Assessing the impacts of a training program for women in Peru: Are there social networking effects?

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Abstract
The general goal of this study is to assess the impacts on women’s economic and social participation of a peer-to-peer training program in Cañete Province, Peru. We use a quasi-experimental methodology applied to treatment and control groups. The study evaluates three areas of potential effects: (i) participation and returns from economic activities (use of time, labour market participation, family business, savings); (ii) indicators of women’s autonomy, family cohesion and social participation; and (iii) living standards. The impacts we found are mixed. We only detected robust impacts on the propensity to engage in savings and participate in local social organizations by treated women. The channels behind these impacts require more specific research, but we hypothesize that it may be related to expanded social networking. We observe a few specific impacts related to autonomy (negative) and family cohesion (positive), which can be linked to the religious nature of the program. We evaluate differentiated effects by some features of the treatment group as self-assessment of economic usefulness by women as well as trainers’ education and age. In terms of policy, we consider that peer-to-peer programs of this type may have limited impacts in terms of broad development goals like increased income, labour participation and business activity by women, but these can also show some advantages for expanding women’s social networking and access to savings and local organizations. Improved peer-to-peer programs more clearly linked to the economic advancement of women may be more efficient in achieving broader development goals.

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Keywords: Human Capital, Human Development, Human Resources, Formal Training Programs, Training, Skill Building, Specific Human Capital, Training, Occupational Choice; Labor Productivity

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Executive summary

The general goal of this study is to assess the impacts on women’s economic and social participation of a peer-to-peer training program in Cañete Province, Peru. We use a quasi-experimental methodology applied to treatment and control groups without a baseline. The study evaluates three areas of potential effects: (i) participation and returns from economic activities (use of time, labour market participation, family business, savings); (ii) indicators of women’s autonomy, family cohesion and social participation; and (iii) living standards.

Research on this topic remains crucially important in Peru for the discussion on the role of training in increasing women’s economic and social empowerment, and the more general potential welfare benefits generated by training. There is a consensus in Peru that the country needs more active gender policies that challenge existing social institutions and markets, that do not currently allow women, especially in poor urban and rural areas, to obtain higher returns and more social and economic recognition of their capabilities and efforts.

The so-called non-experimental method that we used is based on the evaluation problem (which can be considered a missing data problem). We wanted to assess the effect of the training program on women who participated (treatment on the treated), but we could not observe women who did not participate. The solution was to construct a reliable control group which complied with certain conditions, especially the existence of a set of observable variables \( Z \) that make program participation as exogenous as possible to potential outcomes from the intervention. This requires the balancing of the observables in the control group so these are as close to the treatment group as possible. For this balancing we used a new technique known as entropy balancing (Hainmueller, 2012) that directly tackles the need of making covariates distributions as similar as possible among these two groups (generally, the use of a pscore for balancing is not totally successful at doing this). We compared the results obtained with a more traditional pscore weighting method, imposing in both cases the common support assumption.

This approach still faces the problem of correlations of participation with non-observables, which cannot be dealt with here as we do not have baseline data or retrospective data that can tackle this potential source of bias in estimations. However, we reduced the potential biases due to unobservables when we constructed the control group from towns, which were not intervened...
in, but shared some attributes with the treated ones in some relevant dimensions. This approach ameliorates the problem of self-selection based on unobservables that will be more important if treated and controls were taken from the same localities.

Condoray, the private training center has been operating in Cañete since 1963. The general goal of the institution is to promote sustainable economic development for families in the Cañete Province, 150 km south from Lima, the capital of Peru. One of its most important programs is targeted at poor rural and urban women, offering training at no monetary cost. The program is designed to promote the integrity of women through education, offering weekly mini-courses of three hours in different areas (production, house management, health, hygiene, etc.). The program uses a peer-to-peer methodology, in which the trainers, or promotoras (promoters), local women who are trained directly by the institution, train other women. All course content is designed and taught to promoters by Condoray’s professional personnel. The enrollment of women is for nine months, with continuous training from April to December. Recently, the Program has been operating in 16 different communities, benefiting 1,800 women in the Cañete province from 2009 to 2014. Mostly, the training program works in the southern districts, closer to the province’s capital, San Vicente de Cañete, where the Condoray Center is located. The program does not reach the more distant rural areas and the area of intervention can be described more as an urban-poor and semi-rural.

There are two elements that can be considered as eligibility criteria used by the Condoray training program at town level. According to the current director of the program, the leading criteria for deciding intervention at town level are: (i) women living in the province of Cañete; and (ii) the willingness of local women’s organizations to compromise with the program and to sustain wide participation by their association to the program. Whereas the first criterion is observable, the second is not directly observable for the purposes of searching for control towns. Based on this and methodological considerations to reduce potential biases from non-observables, we approximated the second criterion with two variables: population size and level of women’s education in the potential control towns, which we assume are correlated to the level and intensity of local organizations.

For the survey we selected 15 treated towns where 10 enrolled women were randomly chosen. For the control group, we built a stratified universe of potential control towns from which we also took a random sampling of 15 control towns. For the field work in treated towns, surveyors used
the list of enrolled women, but for control towns enumerators were instructed to select a sample of 10 households in situ, and within each household, to interview an adult woman, especially if she was the head, or a partner of the head of the household. The selection criterion was that there was at least one adult woman present in the household to respond the survey. The total sample size for the survey was 300 women, 150 in the treated communities and 150 in the selected control communities.

We constructed a questionnaire to gather information in three areas of interest for evaluation: (i) women’s economic participation; (ii) autonomy, self-esteem and social participation; (iii) living standards. Applying the proposed methodology, we measured impacts in these areas with mixed results. The evidence suggests that there are some detectable impacts on economic participation (savings), and to a lesser extent, in some social participation and family cohesion indicators, with no statistically significant impacts on standard of living measures. Looking at the type of specific effects encountered, we suggest that a potential driving factor (channel) behind this configuration exists and is what we call a networking effect of a peer-to-peer program. This, and alternative channels for explaining this result, will require further research.

The Condoray training courses seem to be expanding women’s experiences and developing their relationships with other women, something that may be useful for their increased economic participation. The higher participation of enrolled women in the local financial markets is an indicator of this process. Women from Condoray are much more able and willing to save using both formal and informal schemes. This option is also highly linked to an expanded network of contacts and social capital. For instance, the Juntas or Panderos programs, informal schemes for saving, require high levels of trust among participants. More networking capacity may clearly improve the ability to save using these informal mechanisms. Moreover, we see that the indicators of women’s participation in local organizations are clearly enhanced by the Condoray program, although in this case we should be cautious about causality, as an original willingness and commitment of organizations to the program were eligibility criteria for the intervention (at least at town level). In any case, the overall picture suggests an increasing ability of enrolled women to engage in social networking, bringing more participation in local organizations.

On the other hand, the program does not have any significant impacts on autonomy, or self-esteem indicators within households, whereas family cohesion is clearly enhanced. This can be consistent with the design of a program from a Catholic institution that does not explicitly
challenge prevalent family structures, and stresses the importance of family values more than women’s autonomy.

We also see that the program does not have significant impacts on (a limited set of) standard of living indicators due to budget restrictions. However, to a certain extent, this may be expected from low cost peer-to-peer training programs, which are not very in-depth or specialized enough to change returns on women’s assets and abilities. In this case, it is clear to us that more comprehensive training programs with explicit goals for productive areas, and skills for business management and development may be needed. Notwithstanding, the narrow scope of the CTP, it is noteworthy that it has been able to improve women's participation in important economic activities like financial markets. It also seems to be a program that induces more participation of women in social networks and community affairs, which is also a form of improving social capital and an advance to a more equitable relationship between genders.

The evidence of the study also suggest that some specific features of the program may have some differentiated effect on the outcomes. For instance, women who find the courses more useful for economic purposes tend to show higher impacts on the already significant variables. Also, education and age of the trainers seem to be important for getting better results. This is important for a program in which trainers are older and less educated than trainees, a situation that the current administration is trying to change to have better results.

Our main policy recommendation is that the Peruvian Government pays close attention to the potentials of peer-to-peer training programs for women in rural and semi-urban sectors. This approach can be more cost-effective than other traditional top-down alternatives in order to generate important impacts on women’s lives, especially in their ability to participate in broader economic and social networks. However, it is also clear that this type of training may be insufficient to impact women’s key broader economic goals (use of time, labor participation, incomes), so it will require complementary interventions to improve the expected returns from women’s work, assets and skills, in their specific contexts.
I. Introduction

Peruvian women confront more obstacles than men in developing economic, social and political activities, which are the basis for autonomy, active citizenship, and reaching individual and social goals. In rural and poor urban areas, women are mostly in charge of housekeeping tasks like cooking, cleaning, childcare and caring for the elderly. But often, they also have to work outside the household to generate income, and in many instances are involved in running small family businesses. However, when women participate in the income generating arena, they are usually disadvantaged; they receive lower financial compensation and recognition for their efforts. Also, they face fewer opportunities to develop their productive and creative potential than men. The goal of this research, is to assess, to what extent, a peer-to-peer training program targeting women may be able to change, equilibrate, or reshape their economic disadvantage, in a particular context.

The general goal of the study is to assess economic participation and the empowering effects of a training program for women at Condoray, using a quasi-experimental methodology applied to treated and control groups. In particular, we wish to identify three areas of potential effects on women’s situation: (i) participation and returns from economic activities (labour market, family business, savings); (ii) indicators of women’s autonomy and empowerment in decision making and social participation; (iii) aggregate household welfare effects.

Research on this topic remains crucially important in Peru for the discussion on the role of training for increasing women’s economic and social empowerment, and the more general potential welfare benefits generated by this. There is consensus in Peru that the country needs more active gender policies that challenge and change existing social institutions and markets that do not allow women, especially in poor urban and rural areas, to obtain higher returns, and more economic and social recognition of their efforts and capabilities.

The rest of this paper is divided in six sections. The first section presents a brief literature review and our main research questions. The second describes our methodological approach, with a so-called quasi-experimental impact analysis and matching of treated and control groups, based on a set of assumptions and a relatively new entropy balancing method for matching. A third section is devoted to describing our selected case study, Cañete, with a peer-to-peer training program for women at Condoray. The fourth part describes the instruments used for our
study, discussing sample and survey design, questionnaire and type of variables and indicators we used to measure impacts. The fifth section presents the results of applying the methodology for estimating effects on a set of variables and indicators related to the three areas of evaluation. A sixth and final section discusses the results and makes some policy recommendations.

II. Literature review

The specific issue about training and its potential role in the process of women’s economic participation and empowerment has become crucial in the literature (Lastarria, 1998; Quisumbing & Pandolfelli, 2009). Training and technical assistance can make women more economically and socially empowered, increasing their human capital. This helps motivate them (and their families and communities) towards social change. As their human capital increases, women are more able to share and gain knowledge with and from neighbours, to participate in larger information networks, and to become more open to experimentation and innovation. Therefore, women’s resources could be better managed, and as a result, positive impacts on income and self-sufficiency, and their families can be expected.

There is ample literature on the impacts of diverse types of development programs on women’s economic participation, empowerment and welfare (Duflo, 2012). Kabeer (1999) points out the importance of distinguishing between impacts on women’s resources, agency (decision making) and outcomes. In the complex social process of daily life, even programs with similar goals or methodologies may have very different impacts on women depending on the institutional context, resources, and initial conditions.

One of the interventions, which has been more evaluated in the literature, is microcredit directed towards women, especially in Africa and Asia. In this area, there is still controversy about the real effectiveness of these types of programs for increasing women’s empowerment and welfare. Part of the controversy is related to the definition itself and the conceptual model behind the notion of women’s empowerment (Kabeer, 1999; Green, 2008; Mayoux, 1998). In general terms, the impacts of microcredit on women are highly mediated by social and institutional rules in which gender relations are embedded. It is interesting to note that the
evidence points out that when microcredit is accompanied by training and specific gender strategies, it tends to generate better results (Kantor, 2005; Dineen & Le Quan, 2015; Holvoet, 2015: Kuumuori et al., 2015).

The literature about the impacts of training programs on women in developing countries is also large and controversial. During the last decade there has been an increasing use of experimental approaches to evaluate training programs oriented to women, especially in the area of small businesses. In Peru, for instance, a recent study by Valdivia (2015) found evidence of the differentiated impact of training (business best practices) with and without technical assistance, from a randomized experiment with urban women running small businesses. A similar, but more ambitious experimental evaluation, was carried out in Sri Lanka by de Mel et al. (2014). In this case, the authors explored the impacts of training on a group of women with businesses, and on other group interested in starting businesses (start-ups). The results indicate that training seemed to be more effective for start-ups than for established businesses.

Most of the studies about training and women, however, are based on more traditional qualitative and non-experimental quantitative evaluations. A very interesting and insightful qualitative evaluation on the impact of an innovative secondary education program, aimed at Honduran native women (Garifuna), is Murphy-Graham (2008). This ethnographic work found deep and transformative impacts on these rural girls’ and women’s lives from an educational program run in a social context highly biased against women. A key to explain the program’s success was its insistence on having an explicit gender strategy in the educational process, allowing the emergence of contesting discourses to the predominantly male-oriented values and institutions. A similar evaluation, but in this case for a peer education program for teen-age girls in Bangladesh, was developed by Scales et al. (2013). This work used a quantitative non-experimental methodology based on treatment and control groups to assess the program impacts on what these authors call “developmental assets to empower adolescent women” (p.171).

Some studies shed light on how training programs oriented towards women and intended for some specific type of economic impact ended up generating non-expected and empowering effects. For instance, Slater (2001) found that in an urban-agriculture program oriented to women in South Africa with the intent of increasing monetary income, “(the program) is important to women of low-income households in ways less directly related to monetary gain.
Women use urban agriculture to establish social networks, to symbolise a sense of security and to encourage community development” (p. 635). Holvoet (2005), in evaluating a microcredit program, found that impacts changed dramatically when women participated in groups “…Women’s groups membership seriously shift overall decision-making patterns from norm-guided behaviour and male decision-making to more joint and female decision-making” (p. 75). Therefore, there seems to be a sort of networking effect when women participate in training processes with other women, an effect that can be even more effective with peer-to-peer types of programs.

We hypothesized that this may be the case of the Condoray training program that we evaluated in this study. The program uses a peer-to-peer approach that makes the training a social and relationship-building type of process with potential impacts than may go beyond specific content or program goals. There is some evidence of the effectiveness of peer education for girls and women in diverse contexts, such as Kulik and Hofit (2011), Scales et al. (2013), and Lewycka et al. (2013).

For this study, our main research question was: to what extent are there measurable impacts on women’s lives participating in a peer-to-peer training program for adult women in Peru (Condoray)? Related questions were with respect to specific impacts of the program on women’s economic and social participation, autonomy and family cohesion, as well as their living standards. In order to answer these questions, we used a quasi-experimental approach with treatment and control groups, as explained in the next section.

III. Methodology

The methodological approach for this research is the evaluation of the impacts of a training program on women using non-experimental data (Asfaw et al., 2012). Using evaluation language, we called the Condoray training program the treatment group, where we observed treated women who had enrolled and taken courses in the program. We wanted to know what sort of changes this treatment had made in their lives. To properly answer this question, we faced the so called evaluation problem as we needed information about a hypothetical situation: what
would have happened to these participating women if they had not participated in the program. As we cannot observe women both participating and not participating at the same time, we faced a missing data problem (Todd, 2008), which is what our evaluation techniques sought to resolve.

3.1. The Evaluation problem for the Condoray Training Program

The evaluation problem can be formalized as follows. Assume $Y$ is an output variable which we think may be affected by program participation, and $Y_1$ is the value when the woman participates and $Y_0$ when she does not participate. Defining $D=1$ as the situation in which a woman participates in the program, and $D=0$ otherwise, at any point in time, we observe the following situation for the output variable:

$$Y = DY_1 + (1-D)Y_0$$ (1)

In this context, to answer the evaluation question we need to know:

$$E(Y_1|D=1) - E(Y_0|D=1)$$ (2)

that is, the difference in the expected output variable due exclusively to program participation of the participants (treatment effect on the treated). But we cannot observe $E(Y_0|D=1)$, so there is a need to find suitable substitutes. The logical step is to look for the observable $E(Y_0|D=0)$; that is, the output variable for women who did not participate. This is equivalent to searching for a control group, a group of women who are similar to the ones participating, but who, for an exogenous reason, do not participate. The required conditions for finding suitable control groups are the theoretical base for tackling the evaluation problem.

A first solution is to randomize the selection of participants from a known distribution of potential participants. If the randomization is carried out properly; that is, without any biases (which are always difficult to solve a priori, especially for unobservable variables), participation in the program is by definition, orthogonal to women’s assets and decisions, and we can directly use $E(Y_0|D=0)$ as the counterfactual needed for measuring (2). This is the basis of the so called experimental approach, which mimics experiments in the health disciplines, for instance, with treated and control groups taking a medicine and placebo, respectively.
However, often, such an experimental approach is not feasible in social sciences for practical reasons, such as, lack of budget, or for ethical, or cultural reasons. In this case, it is pertinent to ask if there are ways to use non-experimental data for tackling the same evaluation problem. This requires the construction of a suitable control group as close as possible to what would have resulted from a randomization process, so we can assert that measuring (2) is actually possible and reliable.

Thus, we need to look for potential sources of biases in the use of non-experimental data when trying to build such a control group. Here, it is pertinent to distinguish biases in observable and non-observable variables. Solving potential biases on these two dimensions imposes more stringent conditions on the required data. When potential biases arise from observable variables, it is possible to estimate (2) using matching techniques. If there is a set Z of observable variables, such that the outcomes \((Y_1, Y_0)\) are independent of participation status \(D\) conditional on \(Z\), and the following two conditions

\[
E(Y0|Z,D=1) = E(Y0|Z,D=0) = E(Y0|Z) \quad (3)
\]

\[
0 < Pr(D=1|Z) < 1 \quad (4)
\]

are met, it is possible to get a consistent estimator of (2). This means that it is possible that the participation status \(D\) does not help to explain expected output conditional on \(Z\). Also, condition (4) requires that the probability of participation conditioned on \(Z\) is well defined, which is the basis for the construction of a common support for participants and non-participants conditioned on \(Z\) variables.

On the other hand, other potential biases in unobservable factors are particularly worrisome when there is self-selection into a program. If women, who have higher expected outcomes from participating due to private knowledge, are the ones who actually participate, it is difficult to find a suitable control group from local non-participants, as they may be structurally different. In this case, one solution is to use baseline data taken prior to the program, in order to control for unobservable variables which can be assumed are fixed in time (or at least in the time in which the program develops). In this case, it is possible to identify (2) using difference-in-difference estimators (Todd, 2008).
In our case, the program has neither experimental data, nor a baseline for applying difference in difference estimators. We only have current post-program data for participants and non-participants, so we will base our evaluation approach on assumptions (3) and (4). Thus, the main point in (3) and (4) is that we can obtain enough data on Z variables to make participation in the program orthogonal to expected outcomes. As we think that there is self-selection into the program—women with certain features are more likely to participate—we will build our control group not based on individual women in the treated communities, but selecting non-participant communities, which were not selected by program managers. Knowing some of the conditions that the programs’ staff use for selecting treated communities, we may be able to select non-participant communities that are good potential controls, and somehow improve the self-selection problem of unobservables. Therefore, our strategy is to build a control group of non-participating localities, based on observable variables, and a matching procedure at that level, and then gather Z data that will allow us to identify program impacts based upon conditions (3) and (4).

3.2. The weighting of the control group strategy

Assuming conditions (3) and (4) hold, the main methodological issue is how to construct impact estimators using matching techniques between treated and non-treated observations. Matching techniques are based on the work of Rosenbaum and Rubin (1983), in which it is shown that the conditioning on Z in (3) and (4) is equivalent to conditioning on P(D|Z); that is, the probability of program participation. This approach solved the intractable problem of dimensionality for conditioning on a set of variables Z, and made it possible to work with P(Z), known as the propensity score, as the basis for matching methods.

The literature on matching methods has been evolving during the last decade. Initial methods were based on pairing treated and control units through the so-called propensity score (propensity to be treated) function. This function is estimated by relating the probability of being treated to a set of observable variables (Z) from a sample of the population, in which there are treated and non-treated agents. The propensity score function seeks to synthesize the set of variables in a single dimension, looking for the best combination that represents the average value of these. Then, the analyst will check that both groups share a common support and that
there is a correct balancing between treated and non-treated values along the common support. After these checking procedures, he or she can use the pscore values as a measure of distance between treated and non-treated values for the estimation of impacts. Once the function is estimated, there are different algorithms (one-to-one neighbor, one-to-many neighbors, kernel, mahalanobis, etc.) to measure the distance between each treated observation and their potential control, or controls. This is equivalent to weighting each control observation depending on its relationship, or distance to each corresponding treated counterpart, and so to use it to generate impact measurements.

The general problem with this approach is that more often than not using the estimated propensity score for the balancing process does not generate an acceptable balance of covariates among control and treated groups. Researchers need to go back and forth from propensity score estimation to the matching process to check if balancing conditions are sufficient (in terms of biases among observables). In many cases, the balancing after matching is insufficient, and, worse yet, some covariates’ bias increase after matching. Due to these problems, recent literature proposes the use of a more direct and efficient way of searching balancing weights, with algorithms that generate these using information from the observed distribution of covariates in the treated group, and imposing restrictions on the moments for the covariates in the control group. One of these approaches is from Hainmueller (2012), which we will use. This methodology is called entropic balancing and allows the analyst to find an optimal vector of weights that balances each variable of the treated and control groups in the first, second and even higher order statistical moments. In this approach there is no need to check for an ex-post balancing condition since it is accomplished by definition.

Thus, entropic balancing is less discretionary and a more accurate and efficient method to generate the weighted counterfactuals to be used in the process of measuring impacts in quasi-experimental settings, such as the one we have. Once the corresponding weights are obtained, these are used in a simple regression between impact variables and the treatment indicator variable. The coefficient of the treatment variable is the corresponding estimated impact with their standard errors. We will use this method for the estimation in this study, although we also evaluate the traditional p-score and matching approach in Appendix 1.
IV. The Condoray Training Program

Cañete is a province of the Lima Region, where Lima, the capital of Peru is located. The provincial capital, San Vicente de Cañete, is located at about 150 km south of Lima. The province has experienced considerable economic growth during the last decade, based on productive diversification of agriculture, industry, energy and tourism (Cuadros, 2012). However, gender gaps are important. With regards to years of education, Table 1 shows that there are still significant differences between men and women in average years of education, both in the urban and rural sectors.

Table 1: Cañete, mean differences in education by gender and rurality

|          | Male | Female | Diff | Pr(|T| > |t|) |
|----------|------|--------|------|---------|
| Urban    |      |        |      |         |
| <15yrs   | 2.954| 3.014  | 0.060| 0.050  **|
| 15-24yrs | 10.587| 10.870 | 0.282| 0.000  ***|
| 25-34yrs | 11.242| 11.141 | -0.100| 0.007  ***|
| 35-44yrs | 10.833| 10.360 | -0.473| 0.000  ***|
| 45-54yrs | 10.47 | 9.229  | -1.240| 0.000  ***|
| 55-64yrs | 9.327 | 7.405  | -1.922| 0.000  ***|
| >=65yrs  | 6.683 | 4.718  | -1.964| 0.000  ***|
| Rural    |      |        |      |         |
| <15yrs   | 2.801| 2.841  | 0.040| 0.574  |
| 15-24yrs | 10.438| 10.581 | 0.143| 0.042  **|
| 25-34yrs | 10.64 | 10.439 | -0.201| 0.033  **|
| 35-44yrs | 9.995 | 9.338  | -0.657| 0.000  ***|
| 45-54yrs | 9.391 | 8.022  | -1.368| 0.000  ***|
| 55-64yrs | 8.484 | 6.474  | -2.010| 0.000  ***|
| >=65yrs  | 5.788 | 3.883  | -1.905| 0.000  ***|

Source: SISFOH-INEI (2014)
*** significant at 0.01: ** significant at 0.05

Although the gap has basically closed for ages up to 24 years old (due to improvements in access during last two decades, with a mild advantage for young women), it is highly biased against women for all age ranges above 24 years old, who have less education with statistically significant differences at 0.01 significance level (see Table 1). It is also clear that the gap increases with age for all the groups older than 24 years, an indicator of the historical disadvantage that adult women faced and still face, in terms of access to education opportunities in poor urban and rural Peru.
The Condoray private training center has been operating in Cañete since 1963. The general goal of the institution is to promote sustainable economic development for families in the Cañete province. The institution is of religious nature (Catholic), and has several training programs oriented towards different groups of young, and adult women in the area. One of the programs is directed at rural and urban poor women, offering training at no monetary cost. The program is designed to promote women’s integrity through education, and empower their technical and productive training. The program uses peer-to-peer methodology, in which the instructors are promotoras (promoters), local women who are directly trained by the institution, so they can train other women. These promoters are volunteers, who are in charge of giving weekly three-hour mini-courses to enrolled women seeking to expand some productive and general skills, and become more autonomous and self-reliant.

All course content is designed and taught by Condoray’s personnel to promoters, who then communicate the information at their weekly three-hour mini-courses in local communities. The enrollment is for nine months, with continuous training from April to December. Fees are not charged to participants and promoters do not receive any monetary payments for their volunteer work either. However, Condoray does subsidize some materials used for specific courses (like handicrafts), and regularly gives promoters some non-pecuniary incentives for their efforts. Recently, the program has been operating in 16 different communities, and between 2009 to 2013 it benefited 1,800 women in the Cañete province (Condoray, 2015).

We had access to the list of women enrolled in the Condoray training program over six years (2009-2014). The database was built by the institution with some information about enrolled beneficiaries. The distribution of enrolled women by location (called centro poblado in Peru) and year of enrollment, is shown in Table 2.

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<thead>
<tr>
<th>Location</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Missing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boca del Río</td>
<td>0</td>
<td>0</td>
<td>41</td>
<td>9</td>
<td>1</td>
<td>10</td>
<td>22</td>
<td>83</td>
</tr>
<tr>
<td>Cantagallo</td>
<td>25</td>
<td>18</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>56</td>
</tr>
<tr>
<td>Casa Blanca</td>
<td>19</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>21</td>
<td>42</td>
<td>91</td>
</tr>
<tr>
<td>Cerro Candela</td>
<td>23</td>
<td>15</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>21</td>
<td>63</td>
</tr>
<tr>
<td>Cochahuasi</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>0</td>
<td>23</td>
<td>13</td>
<td>56</td>
</tr>
<tr>
<td>Condoray</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>21</td>
<td>5</td>
<td>0</td>
<td>95</td>
<td>121</td>
</tr>
<tr>
<td>Los Olivos</td>
<td>20</td>
<td>12</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td>34</td>
<td>27</td>
<td>105</td>
</tr>
<tr>
<td>Los Ángeles-Miraflores</td>
<td>53</td>
<td>0</td>
<td>11</td>
<td>15</td>
<td>9</td>
<td>16</td>
<td>112</td>
<td>216</td>
</tr>
<tr>
<td>Playa Hermosa</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>3</td>
<td>4</td>
<td>68</td>
<td>107</td>
</tr>
</tbody>
</table>
There were 1,776 women in the database with complete information about location and other variables. The date of enrollment variable, however, had a high proportion of missing values (800).

V. Instruments used in the study

In this section we describe the main instruments used for the implementation of the methodology for measuring the training program effects on women. First, we describe the sample design, then the survey and questionnaire, followed by the matching procedure (entropy balancing), and the variables and indicators we used for measuring effects.

5.1 Sample design and questionnaire

We used the database of women enrolled in 2009-2014 (see Table 2) to generate a sample design that considers treated and control groups of women to which we applied a survey. One important decision was the level at which we constructed a control group. One option was to consider women who enrolled in the program, but did not take the courses (which are taken during nine months over the year). However, the reduced number, and sometimes very special features of these women were considered as a serious problem for using them as a reliable control group.
A second alternative was to search for women in the same localities (towns), where the program operates, and who did not enroll but would be potential enrollees, according to some specific features similar to enrolled women. The problem here is that we did not have information on these features and could not base the sampling on this option. The other problem, discussed in the methodology (section 3), was that it was likely that there is self-selection in this type of program, so women who enroll may be structurally different from non-enrollees, and building a control group at the same treated locality was not the right approach.

The third (and here adopted) option was to search for localities, or towns where the program had not intervened but that have some similarities with the intervened ones for variables that can be relevant for women enrollment. We used the census-type SISFOH-INEI (2014) database used by the Peruvian government for targeting social programs for the search of potential control towns. The database identifies people and some features of their towns, which allowed us to match them with the communities intervened in by the training program.

Here, it is important to discuss some elements of the eligibility criteria used by the Condoray program at the town level. According to the executive director of the program, the leading criteria for deciding intervention at town level consist of the following: (i) women living in the province of Cañete; and (ii) the willingness of local women’s organizations to compromise with the program and to sustain wide participation by their association with it. Whereas the first criterion is observable, the second is not directly observable for the purposes of the search of control towns. We approximated that variable with the population size, and level of education of women in the towns, which we assume were correlated to the level and intensity of the potential compromise of women’s organizations with this type of program.

We decided to carry out the survey in almost all of the towns intervened in by Condoray (15 out of 16). For each selected locality, we randomly selected 10 enrolled women from the list of enrolled women, and also another 10 names as backups. Enumerators had both the name and address of women to be interviewed. This was the basis for the treated group. For the control group, we carried out a searching procedure of potential control communities only within the province of Cañete, and restricted the search to the ones with a population between 400 and 3300, a similar range to the one of the treatment groups of the localities. A total of 52 towns was considered for the random selection process. We classified these in four strata, according to size.
and percentage of women with higher education (more than secondary). The classification is described in the Table 3.

### Table 3: Strata of towns for searching for the control group

<table>
<thead>
<tr>
<th>Population</th>
<th>Percentage women high education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Low</td>
<td>16</td>
<td>11</td>
</tr>
<tr>
<td>High</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>26</td>
</tr>
</tbody>
</table>

**Source:** SISFOH-INEI Database (2015)

We randomly selected 5 towns in each of the four strata to have a total of 20 potential communities for the control group. For the field work, we took a simple random sample of 15 of these 20 towns to be surveyed (equal to the treatment group), with a target of 10 women surveyed per town. In this case, enumerators were instructed to select in situ a sample of households, and within each household, an adult woman to interview, according to the criterion that there is at least one adult woman present in the household to respond the survey.

Thus, the sample size was 300 women to be interviewed, 150 in the treated communities and 150 in the selected control communities. We designed a questionnaire to be applied only to one adult women in each household of the sample. We applied a preliminary and more extensive version of the questionnaire to a group of women in a pilot study, and decided to limit the initial amount of questions in order to have interview sessions of no more than 50 minutes. We also decided that the enumerators would be all women, which makes respondents more confident to allow the enumerator to enter their houses, given increasing security issues in Cañete.

The survey was applied successfully\(^1\) and we were able to gather information from the projected sample of 300 women, with exactly 150 in the treated group and 150 in the control group. For the expansion factor of each observation, we used the probability of selection from the list of enrolled women in the case of the treated group. In the case of the control group, we adjusted the denominator of the probability of selection with an expected number of enrollees; that is, an estimate of the number of women that would have enrolled if the program entered

---

\(^1\) The survey was applied between October 5\(^{th}\) and October 20\(^{th}\), 2015, by a team of 4 enumerators and 1 field supervisor.
these localities\(^2\). This was done to avoid inflating the expansion factor for the control group if we merely used the adult women population size of each selected town for the calculation.

### 5.2 Matching treated and control groups

As was explained in section 3, in order to measure potential effects of the training program on treated women we needed to check for the reliability of the control group looking for Z variables (observable) which may be related to program participation that we need to condition for, in order to measure impact estimators. We selected a set of variables that we considered were related to the probability of enrollment in the Condoray program and their mean values and t-test for control. Treated groups are displayed in Table 4\(^3\). In particular, the variable participation in public social programs was estimated at the town level from the SISFOH database, so we were able to control by the presence of social programs, also as criteria for matching observations.

| Variable                          | Treated | Control | %bias | t    | p>|t|
|----------------------------------|---------|---------|-------|------|-------|
| Age                              | 41.9    | 38.2    | 26.2  | 2.27 | 0.02  |
| Children                         | 1.78    | 1.8     | -1.5  | -0.13| 0.90  |
| Years Education                  | 8.80    | 9.41    | -14.2 | -1.23| 0.22  |
| Marital Status                   | 1.96    | 2.15    | -19   | -1.65| 0.10  |
| Independent Worker               | 21%     | 25%     | -11.1 | -0.96| 0.34  |
| Housekeeper                      | 24%     | 45%     | -44.4 | -3.85| 0.00  |
| Population size                  | 1,116   | 1,226   | -15.4 | -1.33| 0.18  |
| Catholic                         | 86%     | 85%     | 1.9   | 0.16 | 0.87  |
| Participation in social programs | 1.9%    | 3.2%    | -51.1 | -4.43| 0.00  |

**Source:** Cañete Survey, GRADE (2015)

There are few significant differences (based on a t-test of means). Women in the treated group were older, were more likely to be married, and were less likely to be housekeepers than the ones in the control group. Also, there was less presence of social programs in treated towns (1.9% versus 3.2% of participation in these programs). In Appendix 1, we generate the pscore function that can be used to match treated and control observations. However, as is shown in

\(^2\) This expected value was generated by applying one to one matching between treated and control towns, and assigning the ratio of enrolled women in treated towns to their matched control counterparts.

\(^3\) In all the estimations we used the expansion factor for each observation.
Appendix 1, it was not possible to achieve a good balance for all Z variables\(^4\). This is why we recurred to the entropy balance approach to directly find weights that assure balancing in the covariates between control and treated observations. We applied the entropy balance technique\(^5\) to our data in the established common support (see Appendix 1 where we estimate the common support). The routine equalizes the distribution of all specified Z variables in the three first moments of their distribution. The equalization process for all the covariates is shown in Table 5.

### Table 5: Results of using entropic balancing

<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Variance</td>
</tr>
<tr>
<td><strong>Before ebalance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>41.16</td>
<td>201.90</td>
</tr>
<tr>
<td>Children</td>
<td>1.79</td>
<td>1.55</td>
</tr>
<tr>
<td>Years of Education</td>
<td>8.98</td>
<td>18.93</td>
</tr>
<tr>
<td>Marital Status</td>
<td>1.97</td>
<td>0.96</td>
</tr>
<tr>
<td>Independent Worker</td>
<td>0.20</td>
<td>0.16</td>
</tr>
<tr>
<td>Housekeeper</td>
<td>0.24</td>
<td>0.18</td>
</tr>
<tr>
<td>Population size</td>
<td>1077</td>
<td>233591</td>
</tr>
<tr>
<td>Catholic</td>
<td>0.88</td>
<td>0.11</td>
</tr>
<tr>
<td>Part. social program</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>After ebalance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>41.16</td>
<td>201.90</td>
</tr>
<tr>
<td>Children</td>
<td>1.79</td>
<td>1.55</td>
</tr>
<tr>
<td>Years of Education</td>
<td>8.98</td>
<td>18.93</td>
</tr>
<tr>
<td>Marital Status</td>
<td>1.97</td>
<td>0.96</td>
</tr>
<tr>
<td>Independent Worker</td>
<td>0.20</td>
<td>0.16</td>
</tr>
<tr>
<td>Housekeeper</td>
<td>0.24</td>
<td>0.18</td>
</tr>
<tr>
<td>Population size</td>
<td>1077</td>
<td>233591</td>
</tr>
<tr>
<td>Catholic</td>
<td>0.88</td>
<td>0.11</td>
</tr>
<tr>
<td>Part. social program</td>
<td>0.02</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Source:** Cañete Survey, GRADE (2015)

As can be seen, for most variables, the three moments are practically identical.

---

\(^4\) We tried alternative specifications of the pscore estimation, but did not find an good alternative that reduced biases for all the nine covariates at the same time. This makes the estimation of impacts model dependent and the required orthogonality between covariates and participation more difficult.

\(^5\) We used the ebalance routine from the statistical software Stata, version 12.0.
VI. Main results

In this section we describe variables used to measure impacts and discuss the results.

6.1. Impact variables

For the impact estimation we selected a set of variables in three areas:

(1) Economic participation of women

1.1. Use of time
   1.1.1. Hours caring for children
   1.1.2. Hours doing housekeeping
   1.1.3. Hours working outside
   1.1.4. Hours studying
   1.1.5. Hours in training

1.2. Family business
   1.2.1. Woman runs a family business

1.3. Savings
   1.3.1. Woman saves using formal financial institution
   1.3.2. Woman saves using non formal institutions

(2) Women’s autonomy, self-esteem and social participation

2.1. Degree of autonomy in taking decisions (scale 1-4; 1=no decision, 2=permission from partner, 3=shared decision, 4=autonomous decision). We used the first component of a principal component analysis carried out on all the variables in this module related to decisions on training, work and social activities.

2.2. Sense of self-value and assertiveness (scale from 1 to 5; 1=totally disagree, 5=totally agree). We used the first component of all variables in this module, representing the combination that positively generated larger variance in the data.
2.3. Sense of family cohesion (scale from 1 to 5; 1=totally disagree, 5=totally agree). We used the first component of all variables in this module, representing the combination that positively generated larger variance in the data.

2.4. Participation of women in local/social organizations

2.4.1. Number of local/social organizations woman is participating in
2.4.2. Is participating in local/social organization’s directive board
2.4.3. Participates in some (at least one) local/social organization

(3) Household living standard

3.1. There have been home improvements in the last 5 years
3.2. Number of persons per room in home (crowding)
3.3. Monthly family per capita income

Results for the impacts on each of the three areas based on the entropy balance method are displayed in Table 6.

Table 6: Estimated Condoray Training Program impacts on women

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Treatment</th>
<th>Effect</th>
<th>Std Err</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Economic participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.1. Hours caring children</td>
<td>12.594</td>
<td>16.685</td>
<td>4.091</td>
<td>2.522</td>
<td>0.106</td>
</tr>
<tr>
<td>1.1.2. Hours doing house keeping</td>
<td>28.406</td>
<td>27.315</td>
<td>-1.091</td>
<td>2.654</td>
<td>0.681</td>
</tr>
<tr>
<td>1.1.3. Hours working outside</td>
<td>25.153</td>
<td>26.524</td>
<td>1.371</td>
<td>3.959</td>
<td>0.729</td>
</tr>
<tr>
<td>1.1.4. Hours studying</td>
<td>0.421</td>
<td>0.106</td>
<td>-0.315</td>
<td>0.322</td>
<td>0.328</td>
</tr>
<tr>
<td>1.1.5. Hours in training</td>
<td>0.026</td>
<td>0.705</td>
<td>0.679</td>
<td>0.119</td>
<td>0.000***</td>
</tr>
<tr>
<td>1.2.1. Runs a family business</td>
<td>35.1%</td>
<td>27.0%</td>
<td>-8.1%</td>
<td>13.6%</td>
<td>0.552</td>
</tr>
<tr>
<td>1.3.1. Saves in formal financial institution</td>
<td>0.6%</td>
<td>8.6%</td>
<td>8.0%</td>
<td>2.5%</td>
<td>0.001***</td>
</tr>
<tr>
<td>1.3.2. Saves in non formal institution</td>
<td>18.2%</td>
<td>44.1%</td>
<td>25.9%</td>
<td>8.3%</td>
<td>0.002***</td>
</tr>
<tr>
<td>2. Autonomy, self-esteem, cohesion and participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1. Autonomy in decisions</td>
<td>0.445</td>
<td>-0.114</td>
<td>-0.559</td>
<td>0.370</td>
<td>0.132</td>
</tr>
</tbody>
</table>

* These are organizations in general, not any that may be directly related to Condoray’s program. However, as we explain below, Condoray used the compromise of local organizations as an eligibility criterion so these indicators must be treated with caution as impact indicators.
2.2. Self-esteem and assertiveness  

|                      | 0.222 | 0.083 | -0.140 | 0.268 | 0.604 |

2.3. Family cohesion  

|                      | -0.382 | 0.320 | 0.702 | 0.258 | 0.007 |

2.4.1. Number of organizations she participates  

|                      | 0.978 | 1.510 | 0.532 | 0.228 | 0.021 |

2.4.2. Participates in organization’s directive board  

|                      | 0.243 | 0.216 | -0.027 | 0.147 | 0.853 |

2.4.3. Participates in some local/social organization  

|                      | 0.656 | 0.816 | 0.160 | 0.106 | 0.132 |

3. Living standards  

|                      | 0.473 | 0.410 | -0.063 | 0.130 | 0.629 |

|                      | 1.582 | 1.517 | -0.065 | 0.193 | 0.735 |

|                      | 492.6 | 481.1 | -11.46 | 49.19 | 0.816 |

Observations  

|                      | 150   | 150   |

* significant at 0.1; ** significant at 0.05; *** significant at 0.01 level of confidence.  

Source: Cañete Survey, GRADE (2015)

There were some impacts on economic participation (savings), in family cohesion and in social participation. There are no detectable impacts on living standards.

In the area of economic participation, there was an increase of time devoted to caring for children (about 4 more hours per week, marginally significant at 15%), but no impacts on other time allocation variables, except for the expected hours going to training (0.7 more hours per week). In this economic area also, there was no effect on women’s participation in running a family business (the impact coefficient is negative, -8.1%, but not statistically significant).

The impacts on savings, however, were strong and consistent in other estimations (for example, using the p-score of Appendix 1 and a one-to-one neighbor estimation, not shown here). The program increased the propensity to save in formal institutions by 8%, from almost nothing in the control group to 8.6% for the treatment group. The effect was even more pronounced for women’s savings in non-formal institutions, with an increase of 26 percentage points for the treated group. Formal financial institutions are Banks, Rural and Municipal Credit Unions, whereas non-formal are Juntas or Panderos (very popular mechanisms for saving used by an increasing amount of poor urban and rural Peruvian households).

In general, the CTP seems to have had some impacts on women’s participation in economic activities. The main effect is women’s ability and disposition to save. An anonymous referee to this paper raised some legitimate concerns about the impact on savings as it may have been a criterion for town selection into the program. This issue, however, did not appear in interviews to the program’s
type of training offered by Condoray does not have any significant effects on women’s use of
time, besides for training, nor for running small businesses\(^8\).

For autonomy, self-esteem and cohesion variables, we saw a negative effect on the measure
of autonomy (capacity to decide independently of partner), although it was only significant at the
15% confidence level. On the other hand, there was no effect on self-esteem and assertiveness,
but here is a clear a robust impact on the measure of family cohesion. This type of effect is
expected from a program coming from a religious (Catholic) institution, that stresses the
importance of family values.

The CTP seems to have had an effect on increasing women’s participation on the number of
local or community organizations (food support programs, school boards, religious groups, and
others). Women in the treated group participated in 0.5 more times in these types of
organizations. In this case, however, it is still important to be cautious about this result as one of
the eligibility criteria for treated towns was the willingness and intensity of commitment of local
women’s organizations to compromise with the program. We tried to reduce potential biases
and endogeneity in the selection of control towns described before, and the use of Z variables in
section 5.2, but the problem could still be present in the sample\(^9\).

Finally, there are no discernible impacts of the program in any of the three selected standard
of living indicators. It seems that the training offered by Condoray, although having some
impacts on economic and social participation, is not enough to generate statistically significant
impacts on broad outcome economic variables.

director, and savings at the town or individual levels were not observable for the program. There was not a formal
requisite on savings for enrollment. However, it could be that savings were highly correlated to organization at the
town level. If this is the case, the efforts we made to control for the organization variable both at the sampling stage,
and with the processed data would have taken care of potential endogeneity problems of this impact. It should be
mentioned that the savings impact was statistically significant for all specifications and distinct methods used for
assessing impacts (see Appendix 1).

\(^8\) It should be mentioned that the program is not explicitly designed to have impacts on women’s business activities. In
any case, we wanted to check if there was a sort of indirect effect on this area which we did not find.

\(^9\) Although we can condition the estimation to the variable about organization participation, we think that this is an
important area in which this type of peer-to-peer programs have impacts, so we kept it as an impact variable.
6.2. Conditioning on the treatment variable

In addition to the general evaluation, we also differentiated some impacts according to some features of the treated group, like women’s self-assessment of the usefulness of the courses for economic outcomes (related to motivation for participants), and specific features of the trainers (education and age)\(^\text{10}\).

This conditioning led us to form three new treatment groups. For the first case (usefulness), we dropped women, who declared very low usefulness of the CTP courses for having any economic impact from the treatment group. In the second case, we dropped towns in which the average number of years of education of trainers was less than 8 years; and in the third case we eliminated treated towns where the trainers average age was more than 60 years old.

In the following table we show the results of re-estimating impacts using these three new treatment groups, and the same entropy balance method.

### Table 7. Impacts conditioned on redefined treatment groups

<table>
<thead>
<tr>
<th></th>
<th>Control Value</th>
<th>Non conditioned Effect</th>
<th>Higher usefulness</th>
<th>Trainer more than 8 years educ</th>
<th>Trainer less than 60 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Economic participation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.1. Hours caring children</td>
<td>12.594</td>
<td>4.091</td>
<td>2.761</td>
<td>2.758</td>
<td>2.607</td>
</tr>
<tr>
<td>1.1.2. Hours doing house keeping</td>
<td>28.406</td>
<td>-1.091</td>
<td>-2.288</td>
<td>-1.617</td>
<td>2.699</td>
</tr>
<tr>
<td>1.1.3. Hours working outside</td>
<td>25.153</td>
<td>1.371</td>
<td>1.335</td>
<td>4.15</td>
<td>3.017</td>
</tr>
<tr>
<td>1.1.4. Hours studying</td>
<td>0.421</td>
<td>-0.315</td>
<td>-0.339</td>
<td>0.32</td>
<td>-0.275</td>
</tr>
<tr>
<td>1.1.5. Hours in training</td>
<td>0.026</td>
<td>0.679</td>
<td>0.966</td>
<td>0.16</td>
<td>***</td>
</tr>
<tr>
<td>1.2.1. Runs a family business</td>
<td>35.1%</td>
<td>-8.1%</td>
<td>-9.4%</td>
<td>13.8%</td>
<td>-8.6%</td>
</tr>
<tr>
<td>1.3.1. Saves in formal financial institution</td>
<td>0.6%</td>
<td>8.0%</td>
<td>8.4%</td>
<td>0.03</td>
<td>***</td>
</tr>
<tr>
<td>1.3.2. Saves in non formal institution</td>
<td>18.2%</td>
<td>25.9%</td>
<td>31.6%</td>
<td>0.09</td>
<td>***</td>
</tr>
<tr>
<td><strong>2. Autonomy, self-esteem, cohesion and participation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1. Autonomy in decisions</td>
<td>0.445</td>
<td>-0.559</td>
<td>-0.413</td>
<td>0.38</td>
<td>-0.618</td>
</tr>
<tr>
<td>2.2. Self-esteem and assertiveness</td>
<td>0.222</td>
<td>-0.140</td>
<td>-0.027</td>
<td>0.29</td>
<td>-0.248</td>
</tr>
<tr>
<td>2.3. Family cohesion</td>
<td>-0.382</td>
<td>0.702</td>
<td>0.712</td>
<td>0.27</td>
<td>***</td>
</tr>
<tr>
<td>2.4.1. Number of organizations she participates</td>
<td>0.978</td>
<td>0.532</td>
<td>0.735</td>
<td>0.24</td>
<td>***</td>
</tr>
</tbody>
</table>

\(^{10}\) We also tried to differentiate by the time elapsed since the training, but results were not different to the original scenario.
The first column in Table 7 shows the value of the variable for the control group, and the second the effect found in the original base scenario (Table 6). The rest of the table shows the effects with the redefined treatment groups.

We see that the redefinition did not change the variables in which the program had impacts, but in some cases it increased the size of the effects. For instance, the subset with more motivated women had more hours of training, higher impacts on savings and a significant effect on participation in local organizations (variable 2.4.3. which was not statistically significant before). The education of the trainer did not seem to be more important than the motivation variable, as impacts were generally lower for that case. In the case of the age of the trainer, the effects on formal training were higher than for the other two cases, indicating that this variable may be important in the channel explaining this effect (younger trainers may be more effective in developing the social networking required for expanding participation in the financial sector).

### VII. Discussion and policy implications

The effects of this Peruvian peer-to-peer training program on women are mixed on the three evaluated areas, and the evidence suggests that there are some relevant impacts on economic and social participation, but not in aggregate autonomy/self-esteem indicators, and living standard measures. Looking at the type of specific effects encountered, we hypothesize that a potential driving factor behind this type of configuration of impacts is what we can call a networking effect of a peer-to-peer program.
In interviews with promoters, they were emphatic in saying that the program’s mini-courses are good for women because they get out of their homes and get to know other women with similar interests and contrasting experiences. The training courses operate as a way of expanding women’s experiences and developing relationships with other women that may be useful for triggering more active participation in financial markets and other social organizations. We consider the two areas in which we detected significant differences between treated and control groups to be a clear indication of this effect. Women enrolled in the CTP were much more able and willing to save using both formal and informal schemes. This option was correlated to an expanded network of contacts and social capital. More networking capacity may clearly improve the ability to save, which is an important goal for empowering women. Also, we see that the indicators of women’s participation in local organizations were clearly enhanced by the Condoray program.

In addition, we did not see impacts on autonomy or self-esteem indicators related to decision making and assertiveness of women. However, we did find a consistent impact on what the CTP calls family cohesion. This result then is consistent with the design of a program coming from a religious (Catholic) institution that does not explicitly challenge prevalent family structures and values, and rather, stresses the importance of family cohesion and communication.

Looking at the economic arena, the program does not seem to have had significant impacts on the use of time (besides training), or on the probability of having a family business. We also see that the program has not had any impacts on a limited set of living standard indicators (the ones we were able to measure given the limitations of our budget). However, this may be expected of low cost peer-to-peer training programs which are not specialized enough to change returns to women’s assets and abilities. In this case, it is clear to us that a more comprehensive training programs may be needed, with explicit goals regarding productive areas and skills for business management. Notwithstanding this narrow scope of the CTP, it is noteworthy that it has been able to improve women’s participation in important economic activities like formal and non-formal savings. It also seems to be a program that induces more participation of women in social networks and community affairs, which is also a form of improving social capital, and advance in more equitable relationships between genders.

The evidence also suggest that some specific features of the program may have some differentiated effect on the outcomes. For instance, women who found the courses more useful
for economic purposes, tended to show higher impacts on the already significant variables. Also, the education and age of the trainers seemed to be important for getting better results. This is important for a program in which trainers are older and less educated than trainees, a situation that the current administration is trying to change to improve results.

Our main policy recommendation is that the Peruvian government pays closer attention to the limits and potentials of peer-to-peer training programs for women in rural and semi-urban sectors. This approach could be more cost-effective than other traditional top-down alternatives, in order to generate important impacts on women’s lives, especially in their ability to participate in broader economic and social networks. However, it is also clear that this type of training may be insufficient to impact deeper development indicators, so it will require complementary interventions to improve the expected returns from women's work, assets and skills, in their specific contexts.


Appendix: Results using the pscore and matching method

Based on these Z variables described in section 5.2, we estimated a Probit Model, \( \text{Prob}(D|Z) \), for program participation with coefficients shown in the following Table.

**Table 8. Probit regression on the probability of being treated**

| Coef. | Std. Err. | z    | P>|z| | [95% Conf. Interval] |
|-------|-----------|------|------|-------------------------|
| Age   | 0.053     | 0.033 | 1.610| 0.107                   | -0.011                  |
| Age2  | 0.000     | 0.000 | -0.800| 0.426                   | -0.001                  |
| Children | 0.079     | 0.074 | 1.070| 0.285                   | -0.066                  |
| Education | 0.010     | 0.026 | 0.390| 0.693                   | -0.040                  |
| Marital status | -0.068     | 0.088 | -0.770| 0.443                   | -0.240                  |
| Independent worker | -0.768*** | 0.216 | -3.560| 0.000                   | -1.191                  |
| Housekeeper | -1.077*** | 0.198 | -5.450| 0.000                   | -1.464                  |
| Population size | 0.000***   | 0.000 | -4.050| 0.000                   | -0.001                  |
| Catholic | -0.160     | 0.253 | -0.630| 0.527                   | -0.655                  |
| Particip. social program | -31.306*** | 5.301 | -5.910| 0.000                   | -41.696                 |
| Constant | 0.425     | 0.772 | 0.550| 0.582                   | -1.089                  |

Number of observations 300
Wald chi2(10) 84.74
Prob > chi2 0
Pseudo R2 0.2525
Log pseudo-likelihood -154.75

Note: Sum of weights is 3,002. *** significant at 0.01; ** significant at 0.05; * significant at 0.1
**Source:** Cañete Survey, GRADE (2015)

There are some variables\(^{11}\) that seemed to influence the probability of being treated more clearly, such as, the respondent’s occupation as an independent worker or as housekeeper (both reduced the probability), and population size of the community (also decreased) and level of participation in social programs in the town (negative). The common support for the distributions is \([0.025, 0.980]\).

In the Figure 1 we show the kernel estimate of the distribution of the probability of being treated, both for the treated and control groups in the sample in the common support\(^{12}\).

\(^{11}\) We could not include relevant variables that could be used to measure pre-treatment trends in the survey. The recall questions that we considered in an initial pilot survey did not work very well and so we decided to drop these in order to have a manageable questionnaire. There was also the problem of many different recall periods, as treated women participated in different years since 2010.

\(^{12}\) There are 11 observations in the control group which were not part of the common support (pscore value below the lower limit). All treated observations remained in the common support. All further weighting and impact estimations were carried out within this common support.
We checked the balancing achieved after using the pscore in weighting control observations. There was improvement in reducing biases in most variables, as can be seen in the Figure 2.

However, some variables cannot be balanced, and in some cases the bias changes sign, or is increased.