FIRING SILVER BULLETS WITH CAUTION: DOES MEXICO’S PROGRESA IMPACT PARENTAL DEMAND FOR EDUCATION EQUALLY AMONG INDIGENOUS AND NON-INDIGENOUS POPULATIONS?

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FIRING SILVER BULLETS WITH CAUTION: DOES MEXICO’S PROGRESA IMPACT PARENTAL DEMAND FOR EDUCATION EQUALLY AMONG INDIGENOUS AND NON-INDIGENOUS POPULATIONS?

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ABSTRACT

While there is broad consensus that education reduces poverty, it is not clear that poverty alleviation programs that tackle poverty through education are successfully and equitably reducing poverty among their poor. Mexico’s Progresa conditional cash transfer (CCT) program is one such program that tries to tackle the intergenerational transmission of poverty by providing incentives for parents to send their children to school. The literature shows that indigenous populations tend to be more marginalized, poorer, less educated, have poorer health and be more likely to participate in child labor. Because of persistent gaps between indigenous and non-indigenous populations in Mexico, it was hypothesized that indigenous parents in Progresa would demand less education for their children. Using the Encuesta de Características Socioeconómicas de los Hogares (ENCEL) 1998, OLS regressions reaffirm the benefit of the program in stimulating demand for education overall, but suggest that indigenous parents in
*Progresa* demand less education. The model also showed that indigenous populations demand more education outside of *Progresa*, undermining cultural arguments for poor educational outcomes in indigenous communities, but suggesting that something about *Progresa* is not well-suited for the particular needs of indigenous parents as they attempt to prevent their children from inheriting generations-old poverty. From these results, policy makers are advised to focus on improving the quality of the education that the students *Progresa* brought into schools receive, assuring access to schools for Mexico’s most marginalized families, and providing equality of opportunity to those who would escape poverty and benefit from broader economic growth, as these factors are likely behind the lower demand for education among Mexico’s indigenous parents in the program.
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Ultimately, this thesis is for those who have suffered from exclusion and poverty, believe in education and are desperately fighting to end the transmission of poverty in this generation. May we find a way to help those like Mexico’s indigenous populations, be they in rural Puebla, Africa, or even the Developed World, to realize their dreams and live lives in which all their hard work and struggles pay off.
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Chapter 1. Introduction

A poverty-alleviation program is only effective if it interrupts the intergenerational transmission of poverty that traps society’s poorest, most marginalized groups. Because education provides opportunities for greater social mobility, reduces child labor, and builds human capital, it is considered one of the most sustainable means of breaking the transmission of poverty from parent to child. This increased human capital on an individual level provides greater opportunities to perform formal-sector, highly skilled labor and to make better decisions for the good of oneself and one's family. At the societal level, increased human capital develops an increasingly sophisticated and internationally competitive labor force. In this way, programs that aim to reduce poverty through education do so by giving individuals the skills they need to increase their labor market returns and by increasing a country's ability partake in macroeconomic growth that gives opportunities to its citizens.

To combat its severe poverty, particularly in rural areas, Mexico designed a conditional cash transfer (CCT) that would attempt to fight poverty by incentivizing demand for education. This CCT, called Progresa (now Oportunidades), is premised in part on the idea that Mexico's poor have too many opportunity costs to afford to keep their children in school. Poor parents may value the immediate returns from child labor more than the future gains from their child’s education, thus demanding less education
for their children. These kinds of ‘negative coping mechanisms’ allow the poor to continue eking out a living in the short-term, but prevent them—and their children—from escaping poverty in the longer-term. This is one of the reasons why poverty is transmitted across generations, the problem that Mexico's Progresa was designed to address.

The theory behind Progresa seems to—on aggregate—translate well to reality. The program’s cash transfers, conditioned on school attendance, shows success in reducing child labor, higher school attendance and reducing urban-rural poverty disparities. Poverty reduction is connected to improved educational outcomes, and Progresa reduced the number of poor by ten percent and the depth of poverty by 30 percent (Skoufias 2001). Progresa also increased primary school enrolment by 1.04 percent for boys and 1.45 percent for girls and secondary school enrolment by about four percent for boys and eight percent for girls (Schultz 2000). Poor, rural 9th graders increased schooling by .66 years, or 10 percent (Skoufias 2000, September). Overall results in poverty reduction and educational attainment seem promising.

The program assumes that all segments of the population will benefit equally from the program as designed, and by extension, demand low education for the same reasons—reasons that can be resolved by the Progresa subsidy. Yet, studies have shown that Mexico's poorest group, the indigenous, still suffers from persistent poverty over 10 years after the program was implemented. Thus, Progresa's successes and theoretical mechanisms may deserve another look to evaluate their impact on this group in particular.
Across Latin America, indigenous peoples comprise 10 percent of the region’s population and are the region’s most disadvantaged group in terms of severity and depth of poverty (World Bank 2005, May 18). In Mexico, the income gap widened by 10 to 12 percent between indigenous and non-indigenous areas from 1989 to 2002. After 1998, poverty levels declined for the non-indigenous, while they remained stagnant in indigenous areas. As a result, over two-thirds of Mexico’s indigenous population lived on $2 or less per day in 2002, compared to about 11.2 percent of the non-indigenous. This is due in part to indigenous populations participating in the Mexican workforce at a lower rate and receiving less pay for their work. While greater years of schooling is a highly significant predictor of earnings overall, “regardless of education, work experience, hours worked, employment category, sector of residence, marital status or union membership, workers in indigenous areas are paid less than those in non-indigenous areas” (Rodriguez 2006). While education can be a pathway out of poverty for Mexico’s indigenous populations, discrimination is still a barrier impeding indigenous people’s success.

Has the program that became the new silver bullet in development really improved the lot of Mexico’s poorest groups equally? While Progresa is lauded for its successes, the incidence of poverty among indigenous municipalities increased from being 3.7 times higher than non-indigenous groups in 1992 to 4.5 times higher in 2002 (World Bank 2005, May 18). While 1994 to 2004 was dubbed the Decade of Indigenous Peoples, very little poverty reduction occurred among indigenous populations during the
decade, the indigenous poverty gap deepened, and indigenous people continued to have fewer years of education and less access to basic health services (Hall and Patrinos 2005).

This widening disparity in depth of poverty between Mexico's indigenous and non-indigenous poor shows that Progresa's general successes may not translate to equally improved outcomes for all. This study aims to separate the effect of Progresa to determine if indigenous populations get the same benefits from this widely acclaimed, focusing on parental demand for education. Specifically, this evaluation of Progresa seeks to determine whether the CCT impacts parental demand for education in the same way in indigenous and non-indigenous populations. Before proceeding with such an evaluation, however, it is critical to provide an understanding of how Progresa works.

**Mexico’s Progresa-Oportunidades CCT**

When Mexico found itself in the midst of an economic crisis with myriad disconnected poverty programs in the mid-1990s, then President Ernesto Zedillo and Deputy Minister of Finance Santiago Levy recognized the need for a poverty reduction strategy that broke the cycle of intergenerational poverty. The program would need to invest in Mexico’s human capital development to bring about long-term economic growth. It would also need to prove its effectiveness to justify broad, costly reforms in a cut-throat, short-term political arena. The resulting strategy included a cash transfer conditioned on health, education and nutritional activities called Progresa that was
designed to provide the capital and incentives to poor families to invest in their future in spite of short-term financial hardship.

*Progresa* gives conditional benefits to poor families in three areas: education, health, and nutrition. Mothers of children in grades three to nine in poor households are given a cash transfer every two months if their children remain enrolled with at least 85 percent attendance. Mothers are also given cash transfers for food purchase, nutritional supplements and health education in exchange for mandatory health care visits to public clinics. These health interventions are tied to children under age five, who tend to be most vulnerable and could be impacted for life if they fail to receive treatment for even mild health problems. Overall, these transfers represented about 20 percent of a poor household's income, which was large enough to incentivize the targeted behavior, but small enough to mitigate dependence. Additionally, the government required recipients to give up participation in other anti-poverty programs to avoid inefficient duplication. By 1999, *Progresa* used about 20 percent of Mexico’s poverty alleviation budget, costing about $777 million. The program expanded from 140,544 households in August 1997 to about 2.6 million in early 2000 (Skoufias 2005).

The program was unrolled with a randomized experimental design in rural Mexican villages that met poverty preconditions in 1997. *Progresa* has since been credited with a monumental reduction in poverty and child labor, improvement in health and nutrition outcomes, and increase in school enrollment and attendance. After a three
year pilot phase and the transition to President Vicente Fox in 2001, *Progresa* was renamed *Oportunidades* and expanded to cover 5 million families in Mexico. The success of *Progresa* has inspired comparable programs worldwide in both developing and developed contexts including El Salvador, Brazil, Indonesia, and New York City to name a few (City of New York 2007, Goldstein 2009, Schady and Fitzbein 2009).

According to its principal architect Santiago Levy, the motivation behind *Progresa*, the world’s first large-scale CCT program, was “to enhance the human capital of those living in extreme poverty” (Levy 2006). This motivation is interesting and will be important to understand in evaluating the program’s effectiveness, as this poverty-alleviation program was not designed merely as a form of welfare.

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The minimal requirement of school attendance under *Progresa* is necessary, but seems hardly sufficient to produce the kind of long-term competencies needed to bring marginalized groups out of poverty. The need for more than mere attendance is seen in Mexico’s record of having one of the lowest educational attainment scores in the OECD according to international PISA test scores (Hugonnier 2009). Furthermore, there is significant evidence that education components of CCTs are reaching the poor, but are largely targeting those who would already attend school (Reimers 2006). It is thus not clear is that *Progresa* is building the necessary demand for education in the poorest households—especially particularly disadvantaged indigenous households—that need to
escape poverty most desperately and have been perennially excluded from national economic growth.

Because using short-term data makes assessing long-term results challenging, this study seeks to measure parental demand as a way of understanding Progresa’s long-term effects. Parental estimations of the amount of education they demand for their children will likely frame their future valuation of education, arguably serving as a more robust predictor of future child attainment than current attainment levels. One can imagine that these perceptions, and in turn demand, will vary based on cultural factors that differ drastically between marginalized indigenous and more socially integrated economic agents. Furthermore, one would expect that changes in parental perception serve as a good indicator of movement in long-term beliefs, which will give a clearer indication of the real effect of Progresa on the value of and demand for education. This paper looks at the roots of educational demand—parents’ perceptions of education demanded for their children—to assess whether Progresa is building the necessary demand for education in marginalized indigenous households as effectively as other households to break the long-term, intergenerational poverty that particularly affects this group.

This study seeks to determine whether Progresa affects demand for education equally among indigenous and non-indigenous populations. Chapter Two evaluates key literature connecting education to poverty reduction, analyzing the effectiveness of CCTs, and looking at the ways in which indigenous populations tend to be disadvantaged. The
chapter concludes by looking at the emerging use of perceptions data in econometric analyses, which contributes greatly to the model used in Chapter Four. Chapter Three uses the literature to develop conceptual framework for projecting parental demand for their children’s education and posits that indigenous parents receiving Progresa will demand less education than non-indigenous recipients. Chapter Four discusses the characteristics of the National Household Survey that accompanied the Progresa CCT (ENCEL 1997-2000) develops four OLS regressions that will be used in Chapter Five to show that the effect of the CCT on parental valuations of education differs between indigenous and non-indigenous Mexican households. Chapter Six concludes with an analysis of possible steps to improve Progresa to specifically target educational outcomes that promote a more equitable resulting reduction of poverty, development of human capital and participation in macroeconomic growth.
Chapter 2. Literature Review

Poverty and Education

Human capital, which is built through greater access to and quality in education, is widely believed to contribute to improved economic outcomes and lower levels of poverty (Psacharopoulos et al 1994, DeGeynt 1996). A historical perspective of the benefits of education demonstrates that the spread of education provision worldwide after 1850 contributed to the massive economic growth seen starting in the industrial revolution (Stevens and Weale 2003, Easterlin 1981). The mechanisms by which improved education affects poverty include raising wages, improving health decisions and outcomes and building societal capital stocks (Psacharopoulos and Mattson 1996, Mincer 1974, Psacharopoulos and Woodhall 1985). In fact, Psacharopoulos estimates that human capital accounts for over half of any given country’s capital stocks—80 percent in most developed countries (Psacharopoulos and Mattson 1998, Becker 1993). Education affects poverty in two ways: it endows individuals with the necessary human capital to participate in and benefit from macroeconomic growth, and it builds the necessary human capital stocks at the aggregate societal level needed to fuel macroeconomic growth, which in turn provides for general well-being and reduced poverty.

Nevertheless, many developing countries neglect education as part of their development and poverty-reduction strategies (Tilak 2005). While linkages between
higher education and poverty are contested, at the primary and secondary levels in which Progresa seeks to boost educational demand there is more consensus that education promotes broader growth and reduces poverty.\(^1\) For this reason Psacharopoulos and Woodhall note that developing countries will get the most benefits when investments in education are targeted to primary schooling, higher quality of instruction, and “cost-recovery at the higher levels of education” (1985).

**Inequality and Indigenous Peoples**

Education does not just reduce poverty levels and promote economic growth; it also reduces societal inequality (Psacharopoulos et al. 1997). When talking about reducing inequality, it is imperative that educational benefits do not miss the marginalized populations that tend to be ignored and mired in intergenerational poverty. In Latin America, indigenous populations tend to suffer significantly worse socioeconomic conditions than the population at large, with labor market discrimination, high poverty rates and limited access to public education and health (Psacharopoulos 1995, Davis 1999, Hall et. al 2006). In 2000, Mexican indigenous children aged seven to fourteen had eight percent fewer years of education than the population at large. There were also higher drop-out rates among indigenous populations (Ramirez 2006). Hall and Patrinos note that such figures represent a reduction in the disparity in educational

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\(^1\) A strand in the literature that questions the linkages between education and macroeconomic growth and poverty, but note that this strand tends to focus more on higher education at the expense of technical and vocational training (Wolf 2002).
attainment between indigenous and non-indigenous groups over time, but did not translate into a reduced disparity in terms of poverty (2006). While the literature shows that improved educational attainment should reduce poverty and inequality, it is alarming that Mexico’s indigenous populations are not seeing these benefits even as the achievement gap between them and non-indigenous counterparts narrows.

Aside from a moral and economic concern about the most vulnerable, the 1994 Zapatista uprising in Chiapas, Mexico, demonstrates the political and public policy importance of reducing inequality. Hall et. al note that the rebellion was the result of a feeling of an increasingly global economy that was persistently ignorant to the plight of indigenous economies and cultures (2006). Efforts to reduce poverty via improved educational outcomes may, in fact, require vastly different character to reach these marginalized populations (Psacharopoulos 1995). One must consider such cultural distinctiveness when evaluating CCTs like Progresa to determine if the intention of overcoming entrenched poverty through increased school attendance is indeed reaching the all of Mexico’s poor.

**Conditional Cash Transfers**

Conditional Cash Transfers (CCTs) involve providing an income transfer to poor households—often to women in the households—on the condition that the household comply with a variety of conditions, often including school attendance for children, basic
nutrition or regular health check-ups (Reimers 2006, Fiszbein and Schady 2009). CCTs have been heralded as a more politically feasible and potentially holistic means of eradicating poverty that specifically targets household behaviors considered essential to improving livelihoods in a sustainable manner.

CCTs attack poverty by alleviating short-term money shortages that may reduce consumption of vital contributions to personal development and by stimulating demand for socially optimal behaviors that contribute to the construction of social capital and break the cycle of intergenerational poverty (Fields et. al 2007, Reimers 2006). While it is now widely believed that a country’s economic growth is one of the best means of reducing poverty (Fiszbein and Schady 2009), it is believed that countries that have institutions designed to promote economic freedom tend to grow more rapidly, so well-designed anti-poverty measures can feed into a virtuous cycle of growth (Gwartney, Holcombe, and Lawson 2004).

Unfortunately, while CCT programs offer clear benefits in terms of improved short-term health and education outcomes and in reducing uncertainty related to economic instability, it is not clear that their benefit on education, the basis of valuable human capital, bears out in the long run (Dearden et al 2005). The rationale goes that CCTs encourage families to invest in children’s education such that they will break the intergenerational poverty cycle. This in turn has led to the use of CCTs, which often promote mere enrolment as the means of improving education, as a substantial chunk of
education spending (Reimers 2006). Reimers believes that CCTs serve as a subterfuge, a politically easy cash transfer that gets children into school but does little to affect the quality of education provided once they are there (ibid).

De Janvry and Sadoulet note that CCTs tend to be premised on the idea that “the supply of schools is sufficiently adequate and that the main barriers to schooling come from income constraints, direct costs, opportunity costs, as well as preferences” (2004). Morley and Coady similarly discuss the problems of quality and access, which they note are not reflected in most CCT programs. Even in the rare case that a quality school is accessible, there are lower utilization rates among the poor (2003). Studies by UNESCO and the OECD find that schools available to marginalized populations—like Mexico’s indigenous populations—are of low quality because they lack resources, are largely rural and house children from low-income households (2003). Children in these communities “often attend the worst schools, are served by the least educated teachers, have the least amount of didactic resources, and are more likely to arrive at school hungry and ill” (Hall & Patrinos, 2005).

**Perceptions Theory**

The emerging theory of the role of perceptions on action demonstrates the importance of deep-seated beliefs and previous knowledge in determining future action. This suggests that understanding parents’ beliefs about their children’s education will be
a good predictor of how they will educate their children. If *Progresa* is designed to break the circle of poverty by creating long-term social capital, then understanding how *Progresa* shapes the beliefs of parents regarding the amount and value of education they will demand for their children may provide us with a more complete understanding of the long-term benefits of *Progresa* on construction of social capital through increased demand for and appreciation of education.

Harold I. Brown looks at how science has been at a crossroads where classical empiricism—premised upon the importance of observation to understanding the world around us—and its application to science through the scientific method and falsifiable experimentation are proving incomplete in developing a complete understanding of causal relationships. Brown, following an emerging body of scholarship on the role of personal perceptions and theories on shaping one’s understanding of and action in the world (Hanson 1958, Polanyi 1958, Toulmin 1961, Kuhn 1962), demonstrates that direct observation is only part of learning, noting the importance of understanding the knowledge prompting observed behaviors (Brown 1977). Brown shows that previous knowledge and perceptions limit one’s ability to appreciate and act on things in the world around us, including the value of more education.

This theoretical appreciation of the importance of perceptions has gained importance in economics and political science. In studies of the economics of happiness, an increasing awareness of the inadequacy of proxy measures like income lead to an
increased use of perception-based measures to evaluate individual and national happiness or quality of life (Frey and Stutzer 2000, Diener et. al 1999, Graham and Lora 2009). The value of these contributions to data analysis were recognized in 2002 when Daniel Kahneman received the Nobel Prize in Economics for “having integrated insights from psychological research into economic science” (Coyne and Boettke). In political science, indices designed to track the quality of governance like the Freedom House *Freedom in the World Report* on the level of democracy in a given country and the comparable *Worldwide Governance Indicators* published by the World Bank annually use perceptions-based data (Freedom House Methodology 2008, World Bank Governance Matters 2009). Perceptions are at the heart of these and many other key indicators used to formulate public policy, and efforts to codify subjective data have created a rich new source for robust analyses in the social sciences.

This idea is borne out by the literature on the effect of parents’ perceptions and how they serve as a determinant for how much they value education for their children, and the amount of education they will subsequently demand for their child. One study finds that parental involvement is considered the most important influence on a student's progression through education (Mitrosilii and Saiti 2005). One can reasonably expect that their perceptions of the value of their children’s education would then have a strong impact on the amount actually demanded and in turn the amount of human capital benefits children accrue from programs designed to increase school attendance. The
mechanisms behind this relationship can be seen in the shift toward increased parental power in schools and the movement toward decentralization of school control (Munn 1998, Hoover-Dempsey and Sandler 1997).

With limitations in understanding how CCTs like Progresa affect the amount of education demanded and not just attendance of the most marginalized populations they endeavor to reach and recognizing the role of parents perceptions on children’s education, what follows attempts to understand whether the Progresa CCT has had a different impact on the demand for education among indigenous and non-indigenous populations in rural Mexico.
Chapter 3. Conceptual Framework

The literature is very clear on the disadvantages that Mexico’s indigenous populations face in relation to their non-indigenous counterparts: poorer health, less education and greater likelihood to engage in child labor. Less parental education, poorer health and child labor competing with school attendance would suggest that these populations will, because of the unfortunate socioeconomic conditions in which they find themselves, demand and value education less for their children. Additionally, the 1994 Zapatista uprising in Chiapas show that indigenous populations were historically disconnected from political and economic power in Mexico. One might also predict, then, that national programs like Mexico’s Progresa CCT exclude, perhaps unintentionally, those in indigenous populations that might most need its help. Considering these micro and macro-economic realities that Mexico’s indigenous populations face, one might posit that Mexico’s Progresa will have less of an effect on the amount of years of education that indigenous parents demand for their children than those in exclusively Spanish-speaking households.

Various factors impact parental perceptions of the value of education that may explain differences in indigenous and non-indigenous parents’ demand for their children’s education under Progresa. The following chart summarizes the key factors in
three categories—parental characteristics, household characteristics, and school characteristics—and identifies the predicted effect on parental demand for education:

Hypothesis: Given the disadvantages that indigenous populations face, it is predicted that Progresa will increase indigenous parents’ demand for education less than that of non-indigenous parents. It is worth exploring the mechanisms working behind this complex relationship by unpacking the rationale behind the anticipated effects of these factors to understand assumptions upon which any subsequent econometric model relies.

Parental Factors

Parental levels of education have been shown time and again to be a good predictor of a child’s education, with more educated parents demanding more education for their children (Boisser 2004). Parental motivation and school involvement should also
have a positive relationship with demand, though the causal direction of the relationship is not quite as clear. It might be that parental perceptions of the value of education motivate them to participate more in their children’s schooling. Conversely, increased participation might make them feel like stakeholders with an active role in their children’s education and thus increase their demand. Some combination of these two explanations is likely most accurate, and one can thus say that there is probably some effect of parental motivation and participation on demand. What is clear is that one would expect this relationship, regardless of the direction of the effect, to be positive.

Finally, more basic characteristics like age and gender of the parent are likely to have indeterminate effects on their perceptions of the value of education. One could imagine that an older parent that has more traditional values might perceive the value of the education of their daughter to be less valuable, so age could have a negative effect in this case. Conversely, one might think that an older parent has raised more children and may have noticed a difference in the prospects for their most educated children and values education more. In terms of gender, the literature points to women being more likely to value and invest in their children’s education (World Bank 2009).

Household Factors

Household factors can be divided into two categories: those that describe the individuals of the house and those that describe its location. In terms of factors describing individuals, the literature is pretty clear about the detrimental effects of being indigenous
on myriad social welfare outcomes. Not sharing the mainstream culture that sets educational curricula, having a distinct language (which is how indigenous is defined in Mexico and this study), occupying a lower socioeconomic status and living in more marginalized locations that prevent a direct connection between education and the job market or economic growth would all suggest that being indigenous might have a negative impact on the parent’s perceptions of the value of their children’s education. That said, with increasing attention to indigenous issues in Mexico since the Zapatista uprising, it could be that a leaf has turned in Mexico and indigenous populations are more motivated to catch up and share in broader growth, pushing them to demand more education. Historically, one would anticipate the negative relationship to dominate, though it would be exciting to discover that this is not the case as it would indicate that supply and not demand issues are leading to suboptimal educational outcomes for indigenous groups.

In terms of household location factors, one might expect that areas with higher levels of marginalization and poverty like Puebla would have lower parental perceptions of educational value. States with higher levels of development or more schools, however, are likely associated with higher parental assessments of the value of education. From these explanations, it is also clear why degree of marginalization might have a negative impact on parental perceptions, while school access would increase perceptions of the value of education. A labor market linked to education and mere access to social services
is likely to stimulate the demand that would boost parental valuations of their children’s education.

Economic factors can also be broken up into two broader categories: ability to invest in education and opportunity costs of education. In terms ability to invest, the amount of resources available in the household will likely shape perceptions of the relative need for education. One expects a positive relationship between wealth and educational demand, as households that can afford more are more able to afford education. One expects additional income from programs like Progresa to increase the value of education to parents as rational economic actors that value their child’s education more because it is now a source of income (incentives pay). In terms of opportunity costs, one might consider that a house that lacks basic food, health and nutrition is not in a place to value education as much because they have basic needs that remain unfilled (Maslow 1943). For this reason, one expects a positive relationship between filling basic health and nutrition needs and parental demand for their children’s education. If a family perceives a child to be best suited to work, they may value a child’s employment above his/her education, particularly in rural, agricultural areas where the whole family is expected to work. The value of child labor should thus be inversely correlated with the level of value they place on their child’s education.
School Factors

High quality schools are likely to attract demand. Thus, one might expect that quality teachers teaching quality lessons in a safe environment prompt greater parental demand for education. Similarly, lower class sizes may signal more individual attention or a more manageable environment that might lead parents to value the education of a child more than a child that is less likely to get personal attention in a class with more children enrolled. Regardless of the explanation, it seems likely that the relationship would be positive between quality and parental value of education. Additionally, for poorer families, schools that tend to be magnets for social programs may represent an important income supplement that increases the value of school.

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While other factors may motivate parental demand, these are the major factors that past studies of education outcomes and common sense suggest have the greatest impact. In crafting an econometric model, the quality of available data, availability of appropriate proxies for less concrete factors and consistency in survey administration will decidedly lead to a more reduced model that operationalizes as many of these theoretical factors impacting parental demand for children’s education as is quantitatively possible.
Chapter 4. Data and Methods

Describing the Data Set

To assure transparency in assessing the benefits associated with Progresa, the International Food Policy Research Institute conducted a 1997 baseline questionnaire and then biennial evaluation surveys from 1998 through 2000 for the same households. The Encuesta de Características Socioeconómicas de los Hogares (ENCEL) is a household survey that was conducted to measure the changes in behavior resulting from Progresa in five areas: education, food consumption, expenditures, health care, and ability of the woman to make household decisions (Secretaría de Desarrollo Social 1998). Two additional surveys were conducted in 2003 and 2007, though only some respondents were part of the original baseline survey.²

The survey used an experimental design, randomly choosing 506 of 6,396 rural localities with the requisites for program admission to participate in the evaluation from seven states: Guerrero, Hidalgo, Michoacán, Puebla, Querétaro, San Luis Potosí y Veracruz. Of the 506 localities, 320 served as “treatment” communities and 186 served as “control” communities with each locality having roughly a .6 probability of being placed in the treatment group. “Treatment” in this case refers to localities incorporated into the

² After 2000, the 186 control localities were admitted into the program, so to obtain middle-term results of the effectiveness of Oportunidades, a new control of 151 localities with similar characteristics to the original 186 was admitted with some controls involving multiple parameterization based on propensity scores.
program in 1998, while “control” refers to those incorporated two years later in 2000 (beyond the scope of this study and the ENCEL dataset). A total of 24,000 household surveys were conducted in the 506 localities. During this period, six visits were conducted (every six months) to gather information that would allow for the calculation of indicators of social development for each group to evaluate the short-term effects of the program (Secretaría de Desarrollo Social 2005, November).

**Analysis of Variables**

To operationalize the conceptual framework, variables that directly measure a theoretical factor affecting parental perceptions of the value of education or a justifiable proxy for such factors were drawn from the 1998 ENCEL datasets. What follows discusses the directly measured, proxy and omitted variables in the conceptual model to give shape and reason to the resulting econometric model.

**Dependent Variable**

The dependent variable used in this study is a variable that answers the question “to what level do you want your child to study in school?” The October 1998 survey asks the specific grade to which parents would like their child to study, and this interval-ratio answer provides a more specific and meaningful interpretation. This study will thus use the October 1998 data to evaluate parental demand one year after Progresa took effect. The inconsistency of perceptions-based questions across surveys ultimately prevented
this study from taking advantage of the rich potential to construct panel data from the three years of ENCEL survey data.\(^3\)

**Independent Variables**

Some of the factors identified in the conceptual framework are measured by variables in the ENCEL datasets. Among the parental factors, those directly measured include age (an interval-ratio variable, measured in years), gender (a binary variable that equals one if the parent is male and zero if the parent is female), level of education (an interval-ratio variable, measured in years) and involvement in school events and parent teach organizations (two binary variables that indicate whether or not the parent participated in school events or the parent teacher organization). Directly measured household factors include indigenous status (a binary variable that equals one if the household speaks an indigenous language), location (seven specific binary state variables), a marginalization index (an interval-ratio variable that measures degree of marginalization), whether the household received *Progresa* (a binary variable that equals one if the household received the CCT), and money spent on school supplies (an interval-ratio variable that measures the amount of pesos spent on school supplies). No school-related factors were directly measured on the survey.

\(^3\) Unfortunately, this question was asked in two different ways—parents could indicate the level to which they wanted their child to study in the earlier iteration and then parents could indicate the specific grade in the second iteration—and was only asked in 1998, which prevented using all six datasets to construct more robust panel data that would have eliminated concerns of omitted variable bias.
Many factors identified in the conceptual framework are approximated using proxy variables from the survey. Parental motivation, for the sake of this analysis, is assumed to be measured by parental participation in school events and involvement in parent teacher organizations. Number of children, while not directly measured, was constructed for each household by counting the number of children of school age in the household (interval-ratio).

Measuring household wealth is something that has drawn considerable attention in econometric analyses, and the benefits and drawbacks for potential measures were given careful consideration in this study. Household income seems to be a logical measure of household wealth, but it is quite complicated to construct given the diversity of sources of informal and formal income, remittances from abroad, credit and loans, welfare programs and scholarships, and the receipt of goods and services that are incredibly hard to measure.

Household expenditures are another means of measuring wealth because expenditures are necessarily monetized and thus measured consistently (even if a survey excludes certain expenditures, those that are measured are consistent). Furthermore, expenditures allow for savings and income smoothing that include borrowing or spending beyond a household’s income that may more accurately capture the “wealth” of a household for a given period (Hoddinott et al. 2000). As a result, an expenditures variable
summing the amount of pesos spent on food, health, transport, clothing, shelter and school supplies measures family wealth (interval ratio in pesos).

To measure the opportunity costs of child labor, this analysis relies heavily on questions asking parents the age at which it is appropriate for their child to begin working (interval ratio, measured in years). The amount of meals eaten in the household per day is used to gage proper nutrition (interval ratio). Only two school-related factors have rough proxies in the ENCEL dataset, questions asking parents to evaluate teacher’s preparedness and punctuality (binary variables activated if the parent is satisfied) and a question that measures if the parent feels that what is taught in school is important (a binary variable activated if the parent feels material covered is important).

Factors like school access and distance, the safety and quality of the school premises, class sizes and access to school meal programs were not measured in the ENCEL survey. Given that Progresa is conditioned on school attendance, one can safely assume that participating communities had some access to schools, though a more precise measure of access would likely shape parental demand for education. Variation resulting from the quality of premises and class sizes, while also informative, are assumed to be covered to some degree by questions about the quality of teachers and materials learned, though admittedly with some imprecision. Access to school meal programs would be a robust control variable, if Progresa recipients were not required to give up other welfare programs to receive the benefit of the CCT.
Descriptive Statistics

This analysis uses a dataset representing seven states with 61.5 percent of individuals receiving the Progresa CCT. Houses are not equally likely to come from each of the seven states, with one quarter of those surveyed coming from Veracruz and just five percent coming from the small state of Querétaro. Reflecting Progresa’s attention to the poor and marginalized, 31.6 percent of those surveyed are indigenous (19.8 percent indigenous and in Progresa), 64.6 percent are highly marginalized, and 59 percent are extremely poor. Those surveyed have an average age of 25.2 and about 50.3 percent are men. The average household has 3.71 children, spends 4,271 pesos ($348) on a biennial basis (43 pesos, or $3.54, on school supplies), eats about 2.5 meals per day, and has a parental education level of five years, though with a standard deviation of 4.11 years.

Parents demanded 7.27 years of education on average for their children with a wide standard deviation of 7.66 years. Similarly questions about the age at which parents believe their sons or daughters should start helping with work or working for money also allowed for interval-ratio interpretations. Parents felt boys and girls should start working for money on average at age 11.2 with a standard deviation of about 7.4 years. Parents felt boys should assist in work at age 7.7 with a standard deviation of about 5.5 years, while they felt girls should assist in work at a later age of 8.4 but with a much wider standard deviation of over ten years.
In terms of the perceptions data that will drive this analysis, one can see the limitations of the survey by comparing the perceptions-based questions that allowed for interval-ratio answers compared to those that prompted only a binary (yes or no) answer. When one turns to questions of parent’s perceptions of various qualities of their children’s teachers or of the parity of men and women in the home, because these questions were phrased as yes or no, there is little variation, with over 90 percent of people agreeing with the statement as posed with standard deviations between .17 to .3.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Education Demanded (Years)</td>
<td>125674</td>
<td>7.27</td>
<td>7.66</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Progresa</td>
<td>119410</td>
<td>0.615</td>
<td>0.487</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Indigenous</td>
<td>108530</td>
<td>0.316</td>
<td>0.465</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Indigenous*Progresa</td>
<td>103034</td>
<td>0.198</td>
<td>0.398</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Poor or Extreme Poor</td>
<td>119410</td>
<td>0.59</td>
<td>0.492</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Age (Years)</td>
<td>119410</td>
<td>25.2</td>
<td>20.3</td>
<td>0</td>
<td>99</td>
</tr>
<tr>
<td>Meals Eaten Per Day</td>
<td>22559</td>
<td>2.47</td>
<td>0.571</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Spending on School Supplies (Pesos)</td>
<td>22559</td>
<td>43.43</td>
<td>346.41</td>
<td>0</td>
<td>9999</td>
</tr>
<tr>
<td>Household Expenditures (pesos)</td>
<td>125674</td>
<td>4271.47</td>
<td>3547.35</td>
<td>0</td>
<td>25974</td>
</tr>
<tr>
<td>Parental Education Level</td>
<td>125265</td>
<td>5.04</td>
<td>4.11</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Number of Kids in Household</td>
<td>112818</td>
<td>3.71</td>
<td>1.93</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>State of Guerrero (binary)</td>
<td>125674</td>
<td>0.083</td>
<td>0.276</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>State of Hidalgo</td>
<td>125674</td>
<td>0.172</td>
<td>0.378</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>State of Michoacan</td>
<td>125674</td>
<td>0.1204</td>
<td>0.325</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>State of Puebla</td>
<td>125674</td>
<td>0.157</td>
<td>0.363</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>State of Queretaro</td>
<td>125674</td>
<td>0.058</td>
<td>0.234</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Specifying the Econometric Model

To determine whether Progresa impacts equally the demand of indigenous and non-indigenous parents for education, an OLS regression will be run to determine how the key factors—being in Progresa, being indigenous and being both indigenous and in
the CCT—affect demand for education. The model is then run three additional times controlling for different factors that might impact parental demand beyond participation in Progresa and one’s indigenous status. In this section I identify limitations on the population analyzed, specify an empirical model, and discuss potential limitations of the model. The following chapter presents the results from the four iterations of the model.

**Population Restrictions in the Econometric Model**

The ENCEL survey evolved to increase the body of knowledge surrounding the Progresa CCT. It also changed due to the constantly evolving nature of what is, at heart, a politically driven program that has continued to expand as is the tendency of popular welfare programs. Because this study uses parental perceptions to measure years of education demanded and several controls like the quality of teachers and beliefs about child labor, the data had to be restricted further to 1998, as this was the only year for which consistent data was collected for the dependent and control variables that were quintessential to operationalizing this study. While this decision eliminated the possibility of constructing panel data and running a fixed effects model to control for exogenous factors, it yields a snapshot of the factors shaping demand for education related to Progresa after the program’s first year.

The unit of analysis in this model is households participating in the randomized experiment—that is families that were randomly assigned to receive or not receive the
benefits of the CCT. Restrictions on the population participating in the program to
families with school-aged children (you cannot condition aid on going to school if the
child is not eligible to go to school) and restrictions on data collection to villages of over
20 households were decisions made by the independent evaluator, and these are thus
limitations of the data available. That said, for any family surveyed, no family is
excluded unless they are missing responses for a key variable, which does not appear to
affect most units across the four iterations of the model.

The Four Iterations of the Econometric OLS Model

For the effects of Progresa, being indigenous and being both indigenous and in
Progresa, the initial OLS econometric model is as follows:

$$Y_{ij} = \beta_0 + \beta_1 C_{ij} + \beta_2 (CCT)_{ij} + \beta_3 (CCT*Indig)_{ij} + \epsilon$$

where $Y_{ij}$ is the level of education parent $i$ demands for their children in household $j$ in
years, $C_{ij}$ is a binary variable representing participation of parent $i$ in household $j$ in
Progresa, Indig$_{ij}$ is a binary variable indicating whether or not parent $i$ in household $j$ is
indigenous, and (CCT*Indig)$_{ij}$ is an interaction term that measures the effect of parent $i$
in household $j$ being indigenous and getting the CCT.

The next three iterations build to a full model, which is as follows:

$$Y_{ij} = \beta_0 + \beta_1 C_{ij} + \beta_2 (CCT)_{ij} + \beta_3 (CCT*Indig)_{ij} + \alpha' + \gamma' + \delta' + \epsilon$$
in which $\alpha$ is a vector representing various household characteristics for parent i in household j that affect demand for education, $\gamma$ is a vector for quality of teachers and interactions that parent i in household j has with teachers, and $\delta$ is a vector for perceptions of parent i in household j of various forms of child labor. The following table summarizes the specific variables included in the four models:

<table>
<thead>
<tr>
<th>Model</th>
<th>Independent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Simple)</td>
<td>Progresa, Indigenous, Progresa*Indigenous</td>
</tr>
<tr>
<td>2 (Includes Household Controls)</td>
<td>Model 1 + poverty index + age + meals per day + spending on school supplies + household expenditures + parental education levels + number of kids in household + seven state indicators (Guerrero, Hidalgo, Michoacan, Puebla, Querétaro, San Luis Potosí, and Veracruz) + parent is illiterate + parent is in school + parent gender (male) + marginalization indicator</td>
</tr>
<tr>
<td>3 (Includes a single control for child labor and teacher characteristics)</td>
<td>Model 2 + age boy should work for money + age girl should work for money + parent believes teacher is prepared.</td>
</tr>
<tr>
<td>4 (Contains multiple child labor and teacher characteristic controls)</td>
<td>Model 3 + age at which boys should help with work + age at which girls should help with work + evaluations of whether teachers are patient, competent and timely + parental participation in PTO + whether parent has spoken with child's teacher.</td>
</tr>
</tbody>
</table>

**Limitations of the Model**

This study has worked to overcome three principle limitations: inconsistent data presented in limiting yes/no questions, the potential for bias emerging from omitted
factors that influence parental demand for education, and the presence of multicollinearity among variables measuring similar characteristics in Model 4.

The ENCEL survey offers data resulting from yes/no questions posed to heads of household about teacher quality and child labor. While this data was not designed explicitly to be a rich analytical tool for educational demand, it creates a unique opportunity to capture the effect of illusive factors like “teacher quality” and “parental involvement” on parental demand for education. Unfortunately, because parents’ perceptions were limited to a yes or no answer, we are denied the nuanced interpretations that interval ratio or ordinal responses offer. Additionally, because such questions were often improvised over time, the questions are not consistently posed to parents. This study, in an effort to make use of these perceptions, was limited to 1998, to assure that the questions were consistently asked and answered.

These unique perceptions-based data were used to control for underlying factors that affect parental demand for education. To address bias from omitted variables, efforts were made to control for a wide range of factors that are thought to affect parental views of the importance of education, including child labor, teacher quality, gender parity, location, household characteristics, and parental involvement in schooling. While omitted variable bias is always a concern, the statistical significance achieved on the key variables does not vary greatly as controls are added. This suggests that the significance levels of the key variables are plausible, though the these effects may be biased because
the effects of latent factors like parental love of learning or motivation may explain variation that is currently attributed to Progresa in the model. The comprehensive use of perceptions-based data on teacher quality, parental participation and views on child labor, however, mitigates concern over the impact of omitted variable bias.

To control for teacher quality and views on child labor, a variety of different questions about how the parent perceives the teacher and child labor were included in the full model (model 4). Because parental views of the teacher overall may shape how they answered each specific question about teacher characteristics or views on child labor generally may influence how they answer specific questions about instances of involving children in household tasks or labor, there is a concern that one related control may vary in tandem with other related controls, causing erratic and erroneous estimates of the effects of these collinear variables. To address this possible multicollinearity issue between comparable parental assessments of teacher quality or the age at which children can begin various types of work, model three limits measures of teacher quality to teacher preparedness and child labor to age child may begin working for money. There is very little difference in the coefficients, significance levels, and amount of variation explained in these two models, which suggests that multicollinearity did not affect the precision of the model. This is likely driven by the large amount of observations that allow for precise, efficient estimates, even when there is a potential for multicollinearity concerns.
Chapter 5. Results

Three key findings reaffirm the effectiveness of Progresa while demonstrating room for improvement vis-à-vis indigenous populations in Mexico: Progresa unequivocally increases demand for education on aggregate; indigenous populations demand more education than their non-indigenous counterparts; and yet, indigenous participants in Progresa tend to demand less education than non-indigenous participants. This section first looks at these three key findings and then goes into more detail about the impact of other factors on parental demand for education including household characteristics, location, child labor, teacher quality, and parental involvement.

Progresa, Indigenous Populations and Demand for Education

Every iteration of the model indicated a strong positive impact of Progresa on the level of education parents demanded for their children in 1998, with all models statistically significant at the .01 level. Controlling only for indigenous status and indigenous participation in Progresa, the simple model shows that on average, parents receiving the CCT demand about .75 more years of education than those not receiving the CCT. This very basic model, however, only accounted for about 0.21 percent of the variation in parental demand for education. Upon controlling for basic household characteristics, the model captured about 49.45 percent of variation in demand for education, and we can see that the effect of Progresa drops to an increase of about .54
years of education demanded. While the remaining three models included additional controls for the parity of women, child labor and teacher characteristics (and explain between 49.47 and 53 percent of variation in the dependent variable), one sees that the effect of *Progresa* participation is a highly statistically significant half-year increase in the amount of education that parents demand for their children.

Looking at the effect of being indigenous on parents’ demand for their children’s education, one can see that being indigenous has a positive and statistically significant effect on demand for education in all models. The magnitude and strength of the effect is exaggerated in the simple model, with indigenous parents demanding 0.29 years more schooling for their children than non-indigenous parents. As other controls are added, it would appear that indigenous parents still demand about one-fifth of a year more education for their children than non-indigenous parents (significant at the .10-level).

The key variable of interest, the effect of being indigenous and in *Progresa*, never yields results that are statistically significant at the .10-level, though the results do paint a picture that supports the hypothesis that indigenous participants in *Progresa* benefit less in terms of education demanded for their children than non-indigenous participants. Controlling for teacher quality, parental interaction with teachers and most importantly child labor, the effect of being indigenous and in *Progresa* approaches significance (reaching the .17-level). Indigenous parents receiving the CCT demand about 0.19 years less education for their children than non-indigenous parents in *Progresa*. While not
highly significant, the implications of this finding do suggest that *Progresa* may not have had as big of an impact on the educational outcomes for the most marginalized.

**Table 3: Summary of Quantitative Results for All Models**

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R-Squared</strong></td>
<td>.0021</td>
<td>.4945</td>
<td>.5290</td>
<td>.5303</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>103034</td>
<td>22427</td>
<td>22203</td>
<td>22055</td>
</tr>
<tr>
<td><strong>Key Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In <em>Progresa</em> (0, 1)</td>
<td>.749***</td>
<td>.539***</td>
<td>.526***</td>
<td>.529***</td>
</tr>
<tr>
<td></td>
<td>[.060]</td>
<td>[.085]</td>
<td>[.083]</td>
<td>[.082]</td>
</tr>
<tr>
<td>Indigenous (0, 1)</td>
<td>.288***</td>
<td>.202*</td>
<td>.197*</td>
<td>.210*</td>
</tr>
<tr>
<td>In <em>Progresa</em> and Indigenous (0, 1)</td>
<td>-.1289</td>
<td>-.119</td>
<td>-.192</td>
<td>-.187</td>
</tr>
<tr>
<td></td>
<td>[.1063]</td>
<td>[.144]</td>
<td>[.140]</td>
<td>[.140]</td>
</tr>
<tr>
<td><strong>State Controls Included</strong>*</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Household Controls</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Expenditures</td>
<td>---</td>
<td>.000007</td>
<td>.000003</td>
<td>.000004</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[.000009]</td>
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<td>[.000009]</td>
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<tr>
<td>Parental Education Level</td>
<td>---</td>
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<td>.106***</td>
<td>.104***</td>
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<tr>
<td></td>
<td></td>
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<td>[.014]</td>
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<tr>
<td>Number of Kids in Household</td>
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<td>2.44***</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>[.0186]</td>
<td>[.022]</td>
<td>[.022]</td>
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<tr>
<td>Level of Marginalization (0, 1)</td>
<td>---</td>
<td>-.125</td>
<td>-.105</td>
<td>.096</td>
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<tr>
<td></td>
<td></td>
<td>[.080]</td>
<td>[.077]</td>
<td>[.076]</td>
</tr>
<tr>
<td>Extremely Poor Household (0, 1)</td>
<td>---</td>
<td>-3.36***</td>
<td>-2.52***</td>
<td>-2.59***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[.078]</td>
<td>[.075]</td>
<td>[.075]</td>
</tr>
<tr>
<td>Parent is Male (0, 1)</td>
<td>---</td>
<td>-.005</td>
<td>-.046</td>
<td>-.029</td>
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<tr>
<td></td>
<td></td>
<td>[.110]</td>
<td>[.107]</td>
<td>[.107]</td>
</tr>
<tr>
<td>Number of Meals Eaten Per Day (0, 1)</td>
<td>---</td>
<td>.277***</td>
<td>.188***</td>
<td>.184***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[.060]</td>
<td>[.060]</td>
<td>[.058]</td>
</tr>
<tr>
<td>Expenditures on School Supplies</td>
<td>---</td>
<td>.0007***</td>
<td>.0006***</td>
<td>.0006***</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>[.0001]</td>
<td>[.00094]</td>
</tr>
<tr>
<td>Age</td>
<td>---</td>
<td>.031***</td>
<td>.030***</td>
<td>.030***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[.003]</td>
<td>[.002]</td>
<td>[.002]</td>
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<tr>
<td><strong>Child Labor Perception Controls</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Boy Should Work for Money</td>
<td>---</td>
<td>---</td>
<td>.054</td>
<td>.078**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[.037]</td>
<td>[.037]</td>
</tr>
<tr>
<td>Age Girl Should Work for Money</td>
<td>---</td>
<td>---</td>
<td>-.044</td>
<td>-.026</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[.037]</td>
<td>[.038]</td>
</tr>
<tr>
<td>Age Boy Should Help with Work</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-.062***</td>
</tr>
</tbody>
</table>

38
Parental Participation Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>β</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent is in PTO (0, 1)</td>
<td>-.002</td>
<td>.097</td>
</tr>
<tr>
<td>Parent spoke to teacher (0, 1)</td>
<td>-.084</td>
<td>.097</td>
</tr>
</tbody>
</table>

Teacher Quality Parental Perceptions

<table>
<thead>
<tr>
<th>Perception</th>
<th>β</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher is patient (0, 1)</td>
<td>1.10***</td>
<td>.257</td>
</tr>
<tr>
<td>Teacher arrives prepared (0, 1)</td>
<td>2.93***</td>
<td>.129</td>
</tr>
<tr>
<td>Teacher is qualified (0, 1)</td>
<td>-.481*</td>
<td>.250</td>
</tr>
<tr>
<td>Teacher arrives on time (0, 1)</td>
<td>.458**</td>
<td>.230</td>
</tr>
</tbody>
</table>

** Additional Controls**

<table>
<thead>
<tr>
<th>Control</th>
<th>Parent is illiterate</th>
<th>Parent is in school</th>
<th>Women perceived to be equal to men</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

* Individual controls for the seven states surveyed are generally significant and have large effects. These results are presented and discussed later in the section (Location Controls).

** Only the question asking perceptions of the equality of women has statistically significant effects. The effect is about .28 year increase in years of education demanded if the respondent perceived men and women to be equal. While interesting, this is beyond the scope of the paper.

** Other Factors Influencing Demand for Education**

While the key variables in this analysis yield interesting results about the effect of Progresa and one’s indigenous status on the amount of education parents demand for their children, the ENCEL 1998 data also allow for an analysis of other factors that effect parental demand. Some of these factors—like parental education, number of children and
child labor—are already quite prominent in analyses of educational outcomes, yet ENCEL also allows for an analysis of the effect one’s location in Mexico and the effect of perceived teacher quality on parental demand. The study now turns to a discussion of the effects of interesting household characteristics, location, child labor, teacher quality, and parental involvement on the amount of education demanded by Mexican parents for their children in 1998.

**Household Characteristics**

Household characteristics investigated looked at household wealth, parental education and age, and the number of children in the household. These characteristics explain a large portion of the variation, as they brought the r-squared values up to 0.4945 from the mere .002 in the simple model with no controls. Even with additional controls for teacher quality, child labor, gender parity and location, one can see that the magnitude, direction and significance levels for these variables tend not to change.

Two variables are not statistically significant, somewhat surprisingly: the level of household expenditures and the degree of marginalization. Each additional peso spent yields a mere .000007 years of increased parental demand for their child’s education in the reduced model and about half that amount in the full model, though neither is
statistically significant at conventional levels. Additional controls like expenditures on school supplies, the number of meals per day, and a poverty index likely captured the bulk of wealth effects. Degree of marginalization yielded a decrease in years demanded by 0.12 in the reduced model and an increase in education demanded by 0.09 in the full model (neither significant), which indicates that additional controls may have absorbed any effect of marginalization, especially given that this variable was measured as a binary variable that only indicated if the family was “marginalized” or “very marginalized.”

Parental characteristics like education and age tended to increase amount of education demanded for children. The literature shows that more educated parents have more educated children, and for each additional year of education, parents demanded about 0.10 years more education for their children (statistically significant at the .01-level). More surprisingly, for each year older the parent was, they tended to demand .03 more years of education (statistically significant at the .01-level). One might expect that older parents are more traditional and thus would demand less education, but given that the mean age was about 25 years old, it might just show that “older” parents here tend to develop a healthy appreciation for the value of education for their children.

In terms of wealth effects, households rated as extremely poor tended to demand about 0.30 fewer years of education than their “poor counterparts” (significant at the .01-

\[4\] Out of concern for a functional form misspecification, a model was also run with logged expenditures, though these yielded even smaller coefficients with p-values of 0.98. A logged expenditures variable was thus not included in the final models.
level), which reaffirms the idea that poorer families tend to have less education and extends it to show that they also demand less education. Increased expenditure on school supplies was shown to have a positive, highly significant (.01-level) effect on amount of education demanded, with each additional peso spent on school supplies yielding about .0006 additional years of education demanded in both models. Finally, the amount of meals a family ate daily also was positively and highly significantly associated with greater demand for education. In model 2, for each additional meal eaten per day, parents tended to demand an additional 0.28 years of education. In model 4, this figure drops slightly to an increase of .184 years per additional meal (both significant at the .01-level).

One final household control was the number of children in the household. Somewhat counter-intuitively, each additional child is associated with a 2.44 (model 2) or 1.96 (model 4) year increase in the amount of education demanded for children in a household (significant at the .01-level). One might think that having more children would spread a family’s resources thin, and thus lead them to demand less education. An alternate explanation that might make a bit more sense of the effect observed here is that families with more children have older children that can earn money to support the family, have old supplies and uniforms that can be passed down, or may have developed an appreciation for the benefits that their more educated children had. It may be the incentive of getting the CCT benefit for more children. It may simply be that they have become more effective parents with more practice. In either case, the amount of children
in a family is a strong and powerful predictor of amount of education demanded by parents in the ENCEL survey in 1998.

**Location**

Because the data come from only seven states, there is a rich opportunity to identify states in which parents demand the least education in the context of *Progresa*. In model 2, Guerrero was selected as the baseline. Parents in Hidalgo and Veracruz demanded more education for their children, with parents in Hidalgo demanding .065 years more education than those in Guerrero (significant at the .01-level) and parents in Veracruz demanding .35 years less than their counterparts in Guerrero (significant at the .05 level). Parents in Michoacán demand about .01 years less than those in Guerrero (not statistically significant), those in San Luis Potosí demand 0.06 years less than those in Guerrero (not statistically significant), those in Puebla demand .517 years less than those in Guerrero (significant at the .01 level), and those in Querétaro fare the worst, demanding about 0.8 years less than parents in Guerrero.

When accounting for child labor and teacher characteristics, this ordering of parental demand changes slightly, though all states take on highly significant values. Querétaro is the baseline in the fully expressed model, and just as before it performed the worst. Hidalgo is once again the best performer with parents demanding 1.36 more years of education for their children than those in Querétaro. Parents in Guerrero demand 1.28
years more education for their children than those in Querétaro, those in Veracruz demand 1.09 more, those in Michoacan demand .866 more, and those in San Luis Potosí demand .734 more years (significant at the 0.01-level). Finally, those in Puebla demand .386 years more education than those in Querétaro (significant at the .05-level).

Table 4: Education Demanded by State

<table>
<thead>
<tr>
<th>State</th>
<th>Model 2</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guerrero</td>
<td>baseline</td>
<td>1.28***</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>[0.193]</td>
</tr>
<tr>
<td>Hidalgo</td>
<td>.650***</td>
<td>1.36***</td>
</tr>
<tr>
<td></td>
<td>[.148]</td>
<td>[.161]</td>
</tr>
<tr>
<td>Michoacan</td>
<td>-.0124</td>
<td>.866***</td>
</tr>
<tr>
<td></td>
<td>[.163]</td>
<td>[.170]</td>
</tr>
<tr>
<td>Puebla</td>
<td>-.517***</td>
<td>.386**</td>
</tr>
<tr>
<td></td>
<td>[.149]</td>
<td>[.165]</td>
</tr>
<tr>
<td>Queretaro</td>
<td>-.802***</td>
<td>baseline</td>
</tr>
<tr>
<td></td>
<td>[.196]</td>
<td>---</td>
</tr>
<tr>
<td>San Luis Potosi</td>
<td>-.061</td>
<td>.734***</td>
</tr>
<tr>
<td></td>
<td>[.151]</td>
<td>[.163]</td>
</tr>
<tr>
<td>Veracruz</td>
<td>.329**</td>
<td>1.091***</td>
</tr>
<tr>
<td></td>
<td>[.139]</td>
<td>[.162]</td>
</tr>
</tbody>
</table>

The results for Querétaro are interesting because the state tends to have a higher level of overall education, but also suffers from extreme inequality. Additionally, the state is characterized by high illiteracy rates, particularly in the rural areas. Given the rural focus of Progresa, this result demonstrates the importance of carefully identifying pockets of poverty within states in targeting poverty. Similarly, Puebla has high poverty levels, which would explain its consistently lower demand for education. It might further reinforce the idea that Progresa is not affecting changes in demand as well in indigenous
populations as it does in non-indigenous populations because this state with high indigenous populations is consistently among the lowest in years of education demanded by parents for their children.

**Child Labor**

The results for child labor are not significant in the basic model (2), though a break-down by gender that distinguishes between employment for money (boy work and girl work) and assisting in other work (boy help and girl help) yields significant effects on the quantity of education demanded by parents. The questions used to generate these variables are, “at what age is it appropriate for your son or daughter begin to work for money?” and “at what age is it appropriate for your son or daughter to help with work?”

Using the results in the advanced model, for every year older that a parent thought their son should work for money, they tended to also to demand about 0.08 more years of education for their children (significant at the .05-level). Curiously enough, for every year older they felt their daughter should be, they demanded .03 years less education for their children (not statistically significant). This suggests that gender plays a large role in how parents evaluate the opportunity cost of sending their children to school, with the perception that boys reap more dividends from school than girls.

The results are significant and consistent across genders, though small, for how old children should be before assisting with a job. For every year older a parent thought a
boy should be before he helps with work, the parent tended to demand about .06 fewer years of education for their children (significant at the .01-level). For every year older a parent thought a girl should be before she helps with work, the parent demanded about .006 fewer years of education (significant at the .10-level). This result would suggest that parents do not view involving their child in work and schooling as substitutes, and given the minute size of the coefficients, it probably reflects the realities of most poor Mexicans that they require their child’s help in some capacity to make ends meet. These results echo studies showing the girls involved in Progresa tend to work more and go to school more, demonstrating that the two activities are not mutually exclusive.

**Teacher Quality and Parental Involvement**

Teacher quality, as measured by parental assessments of whether or not they feel their children’s teachers are patient, prepared, competent and timely, has large and highly significant effects on the amount of education that parents demand. In model 4, parents who rated their children’s teachers as patient demanded 1.1 years more education than those rating their child’s teacher as impatient (significant at the .01-level). Those who felt their children’s teachers were prepared tended to demand 2.07 more years of education for their children than parents who did not (significant at the .01-level). Parents who felt their children’s teachers tended to arrive on time demanded about 0.46 more years of education for their children (significant at the .05-level), though curiously parents who
thought their child’s teacher was competent demanded about .48 years less education for their children (significant at the .10-level). To avoid multicollinearity issues arising from parents rating a teacher the same across multiple binary controls for teacher quality, a reduced Model 3 only measures teacher quality using teacher preparedness. Parents rating their child’s teacher as prepared demanded nearly 3 more years of schooling for their children (significant at the .01-level). Overall, it appears that teacher quality has large, highly significant effects on parents’ demand for education for their children.

Interestingly enough, parental participation does not appear to have a large or significant effect on parental demand for education. Involvement in a parent teacher organization (PTO) seems to decrease parent’s demand for education for their children by about 0.002 years (not statistically significant) and speaking to the teacher by about 0.08 years (also not significant). Given that about 65 percent of parents were involved in a PTO and over 85 percent had spoken to their child’s teacher, it is surprising that these interactions did not shape their demand for education in a positive, large or significant way. That said, because the program targeted poorer parents, parents who attended school more may have perceived that the schools were of lower quality, which may have led to a very small, though insignificant, tendency to demand slightly less education for their children. It could be that poorer parents were more likely to be asked to come to school for problems related for their children, as well, which depressed demand.
Chapter 6. Discussion

Culture cannot be the excuse for poor student performance in Mexico. The data has shown that even though Mexico’s indigenous populations are indeed culturally, linguistically and socioeconomically diverse from non-indigenous groups, indigenous parents demand more, not less, education for their children. Unfortunately, this slightly higher preference for education among indigenous populations was almost entirely counteracted for those receiving the Progresa CCT. While the effect was not statistically significant at conventional levels, it was nearly significant, suggesting that the program may not impact indigenous parents’ demand for their children’s education as much as non-indigenous groups. The analysis confirms the highly significant and strong impact of Progresa on parental demand for education overall.

These results suggest that most Mexican parents are rational economic actors that must make sacrifices across the board when they lack the resources and access to opportunities. Indigenous parents are not opposed to educating their children, investing in their children’s schooling, or culturally against participating in the national education system. Nevertheless, they are either not benefiting as much from potential human capital gains from Progresa or something about Progresa’s design is muting their tendency to demand more education for their children. Given persistent education and poverty gaps between indigenous and non-indigenous groups, this is still detrimental.
This should direct Mexican policy makers wanting to improve education not to belabor the idea of some kind of cultural backwardness or inability to assimilate, but rather to continue to assure equality of opportunities for these marginalized groups. It suggests that *Progresa* and its successor *Oportunidades* are indeed valuable because socioeconomic factors are key drivers in parental demand for and valuations of education. Nevertheless, it seems that something about the way *Progresa* crafts incentives to boost parental demand for their children’s education is not working for indigenous parents. It could be that the nearest school is not welcoming. Hall and Patrinos point to better outcomes for indigenous educational attainment from bilingual school (2006). It also suggests however that because marginalization is a big part of underperformance and low demand, that efforts to assure educational access in these marginalized areas will be key to targeting those who need it most. This recommendation is all the more important for extremely marginalized localities that did not have the requisite infrastructure to condition a transfer on school attendance.

We saw from a UNESCO analysis that nearly every *Progresa* recipient would have already sent their children to school (2006). This might lead one to believe that the program is not affecting actual educational demand, but this analysis suggests that the CCT does move parental demand in a significant way, which should in turn build human capital through education as its creators envisioned. This analysis also upholds previous
evidence that suggests that the targeting of the program was successful, reaching Mexico’s poorest, most marginalized and indigenous populations quite successfully.

While the CCT is highly successful in providing the fiscal incentives to get kids into school, Mexico’s poor performance on international educational tests (PISA), alarming levels of teacher absenteeism, and a severe lack of educational infrastructure especially in marginalized areas signal that Progresa is but a first step to moving the underlying forces of education that will lead to broader economic growth and poverty reduction. The models show that parental demand for education for their children is strongly and significantly impacted by quality teachers as measured by their attitude toward children and the professionalism with which they carry out their jobs. Future reform must build teacher quality and to help parents see these gains so that they trust in the education system and will seek to educate their children for many more years.

Next steps should address systemic inequalities, improve quality and get teachers in the classroom, and make access to school a reality for the most marginalized. This last group is likely to get lost behind a well-regarded program like Progresa, as conditionality can only be administered in locations where the conditions can be met: if there is no school, a conditional program like Progresa cannot stimulate school attendance, regardless of the incentives provided. Nevertheless, attendance can be stimulated through programs like Progresa, and getting them in the door is a necessary but insufficient first
step. *Progresa* may remove poverty in a short-term manner and it may reduce broader macroeconomic inequalities that allow for broader participation in economic growth.

It also seems that it does have a positive affect on the amount of education that families demand for their children, though the effect may be muted in indigenous communities. Simple infrastructure building in the most marginalized communities, better accountability on the part of teachers with persistent attendance problems, and improved quality in the level and content of instruction will thus be needed to translate newly incentivized attendance into improved outcomes and eventual poverty reduction.

One thing that enabled this study is that the program’s design allows for a randomized experiment and rich, unique data to provide an opportunity to evaluate the program on many levels. This study aimed to evaluate using a less traditional metric—that of parental evaluations and demand—based on the premise that parental demand for education for their children will be the best long-term predictor of educational attainment. Luckily, the ENCEL survey asked unique questions that measured how far parents would like their children to go in school, how valuable they felt their children’s lessons, how they perceived teachers’ quality, how early parents believe their children should start working, and how much parents spent on their children’s education and school supplies.

These may not be the perfect measures of or controls for parental demand, but they provide a rich starting point for this rather underdeveloped field of perceptions theory, especially because this field offers measures for factors that prove incredibly
difficult to quantify. To determine the persistence of this inequality of effects on educational demand between indigenous and non-indigenous groups, future studies will need consistent data of this nature to evaluate the current Oportunidades CCT, the successor to Progresa. While one might hesitate before applying 1998 results to the present, the persistence of disparities in outcomes between indigenous and non-indigenous groups along with Mexico’s consistently low scores on international tests like the PISA suggest that these results may hold today (Hall and Patrinos 2005, Ramirez 2006, Hugonnier 2009). Regardless, it is clear that further studies applying these kinds of analyses would enhance evaluations of the long-term effects of Oportunidades. Future analyses adopting this emergent means of evaluation would benefit greatly from more consistent collection of data on parental perceptions of education (or perceptions in general) to generate more robust analyses that may do an excellent job of projecting future demand and investment in areas like education.

This analysis depended upon these imperfect questions on parental perceptions and beliefs from the ENCEL survey, but it was hindered by the inconsistency that characterized the asking of these key questions on perceptions. Future longitudinal studies and panel data will provide much richer and more robust results if these questions are asked in a way that offers data that is not universally ordinal, but rather offers meaningful interval-ratio responses or that offers a more complete ranking system for parents to give a more precise evaluation. Additionally, the questions need to be asked
consistently across time and thus must be planned in advance of the study and carried throughout the study period.

**Final Conclusions**

This project has evaluated Mexico’s Progresa CCT program to see whether it had as much of an effect on the amount of demand for education by indigenous parents as non-indigenous parents. The literature suggested that indigenous populations tend to be more marginalized, poorer, less educated, have poorer health and be more likely to participate in child labor. This review of the literature suggested a hypothesis that indigenous families would indeed benefit less from the Progresa CCT, and thus indigenous families in Progresa would demand less education for their children.

The data revealed that indigenous populations would demand more education, though the driver of low observed demand is lack of money or opportunities, not their culture. It also supported, albeit not definitively, the conclusion that Progresa does not stimulate as much increased demand in indigenous families as it does in non-indigenous ones. The effectiveness of Progresa overall shows that the program’s incentives work to stimulate demand for education. Furthermore, the data showed that indigenous parents tend to demand a bit more education than their non-indigenous counterparts. What this suggests is that indigenous parents receiving Progresa are not responding as strongly to the incentives in the CCT as non-indigenous parents. The likely reasons behind this
phenomenon include the weakness of Mexico’s overall education infrastructure, poor quality of instruction (which we have seen has a significant effect on parental demand) and the exclusionary nature of Mexico’s schools for indigenous children who tend to live in more marginalized areas with worse access to schools. Policy makers are advised to focus on improving the quality of the education that these students who have been incentivized to go to school receive, assuring access to schools for Mexico’s most marginalized families, and providing equality of opportunity to those who would escape poverty and benefit from broader economic growth.

The analysis concludes by recognizing great potential for analyses based on perceptions data, and implores future program designers and evaluations to consider including questions that gage perceptions more specifically in a consistent manner throughout the life of their evaluations. As Progresa expands into the Oportunidades program that covers nearly 20 percent of all Mexican households, it may benefit from greater use of these kinds of perceptions-based evaluations to generate a clearer sense of the long-term effects of each of its components on future demand and inherent value of services provided that datasets like the ENCEL do not adequately support. Progresa will only represent the progress its name touts when it feeds more directly into providing quality outcomes that will build the social capital and analytical skills to bring Mexico’s poorest and most marginalized populations out of poverty and into a modern, information-based economy.
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