Can Hope Elevate Microfinance? Evidence from Oaxaca, Mexico

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Abstract: Recent evidence suggests that the average effects of microfinance on borrowers is more modest than previously claimed. However, treatment effects are heterogeneous and may include transformative impacts for some, but the moderators and mechanisms behind this heterogeneity are poorly understood. We carry out an experiment to test whether an intervention designed to increase aspirational hope among borrowers can elevate microfinance impacts. In collaboration with a microfinance lender in Mexico, we produced a documentary featuring successful borrowers within the organization and designed and implemented a hope curriculum rooted in positive psychology (Snyder, 1994), which conceptualizes hope as aspirations, agency and pathways. Bank officers incorporated this curriculum periodically into their regular weekly meetings with a randomly treated half of 52 women's savings and credit groups over the course of one year. We find that the intervention significantly increased indices measuring both aspirational hope and microenterprise performance over this time period. Treated borrower groups were also more likely to persist to future lending cycles.

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1. Introduction

The material conditions and external constraints that characterize persistent poverty are often easier to identify than the internal constraints that afflict the poor. These layers of constraints interact in complex and dynamic ways, often with important interdependencies and feedback loops that perpetuate poverty (Barrett and Swallow 2006). Based on a perceived locus of control that attributes causality to factors outside their control, the poor can develop internal constraints in such conditions that may alter input levels and effort by artificially restricting what is considered to be possible (Sen 1999; Bernard et al., 2014, Dalton et al., 2016). In this paper, we implement a randomized controlled trial (RCT) with female microentrepreneurs in Oaxaca, Mexico to understand whether explicitly addressing internal constraints can amplify the impact of microfinance.

Dramatic narratives in great literature often involve internal struggles with and realizations of the limits of human strivings. Similarly, internal constraints and their social and emotional roots figure prominently in philosophy, theology and – more recently – psychology (Lybbert and Wydick, 2018). While these explorations of the inner perceptions of what is possible often assume they are innate to the human experience, some philosophers and theologians apply them to the experience and potential of the poor specifically. Explorations of this kind are much newer in the field of economics – and are generating some intriguing evidence (Lybbert and Wydick 2018). There is reason to believe, for example, that internal constraints may play important moderation roles in the impact of interventions such as microfinance and may thereby help account for impact heterogeneity.

In contrast to the first wave of empirical microfinance evidence, which generally aligned well with favorable anecdotes offered by microcredit organizations and advocates, the more rigorous experimental evidence generated in the past decade has suggested more moderate or even neutral impacts on borrower income and consumption. An impressive contribution to this second wave of rigorous evidence came in the form of six microcredit RCTs in different countries across a range of locations, borrowers, lenders, and loan characteristics designed to enable direct comparisons of estimated impact.[1]

Taken together, these studies provide "a consistent pattern of modestly positive, but not transformative, effects" (Banerjee et al. 2015). These evaluations include only limited

[1] These evaluations were published in 2015 as a special issue of *American Economic Journal: Applied Economics* (volume 7, issue 1).

analysis of heterogeneous treatment effects, which hints that microcredit may be "good for some, bad for others" (p.14) and is a promising area for further research. As noted in the introduction to this collection:

> "…there is growing concern among policymakers, advocates, and funders that one or more behavioral tendencies leads some, perhaps many, people to do themselves more harm than good by borrowing. It is worth emphasizing that there is scant evidence on how behavioral tendencies actually mediate credit impacts (Zinman 2014), and in any case, the presence of behavioral deviations from rationality may in some cases strengthen the case for microcredit rather than weaken it (Banerjee and Mullainathan 2010; Bernheim, Ray, and Yeltekin 2013: Mullainathan and Shafir 2013; Carrell and Zinman 2014)." (Banerjee et al. 2015, p.20)

Our evaluation of the impact of hope on the effect of microfinance aims to enhance our understanding of how behavioral tendencies – in this case, borrowers' aspirations and perceptions of their capacity to realize these aspirations – moderate and mediate impacts of credit on microenterprise outcomes. The opportunity to design and conduct this research emerged because our microfinance partner in Oaxaca, Mexico, *Fuentes Libres* (*Fuentes* hereafter), had come to a similar conclusion, observing that some of their borrowers flourished with access to microcredit, while the majority remained roughly the same after joining community banks. In collaboration with *Fuentes*, we designed and test an intervention to evaluate hope, operationalized originally by Snyder (1994) as aspirations, pathways and agency, to ascertain if internal constraints might magnify the impact of microfinance access.

Snyder's (1994, 2002) work developing "hope theory" provides the conceptual framework for our intervention. In this research, Snyder argues that hope is not purely an emotional experience; it is also a cognitive process. Hope is a way of thinking about one's future, one's plans for the future and about oneself. Specifically, Snyder's work understands hope as (i) aspirations (goals) about future achievements, accomplishments or states of being, (ii) pathways by which one envisions realistic progress towards these aspirations, and (iii) agency to act in accordance with these perceived pathways in pursuit of these aspirations. Since this is intended to be an empirically-tractable conceptualization of hope, Snyder and others have developed and tested self-reported hope scales to assess each of these dimensions and construct comparable composite hope measures that can be used to understand the relationship between hope and performance and other personal outcomes. As described throughout this paper, we use this framework as the basis for a simple

economic model to guide our empirical work, for the hope intervention, and for our measurement and evaluation of hope changes induced by this intervention.

Fuentes lends to women who operate micro-enterprises and are part of its network of savings and credit groups (SCGs). Together we designed a hope intervention that consisted of the screening of a commissioned 25-minute documentary that featured four successful borrowers from our study area, goal-setting exercises focused on the micro-enterprises of these women, and periodic follow-up messages related to the three components of hope. Our randomization utilized 26 matched pairs of SCGs based on relevant observable features, where we randomly assigned one group from each pair to receive the hope treatment. To track outcomes, including self-reported hope measures and business performance, we conducted surveys at baseline, then one and 12 months after treatment began. We also use *Fuentes* administrative data from these groups to track savings and loan demand as outcome variables.

Several findings emerge from this study related to our main research question, whether hope can elevate the impact of microfinance and microenterprise performance. First, before exploiting exogenous variation in exposure to the hope curriculum, we find that baseline and endline measures of hope are strongly correlated with endline business performance. This suggests that endogenous differences in hope among these microentrepreneurs are positively correlated with—and a predictor of—microenterprise outcomes. Second, exploiting our randomization, we find that the intervention increased measured hope among treated borrowers. At one month, the strongest effects on hope come from increased aspirations, but at 12 months the strongest effects come from increased agency and pathways, suggesting that hope components are malleable but may activate at time steps. Third, we find that the intervention moderately but measurably improved micro-enterprise outcomes, all of which display positive point estimates, and are jointly statistically significant as captured by a composite index of business performance. Finally, treated groups are more likely to continue into future lending cycles, although increases in savings and loan demand within these groups are not statistically significant.

We begin in Section 2 with an overview of an economic model that captures the elements of hope theory and discuss its implications for the design and analysis of results in the present study. We then provide details of our hope intervention in Section 3 and the data and empirical strategy, including the measurement of hope and other outcomes, in

Section 4. We present, interpret, and discuss our results in Section 5, which differentiates between results from our registered pre-analysis plan (PAP)[2] and exploratory results that we believe offer interesting insights but were non-pre-specified. We conclude with a discussion of what this research and these results contribute to our understanding of heterogeneous microfinance impacts. How viable is amplifying aspirational hope as a strategy for elevating microfinance impacts? This remains an open question that deserves continued research as one of several potential behavioral dimensions to the credit and investment decisions of the poor.

2. An Economic Model of Hope

To elucidate potential channels by which hope may shape economic outcomes, Lybbert and Wydick (2018) develop a model of hope that explicitly incorporates the elements and essence of hope theory (Snyder 1994). At the outset, it is important to distinguish between *aspirational hope* that motivates action aimed at an aspiration and *wishful hope* that passively yearns for a given outcome that the agent considers outside her control. While wishful hope is believed to be important in many contexts, such as medical healing and coping with events outside of one's control (Del Vecchio Good et al. 1990), in this research, we focus on aspirational hope that is more naturally proactive. We provide a brief overview to the economic model derived in Lybbert and Wydick (2018) in order to set the stage for our hope intervention and to derive the testable predictions for our experimental design of this intervention.

The three components of Hope Theory—aspirations, pathways and agency—each play a distinct role in this simple economic model. As an adaptation of prospect theory (Kahneman and Tversky 1979), aspirations enter the model as a reference point in the utility function such that utility is marginally increasing in outcomes up to the aspiration, A, and diminishing thereafter. Individuals with aspiration-dependent utility choose the amount of costly effort e at time t to maximize the level of outcome Y at $t+1$ subject to the cost of effort. The realized outcome is a function of both effort and an idiosyncratic shock v, where the mapping of effort into expected outcome reflects the agency component of the model. Finally, pathways are introduced as an outcome constraint $\bar{Y}$

[2] Our pre-analysis plan is available at: https://www.socialscienceregistry.org/trials/721/history/4332.

such that the marginal product of effort is zero for outcomes beyond a given pathways constraint, capturing the notion that a failure in formulating viable pathways beyond this point makes it impossible for the agent to imagine achieving higher levels of outcomes through increased effort. The specific model of Lybbert and Wydick (2018) based on this set up is as follows:

$$\max_{\{e_t\}} \quad U_{t+1} = E(u_{t+1}) - c(e_t) \; (1) \tag{1}$$

$$\text{s.t.} \quad \mathrm{Y}_{t+1} = \pi e_t + \pi_v v_{t+1} \tag{2}$$

$$E(Y_{t+1}) = \begin{cases} \pi e_t & if \quad e_t < \bar{e} \\ \bar{Y} & if \quad e_t \geq \bar{e} \end{cases} \tag{3}$$

$$u(Y|A) = A\left(\frac{Y}{A}\right)^{\frac{1}{1-\alpha}} \cdot 1(Y < A) + A\left(\frac{Y}{A}\right)^{1-\alpha} \cdot 1(Y \geq A) \tag{4}$$

$$\pi\bar{e} = \bar{Y}$$

$$v_{t+1} \sim N(0, \sigma^2)$$

$$\alpha \in [0,1]$$

In Equation (1), $c(\cdot)$ indicates the cost of effort such that $(0) = 0$, $c'(\cdot) > 0$ and $c''(\cdot) > 0$. Equation (2) defines outcomes at $t+1$, determined by the random shock v_{t+1} and effort e_t, and where π and π_v represent the marginal productivity of effort and the contribution of the random shock to the outcome achieved, respectively. The pathways constraint is represented as $\bar{Y}$ in Equation (3). Equation (4) defines a reference-dependent utility function that exhibits a discontinuity at the aspiration A, which is assumed to be exogenous to simplify the model:[3] The utility function is convex below A and concave after A is reached. The sharpness of this discontinuity is determined by the importance of aspirations α, with two extreme cases being a linear utility when $\alpha = 0$ and a (lexicographic) step function when $\alpha = 1$.

A particular version of this model allows us to introduce our hope intervention. Consider the case where the individual systematically under-perceives both agency and pathways such that

$$\tilde{\pi} = \begin{cases} \pi & if \quad e_t < e^0 \\ \rho_\pi \pi' & if \quad e_t \geq e^0 \end{cases}$$

[3] See Lybbert and Wydick (2018) for a discussion of this assumption and alternatives.

and

$$\tilde{\bar{Y}} = \rho_{\bar{Y}} \bar{Y}$$

with $\rho_{\pi} < 1$ and $\rho_{\bar{Y}} < 1$. Through the actual (objective) agency and pathways and individuals' perceptions about them the model accommodates both external constraints and internalized constraints that are the basis of perceived self-efficacy[4] (see Wuepper and Lybbert 2017), for example.

Recent literature has linked the lack of effectiveness of financial inclusion interventions to a series of psychological and behavioral factors, including the lack of hope (Duflo 2012). Under the model outlined above, an intervention that increases hope increases effort at t with the expectation of a higher outcome at $t + 1$. Our intervention aims to increase hope by reducing individuals' under-perception of their agency and pathways by better aligning their perceived agency and pathways with reality. We hypothesize that this psychological realignment of what female entrepreneurs believe to be true and possible with what is actually true and possible will improve microenterprise performance.

This simple model specifically predicts that individuals will increase effort as their aspirations grow, their ability to identify pathways out of poverty sharpen, and the perception of their own agency becomes heightened. If, as we believe to be true in the Oaxacan context, impoverished female entrepreneurs begin with low aspirations and undervalue their own agency and pathways, all these increases in effort yield a higher expected outcome. To test these hypotheses, we designed and implemented a field experiment to induce exogenous shifts in aspirations, pathways and agency among this population of subjects.

3. The Oaxaca Hope Project

3.1. *Fuentes Libres*

Fuentes is a faith-based nonprofit organization affiliated with the Evangelical Covenant Church that works in two sites of the state of Oaxaca: the Oaxaca City Valley and the Tehuantepec Isthmus. Founded in 1998 to originally serve low-income indigenous women,

[4] Throughout this paper, we use the term agency, but recognize that this term and perceived self-efficacy are often used interchangeably, including in the psychology literature but especially in the emerging economics literature on the topic. Wuepper and Lybbert (2017) provide a discussion to help differentiate agency from self-efficacy, but they are ultimately very similar concepts.

Fuentes offers financial products to female microentrepreneurs that otherwise would be excluded from the formal financial sector to a broader client base that includes not only indigenous women. The organization does little promotion and relies primarily on word-of-mouth: women older than 18 with a functioning business are invited by their peers to join one of *Fuentes'* SCGs. Each SCG is composed of at least 12 women and meets every week for a 16-week loan cycle.[5] At the beginning of each cycle, each group member is given an individual *Fuentes* loan to be repaid throughout the cycle in weekly installments at an interest rate fixed by *Fuentes*. At set weekly meetings, SCG members are encouraged to contribute at least 20 pesos to a SCG savings account,[6] although this is not a formal requirement. The SCG pool of savings can be used, at the group's discretion, to serve as an additional credit source for the group members, at an interest rate decided by the group. The savings and the earned interest are split according to the savings shares of members at the end of each cycle. During the working cycle, a bank officer assigned to each group provides basic financial training, business counseling, and spiritual encouragement to group members. During the time of our fieldwork, three bank officers worked in each of the operation sites. At the end of each 16-week cycle, accounts are fully settled. Barring organizational problems or widespread discontentment among members, the group meets again within two or three weeks to start a new cycle, potentially with new members, as described below.

We worked with 52 SCGs, of which four did not depend on *Fuentes* for credit financing at the time of the study and are known as *independent* SCGs. The independent groups, once dependent on *Fuentes* financing and management, are different from the rest of the *Fuentes*' groups in at least three characteristics: they have been working for several years, they have the capability of doing their own accounting, and, most importantly, they entirely self-finance the credit offered to their group members from group savings. We began collaborating with *Fuentes* in January 2015, launched the project in June 2015 and concluded endline data collection in August 2016. During this period, 21 of the groups operated in the Oaxaca Valley and the remaining 31 operated in the Tehuantepec Isthmus. Figure 1 provides a timeline of the intervention and data collection rounds. The baseline survey was administered from June to September of 2015, followed by a one-month follow-

[5] Although some groups are allowed to function with at least 6 members under special circumstances.
[6] At the time of the study one US dollar was equivalent to around 18 Mexican pesos.

up survey. A 12-month follow-up survey was collected between June and August 2016. For our analysis, we also utilize administrative data on savings and credit disbursement that ranges from six months before the baseline up to six months after the 12-month follow-up.

The *Fuentes* SCGs are not static and their composition can be fluid, which presents some challenges for our study. First, while some groups have been operating for several years, others disappear after just a few borrowing cycles. Between the baseline and 12-monthhs follow up surveys, 12 SCGs were dissolved. Because group survival to the next loan cycle is an indication of how well the group is serving the needs of its members, we test whether group survival is affected by the treatment using survival analysis. Second, even for continuously functioning groups, members can be added at the beginning of each cycle while a few others may leave. As a result, for some of our outcome variables we take group averages as the outcome of interest, which we address in greater detail in the data section below.

3.2. Hope Intervention

The hope intervention we designed in collaboration with *Fuentes* reinforced the three components of hope theory and was rolled out to SCGs in three phases. In the first phase, just after the collection of the baseline data, we presented to the treated SCGs a mini-documentary that we specifically commissioned for the project, an approach inspired by Bernard et al (2014). This 25-minute documentary[7] features four actual *Fuentes*' members (two in each operation site) who managed to rise above difficult circumstances and found success in their micro-enterprise at least partly as a result of credit from their *Fuentes* SCGs. In this documentary, each woman described her personal experiences including her economic background, difficulties she faced as child and young adult, and the ways she has learned to achieve goals in her personal life and business. The documentary was structured around an interview guiding these women to discuss aspirations, pathways and agency based on their experiences. While the women featured in this documentary were chosen because they had achieved a degree of prosperity in their business, they were not exceptional entrepreneurs who possessed resources unavailable to other women belonging to *Fuentes*. Indeed, their backgrounds and daily struggles were very familiar to other group members,

[7] The documentary can be viewed online at https://www.youtube.com/watch?v=gAidmWKCCD0 .

and successes they described in the interview were consequently within reach for most of their fellow SCG members.

In a second phase of the treatment, after screening the documentary a member of our research team guided members of treated SCGs through a discussion of the film and a goal-setting exercise. This consisted of providing to each member of the treated groups a 10x30 cm refrigerator magnet that included three blank fields in which they could record a business sales goal, a savings goal, and another open goal related to their personal lives, families, or businesses. SCG members in the treatment group were asked to place their magnets as a reminder of their goals on their refrigerator.[8]

Finally, in a third phase, the bank officer for treated groups followed up with a weekly hope curriculum, which was particularly intensive in the first four weeks, but continued through an entire year until the 12-month follow-up survey. This hope curriculum consisted of brief weekly discussion topics to help reinforce the role of aspirations, pathways and agency in their business and personal lives.[9] These sessions included case studies on microenterprise success and stories from successful women inside and outside the group often with a faith-based emphasis. Each week's message was designed to underscore one of the three hope components. It is important to note that this curriculum consisted of a collection of inspirational thoughts, group exercises and discussions and intentionally did not include any hard skills or financial literacy elements.

3.3. Experimental Design

The treatment was randomized at the group level using a matched-pair cluster design. Out of the total 52 SCGs in the study, we created 26 pairs of similar groups using observable characteristics. In particular, we created group pairs using a hierarchy of categories that were created *a priori* from variables that officials at *Fuentes* believed to be most influential to group homogeneity and performance. These included, in order of importance, the bank officer, the group size, the experience of the group, the average age of the group members, and the similarity of operated businesses. For each pair, we then randomly assigned one SCG to treatment and the other to control. Such matched-pair cluster randomization

[8] The goal could be eventually erased and reset at any time with erasable markers.

[9] Both treatment and control SCGs convene weekly meetings with their bank officer in order to process savings contributions and loan repayments. These standard meetings, which could last up to an hour, typically also include a faith-based message and some discussion of basic financial or micro-enterprise management. The hope curriculum in treated groups extended these meetings by 15-20 minutes.

improves the balance at baseline and increases statistical power (Imai et al. 2009) and is particularly useful with limited numbers of randomization units. As long as the assignment of SCGs to control and treatment groups generated comparison pairs that are more similar to each other than to other SCGs, controlling for these matched pairs in estimation sharpens the estimated treatment effects of the intervention.

In Figure 2, we map the two *Fuentes* sites included in the study. Areas A and B correspond to the Oaxaca Valley Site, while areas C, D, and E are those in the Tehuantepec Isthmus site. Although these areas span different municipalities and wider regions, the two sites correspond to the internal administrative division of *Fuentes*. Figures in Appendix A2 show the location of the SCGs in our study with more detail, including numbers correspond to the 26 different matched pairs.

4. Data and Empirical Strategy

4.1. Data

Our empirical work utilizes two types of data. First, we use the individual panel survey data collected in the fieldwork stage of the project with baseline in the summer of 2015, a one-month follow-up survey, and a 12-month follow-up survey collected in the summer of 2016. The questionnaire included basic demographic information of the SCG members such as age, schooling, religion, number of children, marital status and type of business owned. We also collected data to construct measures of happiness, hope, aspirations, pathways, and agency, as well as measures of religiosity and micro-enterprise performance.

Our individual survey data set included 601 SCG members of which 326 were members of treatment groups and 275 of control groups. The attrition rate from baseline to endline was approximately 5 percent, primarily due to members relocating to other states in Mexico without a known phone number. For those groups that were dissolved between the baseline and 12-month follow-up survey period, we scheduled visits with each former member individually in their homes. In Section 4.2 we give a detailed explanation of the variables included in our questionnaire and the way we construct the outcomes of interest. In Appendix A1, we include our complete translated questionnaire, which was administered in Spanish.

The second source of data we use is the administrative data from *Fuentes* that includes – as recorded by the bank officer and verified by group members – the amount of

weekly savings and internal loans, as well as the amount of *Fuentes* loans at the beginning of the cycle. Internal loans are financed with the accumulated pool of savings in each group and are given at an interest rate decided by the group. Since these credits depend on the availability of funds, most groups do not offer internal loans until after at least one or two cycles of operation. Other groups do not offer internal credits at all. *Fuentes* loans are externally financed by *Fuentes* and given once at the beginning of each borrowing cycle. We collected administrative data for all 48 of the currently *Fuentes*-financed groups; this data extends before the baseline and after the 12-months follow-up surveys to approximately 16-20 months for most SCGs.

As described earlier, there is some churning of individual members of SCGs at the beginning of each borrowing cycle. Due to these dynamics, some women we surveyed at baseline subsequently left their SCG. The administrative data for such members was updated until the cycle they left the group. In order to address these challenges introduced by the churning of SCG membership, when using the administrative data, we analyze the financial outcomes using group-level averages by treatment status.

4.2. Measuring psychology, religiosity and business performance

We divide our outcomes into three broad categories: psychological outcomes, religiosity outcomes, and business performance outcomes:

Psychological outcomes: We designed a series of modules in the questionnaire to characterize psychological outcomes of the individuals in our sample based on survey instruments in the psychology literature. Responses to these questions allow us to construct indexes measuring happiness, optimism and the degree of awareness and importance of aspirations, pathways and agency in the woman's personal and financial life. We also elicited measures of future-mindedness and risk-aversion.

We construct an index of happiness and an index of optimism by asking the respondents, respectively "how happy do you feel today?" and "how positively do you feel about the future?" Respondents gave their assessments using a 10-point scale. We construct standardized happiness and optimism indexes by subtracting the mean and dividing this difference by the standard deviation of the entire sample. Thus, our measures have a mean of 0 and unit standard deviation and variance; impacts for these indexes can therefore be interpreted as changes in standard deviation units.

To construct the aspirations index we asked the respondents to evaluate using a 10-point scale how strongly they agreed with the following five statements: 1) "it is better to accept things as they come rather than dreaming for a better future"; 2) "it is better to have aspirations for your family rather than accepting each day as it comes"; 3) "I am very satisfied with the sales and profit from my business"; 4) "when you have a business it is important to set goals"; and 5) "I have goals and specific plans for my business growing". We use responses to these five questions to build an aspirations index using the method proposed by Anderson (2008). This index captures how important goals and aspirations are in the way the respondent manages her personal affairs and her micro-enterprise.

To assess the pathways dimension of hope, we construct a pathways index using respondents' 10-point assessment of how strongly they agree with the following five statements: 1) "I can find a way to solve most of my challenges"; 2) "if my business sales are low, I know how to explore new markets"; 3) "I get easily disappointed when I find obstacles in my business"; 4) "if I went out of business, I could start a new business with a new product:; and 5) "social networks are a means to boost the grow of my business."

Similarly, we construct an agency index that captures the individual's perception of self-efficacy, locus of control, and the relative importance of effort and external forces in businesses performance. To create this index, we ask respondents to evaluate on a 10-point scale how they feel or how strongly they agree with the following questions and statements: 1) "how important is working hard for the prosperity of your business?"; 2) "how important is luck for businesses prosperity?"; 3) "my future is mainly determined by my own actions and not by others' actions"; 4) "it is difficult for people like me to be a community leader"; and 5) "women as me can add for a positive change in our community".

We further construct two indexes intended to measure time and risk preferences. First, we construct a future orientation index by asking the respondents to evaluate using a 10-point scale their agreement with the following three statements: 1) "when I have a task to do I do it right away rather than leaving it for tomorrow"; 2) "it is more important to enjoy life now rather than making sacrifices to enjoy it more in the future"; and 3) "I use my business' profits to reinvest rather than to expending on my personal needs." Our risk-aversion index measures agreement with the following three statements: 1) "In general, I am a person willing to take risk"; 2) "When I learn about new business opportunities in the

market I am willing to take financial risks to invest in those opportunities"; and 3) "I prefer 100 pesos rather than a flip-coin of 500 pesos or nothing (yes or no)".

Religiosity outcomes: We construct a simple index to measure the religious convictions and commitments the individuals in our sample. While *Fuentes* is a Christian faith-based organization, the female members of *Fuentes* SCGs are not uniformly religious: around 60 percent of the women in our sample are Catholic, 30 percent Protestant, and around 10 percent consider themselves non-religious, without religion, agnostic, or atheist. For our religiosity index we ask: 1) "How many days a week to you devote time for actively praying or reading the Bible?"; 2) "How many days a week do you go to church or meet with a church-related group?"; and 3) "Which of the following statements best describes your religious understanding: {God gives opportunities to grow and prosper, God directs every event in your life}." The latter question is used to help understand whether a subject's faith is centered more in aspirational hope (more proactive) relative to wishful hope (more passive).

We use Anderson's (2009) procedure to create two composite hope indexes, which we call *Hope 3* and *Hope 8*. *Hope 3* is created as the combination of the aspirations, pathways and agency indexes. *Hope 8* is created as the combination of these three hope components plus the happiness, optimism, time and risk preference, and religiosity indexes. These two composite hope indexes are consistent with established practice in psychology and capture a broader characterization of individuals' hope.

Business performance outcomes: In our survey, we also included questions to capture self-reported measures of business performance. For this, we ask the respondent to report: 1) "how many hours they worked in their business in the previous seven days?"; 2) "what were your total sales in the last seven days?"; 3) "what was your profit in the last seven days?"; 4) "how much did you save in your *Fuentes* account the past week?"; and 5) "how many employees does your business have? If none, do you have plans for having employees in the future?" We use these individual outcomes to construct a Business Performance Index following Anderson (2009).

4.3. Pseudo-Structural Estimation of Utility Function Parameters

4.3.1. *Testing for an aspirations-based utility function*

One of the main features of the model of hope we use to motivate our intervention is the aspirations-based utility function shaped as in Equation (4). We first test whether the preferences of individuals in our sample are consistent with an aspirations-dependent utility function. We then subsequently test for changes in its parameters as a result of our intervention to help ascertain whether the intervention impacted aspirations.

To carry out a structural estimation of our aspirations-based utility function, we use self-reported satisfaction over levels of gross sales income. To obtain a normal range of sales, we ask subjects to estimate sales under different combinations of high, normal, and low effort with good, regular, and bad luck. Then we asked them to assess their satisfaction in a $0-10$ scale for each outcome. This procedure allows us to recover the utility schedule of each user as a function of sales income.[10] Note that we refer to what follows as a pseudo-structural estimation procedure because the levels of satisfaction that represent utility in our model were directly elicited rather than implicitly represented based on observed choices. While unconventional, we believe this approach is nonetheless insightful.

To formally test whether utility of subjects in our sample displays characteristics consistent with the aspirations-based utility of (4), we use these satisfaction by sales self-reports to fit a curve using nonlinear least squares. First, we estimate the parameters using the entire sample at baseline, parameterizing the utility function as follows:

$$satisfaction_i = A\left(\frac{sales_i}{A}\right)^{\frac{1}{1-\alpha}} \cdot 1(sales_i < A) + A\left(\frac{sales_i}{A}\right)^{1-\alpha} \cdot 1(sales_i \geq A) \quad (5)$$

A more general version of Equation (5) allows for a heterogeneous degree of convexity and concavity above and below the aspirations point (Lybbert and Wydick, 2018). We investigate whether a curve with these characteristics is supported by our data by estimating a variation to the curve in Equation (5) as in Equation (6):

$$satisfaction_i = A\left(\frac{sales_i}{A}\right)^{\frac{1}{1-\alpha_1}} \cdot 1(sales_i < A) + A\left(\frac{sales_i}{A}\right)^{1-\alpha_2} \cdot 1(sales_i \geq A) \quad (6)$$

This more flexible version in (6) is convenient because standard neoclassical utility represents the special case when $\alpha_1 = \frac{\alpha_2}{\alpha_2 - 1}$ and $\alpha_2 > 0$, the curve is concave over positive values of the right-hand-side argument. We test whether these conditions hold in our data.

4.3.2. *Treatment effect on utility parameters*

[10] To normalize sales across respondents, we add one, then use a z-score of log sales and add 10. These transformations avoid the presence of zeros in utility.

The intervention we implemented could have two potential effects on individuals' preferences. First, it could change the reference point of utility A, that is, the treatment could shift aspirations. Second, it could change the relative weight α of aspirations in utility. To test whether our intervention increased A and/or α, we estimate the parameters of our utility function using nonlinear least squares for each treatment arm at baseline and at the 12-months follow-up. We provide the difference-in-differences estimate of the effect of the treatment on these two parameters.

4.3.4 Reduced-form Estimation of Treatment Effects on Outcomes

We estimate treatment effects at the individual level on outcomes using ANCOVA specifications that control for the baseline level of the outcome variables of the following general form (McKenzie, 2012):

$$y_{ijpt} = \alpha + \tau Treatment_j + \theta y_{ijp,t-1} + X_i'\beta + \gamma_p + \varepsilon_{i,t}, \qquad (7)$$

where y_{ijpt} is the outcome variable of individual i who is member of SCG j in matched pair p at time t, and which includes measures of hope and hope components, religiosity, time and risk preferences, business performance, and the specific micro-enterprise investment measures included in this business performance index. We control for observable covariates X_i, including age, education, religion, number and age of children of each of the individuals. To account for the matched pair cluster randomization design, we control for the matched-pair fixed-effect γ_p, where p indexes the 26 different pairs (Imai et al. 2009). We cluster the standard errors at the SCG level. While ANCOVA is our preferred specification since it has been demonstrated to provide smaller standard errors, based on our PAP we also carry out difference-in-differences, which yield similar results and are available upon request.

For those outcomes potentially correlated to each other and that are not aggregated into an index (business hours worked, log of sales, log of profits, log of savings, number of employees, and the dummy indicator for planning to hire employees in the future), we control the type I error rate using the Benjamini and Hochberg (1995) procedure that corrects for "the expected proportion of falsely rejected hypotheses -the false discovery rate" at a 0.05. We flag the estimated coefficients that are significant after the correction with the symbol "^".

Conventional regression analysis relies on sampling-based inference, where uncertainty comes from the sampling error. Since we work with the entire population of

Fuentes Libres SCGs, this conventional source of uncertainty is, in the strict sense, non-existent in our case. To provide further robustness to our findings, we also carry out randomization inference (Athey and Imbens, 2017). In randomization-based inference, uncertainty comes from the assignment of the treatment. This provides a particularly compelling robustness check on our statistical inference in this case because of the limited number of randomization units (SCGs) we inherited from *Fuentes*. Specifically, we randomize the group-level treatment assignment 1000 times and estimate Equation (7) in each repetition. This random assignment of treatment yields the distribution of the treatment effects we would expect under the sharp null hypothesis of zero effect (Kerwin and Thornton, 2018). The randomization inference p-value is given by the share of the repetitions in which the absolute value of the estimated *fake effect* is greater than the actual effect obtained using the real data. We report randomization-inference p-values together with the regular p-values.

4.4. Econometric Specification for Estimating Effects on Group Outcomes

We use the administrative data to evaluate the effect of our treatment on savings and credit demand. For savings and internal credit, we estimate a modified version of (7) where we substitute the outcomes at the individual level for group average weekly savings and group average weekly demand for internal loans as the dependent variable, and where we control for the week within the current borrowing cycle, an indicator variable for the week of the month, and the pair dummy, and where we cluster the standard errors at the group level. In our ANCOVA specification we include as baseline outcome the mean of the average group weekly savings or internal loan demand for all weeks before the treatment for which we have data.

We also analyze the effect of the treatment on the group average demand for *Fuentes* loans per cycle and the total demand for loans per cycle defined as the group average sum of *Fuente*-financed loans and internal loans. As described earlier, *Fuentes* loans are given once, at the beginning of each cycle. The amount of loans varies individually within a cycle, and across individuals from a cycle to the next one. Here we estimate an analogous version of (7) with data at the cycle level:

$$y_{jp.c} = \alpha + \tau Treatment_j + \theta y_{jp,c_0} + W_j'\mathrm{B} + \gamma D_p + \xi_{j,c} \qquad (8)$$

where $y_{jp.c}$ is the log of the loan demand (either *Fuentes* loans or total loan demand). We include a vector of group level characteristics W_j that include the cycle number as a measure

of the time a group has been working together. Similarly to the weekly Equation, $D_p$is the pair indicator. We cluster the standard errors at the group level. For our ANCOVA estimation we include y_{jp,c_0}, which is the average of each outcome in all pre-treatment cycles for which we have data.

5. Empirical Results

We structure the presentation of our results in this section as follows. First, we estimate simple (non-experimental) correlation functions to test how our measures of business performance are shaped by baseline and endline measures of hope. Although these results do not capture causal relationships, they do provide a useful point of departure for our true causal estimates as they suggest that endogenous hope is strongly correlated with business performance. Second, we present and discuss balance tests that show that the randomization of the treatment was successful. Third, we present pseudo-structural estimations of the utility function parameters and test whether these change as a result of the intervention. Fourth, we present the ANCOVA results on psychological, religious, and business outcomes. Finally, we present exploratory results not included in the pre-analysis plan that we find insightful even if not confirmatory in the strict sense.

5.1. Correlation of Hope with Business Performance

To set the stage for our ANCOVA estimation of the causal effects of our hope intervention on borrower hope and micro-enterprise performance, we begin by whether hope correlates positively with enterprise performance. First, we estimate the relationship between endline hope on endline business performance measures, as in Equation 9:

$$y_{ijp.t} = \alpha + \tau Hope8_{ijp,t} + \theta y_{ijp,t-1} + X_i'\beta + \gamma D_p + \varepsilon_{i,t} \qquad (9)$$

where the estimate τ is the conditional (on controls) correlation between our index of 8 hope variables and business performance. We also estimate this correlation regression using baseline hope, $Hope8_{ijp,t-1}$, as a test of whether baseline levels of hope predict future improvements in business performance. These results are shown in Table 1 and suggest that endline hope and endline business performance are strongly correlated: Borrowers with high *Hope-8* at the end of the intervention have significantly higher sales, profits and business performance. Although slightly weaker and less precise, we also find that higher hope *predicts* stronger business performance one year later: borrowers with high *Hope-8* at

baseline have higher sales and profits a year later. Although these results do not imply that high hope causes improved business performance—indeed the opposite just as likely may be true: the anticipation of a future development that is likely to positively affect business performance may cause entrepreneurs to be more hopeful at baseline. The crux of our research design and analysis is to test whether we can exogenously stimulate hope among borrowers and use this exogenously-induced hope to determine whether (to what extent) this relationship is in fact caused by higher hope.

5.2. Balance Tests

In Table 2 we show summary statistics of the variables collected in the survey at the baseline and test for balance in observable characteristics of individual SCG members and outcomes across the treatment status by regressing the value of each of the characteristics and outcomes on the treatment indicator. We find that only the number of a woman's children younger than 18 years of age seems to be smaller in the treatment group (significant only at 10%). Although the randomization appears to have been successful, we account for any residual imbalance in the randomization of treatment by controlling for a set of individual characteristics in the estimation of the treatment effects at the borrower level. Table 3 shows the levels of savings, internal loans, and *Fuentes* loans, at the borrowing cycle of the baseline. The mean group average saving is 32 pesos a week and the mean group average internal loan is 109 per week. The mean group average *Fuentes* loan is 3,489 pesos per cycle. None of these financial measures is statistically different across treatment and control groups at baseline.

5.3. Confirmatory Results (Pre-Specified)

The pre-analysis plan for this project pre-specified several borrower-level outcomes of interest, along with a few SCG-level outcomes using *Fuentes* administrative data. This section discusses these pre-specified results.

5.3.1. *Testing aspirations-based utility vs. neoclassical utility*

Does the utility function of our subjects more closely resemble an aspirations-based utility function or the standard neo-classical utility function? We implemented a nonlinear least squares procedure to estimate (5) using our data at baseline, 1-month follow-up, and the 12-month follow up. The results of the single estimated parameter α are in Table 4, and results where we allow the parameters to vary before (α_1) and after (α_2) the aspiration-based

reference point in Table 5. We estimate standard errors using a bootstrap procedure that randomly resamples over 1,000 repetitions.

Table 4 shows an estimate of α at baseline of 0.93, at 1-month follow-up of 0.92, and at 12-month follow-up of 0.83, all indicating slight convexity in the utility function before the aspiration and slight concavity to the utility function after it. Where as in (6) the parameters are allowed to vary before and after the reference point we estimate α_1 at 0.93 and α_2 at 0.75 in Table 5. We test for $\alpha_2 = \frac{\alpha_1}{\alpha_1 - 1}$ reference and strongly reject the null hypothesis of standard neo-classical utility at $p < 0.01$ in favor of aspirations-based utility. (We present our data and the fitted curve with the parameter estimates from Table 5 in Figure 3.) This provides evidence, albeit based on self-reported satisfaction levels, that utility appears to be convex below a Kahneman-Tversky-type reference point—consistent with the presence of an aspiration point in our theoretical model—and concave thereafter.

5.3.2 Treatment Effects on Utility Parameters

We estimate the utility parameters in Equation 5 for each treatment group at baseline and at the 12-months follow-up, providing a difference-in-differences estimate of the changes in the parameters A and α due to the treatment.. We calculate bootstrapped standard errors of the difference-in-differences estimate by repeating the same procedure in 1000 bootstrap repetitions in which we resample groups. We find no statistically significant changes on neither A nor α due to the treatment.[11] While this suggests that the self-reported satisfaction matrix was unchanged by the treatment on average, it is possible that this estimate on average obscures heterogenous treatment effects on these pseudo-structural parameters across groups and individuals. To explore this possibility, we follow the same nonlinear procedure to estimate the utility parameters at the group and individual levels[12], both at baseline and at the 12-months follow-up. We present the results of this analysis in the Appendix Figure A3 where we plot the solutions for A and α at both baseline and the 12-months follow up.

5.3.3 Impacts on Psychological and Religious Outcomes

[11] The corresponding treatment effects on A and α are 0.0006 (s.e. 1.4340) and 0.0082 (s.e. 0.1408).
[12] These results are only exploratory given the data limitations: for a given group, we have only on average 12 individuals for fitting the curve. For a given individual, we only have her 10 utility-sales pairs.

In Table 6 we present the results of the estimation of Equation 7. The relevant coefficients for effects at the short-run follow up is *Treatment* × *one-month follow-up*.[13] At one month, we found aspirations to be strongly elevated by the treatment, a 0.27σ increase and positive but insignificant effects on other psychological variables. At the one-month follow-up, we saw a 0.18σ increase in the Hope-3 Index ($p < 0.05$), but an insignificant 0.18σ increase in the Hope-8 Index. One month after treatment, the main impact appears to have been in elevated aspirations.

At the 12-month follow-up (*Treatment* × *12-months follow-up*) we find positive point estimates on every measure of hope, with many showing statistical significance. While the effect on aspirations had subsided after one year, we find subjects in the treatment group had realized positive and statistically significant increases in optimism (0.13σ), agency (0.15σ), conceptualization of pathways out of poverty (0.17σ), and future orientation (0.12σ). A religiosity index which had been negative after the one-month follow-up, showed an increase of 0.14σ. This pattern of results may suggest that aspirations can be changed quickly but it is hard to sustain these changes (perhaps given the self-confirming nature of aspiration feedback loops), while agency and pathways only change more gradually with experience.

Measuring the increase in overall hope, we find that the Hope-3 index increased by 0.14σ ($p < 0.05$) and Hope-8 by 0.17σ ($p < 0.01$). The treatment has a positive and statistically significant effect at a 99% level on the aspirations index, and a significant effect at a 95% on the Hope-3 and Hope-8 indexes. 7 also presents the effect of the treatment at the 12-months follow-up survey on psychological outcomes, *Treatment* × *12-months follow-up*. A summary of these effects is shown in Figure 4.

5.3.4 Impacts on Economic Outcomes

As seen in Table 7 and Figure 4, although sales and profits show large point estimates indicating increases of 16.2% and 16.9% respectively at the time of the one-month follow-up, the treatment did not exhibit statistically significant effects on economic outcomes. We did not expect to see changes in employment at the end of one month, and

[13] An earlier working paper (Lybbert and Wydick, 2017) includes an analysis of the short-term reduced-form impacts of the hope intervention on borrower outcomes based on the one-month follow-up survey data. We review these results briefly here, focusing mainly on the 12-month follow-up results.

results indicated an essentially zero point estimate for changes in employees and even plans to add employees to businesses. Savings in community banks increased, but without statistical significance and hours dedicated to the microenterprise surprisingly declined, although not significantly. A business performance index shows essentially no gain at one month.

By the 12-month follow-up, however, we find that like the psychological and religious outcomes, the point estimate on every economic outcome we measure is positive (see Figure 4). This includes including hours worked sales, profits, and savings, although point estimates are low and statistically insignificant. We find that the women in the treatment group significantly increased employment in their enterprises relative to the control group ($p < 0.10$). We find this is important because by far the modal level of employees in both treatment and control was zero; after treatment, eight women in the treatment group added a single employee to their businesses, while zero employees were added in the control group. We view this increase as a small but remarkable difference given the level and dynamics of employment creation within enterprises in the counterfactual. The treatment group was also far more likely (12 percentage points, $p < 0.01$) to indicate that it planned to add employees in the future.

Because all economic outcomes were positive (albeit many statistically insignificant) the treatment shows a 0.18σ increase in the business performance index.[14] Overall, we interpret our results as suggestive of modest but significant effects on business performance with business outcomes generally increasing, but with impacts on enterprise variables from our survey at 12 months not as clear or robust as on psychological variables.

5.3.5 Impacts on Group Financial Outcomes

In Table 8 we present the results of using Equation (7) at the group level to estimate the treatment effect on average weekly savings (column 1), average weekly demand for internal loans (column 3), and the sum of savings and internal loans (column 5). The coefficient on the variable *Treatment* gives the treatment effect. We find no statistically significant effect of treatment on savings nor internal loans, but we do find that the total use of microfinance increases for treated groups. In columns 2, 4, and 6 we present the

[14] Note that we test the treatment effect on individual outcomes of business performance. Thus, we correct for a false discovery rate using the Benjamini-Hochberg (1995) procedure. The effect on the plans for future employees persists after the correction.

results where we test for a differentiated effect of treatment at the first 6 months after it versus the following period. We find no evidence of a differentiated effect after six months of the treatment on savings, but we do find that a positive effect of the treatment on loan demand and total use of microfinance at the first six months after the treatment but that decays afterwards. Finally, in Table 9 we analyze the effects of the treatment on the cycle group-average *Fuentes* loan. *Fuentes* loans are given at the beginning of the cycle and their size depends on both an initial individual request and an evaluation from the micro finance on the probability of repayment. *Fuentes* loans tend to increase with the age of the borrowing group, so we control for the number of working cycle in our estimation of Equation 8. We did not expect to see much of an effect of the treatment on this type of credit given the formula used to assign the amounts of *Fuentes* loans and the econometric results confirm our hypothesis, yet we find that average borrowing increases by approximately 15.4% in column 4 of Table 9 ($p < 0.05$).

5.4. Exploratory Results (Not Pre-Specified)

Our research design and data offer several opportunities to explore results and patterns beyond those pre-specified in our pre-analysis plan. These additional results, while exploratory, are nonetheless insightful and suggest potential directions for future research on these topics.

5.4.1. *Mediation Tests*

We analyze some possible channels of the impact of the treatment on business performance using a mediation test. With this analysis we could at least partially disentangle how the hope intervention produces a change in the outcomes of interest. An intuitive way of thinking about mediation is in terms of the Baron and Kenny (1986) mediation triangle in Figure 5. In this analysis, we ask whether different components mediate the modest increase we see from treatment in the business performance index.

The treatment direct effect on the outcome is given by the arrow labeled as *c*. The indirect effect of the treatment is the product of the effect of the treatment on the mediator (*a*) and the effect of the mediator on the treatment (*b*). We estimate the indirect and total effect of treatment on business performance with the different components of hope (aggregate and disaggregate indexes) using structural estimation. The results of these estimations are presented in Table 10.

Our mediation test show statistically significant total effects of the treatment on business performance, all of them very similar in magnitude to that on the coefficient on *Treatment* × *12-months follow-up* in Table 7 (0.18). There is a statistically significant mediation effect via the pathways and future orientation indexes. Also, the composite index *Hope 3* exhibits a statistically significant mediation effect. Thus, the treatment has a positive indirect effect on almost every component of our hope indexes, which mediates the effect of the treatment on business performance. But evidence of mediation requires that the significance of the treatment variable diminishes as it, along with the mediation variable, is included in the regression of the outcome variable. Because the treatment variable remains significant when it is included with the mediators in this regression, it appears that other dimensions of the hope treatment not fully measured or captured by our mediator variables also positively affected business performance.

5.4.2. *Group Survival as Treatment Outcome*

We also study whether the treatment influenced the rate at which the groups were dissolved during the year after the treatment began. We perform a survival analysis at the group cycle-group level since only at the end of each cycle groups are in risk of being dissolved. In Figure 6, we present the Kaplan-Meier estimated survival functions of the probability of each group of surviving c cycles or beyond, for both the treatment and controls groups. These estimated survival functions show that treated groups outlasted control groups by approximately two cycles on average. To formally test this differentiated survival rate as a treatment effect from the hope intervention we estimate a Weibull proportional-hazards survival model, parameterized with the treatment indicator and the dummy indicator for treatment pairs. The coefficient on the treatment indicator is -8.86 (standard error 2.61) which indicates an estimated statistically significant lower probability of treatment groups to be dissolved at each of the observed cycle.

One potential concern with this result might be that our partner *Fuentes* made a disproportionate effort to keep treated SCGs functioning for the duration of the study. While we cannot directly test if this is the case, based on our communication with officials at *Fuentes* before, during, and after the 12-month intervention we are confident that aside from the hope curriculum treatment and control SCGs were given access to the same services and support. The disbanding of SCGs after the completion of a 16-week loan cycle typically reflects unfavorable or dysfunctional group dynamics, conflicts or other tension

among members, and lack of repayment. Although we cannot rule out other explanations, it seems plausible that increased survival of the treated SCGs was due at least in part to the hope intervention itself, including more favorable group dynamics and relationships among the women in these groups.

5.4.3. *Treatment Effects by Religion*

We did not pre-specify tests of heterogeneous treatment effects by religious affiliation, but soon after the intervention started we realized that this was likely to be an important dimension of the effects of the intervention. Specifically, Catholic women in the SCGs appear to be more engaged in and responsive to the hope curriculum. In separate work, Wydick, Dowd, and Lybbert (2017) use the one-month follow-up data to study treatment effects between Catholic and Protestant evangelical women separately – which constitute 74% and 26% of the sample overall, respectively. They find that while Protestant evangelical women had higher hope measures at baseline – including significantly higher optimism, aspirations, happiness, and composite hope indexes[15] – the intervention had much stronger effects on Catholic women. In fact, the effect on non-Catholic women was close to zero, which implies that the overall positive effects at the one-month midline were driven entirely by the very strong effects among Catholic microentrepreneurs. The one-month follow-up results for business performance are consistent with this pattern as the intervention caused larger gains in business performance among Catholic women, including an increase in micro-enterprise profits that is significant at the 10% level. As concluded in the chapter that contains that analysis,

> "The religious messages we designed to induce hope were likely familiar to many Protestant women but less so for Catholic women in the study. This novelty of the hope intervention may partly explain the relatively large impact such messages had on hopefulness among these women. Although meant to appeal to both Catholic and Protestant women, the intervention would be viewed by many as "Protestant" in nature and was implemented by Protestant evangelicals working for an evangelical faith-based organization. Thus, what we appear to see, at least in the very short term, is a group of Catholic women who were strongly impacted by a Protestant-leaning intervention that emphasized human agency within a generally biblical worldview." (Wydick, Dowd and Lybbert 2017)

This finding is consistent with the work of Gharad, Choi, and Karlan (2018) who find that a Protestant evangelical curriculum implemented mainly to low-income Catholics in the

[15] These two groups were similar in risk aversion, future orientation and business performance.

Philippines had significant impacts on increasing household income through microenterprise growth. Building on these intriguing one-month follow-up results, we test how persistent these heterogeneous treatment effects are through the full year of the intervention. Appendix Tables A1 and A2 present the estimates of the treatment effect interacting the treatment dummy with a dummy for Catholic women.

Catholic women exhibit lower aspirations, agency, and religiosity, measured by their corresponding indexes. Catholic women also have lower business profits. Allowing for heterogenenous treatment effects by religious affiliation suggests that the endline treatment has a differentiated effect on Catholic women, compared to those identified as Protestant evangelical: the effect on happiness and avenues is lower among Catholic women, while the treatment has a larger effect on the number of worked hours among Catholic women. We are continuing to explore these differences and to compare these endline effects to the one-month midline effects described above. Since this project was not designed to test for this dimension of heterogenous response to the hope intervention, further research would be needed to rigorously estimate and understand these effects.

6. Conclusion

Poverty—especially persistent poverty—often emerges from the interactions and interdependencies between layers of constraints. The disappointing microfinance impacts found in recent empirical work (e.g., Banerjee et al. 2015) may in part reflect this tangle of constraints: Relaxing an external credit constraint may do little to address internalized constraints related to how a would-be micro-entrepreneur views herself, her future and opportunities around her. Understanding the role behavioral biases, constraints and tendencies play in shaping the impacts of microfinance – among other poverty alleviation interventions – has been flagged as a research priority in this area. A similar desire to understand the behavioral and psychological roots of pronounced heterogeneity in microfinance impacts motivated our microfinance bank partner to collaborate on this project, which tests the influence of hope on the microfinance and other outcomes of their existing borrowers.

Building directly on hope theory, the intervention we evaluate in this paper explicitly reflects aspirations, pathways and agency as the three core elements of hope as a cognitive process. This hope treatment consisted of an intervention in which half of 52

savings and credit groups were randomly shown a short documentary showcasing the life experiences and successes of four fellow group members, guided through a simple goal-setting exercise and learned from a hope curriculum that included periodic exercises and discussions at the set weekly meetings convened by these groups. We find that the intervention raised all three components of hope, albeit with an apparent temporal sequencing. In the first month, the hope treatment increased aspirations significantly but had no measurable effect on pathways and agency measures. One year later, however, the effect on aspirations faded, and the effect on pathways and agency was significant and large in magnitude. This pattern of results seems sensible: Aspirations may be more malleable in the short run than an individual's perceptions of possible pathways to achieving these goals and her sense of agency to pursue and reach these goals. Enhancing pathways and agency, on the other hand, may come only slowly through steady trial and error – and with an accumulation of small successes.

We find that our hope intervention also increased various measures of microenterprise performance, including significant increases in plans to hire employees and in a composite business performance index. Using administrative data from our microfinance partner, we investigate the treatment effect on savings and loan demand. Although the treatment did not have a statistically significant effect on institutional microfinance borrowing, likely due to constraints related to savings requirements, the intervention strongly increased internal loan demand, slightly increased weekly savings and increased the probability that a savings and credit group continued to future lending cycles.

While this study finds evidence that hope is malleable and can be increased by an external intervention and that this increased hope elevates the performance of microenterprises, we consider this to be one of the first rather than last words on the topic of aspirational hope and movements out of poverty. Indeed, the design and evaluation of this intervention raise as many questions as they answer. One of these lingering questions looms large: Is there a difference between the kind of (endogenous) hope that emerges within an individual based on personal traits, beliefs and experiences and the kind of hope that we induce exogenously via our hope curriculum? We find that both endogenous and exogenously-induced hope relate importantly and measurably to microenterprise performance. It seems possible – even likely – that endogenous hope may be a more resilient

form of hope as it is potentially the result of a self-confirming equilibrium that is reinforced by new experiences and updated beliefs. Differentiating between these types of hope and their effects on real outcomes in both the short- and long-run remains an intriguing and important research priority.

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Figure 1 Timing of intervention and data collection

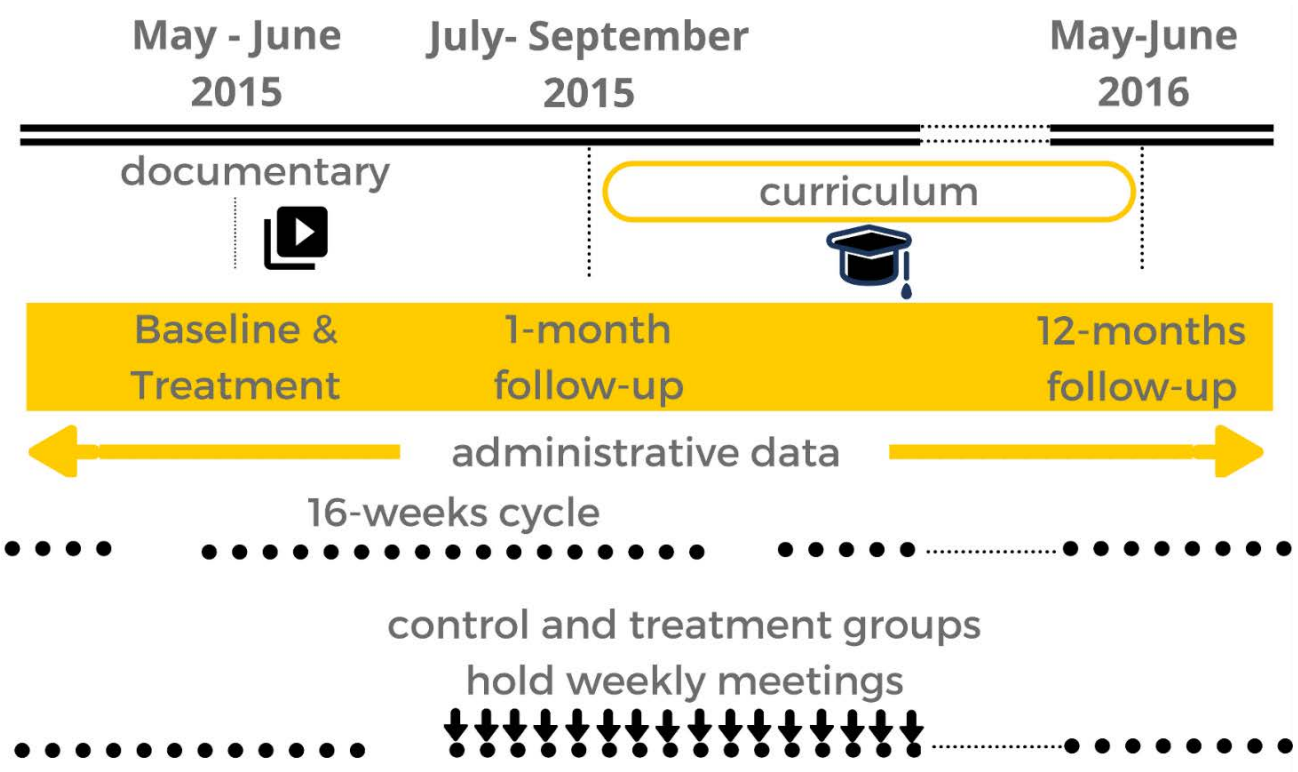


Figure 2 Location of SCGs included in the study in the state of Oaxaca, Mexico (see Appendix for detailed maps of areas A, B, C, D, and E)

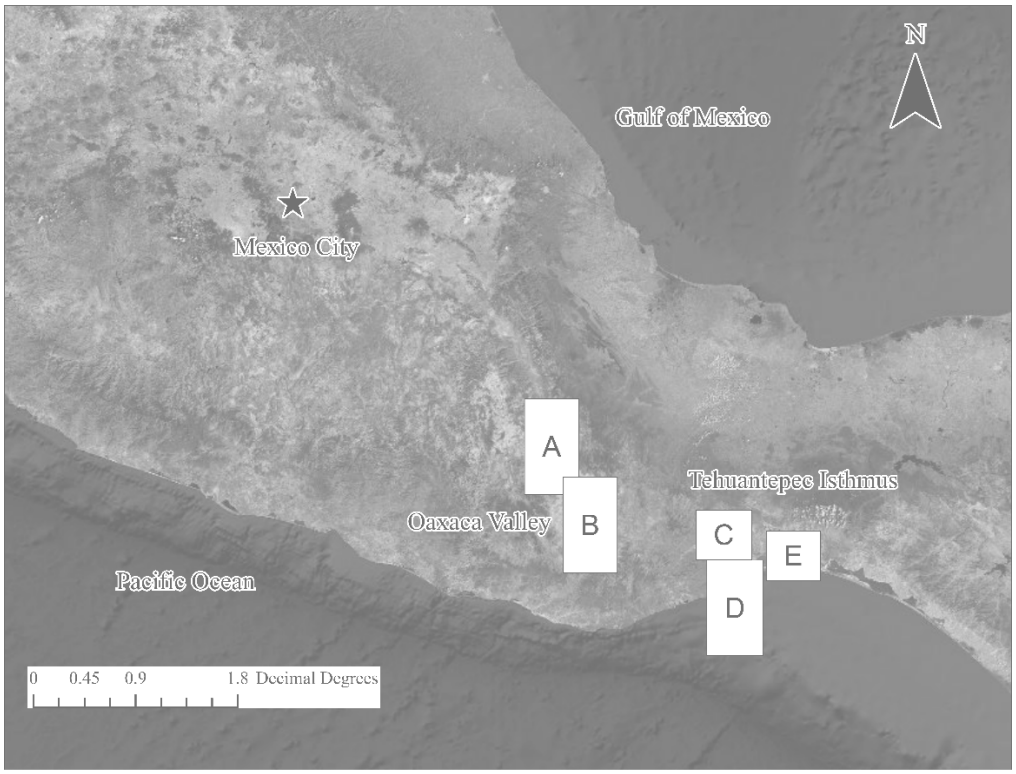


Figure 3 Fitted curve with the parameter estimates in Table 5

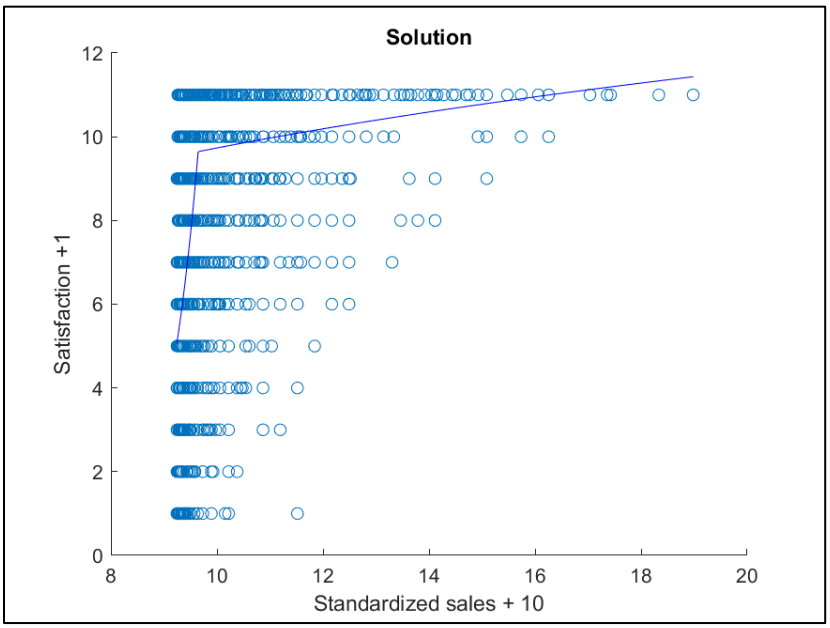


Figure 4 Reduced-form Impacts from Treatment

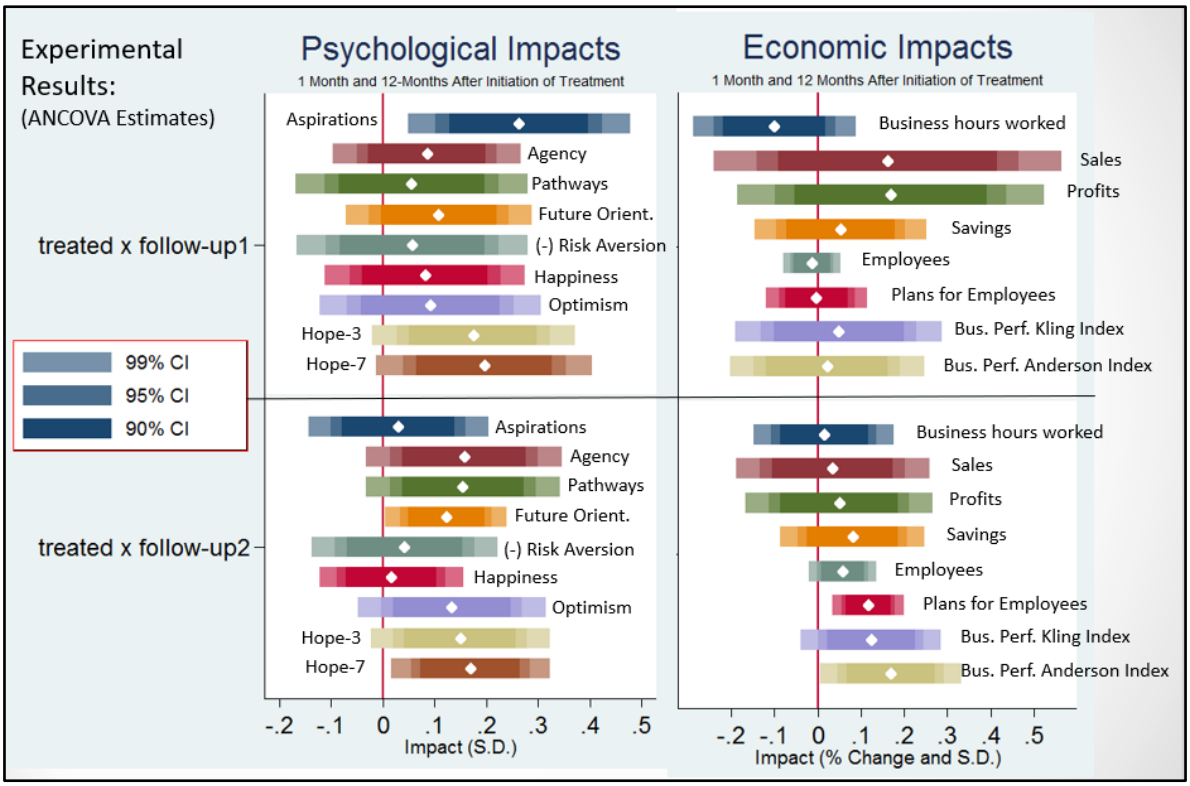
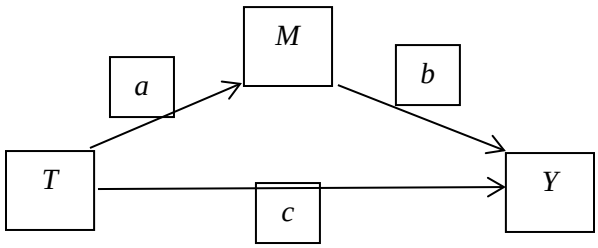


Figure 5 Mediation Triangle



a = direct effect of treatment on mediator

b = direct effect of mediator on outcome

c = direct effect of treatment on outcome

*a*b* = indirect effect of treatment on outcome

c+*a*b* = total effect of treatment on outcome

Figure 6 Group survival test

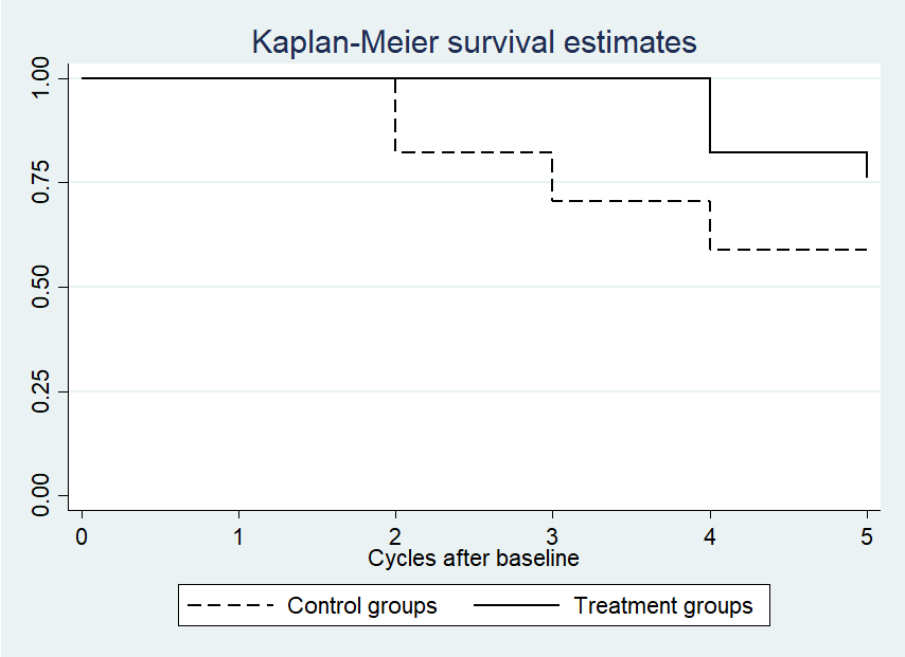


Table 1 Correlation of business performance with hope index

VARIABLES	(1) Log of sales	(2) Log of profits	(3) Bus. Perf. Index
Hope-8 Index at 12-months follow up	0.09***	0.12***	0.09**
	(0.03)	(0.03)	(0.04)
Observations	683	683	729
R-squared	0.31	0.25	0.24
Hope-8 Index at baseline	0.08*	0.11**	0.04
	(0.04)	(0.05)	(0.04)
Observations	683	683	729
R-squared	0.31	0.24	0.24

Notes: standard errors clustered at the group level in parentheses. Significance codes: *** p<0.01, ** p<0.05, * p<0.10. All regressions follow an ANCOVA specification controlling for the baseline value of the outcome. All regressions include controls for age, education, a dummy for members self-identified as protestant evangelical, a dummy for bank leaders, number of children, number of children younger than 18 years of age, a dwelling index, a dummy for the type of business, and treatment pair fixed effects.

Table 2 Balance test of observed characteristics and outcomes at baseline

	Mean at baseline	Treatment dummy coefficient	Std. error	*N*
Controls:				
Age at baseline	41.00	2.62	(0.75)	552
Years of completed education	7.31	0.56	(0.46)	552
Identifies as protestant evangelical	0.28	-0.07	(0.05)	555
Number of children	2.91	0.11	(0.17)	552
Number of children under 18	1.34	-0.27*	(0.10)	552
Community bank leader	0.28	-0.02	(0.02)	552
Business: Clothes (dummy)	0.13	0.02	(0.03)	555
Business: Food (dummy)	0.30	0.07	(0.03)	555
Business: Groceries (dummy)	0.06	-0.01	(0.02)	555
Outcomes:				
"How happy are you today?"	8.68	-0.02	(0.11)	552
"How optimistic about future?"	8.63	-0.07	(0.14)	552
Aspirations Index	-0.00	-0.03	(0.08)	555
Agency Index	0.02	-0.02	(0.11)	555
Avenues Index	-0.28	0.11	(0.09)	555
Future Orientation Index	-0.00	-0.07	(0.09)	555
Risk Aversion Index	-0.12	0.18	(0.09)	555
Hope-3 Index	-0.11	0.03	(0.09)	555
Hope-8 Index	-0.12	0.03	(0.08)	555
Business hours worked	35.38	-0.18	(2.14)	541
Log of sales	7.22	0.02	(0.10)	541
Log of profits	6.26	0.01	(0.09)	541
Log of savings	3.50	0.21	(0.08)	549
Employees	0.11	-0.00	(0.03)	541
Plans for Employees	0.54	-0.06	(0.05)	541
Bus. Perf. Index	-0.00	0.06	(0.07)	555
Weekly Days Pray or Read Bible	4.19	0.10	(0.14)	551
Weekly Days Attend Church or Church Group	1.25	-0.10	(0.13)	551
Agrees God Gives Opportunities to Grow & Prosper	-1.50	0.02	(0.04)	550
Religiosity Index	-0.13	0.01	(0.08)	555
H0: treatment status is predicted by observables (p-value)	0.12			

Notes: standard errors clustered at the group level in parentheses. Significance codes: *** p<0.01, ** p<0.05, * p<0.1

Table 3 Balance test of financial outcomes at baseline

	Mean at baseline	Treatment dummy .		
		Coefficient	Std. error	*N*
Savings				
Weekly	32.15	4.77	(4.44)	2223
Log of weekly	3.34	0.18	(0.12)	2223
Pre-treatment weekly	30.27	7.00	(4.13)	48
Log of pre-treatment weekly	3.37	0.20	(0.11)	48
Internal loans				
Weekly	109.06	-29.35	(24.73)	1814
Log of weekly	2.06	-0.35	(0.35)	1814
Pre-treatment weekly	98.34	-28.35	(22.83)	41
Log of pre-treatment weekly	4.35	-1.10*	(0.44)	41
Savings + Internal loans				
Weekly	144.05	-27.79	(27.56)	1814
Log of weekly	4.13	-0.09	(0.19)	1814
Pre-treatment weekly	130.93	-25.21	(25.47)	41
Log of pre-treatment weekly	4.72	-0.36	(0.22)	41
Fuentes loans				
Pre-treatment cycles	3489.90	-270.21	(388.04)	90
Log of pre-treatment cycles	8.09	-0.06	(0.10)	90

Table 4 Parameter estimates of the utility function in Equation 5

	Baseline	1-month follow-up	12-months follow-up
A	9.65	9.63	10.26
(se)	(0.22)	(0.22)	(1.60)
α	0.93	0.92	0.83
(se)	(0.03)	(0.04)	(0.14)

Table 5 Parameter estimates of the utility function in Equation 6

	Baseline
A	9.65
(se)	(0.07)
α_1	0.93
(se)	(0.02)
α_2	0.75
(se)	(0.05)
$\alpha_2 = \frac{\alpha_1}{\alpha_1 - 1}$	3.91
(se)	(1.38)

Table 6 Treatment effect on psychological and religiosity indexes (ANCOVA)

Independent variables:	(1) Happiness	(2) Optimism	(3) Aspirations	(4) Agency	(5) Pathways	(6) Future Orientation	(7) Risk Aversion	(8) Religiosity	(9) Hope-3	(10) Hope-8
Treatment x one-month follow-up	0.07	0.09	0.27***	0.04	0.04	0.11	0.04	-0.10	0.18**	0.14
	(0.067)	(0.075)	(0.082)	(0.063)	(0.083)	(0.070)	(0.084)	(0.098)	(0.071)	(0.089)
	[0.29]	[0.34]	[0.00]	[0.60]	[0.69]	[0.12]	[0.72]	[0.40]	[0.05]	[0.23]
Treatment x 12-months follow-up	0.02	0.13*	0.02	0.15**	0.17**	0.12**	0.01	0.14**	0.14**	0.17***
	(0.048)	(0.064)	(0.066)	(0.068)	(0.071)	(0.046)	(0.066)	(0.060)	(0.067)	(0.061)
	[0.75]	[0.15]	[0.79]	[0.13]	[0.07]	[0.02]	[0.90]	[0.04]	[0.13]	[0.02]
12-months follow up (dummy)	0.10	0.03	0.13	0.05	0.20**	0.04	-0.10	-0.06	0.17**	0.05
	(0.077)	(0.058)	(0.096)	(0.072)	(0.078)	(0.059)	(0.075)	(0.086)	(0.078)	(0.080)
	[0.26]	[0.70]	[0.03]	[0.86]	[0.90]	[0.60]	[0.60]	[0.40]	[0.35]	[0.64]
Age at baseline	-0.00	-0.00	-0.01*	-0.01	-0.00	-0.01*	-0.00	0.01***	-0.01**	-0.00
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)
Years of completed education	0.01	-0.00	0.03***	0.04***	0.03**	0.01	0.01*	-0.01	0.04***	0.02*
	(0.010)	(0.010)	(0.009)	(0.011)	(0.011)	(0.009)	(0.008)	(0.008)	(0.012)	(0.012)
Identifies as evangelical	-0.00	-0.06	0.17***	0.25***	0.03	0.03	0.08	0.27***	0.19***	0.22***
	(0.081)	(0.087)	(0.065)	(0.062)	(0.046)	(0.058)	(0.065)	(0.073)	(0.056)	(0.068)
Number of children	0.01	-0.02	-0.01	0.01	-0.02	0.01	0.04	-0.02	-0.01	-0.00
	(0.021)	(0.022)	(0.017)	(0.020)	(0.021)	(0.019)	(0.030)	(0.018)	(0.021)	(0.020)
Number of children under 18	-0.05	0.02	-0.00	-0.02	-0.03	-0.03	-0.06*	0.03	-0.02	-0.03
	(0.033)	(0.029)	(0.022)	(0.026)	(0.024)	(0.022)	(0.032)	(0.031)	(0.024)	(0.029)
Community bank leader	-0.04	0.08	0.14**	0.00	0.02	-0.04	0.07	0.03	0.08	0.07
	(0.072)	(0.065)	(0.068)	(0.062)	(0.062)	(0.070)	(0.064)	(0.055)	(0.067)	(0.058)

Index of dwelling quality	-0.01	0.08*	0.08**	0.06**	0.08**	0.04	0.01	0.05	0.09***	0.08**
	(0.025)	(0.039)	(0.032)	(0.024)	(0.030)	(0.031)	(0.027)	(0.029)	(0.030)	(0.032)
Dependent variable at baseline	0.19***	0.13***	0.14***	0.26***	0.26***	0.22***	0.23***	0.25***	0.28***	0.27***
	(0.034)	(0.033)	(0.038)	(0.030)	(0.029)	(0.032)	(0.037)	(0.051)	(0.032)	(0.032)
Constant	0.05	0.07	-0.13	-0.43*	-0.35	-0.23	-0.19	-0.32*	-0.38	-0.37*
	(0.183)	(0.220)	(0.232)	(0.220)	(0.275)	(0.196)	(0.206)	(0.175)	(0.243)	(0.212)
Observations	1,327	1,327	1,327	1,327	1,327	1,327	1,327	1,327	1,327	1,327
R-squared	0.08	0.07	0.15	0.21	0.22	0.11	0.12	0.17	0.26	0.18

Notes: standard errors clustered at the group level in parentheses. Significance codes: *** p<0.01, ** p<0.05, * p<0.10. Randomization inference p-values in brackets. All regressions follow an ANCOVA specification controlling for the baseline value of the outcome. All regressions include treatment pair and type of business fixed effects.

Table 7 Treatment effect on economic outcomes (ANCOVA)

Independent variables are:	(1) Business hours worked	(2) Log of sales	(3) Log of profits	(4) Log of savings	(5) Employees	(6) Plans for Employees	(7) Bus. Perf. Index
Treatment x one-month follow-up	-2.40	0.16	0.17	0.05	-0.01	-0.00	0.01
	(1.687)	(0.151)	(0.133)	(0.074)	(0.025)	(0.044)	(0.072)
	[0.27]	[0.36]	[0.32]	[0.60]	[0.59]	[0.97]	[0.87]
Treatment x 12-months follow-up	0.35	0.03	0.05	0.08	0.06*	0.12***,^	0.18***
	(1.456)	(0.084)	(0.081)	(0.063)	(0.030)	(0.031)	(0.060)
	[0.86]	[0.63]	[0.53]	[0.21]	[0.08]	[0.00]	[0.00]
12-months follow up (dummy)	1.56	0.45***,^	0.46***,^	0.14**	-0.00	-0.07	0.11*
	(1.800)	(0.117)	(0.103)	(0.067)	(0.031)	(0.041)	(0.065)
	[0.91]	[0.22]	[0.19]	[0.61]	[0.95]	[0.03]	[0.98]
Age at baseline	0.14*	-0.00	-0.00	0.00	-0.00	-0.01***,^	-0.00
	(0.076)	(0.004)	(0.004)	(0.002)	(0.001)	(0.001)	(0.003)
Years of completed education	0.39**	0.02	0.02	0.01	0.01	0.00	0.02**
	(0.175)	(0.014)	(0.015)	(0.007)	(0.004)	(0.005)	(0.010)
Identifies as protestant evangelical	-0.47	0.19	0.25**	0.03	-0.03	0.05	0.05
	(1.588)	(0.126)	(0.118)	(0.061)	(0.035)	(0.038)	(0.072)
Number of children	-0.56	0.02	0.02	-0.01	-0.00	-0.00	-0.02
	(0.518)	(0.019)	(0.022)	(0.012)	(0.011)	(0.010)	(0.022)
Number of children under 18	-0.00	-0.02	-0.03	-0.02	-0.00	-0.02	-0.02
	(0.602)	(0.044)	(0.039)	(0.017)	(0.012)	(0.017)	(0.031)

Community bank leader	1.14	-0.06	-0.05	0.01	0.02	0.02	0.04
	(1.469)	(0.087)	(0.088)	(0.042)	(0.039)	(0.042)	(0.075)
Index of dwelling quality	0.13	0.07**	0.05	0.05***,^	0.00	0.03**	0.04*
	(0.639)	(0.036)	(0.035)	(0.018)	(0.015)	(0.012)	(0.025)
Dependent variable at baseline	0.46***,^	0.56***,^	0.53***,^	0.40***,^	0.46***,^	-0.16*	0.50***
	(0.037)	(0.048)	(0.051)	(0.071)	(0.120)	(0.091)	(0.049)
Constant	0.91	2.40***	2.21***	1.32***	0.00	1.09***	-0.49**
	(4.311)	(0.485)	(0.386)	(0.273)	(0.094)	(0.122)	(0.194)
Observations	1,228	1,229	1,227	1,233	1,228	1,200	1,327
R-squared	0.35	0.28	0.25	0.26	0.16	0.17	0.29

Notes: standard errors clustered at the group level in parentheses. Significance codes: *** p<0.01, ** p<0.05, * p<0.1. Randomization inference p-values in brackets. ^ indicates that null hypothesis is rejected at a 0.05 level after correction for a false discovery rate (Benjamini and Hochberg, 1995). All regressions follow an ANCOVA specification controlling for the baseline value of the outcome. All regressions include treatment pair and type of business fixed effects.

Table 8 Treatment effect on savings and internal loans (ANCOVA)

Independent variables are:	(1) Log of avg. group weekly savings	(2) Log of avg. group weekly savings	(3) Log of avg. group weekly internal credit demand	(4) Log of avg. group weekly internal credit demand	(5) Log of avg. group weekly (savings+ internal credit)	(6) Log of avg. group weekly (savings+ internal credit)
Treatment	0.02	0.01	0.44	0.54*	0.39**	0.44***
	(0.04)	(0.07)	(0.30)	(0.32)	(0.15)	(0.16)
Six months after treatment (dummy)		0.03		0.09		0.16
		(0.08)		(0.25)		(0.13)
Treatment x Six months after treatment		0.03		-0.20		-0.02
		(0.11)		(0.24)		(0.14)
Cycle number	1.16***	0.12***	0.02	0.01	0.16**	0.12*
	(0.10)	(0.04)	(0.14)	(0.15)	(0.07)	(0.07)
Cycle number squared	0.13***	-0.01***	0.00	0.00	-0.01*	-0.01
	(0.04)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Dependent variable at baseline	-0.01***	1.15***	(0.30)	0.35*	0.65***	0.67***
	(0.00)	(0.10)	0.35*	(0.18)	(0.17)	(0.16)
Constant	-1.05**	-1.00**	-0.29	-0.34	0.14	0.21
	(0.44)	(0.43)	(1.29)	(1.36)	(0.97)	(0.95)
Observations	2,443	2,443	1,880	1,880	2,121	2,121
R-squared	0.47	0.47	0.40	0.40	0.41	0.41

Notes: standard errors clustered at the group level in parentheses. Significance codes: *** p<0.01, ** p<0.05, * p<0.1 All regressions follow an ANCOVA specification controlling for the baseline value of the outcome and including treatment pair, number of within cycle week, and month fixed effects.

Table 9 Treatment effect on *Fuentes* loans, and total microfinance use (ANCOVA)

	(1) Log of avg. group cycle *Fuentes* credit demand	(2) Log of avg. group cycle *Fuentes* credit demand	(3) Log of avg. group cycle total microfinance use	(4) Log of avg. group cycle total microfinance use
Treatment	-0.02	-0.04	-0.10	-0.14**
	(0.05)	(0.05)	(0.07)	(0.07)
Three cycles after treatment (dummy)		0.04		-0.02
		(0.06)		(0.05)
Treatment x Three cycles after treatment		0.09		0.15**
		(0.08)		(0.07)
Cycle number	0.12***	0.09**	0.12***	0.11***
	(0.04)	(0.04)	(0.04)	(0.03)
Cycle number squared	-0.01***	-0.01***	-0.01**	-0.01**
	(0.00)	(0.00)	(0.00)	(0.00)
Dependent variable at baseline	0.57***	0.63***	0.81***	0.76***
	(0.11)	(0.09)	(0.12)	(0.11)
Constant	3.22***	2.94***	1.18	1.76*
	(0.85)	(0.72)	(1.05)	(0.97)
Observations	143	143	113	113
R-squared	0.57	0.59	0.75	0.77

Notes: standard errors clustered at the group level in parentheses. Significance codes: *** p<0.01, ** p<0.05, * p<0.1. All regressions follow an ANCOVA specification controlling for the baseline value of the outcome and including treatment pair fixed effects.

Table 10 Mediation test of psychological and religiosity outcomes on business performance

Mediator	Effect of treatment on mediator *a*	Effect of mediator on outcome *b*	Total effect *a*b*	Effect of treatment on outcome controlling for mediator
Happiness Index	0.02	0.08	0.00	0.18
	(0.05)	(0.04)	(0.00)	(0.06)
Optimism Index	0.13	0.01	0.00	0.18
	(0.06)	(0.03)	(0.00)	(0.06)
Aspirations Index	0.02	0.02	0.00	0.18
	(0.07)	(0.02)	(0.00)	(0.06)
Agency Index	0.15	0.07	0.01	0.17
	(0.07)	(0.03)	(0.01)	(0.06)
Pathways Index	0.17	0.09	0.01	0.17
	(0.07)	(0.04)	(0.01)	(0.06)
Future Orientation Index	0.12	0.06	0.01	0.18
	(0.05)	(0.03)	(0.00)	(0.06)
Risk Aversion Index	0.01	0.01	0.00	0.18
	(0.07)	(0.03)	(0.00)	(0.06)
Spiritual Health Index	0.14	-0.01	0.00	0.19
	(0.06)	(0.03)	(0.00)	(0.06)
Hope-3 Index	0.14	0.08	0.01	0.17
	(0.07)	(0.03)	(0.01)	(0.06)
Hope-8 Index	0.17	0.06	0.01	0.17
	(0.06)	(0.04)	(0.01)	(0.06)

Notes: Standard errors clustered at the group level in parentheses. The standard error of (*a*b)* is calculated as $\sqrt{b^2 s_a^2 + a^2 s_b^2 + s_a^2 s_b^2}$, where s_a and s_b are the standard errors of *a* and *b* (see Baron and Kenny, 1986). All regressions follow an ANCOVA specification controlling for the baseline value of the outcome. All regressions include controls for age, education, a dummy for members self-identified as protestant evangelical, a dummy for bank leaders, number of children, number of children younger than 18 years of age, a dwelling index, a dummy for the type of business, and treatment pair fixed effects.

Appendix.

Figure A1 Questionnaire Sample

Fuentes Libres Sample Questionnaire

I voluntarily participate in the study (print name and signature): _____

I. Basic Data

Name_____ Community Bank _____ Age____
Education (last grade level) _____ Religion_____ How long? _____ Marital Status: S M U D W
Children: ___ C. Minors _____ Number of bedrooms in house___ Material of walls ___ Type of floor ____
Type of roof ____ Community bank leader?_____ When did you start? M/Y____
Business Type: _____ Years w/ Business____

II. Psychological and religiosity Data

(In a 0-10 scale, where 10 is that you strongly agree and 0 that you strongly disagree, assess the following statements):

A. a) General Happiness: All things considered, how happy are you today? (0-10) ____
b) All things considered, how satisfied are you with your life? (0-10) ____

B. General Optimism: "All things considered, how hopeful do you feel about the future?" (0-10) ____

C. Three Components of Hope

1. Aspirations and Goals: 5 questions (In a 0-10 scale, where 10 is that you strongly agree and 0 that you strongly disagree, assess the following statements):

a) ___ "It is better learn to accept the reality of things than to dream for a better future."
b) ___ "It is better to have aspirations for your family than to accept each day as it comes."
c) ___ "I am satisfied with the current sales and profits from my business."
d) ___ "It is wise to establish goals when one has a business."
e) ___ "I have specific goals and plans for the future growth of my business."

2. Agency and Self-Efficacy:5 questions (In a 0-10 scale, where 10 is that you strongly agree and 0 that you strongly disagree, assess the following statements):

a) ___ On a scale of 0 to 10 how important is *hard work* to prospering in business?
b) ___ On a scale of 0 to 10 how important is *being lucky* to prospering in business?
c) ___ "My future is shaped mainly by my own actions rather by than the actions of others."
d) ___ "It is difficult for people like me to be a leader in the community."
e) ___ "Women like me can help bring about positive change in our community."

3. *Avenues/Pathways: 5 questions*

a) ___ "I can find a way to solve most problems."
b) ___ "If my business sales are low, I know how to explore new markets."
c) ___ "I become discouraged easily when I encounter obstacles in my business."
d) ___ "If my current business fails, I could start a new business selling a different product."
e) ___ "Social networks are ways to grow my business."

D. Future-Orientation: 3 questions

a) ___ "When I have a chore, I do it immediately rather than putting it off for later."
b) ___ "It is far more important to enjoy life today than to make sacrifices for tomorrow."
c) ___ "I use my business profits more for business re-investment than personal needs."

E. Risk Aversion: 3 questions

a) ___ "In general, I am a someone that is willing to take risks."
b) ___ "When I learn about new opportunities in the market, I am willing to take financial risks to invest in those opportunities."
c) ___ Yes or No: "I'd rather have 50 pesos in my hand than equal chances at 500 pesos or nothing."

F. Spiritual Orientation: 3 questions

a) How many days per week do you set aside time to pray actively or read the Bible?_____

b) How many days per week do you attend church or meet with a church-related group?_____

c) Do you feel more strongly that God: (i) ___ gives you opportunities to grow and prosper, or

(ii) ___ controls the events of your life?

III. Business Data

A. How many hours did you dedicate fully to your business during the previous 7 days? _____

B. What were your gross sales (in pesos) in your business during the previous 7 days? _____

C. What were your profits (in pesos) from your business during the previous 7 days? _____

D. How much did you save with Fuentes Libres during the previous 7 days? _____

E. How many employees do you have in your business? _____ Plan to have employee in the future? _____

IV. Satisfaction Over Levels of Sales and Savings

A. What is your best estimate of your weekly sales under the following scenarios? (Satisfied 0-10.)

	Bad Luck	**Normal Luck**	**Good Luck**
<u>Maximum</u> Effort & Hours	**Ventas_____** **Satisf. Level_____**	**Ventas_____** **Satisf. Level_____**	**Ventas_____** **Satisf. Level_____**
<u>Normal</u> Effort & Hours	**Ventas_____** **Satisf. Level_____**	**Ventas_____** **Satisf. Level_____**	**Ventas_____** **Satisf. Level_____**
<u>Minimum</u> Effort & Hours	**Ventas_____** **Satisf. Level_____**	**Ventas_____** **Satisf. Level_____**	**Ventas_____** **Satisf. Level_____**

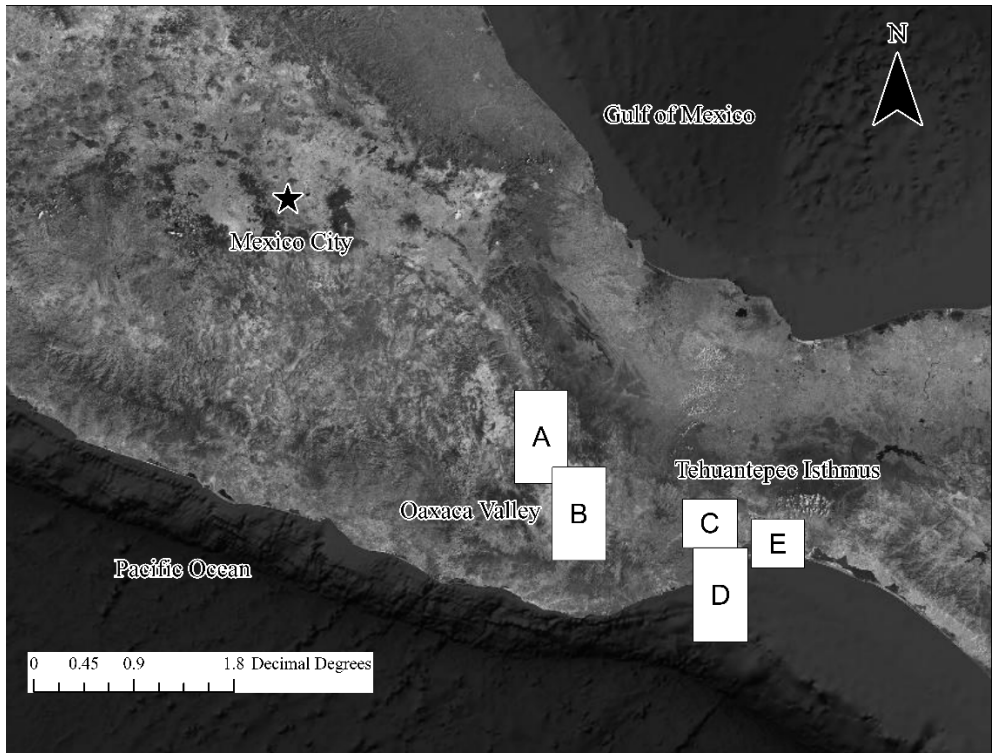
10. At sales level 20% higher than Max Effort and Good Luck_____ Satisif. Level_____

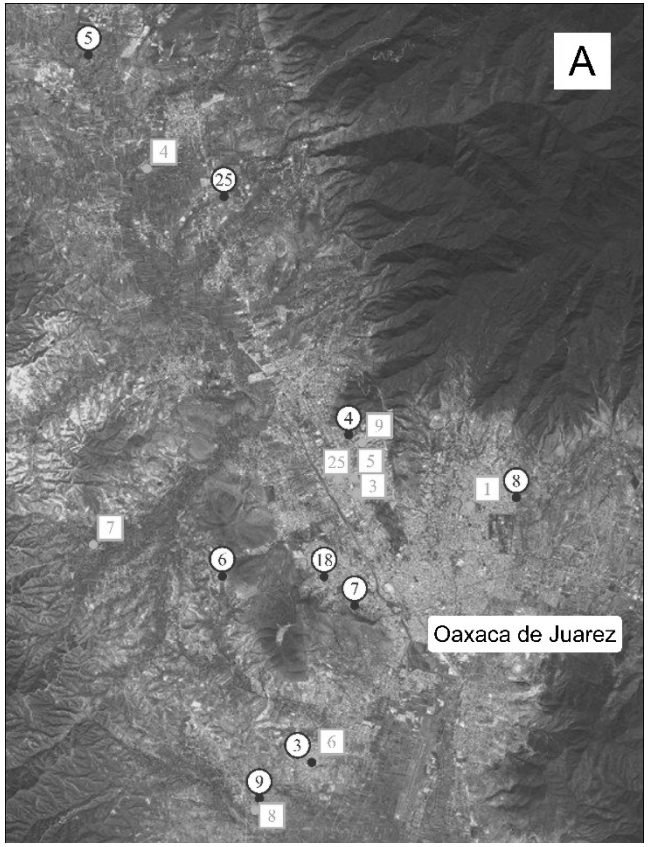
(Use question **III.(D)** and multiply by 3, then divide by 10 to create 10 deciles of possible savings outcomes.)

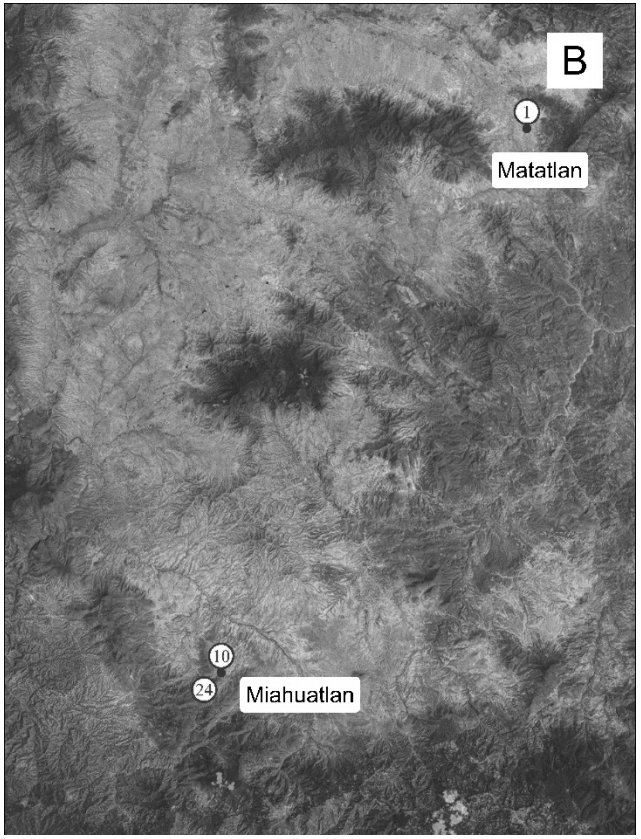
	Savings L1:	**Savings L2:**	**Savings L3:**	**Savings L4:**	**Savings L5:**
How satisfied? (0-10)					

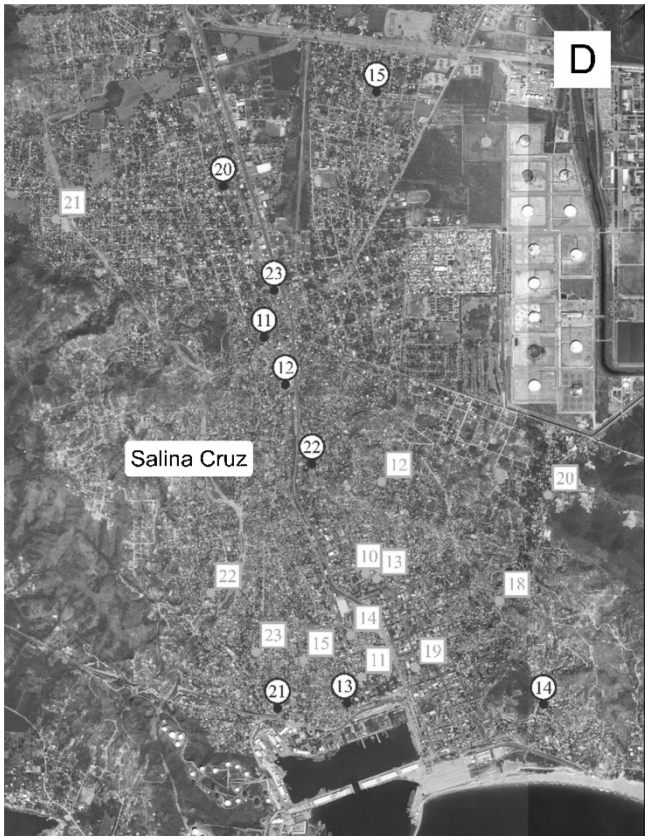
	Savings L6:	**Savings L7:**	**Savings L8:**	**Savings L9:**	**Savings L10:**
How satisfied? (0-10)					

Figure A2 Detailed location of groups in the study sites






B
1
Matatlan
10
24
Miahuatlan


D
15
20
21
23
11
12
Salina Cruz
22
12
20
10
13
22
18
14
23
15
19
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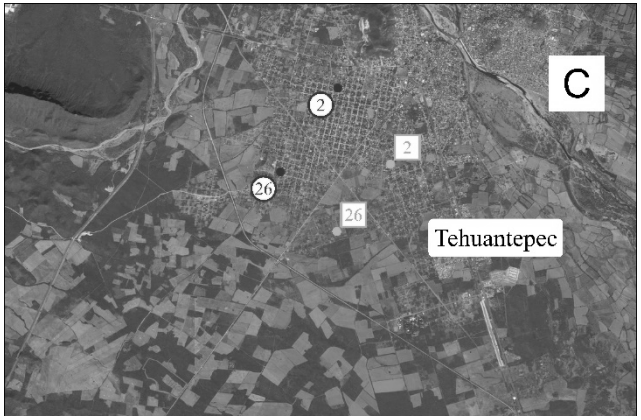
21
13
14


C
2
2
26
26
Tehuantepec

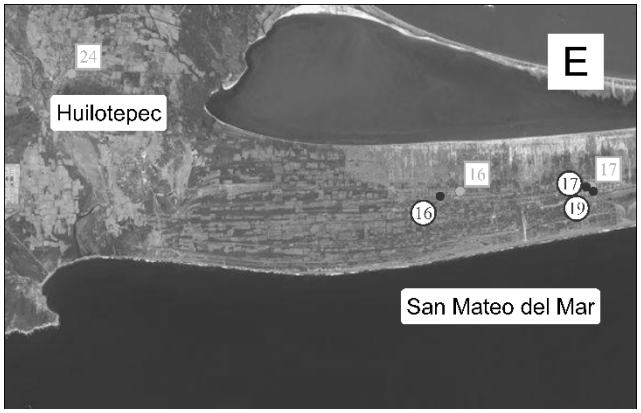
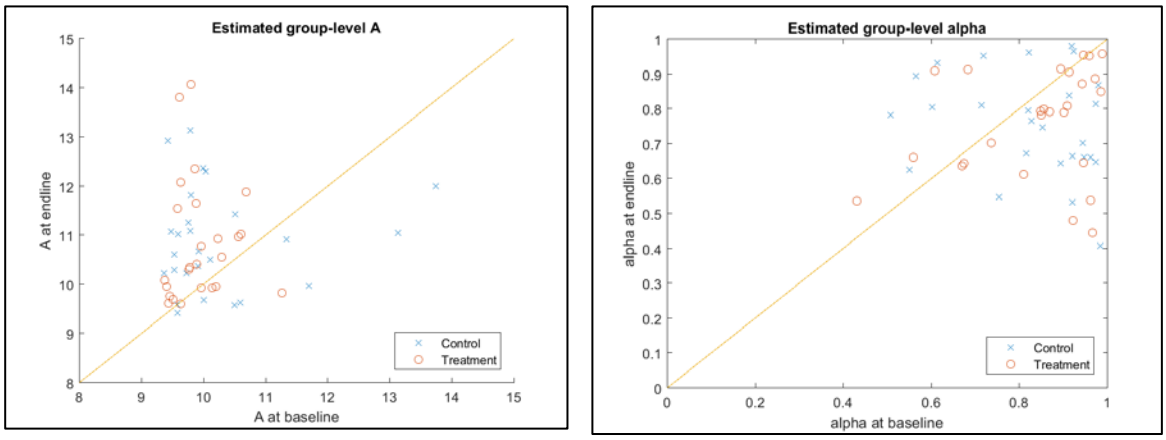

E
24
Huilotepec
16
17
17
16
19
San Mateo del Mar

Figure A3 Nonlinear least squares estimates for A and α by group and individual

a) By group

A α



b) By individual

A α

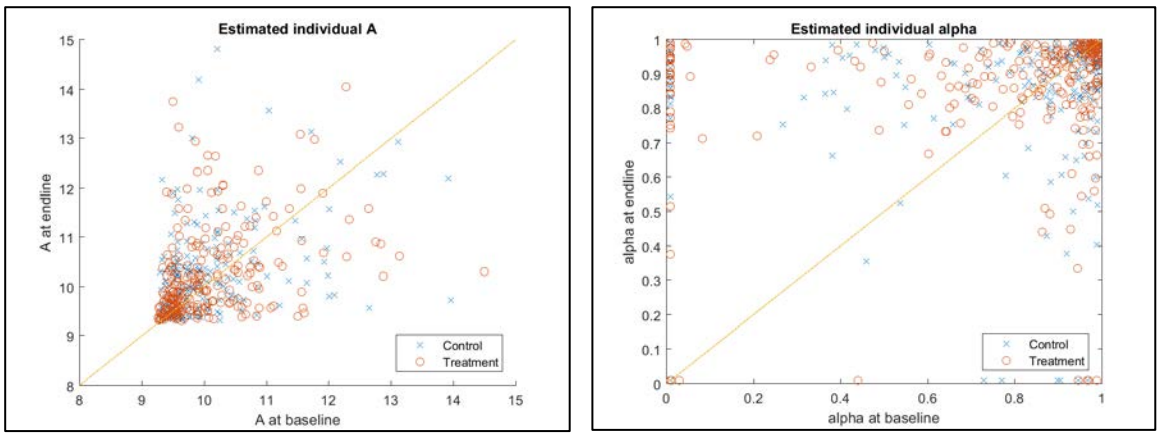


Table A1 Treatment effect on psychological and religiosity outcomes by religion (ANCOVA)

	12-months follow-up	Catholic (dummy)	Treatment x one-month follow-up	Treatment x 12-months follow-up	Treatment x one-month follow-up x Catholic	Treatment x 12-months follow-up x Catholic	Observations
Happiness Index	0.09	0.10	0.15	0.24*	-0.11	-0.27*	1327
	(0.08)	(0.08)	(0.14)	(0.13)	(0.16)	(0.14)	
Optimism Index	0.03	0.01	-0.12	0.18	0.27	-0.06	1327
	(0.06)	(0.13)	(0.18)	(0.18)	(0.19)	(0.19)	
Aspirations Index	0.13	-0.18**	0.22*	0.05	0.06	-0.03	1327
	(0.10)	(0.09)	(0.12)	(0.15)	(0.15)	(0.16)	
Agency Index	0.05	-0.25***	-0.08	0.28*	0.16	-0.15	1327
	(0.07)	(0.08)	(0.12)	(0.14)	(0.12)	(0.14)	
Avenues Index	0.20**	0.00	-0.03	0.36***	0.09	-0.23*	1327
	(0.08)	(0.06)	(0.11)	(0.12)	(0.11)	(0.12)	
Future Orientation Index	0.04	-0.06	-0.09	0.25	0.26*	-0.15	1327
	(0.06)	(0.07)	(0.13)	(0.15)	(0.14)	(0.17)	
Risk Aversion Index	-0.09	-0.13	-0.05	-0.05	0.12	0.07	1327
	(0.08)	(0.09)	(0.16)	(0.13)	(0.15)	(0.14)	
Religiosity Index	-0.06	-0.28**	-0.15	0.15	0.07	-0.00	1327
	(0.08)	(0.13)	(0.19)	(0.16)	(0.16)	(0.18)	
Weekly Days Pray or Read Bible	-0.31	-1.07***	-0.54*	0.67	0.15	-0.51	1249
	(0.24)	(0.25)	(0.30)	(0.42)	(0.35)	(0.45)	
Weekly Days Attend Church or Church Group	-0.13	-0.71***	-0.66*	0.15	0.47	-0.05	1249
	(0.15)	(0.26)	(0.38)	(0.34)	(0.35)	(0.40)	
Agrees God Gives Opportunities to Grow & Prosper	0.06	0.26***	0.14**	0.01	-0.08	0.04	1246
	(0.04)	(0.05)	(0.07)	(0.08)	(0.07)	(0.09)	
Hope-3 Index	0.17**	-0.18**	0.07	0.30**	0.14	-0.19	1327
	(0.08)	(0.07)	(0.11)	(0.12)	(0.13)	(0.11)	
Hope-8 Index	0.05	-0.24**	-0.04	0.31**	0.22	-0.16	1327

	(0.08)	(0.09)	(0.16)	(0.15)	(0.16)	(0.16)

Notes: standard errors clustered at the group level in parentheses. Significance codes: *** p<0.01, ** p<0.05, * p<0.10. All regressions follow an ANCOVA specification controlling for the baseline value of the outcome. All regressions include treatment pair and type of business fixed effects. We also control for the respondent's years of education, their number of children, a dummy variable for the respondent being a bank leader, and an index of dwelling quality.

Table A2 Treatment effect on economic outcomes by religion (ANCOVA)

	12-months follow-up	Catholic (dummy)	Treatment x one-month follow-up	Treatment x 12-months follow-up	Treatment x one-month follow-up x Catholic	Treatment x 12-months follow-up x Catholic	Observations
Business hours worked	1.57	-0.08	-0.35	-3.66	-2.55	4.76*	1228
	(1.82)	(1.85)	(2.70)	(2.82)	(3.19)	(2.82)	
Log of sales	0.45***	-0.24	0.15	-0.10	0.02	0.17	1229
	(0.12)	(0.16)	(0.31)	(0.19)	(0.33)	(0.21)	
Log of profits	0.46***	-0.27*	0.19	-0.05	-0.03	0.11	1227
	(0.11)	(0.15)	(0.29)	(0.19)	(0.32)	(0.21)	
Log of savings	0.14**	0.01	0.21*	0.05	-0.20*	0.03	1233
	(0.07)	(0.08)	(0.12)	(0.13)	(0.12)	(0.12)	
Employees	-0.00	-0.01	-0.05	-0.02	0.05	0.09	1228
	(0.03)	(0.05)	(0.06)	(0.05)	(0.07)	(0.07)	
Plans for Employees	-0.07	-0.06	-0.02	0.10	0.02	0.02	1200
	(0.04)	(0.05)	(0.09)	(0.06)	(0.10)	(0.08)	
Bus. Perf. Index	0.12*	-0.09	0.02	0.02	-0.00	0.19	1327
	(0.07)	(0.09)	(0.14)	(0.12)	(0.15)	(0.14)	

Notes: standard errors clustered at the group level in parentheses. Significance codes: *** p<0.01, ** p<0.05, * p<0.10. All regressions follow an ANCOVA specification controlling for the baseline value of the outcome. All regressions include treatment pair and type of business fixed effects. We also control for the respondent's years of education, their number of children, a dummy variable for the respondent being a bank leader, and an index of dwelling quality.