenous Population
Low Gender Equality Index	Peru	Mexico
High Gender Equality Index	Guatemala	Belize

By choosing countries in Latin America, I have lowered the chance of confounding variables that could influence the educational gender gap. Each of these four countries has a common religion, official language, political system, geographic location [Western Hemisphere] and history of colonization by the Spanish.

Operationalization

As the factors I have chosen are inherently qualitative, I am using proxy variables to assess each independent variable. Each factor is impossible to assess as a whole without looking at individual variables that contribute to the factor overall. The dependent variable, size of the gender gap, will be measured by a number of different proxy variables as well. To evaluate who is going to school and what the students get out of it, I will include male/female net attendance ratio, male/female youth literacy rate, and the percentage of girls who are out of school. All of the data for these variables comes from UNICEF and UNESCO. To measure how long the students stay in school once they get there, I will use World Bank data on male/female primary school completion rate and male/female persistence to grade 5. I chose male/female net attendance ratio rather than net enrollment ratio, because children can be enrolled in school and just not attend, therefore, the attendance ratio is a better indicator of who goes to school.

The patriarchy variable will be assessed by three measures: the Gender Inequality Index, percentage of female participation in the workforce, and the World Values Survey. The Gender Inequality Index is a measure created by the UN Development Program to assess the level of gender inequality in every country in the world. For this indicator, the closer the index gets to zero, the more gender equality a country maintains, and the closer the index gets to one, the greater inequality is present. The indicator of female participation in the workforce comes from UN Habitat data and showcases the societal investment in women as professionals outside the home. To assess the overall level of patriarchy in each country, I have chosen to use the World Values Survey as a measure of how society values of women as

professionals. See the Appendix for the survey questions that were used to gather the information and tables that outline the results for Mexico, Peru and Guatemala. The World Values survey was not given to residents in Belize during the 2005-2008 wave, but was given during the 2010-2012 wave, results of which will be published in 2013.

In examining the level of governmental financial investment in education, I evaluated three proxy variables that demonstrate the level of investment in education. To proxy governmental financial investment, I used the total amount spent on educational spending as a percentage of the entire federal budget and as a percentage of GDP. Data for both of these proxy variables comes from UNESCO. In order to calculate how educational spending is distributed to the students, I used per-student spending as a percentage of GDP per capita, the data for which came from the World Bank Education Statistics.

Familial factors were the most difficult to quantify, as it would be difficult to survey every family on how they allocate funds towards their children's education. To proxy the level of the education of the mother, I used the variable of adult female literacy rate as a percentage of males, which comes from UNICEF data. In addition, I will use the national fertility rate as a measure of how many children are in the family, which I gathered from a variety of different sources, including OECD and UN Habitat. I chose fertility rate rather than average household size, because households commonly include extended family members, such as grandparents and cousins. To take into account the infant mortality rate in analyzing how many are in the family, I will use an adjusted figure for fertility rate, subtracting infant mortality rate from total national fertility rate. Finally, I chose to include the adolescent fertility rate of women aged 15-19, because when girls have a child, they are unlikely to continue attending school.

To assess structural factors that affect the educational gender gap, I used proxy variables concerning the kinds of people that receive educational services. Structural variables on the composition of the population include the percentage of the rural population and the percentage of the population that is in poverty, data for which all came from the World Bank. The percentage of the indigenous population comes from the World Directory of Minorities International.

Hypotheses

The above operationalization helps to analyze the impact the variables have on the educational gender gap. The following hypotheses will be evaluated to discover which has the strongest effect on the educational gender gap:

Hypothesis 1: As the level of gender inequality increases, the gender gap increases.

Hypothesis 2: As governmental financial investment in education increases, the gender gap decreases.

Hypothesis 3: As adjusted fertility rate increases, the gender gap increases.

Hypothesis 4: As adult literacy rate increases, gender gap decreases.

Hypothesis 5: As the indigenous population increases across cases, the gender gap increases.

The evaluation of these hypotheses will reveal which variable has the most significant effect on the educational gender gap.

Methodology

The methodology I used to examine the effect of these variables in Mexico, Guatemala, Belize, and Peru is Mill's Indirect Method of Difference. This method investigates similar cases that have different outcomes on the dependent variable and examine which independent variables have a causal the Spanish, which "makes the real cause easier to spot" (VanEvera 1997). The indirect method in particular uses a

paired comparison to find the variable that has the most causal effect. The following research will compare the values of the operationalized independent variables in each country and how they affect the educational gender gap.

To evaluate the level of the proxy variables, I will use cut-off points to evaluate the level of each factor maintained by the case study. For the gender gap, I will consider a country to have a closed gender gap if the proxy variables differ from males to females from 0% to 3%, and moderate if the values are between 3% and 5%. The gender gap is considered persistent if the proxy variables differ by 5% or greater. For the patriarchy variable, I consider a Gender Inequality Index value below 0.4 to be low, approximately 0.45 to be moderate and 0.5 and above to be high. In regards to governmental financial investment, "according to international benchmark, every government must allocate 20% of national budget for education or spend 6% of GDP in education" (Khaled 2011). Therefore, I will consider a country's investment in education sufficient if the GDP is within two percentage points of 20%, and insufficient if it is below that level. The adjusted fertility rate will use a benchmark value of three children, where a value below three is low and a value above three are high. The adult female literacy rate will use a cut-off value of 88%, where a value above 88% is high and a value below 88% is considered low. Finally, the percentage of the population who identifies as indigenous will use a cut-off value of 30%, where below 30% is low and above 30% is high.

Case Study: Mexico

The Mexican Education system has done much to try to close to educational gender gap in the past few years. Scholars Creighton and Park argue that the "general finding is of a closing gender gap in Mexican educational attainment" due to "six decades of reform in Mexican education" (Creighton 2010). The following proxy variables demonstrate the argument Creighton and Park that the educational gender gap is closed. The net attendance ratio in primary school for males and females are both 97% (UNICEF 2005-2010). Primary school completion rate for males and females are equal at 104% (UNICEF 2005-2010). In addition, the rate of males and females who persist until the end of 5th grade is also equal at 95% (Bank 2010). The percentage of girls who are not in school is a negligible 1% (UNESCO 2008). Finally, the youth literacy rate of males is 99% while the female youth literacy rate is 98%, a difference that could simply be subject to rounding (UNICEF 2005-2010). Therefore, I conclude based on the cut-off point of a 3% difference for proxy variables as well as the analysis made by Creighton and Park, the educational gender gap in Mexico is minimal to non-existent.

Patriarchy Variable

As concluded in the literature review, patriarchal society negatively impacts the view that education is beneficial for girls, and having an unequal society leads to unequal outcomes in education. The Gender Inequality Index for Mexico is at a moderate level at an index of 0.448, based on the moderate cut-off value of 0.45 (UNDP 2011). Labor Force Participation Rate, which indicates how much women are a part of the workforce, is one of the lowest in this study, at 47% (Bank 2010).

The results from the World Values Survey show a moderately favorable view towards gender equality. As outlined in the appendix, the results illustrate that a majority of society would approve of single mothers, which indicates that Mexican society believes that a woman can make her own decisions about her lifestyle (Moreno 2005-2008). Additionally, a majority of respondents agreed that being a housewife was just as fulfilling as having a career, which could indicate that Mexican society does not see value in educating their daughters at a high level if they could be just as happy being a housewife (Moreno 2005-2008). A majority of respondents disagreed or strongly disagreed with the statements "in general, men are better political leaders than women" as well as "in general, men are better business executives than women," which indicates that Mexican society views men and women as having equal leadership potential (Moreno 2005-2008). Finally, a majority of respondents indicated that a university education is just as important for men as it is for women (Moreno 2005-2008). After analyzing these proxy variables, I

have concluded that the level of patriarchy in Mexican society is at a moderate level.

Governmental Financial Investment Variable

The extent to which the government financially invests in the education of its people was operationalized by how much money the government invests through a variety of indicators. The amount the Mexican government spends on education, as a percentage of the total federal budget, is 21.6%, a sufficient level compared to the international benchmark of 20% (UNESCO 2009). This equates to 4.9% of the nation's GDP (UNESCO 2009). Furthermore, the amount that is spent per student as a percent of GDP per capita is 16% (Bank 2010). Compared to the other cases in this study, these are all very high numbers. Therefore, I conclude that Mexico has a high level of governmental financial investment in the education sector.

Family Variable

The family variable uses the following proxy variables to demonstrate the influence of the family on the educational gender gap. Mexico has a high adult female literacy rate as a percentage of male, at 97%, compared to the cut-off value of 88% (UNICEF 2005-2010). This indicates that mothers are educated and are therefore more likely to send their children to school. The proxy variable for sibsize was adjusted fertility rate, and in Mexico I calculated this figure to be an average of 2.096 children per woman, lower than the cut-off value of 3 children per woman (Bank 2010). The adolescent fertility rate of girls aged 15-19, as indicated by number of births per 1000, is 68 teen births per 1000 in Mexico (Bank 2010). The culmination of these proxy variables indicates that the family variable in Mexico has a positive influence on the gender gap.

Structural Variable

Mexico has a small indigenous population at only 13%, compared to the other cases in this study and the cut-off value of 30% (International 2005). Mexico also has a low rural population at 22% relative to the other countries in my research (Bank 2010). The headcount ratio of the rural population, the proportion of the rural population that is considered poor, is 61% (Bank 2010). This indicates that of those who live in rural areas, a majority of them are also in poverty. Finally, the total percentage of the population that lives below the poverty line is 48%, which is large compared to the other cases (CIA 2010). The values of these proxy variables lead me to conclude that the structural variable has a moderate influence on the educational gender gap in Mexico.

Case Study: Peru

Similar to Mexico, the Peruvian educational system has reached relative gender equality in education. The literacy rates of male and female youth in Peru are equivalent, at a rate of 96% (UNICEF 2005-2010). There is a small difference in the net attendance rate of males and females, 98% and 97%, respectively (UNICEF 2005-2010). There is a gap in the number of males and females who persistence to grade, at 85% and 83%, respectively (Bank 2010). The gap gets just a bit wider when one considers primary completion rate of males and females in Peru, at 90% and 87%, respectively (Bank 2010). Despite these gaps, the percentage of girls who are out of school is only 3%, the cut-off value for the gender gap. Therefore, after assessing these proxy variables, I have concluded that the educational gender gap in Peru exists, but is minimal to moderate in size.

Patriarchy Variable

Peru maintains the lowest Gender Inequality Index of all the cases in this study at a score of 0.415, which I consider close to the cut-off value of 0.4, a moderately low level (UNDP 2011). All of the scores in the

rest Latin America hovered at this moderate level around 4.5 and 5.0. The labor force participation rate of women in Peru is a staggering 70%, which is 23% higher than Mexico's low level where just 47% of women participate in the workforce (Bank 2010).

The World Values Survey data exposed some interesting trends in Peru. A majority of respondents said they would disapprove of a woman having a child outside of marriage, which indicates that Peruvian society disapproves of women taking on non-traditional gender roles (Romero 2006). A majority of respondents agreed that being a housewife was just as satisfying as having a job, which could translate into a lack of societal investment in girls' education (Romero 2006). A majority of respondents disagreed or strongly disagreed with the statements "in general, men are better political leaders than women" as well as "in general, men are better business executives than women" which indicates that Peruvian society views men and women as having equal leadership potential (Romero 2006). Finally, a large majority of Peruvians thought that a university education was just as important for men as it was women (Romero 2006). Based on these proxy variables, I argue that there is a moderately low level of patriarchy in Peru.

Government Financial Investment Variable

The Peruvian government invests very little in the education of its children when compared to Mexico. The amount the Peruvian government spends on education is 16% of total expenditure, which is not within 2% of the international benchmark of 20%, which I therefore consider to be low (UNESCO 2009). This translates into just 2.6% of Peru's GDP (UNESCO 2009). The per-student amount that is spent equates to just 8% of GDP per capita, half of what Mexico spends per student (Bank 2010). Considering all of these factors together, I have concluded that the Peruvian government's financial investment in education to be low.

Family Variable

As described in the literature review, the composition of the family and education of the mother play significant roles in predicting the education level of a daughter. The adult female literacy rate is 89%, which is close to the cut-off value of 88%, which I will consider moderately high (UNICEF 2005-2010). The adjusted national fertility rate in Peru is at a rate of 2.986 children per mother, which is just under the cut-off value of three children (Bank 2010). Finally, the adolescent fertility rate of girls aged 15-19 is 51 births per 1000, which is 17 births less than Mexico (Bank 2010). These proxy variables lead me to conclude that the family variable in Peru has a moderately positive influence on the gender gap.

Structural Variable

Peru has a high percentage of the population that identifies as indigenous at 45%, which is 15% higher than the cut-off value of 30% (International 2005). The percentage of the population that lives in a rural area is a moderately low 29%, but is 7% higher than in Mexico (Bank 2010). The headcount ratio of those that live in poverty in a rural area is 60%, not too different from Mexico's 61% (Bank 2010). The total percent of the population living below the poverty line is 34.8%, the lowest percentage of all four cases (CIA 2010). Based on these proxy variables for the structural factors, I conclude that this variable has a minimal to moderate effect on the educational gender gap.

Case Study: Belize

The small Central American country of Belize has not been as successful as Mexico and Peru in closing the educational gender gap. The primary school net attendance rate is equal between males and females at 95% (UNICEF 2005-2010). There is a small gap in literacy rate, 77% for males and 76% for females (UNICEF 2005-2010). The gap grows when measuring persistence until grade 5, which is 93% for females and 95% for males in Belize (Bank 2010). The gap in primary school completion rate is the

largest of all the cases, with only 98% for females and 113% for males, a gap of 15%, which is far larger than the cut-off value of a 5% difference (Bank 2010). In addition, the percentage of girls who are out of school is 9%, the largest percentage in all of the cases (UNESCO 2008). In weighing the significant gender gaps with the equal attendance ratio, I conclude that Belize has a moderately large gender gap.

Patriarchy Variable

The culture of patriarchy still remains dominant in Belize. The Gender Inequality Index for Belize is moderately high compared to the rest of the cases at an index of 0.493, and is close to the cut-off value of 0.5 (UNDP 2011). The percentage of women in the labor force in Belize is a small majority at 51% (Bank 2010). As mentioned in the research design, the World Values Survey did not interview citizens in Belize in the 2005-2008 wave of interviews. Since there is not as much information on the patriarchal variable for Belize, my conclusion for this variable can only be considered moderate, and not strong in either direction.

Government Financial Investment Variable

Compared to other countries, the Belizean government has made significant investments in education. The government of Belize spends 18.7% of its total government expenditure on education, which is within 2% of the international benchmark of 20% (UNESCO 2009). This figure translates into 6.1% of GDP, the highest percentage of GDP spent on education across all four of these cases and is right on target with the international benchmark of 6% (UNESCO 2009). In addition, the Belizean government's per-student expenditure as a percent of GDP per capita is also the highest of all the cases, at 20% (Bank 2010). All of these variables culminate into a high level of governmental financial investment in Belize.

Family Variable

As mentioned in the literature review, family variables can have a negative impact on the decision to send girls to school. The literacy rate of adult females in Belize is a low 70%, a difference of 18% from the cut-off value of 88% (UNICEF 2005-2010). This is the lowest rate of the four countries, and negatively affects the educational gender gap. The adjusted fertility rate of women in Belize is a moderate 3.135 children per woman, just higher than the cut-off value of three children (Bank 2010). The adolescent fertility rate of Belizean girls aged 15-19 is 76 births per 1000, 25 births less than Peru (Bank 2010). After weighing these proxy variables for family influence, I conclude that family factors have a negative influence on the educational gender gap.

Structural Variable

The structural variable in Belize has a low impact on the educational gender gap. Belize has the lowest indigenous population of any country in this study, at only 10% of the population, a 20% difference when compared to the cut-off value of 30% (International 2005). However, Belize has the second highest rural population in the study at 47%, which is 18% higher than Peru (Bank 2010). The headcount ratio of rural people in poverty is 44%, indicating that poor people living in the rural areas are the minority (Bank 2010). The total percentage of the population that lives below the poverty line is 43%, a low figure compared to the other cases (CIA 2010). Overall, the structural variable has a low impact on the educational gender gap.

Case Study: Guatemala

Guatemala, a country that is still reeling from a brutal civil war that lasted 36 years, is struggling to educate its children equally. The educational gender gap in Guatemala is present in every proxy variable. The net attendance ratio of Guatemalan males is 95.7% while the net attendance ratio for females is

91.3% (UNICEF 2005-2010). The gap in youth literacy rate is 89% for males and 84% for females, a gap of 5% (UNICEF 2005-2010). Primary school completion rate has the largest gender gap, with 81% of females and 87% of males completing primary school, a gap of 6% (Bank 2010). The smallest gap is in the persistence to fifth grade, in which 70% of females and 71% of males continue on to fifth grade (Bank 2010). The percentage of girls that are out of school is 5%, which is lower than Belize, at 9%, but is still higher than Peru and Mexico (UNESCO 2008). Compared with a cut-off difference of 3%, all of these variables can be considered to have a large difference in values. Due to the extent of the gaps in all of the proxy variables, I contend that there is a large educational gender gap in Guatemala.

Patriarchy Variable

Not only does Guatemala have the largest educational gender gap, but Guatemalan society is also highly patriarchal. The gender inequality index in Guatemala is the highest of all four of the cases in this study, at an index of 0.542, considerably higher than the cut-off value of 0.5 (UNDP 2011). The labor force participation rate is 42.5%, which is the lowest of all the cases in this study, a staggering 27.5% below the rate of Belize (Bank 2010).

The World Values Survey exhibits further the extent of gender inequality in Guatemala. It was a bit ambiguous as to whether or not Guatemalans approved the question of whether the respondent approves of a woman having a child outside of a marriage, as 48.2% approved and 44.3% disapproved (Survey 2004). A majority agreed with that statement that it is just as satisfying being a housewife as having a career (Survey 2004). Additionally, a majority of respondents disagreed with the statements "in general, men are better political leaders than women" as well as "in general, men are better business executives than women" which indicates that Guatemalan society views men and women as having equal leadership potential (Survey 2004). Finally, a large majority disagreed or strongly disagreed with the statement that "a university education is more important for men than for women (Survey 2004). Putting all of these proxy variables together, I contend that the patriarchy variable in Guatemala is at a moderately high level.

Government Financial Investment Variable

Compared to other countries in this study, the Guatemalan government's financial investment in education is quite low. The total amount the Guatemalan government spends on education, as a percentage of the total federal budget, is just 13.02%, 6.8% off the international benchmark of 20% (UNESCO 2009). This figure translates into just 3.2% of GDP, 2.8% off where translated international benchmark for GDP (UNESCO 2009). The percentage of GDP per capita that is allocated to per-student expenditure in Guatemala is 10%, half the per-student expenditure spent in Belize (Bank 2010). After analyzing all of these proxy variables, I have concluded that Guatemala has a low level of government financial investment in education.

Family Variable

The family variables in Guatemala have had negative effects on the educational gender gap. The adult female literacy rate, which indicates the level of education the mother receives, is a moderate 87% in Guatemala, close to the cut-off value of 88% (UNICEF 2005-2010). The adjusted national fertility rate is the highest of all the cases in this study, at 4.875 children per woman, much higher than the cut-off value of three children (Bank 2010). The adolescent fertility rate of girls aged 15-19 is the highest of all four cases as well, at 105 per 1000 births (Bank 2010). Considering that all of these values are quite high compared to the other cases in this study, I argue that the family variable in Guatemala has a negative impact on the educational gender gap.

Structural Variable

Structural factors in Guatemalan society have a significant impact on the educational gender gap. Guatemala has the highest percentage of indigenous peoples of all the cases at 55% of the population, 25% higher than the cut-off value of 30%. The percent of the population that lives in a rural setting is over half the population, at 51%. Of those who live in a rural area, the headcount ratio that lives in poverty is 71%, the largest of all four cases. The overall poverty rate in Guatemala is also the highest, at 56.2% of the population, indicating more than half the population lives in poverty. Taking all of these proxy variables into account, I conclude that the structural variable has a large influence on the educational gender gap in Guatemala.

Data Analysis

Mill's Indirect Method of Difference

The analysis that follows uses Mill's Indirect Method of Difference to analyze which factor is the most influential cause in the educational gender gap. This methodology uses a paired comparison of cases that have similar outcomes to see which independent variables are the most influential on the educational gender gap. The countries have been paired by size of the educational gender gaps, where both Mexico and Peru have minimally sized educational gender gaps while Guatemala and Belize both have sizeable educational gender gaps. By comparing the influence of the independent variables in this manner, we can more easily indentify which variable has a direct influence on the size of the educational gender gap.

Patriarchy Variable Across Cases

In both Mexico and Peru, countries in which the educational gender gap is closed, patriarchy was at a moderate level. In contrast, both Guatemala and Belize, countries in which the educational gender gap persists, have high levels of patriarchy. Given that the two country clusters have the same level of patriarchy between cases, Mill's Indirect Method of Difference allows me to conclude that patriarchy is a significant variable, because the cases covariate together.

Government Financial Investment Across Cases

The level of governmental financial investment in Mexico is high, while in Peru it is quite low. In Belize, the government invests more in education that any of the other cases while Guatemala invests the smallest amount of all the cases. If these variables were to be significant, then both Guatemala and Belize should have low levels of governmental financial investment and both Peru and Mexico would have high levels. Since this is not what seems to have happened with the data, I conclude that governmental financial investment is not a significant indicator of the size of the educational gender gap.

Family Variables Across the Cases

In the cases of Mexico and Belize, both countries have strong, positive family variables. On the other hand, Guatemala and Belize both have strong, negative family influence variables. It is clear that the countries with closed gender gaps have positive family variables and the countries with persistent educational gender gaps have negative family variables. Using Mill's Indirect Method of Difference, I conclude that family variables have a significant impact on the educational gender gap.

Structural Variables Across the Cases

The structural variables in both Mexico and Peru have moderate effects on the educational gender gap. While this could come to a significant conclusion, this is not the case in the other country cluster. Guatemala has a high structural variable, but Belize has a low structural variable. Due to this difference, I cannot conclude that this variable has an effect on the educational gender gap. Therefore, I conclude that

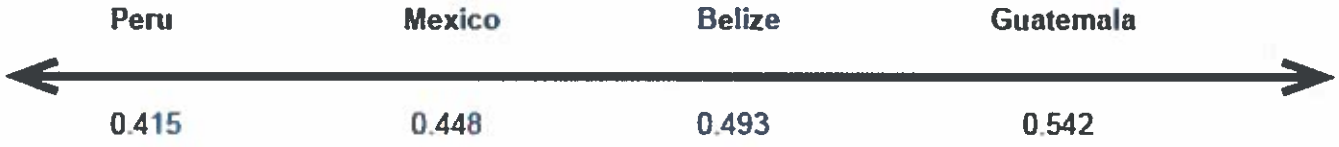
structural variables are insignificant variables.

Figure 1: Mill's Indirect Method of Difference Data Visualization

The above visualization illustrates how Mill's Indirect Method of Difference concludes which variables are significant and which variables are insignificant.

Analysis of the Hypotheses

After analyzing the case studies and using Mill's Indirect Method of Difference to find the most significant causational variables, I analyzed my findings in the context of the hypotheses outlined in my research design.



Hypothesis 1: As the Gender Inequality Index increases, the gender gap increases:

The ends of either side of the spectrum indicate that when the Gender Inequality Index increases, the size of the gender gap also increases. Therefore, this hypothesis failed to be rejected and I can conclude that this covariation exists and gender inequality is a significant variable.

Hypothesis 2: As governmental financial investment increases, gender gap decreases

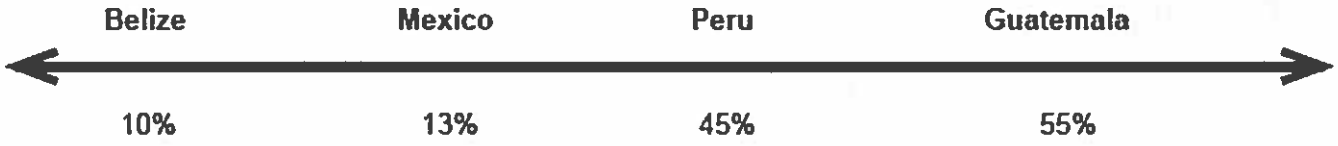
If this hypothesis were to be true, Belize should have had a low level of government financial investment and Peru would have a high level of investment. This is not the case. Therefore, the governmental financial investment variable has been rejected, and I conclude that this covariation does not exist and the variable is insignificant in causing the educational gender gap.

Hypothesis 3: As adjusted fertility rate increases, gender gap increases

As the adjusted fertility rate increases across the cases, there is an exact correlation with the size of the educational gender gap. Therefore, I have failed to reject this hypothesis and conclude that this covariation does exist and fertility rate is a significant variable.

Hypothesis 4: As adult female literacy rate increases, gender gap decreases

As is evident in the figure above, as the adult female literacy rate increases, the gender gap decreases. When moving along the spectrum, the highest literacy rate corresponds to a small educational gender gap and a low literacy rate corresponds to the largest educational gender gap. Therefore, I fail to reject this hypothesis and conclude that covariation does exist and adult female literacy rate is a significant variable.



Hypothesis 5: As the indigenous population increases across cases, the gender gap increases

If this hypothesis were to be true, Peru should have a low indigenous population and Belize should have a high indigenous population. However, this is not the case. Therefore, we reject the hypothesis and conclude that covariation does not exist and that indigenous population is not a significant indicator.

Results

By using Mill's Indirect Method of Difference, I discovered which variables were significant and which were insignificant in causing the educational gender gap. The first variable I found to be significant is patriarchal society structure. This result indicates that the more patriarchal the society, the larger the educational gender gap. The second variable I found to be significant is family factors. High education level of the mother leads to a smaller family size and the family is therefore more likely to send their daughters to school.

In concluding which variables were significant, I was able to discover which variables were insignificant. I found that governmental financial investment in education did not have a significant effect on the final outcome of the educational gender gap size. This indicates that, even though a country may have a large percentage of their budget designated towards education, this does not necessarily translate into a smaller educational gender gap. In addition, I found the structural variable to be insignificant in causing the educational gender gap. This result implies that factors like presence of a large indigenous population does not translate into a large educational gender gap.

Conclusion

As a result of this study, I found patriarchal societal structure and family factors have the largest causational effects on the size of the educational gender gap. The data showed increases in adult female literacy rate, and decreases in the Gender Inequality index and adjusted fertility rate, lead to a decrease in the size of the educational gender gap. In addition, I found governmental financial investment in education and structural factors do not have a strong causational effect on the size of the educational

gender gap. In the case of these two variables, the data did not covariate together, which indicates that the variables are not significant in effecting the size of the educational gender gap. These results surprised me, because they directly contradicted my hypotheses and assumptions.

The most surprising results, in particular, were that the insignificant variables had many policy implications. First, the data showed the governmental financial investment variable was insignificant, which is contrary to the consensus of the international development community. As discussed in the introduction, for years international conferences on education have concluded that the best way to combat the educational gender gap is through governmental financial investment in the education sector. The findings of this study directly contradict this conclusion, and argue that more government financial investment in education does not lead to a reduced educational gender gap. This conclusion indicates that the way the international community intends to fix the gender gap would do little to actually bring about educational equality.

While structural factors, such as percentage of rural and indigenous populations, did not have a significant effect on the educational gender gap overall, these proxy variables have particular relevance in Guatemala. In Guatemala, 1 in 5 indigenous girls do not attend school (Foundation 2011). Since this figure is so high in Guatemala, I was surprised to see that this variable was not significant across the four cases. In addition, the literature review extensively discussed the many barriers that indigenous women face as well as the impact of lack of access to schools for those in rural populations, but these variables did not seem significant across cases.

A major flaw in my research was the inclusion of the World Values Survey data and the missing values for Belize. At the time this paper was written, the 2010-2012 wave had not been published, and therefore the results from that wave of interviews could not have been used. In addition to missing values, the conclusions made based on the data are subjective and many assumptions were made in including this in the research. In some cases the percentages were so close it was difficult to gauge the general consensus of the country.

From a statistical standpoint, the idea of proving causation of a phenomenon with such little data is troubling, and would argue the conclusions made here are weak. A statistician would argue true causation can only be found in a multiple linear regression model of aggregated world data, in order to see which of the regression coefficients is the largest and which has the most significant correlation. For the purpose of this study, the sample size was too small and dependent variable was inherently categorical, which does not satisfy the normality assumptions necessary for using a regression model.

Future research should use the suggested multiple linear regression model to find the exact causal mechanisms of size of the educational gender gap. Additionally, future research should investigate how indigenous girls are marginalized from the educational system, which further perpetuates the educational gender gap. A theory that could be focused on in the future is the possible impact of teacher quality on whether girls attend school. Finally, future research could focus on how education sector-specific donor aid either reduces or perpetuates the educational gender gap.

Going forward, the goal of governments should be to reduce patriarchy and make family factors have a more positive influence. Governments could implement such projects by starting a grassroots movement to reduce patriarchy and increasing the adult female literacy rate through adult education programs. Finally, although I found the structural variable to be insignificant across these four cases, governments should work to reduce both institutional and societal discrimination against indigenous women to help reduce the educational gender gap. Overall, governments and international organizations should reduce the focus on increasing governmental financial investment as the answer to closing the educational gender gap and begin programs to increase the societal value of girl's education.

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Appendix

Appendix: Data Tables