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The Second-Generation Effects of Microcredit in Western Guatemala

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THE SECOND-GENERATION EFFECTS OF
MICROCREDIT IN WESTERN GUATEMALA

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2011

Dedication

For my Ozark kin –
It ain't no hill for a stepper.

THE SECOND-GENERATION EFFECTS OF
MICROCREDIT IN WESTERN GUATEMALA

by

JORDYN ELIZABETH HAUGHT, B.A.

THESIS

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Chapter 1: Introduction

In 2006, Muhammad Yunus won the Nobel Peace Prize for his work in microcredit. Since then the subject of microfinance has become inescapable in discussions of poverty reduction and development, as some have proclaimed that the means to end poverty has finally been found. Of course, that conclusion is overstated. Although the practice is attracting a great deal of attention in the media and among non-governmental organizations, rigorous academic investigation of microcredit's short- and long-term impacts is lacking. No strong empirical evidence exists that microloans lead to economic improvement in a country, and even its individual-level effects are mixed. Influential institutions like the UN and USAID are pouring resources into these programs without a thorough knowledge of their efficacy.

How can we go about evaluating the success of microcredit at creating “economic and social development from below,” as phrased by the Nobel Committee? The first evaluations of microcredit were not conducted in a very rigorous manner, leading to an overly positive depiction of their impacts. Subsequent studies have shown that the individual effects of microcredit are far more mixed than originally supposed. According to a few recent studies, anywhere between 10% and 25% of participants in microcredit programs actually go bankrupt after receiving loans, while only another quarter show gains (Mosley 1996a, 1996b). Significantly more study is needed before we can make any strong conclusions concerning the individual level effects of microcredit, especially broad and methodologically rigorous study, but it is clear that closer examination is in fact necessary; microcredit simply is not the panacea some had assumed it would be. I attempt to help clarify these phenomena by providing another perspective on the individual-level effects of microcredit.

All the same, the pioneers of microfinance did not envision that their creation would be limited to individuals. It is also assumed to affect the children of recipients. If microcredit affects borrowers, then it almost certainly affects their children in some ways, which could have more far-reaching consequences. Of the recent scholarship on microcredit, most is conducted by economists and does not focus on societal impact (Armendáriz and Morduch 2010, 5). Those who do usually consider a few second-generation effects, perhaps level of education of the children of borrowers, but those are rarely the focus of study (Bayuglen 2008, 527, 539). Rather, they seem to be considered as supporting evidence for the hypothesis that microcredit has an individual-level, first-generation effect. Without scholarship on second-generation effects, how can we evaluate whether the long-term goals of microcredit are being met? My study is a starting point aimed to fill that gap in the literature. By directly gathering information from recipients of microloans in Guatemala, I am able to give some interesting preliminary answers to the second-generation question.

Another recurring theme in the microcredit literature concerns the empowerment of women. These programs are often targeted at women, bringing them into closer contact with the formal economy and providing a source of personal income. Some scholars believe that children benefit when women are given more control over household expenditures, as women are hypothesized to be more interested than men in diverting resources to their offspring rather than to themselves (Skoufias 2001). Thus when a mother receives a loan, her children should be healthier and better educated than those of a father receiving a loan, all other things being equal. This is a contentious hypothesis, though. Some studies have shown that mothers tend to distribute family resources disproportionately to male children, and that mothers involved in microcredit are more likely than non-borrowing mothers to keep their daughters home from

school to help them with their businesses (Armendáriz and Morduch 2010, 221; Mayoux and Johnson 1997). Others say that there is no difference between the way mothers and fathers distribute resources to their children (Roodman and Morduch 2009). Since the literature is quite mixed on this point, my study offers another window into the processes at work.

The broadest research questions I aim to investigate, then, focus in turn on borrowers and their children. First, does receiving a microloan really improve individual well-being? How do any such material changes affect the children of borrowers? It is probable that the people who receive microloans were not seriously invested in formal aspects of the economy before becoming borrowers (World Bank 2004, 1). By becoming involved in microfinance, it stands to reason that many loan recipients also become involved in the formal economy for the first time. Does this cause any other lifestyle or value changes for the borrower and her children? Finally, do the children of female borrowers experience stronger effects than the children of male borrowers due to a gender-based difference in household expenditure preferences?

My argument draws from the strongest sections, and sometimes the conventional wisdom, of the microcredit literature. I hypothesize that microcredit does positively influence the economic situation of borrowers. Since borrowers should accordingly have more resources to direct to their children than their peers in similar pre-loan economic situations, the offspring of loan recipients should be healthier and better educated. The childbirth patterns of these children should reflect their higher level of education; therefore they should have fewer children and at a later age than the offspring of non-borrowers.

These material effects are not the only important ones, however. Most Guatemalans work in low-skill jobs outside of the formal economy. Receiving a microloan brings them into closer contact with the formal sector. If the microloan also results in an improved economic situation,

the borrower should come to associate involvement in the formal economy with increased well-being. In addition, the positive experience with microcredit should make them feel empowered to control their financial futures, something we could call entrepreneurship or “economic self-efficacy.”¹ Recipients of microloans, then, should feel a stronger sense of economic self-efficacy than non-borrowers. It is possible that microcredit does not increase an individual’s sense of self-efficacy, but rather that people with a higher sense of economic self-efficacy seek out loan programs. In that case, microcredit does not increase self-efficacy, but it does facilitate the expression of that sense. Therefore it is possible that microcredit causes an increase in self-efficacy, or loan involvement may simply be correlated with that increase. All of this means that the loan recipient now sees entrepreneurial activities in the formal economy as the path to betterment, and he or she is more able and likely to emphasize education for his or her children and to encourage them to take high-skill jobs in the formal economy. In other words, a parent’s sense of economic self-efficacy and trust in the formal economy is passed on to his or her child. Given that I cannot directly interview the children I must attempt to indirectly determine whether or not this occurs. Hence I hypothesize that a heightened sense of economic self-efficacy and trust in the formal economy manifests in children in the jobs they take. Children of loan recipients should be more likely than those of non-recipients to hold high-skill jobs in the formal economy, and to delay childbirth in order to pursue such careers.

Children who are well educated, healthy, have a strong sense of economic self-efficacy and a desire to work in high-skill jobs planted in them by their parents are more likely to be successful actors in the formal economy. If these second-generation effects do exist, then over time many more lives than just those of the borrowers could be affected by microcredit. The

¹ According to political scientist Orsan Bayulgen (2008, 525), the material benefits, “self-efficacy” and “social capital” generated by involvement in microcredit should bring about general societal development, increasing the likelihood of economic growth.

number of recipients of microcredit is only growing, in Guatemala and around the world. As more and more children grow up with better individual living conditions and a stronger value placed in the home on preparation for involvement in high-skill jobs in the formal economy, the general level of economic development in that country could increase. It is still too early to detect this trend on a country level if it exists, since microfinance has only been influential for around twenty years. Nonetheless this period of time is sufficient to glean whether or not effects exist on a second-generation level, and if they do, future study should attempt to ascertain whether microcredit could possibly have a macro-level effect.

Finally, gender should have an effect on all of these hypotheses. I expect that the children of female borrowers will be more healthy and educated than those of male borrowers, more likely to hold high-skill jobs, and less likely to give birth often and at a young age. If women are indeed more likely than men to pour their earnings into the well-being of their family, as evidenced by these indicators, it would be fortunate that women outnumber men as microfinance borrowers and beneficial to continue to disproportionately encourage women into the practice.

In order to provide some preliminary answers to these questions I conducted survey research in Western Guatemala during two weeks in January 2011. The largest institution in the country dedicated expressly to providing microcredit, Fundación Génesis Empresarial, graciously agreed to give me access to their clients and to help me find non-borrowers to interview as well. I returned with 97 interviews conducted with 68 Guatemalans who had received a microloan at some point in their lives, and 29 who had never received a formal loan. In the sample of their 306 children, the parents of 94 had never received a loan, while the parents of 212 had received a loan at some point. I investigated my eight hypotheses using quantitative analysis of these data. My sample was in many ways one of convenience, so I do not attempt to

conduct a study broad and rigorous enough from which to draw strong conclusions. Rather I hope to explore the plausibility of further in-depth research on these under-studied and important topics.

My thesis aims to address a number of long-debated puzzles in the literature, as well as investigate new ones. The ideas that gender may lead to different levels of household expenditures and that personal well-being may be increased through receiving microloans have been extensively discussed, but no definitive answers have been reached. On the other hand, the second-generation social effects of microfinance have not been widely investigated. My idea that increased involvement in the formal sector and a heightened sense of economic self-efficacy result in a trust in the high-skill formal economy that is passed on to the borrower's children is also a new contribution. My original data and analysis seek to explore possible avenues of fruitful research within these gaps in the literature, providing information that is at the same time important for real-world policy application as governments and organizations pour resources into microfinance without a solid understanding of its effects and value.

In this introduction I have established the research questions to be pursued, their relevance to scholarship and policy, the basic state of the research on microcredit and its second-generation effects, and a sketch of my argument concerning how I believe the research question will be answered. In the following section I present a more detailed overview of the literature on microcredit, hitting on the main veins of study as well as scholarship focused particularly on second-generation effects. I also present the eight hypotheses derived from this literature that aim to answer the main research question, namely whether microcredit has a positive impact in general and more specifically on the children of recipients and when the borrower is female. In the third chapter I present my research design, then focus on the survey instrument itself and the

manner in which it was conducted. Next I describe the various variables constructed with the survey data and how they were used to quantitatively test my hypotheses. In Chapter 4 I present the results of this analysis and illustrate them with vignettes from the surveys. I begin with the four hypotheses concerning the material and social effects of microcredit, then move to the three hypotheses concerning personal effects. Finally I discuss the results found for the male-versus-female recipient hypothesis. In the final chapter I summarize my findings and discuss their implications.

Chapter 2: Literature Review and Hypotheses

Little strong empirical evidence exists that microloans lead to second-generation improvements, and studies concerning their first-generation effects come to mixed conclusions (Armendáriz and Morduch 2010, Honohan 2004, Ledgerwood 1999). Many anecdotal and case study accounts of the myriad effects of microfinance exist, but due to selection bias these tend to be overly glowing evaluations (Armendáriz and Morduch 2010, 267). Of the more methodologically careful existing studies, most have been conducted by economists and therefore focus on financial and purely economic topics. Consequently, work “estimating [the] social impacts” of microcredit is lacking, since little rigorous, broad study has been conducted on this topic (Armendáriz and Morduch 2010, 5). Scholars have pointed out that involvement in microcredit allows borrowers to “invest... in their children’s future,” but few “large-impact” studies have been conducted to test whether or not they truly do so (Bayuglen 2008, 527, 539). I am, nonetheless, able to draw from some important works that attempt to evaluate the social influence of microcredit.

Microfinance includes a number of financial services like insurance, savings and credit (Armendáriz and Morduch 2010, 15). Microcredit, then, is a form of microfinance, particularly referring to small loans given to people with low incomes, usually with the expectation that the funds will be invested in small personal businesses and paid back once the new entrepreneur turns a profit. In the 1980s the Grameen Bank pioneered work in this field by forming local groups of borrowers to share expertise and exert peer pressure among themselves in order to grow their businesses and promptly repay the loans (Bayuglen 2008, 525). Much early theory on microfinance focused on this group-borrowing mechanism and its possible economic, social and

political effects. In economics it was posited that group lending lessened risk by increasing the probability that borrowers would repay on time (Armendáriz and Morduch 2010, 98; Bayuglen 2008, 534). Other social scientists focused on the “social capital” built by these interactions, and how that capital could be translated into political advocacy (Bayuglen 2008). While this is the most developed line of theoretical thought in the non-economic microfinance literature, it may not be the most fruitful. Evidence is gathering that microcredit can be effective without group lending (Armendáriz and Morduch 2010, 161). Conclusions remains mixed, but even major institutions like the Grameen Bank in Bangladesh have moved away from the group-lending model to more individually based loans. As the importance of the group-lending thesis seems to be lessening, and because the mechanism is not directly pertinent to my research, I do not incorporate it in my study. However, I am able to control for the manner in which the respondents to my survey receive their loans. Of the 68 loan recipients I surveyed, 31 receive individual business loans, 24 have group business loans, and 13 have individual home loans. These are included as control variables in the analyses.

2.1 Economics-based literature

The next main body of literature on microcredit is based in economics, especially non-neoclassical economics. According to the basic economic principle of diminishing marginal returns, capital should flow to where it produces the largest returns (Armendáriz and Morduch 2010, 6). Poor business owners have a higher return to capital than rich ones, so money should flow from the rich to the poor (Armendáriz and Morduch 2010, 7). This obviously does not occur in reality. Economists use the ideas of adverse selection and moral hazard to explain this phenomenon, and show how microfinance lessens these problems in order to get capital to the poor (Armendáriz and Morduch 2010, 8-9). Economists also focus on the implications of forms

of microfinance other than microcredit, like savings and insurance. Much of the literature investigates which institutional arrangements yield economic benefits, how microfinance institutions can turn a profit and how they should be managed, how much commercialization and regulation is necessary, and why microfinance may or may not be more successful than other similar credit-providing arrangements. There are even multiple textbooks dedicated to these questions (Armendáriz and Morduch 2010, Ledgerwood 1999, Ledgerwood and White 2006, Rhyne 2009, Robinson 2001).

These areas of focus in the literature illustrate a point I touched upon in the introduction to this chapter: the main body of rigorous academic work on microcredit is conducted by economists, but little of that research focuses particularly on the social effects of receiving microloans. It centers on income increases, solvency of the microcredit institutions themselves, and increased access to credit, instead of social effects like changes in health, education and birth rate. Most economists support the “financial systems” approach to lending, which focuses on getting loans to the “economically active poor” who do not have access to traditional loans but are capable of paying them back (Robinson 2001, 22). This stands in contrast to the “poverty lending approach,” like that of the Grameen Bank, in which the focus is lifting people from poverty (Robinson 2001, 22). The research of most economists, then, does not directly address poverty alleviation; they are interested in getting credit to more of the population, which presumably has a positive effect on income. The textbook I reference that most explicitly argues in favor of the financial systems approach does not include studies that investigate the social impacts of microcredit. The big questions like “Can microfinance help the economically active poor increase their incomes?” are answered with a section dedicated to a handful of personal vignettes.

This is a very different focus than the mainstream “poverty lending” attitude toward microcredit. Unlike most economists, I choose to evaluate microcredit as a tool to alleviate poverty, as that is the goal for which most organizations employ microcredit and for which microcredit is publicized. This approach is also appropriate, since the foundation I worked with in Guatemala subscribes to it. Fundación Génesis Empresarial (FGE) is a non-profit, and when I landed in Guatemala they were adamant that I meet with upper-level members of management so that they could describe to me the philosophy and goals of the foundation. In a nutshell, FGE wants to help people, and they want to do that by making loans accessible to those who otherwise could not get them, as well as by teaching them valuable skills to enable the recipient to make good use of the loans.

I turn to the economic literature for two of my hypotheses: that microcredit leads to individual economic gain, and that participation in microcredit leads to increased involvement in the formal economy. The economic literature points out that most recipients of microloans were excluded from “conventional financial systems” before they found microcredit (Bayuglen 2008, 526). Those considered “unbankable” are the main borrowers of microcredit, typically the poor and members of other marginalized groups (Bayuglen 2008, 526, 531). The informal sector of an economy is characterized by lack of government regulation, and wages significantly below those of workers in the formal sector (Cohn 2005, 391). Most of these borrowers had little contact with the formal economy before microloans (World Bank 2004). Microcredit brings these groups into the market economy through the credit apparatus; however, they remain mostly informal members of the market. Therefore the economic literature provides a great deal of support for my hypothesis that microcredit brings borrowers into closer contact with the formal economy.

Given the “financial systems” focus of the economics literature on microcredit, only a small portion shares my goal of attempting to determine whether involvement in microcredit has positive social effects. These tests are also focused mostly on first-generation outcomes. Many are formal impact analyses, which attempt to find whether a program has achieved its intended goal (Ledgerwood 1999, 46). Impact analyses investigate the economic, “sociopolitical” and personal effects of microcredit programs (Ledgerwood 1999, 47). As I and numerous other authors have noted, we are lacking this type of study. Due to the expense of conducting them, both researchers and the lending institutions themselves do not undertake enough impact analysis (Ledgerwood 1999, 48). My study addresses this paucity of literature. It is not exactly an impact analysis; my sample includes borrowers from a number of institutions, and even though the bulk of respondents are from one institution, that foundation does not have explicit goals outside of poverty reduction. However, I do investigate all three kinds of effects. I look at the straightforward economic or material impact of the program and at the social effects seen in children’s level of education and health. The personal effects that I consider are the impacts of increased involvement in the formal economy and an increased sense of individual entrepreneurship on the value a person assigns to interacting with the formal, high-skill economy. If borrowers have a values shift due to involvement in microcredit and come to have a higher personal estimation of the worth to be derived from working in the formal economy, then they should be more likely to push their children in that career direction.

Within the limited impact-analysis literature focused on poverty alleviation, many authors assert that microcredit leads to increased personal economic well-being. One of the most well-known studies is that of Khandkar and Pitt (1998), who showed that for every loan of 100 taka, the Bangladeshi currency, household expenditures by female borrowers increased by 18

taka.² Another 1998 study found that when education was combined with a microloan program in Ghana, the income of women in the program was double that of non-borrowers (McNelly and Dunford 1998). Multiple studies in Bangladesh, China and Madagascar have found that involvement in microcredit leads to an increase in available calories in the home (Zeller and Meyer 2002). There is a body of research that explores the second-generation effects of microcredit, but usually as a side note to the already limited amount of literature focused on first-generation impact analysis. Evidence exists, though, supporting my hypothesis that involvement in microcredit has positive second-generation impacts. For instance, a study using survey data in Tanzania found that access to credit through microloans “acts as a substitute for child labor” (Honohan 2004, 24). In addition, a significant amount of literature exists extolling the virtues of microcredit, but the glowing nature of these many accounts is often due to cherry-picking of successful cases (e.g. Smith and Thurman 2007, with foreword by Muhammad Yunus). One such book rosily proclaims that microcredit specifically can play a very important role in “cutting poverty in half by 2015” (Daley-Harris and Awimbo 2006).

However, the evidence is not uniformly supportive of the proposition that access to microcredit invariably betters the borrower’s welfare. According to a study conducted in Bolivia, around twenty-five percent of loan recipients had “spectacular gains” after borrowing microloans (Mosley 1996b). However, 60 to 65 percent of borrowers “stayed about the same,” while 10 to 15 percent actually went bankrupt (Mosley 1996). Another study from India found that about half of recipients gained, while around 25 percent stayed the same and another 25 percent lost (Armendáriz and Morduch 2010, 268). Studying the Grameen Bank itself, one author concluded that the economic situation of 77% of clients stayed more or less the same (Islam 2007, 166). As for second-generation effects, the conclusions are mixed as well. According to a study of

² The gendered component of their research will be discussed in Section 2.2.

microfinance institution SHARE in India, involvement increased male children's level of education, but not that of female children (Copestake et al. 2005, 82). Multiple studies have found no effect of receiving microcredit on child nutrition (Zeller and Meyer 2002). Many economists, especially those of the financial systems approach, argue that microcredit by itself is not enough to have a positive impact. They argue that voluntary savings programs and other forms of microfinance are a better choice than microcredit alone, and that microcredit in its best form is coupled with savings and insurance programs (Robinson 2001, 26; Armendáriz and Morduch 2010, 4; Ledgerwood and White 2006, xxx).

It is important to note once again that we lack sufficient empirical study to draw strongly generalizable conclusions on the net effects of microcredit. Nonetheless, it seems that most recent studies find far more mixed effects than past work. I take the side of the conventional microfinance wisdom and hypothesize that microcredit will have a positive impact on the lives of Guatemalans, but recognize the strong possibility as outlined in the recent literature that the relationship will not be as I have hypothesized.

I also draw the idea from the general economic literature that bringing more participants into high-skill formal jobs leads to macro-level economic development, focusing on high growth rates of gross domestic product (Cohn 2005, 426). This development, or integration into the market-based, liberal, internationally interconnected and mostly privatized formal economy, is marked by a number of changes. The process of industrialization, a first step on the road to development, sees a mass migration of rural dwellers to urban areas in search of manufacturing and service-sector jobs. As the economy develops, more and more education is needed to be involved in the most current jobs, and the birth rate drops as people pursue jobs over children; a career in a "professional" or high-skill job requires this education and childbirth delay, and

marks involvement in the market economy. Integration of more and more people into high-skill jobs in the formal economy leads to increased economic development (Frankel 2010; Dollar 2010; Sally 2010). These processes normally occur due to macro-level phenomena. However, if microcredit can encourage children to take high-skill jobs and delay childbirth, perhaps over time it could become a variable that shapes a country's development prospects. Again, I do not attempt to test whether microcredit has society-level effects. I am simply noting that integrating more people into high-skill, formal-sector jobs is always a good thing for development prospects, and parent involvement in microcredit might have that effect on the second generation.

2.2 Women's empowerment literature

Another main body of microfinance scholarship centers on women's empowerment. These scholars posit that women are traditionally excluded from the economic sector and can become active in it through microfinance, gaining empowerment and personal income (Bayuglen 2008, 531). One major part of this literature focuses on household decision-making. Many posit that women have different spending preferences than men, and are more likely to invest in their household and their children (Blumberg 1989). Women are believed to put their new earnings especially toward their children's health and education, while men are believed to be more likely to spend income on themselves, especially on gambling or other vices (Skoufias 2001). This can be seen in lowered incidence of infectious diseases, increased household nutrient intake, and normal height-for-age and weight-for-height of children when women generate their own income through microcredit (Thomas 1990; Thomas 1994). School enrollment should also improve (Skoufias 2001). In 1998 Khandker and Pitt published what is probably the most influential study addressing the household expenditure preferences question. The most well known finding showed that, of a loan of 100 taka, men spent 11 taka in the home, while women spent 18

(Khandker and Pitt 1998). However, research on this question has expanded since the 1990s, and the hypothesis is no longer uniformly supported in the literature. Some scholars point out that women may be more likely to funnel resources to their male children, since those children will be the breadwinners (Armendáriz and Morduch 2010, 221). In addition, when women become involved in microcredit-funded enterprises, they may pull their daughters from school to help (Mayoux and Johnson 1997). Others simply argue that the data do not confirm any relationship between gender and income allocation within the household (Roodman and Morduch 2009).

The gender-related literature also contains contending ideas concerning the impact of microcredit on fertility. One line of thought argues that women involved in microfinance will have fewer children, for a number of reasons (Rahman and Da Vanzo 1998; Schuler, Hashemi, Riley 1997; Schultz 1990). Perhaps the opportunity cost of the newly self-employed woman's time increases, and she prefers to spend her time making money rather than having children. There may also be some effect caused by peer pressure when the loan is group-based, whereby the woman is urged to invest her earnings in the health and education of her existing children – or, into the lending group itself. However, the impact of microfinance on fertility might be quite the opposite. It could be that, as the income of female microloan recipients rises, their demand for children may rise as well (Pitt, Khandker, McKernan et al. 1999). In some cases where women have stable employment their fertility actually increases, since they feel financially secure and able to provide for more children (Adserá 2004, 38). Although I do not pursue this question in the first generation, I do investigate the fertility rates of borrowers' children, and the same general arguments apply.

The effect of education rates on fertility is better understood. Many scholars agree that education increases the age at which a woman is likely to get married, therefore increasing her

age at first pregnancy and decreasing the total number of children she bears (Weinberger 1987, 35). Extended years of education occupy women during their normal early childbearing years; women want this education because it significantly increases the amount of money they are destined to earn (Adserá 2004, 38). In other words, a college education means a college-level job. The monetary return for a college-level job versus a secondary-education job is sufficiently larger that women will choose to postpone having children during college, and as they establish their career, so they can work at a higher wage level throughout their lives (Bratti 2003, 543). Therefore, if microcredit leads to higher levels of education, it stands to reason that it should also lead to later age at first birth and lower number of total children.

2.3 Social psychology literature

Outside of microfinance, the social psychology literature on self-efficacy, particularly concerning entrepreneurial and economic self-efficacy, plays a major role in my argument. Self-efficacy is “an individual’s personal belief in his or her own capacity to accomplish a given action” (Grabowski et al. 2001, 164). Self-efficacy has motivational and cognitive aspects. Part of a person’s level of self-efficacy is their motivation to be in control and how much they exercise it (Gecas 1989, 293). Another part is their more cognitive evaluation of how much control they think they and other people have (Gecas 1989, 293). The idea that a person can feel that her personal action can have an impact has been applied in politics, sociology, and business in various ways (Bayuglen 2008; Grabowski et al. 2001; Luthans and Ibrayeva 2006; Madsen 1987). The application most important to my study is the “entrepreneurial self-efficacy” of Luthans and Ibrayeva (2006). They theorize that the “personal characteristics” or the level of self-efficacy of entrepreneurs combined with the “environmental context” yields their personal entrepreneurial self-efficacies (Luthans and Ibrayeva 2006, 95). This entrepreneurial self-

efficacy can be defined as “entrepreneur’s beliefs and confidence in their capabilities to affect their environment and become successful by their behaviors” (Luthans and Ibrayeva 2006, 96). The emphasis is on both a feeling that personal action can bring success, and that the environment is conducive to that success. Therefore, when people with this sense of efficacy are given economic opportunities, they are likely to be more successful than others without the driving sense of entrepreneurship. In addition, finding ways to build this self-efficacy in developing economies would be beneficial for economic growth. Since they are so closely related, in this paper I use the terms “economic self-efficacy,” “entrepreneurial self-efficacy” and “entrepreneurship” interchangeably.

I draw on this literature to argue that microcredit can be one method of building entrepreneurial self-efficacy. Microcredit puts the economic well-being of borrowers into their own hands. Once they begin to actually benefit materially, their sense of economic self-efficacy grows, since they see that personal effort can actually have a positive effect. They come to view personal control as viable, and the economic environment as conducive to the exercise of personal control. This especially relates to their feelings toward the formal economy; before involvement with microfinance, they may have felt a sense of fatalism or distrust of the formal economy, but after involvement, they come to see the greater economic environment as favorable and worth being involved in. This sense of economic self-efficacy will be passed on to their children, whom they will encourage to become more fully integrated members of the formal economy.

Other than group-lending, gender-oriented and economic theories, few attempts have been made to create a generalized concept of why and how microfinance impacts lives. Perhaps this is because the relevant empirical basis for such a theory is lacking – if we are not sure of the

social impacts of microcredit, how could we build a theory explaining them? Still, the scholarship presented here provides support for each of my claims concerning the social effects of microcredit.

2.4 Argument and hypotheses

I argue that microcredit has three main effects on the borrower: economic gain, an increased personal sense of economic self-efficacy, and increased involvement in the formal economy. These changes affect the children of borrowers in a number of ways. First, economic gain leads to healthier children, better-educated children, and improves the probability that children will delay their own childbirth and have fewer children. Increased economic self-efficacy coupled with involvement in the formal economy makes parents trust the formal economy to bring prosperity, and therefore push their children to become involved in the formal economy themselves. Parents value their children's education because they know their children need to go to school in order to harness their potential as actors in the formal economy. Consequently the children of borrowers will be more likely to take high-skill jobs in the formal economy. These effects should be stronger when the borrower is a woman, since women should be more likely to invest in their children than men.

I derive a number of hypotheses from this argument. The first set of hypotheses concern the material benefits gained from microcredit and its second-generation effects. The results of these analyses can be found in Chapter 4, Section 1. First, involvement in microcredit should lead to increased personal economic well-being. I draw this hypothesis from the (albeit mixed) impact analyses in the economics-based literature. This hypothesis compares the first-generation borrowers and non-borrowers, and also looks within the sample of loan recipients.

H1: Involvement in microcredit leads to increased individual economic well-being.

The next hypotheses consider the possible results on children of increased well-being achieved through microcredit. They center on how the children of loan recipients compare to non-recipients. I posit that economic gain leads to healthier, better-educated children; these ideas are drawn from both the impact-analysis and the gender-focused microfinance literature, especially that concerning household expenditures. I would like to note that I do not think the factors affecting second-generation education are constrained to the simple material benefits of microcredit; as I argue, due to a change in values brought about by involvement in microcredit, borrowing parents are more likely to encourage their children to take jobs in the formal economy, and therefore are more likely to ensure that their children get the education they need to succeed in those jobs.

One more hypothesis fits into this section. As shown in gender-related development scholarship, when education levels increase on a macro level, birth rates tend to decline. Also, macro-level economic development usually leads to a decline in birth rates. I apply these ideas to the micro level: if individual economic circumstances improve for a child when her parent becomes involved in microcredit, and if her education also raises as a result, then she is likely to have fewer children at a later age. Like the education hypothesis, the birthrate hypothesis is also related to my argument that a value change occurs in loan recipients. As the children of loan recipients are taught to strive for a job in the formal economy, they will be more likely to delay childbirth in order to pursue that type of career.

H2: The children of microcredit recipients suffer from fewer preventable childhood diseases and have higher immunization rates than those of non-recipients.

H3: The children of microcredit recipients attend more years of schooling than those of non-recipients. They are also more likely to attend university.

H4: The children of microcredit recipients have fewer children and at a later age than those of non-recipients.

The second set of hypotheses concern concepts that are more difficult to measure. The results of the analyses conducted around these hypotheses can be found in Chapter 4, Section 2. According to the microcredit literature based in economics, most loan recipients interact with the formal economy for the first time when they receive a microloan. Hence becoming a borrower leads to increased involvement in the formal economy.

H5: Involvement in microcredit brings the borrower into increased contact with the formal economy.

Now the impact on borrowers becomes a bit more complex. In concert with the economic literature claiming that microcredit leads to personal financial benefit and is the first interaction of most borrowers with the formal economy, and the social psychology literature on economic self-efficacy, I hypothesize that increased involvement in the formal economy coupled with the personal financial benefits of microcredit leads to an increase in economic self-efficacy.

H6: Involvement in microcredit leads to a greater sense of economic self-efficacy.

I have attempted to test this hypothesis to find whether microcredit actually increases the entrepreneurship of the borrower, but it is difficult to accurately determine whether borrowers feel more economic self-efficacy before or after loans. It is important to note that it is possible that entrepreneurial people self-select into microfinance programs; that is to say, some people may naturally have a stronger sense of economic self-efficacy and therefore choose to become

involved in microfinance (Khandker and Pitt 1998). If this is true, microcredit involvement does not have a causal impact on self-efficacy. However, the force behind all of the effects, if they are present, is still the recipient's entrepreneurial drive facilitated by microcredit. Without that opportunity, the borrower might or might not have found another one. I do not intend to argue that microcredit is the only path to increased self-efficacy, nor to economic well-being. In the end, I argue that the entrepreneurial spirit of the person is the causal force resulting in the changes I am positing, and that involvement in microcredit is one manner of creating and facilitating that spirit.

In essence I argue that microcredit eases borrowers into the formal economy, building an entrepreneurial sense of economic self-efficacy that they pass on to their children. Borrowers themselves probably remain in the informal sector, but their children grow up healthy and educated, and adopt their parent's self-efficacy. This means that the children of microloan recipients are more likely to be able to take a spot in the formal economy, and more motivated to do so. It is likely, then, that children of loan recipients will have jobs in the formal sector, and be particularly likely to take high-skill ones.

H7: The children of microcredit recipients are more likely to work in high-skill, formal sector jobs than those of non-recipients.

My final hypothesis concerns the interaction of gender with this process, and draws on the literature concerning women's empowerment. It is widely known that women receive microcredit at significantly higher rates than men. A number of scholars have posited that women are more likely to invest their earnings back into the household, resulting in better health and education for their children. Other scholars have countered with empirical results that show no relationship between the at-home investments of mothers versus fathers. If my hypothesis that

the children of female borrowers do benefit more is substantiated, it would be valid support for the existing policies of many microcreditors that favor and recruit women, and give an incentive to further draw women into microcredit in the future. Seeing as the relationship here remains a point of contention, the results of this portion of my study will contribute to another relevant and current gap in the literature.

H9: The children of female microloan recipients are more likely than the children of male recipients to exhibit the positive characteristics in the previous hypotheses.

Chapter 3: Research Design

To test these hypotheses I conducted original survey research in Guatemala during the first two weeks of January 2011. I gathered 97 survey responses, a large enough sample to facilitate quantitative analysis of the data. The survey, included here as Appendix 2, asks general questions concerning the loan recipients' personal histories and the educational, child-rearing and career paths of their children. It also asks questions centered on more abstract topics, intended to ascertain whether loan recipients have a higher sense of economic self-efficacy than non-borrowers, and whether the borrower feels that receiving microcredit has increased her personal material well-being.

Although I consider my study a kind of rough impact analysis, due to numerous time, resource and situation constraints I was not able to fulfill the conditions of a typical impact analysis. Most importantly, I was not able to establish a baseline before the beginning of the microcredit program, nor was I able to set control and treatment groups. Therefore I use a non-experimental research design, and consider my work a plausibility probe to determine whether it is worthwhile to expend significant time and resources conducting a broader, more extensive survey. Since my exploratory effort yielded some significant results, I believe that further inquiry into the subject is warranted, and I hope to extend the study to more of Latin America in future research.

3.1 Study Design

Given the paucity of impact analyses of microcredit programs, there is very little data to be analyzed on the subject. Hence I chose to gather my own data to investigate questions of the first and second-generation impacts of microcredit. Study is especially lacking in Central

America, as most tends to center on South Asia. Guatemala is a suitable laboratory for this research because enough years with microcredit have passed that second-generation effects can be investigated. I coordinated with the largest microlender in the country, *Fundación Génesis Empresarial*, which loaned around 554 million US dollars to some 275,379 borrowers by May of 2010. The foundation has been active in the country for 23 years, a suitable length of time for second-generation effects to be visible. The foundation is also a good candidate for study since it is a non-profit and has a stated goal of raising people from poverty, as opposed to bank-run microcredit programs that are more interested in profit generation.

Most impact analyses are conducted using some combination of closed-answer survey format and open-ended interviewing, so I adopted this format in my own study. Most of my actual hypothesis testing involves analysis of the quantitative data gathered in the closed-answer portion, but I include vignettes from the more open questions as illustrative material for my conclusions. I focus on quantitative testing because I want my results to be as generalizable as possible. With the time and resources I had available I would have only been able to conduct one case study, whereas I was able to survey three separate areas using a quantitative survey design. In addition, my research design is more easily replicable than a qualitative one, and I want to ensure that my results are verifiable.

Impact analyses tend to focus on a range of units of analysis, but when investigating material, social and personal changes the typical unit of analysis is the “client as an individual” (Ledgerwood 1999, 57). This is opposed to approaching the “client as a client” in order to get his or her opinion of the services received, or to considering the enterprise as the unit of study in order to compare its profitability and prospects to those of other institutions (Ledgerwood 1999, 57). Consequently the unit of analysis in this study is the individual client, or in my case what

can also be known as the “intrahousehold” level, since I investigate the effects of microcredit on all people in the respondent’s home (Ledgerwood 1999, 57). Some of the most common impacts analyzed on the household and individual level with quantitative methods are income, asset accumulation, child health and child education, all of which I explore in this study.

While conducting rigorous impact analyses is essential to truly understanding the effects of microcredit programs, they have not been widely undertaken. This lack of research can be attributed to the high resource costs associated with conducting them, both of time and money, and the difficulty of doing so accurately (Ledgerwood 1999, 49). Most impact analyses have one major goal: to show the impact of receiving the intervention in question on client income (Ledgerwood 1999, 51). However, it is very difficult to be certain that an individual’s change in income is really due to receiving microcredit, a problem known as the “attribution dilemma” (Ledgerwood 1999, 51). The best way to attempt to overcome this dilemma is a careful experimental research design. Two groups of individuals are randomly selected: the “treatment” group, which receives the intervention, and the “control” group, which does not (Ledgerwood 1999, 55). Randomly selecting participants ensures that the two groups are mostly similar in every way except for involvement in the treatment, meaning that any change in outcome that is different between the groups should be due to the intervention. Usually this type of study begins before the intervention so that a baseline may be established, then continued over time (Ledgerwood 1999, 52).

In sum, my study would have to cover a lengthy time horizon and involve randomly selected control and active groups in order to ascertain whether or not borrowers are better off materially than they would have been in the absence of microloans (Armendáriz and Morduch 2010, 270). Unfortunately my study falls short of these parameters. As the literature points out,

creating control and treatment groups requires explicit coordination with the microcredit institution under study and a substantial time and resource commitment. I could not establish these groups nor randomly select a sample, so I had to use one of convenience. Therefore I employ a quasi-experimental research design. My single cross section is a quick and cheap way to get data, as required by the limited resources for this study, but the short time horizon complicates my ability to attribute changes to microcredit.

This research is not without merit, however. Although I am not able to ascertain what the respondent's standard of living would have been in the absence of microcredit, I can compare his or her current state to that of the non-borrowers in the sample. This provides a resource-efficient exploratory method of comparing the situations of loan recipients to non-recipients, especially when coupled with a number of control variables that make the results more reliable. Given that even these crude measures are often significant in my study, there is sufficient justification for more nuanced study of the questions pursued here.

3.2 Survey and Sample

The survey administered to respondents is included as Appendix 2. It is divided into four sections. The first section asks general questions of respondents, seeking to determine whether loan recipients feel that their economic situation is better than that of non-borrowers (H1), whether their sense of economic self-efficacy is higher (H6), and whether they are more or less involved in the formal economy (H5). Only recipients of microloans completed the second section. It asks a number of questions about the loans received by the participant, what they are being used for, and what kind of work the recipient did before becoming involved in microfinance. Questions also attempt to decipher whether the recipient is better off materially after receiving microcredit (H1). The next section of the survey addresses my hypotheses

focused on the children of recipients. I ask whether each child suffered from a serious disease (H2), how many years of school they completed including years of university and why they left school early if they did (H3), how many grandchildren the recipient has and at what age their children began having children (H4), and what kind of job each child works in (H7). The survey ends with a battery of basic demographic questions. This section asks the sex of the subject so that I may test whether second-generation effects are stronger when the recipient is a woman (H8).

I include more than one question aimed at each hypothesis so that I have multiple ways to test them. I used the AmericasBarometer survey for Guatemala by the Latin American Public Opinion Project as the wording base for many of the questions, and these questions were extensively pre-tested. However, I was unable to pre-test my own questions, so there is a possibility that some bias entered the data through imprecise question wording. I only have cause to believe that this occurred for one question, number 5 in Section 1 of the survey, corresponding to the variable *control*. I was surprised that nearly all respondents felt that they are very much in control of the future and success of their business. It is possible that some interpreted my use of the word “control” as a kind of accounting control; in other words, they felt that I was asking if they had the more basic secretarial aspects of their business under control. However, a few respondents immediately recognized the intent of the question and named things that are out of their control. The question is probably imperfectly worded, then, but the bias should not be too severe. All of the surveys were completely anonymous.

I administered the surveys with the help of *Fundación Génesis Empresarial* (FGE). This institution is the largest dedicated expressly to microlending in Guatemala, and also a non-profit with the goal of promoting “the socioeconomic development of the owners of microbusinesses”

in order to “accelerate the progress of Guatemala” (Fundación Génesis Empresarial 2007). In Guatemala most providers of small loans are banks, some with a focus on rural and small business development, but still financial institutions offering a broad spectrum of services. FGE is one of only a few institutions expressly dedicated to providing small loans at low interest. It is therefore somewhat atypical among microlenders in Guatemala. It is suitable for study, though, since most research on microcredit focuses on institutions like FGE that were created specifically as microfinance providers.

FGE gives home and business loans from their offices across the country. Business loans range from small loans given to “communal banks,” also known as group lending, to larger loans given to individuals known as “loans for microbusinesses,” to the largest loans for established businesses called “loans for small businesses” (FGE 2007). Home loans are given to individuals who can prove that their living conditions are poor, that they are unable to fix those conditions without the loan, but that they are still capable of repaying it. They are often used for repairing existing homes or adding another room, but are sometimes taken to construct new homes, typically made of cement blocks.

The company’s central office is in Guatemala City, with regional offices called *sucursales* throughout the country. Each *sucursal* has a boss and a team of *asesores*, employees who make contacts with potential clients, evaluate whether they are suitable, and then monitor them and collect their payments. These *asesores* are selected from within the communities that they monitor, ensuring that they have trust built up in the community as well as prior knowledge of probable applicants. Management sees this vetting process as integral to assuring the success of the institution, since they try to only give loans to reliable clients. Ensuring that a client is reliable entails casually interviewing members of the community to make sure that the potential

recipient and their spouse do not drink and are responsible. Therefore there is some selection bias inherent in the sample of loan recipients; most people who successfully receive loans are possibly less likely than others to spend their money on alcohol and more likely to work hard investing the funds into their businesses.

I contacted Génesis by e-mail and phone and explained the goals of my project. The administration in the central office agreed to facilitate the research by giving me access to their clients, and also by helping me interview non-borrowers in the same communities. Their cooperation came with two requirements: that I must share my findings when the study is finished, and that a representative from the foundation had to accompany me at every interview. The second stipulation obviously has some implications for my data. It is possible that the presence of a member of the foundation biased my survey results. However, the presence of an *asesor* was also indispensable. Due to Guatemala's violent political history and present, most citizens are naturally suspicious of interviews. I would have been able to collect far less information without a sponsoring organization with as much goodwill in the community as Génesis. At any rate, the bias in the data is mitigated because the representative typically did not stay for the full interview. The interaction began by introducing me to the respondent and explaining to him or her that I was conducting a study for my thesis research. Then the *asesor* asked if the person would like to be interviewed since participation was completely voluntary. If the interviewee was a client, the *asesores* stressed that the responses were anonymous and would have no impact on funding opportunities, then left the room or the interview area. In most cases the respondents appeared to be giving quite honest information. Many prefaced statements by saying that they probably should not say something, but that they could not help but be honest,

and continued on openly with the opinion. In fact, quite a few said negative things about the organization while the *asesor* was still in the room.

Each day I was assigned to one or two *asesores* in the office I was working in, and they took me to see a number of their clients. Some *asesores* made appointments with their clients by calling them via cellular telephone. Every person who I interviewed, loan recipient or not, owned a cell phone, so contacting interviewees in this manner did not bias the sample. Other *asesores* simply took me to see their clients without giving them prior warning. Interviews were conducted either in the respondent's home or place of work. I interviewed the main loan recipient, but the spouse or children of the respondent were also present at times and answered questions as well, which I notated on the surveys but did not use in the quantitative analysis. Most of the interviews took between 15 and 30 minutes, depending on the number of children of the respondent and the setting. In busy businesses the interviews often took longer, as I let the respondent attend each customer and asked questions in between.

I worked in three *sucursales* in Western Guatemala, based in the cities of Quetzaltenango, Huehuetenango and San Marcos. I was originally scheduled to work in Eastern Guatemala, where Génesis has been active for the longest amount of time. This would have yielded a longer time period for the effects of receiving microcredit to disseminate to the children of recipients. Two weeks before my trip, however, the government declared a state of siege in the states I had planned to work in due to the escalating drug violence in those areas. FGE graciously moved my itinerary to the safer western portion of the country, but unfortunately those offices have not been active for as long as their eastern counterparts. I would like to have had wider geographical variation as well, but the organization suggested that due to limited time it would be much more efficient to focus in one area, allowing me to gather substantially more

surveys. I chose observations over geographical variation, which perhaps enters some bias into the data, but given the exploratory nature of this study and the more or less similar composition of the Guatemalan population across regions I did not think the possibility of bias from geographical concentration too severe. The only major change between regions involves which indigenous ethnicity is most prevalent, and the socioeconomic differences between *mestizos* and indigenous people are much larger than those between different indigenous groups.

The *sucursales* I visited are illustrated below in Figure 3.1. Each state is named after its capital city, and it is in these capital cities that the *sucursales* are based. I worked in Huehuetenango for the first three and a half days, finishing there with 35 interviews. I spent the next three days working in the San Marcos office. I gathered 33 interviews there. Finally, I ended in the Quetzaltenango office, where I got 29 surveys in my last two and a half days.

My sample of loan recipients and non-borrowers is more or less one of convenience. This is not a random sample since I am only working with one microfinance organization, and because it does not account for clients who may have received loans and dropped out due to lack of success or because they were so successful they moved on to larger bank loans. I would need to find every person who has ever received a microloan, and their children, to have a truly random sample. However, while surveying non-clients I encountered quite a few people who received loans from sources other than FGE, making my sample somewhat more representative of the population of Guatemalan microloan recipients. In addition, *asesores* usually took me to people they knew personally to gather the non-borrower surveys. This is certainly not a random process of selection, but I do not think it entails serious bias since the *asesores* tended to take me to a wide socioeconomic range of non-borrowers. My study is generally biased, unfortunately, against non-borrowers. Since it was easier to track down clients, and even among non-clients

many Guatemalans had received microloans, 68 of my sample of 97 had received some kind of loan, while only 29 respondents had never received a loan.



Figure 3.1: *Sucursales* in Guatemala. Circles indicate cities where I worked.

The total number of observations for tests concerning first-generation effects is fairly low at 97, especially when some observations drop due to missing data. Logistical regression analyses need around 100 observations to function, so I am hovering at the bottom end of the sufficient number of observations for this test. On the other hand, the interviews with the 97 respondents yielded a sample of 306 children. This is a more suitable number of observations for running regression analyses, although an N of over 500 yields the most reliable results (Long and

Freese 2006, 77). When a few specific dependent variables are used in the child dataset, like the measure of adult children's education, the N falls substantially, so the number of observations depends significantly on the dependent variable in use.

I tried to stress to each *sucursal* that I needed to see a cross-section of clients, not just the successful ones, but it would be hard for me to prove that I did survey a representative sample in that respect. Consequently it is possible that my results are biased somewhat in favor of successful recipients. Yet this bias is probably mild, since many respondents reported that their gains from microcredit were small or non-existent. I also asked to interview clients with different amounts of experience with microcredit, and my sample does seem to have good variation on this variable, ranging from clients with one month of time working with microcredit to 16 years. The sample of men versus women is quite reflective of the actual population of loan recipients; of the 68 borrowers in my sample, 51 or 75% are women, and 17 or 25% are men. In the actual population of recipients, 70% are women (Personal Communication: Evelyn Di Chiara, e-mail, November 10, 2011). Of 29 non-borrowers, 10 are men and 19 are women.

Around 88% of FGE's borrowers are in rural areas; however, due to the time and difficulty involved in reaching this population, my sample of loan recipients is only 64% rural and 36% urban. Among non-loan recipients, 41% of my sample lives in rural areas and 59% in urban ones. In 2010 about 49% of the population was living in urban areas, so urban dwellers are over-represented in my sample (CIA 2011). When looking at the data for the individual states I surveyed, the differences are smaller. According to 2002 census data, 77% of the population of Huehuetenango lives in rural areas (INE 2002). This is very similar to my sample: out of 24 respondents in the state of Huehuetenango, 27 or 79% live in rural areas. The numbers for Quetzaltenango are also closely mirrored by my sample. In 2002 55% of the population lived in

urban areas, and 54% of my sample in the region (15 of 28) are urban dwellers (INE 2002). The only sample of the three that is actually skewed to favor urban dwellers is that of San Marcos. Of 34 respondents, 19 or 54% live in the city, while only 22% of the total population actually lives in urban locales.

Indigenous people are more or less correctly represented in the recipient sample. According to a UN-Habitat study, 55% of the Guatemalan population belongs to one of the indigenous ethnic groups, while 45% are *mestizo* and Spanish-only speakers (Valladares Cerezo 2003). In my sample, a similar 51% of loan recipients are indigenous, and 49% *ladino*. Among non-borrowers indigenous people are over-represented, since 65% of respondents are indigenous and 35% are *mestizo*.

Finally, my sample is roughly representative in terms of loan kinds. 18% of Génesis clients take home loans, nearly identical to the 19% of my sample receiving home loans (FGE 2007). 7% of my respondents are receiving the largest type of loans, small business loans, slightly larger than the 5% of the population doing so. 35% of my sample are taking group loans as opposed to 49% of clients, and 38% are taking individual small loans in comparison to 28% of the loan-receiving population. I only surveyed small business owners, except for two recipients of home loans who are employees in a business that is not family owned. I limited the sample in this way because I thought that a non-recipient of loans who does not own her own business could not be comparable to a microbusiness loan recipient. However, since I do not sample employees I cannot know if there are important differences between business owners and employees, nor can I explore the mechanisms by which employees become business owners or take microloans.

3.3 Variables and Quantitative Methods of Analysis

The survey responses provide the information encoded in the 45 unique variables I used in this study, presented in the Appendix: Respondent Codebook and Children Codebook sections. Variables can be thought of as belonging to one of three groups: independent, dependent or control. I prepare the quantitative analyses around the dependent variables, each model including one of three independent variables, plus controls suitable to the situation.

All of the main independent variables are different ways of measuring how much involvement the respondent has had with microcredit. When investigating the impact of microcredit on the borrowers themselves, the independent variable records whether the person has taken loans. For the hypotheses concerning the impact on children, the independent variable focuses on the amount of time that the child has been exposed to microloans through his or her parent. In both the child and recipient datasets I constructed three independent variables. The first is a simple dichotomous measure, *yesornoloan*, which records whether the respondent has ever received a loan (Variables 24 and 45). Hence the variable tells whether that child's parent has ever received any kind of microloan. This is the crudest independent variable, since it does not reflect the amount of time the person has been receiving the loan, nor what kind it is.

Next I created the ratio-level *pctageloan* variable (Variables 16 and 41). This measure records the percentage of the respondent's age during which he or she has received microloans. In the survey I asked how many years ago each loan was taken. I selected the oldest loan then divided that number of years by the age of the respondent to get this variable. For children, I first figured out each child's age when the parent began receiving loans by subtracting the number of years the parent has been receiving the oldest loan from the child's age. If the parent began receiving loans before the child was born, I record the child's age at first loan as 0. I subtracted

the age at first loan from the child's current age, yielding the number of years the child has been alive while her parent received microloans. Then I divided that number of years by the child's current age, yielding the percentage of her age that her parent has been receiving loans. This variable is more nuanced than the first, then, because it can account for difference in effects over time. I also created another variable, *pctchildhoodloan*, that is computed in the same way but only considers time receiving loans while the child was under the age of 18, or living in the home without a full-time outside job. When I ran the analyses with this variable the results were almost identical to those of *pctageloan*, so I only report the results for the latter in the results section.

My final independent variable, *yesnobusn*, is dichotomous (Variables 23 and 44). It is coded 1 if the respondent has received a business loan, and 0 if the respondent has only received home loans or has never received any loan. This variable has the benefit of shedding light on whether business loans are particularly likely to create any effects.

I include a standard battery of control variables in each model, as well as controls specific to each hypothesis. Controls must be included to ensure that the data are comparable. If I did not control for the urban or rural home of the respondent, for instance, I could not be sure that variation in outcomes was caused by involvement in microlending, since differences between the two areas could be causing the variation in results instead. The standard controls I use in every model include *age*, *female*, *urbanrural* and *indigenous*. *Age* (Variables 1 and 30) records the age in years of the respondent or the respondent's child, depending on the dataset. *Female* (variables 7 and 41) codes the respondent or child as 0 if male or 1 if female, and *indigenous* records the respondent or child as 0 if *mestizo* or 1 if indigenous (Variables 9 and 37). *Urbanrural* (Variables 22 and 43) describes the area in which the respondent or his child lives. It is coded 0

if a rural area, 1 if semi-urban, or 2 if urban. I made this measure simply by looking around the area of the interview if it was conducted in the respondent's home or in the same area as their home. I considered an area rural if houses were quite spread out and services like stores and gas stations were difficult to access. I coded an area as semi-urban if it was a small town separate from an urban conglomeration, or if it was a sparsely populated area somewhat near a large city. I counted an area as urban if it was within a city or suburb. If the interview was conducted away from the person's home I asked where he or she lived, then consulted the *asesor* as to what kind of location it was. This is an effective method since the *asesores* are from the communities they work in, and are accordingly very familiar with them.

Most models include some variables to control for level of education. On the respondent level, this variable (4) is called *educ*. It records the last level completed by the interviewee, ranging from no formal schooling, some years of or completed primary school, some years of or completed middle school (*básicos*), some years of or completed secondary education, to some years of or completed university. When the child's level of education is important, two variables can be used: *complete* or *aduleduc*. These variables are also used as dependent variables in the tests of the education hypotheses. In other models they control for the level of education of the child. *Complete* (Variable 33) is coded as 0 if the child has not completed the appropriate amount of school for his age, and 1 if he has. *Aduleduc* (Variable 26) focuses only on the adult children of respondents and uses the same scale as the *educ* variable. Finally, when the model needs to account for the level of education of the child's parent who responded to the survey, *parenteduc* is included. It is the exact same variable as *educ*, except that it is included in the child dataset.

A few other control variables were only sporadically significant. For instance, I asked respondents if they received remittances, and if so, to what point the family income depends on

that money. Of the 97 respondents, only 12 reported that they receive remittances, although most people knew someone working outside of the country and many said that they received remittances in the past (for example, Respondent 59). Of the 12, 9 said that they depend on the remittances very little. Most said that they were more like gifts at special times of the year than actual income (Respondent 17). Only three reported that they depend heavily on the remittances. I made the variable *remitt* with this information, coding reliance on remittances from a scale of 1 to 4 (Variable 18). *Remitt* was only significant in one test, which is discussed in the analysis section, but otherwise I do not include its insignificant results. The same is true for *aveloanamt*, a variable (2) that records the average loan amount for each respondent. For interviewees who have never received a loan their value for this variable is 0. For all others I add up the amount of each loan received in quetzals and take the average, which becomes the respondent's value for this variable. I sometimes included *aveloanamt* as an alternative independent variable, but since it was not often significant I discuss it only once in the results section.

A number of other controls were included in the various models. They were neither significant nor substantially increased the models' r-squared values, so I have not included them in the discussions and tables in the results section. In the literature review I discussed the body of work on microfinance that focuses on the group lending mechanism. According to early scholarship in this area, group lending should be more effective than individual loans. In line with more recent studies, though, the variable that controls for whether the recipient's loan was given individually or through a group was always insignificant. I asked each borrower how they receive their loans, and then coded the variable 2 if individual, 3 if in a duo and 4 if through a group. Respondents who have never received a loan were coded as 1. I could not run this control in the same models as my typical independent variables, since the data are collinear. I did run

indivgroup (Variable 10) as the main independent variable on a number of the dependent variables under investigation, and it was never significant. Two other controls never yielded significant results: *govmoney* and *parentloanyesno*. The former (Variable 6) records whether the respondent receives any kind of money through the government, either through retirement funds or the *Mi Familia Progres*a conditional cash transfer program. The latter (Variable 15) measures whether the respondent's parent received microloans. Neither of these variables has a significant impact on the social, material and personal effects in question. The CCT program is quite new, so it is possible that its effects simply are not visible yet.

The final control variable of interest is the age at which a child was exposed to loans, or the child's age when his or her parent began taking microloans. This variable is theoretically important, because we cannot expect a child to exhibit any effect due to exposure to microcredit if the parent began borrowing when the child was already an adult. Unfortunately I was not able to include the variable as a control when running tests on the full sample of respondents, including both loan recipients and non-borrowers, since no age at first loan can be recorded for children who have never been exposed to one and those observations are therefore coded as missing data. In some cases, then, I may not be seeing a significant effect of microcredit because I am not accounting for age at first loan and cannot be sure if the observation coded is pre- or post-loan. I was able to include age as a control variable, and age is highly correlated with age at first loan, with a correlation coefficient of .9094. Age at first loan was also included as a control whenever I ran a test among children of loan recipients.

The dependent variables consist of a wide range of data and are discussed in more detail in the results section. When the dependent variable is dichotomous I analyze the data using logistic regression. For categorical dependent variables, for instance a ranking of how financially

stable the respondent feels before and after microcredit, I analyze the data using ordered logistic regression. Finally, for count-level data I use Poisson regression analysis, and for ratio level data like the amount of money the respondent makes, I use Ordinary Least Squares regression. All of these analyses are calculated with robust standard error terms. Since I typically use two or more dependent variables to test each of the eight hypotheses, and each of those dependent variables must be run separately with the three independent variables, I conducted around 60 separate analyses.

Within the set of tests for each dependent variable, I ensure that the same observations are being used in all three tests. Consequently the results of these tests can be compared. I do not run all three independent variables in the same models. The variables record similar data in different ways, so multicollinearity issues should result. In fact the correlation between any two independent variables is notable but not extremely high: .6176 between *yesornoloan* and *pctageloan* and .6529 between *yesornoloan* and *yesnobusn*. However, if *pctageloan* and *yesornoloan* are run in separate models and are significant, when they are included in the same model they tend to lose significance. One of the variables also tends to flip signs. There appears to be some level of interrelatedness between them, then. The best way to reconcile these problems would be to interact the two main independent variables in the same model. Due to the time constraints of this study I was unable to conduct this analysis, so I ran each independent in a separate model. No other variables were highly correlated. I treat all tests as two-tailed; since the literature is mixed on most of these questions, I cannot assume that the sign of the coefficient will point a particular way. Finally, in the tests involving the children of microcredit recipients, I clustered the observations so that the children of each respondent are not considered independent of each other but rather as the offspring of a common parent.

Chapter 4: Analysis and Results

4.1 Hypotheses Concerning First and Second-Generation Material and Social Effects

When material well-being, integration into the formal economy and economic self-efficacy all rise due to involvement in microcredit, I expect that the children of borrowers become healthier, better educated, involved in high-skill careers in the formal economy, and likely to have fewer children at a later age than the children of non-borrowers. The initial section of my argument concerns the possible first-generation material benefits of engaging in microcredit, and the potential effect of those gains on the second generation. Drawing from the literature on microcredit, I argue that involvement in microcredit typically leads to increased economic well-being for the individual (H1). If involvement in microcredit leads to increased individual economic well-being, it stands to reason that those material benefits will accrue to the children of the borrower as well. Therefore I hypothesize that the children of microcredit borrowers will be less likely to suffer from serious childhood diseases and have higher immunization rates (H2: Health) and be more likely to complete the government-mandatory years of schooling as well as attend more years afterwards (H3: Education) than the children of non-borrowers. In conjunction with the increased expression of economic self-efficacy discussed in the next section, material gains by the parent should also lead children to have fewer children of their own and at a later age than the offspring of non-borrowers (H4: Birth).

4.1.1. H1: Involvement in microcredit leads to increased economic well-being

I tested my first hypothesis in a number of ways. The first methods involve comparing loan recipients to non-recipients, and the second set of tests look within the sample of recipients

to compare their experiences. First I discuss the tests covering all responses, and in the following section I discuss the analyses covering only the responses of loan recipients.

Tests of full dataset

In the full sample I ran a number of variations of two models. The first model used the ordinal variable *makingitcurr*, ranking the respondent's feeling about how he or she is currently "making it" economically on a scale of 1 (not receiving enough family income to get by on) to 3 (receiving enough family income to get by on as well as save). In every test I used *makingitcurr* as the dependent variable (Variable 12). To test the impact of receiving a loan on whether or not the family income is enough to get by on, I used three independent variables. The first, *yesornoloan*, is a simple binary variable (Variable 24). The next, *pctageloan*, represents the percentage of the respondent's age during which he or she has been receiving loans (Variable 16). Finally, the binary variable *yesnobusn* represents respondents who have received a business loan, versus those who have never received a business loan in particular (Variable 23).

Table 4.1 presents the results of the ordered logistic regression analyses with *makingitcurr* as the dependent variable. Model 1a uses *yesornoloan* as the main independent variable, 1b uses *pctageloan*, and 1c uses *yesnobusn*. Six control variables are also included, representing the respondent's gender, age, ethnicity, level of education, urban or rural home, and whether the respondent receives remittances.³ As Table 4.1 shows, all three of the main independent variables (has or has not received a loan, percent of age receiving loan, and business loans) are significant in their respective models. The model using age at receiving loan as the independent variable is also significant, with very similar results all around. Of the control

³ Three other controls were included in various different models, but were never significant, so I have not included them here: *parentloanyesno*, *aveloanamt*, and the *govmoney* dummies. Nor is *aveloanamt* significant when run as a main independent variable.

variables, education and remittances are significant in all four models, and age is significant in two.

Since the analysis conducted in this model is ordered logistic regression, the coefficients need special interpretation. I report the predicted probabilities of change in the dependent variable in the column next to each model.⁴ If the respondent receives any kind of loan, the probability that she will report that her family is making enough money to get by on as well as save is 30% greater than a respondent who has not received a loan (min->max/0->1 = .3024). This effect becomes stronger over time, as we can see in Model 1b with the percent of age variable. As the percent of the recipient's age involved in microcredit increases from its minimum to maximum value, the respondent becomes 68% more likely to report that his family has enough money to survive and save (min->max = .6760). Finally, if a respondent receives a business loan, the probability that she will report that her family is making enough money to get by on as well as save is 36% greater than for a respondent who does not receive business loans (min->max = .3631). These predicted probabilities show that receiving a microloan, particularly a business loan and any loan over a longer period of time, substantively and positively influence the way respondents perceive their personal economic situations. According to the results of

⁴ Tables throughout this study list the discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. In the text I discuss probabilities for other changes in the independent when appropriate.

Table 4.1
Ordered logistic regression on *makingitcurr*

Independent Variables	Model 1a (yesornoloan)	Coefficient	Model 1b (pctageloan)	Coefficient	Model 1c (yesnobusn)	Coefficient
yesornoloan	1.943*** (.6078)	-.3451, .0427, .3024	--	--	--	--
pctageloan	--	--	8.676*** (2.695)	-.2809, -.3951, .6760	--	--
yesnobusn	--	--	--	--	1.886*** (.5125)	-.2523, -.1109, .3631
female	-.0436 (.5221)	.0059, .0029, -.0087	.1418 (.5185)	-.0195, -.0082, .0277	-.5208 (.5448)	.0609, .0491, -.1100
age	-.0314 (.0282)	.2316, .0412, -.2728	-.0552** (.0287)	.4319, .0079, -.4397	-.0454 (.0290)	.3354, .0419, -.3772
indigenous	.5722 (.4810)	-.0770, -.0375, .1146	.3999 (.4855)	-.0535, -.0262, .0797	.8020* (.4897)	-.1021, -.0591, .1612
remitt	.9152* (.5402)	-.1759, -.4158, .5917	1.088** (.5529)	-.1858, -.4713, .6571	1.072** (.5528)	-.1748, -.4756, .6504
educ	.1943* (.1115)	-.1830, -.1475, .3306	.1960* (.1118)	-.1831, -.1496, .3327	.2765** (.1162)	-.2364, -.2320, .4684
urbanrural	.2417 (.2965)	-.0668, -.0283, .0951	-.0549 (.2764)	.0147, .0072, -.0219	-.0587 (.2771)	.0150, .0086, -.0236
τ_1	1.196 (1.553)		-.7289 (1.454)		-.2836 (1.499)	
τ_2	3.809 (1.610)		1.904 (1.465)		2.401 (1.522)	
Pseudo R ²	.1679		.1710		.1912	
LR chi-square	29.12***		29.66***		33.16***	
number of observations	82		82		82	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p \leq .01; **p \leq .05; *p \leq .10

Coeff = discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. Computed using *prchange* command, looking at the *min* \rightarrow *max* column. First coefficient listed for each

independent variable represents coefficient when dependent = 1, second coefficient when dependent = 2, third coefficient when dependent = 3.

models 1a through 1c in Table 4.1, then, statistically significant support exists for my hypothesis that involvement in microcredit leads to increased economic well-being.⁵

Tests using only the responses of loan recipients

To further investigate the first hypothesis I looked at four variables within the set of loan recipients. *Makingitpre* (Variable 13) asks the same question as *makingitcurr*, except that it refers to the period before the respondent received the loan. *Situation* asks the respondent if she feels that her current economic situation is worse (1), the same (2), a little better (3) or substantially better (4) than before taking loans. *Incomebuspct* (Variable 8) is the percentage change in income of the respondent's business after receiving a loan. Finally, *thingsploan* is a number between 1 and 5 that tells how many of the objects, described in the *things* variable, the recipient currently owns but did not own before receiving a loan (Variable 21).⁶

First I compared *makingitpre* to *makingitcurr*, using a cross-tabulation with Pearson chi-square and Kendall's tau-b statistics. This is an appropriate test because both are ordinal level

⁵ I tested the same hypothesis using the count-level *things* as the dependent variable in a series of Poisson regression models. This variable asks the respondents how many of five items (television, cellular phone, refrigerator, microwave, and computer) they currently have in their homes (Variable 20). Of 95 observations, 6 respondents own only one of these things, 18 own two, 21 own three, 22 own 4 and 28 respondents have all five possessions. The independent variables did not have a statistically significant effect on the number of things owned by the respondent. Only one of the control variables influences the number of things a person owns: level of education. For every rung in the educational ladder that the respondent climbs, her count of things will increase by about 6%. I pared down the model, taking into account the small sample size, but none of the independent variables became significant. I found similar results when looking within the sample of only loan recipients.

⁶ Income is a typical measure of whether receiving loans has had an impact, and often plays an important role in some studies as a control. However, I was unable to get a measure of income that is meaningful in either of these contexts. Since I interviewed small business owners, they can give a rough estimate of how much money the business makes in a given time frame, but since they re-invest so much of their earnings into their businesses and do not pay taxes on income, most respondents were unable to accurately estimate how much money they "make" or keep in a month after accounting for business expenses. I was able to calculate percentage change in income after receiving loans, which is meaningful, but raw income is not. Raw income is misleading, since some businesses require more capital than others; it seems that these individuals are making more money than others, but in reality they are simply providing a more expensive product that requires more capital investment from earnings.

variables with the same number of categories (Pollock 2006, 123). Table 4.2 shows that only four respondents feel that they are less able to make it on their family income compared to their situation before taking a loan, whereas 29 feel that they have moved up by either one or two steps. Another substantial portion, 20 loan recipients, feel that their ability to “make it” on the family income is the same as before taking loans. However, neither the chi-square (2.784, $p=5.95$) nor the tau-b (-0.0296) value provides evidence to suggest that there is a significant relationship between the two variables.

Table 4.2
makingitpre by makingitcurr

	Family is not making enough to get by on	Family is making just enough	Family is making enough to get by and to save	Total
Family was not making enough to get by on	2 40.00	10 38.46	10 45.45	22 41.51
Family was making just enough	2 40.00	15 57.69	9 40.91	26 49.06
Family was making enough to get by and to save	1 20.00	1 3.86	3 13.64	5 9.43
Total	5 100.00	26 100.00	22 100.00	53
Pearson chi-square	2.784			
Kendall’s tau-b	-0.0296			
N	53			

*** $p \leq .001$

The lack of significance is surprising, since most loan recipients talked about how their loans had improved their lives outside of the structured questions. Some respondents were

emphatic about praising the loan. Respondent 37 was so adamant that she said, “Génesis brought us from poverty,” and I was so impressed by her enthusiasm that I noted next to the quote that the *asesor* was not in the room. I saw that Respondent 52 “does a very brisk business!” in her market stall selling basic food products. She said, “We lived poorly, my children were hungry.” After receiving microloans she was able to start the store, and now after her eighth loan, “There is always enough product to keep selling.” Respondent 58 said that her toy and gift store has “grown quite a lot” because they have “some more resources” to invest in inventory. Respondent 76 says that “We are much better, we built a little new room and kitchen with our earnings.” She attributes the change to the loan because “If you invest a little in your business, you know that you will get back a little more.” Respondent 17 says the loan helped his business giving computer classes because it “helps him get more clients.” According to Respondent 53, her loan is the “fundamental base” of her successful store and various other enterprises that are continually expanding. Home loan recipients feel similarly, because they see a tangible difference due to the loan very quickly. Respondent 74 said, “Before, all four of us lived in this one room. Now we have another room, a bathroom. Now it’s enough. We wouldn’t have been able to save enough to do this – something always happens and you have to spend your savings.”

Not all respondents agree that the impact is so strong, of course. Many noted that the loans are helpful until some kind of crisis occurs, usually a drop in sales or an illness. The same respondent in the previous quote admitted that it is hard to make the payment when sales are low. For survey 51 I chatted with a husband and wife who had both received loans from Génesis. The wife had stopped taking loans and working because of a sudden serious illness. Her husband works in carpentry, and many respondents noted that sales are down in that profession. He said, “When there’s no work, I feel like we may not make the payment.” They have missed two since

his wife became sick, and are only making them now because their teenaged sons are working over Christmas break. “The support of my wife’s income is fundamental for us to pay the loan,” he said, so things have been very difficult since she had to stop working. Another case is that of Respondent 80, who at the age of 23 became “sick for two months. I didn’t know what was wrong with me. I went to four clinics and they all told me different things.” Génesis raised her interest rate because she could not pay, but fortunately she was able to get back to work and they lowered the rate again. Respondents 27, 53 and 61 had similar problems when sales dropped. Number 60 took a loan “years ago” to start a small food store that failed. She said that “the loan did help, but when sales dropped at the store, it got hard.” She defaulted and the bank raised her interest rate.

The *situation* variable gives a good overview of the opinions expressed in the quotes above. I broke it down to see how many respondents feel that their economic situation worsened or bettered after receiving microloans. According to a tabulation of the variable, as seen below in Figure 4.1, most respondents feel that their economic situation has improved either a little or a lot since receiving a loan. In addition, the median value for the *situation* variable is 3, showing that most respondents feel that their economic situations are a little better post-loan, thereby supporting my hypothesis that receiving microcredit increases personal economic well-being.

However, the particular kind of loan does not seem to influence the borrower’s economic situation. Using ordered logistic regression, I analyzed the influence of the three different loan kinds (1=business, 2=home, 3=mix) on whether the respondent thinks her current economic situation is worse, the same, a little better or significantly better than before receiving loans. None were significant. Neither were the variables representing the age of the recipient when she received her first loan, nor the percentage of her life during which she received them. The only

significant variable was the control representing the average amount, in quetzals, of each recipient's loans, but the model itself did not seem to be significant since it had a low chi-square and high p-value.⁷

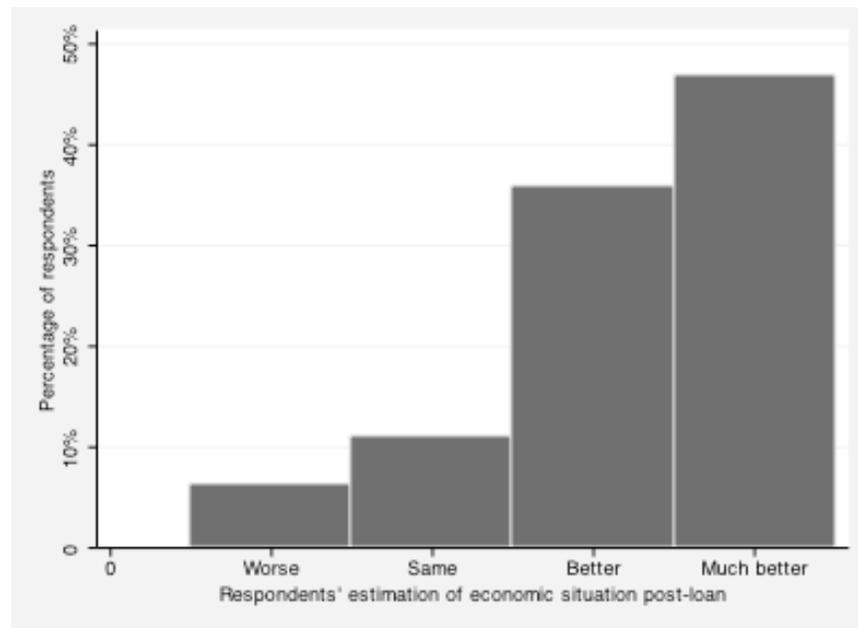


Figure 4.1: Respondents' estimation of post-loan economic situation

To apply *incomebuspct* to the hypothesis of whether microloans lead to increased well-being, I simply took its average. On average, the businesses of respondents show a 148.74% increase in income after receiving a loan. This average was calculated using the 53 observations of the *incomebuspct* variable. The median increase in income is a similar 120%.⁸ Only three borrowers report a decrease in income, while 14 report no change and the remaining 36 borrowers report an increase in income between 4% and 1500%. Finally, I averaged the 59 values for *thingsploan* and found an average increase of one possession after receiving a loan. This is only a descriptive statistic, of course, and the Poisson regression analysis presented in

⁷ I do not report the full model statistics in a table because of the lack of significant results.

⁸ When an outlier is removed (a 1500% increase in income), the mean becomes 122%, almost equal to the median.

Table 4.2 using *things* as the dependent variable shows that receiving a loan does not seem to influence the current number of possessions owned by an individual.

Conclusions of Hypothesis 1 Tests

The results of the tests of my first hypothesis are mixed. According to ordered logistic regression analysis, borrowers are “making it” more easily than non-borrowers. However, as shown by the *things* regression analyses, receiving a loan does not seem to increase the number of key possessions that the recipient owns. Age, education level, urban or rural home, gender and ethnicity do seem to influence the number of possessions a person owns. Within the loan recipient dataset the answer is slightly different, since descriptive statistics show that the possessions of recipients increase by one object after receiving a loan. Regression analysis, though, concludes that neither kind of loan nor percentage of age receiving a loan influences the number of possessions, meaning that if it is true that receiving a loan increases the number of belongings, this effect must not increase over time nor depend on the kind of loan. Consequently, the number of an individual’s possessions does not appear to be related to receiving loans, which contradicts the descriptive increase in objects reported by borrowers.

This story is repeated when my focus turns to the sample of loan recipients exclusively, since all of the descriptive statistics seem to show that people involved in microcredit have a higher standard of living, but further analysis reveals no statistically significant relationship between receiving a loan and well-being. Most recipients think they are “making it” more easily than they were before taking loans, but the correlation is not significant. The *situation* variable is similar, descriptively showing that most recipients feel better off now than before receiving loans, but ordered logistic regression shows no influence by the kind of loan or amount of time

receiving it on their economic situation. In addition, businesses of respondents show an average 150% increase in income generation after taking loans.

Although the results of these tests are mixed, I believe there is enough support for my hypothesis. All of the descriptive statistics point toward a positive correlation between receiving a loan and well-being. The ordered logistic regression analysis on *makingitcurr* provides a more reliable measure with the same results. This analysis also shows that receiving loans, especially business loans and any loan received over time, substantively and positively influences the respondents' perceived economic situation. The other tests yield no statistically significant results, so there are no findings indicating a negative relationship by loan borrowing on perceived situation. Since the findings for the *makingitcurr* variable are so strong, I conclude that the lack of findings for these couple of variables is probably due to the small number of observations being tested and the lack of variability in such a limited dataset.

4.1.2 H2: Child health

Illness Propensity

To test the first part of this hypothesis, that the children of loan borrowers are less likely to have had a serious childhood disease, I use the binary variable *illness* (Variable 35) as the dependent variable in a series of logistic regression models. Of 291 children of respondents, 61 or about 21% had experienced a serious illness. The most common diseases reported were bronchopneumonia and other lung problems (17 children), infections requiring hospitalization, particularly gastrointestinal ones (10 children), serious allergic reactions (5 cases), hepatitis (4 cases) and appendicitis (4 cases).⁹ These severe episodes of bronchopneumonia typically could have been prevented with better medical care, and hepatitis can be prevented by receiving extra

⁹ Malaria and dengue fever are more common in Eastern than Western Guatemala.

vaccinations and by eating food that was not poorly prepared. Therefore the most common diseases reported would likely have been prevented if the family had a higher income.

The three independent variables are the simple binary *yesornoloan*, percentage of the child's age during which his parent has been receiving loans (*pctageloan*), and the dichotomous *yesnobusn*, whether the respondent receives particularly business loans. Five control variables representing ethnicity, age, gender of child, urban or rural home and whether the child has completed basic education are also included. The results when each independent variable is run in an individual model, including the five control variables in each, are presented in Table 4.3. Two of the independent variables, those representing receiving any kind of loan and receiving a business loan, are statistically significant. Surprisingly, the results indicate that receiving loans increases child illness propensity. Since this analysis was conducted using logistic regression, additional tests must be run to interpret the coefficient. The predicted probabilities of change in the dependant variable computed for Model 3a are found in the column next to the results for that model. If the respondent receives any kind of loan, the probability of her children having a serious illness is 12% greater than a respondent who has never received a loan ($\text{min} \rightarrow \text{max} / 0 \rightarrow 1 = .1168$). This effect is slightly more pronounced for business loans; if the respondent has received one, the probability of her children having a serious illness is 13% greater than a respondent who has not received a business loan ($\text{min} \rightarrow \text{max} / 0 \rightarrow 1 = .1326$). The only significant control variable is parent education, and it remains significant in each model. Changing the respondent's level of education from its minimum to its maximum decreases the probability of his or her children having a serious illness by about 8% ($\text{min} \rightarrow \text{max} = .0866 / .0829$).

The pseudo r-squared values for both of these models are quite low, indicating that the models account for little of the variance in the dependent variable – only five or six percent. The

Table 4.3

Logistic regression on *illness* with robust standard errors clustered on *respondent*

Independent Variables	Model 3a (yesornoloan)	Coefficient	Model 3b (pctageloan)	Model 3c (yesnobusn)	Coefficient
yesornoloan	.8623** (.4283)	.1168	--	--	--
pctageloan	--	--	.0020 (.0051)	--	--
yesnobusn	--	--	--	.8859** (.3562)	.1326
indigenous	.2471 (.3647)	.0371	.2856 (.3565)	.3423 (.3563)	.0509
urbanrural	.1479 (.2216)	.0443	-.0088 (.2156)	.0599 (.2204)	.0179
age	-.0154 (.0179)	-.1091	-.0177 (.0175)	-.0192 (.0174)	-.1316
female	.0359 (.2700)	.0054	.0400 (.2682)	.0414 (.2717)	.0062
parenteduc	-.1900** (.0866)	-.1955	-.1812** (.0853)	-.1577* (.0829)	-.1647
constant	-1.620* (.8883)		-.7312 (.8586)	-1.403* (.7902)	
Pseudo R ²	.0455		.0297	.0568	
Wald chi-square	11.17*		7.50	16.15**	
number of observations	283		283	283	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p<.01; **p<.05; *p<.10.

Coefficient = discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. Computed using *prchange* command, looking at the *min* → *max* column. Since the dependent variable is binary, there is only one coefficient to report.

results of the models, then, are notably marginal. However, there is a statistically significant effect of receiving loans, particularly business loans, on child illness. This finding contradicts my hypothesis that receiving a loan decreases the likelihood of illness.

A disturbing trend emerges when these tests are run again in sub-populations based on gender. When I restricted the sample to women, I found that receiving any loan or receiving a business loan has a positive and statistically significant effect on illness propensity; when I restricted the sample to men, I found that as percentage of age receiving a loan increases, the

probability of having a childhood illness decreases. The results for the female sub-sample are reported in Table 4.4, and those of the male sample are reported in Table 4.5. Since the same independent variables are not significant in both sub-samples, we cannot directly compare the difference in their effects.¹⁰ We can see that among female respondents, borrowing has a significant positive effect on illness propensity: taking any loan increases the likelihood that the respondent's child has had a serious childhood illness by about 13% (min→max=12.55). On the

Table 4.4

Logistic regression on *illness* with robust standard errors clustered on *respondent*, female sub-sample

Independent Variables	Model 4a (yesornoloan)	Coefficient	Model 4b (yesnobusn)	Coefficient
yesornoloan	.9214** (.4459)	.1255	--	--
yesnobusn	--	--	1.120*** (.3964)	.1615
indigenous	.4574 (.4149)	.0703	.5428 (.4048)	.0819
urbanrural	.2040 (.2497)	.0620	.1906 (.2541)	.0568
age	-.0234 (.0193)	-.1635	-.0223 (.0197)	-.1541
female	.1587 (.2890)	.0243	.1370 (.2980)	.0206
parenteduc	-.2017** (.0971)	-.2088	-.1418 (.0971)	-.1509
constant	-1.756* (.9645)		-2.001** (.9199)	
Pseudo R ²	.0646		.0824	
Wald chi-square	13.90**		19.26***	
number of observations	220		220	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p≤.01; **p≤.05; *p≤.10.

Coefficient = discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. Computed using *prchange* command, looking at the *min*→*max* column. Since the dependent variable is binary, there is only one coefficient to report.

¹⁰ I do not report the insignificant results in the tables; namely, those for the independent variable *pctageloan* in the female sub-sample, and those for *yesornoloan* and *yesnobusn* in the male sub-sample.

Table 4.5

Logistic regression on *illness* with robust standard errors clustered on *respondent*, male sub-sample

Independent Variables	Model 5 (pctageloan)	Coefficient
pctageloan	-.0500*** (.0193)	-.3670
indigenous	-2.156** (1.035)	-.2083
urbanrural	-1.786*** (.5546)	-.3007
age	.0135 (.0613)	.0407
female	.1056 (.8069)	.0078
parenteduc	-.1565 (.2136)	-.0761
constant	4.569 (2.161)	
Pseudo R ²	.2128	
Wald chi-square	14.15**	
number of observations	63	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p≤.01; **p≤.05; *p≤.10.

Coefficient = discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. Computed using *prchange* command, looking at the *min* → *max* column. Since the dependent variable is binary, there is only one coefficient to report.

other hand, among male respondents, increasing the percentage of a child's life receiving a loan from its minimum to its maximum decreases the probability of illness by 37% (min→max=-.3670). Increasing the percentage of life receiving a loan by 10% decreases the possibility of illness by about 4% (-+1/2=-.0037 for one percent increase). Therefore it seems that the negative effect among male borrowers is slightly smaller than the positive effect among females.

It should be noted that restricting the sample to men leaves only 63 observations for testing. However, the r-squared of that model, 22%, is substantially stronger than those of the female sub-sample, which are only 7 to 8%. Again, perhaps including a control variable for age

at first loan would change the results of this test; maybe women see illness among their children and choose to take loans to try and help them, while men take loans for other reasons, and if age at first loan were included we would see that most illness occurred before loans. This seems unlikely, however, since the variables for age and age at first loan are highly correlated, and age is already included as a control in these models.

Immunization Probability

To test the second part of H4, that the children of borrowers are more likely to have received their immunizations, I used the binary variable *immun* (Variable 43) as the dependent variable in a series of logistic regression models. Due to the limited amount of variance in the dependent variable, my results for these analyses yielded no significant results. As I conducted the surveys I was surprised to find that the children of almost all respondents had been immunized. Of my total sample of 298 children, only 11 had not received their immunizations, or 3.7% of the sample. This is more or less consistent with countrywide data, as the World Health Organization estimated in 2009 that about 93% of children had received the suggested battery of immunizations (WHO 2010).

When I noticed this trend I began asking respondents where they got their children's immunizations, and nearly everyone said that they had received them at the local "puesto de salud," small clinics that give free government-funded immunizations. I saw the clinics in virtually every small community I visited, so lack of resources and distance did not seem to be factors that kept people from immunizing. When asked why they did not immunize a child, parents gave one of three responses: that they were too young when they gave birth to know what to do (Respondent 67), that they did not have time to leave their business to take their child (Respondents 9, 72, 80), or that their own parent told them not to immunize because it gives the

child a fever (Respondents 84 and 96). The latter response is a vestige of old suspicions concerning immunizations, especially among the indigenous populations. The two women who gave me this response have realized the importance of immunizing, and both expressed regret that they did not take their children. Respondent 84 said, “They got fevers, and I thought it wasn’t necessary. I feel ignorant now. I wish I had done it.” Thus negative attitudes toward vaccination seem to be dropping substantially in the childbearing-age population. Due to these factors, immunization is becoming widespread in Guatemala. It is worth noting, though, that three of the six parents who did not immunize did not do so due to the pressures of their personal businesses.

Conclusions of Hypothesis 2 Tests

When analysis is conducted using the general sample of respondents concerning the impact of receiving microloans on child illness propensity, a slight positive relationship is detected. Contrary to the hypothesis, then, receiving a microloan increases the likelihood that the respondent’s child will have had a serious illness. When this analysis is run in gender sub-sets, the difference between the effect of microloans on child illness for men and women is quite marked. Among female respondents, receiving a microloan increases the likelihood of child illness by 13%, and receiving a business loan increases the possibility by 16%. Among men, the effect reverses; receiving a loan decreases the probability of childhood illness, as I originally hypothesized. Apparently the effects of receiving microcredit depend heavily on the gender of the recipient, and in this case, women receiving loans actually leads to the opposite of the hypothesized effect.

4.1.3 H3: Child education

Completion of Mandatory Education

To test the hypothesis that the children of loan borrowers are likely to attend more schooling than the children of non-borrowers, I use the ordinal variable *complete* (Variable 33) as the dependent variable in a series of ordered logistic regression models.¹¹ This variable assigns a value of 0 to children who are too young to attend school, a value of 1 to children who did not complete all years of school for their ages, 2 for children who are currently enrolled in school but behind by three years or less, and 3 for children who have completed all years of schooling suitable for their ages.¹² The “suitable” amount of education is calculated based on the child’s progress through the legally mandatory years of schooling. These include grades one through six, known as “*primaría*” and equivalent to primary school in the United States for ages 7 through 12, and grades seven through nine, called the “*básicos*” and somewhat equivalent to our middle school for ages 13 through 15 (International Bureau of Education 2010). For instance, if a child is 13 and is currently enrolled in her first year of *básico*, then she is coded as a 3 for having completed all appropriate years of schooling. Of my 306-child sample, 55 are too young to have attended school.¹³ Of the 261 children who are school-age, 55 or about 21% did not complete the suitable amount of schooling, 6 or about 2% are behind by three years or less, and

¹¹ I also attempted to test the impact of receiving microcredit on literacy. Since only 3 children could not fully read and write out of 245 children old enough to do so, there was not enough variation in that variable to achieve any statistically significant results.

¹² This variable is technically nominal and not ordinal level when the 0 values are included. Therefore I created a new variable, *complete2*, only including observations coded 1-3. I used both *complete* and *complete2* in the same tests, and found that when *complete* was used, the only statistically significant variable was age. This is to be expected; age and the 0 value are highly correlated, since any child under the age of 5 has a 0 value for *complete*. For that reason I do not report the results of the tests using *complete*, and only those of *complete2*.

¹³ This is a fuzzy area, since children are allowed to go to pre-primary school from the ages of 4 to 6. If the respondent told me that her child under 7 is attending pre-primary, I coded that child as a 3. If the respondent told me that her child under 7 is not attending school yet, I coded that child as a 0, or too young to be attending school.

200 or about 77% have completed the appropriate amount of schooling. Consequently I have a decent amount of variation in my sample.

To focus on adults who have had the opportunity to go to college, I also tested my education hypothesis using the ordinal variable *adulthoodeduc* as the dependent variable in a new series of ordered logistic regression models.¹⁴ This variable codes any child who is still enrolled in school below the university level or too young to be in school as 0; therefore any child whose observation for *adulthoodeduc* is coded 1-9 is no longer enrolled in school, and his or her value for the variable expresses the last stage of schooling that he or she completed. Of 306 children, 194 are currently in school or too young to be in school, so 112 children who have stopped attending school comprise the *adulthoodeduc2* sample. These children are coded from 1 = child received no formal education, to 10 = child is currently attending university (see Variable 26 for more details). This measure is able to capture a wider range of education than the *complete* variable, since it looks past the mandatory schooling years to secondary and university education. Secondary education after the mandatory *básicos* is called the *ciclo diversificado* or *carera*, and involves two to three years of training either in a career or in preparation for university (International Bureau of Education 2010). There is a fairly nice distribution of observations across categories, except for the secondary-school graduation category (7 = child graduated from career), where 33 observations cluster.

The ordered logistic analyses conducted on *complete2* and *adulthoodeduc2* did not yield any significant results for the main independent variables, so I do not include them here. In the *complete2* models, the control variables for increased parent education level and living in a more

¹⁴ This variable is technically nominal and not ordinal level when the 0 values are included. Therefore I created a new variable, *adulthoodeduc2*, with only observations coded 1-3. I used both *adulthoodeduc* and *adulthoodeduc2* in the same tests, and found that when *adulthoodeduc* was used, the only statistically significant variable was age. This is to be expected; age and the 0 value are highly correlated, since most children under the age of about 18 have a 0 value for *adulthoodeduc*. For that reason I do not report the results of the tests using *adulthoodeduc*, and only those of *adulthoodeduc2*.

urban area have a positive, significant effect on likelihood of completion of mandatory schooling. The control variable for child age has a significant negative effect. Age is obviously a major factor in determining school completion, which is intuitive for a number of reasons. First, the older the child, the more likely he or she will drop out. Also, attitudes concerning education have changed greatly in the past few decades. Many parents told me that they had received little education as children, for a number of reasons. Some pointed out that education is more essential now, and jobs that used to have no education minimum now require the government-mandatory years of schooling (Respondent 27). Others mentioned that attitudes about girls' role in education have changed. According to one fifty-year-old woman who dropped out of school after the third grade, "My family didn't want me to keep going. They thought that only boys should study" (Respondent 87). A K'iche-speaking woman, age 48, who completed only the second grade said, "They didn't give you the opportunity. My mom said, the ones that matter more are the boys" (Respondent 88). However, parents did not exclusively keep their female children away from school. They often did not want their male children to attend, either. According to survey 57 with a married couple in their early thirties who dropped out after the sixth grade, neither of their parents wanted to keep spending the money to send them to school.

Others quit school due to lack of opportunity and pressing financial circumstances. Sometimes facilities were not close enough to make attending school regularly a viable option, or their parents simply did not have the money to continue sending them. Respondents 63 and 94, women in their forties, stated that "There were no possibilities for going to school," and "They didn't give people the opportunity." Respondent 92 said she went to work after the sixth grade because "in those days, there was not a lot to choose from." In most cases the family needed another set of working hands. Respondent 80 entered the family flower business after the

fourth grade, a trade in which she still works, because “I couldn’t [go to school] anymore. My dad wanted me to work.” Many women went straight into low-skill work, especially housekeeping, when their parents put them into the workforce (Respondents 69 and 53).

Much of this bleak situation has changed. Government efforts have made education more accessible, both in terms of distance and resources required to attend. A related significant control variable in the mandatory education completion model is *urbanrural*. If a child lives in a more urban area it increases the probability of her completing all required years of education by 32% (min→max = .3232). Obviously further work is needed to make education easily accessible to all members of society. Nonetheless, significant strides have been made to make education more accessible to all, and attitudes have changed substantially on the importance of education and girls in the classroom.

As for the particular effects of microloans on child education, the main sample seems to indicate that there is no effect. When the sample is broken down on gender lines, however, the picture changes. In the male sub-sample, receiving any kind of loan has a positive, significant effect on education completion, as seen in Table 4.7. Given the small sample size, the standard errors of the model are questionable, as are the predicted probabilities of change; more variation in the variables is needed to have better estimates of these relationships. Given the high r-squared of the model and its level of significance, though, it is clear that receiving a loan has an important positive effect on education in the male sample.

In the sample of women, the effect of the independent variables on *complete2* was not significant. However, receiving a loan appears to have a negative effect on *adulthoodeduc2* in the female sample. The results in Table 4.6 show that receiving a loan has a negative, significant effect on achieving higher levels of education. While receiving a loan makes attainment of more

Table 4.6

Ordered logistic regression on *adulthood2* with robust standard errors clustered on *respondent*, female sub-sample

Independent Variables	Model 6 (yesornoloan)	Coefficient
yesornoloan	-1.028* (.5872)	-.0985
indigenous	-.0761 (.7036)	-.0063
urbanrural	1.733*** (.4502)	.2923
age	-.0856** (.0435)	-.2163
female	.1856 (.4068)	.0152
parenteduc	.3362*** (.1154)	.3855
τ_1	-1.902 (2.216)	
τ_2	-.4118 (1.890)	
τ_3	.7678 (1.749)	
τ_4	1.209 (1.767)	
τ_5	1.712 (1.721)	
τ_6	1.944 (1.697)	
τ_7	4.066 (1.660)	
τ_8	4.262 (1.668)	
Pseudo R ²	.1946	
Wald chi-square	30.19***	
number of observations	93	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p<.01; **p<.05; *p<.10.

Coefficient = discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. Computed using *prchange* command, looking at the *min* → *max* column. The coefficient listed is the predicted probability of change for the dependent when it is coded 9.

Table 4.7

Ordered logistic regression on *complete2* with robust standard errors clustered on *respondent*, male sub-sample

Independent Variables	Model 7 (yesornoloan)	Coefficient
yesornoloan	58.32*** (23.32)	.9999
indigenous	-17.11*** (2.108)	-.0001
urbanrural	27.74*** (10.30)	.9999
age	.0307 (.2012)	.0000
female	.7905 (1.259)	.0000
parenteduc	2.218 (1.835)	.0000
τ_1	72.71 (38.19)	
τ_2	73.05 (38.26)	
Pseudo R ²	.6146	
Wald chi-square	473.56***	
number of observations	57	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p \leq .01; **p \leq .05; *p \leq .10.

Coefficient = discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. Computed using *prchange* command, looking at the *min* \rightarrow *max* column. The coefficient listed is the predicted probably of change for the dependent when it is coded 3.

education 99% more likely in the male sample, receiving one makes it 10% less likely among female respondents (min \rightarrow max=.9999/-.0985). As in the tests of the full sample of data, living in a more urban area has a positive effect on education in both models. All statistically significant control variables also show relationships in the correct direction, so the only surprising finding in these two models is the difference between the effects of receiving loans.

Conclusions of Hypothesis 3 Tests

Neither of the dependent variables used to test the hypothesis yield statistically significant results. However, when the tests were run for sub-samples of male and female borrowers, significant effects arose. In the male sub-sample, the dichotomous measure of having received any kind of loan is significant for the *complete2* variable looking at completion of government-mandatory education. This test shows that receiving any kind of loan has a large positive effect on child education completion among male recipients. On the other hand, among female respondents, receiving any kind of loan has a negative effect on the *aduleduc2* variable, which stands for the final level of education completed by children who are now adults. In other words, among male recipients receiving a loan increases child education, in line with my hypothesis, while receiving a loan actually decreases child education in the female sample.

4.1.4 H4: Child birthrate

Number of Children

To test the first part of H4, that the children of recipients have fewer children, I use the count-level variable *numgrandkids* (38) as the dependent variable in a number of Poisson regression models. This variable reports the number of children that the children of each recipient have had; in other words, the number of grandchildren each recipient has by each of their children. Of 300 children of respondents, 245 have not yet had children of their own.¹⁵ Of those who have had children, 16 have had one child, 17 have had 2 children, 16 have had 3 children, and 6 have had between 4 and 7 children.

Table 4.8 reports the results for Poisson regression analyses on the number of grandchildren of the respondent, including the three standard independent variables and five

¹⁵ Due to missing data 60 observations were dropped, making 246 the total number of observations in these models.

Table 4.8

Poisson regression on *numgrandkids* with robust standard errors clustered on *respondent*

Independent Variables	Model 8a (yesornoloan)	Percent change	Model 8b (pctageloan)	Percent change	Model 8c (yesnobusn)	Percent change
yesornoloan	.6218* (.3386)	86.2	--	--	--	--
pctageloan	--	--	.0005 (.0054)	--	--	--
yesnobusn	--	--	--	--	.6724** (.2906)	95.9
indigenous	.0357 (.3096)		.0050 (.3191)		.0295 (.2993)	
urbanrural	.3012 (.2405)		.2236 (.2108)		.3030 (.2481)	
age	.1187*** (.0138)	12.6	.1056*** (.0164)	11.1	.1168*** (.0135)	12.4
female	.4052** (.1966)	50.0	.4423** (.2173)	55.6	.4121** (.2018)	51.0
complete2	-.3931** (.1823)	-32.5	-.3334* (.1754)	-28.4	-.3916** (.1896)	-32.4
parenteduc	.1417* (.0820)	15.2	.1113 (.0701)		.1490* (.0789)	16.1
constant	-4.396*** (.6714)		-3.560*** (.6967)		-4.356*** (.6324)	
Wald chi-square	99.76***		65.24***		114.56***	
number of observations	246		246		246	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p≤.01; **p≤.05; *p≤.10

Percent change = percent change in expected count for unit increase in independent variable. Percent change coefficients were computed using *listcoef* command with the *percent* option.

control variables. As you can see in Models 8a and 8c, both the simple yes-or-no loan variable and the business loan variable have a significant positive effect on the number of children born to the children of the respondent. Increased age and being a female child also have positive effects

across the models, while completing the mandatory years of public education has a negative effect on the number of children born to children of the respondents. Referring to the predicted probabilities in the columns next to the model, if a respondent receives any kind of loan, his or her expected number of grandchildren increases by about 86%, holding other variables constant. If a respondent receives a business loan, his or her expected number of grandchildren increases by a surprising 96%, or nearly one child. In comparison, being female increases the number by around 50%, and completing mandatory schooling decreases the number of grandchildren by only about 32%. A year of additional age increases the number of grandchildren by around 12%, and a standard deviation increase in age (8.810) induces a 185% increase in the expected number of grandchildren (%StdX=184.6).

These results directly contradict my hypothesis. Instead of microcredit involvement having a negative impact on the number of children born to the children of recipients, it has a positive effect. Microloan recipients are likely to have more grandchildren than non-loan recipients. This is especially true for the children of business loan recipients, and does not seem to be contingent on time receiving loans.

Age at First Birth

To test the second part of H4, that the children of recipients have children at a later age, I use the ratio-level variable *agefirstbirth2* (Variable 31) as the dependent variable in a number of ordinary least squares regression analyses. This variable records the age at first birth for each child of the respondent. Of 306 children, only 55 have had their own children, so those 55

observations comprise the *agefirstbirth2*¹⁶ sample. Of these, 20 were 18 or under when they gave birth for the first time, 24 were between 19 and 21, and 11 were 22 or older (up to age 29).

Table 4.9 shows the results of the ordinary least squares regression analyses on *agefirstbirth2*, using the typical independent and control variables. Two of the independent variables, receiving any kind of loan and percentage of age receiving loans, have a negative and statistically significant effect on the age at first birth of the respondent's children. Receiving any kind of loan decreases the age at first birth by 2.1 years. Each increase of one percent in the percentage of a child's age during which his or her parent has received microloans decreases the child's age at first birth by .05 years. In addition, the control for child education level positively affects the dependent variable. Having completed all mandatory years of schooling increases the age at first birth by about 1.3 years. The additional control variables that are important in the other test of child birth rate – child age, child gender, and parent education – are not significant in this analysis. Perhaps this could be due to the notably smaller number of observations in the second model. When the number of grandchildren of the respondent is being assessed, children of respondents who have never given birth can be included in the sample and coded as 0. In this analysis of age at first birth, however, children who have not yet given birth cannot be included in the sample, so the number of observations drops from 246 to 55. The r-squared remains fairly high, though, accounting for between 31 to 35 percent of the variance in the dependent variable.

According to the results of the regression analyses on *agefirstbirth2*, I must reject my hypothesis that microcredit leads the children of recipients to give birth for the first time later than the children of non-recipients. In fact the results show that the effect is opposite to the one hypothesized, and involvement in microcredit decreases the age at first birth of the children of

¹⁶ The age at first birth for any person who has not had children is coded as 0. Since this is basically missing data, I dropped the zeroes and created a new variable, *agefirstbirth2*. For that reason I did not run any analysis using *agefirstbirth*, only *agefirstbirth2*.

Table 4.9

Ordinary least squares (OLS) regression on *agefirstbirth2* with robust standard errors clustered on *respondent*

Independent Variables	Model 9a (yesornoloan)	Model 9b (pctageloan)	Model 9c (yesnobusn)
yesornoloan	-2.118* (1.190)	--	--
pctageloan	--	-.0523* (.0290)	--
yesnobusn	--	--	-1.733 (1.137)
indigenous	-.4111 (.6226)	.2339 (.4737)	-.3743 (.6733)
urbanrural	-.4349 (.4443)	-.3637 (.4165)	-.4407 (.5114)
age	.0567 (.0595)	.0947* (.0490)	.0788 (.0585)
female	-.1408 (.6514)	-.2737 (.6554)	-.3437 (.6025)
complete2	1.261* (.6469)	1.209* (.6662)	1.230* (.6987)
parenteduc	-.2834 (.2924)	-.1415 (.2490)	-.2826 (.3171)
constant	19.18*** (2.720)	16.95*** (1.996)	18.42*** (2.591)
R ²	.3489	.3090	.3207
F value	5.13***	7.13***	4.51***
number of observations	55	55	55

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p≤.01; **p≤.05; *p≤.10

recipients. This effect is significant for two of the three independent variables and seems to be somewhat contingent on time receiving loans.

This picture is again changed when the sample is broken down on gender lines. Table 4.10 shows the results of analysis on the number of grandchildren born to respondents in the

Table 4.10

Poisson regression on *numgrandkids* with robust standard errors clustered on *respondent*, female sub-sample

Independent Variables	Model 10a (yesornoloan)	Percent change	Model 10b (yesnobusn)	Percent change
yesornoloan	1.014*** (.3889)	175.6	--	--
yesnobusn	--	--	.9194*** (.3143)	150.8
indigenous	-.3392 (.3750)		-.3397 (.3632)	
urbanrural	-.0417 (.2797)		-.0122 (.3126)	
age	.1267*** (.0141)	13.5	.1204*** (.0164)	12.8
female	.5530** (.2694)	73.9	.5603** (.2754)	75.1
complete2	-.1423 (.2597)		-.1694 (.2954)	
parenteduc	-.2017(.0971)		.1549 (.0999)	
constant	-4.715*** (.7842)		-4.476*** (.7622)	
Wald chi-square	147.56***		136.70***	
number of observations	189		189	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p≤.01; **p≤.05; *p≤.10.

Percent change = percent change in expected count for unit increase in independent variable. Percent change coefficients were computed using *listcoef* command with the *percent* option.

female sub-sample, and Table 4.11 shows the same for the male sample.¹⁷ Among female respondents, receiving any kind of loan has a strong positive impact on number of grandchildren. Receiving any loan increases the expected count of grandchildren by nearly 176%. This effect is slightly weaker for business loans in particular at 151%. These effects cannot be directly compared to male respondents, because neither of these independent variables is significant in the male sub-set. However, among men, as the percentage of a child's life receiving microloans

¹⁷ The tests on adult education level were not significant in the female and male sub-samples, probably due to the very small number of observations in each group.

Table 4.11

Poisson regression on *numgrandkids* with robust standard errors clustered on *respondent*, male sub-sample

Independent Variables	Model 11 (yesornoloan)	Percent change
pctageloan	-.0295* (.0176)	-2.9
indigenous	1.603 (1.008)	
urbanrural	-.0561 (.4183)	
age	.1770*** (.0413)	19.4
female	-.1329 (.2728)	
complete2	-.3726 (.3846)	
parenteduc	-.3109* (.1707)	36.5
constant	-5.877*** (1.952)	
Wald chi-square	3766.46***	
number of observations	57	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

*** $p \leq .01$; ** $p \leq .05$; * $p \leq .10$.

Percent change = percent change in expected count for unit increase in independent variable. Percent change coefficients were computed using *listcoef* command with the *percent* option.

increases by 1%, the number of children that child will have decreases by 3%, and a standard deviation increase in percent of age receiving loans (34.6725) induces a 64% decrease in the expected number of grandchildren (%StdX=-64.0). Hence we see that receiving a microloan increases the number of grandchildren born to a respondent in the female sub-sample, while it decreases the number of grandchildren born to male respondents.

Conclusions of Hypothesis 4 Tests

The results of the two tests investigating the impact of microcredit on birth patterns do not support my hypothesis. Instead of leading to a decline in fertility, involvement in microcredit

leads to a second-generation increase in birth. In other words, the offspring of loan recipients have more children than the offspring of non-borrowers. In a similar vein, microcredit involvement does not increase the age at first birth of the children of recipients. Rather, it decreases that age. While contradictory to my hypothesis, this result is not unprecedented in the literature. Numerous studies have claimed that increasing family income and especially that of women, who microcredit targets in Guatemala and elsewhere, leads to increases in birth rates since the family has more income to devote to maintaining children. However, this effect has typically only been investigated on the first-generation level. It is very interesting to see it play out for the children of recipients. From my survey experience I can think of one possible reason that this first-generation phenomena would apply to the second. Many of the respondents I spoke to said that some if not all of their adult children continued to live at home. An increase in income for the recipient would obviously accrue benefits for anyone in the home. However, by conducting these tests on male and female sub-samples, I find that this positive effect is limited to women borrowers. It seems that when men borrow microloans, fewer grandchildren result. The positive effect remains significant in the female sample, and does not depend on the kind of loan.

4.2 Hypotheses Concerning First and Second-Generation Personal Effects

According to the literature on microcredit, for most participants the act of borrowing from the microcredit institution is their first direct contact with the formal economy (H5), since they likely have never taken a loan from any other formal source and operate their businesses in the informal sector. The decision to take this loan may be due to that individual's heightened sense of economic self-efficacy, the belief that economic success can be achieved through personal entrepreneurial action, or becoming involved in microcredit may be the catalyst that

creates that sense of self-efficacy. Either way, an individual's involvement in microcredit should be correlated with a greater sense of economic self-efficacy (H6). If involvement in microcredit leads borrowers to more contact with the formal economy, and they learn that exercising economic self-efficacy in the formal economy leads to a higher standard of well-being, they should encourage their children to become more integrated into the formal, high-skill economy. This means that their children should be more likely to work in high-skill jobs in the formal sector (H6: Career).

4.2.1 H5: Recipient first interaction with formal economy

To investigate respondents' level of interaction with the formal economy, I look to two variables: *receipts* (Variable 17) and *loanhistory* (Variable 11). The first is a binary variable, coded 0 if the respondent's business does not issue receipts and 1 if it does. If a business does not issue receipts, then it does not pay government taxes, which means it operates in the informal economy. Of 95 respondents for which I have this information, only 20 issue receipts. This is not surprising since I interviewed small business owners; their profit margins are so low that they are typically not required to pay taxes. The next variable, *loanhistory*, is ordinal-level and reports the respondent's first and subsequent loan experiences. It is coded 1 if the respondent never received a loan, 2 if the respondent has only received informal loans, 3 if the respondent took informal loans before taking a formal microloan, 4 if the respondent has only taken microloans, and 5 if the respondent's first loan was over 25,000 quetzals, what would be considered a normal bank loan. Of 95 respondents, only 5 have taken a normal bank loan, and only one of them started out with a microloan. Three of those respondents have since taken out small microloans to supplement their businesses. 31 respondents have never received a loan. Five respondents took

informal loans before taking a microloan, but no one had taken only informal loans. Finally, 54 respondents have taken only microloans.

Table 4.12
loanhistory by receipts

	Receives no kind of loans	Receives microloans	Receives regular bank loans	Total
Does not issue receipts	22	52	1	75
Does issue receipts	9	7	4	20
Total	31	59	5	95
chi-square	14.64***			
N	95			

***p≤.001

By cross-tabulating these two variables we can see how many respondents with each loan history issue receipts. Observations coded 2 through 4 are considered microloan borrowers, so these observations are lumped together in the second column. 80% of the normal loan recipients seen in the last column issue receipts, while only 29% of non-borrowers in the first column do so. Even fewer microcredit recipients, 12%, issue receipts. In line with the literature, then, my sample shows that most microcredit recipients operate in the informal sector. This relationship is statistically significant, as the Pearson's chi-squared value for the cross-tabulation is 14.64 and significant to the .001 level. Of 64 loan recipients, only 5 had received a real bank loan prior to receiving a microloan. Of that 93% of loan recipients whose first loan was a microloan, 88% do not give receipts. In other words, loan recipients who do not give receipts comprise 88% of the total sample of microloan recipients. This is a 17-point increase over non-recipients of microloans, since 71% of non-recipients do not issue receipts. Also in line with the literature,

then, involvement in microcredit provides the first interaction with the formal economy for most borrowers. This is true for 88% of borrowers, in fact, since they are not already involved through paying taxes or through a regular bank loan. These results offer support for my hypothesis that the first interaction with the formal economy for most microloan borrowers is upon taking the microloan itself. They also show that most recipients continue to operate their businesses in the informal economy after receiving loans.

4.2.2 H6: Recipient economic self-efficacy

To test whether involvement in microcredit leads to or is even correlated with a greater sense of economic self-efficacy, I look to the variables *control* and *hardwork*. Both are ordinal level variables. The *control* variable (3) represents the respondents' answers to the question, "Do you feel that you have control over the future and success of your business?" The answer is coded 1 if the respondent feels that he or she has little or no control over the future of his or her business, 2 if he or she has some control, or 3 if the respondent feels that he or she has complete control. Of the 80 observations for this variable, 53 respondents or 66% of the sample said that they have complete control over the future of their businesses. I found this response rather surprising given the unpredictable economic climate in Guatemala. 22% said they have some control, especially citing competition and the prices of materials needed to run their businesses as factors outside their control. Only 12% or 11 respondents responded that they have little control over the success of their businesses.¹⁸

I found the responses to the next question even more surprising. The *hardwork* variable (7) reports the respondents' answers to the question, "If a person works hard and works a lot,

¹⁸ Keep in mind, though, that the wording of this question was imperfect and consequently possibly biased. See the Research Design section for more details.

will they have enough money?” This variable is coded 1 if the respondent feels that a person can work hard, manage money well and still not have enough money to get by, 2 if the respondent feels that to get by a person has to manage money well in addition to working hard, and 3 if the respondent feels that if a person works hard they will certainly have enough. Of 92 observations gathered for this variable, 66% of respondents think that if a person works hard he or she will certainly have enough to get by on. I found this answer paradoxical. Of 17 respondents who told me that they were not making enough money to get by on, 11 said that a person would certainly have enough to get by on if he or she works hard. Most respondents were obviously working hard; I know this since I interrupted their daily work to ask for ten minutes of their time for an interview, which ended up taking far longer as I snuck questions in between customers.

22% of respondents said that a hard-working person will have enough to get by on as long as they manage their money well, and many particularly stipulated that the person must not “meterse en el vicio,” or become involved in vices like drinking, gambling and prostitution. Only 12% said that it is possible that a person can work very hard and still not have enough to get by on. These respondents expressed bitterness with the economic and political situation in their country, saying things like, “Here in Guatemala there aren’t many rewards for working. You can work a lot and still not have money” (Respondent 64). Many respondents pointed to macro-economic factors to explain this. According to respondent 87, a woman who earns around \$215 a month making tortillas, “With the economy like it is, you have to fight just to eat.” Often respondents would mention that “sales are low” (Respondents 61, 68, 93, among others). A man who sells *huipiles*, the traditional indigenous women’s blouse, said “It is difficult because of the economy. There is no work, there’s no business, everything is very expensive” (Respondent 93).

He continued, “The person who works the most has the least.” When I asked why, he responded that salaries are too low.

Many people complain of inflation, saying that basic products are substantially more expensive than even ten years ago. Respondent 53’s store has suffered, she says, since “People used to consume more, but things are more expensive now. When we started 15 years ago it took 600 quetzals a day to keep product moving. Now it takes 2000 or 3000.” A woman who sells aprons in a Quetzaltenango market said that ten years ago, “the material cost less,” so it was easier to get by on the income from the business. Ten years ago, “Everything was better because things are more expensive now,” according to Respondent 88, who sells women’s underwear in the same market. Others note the lack of employment, especially for the growing numbers who are vocational school or university-educated and expect higher-skill jobs than are available. Respondent 16, a woman who used her \$400 microloan to stock her small store with sodas, says, “If you work hard you can get ahead, but if there aren’t any jobs, that can’t happen.”

From an outsider’s perspective, these opinions seem to be more reflective of the reality in Guatemala. However, nearly 90% of respondents more or less expressed that any person who chooses to work hard can get by. I tried to uncover some variables that could explain what kinds of people are more likely to have this response by running a series of ordered logistic regression analyses with *hardwork* as the dependent variable. None of the typical independent variables I have been using to attempt to measure the impact of receiving a microloan on the respondent’s opinion on *hardwork* were significant. Nor were a few new independent variables I tried, such as average loan amount and number of loans. In various models I included controls for education level, gender, age, urban or rural home, monthly household income, number of key things owned, the respondents’ personal rankings of their economic situations, whether the

respondent's parent had received loans, and whether the respondent receives remittances. Only three controls representing average loan amount, gender and economic situation were significant, and then only sporadically with unimpressive statistics of model fit. For similar tests of *control* I found no recurrently significant variables.

Conclusions of Hypothesis 6 Tests

Since only a few variables appear to have much significance, perhaps these beliefs are more or less cross-cutting across societal strata. Instead of the oft-repeated adages about Latin American fatalism, this sample depicts Guatemalans with somewhat American-like entrepreneurial optimism. This finding contradicts my hypothesis that microcredit recipients would have a stronger sense of economic self-efficacy than non-recipients. Since there is so little variation in the dependent variables, and various correlation and regression tests show no relationship between receiving loans and change in those variables, it appears that microcredit recipients are no more optimistic about their chances in the formal economy than anyone else. Nor can I definitively pinpoint any other factors that help determine who will have a strong sense of their ability to ensure welfare through personal action in the economy. Instead it seems that Guatemalans across the board value hard work and believe it will be rewarded, and feel that they have ultimate control over the success of their business ventures.

4.2.3 H7: Child career

High-skill Jobs

To test the first part of my seventh hypothesis, that the children of borrowers are more likely to work in high-skill jobs, I use the ordinal variable *adultjob3* (28) as the dependent

variable in a series of ordered logistic regression analyses.¹⁹ This variable records the kind of job worked by adult children of the respondent. I used the International Labor Organization's International Standard Classification of Occupations (2010) to classify each child's job as low-skill (2) or high-skill (3). The observations for children who are adults but have no job are coded as 1. Of the 111 adult or self-supporting children of respondents, 13 or about 12% are unemployed or homemakers, 74 or 67% are employed in low-skill jobs, and 24 or about 22% have high-skill careers.²⁰ This is a somewhat small sample size, but with decent variation. As expected given the developing nature of the Guatemalan economy, the bulk of the children are employed in low-skill jobs.

The results of the ordered logistic regression analyses conducted with *adultjob3* as the dependent variable are presented below in Table 4.13. These tests include the three standard independent variables (*yesornoloan*, *pctageloan* and *yesnobusn*) as well as six control variables. Since the parent's level of education had a major influence on the child's level of education in H3, it seems reasonable to think that parent level of education will impact the child's job choice as well. I include it as a control. I also include variables measuring the child's education level, since education levels should be a major factor influencing a person's career. In the results

¹⁹ I also attempted to test this hypothesis using the *underagedream* variable, asking children what kind of job they wanted when they grow up. Unfortunately I only got a sample of 103 children who answered this question, and most of them said they wanted a high-skill job. Within that small sample, a higher proportion of young children (under 10) wanted low-skill jobs, so the small amount of variance in the variable had a great deal to do with age. For these reasons no statistically significant results were found when *underagedream* was used as a dependent variable, and therefore the results of those tests have been excluded.

²⁰ If the child does not work full-time, is still a student or is too young to be working, this was coded as 0 in the original *adultjob*. *Adultjob2* contained these zeroes but consolidated some categories. As in previous dependent variables, to make the variable legitimately ordinal those 0s were excluded, creating variable *adultjob3*. I used both *adultjob2* and *adultjob3* in the same tests, and found that when the former was used, the only statistically significant variable was age. This is to be expected; age and the 0 value are highly correlated, since most children under the age of 18 have 0 values for *adultjob2*. For that reason I do not report the results of the tests using *adultjob2*, and only those of *adultjob3*.

reported below I used the variable representing whether the child finished the government-mandatory years of schooling (*complete2*).

As the models show, all three forms of the independent variable have a positive, statistically significant effect on the skill level of job taken by the children of respondents. The models account for around 12 to 13% of the variance in the dependent variable, which is not huge but substantial enough to warrant attention. First, receiving any loan increases the likelihood that the respondent's child will take a high-skill job by about 17% (min→max=.1668). Next we can conclude that the effect of receiving loans on career choice becomes stronger over time, since the percent of a child's life spent with a microloan is not only significant, but also has a real effect that is not marginal. According to the predicted probabilities in the column next to Model 13b, changing the percent of the child's age that his or her parent has received a loan from its minimum to its maximum decreases the probability of the child being unemployed by about 13%, decreases the probability of the child holding a low-skill job by 42%, and increases the probability of having a high-skill career by 54% (min→max = -.1250, -.4195, .5444). A 10% increase in the percentage of age receiving loans yields a 5% increase in the likelihood that the child will be a high-skill worker ($-+1/2 = .0049$, for a one percent increase in the independent variable). Also, the effect of receiving a business loan seems to be slightly stronger than that of receiving home loans or a mix of loan kinds. Receiving a business loan increases the probability of holding a high-skill job by 21%, as opposed to the 17% effect of receiving any kind of loan (min→max= .2147). The only significant control variable is completion of mandatory child education, which also has a positive effect on holding a high-skill job of around 17% to 21% across the models.

Table 4.13

Ordered logistic regression on *adulthood3* with robust standard errors clustered on *respondent*

Independent Variables	Model 13a (yesornoloan)	Coefficient	Model 13b (pctageloan)	Coefficient	Model 13c (yesnobusn)	Coefficient
yesornoloan	1.122* (.6587)	-.0990, -.0678, .1668	--	--	--	--
pctageloan	--	--	.0317* (.0176)	-.1250, -.4195, .5444	--	--
yesnobusn	--	--	--	--	1.407** (.6819)	-.1153, -.0994, .2147
indigenous	-.5779 (.6284)	.0484, .0394, -.0878	-.8958 (.6646)	.0763, .0549, -.1313	-.5372 (.6333)	.0438, .0358, -.0796
urbanrural	.0863 (.3859)	-.0138, -.0131, .0270	-.0452 (.3400)	-.0071, -.0068, .0139	.1435 (.3721)	-.0226, -.0209, .0435
age	.0230 (.0335)	-.0616, -.0890, .1506	.0173 (.0297)	-.0467, -.0621, .1088	.0214 (.0347)	-.0564, -.0796, .1360
female	.0404 (.5098)	-.0032, -.0031, .0063	.2128 (.5051)	-.0169, -.0156, .0325	.0292 (.5220)	-.0023, -.0022, .0045
complete2	.6549** (.3095)	-.1135, -.0855, .1990	.5532* (.3038)	-.0926, -.0731, .1657	.6986** (.3083)	-.1194, -.0871, .2065
parenteduc	.1888 (.1365)	-.0951, -.1876, .2872	.1626 (.1333)	-.0825, -.1530, .2355	.2164 (.1350)	-.1039, -.2195, .3234
τ_1	.8482 (1.371)		.1291 (1.077)		1.148 (1.382)	
τ_1	4.614 (1.547)		3.948 (1.100)		4.985 (1.609)	
Pseudo R ²	.1177		.1268		.1346	
Wald chi-square	14.42**		16.24**		16.16**	
number of observations	104		104		104	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p<.01; **p<.05; *p<.10

Coefficient = discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. Computed using *prchange* command, looking at the *min* → *max* column. First coefficient listed for each independent variable represents coefficient when dependent = 1, second when dependent = 2, third when = 3.

These tests are the first to provide support for one of my hypotheses, in this case that involvement in microcredit increases the probability that the child of the borrower will be employed in a high-skill job. This effect is dependent on time: as the percent of a child's life during which her parent receives a loan increases, the likelihood that she will hold a high-skill job increases. It also seems that business loans are particularly needed for this result to occur.

Formal Sector Jobs

To test the second part of H7, that the children of loan recipients are more likely to take jobs in the formal economy, I run a series of ordered logistic regression analyses on the dependent variable *adultjobformal2* (Variable 29). It represents whether the child holds a job in the formal economy. I consider respondent children to be working in the formal sector if they are employees of an institution like a government agency or large business, own their own large business that issues receipts, or work most other high-skill jobs. A job is considered to be in the informal economy if it is an employee position with a small business, if the child owns her own small business, or if the child works in a parent's small business that does not issue receipts. Of 97 observations for this variable, 13 children are unemployed, 45 have jobs in the informal economy, and 39 have jobs in the formal economy.

The results of the ordered logistic regression on *adultjobformal2* are presented below in Table 4.14. Of the three standard independent variables, only receiving a business loan is significant. Doing so has a positive effect on holding a job in the formal sector. These results are

Table 4.14

Ordered logistic regression on *adultjobformal2* with robust standard errors clustered on *respondent*

Independent Variables	Model 14a (yesornoloan)	Model 14b (pctageloan)	Model 14c (yesnobusn)	Coefficient
yesornoloan	.8269 (.7518)	--	--	--
pctageloan	--	.0195 (.0165)	--	--
yesnobusn	--	--	1.191* (.7078)	-.1089, -.1676, .2765
indigenous	-.5071 (.5364)	-.6497 (.5229)	-.4501 (.5269)	.0415, .0643, -.1058
urbanrural	-.1551 (.3563)	-.0830 (.3215)	.2136 (.3341)	.0382, .0631, -.1013
age	.0444 (.0340)	.0349 (.0290)	.0484 (.0317)	-.1300, -.2993, .4293
female	-.3738 (.5017)	-.2199 (.5183)	-.4054 (.5174)	.0346, .0626, -.0973
complete2	.4599 (.3564)	.3987 (.3393)	.5080 (.3623)	-.0952, -.1401, .2353
parenteduc	.2568 (.1845)	.2378 (.1877)	.2889 (.1880)	-.1501, -.3703, .5204
τ_1	1.125 (1.620)	.4166 (1.047)	1.639 (1.532)	
τ_2	.2568 (.1845)	3.039 (1.081)	4.297 (1.710)	
Pseudo R ²	.1036	.1045	.1197	
Wald chi-square	11.48	12.11*	11.82*	
number of observations	96	96	96	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p≤.01; **p≤.05; *p≤.10

Coefficient = discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. Computed using *prchange* command, looking at the *min* → *max* column. First coefficient listed for each independent variable represents coefficient when dependent = 1, second coefficient when dependent = 2, third coefficient when dependent = 3.

reported in Model 14c. The model explains around 12% of the variance in the dependent variable, which again is not extremely large, but is certainly notable. None of the control variables have a significant effect on being employed in the formal economy. The predicted probabilities of change in the dependent variable for the independent variables in Model 11c are

presented in the column next to the model results. Receiving a business loan makes a respondent's children 11% less likely to be unemployed, 17% less likely to be employed in a job in the informal economy, and 28% more likely to hold a job in the formal sector (min->max = -.1089, -.1676, .2765).

This test provides more support for my hypothesis that involvement in microcredit increases the probability that the child of the borrower will be employed in a formal-sector job. It seems that business loans are particularly needed to produce this outcome. These results even hold within male and female sub-sections of the data. Among women, receiving a business loan makes it 25% more likely that the respondent's child will hold a high-skill job, and increasing the percentage of a child's age during which his or her parent has received loans from its minimum to its maximum increases the probability that the child will have a high-skill job by 60% (min→max= .2547, .6033). Among men, receiving any kind of loan makes it 28% more likely that the respondent's child will hold a high-skill job (min→max = .2806).

Conclusions of Hypothesis 7 Tests

Both of the tests presented in this section, the first on *adultjob2* and the second on *adultjobformal2*, provide evidence in support of my hypothesis that the children of microloan recipients are more likely to take high-skill jobs in the formal economy than the children of non-recipients. The first model indicates that time has an influence on this effect; the longer parents have been receiving loans, the more likely their children will work high-skill jobs. In addition, both models show that business loans are the most likely form of loan to influence children's career in this way.

In light of the previous findings in this study concerning the second-generation effects of receiving microloans, this conclusion is surprising. I argued that a heightened sense of economic-

self efficacy among borrowers could lead them to encourage their children to take high-skill formal sector jobs, but I found no relationship between receiving loans and a sense of self-efficacy. I did argue, though, that the reasons behind encouraging children into high-skill jobs are multifaceted. A simple increase in education and income could also cause the job effect. However, I did not find that microcredit increases education levels for the second generation. The only piece of my theoretical puzzle that could explain this outcome, then, is first-generation increase in income. Since I did find that receiving microloans appears to raise family income levels, perhaps that change has a direct effect on child job selection.

4.3 H8: Gender effect

This final section centers on the implications of the gendered expenditure preference hypothesis that female loan recipients will be more likely than men to divert the extra income generated by the loan to her offspring. I look within the sample of the children of loan recipients to see if the gender of the parent receiving the loan affects the outcome of the various tests described in the preceding sections. Namely, these concern child health as measured by illness incidence (*illness*) and immunization rates (*immun*), child education as measured by completion of the government-mandatory years of schooling (*complete2*) and last level of education finished by adult children (*aduleduc2*), child birthrate as measured by the number of children born to the offspring of loan recipients (*numgrandkids*) and their age at first birth (*agefirstbirth2*), and kind of child career measured by whether the child has a high or low skill job (*adultjob3*) and by whether the child has a job in the formal or informal sector (*adultjobformal2*). I expect that the children of female recipients are more likely to exhibit the positive characteristics for each test than the children of male recipients.

I ran each of the tests listed above with the appropriate type of regression analysis, just as I did in their individual tests in the full dataset throughout this section. Since all respondents in the sample have received loans, I used the *yesnobusn* variable as an independent variable to see if receiving business loans affects the dependent variable in each test. I included the variable *parentfemale* as the main independent variable to see whether gender has any effect on the outcomes of the tests (Variable 40). Of 212 children whose parents receive microloans, the loan-receiving parent is female for 170 of those children and the loan-receiving parent is male for 42. I also included the appropriate control variables for each test, and am finally able to control for age at first loan (in the place of current age) since the sample is restricted to loan recipients.

I achieved significant results for only one set of hypotheses, those concerning child education. The results for these two variables can be found below in Tables 4.15 and 4.16. Parent gender is significant when the dependent variable is either *complete2* or *adulthoodeduc2*. The independent variable has a negative effect, the opposite of the predicted direction. When a loan-receiving parent is female, her child is 8% less likely to finish the mandatory years of schooling (min->max = -.0611). The r-squared for this model indicates that the independent variables are accounting for a little under half of the variance in the dependent variable, and given the level of significance of the model we can be quite confident that these results are reliable and noteworthy. The effect of *parentfemale* on *adulthoodeduc2* is even more substantial. As seen in Table 4.16, when a loan-receiving parent is female, her child is 24% less likely to attend university (min->max = -.2413). It appears, then, that the children of female recipients are not better educated than those of male borrowers, but rather less educated. The effect is stronger among the older children making up the *adulthoodeduc2* sample, but age at first loan is not significant in that test, so we know the effect is not due to a lack of exposure to loans.

Table 4.15

Ordered logistic regression on *complete2* by *parentfemale* with robust standard errors clustered on *respondent*

Independent Variables	Model 15a	Coefficient
yesnobusn	-1.196 (1.325)	.0344, .0139, -.0483
parentfemale	-1.855* (.9752)	.0433, -.0178, -.0611
indigenous	-.8359 (.8608)	.0287, .0115, -.0401
urbanrural	1.689*** (.5345)	-.1309, -.0472, .1781
ageloan	-.1953*** (.0497)	.6930, -.0700, -.7630
female	-.5162 (.4573)	.0175, .0070, -.0246
parenteduc	.8628** (.4205)	-.2356, -.0728, .3084
τ_1	-2.472 (1.428)	
τ_2	-2.102 (1.483)	
Pseudo R ²	.4396	
Wald chi-square	35.553***	
number of observations	167	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p \leq .01; **p \leq .05; *p \leq .10

Coefficient = discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. Computed using *prchange* command, looking at the *min* \rightarrow *max* column. First coefficient listed for each independent variable represents coefficient when dependent = 1, second coefficient when dependent = 2, third coefficient when dependent = 3.

Table 4.16

Ordered logistic regression on *adulthood2* by *parentfemale* with robust standard errors clustered on *respondent*

Independent Variables	Model 16a	Coefficient
yesnobusn	-.8227 (1.377)	.0227, .0120, -.0544
parentfemale	-2.165*** (.8034)	.0394, .0810, -.2413
indigenous	-.5924 (1.040)	.0225, -.0067, -.0285
urbanrural	1.493*** (.4618)	-.1156, -.0127, .2180
ageloan	-.0810 (.0786)	.1001, -.0130, -.1345
female	-.2191 (.5295)	.0076, -.0011, -.0113
parenteduc	.3876* (.2080)	-.0667, -.0645, .2677
τ_1	-3.857 (2.916)	
τ_2	-2.627 (2.669)	
τ_3	-1.296 (2.450)	
τ_4	-.8225 (2.524)	
τ_5	.1827 (2.514)	
τ_6	.0220 (2.477)	
τ_7	1.932 (2.306)	
τ_8	2.288 (2.262)	
Pseudo R ²	.1822	
Wald chi-square	38.30***	
number of observations	66	

First entry is the unstandardized coefficient, followed by the standard error in parentheses.

***p \leq .01; **p \leq .05; *p \leq .10

Coefficient = discrete change in the predicted probabilities for a minimum to maximum increase in the independent variable. Computed using *prchange* command, looking at the *min* \rightarrow *max* column. First coefficient listed for each independent variable represents coefficient when dependent = 1, second coefficient when dependent = 5, third coefficient when dependent = 9

The lack of significant findings for any of the other variables is puzzling. There is literature in the field on this question to support every possible outcome: positive, negative, or null. I did expect to see some influence of gender on these effects in accordance with the household expenditure preferences literature claiming that women are more likely to allocate resources to their children. Conversely, my null findings fall in with those scholars who argue that women and men have very similar household expenditure preferences.

The results of the tests on education, though, imply that when women receive business loans in particular, the education of their children suffers. Findings throughout this study that run the same tests on male and female samples must also be considered. My hypotheses for child health, education and birthrate were upheld in the male samples, but the opposite effect was true for them in the female samples. Gender seems to have very important effects on the second-generation outcomes of microcredit programs, and in most cases the effect appears to be negative when the borrower is a woman. These conclusions have important implications for microcredit lenders around the world, many of whom actively encourage women into the practice in hopes of diverting more resources to female borrowers' children, and others who hope to use microcredit as a tool for macro-level development.

Chapter 5: Conclusion

This project was born from a simple thought: if receiving microloans has second-generation effects, microcredit could have long-term consequences that most scholars have not been considering. I decided to investigate, first to see if first-generation changes actually do occur, and next to see what impact those changes have on the second generation. I tested to see if microcredit makes individuals better off economically, but then I went further, seeing if microcredit changed some personal attributes of borrowers, specifically their senses of economic self-efficacy and level of involvement in the formal economy. I decided that if these three things – well-being, economic self-efficacy, and formal sector interaction – increased for individuals due to involvement in microcredit, the changes would impact borrowers' children in a number of ways. Their children should be healthier and better educated than those of non-borrowers. The loan-receiving parent should encourage their children to take high-skill jobs in the formal economy more than non-borrowers, and to ensure their preparedness for those careers, the children of borrowers should have fewer children at a later age. I also wondered if these effects would be stronger when the borrower is a woman. Microcredit programs across the world target women for a number of reasons, and one is that many policy makers believe that women direct more of their income to their children than do men. If any of these changes occur due to microcredit, then it is not only a positive force for recipients but also for their children, creating longer-term positive effects and a greater impact than currently understood.

What are the effects of taking microloans on the recipients? First, there is evidence to show that loan recipients feel that their material situation is better than before taking loans. All of

Table 5.1
Conclusions of Hypotheses

Hypothesis	Result
H1: first-generation income	√
H2: child health	X for complete sample X for female sub-set √ for male sub-set
H3: child education	N in complete sample X for female sub-set √ for male sub-set
H4: child birthrate	X for complete sample X for female sub-set √ for male sub-set
H5: first-generation interaction with formal economy	√
H6: first-generation economic self-efficacy	N
H7: child high-skill, formal economy career	√
H8: female versus male loan recipients	X for education tests N for all other tests

√ = confirmed, X = denied, N = null

the descriptive statistics point toward a positive correlation between receiving a loan and well-being: the number of key possessions owned by recipients increases by one object after receiving a loan, most recipients think they are “making it” more easily than they were before taking loans, and the businesses of the respondents I interviewed show an average 120% increase in income generation after taking loans. There is statistically significant evidence that persons receiving a microloan feel they are making it on their incomes more easily than non-borrowers: the ordered

logistic regression analysis on *makingitcurr* shows that receiving loans, especially business loans and any loan received over time, substantively and positively influences the respondents' perceived economic situation. Some of the regression analyses of the statistics that show a descriptive change for microcredit recipients yielded no significant results, but it still seems that receiving microloans does positively affect the economic situation of recipients, and does give them a better position relative to non-borrowers.

As for the personal effects of receiving microcredit, the surveys show that most microcredit recipients operate in the informal sector. Furthermore, involvement in microcredit provides the first interaction with the formal economy for 88% of borrowers, as they are not already involved through paying taxes or through a regular bank loan. On the other hand, microcredit programs do not seem to foster a heightened sense of economic self-efficacy, nor do they seem to simply attract people with it. Instead it seems that Guatemalans across the board value hard work and believe it will be rewarded, and feel that they have ultimate control over the success of their business ventures. Of all my findings I am the most cautious concerning this one, given the difficulty of wording questions that exactly capture the very complicated values I am trying to measure. Of the three changes I investigate for microcredit recipients, then, there is evidence that involvement in microcredit leads to a positive alteration in economic situation and to increased (and usually the only) involvement with the formal sector. However, it does not appear to alter an individual's sense of economic self-efficacy.

How do these changes affect the second generation? There is evidence that child health suffers when a female parent takes a loan, but is positively affected when a father does so. When the borrower is a father, receiving a loan decreases the probability that the respondent's children will have had a serious illness, but that probability increases when the borrower is a woman. The

effects of receiving loans on child education and on birth rate are similar. Overall, involvement in microcredit does not seem to affect child education rates. Among male respondents, though, involvement in microcredit makes it more likely that the child of the respondent has completed all mandatory years of education. Conversely, involvement in microcredit has a negative effect on the final education level of adult children when the borrower is a woman. For child birth rate, microcredit appears to increase the number of children born to the child of a recipient, and decrease the age at first birth of borrowers' children. When broken into samples based on gender, however, the results change slightly. In the male sample, receiving any kind of microloan has a small, statistically significant and negative effect on the number of children born to the child of a loan recipient. For female respondents, receiving a loan still has a positive effect on number of grandchildren, one that is substantially larger than the small negative effect in the male sample. In other words, the impact of microcredit on birth patterns is the opposite of the effect that I hypothesized: instead of leading to a decline in fertility, involvement in microcredit leads to a second-generation increase in birth, but only if the borrower is a woman.

The only hypothesis pertaining to the second generation that is substantiated concerns the effect of receiving microloans on child career path. The children of microloan recipients are more likely to take high-skill jobs and more likely to have a career in the formal economy than the children of non-recipients. These effects are particularly strong when microcredit involvement is through business loans, and are the same for both male and female recipients.

Finally, are these second-generation effects stronger when the loan recipient is female? According to my results when the sample is constrained to borrowers, parent gender has no effect on any of the dependent variables except education. Here it seems that having a female parent who receives loans actually decreases a child's level of education. This effect also seems

to be stronger for older children. The rest of my results in the sample of borrowers show that the gender of the parent receiving the loan does not importantly affect child health, career path, or birth patterns. In light of tests throughout this study, though, it seems clear that gender affects outcomes, and that these outcomes are more negative for female than male borrowers.

Some tests were inconclusive. For the respondents, a few aimed at ascertaining whether microcredit leads to first-generation gains in well-being yielded no significant results. On the level of the second generation, receiving microloans does not have a significant effect on child immunization rates. Given the problems with my research design and the small number of observations I was able to gather, it is interesting that I actually found significant results for so many of the tests.

In sum, most of my results show that microcredit has positive first-generation consequences, but also show that the second-generation effects are quite mixed. As I expected, involvement in microcredit leads to first-generation increases in economic well-being and contact with the formal economy. For the second generation, an increase in formal-sector and high-skill jobs among the children of loan recipients is as I had hypothesized. Improvements in child health and education and decreased birth rate also result, but only for male borrowers. For female borrowers, receiving loans increases child birth rate, increases illness propensity and decreases child education level. These opposite effects are some of the most surprising results in my study, and illustrate that all policies have unintended consequences. Many scholars and most policy makers believe that integrating women into business through microcredit has positive first and second-generation effects, but these results show that they may be mistaken.

Another two hypotheses were refuted, the first concerning the level of economic self-efficacy of borrowers versus non-borrowers. It does not appear that microcredit recipients have a

stronger sense of economic self-efficacy than non-borrowers. In fact self-efficacy hardly varies across the sample. It appears that my argument is incorrect that a heightened sense of self-efficacy facilitated by involvement in microcredit causes any of the second-generation effects; however, my general argument is not hurt, since all of the effects could possibly be caused by simple material gains. The second refuted hypothesis concerns the gender of the loan-receiving parent. It seems to have a significant effect on most of the second-generation outcomes, but one that is opposite to the relationship hypothesized: being a female borrower actually seems to lead to negative effects for children.

Before we can fully understand the second-generation effects of microcredit programs, impact analyses must focus on a broader geographical range of institutions. Bangladeshi and Indian microfinance programs have attracted a great deal of attention, while Latin and particularly Central American initiatives have received little. Study has also tended to focus on microcredit's impacts in very poor countries, but ignores how it affects lives in more developed ones. For instance, perhaps the household expenditure patterns of men versus women are different in very poor countries than in developing ones. Those patterns could also be based on particular cultural characteristics. My results support the stance that men and women distribute resources in different ways, but maybe this conclusion is not accurate elsewhere, hence the mix of conclusions on this question in the literature. The effects of any program differ because of local context, and we cannot know these differences without comparative data.

While my results show that microcredit is generally a positive force in recipients' immediate economic lives, more scholarship must be devoted to ascertaining how generally we can assume that this is true. The results presented here point to a moderate increase in first-generation well-being, but we need to know how many people see this result, how many have

great success, and how many actually have greater economic woes after receiving loans on average. Possible self-selection must also be further investigated. Are people who choose to become involved in microcredit different from non-borrowers in some substantive way? According to my results, they do not differ on economic self-efficacy as I have measured it. My measure has its problems, but even if it is not self-efficacy that separates the groups, perhaps some basic level of optimism or an economic dimension that I have not captured in my control variables does tend to differentiate the people who take loans from those who do not. The attribution dilemma is again at play; how can we know that the children of borrowers are more likely to take high-skill jobs than their non-borrowing peers due to some influence by microcredit, when it could be due to some parental attribute that makes the parent more likely to encourage his or her children to take such jobs as well as to take microloans?

Finally, more study should be devoted to my findings that microcredit involvement leads to a higher birthrate, lowered education and increased incidence of illness for the children of female borrowers. What exact mechanism brings about this difference in outcomes based on gender? This is the most important question that remains to be answered. At first glance we could assume that, since Guatemala is a socially traditional society and women are very much in charge of childcare, when they take business loans they become more busy with work and have less time for their children. When a man takes a loan, on the other hand, the increased income that he generates can be distributed to children without losing the presence of the primary caregiver in the home. We must investigate this situation as a possible cause of lowered education and increased illness. In terms of increased birth rate, how do the resources of one generation translate into an increase in number of members of the third generation? Does this effect depend on certain circumstances; for instance, must the children of loan recipients live in

the same household as the borrower? And why does this effect only occur when the borrower is a woman? Many questions remain to be answered before we can truly understand the effects of microcredit, both for the first generation and beyond.

Although further research is needed to fully clarify the effects of microcredit, my study yields interesting preliminary conclusions that are highly relevant to aid organizations, microfinance institutions and even the governments of developing countries. From a policy perspective, perhaps the immediate effect is the most salient, so my finding that microcredit does tend to make respondents better off supports the use of microcredit as a poverty alleviation tool. However, these effects seem to be fairly modest, especially since the only significant regression analysis concerned the way respondents perceive their economic situation. It is possible that receiving loans makes you feel proactive, but has little substantive effect on your actual situation. Also, respondents may feel a sense of loyalty to the organization – especially in the case of FGE, since it fosters such close connections between clients and *asesores* – so loan recipients may over-estimate the effect of the loan either consciously or unknowingly for that reason. In any case, my study does not make microcredit appear to be a magic bullet. First generation changes tend to be modest. This has major policy implications as institutions evaluate different programs for poverty reduction. Any organization that is considering implementing a microcredit program is aware of the costs of doing so, but they need to know that the return on that investment may be marginal. By conducting cost-benefit analysis, it may prove that other poverty reduction programs, for instance conditional cash transfer or microfinance savings plans, may yield a better immediate return for the same investment.

The second-generation impacts of microcredit shown in this study have significantly more worrisome practical implications. Most microcredit organizations have assumed that

positive second-generation effects follow microloans, but the nature of these effects has been unclear since few scholars have directly focused their attention on them. My preliminary results show that second-generation effects depend on the gender of the parent, and being a female recipient negatively affects the second generation. When borrowers are male, positive second-generation effects of microcredit can apparently be harnessed. Receiving microloans lowers child propensity to serious illness for male borrowers, an effect that would likely be more pronounced in poorer countries where the overall incidence of disease is higher. Male parent involvement in microcredit leads to a higher level of child education, which is important for the career and income paths of children. It also lowers the birth rate of the male borrower's children, indicating that they are delaying childbirth for the benefit of their careers.

All of these results flip for female borrowers. At present microcredit organizations actively encourage female participation, and far more women than men take part in microcredit around the world. Microfinance organizations target women for a number of reasons, one being that women are assumed to direct more of their income to their children than men. My results show that this may not be the case. Perhaps when women take microloans and become involved in a business they have less time at home to take care of their children. Although women may still be targeted for involvement in microcredit for other reasons such as empowerment, policy makers must be aware that drawing women into microcredit may have important negative effects for their children. While the immediate effects of receiving microcredit may be positive for the first generation, then, the net long-term effects could actually be negative.

The only finding that does not depend on parent gender concerns child career path. Little study has been devoted to this question, so policy makers and scholars alike probably do not know that the children of loan recipients appear to be more likely to take high-skill jobs in the

formal economy, an effect that is stronger when the parent has received business loans in particular. This effect might be the most important one, since a child's career is probably the key variable in determining his or her own quality of life. If receiving a loan does increase the probability that the child will hold a high-skill job in the formal sector, it may not be so important that it also increases child illness incidence, decreases education and increases birthrate for the children of female borrowers, since that child will go on to get a higher-paying job anyway. Scholars should investigate the causal mechanism behind this important positive effect so that policy makers are able to cultivate this second-generation increase in modern jobs.

Even when focusing on only the positive first- and second-generation effects of microcredit, we need to keep in mind that macro-level troubles dwarf many micro-level gains. Most respondents mentioned in some form or another that prices are too high and sales too low, and some indicated that there are not enough high-skill jobs for all of the newly qualified candidates. Grassroots-type poverty alleviation efforts will not be enough to independently spur macro-level development. Certain structural conditions, especially inflation and unemployment in high-skill sectors, must be addressed before programs like microcredit can have a major effect.

A final note of interest to policy makers is that particular kinds of loans have different effects. Business loans have the most obvious impact, but qualitatively, business loans in conjunction with home loans also seem to be helpful. Receiving a home loan does not really improve the family's financial situation; in fact, families who receive only home loans are more likely to report that they struggle to pay the loan each month. Obviously, people receiving only home loans do not have a concurrent increase in income, so finances become even more strained. Taking a home loan does result in a quite immediate and dramatic improvement of quality of life, however. Institutions involved in microcredit should consider this carefully. Perhaps the best

solution is to begin families with a business loan, and if their business grows enough to provide sufficient income to pay both the business and a new home loan, then the client should be encouraged to take the latter. This would harness the income-increasing potential of business loans, while also affording clients the immediate improvement of better living conditions. However, policy makers must keep in mind the possible negative effects to the second generation of giving business loans to women. In that context it is possible that giving home loans is the safest bet, if not the option that yields the greatest immediate economic benefit.

The findings presented in this thesis highlight a number of important first- and second-generation effects of involvement in microcredit programs. I provide cautious evidence that microcredit positively affects the lives of borrowers, but show that the common knowledge concerning the second-generation effects of these programs is not quite correct. With this more nuanced knowledge of the second-generation effects of microcredit, institutions like the United Nations and USAID will be better equipped to make funding decisions. This study is only one piece in the puzzle, however. We must have information from a wide variety of countries and cultures before decision makers are able to truly understand the benefits, drawbacks and cost effectiveness of microcredit programs. Hopefully my research draws attention to this deficit and spurs closer study as the second-generation effects and long-term possibilities of microcredit become clearer in the coming years.

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Appendix:

Frequencies of Major Variables

Variables	Frequency	Mean/Median	Range
adulteduc2	Children who have had no formal education = 8 Children who stopped with some or all primary school = 33 Children who stopped during or after básicos = 15 Children who took some years of career or graduated from career = 36 Children who are currently enrolled in college, took some, or graduated = 20	Mean = 5.24 Median = 5 (graduated básicos)	1-9
adultjob3	Unemployed child = 13 Child employed in low-skill job = 68 Child employed in high-skill job = 24	Mean = 2.104 Median = 2	1-3
adultjobformal2	Unemployed child = 13 Child employed in informal-sector job = 45 Child employed in formal-sector job = 39	Mean = 2.27 Median = 2	1-3
age		Mean, kids = 15.61 Median, kids = 14 Mean, respondents = 37.85 Median, respondents = 37	Kids: 1 month – 52 years Respondents: 20 years – 68 years
agefirstbirth2	Child under 18 when gave birth for first time = 7 18-19 = 19 20-21 = 18 22-29 = 11	Mean = 20 Median = 20	16-29
complete2	Children who have not completed the appropriate years of schooling = 55 Children who are behind in appropriate schooling by less than 2 years = 6		

	Children who have completed the appropriate amount of schooling = 200		
control	Respondent feels as if he or she has little or no control over future of business = 7 Some control = 20 Complete control = 53	Mean = 2.58 Median = 3	1-3
educ	Respondents received no formal education = 8 Respondents who stopped with some or all primary school = 48 Respondents who stopped during or after básicos = 15 Respondents who took some years of career or graduated from career = 15 Respondents who are currently enrolled in college, took some, or graduated = 10	Mean = 4 Median = 3	1-9
female	Male = 131 children, 27 respondents Female = 168 children, 70 respondents		0-1
hardwork	Respondent feels that a person can work hard, manage money well and still not have enough money to get by = 11 Respondent feels that a person can work hard but has to manage money well to get by = 20 Respondent feels that if a person works hard they will certainly have enough = 61	Mean = 2.54 Median = 3	1-3
illness	Children who have not had a serious illness = 230 Children who have had a serious illness = 61		0-1
indigenous	Indigenous = 146 kids, 43 respondents Non-indigenous = 160 kids, 54 respondents		0-1
loanhistory	Respondent never received loan = 31 Respondent borrowed from unofficial source before taking microloan = 5 Microloan was respondent's first loan = 56 Normal bank loan was respondent's first loan = 5	Mean = 3.04 Median = 4	1-4
makingitcurr	Respondent feels that the family currently does not have enough to get by on = 22 Respondent feels that the family currently has	Mean = 2.06 Median = 2	1-3

	just enough to get by on = 37		
	Respondent feels that the family has enough to get by on and to save = 27		
makingitpre	Question not applicable = 20	Mean = 1.23	0-3
	Respondent feels that the family did not have enough to get by on before receiving loans = 22	Median = 1	
	Respondent feels that the family barely had enough to get by on before receiving loans = 27		
	Respondent feels that the family had enough to get by on and to save before receiving loans = 5		
numgrandkids	Children who have not yet had children of their own = 245	Mean = .43	0-7
	Children with one child = 16	Median = 0	
	With 2 = 17		
	With 3 = 16		
	With 4 =		
	With 5-7 = 4		
parentfemale	Male = 73 children have male parent		0-1
	Female = 233 children have male parent		
pctageloan	Never received a loan = 94 children, 29 respondents	<u>Kids</u>	0% - 100% (kids)
	Up to 25% of life receiving loan = 71 children, 59 respondents	Mean = 29.73%	
	Up to 50% of life receiving loan = 79 children, 7 respondents	Median = 23%	0%-38% (respondents)
	Up to 75% of life receiving loan = 23 children	<u>Respondents</u>	
	Up to 100% of life receiving loan = 39 children	Mean = 8.71%	
		Median = 8%	
receipts	Respondent that do not issue receipts = 75		0-1
	Respondents that issue receipts = 20		
remitt	No one in home receives remittances = 85 respondents		1-3
	Someone receives remittances and relies on		

	them a little = 9	
	Someone receives remittances and relies on them heavily = 3	
urbanrural	Respondent lives in rural area = 29	1-3
	Respondent lives in semi-urban area = 26	
	Respondent lives in urban area = 41	
yesnobusn	Never received a business loan = 156 children, 51 respondents	0-1
	Received a business loan = 150 children, 46 respondents	
yesornoloan	Never received a loan = 94 children, 29 respondents	0-1
	Received any kind of loan = 212 children, 68 respondents	

Codebook: Respondents Dataset

	VARIABLE NAME	QUESTION WORDING	VALID RESPONSES
1.	age	How old is are you?	Number indicates age of respondent
2.	aveloanamt	Takes average of reported loan amounts; see Survey Section 1A, Q1	Number indicates calculated average amount of loans received, in quetzals
3.	control	Do you feel that you have control over the future and success of your business? (Section 1, Q7)	1 = respondent feels as if she has little or no control over future of business, 2 = some control, 3 = complete control
4.	educ	What was the last year of school that you completed? (Section 3, Q8)	1 = respondent received no formal education, 2 = respondent received some primary school education, 3 = respondent finished primary school (6 th grade), 4 = respondent received some secondary education, 5 = respondent finished secondary education (3o basico), 6 = respondent took some years of career (Bachillerato, Magisterio, Perito Contador, Secretariado) OR graduated from technical school, 7 = respondent graduated from career, 8 = respondent attended but did not graduate university or is currently enrolled, 9 = respondent graduated university
5.	female	Section 3, Q1	0 = male respondent, 1 = female respondent
6.	govmoney	Do you or does someone who lives in your home receive money from the government, for example from the <i>Mi Familia Progres</i> a program or a retirement pension? (Section 3, Q6)	0 = respondent does not receive welfare-type money from government, 1 = respondent receives money from Mi Familia Progresa or other government program, 2 = someone in home is retired and receives pension from government

7.	hardwork	Do you think that if a person works hard and a lot, they will have enough money? (Section 1, Q8)	1 = respondent feels that a person can work hard, manage money well and still not have enough money to get by, 2 = respondent can work hard but have to manage money well to get by, 3 = respondent feels that if a person works hard they will certainly have enough
8.	incomebuspct	Took percent increase or decrease in per-month income of business before and after receiving loans; see Survey Section 1, Q5 and 1A, Q4	Number indicates percent increase or decrease in business income after taking loan
9.	indigenous	Do you consider yourself indigenous or ladino/mestizo/mezclado? (Section 3, Q3)	0 = respondent does not identify as indigenous, 1 = respondent identifies as indigenous
10.	indivgroup	Do you receive your loan individually or with a group?	1 = no loan 2 = individual 3 = duo 4 = group 5 = home improvement
11.	loanhistory	Derived from Section 1A, Q1	1 = Never received loan. 2 = Received loan from unofficial source. 3 = Borrowed from unofficial source before taking microloan. 4 = microloan first loan. 5 = normal bank loan first loan – over Q25,000.
12.	makingitcurr	Right now, the money that you make and the total family income: a) are enough for you to get by on, and you can save, b) are just barely enough for you to get by on, or c) are not enough for you to get by on.	1 = The current total family income is not enough to get by on. 2 = The current total family income is just barely enough to get by on, and leaves no extra for saving. 3 = The current total family income is enough to get by on and allows for saving.

		(Section 1, Q10)	
13.	makingitpre	Before taking your first loan, the money that you made and the total family income: a) was enough for you to get by on, and you could save, b) was just barely enough for you to get by on, or c) was not enough for you to get by on. (Section 1A, Q5)	0 = Question not applicable. 1= The total family income before receiving loans was not enough to get by on. 2 = The total family income before receiving loans was just barely enough to get by on, and left no extra for saving. 3 = The total family income before receiving loans was enough to get by on and allowed for saving.
14.	numberloans	Derived from Section 1A, Q1	Number indicates total number of microloans received from all institutions
15.	parentloansyesno	Has one of your parents received a small loan for their business? If so, which parent and during how many years? (Section 1, Q9)	0 = neither parent ever received loans, 1 = one or both parent received a loan or loans
16.	pctageloan	Calculated by dividing number of years the adult has been receiving microcredit by the adult's total age.	Number indicates percentage of adult's life during which he or she has received any type of loan
17.	receipts	Do you issue receipts? (Section 1, Q3)	0 = does not issue receipts 1 = does issue receipts
18.	remitt	Do you or does someone who lives in your house receive remittances from outside of the country? If so, to what point does your family income depend on the remittances: a lot, a little, or very little? (Section 3, Q7)	1 = no one in home receives remittances, 2 = someone in home does receive remittances but they do not depend heavily on them for household expenditures, 3 = someone in home receives remittances and they depend on them somewhat, 4 = someone in home receives remittances and they depend on them heavily.

19.	situation	Do you consider that your current economic situation is better or worse than before you received loans? (Section 1A, Q6)	:0 = Respondent has never taken loan. 1 = Respondent considers his current economic situation to be worse than before taking loans. 2 = Respondent considers his current economic situation to be the same as before taking loans. 3 = Respondent considers his current economic situation to be a little better than before taking loans. 4 = Respondent considers his current situation to be significantly better than before taking loans.
20.	things	Could you tell me if you have in your home: a television, a refrigerator, a cellular telephone, a microwave, a computer. (Section 3, Q9)	0 = respondent currently does not have a television, cell phone, refrigerator, microwave nor computer, 1 = respondent has one of these things, 2 = respondent has 2... etc.
21.	thingsploan	Before receiving microloans, which of these items did you have in your house? Television, refrigerator, cellular telephone, microwave, computer. (Section 3, Q10)	0 = after receiving a loan, there is no change in the number of things the respondent has. Negative numbers up to 5 indicate things the respondent had before the loan but not after. Positive numbers up to 5 indicate things the respondent acquired after receiving the loan.
22.	urbanrural		0 = rural 1 = semi-urban 2 = urban
23.	yesnobusn	Derived from Section 1A, Q1	0 = parent has never received a business loan, 1 = parent has received a business loan
24.	yesornoloan	Have you received a small loan for your business or home? (Section 1, Q11)	0 = parent has never received loan, 1 = parent has received a loan, past or present.
25.	yrsoldloan	Derived from Section 1A, Q1	Number indicates the number of years since first loan was received from any institution

Codebook: Children Dataset

	VARIABLE NAME	QUESTION WORDING	VALID RESPONSES
26.	adulteduc	<p>This variable was created by using the data from the following question, then dropping out the observations of any child still enrolled in school or any child too young to be enrolled in school. In other words, the variable only includes observations for children who have completed the schooling they plan to attend.</p> <p>What was the last year of school that your child completed? (Section 2, Q7)</p>	<p>0 = child is currently enrolled in school, not yet an adult. 1 = child received no formal education, 2 = child received some primary school education, 3 = child finished primary school (6th grade), 4 = child received some secondary education, 5 = child finished secondary education (3o basico), 6 = child took some years of career (Bachillerato, Magisterio, Perito Contador, Secretariado) OR child graduated from technical school, 7 = child graduated from career, 8 = child attended but did not graduate university, 9 = child is currently enrolled in university, 10 = child graduated university</p>
27.	adultjob	<p>What is the occupation or type of job that your child has? (Section 2, Q13)</p>	<p>0 = child is not an adult, or living independently. 1 = child has no job. 2 = child has low-skill or is studying low-skill career job. 3 = child has high-skill job or is studying high-skill career. 4 = child works in parent's loan business, or primary business if they do not receive loans. 5 = child works in other parent's non-loan business.</p>
28.	adultjob2	<p>Derived from Section 2, Q13.</p>	<p>0 = child is not an adult or is not living independently, 1 = child has no job, 2 = child has low-skill job, 3 = child has high-skill job</p>

29.	adultjobformal	Derived from Section 2, Q13.	0 = child is not an adult or is not living independently, 1 = child has no job, 2 = child has job in informal economy (employee in small business, owns small business, works with parent loan business that is informal), 3 = child has job in formal economy (employees of large business, any high-skill job, owns large business that gives receipts)
30.	age	What is the age of your child in years? (Section 2, Q2)	Number indicates age of child
31.	agefirstbirth	Does your child have children of his/her own? If so, how old was your child when his/her first child was born? (Section 2, Q9)	Number indicates age of child when her first child (respondent's grandchild) was born.
32.	ageloan	Derived from <i>yrsoldloan</i> variable in respondent dataset, and child's current age	Number indicates age of child when parent took first loan/small loan. 0 indicates that child was not yet born.
33.	complete	Has your child completed all appropriate years of schooling for his/her age? (Section 2, Q8)	0 = Child is too young to attend school. 1 = Child did not complete all years of school for his age. 2 = student is behind by less than three years. 3 = Child completed all normal years of school for her age.
34.	female	Section 2, Q1	0 = male child, 1 = female child
35.	illness	Has your child had any serious illness during his/her childhood? (Section 2, Q4)	0 = Child has never had a serious illness. 1 = Child has had a serious illness.
36.	immun	Did your child receive his/her vaccinations? (Section 2, Q5)	0 = Child did not receive all free immunizations. 1 = Child did receive all.
37.	indigenous	Derived from Section 3, Q3: Do you (the parent) consider yourself indigenous or <i>ladino/mestizo/mezclado</i> ?	0 = parent identifies as non-indigenous, 1 = parent identifies as indigenous

38.	numgrandkids	If your child has children of his/her own: how many? (Section 3, Q9)	Number indicates number of children the child has.
39.	parenteduc	What was the last year of school that you completed? (Section 3, Q8)	1 = respondent received no formal education, 2 = respondent received some primary school education, 3 = respondent finished primary school (6 th grade), 4 = respondent received some secondary education, 5 = respondent finished secondary education (3 ^o basico), 6 = respondent took some years of career (Bachillerato, Magisterio, Perito Contador, Secretariado) OR graduated from technical school, 7 = respondent graduated from career, 8 = respondent attended but did not graduate university or is currently enrolled, 9 = respondent graduated university
40.	parentfemale	Derived from Section 3, Q1	0 = parent (respondent) is male, 1 = parent (respondent) is female
41.	pctageloan	Calculated by dividing number of years the child has been exposed to microcredit by the child's total age	Number indicates percentage of child's life that his or her parent has received any type of loan
42.	underagedream	If the child is under the age of 18, still enrolled in school or living at home, or otherwise is not living independently: What occupation does your child want to have when he/she grows up? (Section 3, Q11)	0 = child is an adult or living independently, or child does not have any dream for future career. 1 = child wants low skill job. 2 = child wants high skill job.
43.	urbanrural		0 = rural, 1 = semiurban, 2 = urban
44.	yesnobusn	Derived from Section 1A, Q1	0 = parent has never received business loan, 1 = parent has received business loan

45.	yesornoloan	Derived from question to parent: Have you received a small loan for your business or home? (Section 1, Q11)	0 = parent has never received loan. 1 = parent has received a loan, past or present.

Appendix: Survey

Numero del sondeo: _____
Rural / Urbano / R-U
Sucursal: _____
Hora de empezar: _____:_____
Día de entrevista: _____
Metodología: individual / grupal / no cliente

Sección 1: Préstamos

1. ¿Cuál es la ocupación o tipo de trabajo que usted realiza?

2. ¿Usted tiene un negocio propio? sí / no

Si afirmativa:

¿Su negocio lo comparte con alguien más: esposa(o), hermano(a), amigo(a) otros? Si / no

3. ¿Usted emite facturas? si / no

4. ¿Cuál es la ocupación o tipo de trabajo que realiza?

5. Actualmente, ¿cuánto dinero entra por mes a su casa en total? ¿De su negocio?

6. ¿Cuántas personas en su hogar tienen trabajo? _____

¿Quién, que hacen, y cuanto dinero entra a su casa de sus empleos?

7. ¿Usted siente que tiene control sobre el futuro y éxito de su negocio?

Sí, mucho / Regular / No mucho / No, para nada

8. ¿Usted cree que si una persona trabaja mucho y duro, que esta persona va a tener bastante dinero? sí / no / depende

9. ¿Alguno de sus papás ha recibido pequeños préstamos para el negocio? Sí / no

a. ¿Quién? Madre _____ Padre _____ los dos _____

b. ¿Durante cuantos años? Madre _____ Padre _____

10. Ahora mismo, el dinero que usted recibe y el total del ingreso familiar:

- (a) Les alcanza bien, pueden ahorrar.
- (b) Les alcanza justo sin grandes dificultades.
- (c) No les alcanza, tienen dificultades.

11. Usted ha recibido un pequeños préstamo para su negocio o vivienda? Sí / no
Si la respuesta es afirmativa: sigue con la Sección 1
Si la respuesta es negativa: vaya a la Sección 2

12. ¿Recibe los préstamos actualmente, o en el pasado? / de Génesis o no
Actualmente / en el pasado

Sección 1A: Para los que reciben préstamos

1. ¿De cuales instituciones ha recibido los préstamos? ¿Durante cuantos años trabajaba con cada uno? ¿Cuánto dinero recibe / recibió por cada préstamo, y cuántos préstamos recibe / recibió cada año? Si ha recibido un préstamo de una fuente informal, anotar de quien.

2. ¿Para qué usa / usaba el dinero de los préstamos?

3. ¿A qué se dedicó (en qué trabajaba) usted principalmente antes de recibir los préstamos?

4. Antes de recibir los préstamos, ¿cuánto dinero entró por mes a su casa? ¿De su negocio?

5. Antes de recibir los préstamos, el dinero que usted recibía y el total del ingreso familiar:

- (a) Les alcanzaba bien, podían ahorrar.
- (b) Les alcanzaba justo sin grandes dificultades.
- (c) No les alcanzaba, tenían dificultades.

6. ¿Considera usted que su situación económica actual es peor o mejor que su situación antes de recibir los préstamos? Mejor / igual / peor

7. ¿Usted ha recibido capacitación de Génesis Empresarial / banco? si / no

Si es afirmativa:

- i. ¿Después de haber recibido capacitación considera que su negocio ha mejorado?
si / no
 - ii. ¿Considera que la capacitación le han ayudado para mejorar los ingresos? si / no
 - iii. ¿Las capacitaciones recibidas le han ayudado? si / no
 - a. ¿Cómo le han ayudado?
-

Sección 2: Hijos

¿Usted tiene hijos? Sí / no

Si afirmativa: sigue con la Sección 2

Si negativa: vaya a la Sección 3

¿Cuántos hijos tiene? _____

¿Cuántos hijos viven en su hogar en este momento? _____

Preguntas sobre el hijo/a mayor:

1. ¿Hombre o mujer? H / M
2. ¿Edad en años? _____
3. ¿Su hijo puede leer y escribir en español? Sí / no
4. ¿Su hijo tuvo/ha tenido alguna enfermedad grave durante su niñez?
No / Sí _____
5. ¿Su hijo recibió las vacunas? Sí / Algunas / No
¿Por qué no? _____
6. ¿Su hijo actualmente asiste a la escuela? sí / no
7. ¿Cuál fue el último año de enseñanza que su hijo aprobó?
Ninguno 0
Primaria 1 2 3 4 5 6
Secundaria (Básicos: primero básico, segundo básico, tercero básico) 7 8 9
Bachillerato, Magisterio, Perito Contador o Secretariado (Secundaria) 10 11 12
Universitaria 13 14 15 16 17 18+
Superior no universitaria (explicar) _____
8. ¿Su hijo ha cumplido todos los años de escuela para su edad? sí / no
Si negativa: ¿Porque?
 - i. Para ayudar con mi negocio
 - ii. Para ayudar con trabajos de la familia
 - iii. La escuela es demasiado cara o es muy difícil llegar allí
 - iv. Para conseguir trabajo

- v. Para empezar su propio negocio
- vi. Otro _____

9. ¿Su hijo tiene hijos propios? sí / no
- i. ¿Cuántos? _____ / no sé
 - ii. ¿Cuáles son sus edades? _____ / no sé
 - iii. ¿Cuántos años tenía su hijo cuando nació su primer hijo propio? _____
10. ¿Su hijo es menor de edad? Si / no
- a. *Si es un niño, vaya a las preguntas en Caja 1*
 - b. *Si es un adulto, vaya a las preguntas en Caja 2*

Caja 1: Menor de Edad

11. ¿Cuál es la ocupación o tipo de trabajo que su hijo quiere tener cuando sea mayor?

12. ¿Su hijo hace algún trabajo, o ayuda la familia con algo?

Caja 2 - Adultos

13. ¿Cuál es la ocupación o tipo de trabajo que realiza su hijo? _____

14. ¿Recibe préstamos para microempresa? Sí / no

- a. *Si afirmativa:* ¿Trabaja en la misma empresa que usted? sí / no

15. ¿Su hijo sigue viviendo en su pueblo natal, o ha mudado? Quedado / mudado

- a. *Si ha mudado:* ¿A donde mudó? _____

- b. *Si ha mudado:* ¿Por qué cree usted que su hijo mudó?

- i. Para encontrar un trabajo mejor
- ii. Para encontrar trabajo, porque es difícil encontrar uno aquí
- iii. Otro _____

***Si tienen más que 2 hijos, sigue con páginas extras para los otros hijos.
Si solamente tiene un hijo, vaya a la siguiente pregunta.***

Preguntas sobre el hijo/a mayor:

1. ¿Hombre o mujer? H / M
2. ¿Edad en años? _____
3. ¿Su hijo puede leer y escribir en español? Sí / no

4. ¿Su hijo tuvo/ha tenido alguna enfermedad grave durante su niñez?
No / Sí _____
5. ¿Su hijo recibió las vacunas? Sí / Algunas / No
¿Por qué no? _____
6. ¿Su hijo actualmente asiste a la escuela? sí / no
7. ¿Cuál fue el último año de enseñanza que su hijo aprobó?
Ninguno 0
Primaria 1 2 3 4 5 6
Secundaria (Básicos: primero básico, segundo básico, tercero básico) 7 8 9
Bachillerato, Magisterio, Perito Contador o Secretariado (Secundaria) 10 11 12
Universitaria 13 14 15 16 17 18+
Superior no universitaria (explicar) _____
8. ¿Su hijo ha cumplido todos los años de escuela para su edad? sí / no
Si negativa: ¿Porque?
i. Para ayudar con mi negocio
ii. Para ayudar con trabajos de la familia
iii. La escuela es demasiado cara o es muy difícil llegar allí
iv. Para conseguir trabajo
v. Para empezar su propio negocio
vi. Otro _____
9. ¿Su hijo tiene hijos propios? sí / no
i. ¿Cuántos? _____ / no sé
ii. ¿Cuáles son sus edades? _____ / no sé
iii. ¿Cuántos años tenía su hijo cuando nació su primer hijo propio? _____
10. ¿Su hijo es menor de edad? Si / no
a. *Si es un niño, vaya a las preguntas en Caja 1*
b. *Si es un adulto, vaya a las preguntas en Caja 2*

Caja 1: Menor de Edad

11. ¿Cuál es la ocupación o tipo de trabajo que su hijo quiere tener cuando sea mayor?

12. ¿Su hijo hace algún trabajo, o ayuda la familia con algo?

Caja 2 - Adultos

13. ¿Cuál es la ocupación o tipo de trabajo que realiza su hijo? _____
14. ¿Recibe préstamos para microempresa? Sí / no
a. *Si afirmativa:* ¿Trabaja en la misma empresa que usted? sí / no
15. ¿Su hijo sigue viviendo en su pueblo natal, o ha mudado? Quedado / mudado
a. *Si ha mudado:* ¿A donde mudó? _____
b. *Si ha mudado:* ¿Por qué cree usted que su hijo mudó?
i. Para encontrar un trabajo mejor
ii. Para encontrar trabajo, porque es difícil encontrar uno aquí
iii. Otro _____

Sección 3: Preguntas demográficas

1. Mujer o hombre? (m/h)
2. ¿Cuántos años tiene? _____
3. Usted se considera...
(1) Indígena
(2) Ladino / mestizo
(3) Otro _____
4. ¿Cuál es su lengua materna, o el primer idioma que ha hablado de pequeño en su casa?
(1) Sólo Español
(2) Mam
(3) K'iche'
(4) Kaqchiquel
(5) Q'eqchi'
(6) Otro _____
5. ¿Usted puede leer y escribir en español? Sí / no / un poco
6. ¿Usted o alguien que vive en su casa recibe dinero del gobierno, por ejemplo del programa "Mi Familia Progresá"/jubilado? Sí (explica) _____ / no
7. ¿Usted o alguien que vive en su casa recibe remesas (dinero) del exterior? si / no
a. ¿Hasta qué punto dependen los ingresos familiares de esta casa de las remesas del exterior? Mucho / algo / poco / nada
8. ¿Cuál fue el último año de enseñanza que usted aprobó?
Ninguno 0

Primaria 1 2 3 4 5 6

Secundaria (Básicos: primero básico, segundo básico, tercero básico) 7 8 9

Bachillerato, Magisterio o Secretariado (Secundaria) 10 11 12

Universitaria 13 14 15 16 17 18+

Superior no universitaria

9. Para finalizar, podría decirme si en su casa tienen
- televisor sí / no
 - refrigeradora sí / no
 - teléfono celular sí / no
 - microondas sí / no
 - computadora sí / no

Si recibe o ha recibido micropréstamos, termina con esta pregunta:

10. Antes de recibir los préstamos para su negocio, en su casa tenían
- televisor sí / no
 - refrigeradora sí / no
 - teléfono celular sí / no
 - microondas sí / no
 - computadora sí / no

Curriculum Vita

Jordyn E. Haught graduated from Huntsville High School in 2005 as class valedictorian and a National Merit Finalist. She began attending the University of Central Arkansas in May of that year on the most prestigious scholarship in her state, the Governor's Distinguished Scholarship, as well as the largest of the university, the UCA Foundation Scholarship. While pursuing a bachelor's degree in both Spanish and Political Science with an emphasis in Political Economy and Development, Jordyn spent a summer at the Costa Rican Language Academy and a semester at the Universidad de León studying Spanish, and a summer volunteering with *Nuestra Voz* women's empowerment organization in Guatemala City. She graduated summa cum laude from the University of Central Arkansas in 2009, and was named the International Studies Student of the Year for 2008-2009 by that institution. Upon graduation she entered the Master of Arts program in Political Science at the University of Texas at El Paso. During her two years there she worked as a departmental teaching and research assistant. These duties included a two-semester assignment to the UTEP Writing Center, helping undergraduate and graduate political science students with their various writing assignments. Jordyn also won the university-wide 2010-2011 Cotton Memorial Scholarship for excellence in graduate studies, three research grants from various departments to fund her thesis research, and the Thomas Cook Political Science Graduate Student of the Year award for 2010-2011.

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