Learning and Earning: Evidence from a Randomized Evaluation in India*

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Abstract

This paper examines the economic returns from participating in a subsidized vocational training program in stitching and tailoring offered to women residing in certain disadvantaged areas of New Delhi, India. The availability of pre and post-training data in an experimental framework allows us to measure the impact of participating in this program on a broad range of outcomes. In less than a year, the program has generated substantial improvement in labor market outcomes for these women. In particular, we find that women who were randomly offered the training program are almost five percentage points more likely to be employed, six percentage points more likely to look for a job, on an average work two additional hours, and earn almost twice as much in the post-training period compared to women who were not offered the training. There is a also a large increase in the ownership of sewing machine in the post-training period. The program impacts are much larger for women who completed the training program. Women assigned to the training program have also gained in the form of increased relative confidence. Further, the impact estimates vary with participants' intrinsic preferences for risk, competition, and confidence. Finally, a simple cost-benefit analysis suggests that the program is highly cost effective and that there are considerable gains from both continuing the program in the current location and replicating it in different locations.

Keywords: Vocational training, Panel data, India, Economic returns

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1 Introduction

In recent years, continued low levels of schooling completion combined with high rates of unemployment and increased opportunity cost of obtaining formal education among adults (15+ years) has renewed focus on the "Young and Unemployed". The most recent World Development Report on "Jobs" writes, "*200 million people, a disproportionate share of them youth, are unemployed and actively looking for work. Almost 2 billion working-age adults are neither working nor looking for work; the majority of these are women, and an unknown number are eager to have a job"* (WDR, 2013, pp 48). Women are particularly disadvantaged with regard to general education and labor market options. Despite the importance of youth unemployment, there is little knowledge on how to create smooth school-to-work transitions in low-and-middle income countries, or how to improve the human capital of those who can no longer be sent back to school. In recent years, vocational training is considered by some to be one promising avenue through which young adults, particularly women, can acquire marketable skills that will enable them to secure employment.[1]

There now exists a fairly large literature that assesses the impact of participating in vocational training programs on earnings and employment opportunities using data from developed countries (see Ashenfelter, 1978; Ashenfelter and Card, 1985; Card and Sullivan, 1988; Hotz, Imbens, and Klerman, 2006). The general conclusions that arise from the US and European experiences is that the impact of vocational training programs is generally modest, at best, and that the effectiveness of the program varies with the characteristics of the participants and the type of training (see Heckman, Lalonde, and Smith (1999) and Kluve (2006) for systematic reviews). However, applying these findings to developing countries is inappropriate for a number for reasons. First, much of this literature focuses on simple "on the job training" programs that constrain learning to firm-specific opportunities as opposed to comprehensive skill building geared to enable entry into the general labor market. Second, much of this literature also uses non-experimental data, and therefore cannot estimate the causal effect of training on employment related outcomes due to selection bias (see for example LaLonde, 1986; Ashenfelter and Card, 1985; Todd and Smith, 2005). Finally, the effectiveness of training may depend on the human capital with

[1] Australia, Finland, England, Germany, Netherlands, Austria, Sweden, Switzerland, Norway, Spain, Hong Kong, New Zealand, Paraguay, United States, India, Argentina, Chile, Peru, Uruguay, are some of the countries that have designed such programs. See Annex 2 of Betcherman, Olivas, and Dar (2004) for a complete list of countries and the associated vocational education programs they offer.

which the trainees start and trainees in developing countries start with very low levels of formal education, skill accumulation, and full-time employment compared to those in developed nations.

Evidence on the effectiveness of training programs in developing countries is more limited. Betcherman, Olivas, and Dar (2004), for example, in their review of 69 impact evaluations of unemployed and youth training programs, find only 19 in developing countries. They find that impact estimates of training programs in developing countries are larger than estimates for training programs in the United States and Europe. Similarly, Nopo and Saavedra (2003) in their review of training programs in Latin America arrive at the same conclusion. However, the large majority of the programs analyzed in these surveys are non-experimental in nature. Experimental evaluation of labor market training programs in developing countries is fairly rare – two exceptions include Card, Ibarraran, Regalia, Rosas, and Soares (2011) and Attanasio, Kugler, and Meghir (2011).

The results from these two papers are quite mixed. Card, Ibarraran, Regalia, Rosas, and Soares (2011), using data from a government subsidized training program for low-income youth in urban areas of the Dominican Republic, find that the program only marginally improved hourly wages, and the probability of health insurance coverage, conditional on employment, and find no significant impact of the training program on the subsequent employability of trainees. Attanasio, Kugler, and Meghir (2011), on the other hand, are more positive – using data from a randomized vocational training program aimed at disadvantaged youth in Colombia in 2005, they find that the program raised earnings and employment for women and using a simple cost-benefit analysis of the results argue that the program generates much larger net gains than those found in developed countries.[2]

[2]Hicks, Kremer, Mbiti, and Miguel (2012) and Field, Linden, and Wang (2012) are currently conducting similar evaluations in Kenya and Mongolia respectively. The results of both these projects are as yet unavailable. Fiala, Martinez, and Blattman (2011) examine the effectiveness of a cash transfer program in Uganda that provided young adults nearly unconditional, unsupervised cash transfers to pay for vocational training, tools, and business start-up costs. They find that despite a lack of central monitoring and accountability, most youth invest the transfer in vocational skills and tools. Second, the economic impacts of the transfer are large: hours of non-household employment double and cash earnings increase by nearly 50% relative to the control group. Macours, Premand, and Vakis (2012) find that in the context of Nicaragua access to vocational training in conjunction with a conditional cash transfer program enable households to insure against weather related shocks. They argue that combining safety nets with productive interventions can help households manage future weather risks and promote longer-term program impacts. Groh, Krishnan, McKenzie, and Vishwanath (2012) find that soft skills training program provided to female graduates in Jordan, aimed at improving their employability, has had very limited impact. Skills training is only one component of these impact evaluation studies and hence the results from these three papers are not directly comparable to what we do in this paper.

This paper adds to this limited literature by examining both the impact of having access to and participating in a labor market training/vocational training program on labor market outcomes and other measures of welfare for young women using experimental data from New Delhi, India.[3] To the best of our knowledge, there are no experimental impact evaluation studies of vocational training programs in Asia and in particular, India. The high levels of economic growth accompanied with rising inequality and skill shortage as experienced by India makes it an important setting to evaluate the effectiveness of labor market training programs.

During post-liberalization, India enjoyed a growth rate of 7 percent per annum, a far cry from the so-called *Hindu rate of growth* that formed the upper bound on the growth rate in the three decades prior to the period of economic reforms. This has been accompanied by significant reduction in rates of poverty across the country. However, it is also now accepted that inequality has increased, indicating that many sections of the population are unable to benefit from the phenomenal growth process that the country as a whole has experienced. It has been argued that individuals, at least in certain sections of the society lack the necessary skills that can enable them to take advantage of the opportunities potentially coming their way. Survey conducted by both the World Bank and the Federation of Indian Chamber of Commerce and Industry (FICCI) identify skill shortage as one of the major constraints to sustained growth in the Indian economy (Blom and Saeki, 2011; FICCI, 2011). There are therefore significant potential growth implications from investing in training programs of this kind.[4] Despite this excess demand for skilled labor force, it is however not clear (at least in the Indian context) what the economic returns are from both having access to and participating in vocational training programs.

Our paper contributes to the literature in a number of ways. First, we estimate the economic returns to a subsidized, six month long training program in stitching and tailoring conducted by two local NGOs in New Delhi, India. The program was offered to women between ages 18 and 39 years, with at least five or more grades of schooling and residing in specific disadvantaged areas of New Delhi. Every woman residing in these areas satisfying the criteria was made aware of the program. Those who applied to the program were randomly assigned into two groups - *treatment* (women who were offered the training) and *control* (women who were not offered the training). The experimental design

[3] We use the terms *vocational training* and *labor market training* interchangeably throughout the paper.

[4] Additionally labor force participation in India is considerably lower than in the rest of the world - at around 58%. Further the labor force participation rate for Indian women is less than 50%.

along with the availability of pre-and post-training data allows us to estimate the causal effect of having access to this training program on labor market outcomes, measures of women's empowerment, entrepreneurship, and life satisfaction. Second, we estimate the economic returns from program completion. Third, we identify some of the key barriers to skill accumulation and program completion. Finally, both before and after the training, a subset of the program applicants (irrespective of their assignment into the two groups) were requested to participate in an artefactual field experiment designed to measure their preference for risk, competitiveness, and confidence. Our experimental design along with the availability of pre and post behavioral data also allows us to identify the intent-to-treat effects of the training program on these selected behavioral/intrinsic characteristics. This is an important issue as participation in a program such as this can affect women in a number of different ways. The first is the obvious - skill accumulation. The second and often unaddressed (and un-examined) effect is that on behavior such as appetite for risk tolerance, competitiveness, and confidence, which in turn can have important spillover effects on other dimensions of well-being.

We use pre and post-training data (collected six months after program completion) to estimate the short-run gains from participating in the vocational training program. We find that the program in this very short time has generated substantial improvement in labor market outcomes for program participants. In particular, we find that women who were randomly offered the training program are almost five percentage points more likely to be employed, six percentage points more likely to look for a job, and on an average work two additional hours in the post-training period compared to those who were not offered the training. We also find that during the post-training period, women in the treatment group earn almost twice as much as women in the control group. There is a also a large increase in the ownership of sewing machine in the post-training period. The program impacts are much larger for women who completed the training program. Women assigned to the training program have also gained in the form of increased relative confidence. The impact estimates vary with participants' intrinsic preferences for risk, competition, and confidence. Finally, a simple cost-benefit analysis suggests that the program is highly cost effective and that there are considerable gains from both continuing the program in the current location and replicating it in different locations.

2 Experimental Design

2.1 The Program

The vocational training program in stitching and tailoring services was jointly administered by two non-governmental organizations (NGOs): Pratham Delhi Education Initiative (henceforth Pratham) and Social Awakening Through Youth Action (henceforth Satya) in specific disadvantaged areas (or resettlement colonies) in New Delhi, India. Pratham is one of the largest NGO's in India, reaching out to more than 3 million underprivileged children with their initiatives in pre-school education all over the nation. Satya, on the other hand, is a small NGO which specializes in providing skill development programs to residents in poor communities. Pratham and Satya partnered to provide a rigorous six month long training program in stitching and tailoring services with the aim of making women in these areas adept in making clothes for children, and for adult men and women.

In May 2010, a complete census was administered in the targeted areas in New Delhi as identified by Pratham. While the targeted areas are commonly referred to as *slums*, these are permanent settlements, with concrete houses, and some public amenities (electricity, water, etc.). To be more specific, these are *resettlement colonies*, typically $10-20$ years old, that have absorbed migrants from other parts of the country during New Delhi's recent expansion. All eligible women residing in the target areas were informed of the program through an extensive advertising campaign that lasted for almost 3 weeks, and were invited to apply to have a chance at being selected to receive this training. The potential applicants were also informed of the associated details of the program such as – the location of the training centers, the extent of commitment required (participants were required to commit up to two hours per day in a five-day week), the method of selection (random), course content, and the expected time-span of the program (six months, starting August 2010). All selected participants were required to deposit Rs 50 per month for continuing in the program. This required participants to be ready to commit a total of Rs 300 for the entire duration of the training program with a promise from the NGOs that women who stayed through the entire duration of the program would be repaid Rs 350.[5] Finally, the potential participants were also told that they would receive a certificate

[5]This feature is unique to the program and was introduced by the implementing NGOs to increase commitment and encourage regular attendance. The amount of Rs 50 per month was around one percent of the average household income for the population. All eligible women were informed of this deposit requirement in the advertisement (and prior to applying).

on completing the program. The English version of the advertisement for the program is presented in Figure 1. Satya and Pratham employees held joint information sessions, where women had the opportunity to meet with representatives from the two NGOs to discuss and clarify questions about the program. By the end of June 2010, Pratham received 658 applications.

Two-third of all applications were randomly assigned to the treatment group (women who were offered a spot in the program) and the remaining one-third were assigned to the control group (women who were not offered a place in the program). The program was conducted in two areas of New Delhi – South Shahdara and North Shahdara. Randomization was conducted at the area level, i.e., two-third of the applicants from each area (that is, 164 of the 244 applicants from South Shahdara and 278 of the 414 applicants from North Shahdara) were assigned to the treatment group. North Shahdara is a bigger geographical cluster and therefore, received more applications and had 3 training centers; the remaining 2 training centers were in South Shahdara. Women were assigned to the training center nearest to their home and to classes at their most preferred time, though they had the option of changing both, if necessary. The average time taken to walk from the participants' home to the training center is approximately 13 minutes in North Shahdara and 10 minutes in South Shahdara. The actual program started during the second-third week of August 2010 and continued through the last week of January 2011. The baseline survey was conducted during July - August 2010 and the follow-up survey during the same two months in 2011. Figure 2 provides a schematic representation of the chronology of events.

2.2 Data - Baseline, Follow-up and Attrition

2.2.1 Baseline Data

The baseline socio-economic survey, conducted in July - August 2010 attempted to survey all 658 women who applied to the program; however, survey data could only be collected for 90 percent of the applicants due to respondent's unavailability and occasional refusal to participate in the survey. While the survey response rate was marginally higher in the treatment group (92 percent) compared to the control group (86 percent), the difference is not statistically significant. Our baseline data consists of 594 women, of whom 409 belong to the treatment group and the remaining 185 belong to the control group. The

household questionnaire was designed to collect detailed information on household demographic characteristics, ownership of household assets, labor market outcomes, quality of life, measure of bargaining power, and life satisfaction. The list of outcome variables is presented in Panels A and B of Table 1.

An implication of our evaluation design is that none of the baseline characteristics must be significantly different between the treatment and the control group. To test this assumption, we report pre-intervention averages of all variables used later in the regression analysis. Columns 2 and 3 of Table 2 report sample averages for the treatment and the control group respectively. Column 4 reports mean differences between the two groups and the statistical significance of this difference. There are generally no systematic differences in labor market outcomes between the treatment and the control group; the only exception is job search, where women in the control group are more likely to look for a job than women in the treatment group. Women in the two groups also exhibit similar levels of happiness and bargaining power (empowerment), captured by ROSCA membership and control over resources within the household.[6] Women in the control group though appear to be significantly more likely to own a sewing machine in the baseline compared to women in the treatment group.

The average woman in our sample is 22 years old and more than fifty percent of these women have not completed secondary schooling. About one-third of the women in our sample are married and there is an almost equal distribution of both Hindu and Muslim women in our sample. More than fifty percent of the women belong to scheduled castes.[7]At the baseline, women in the control group appear to be twelve percentage points more likely to have prior experience in stitching and tailoring compared to women in the treatment group. We will be controlling for these baseline characteristics in our main regressions to account for any remaining pre-intervention differences between the two groups.[8]

[6]Anderson and Baland (2002) propose an explanation of membership of roscas in Kenya (similar to chit funds in India) based on conflictual interactions within the household. In their paper, participation in a rosca is a strategy a wife employs to protect her savings against claims by her husband for immediate consumption. So membership in a rosca could be viewed as a measure of bargaining power of the woman.

[7]Scheduled castes are individuals who belong to the second lowest tier of the Hindu Caste System.

[8]While 658 women applied for the program, 594 women could be surveyed at the baseline - the rest (33 assigned to the treatment group and 31 assigned to the control group) refused to participate in the survey. Human ethics requirements mean that we were unable to obtain any information on these 64 women. It could be that the statistically significant difference (in the likelihood of job search and the likelihood of owning a sewing machine) at the baseline could be driven by selection out of the survey. We computed the Lee sharp bounds (see Lee, 2009) under different assumptions on who selects out of the survey (and the program). The computed lower bound for ownership of sewing machine is significantly greater than 0, indicating that the treatment effect is positive and statistically significant even under the

2.2.2 Follow-up Data and Attrition

During July - August 2011, approximately 6 months after the training program was completed, we requested all women who completed the baseline survey to participate in a follow-up survey. Attempts were made to track every woman who was in our final 2010 sample. Despite all efforts, we were unable to trace 90 of the 594 women, resulting in an overall attrition rate of 15 percent. The attrition rate is however not significantly different between the treatment and the control groups: 15.6 percent attrition in the treatment group and 14 percent in the control group ($p - value = 0.61$).[9]

Our identification strategy also relies on the assumption that group assignment does not systematically affect the likelihood of attrition; else the program effects would be biased. In Table 3 we present the baseline differences in the outcome variables of interest between attritors and non-attritors for both groups. Mean differences in outcome variables between the non-attritors and attritors in the treatment group are not statistically significantly different from those in the control group (see column 7), indicating that there is no evidence of differential attrition between the two groups. To examine how the baseline socio-economic characteristics affect the likelihood of attrition, in Table A-1 in the Appendix (Section A.1), we present the marginal effects from a probit regression of the likelihood of attrition, where, the dependent variable is *attrite*, which takes a value 1 if the woman could not be traced during the follow-up and 0 otherwise. Notice that being assigned to the *treatment* group does not have a statistically significant effect on the likelihood of attriting.

We also regress the different outcome variables of interest at the baseline, on the baseline observables, the attrition dummy (*attrite*), the treatment dummy (*treatment*) and a set of interaction terms between the attrition dummy and each of the explanatory variables. The non-interacted coefficients give us the effects for the non-attrited women while the

extreme assumption of the highest ability women selecting out. In the case of job search however the null hypothesis that the lower bound equals 0 cannot be rejected. In this case therefore there is no program effect under the *extreme* assumption of the highest ability women selecting out. Remember that this is under an extreme assumption and in reality it is unlikely that the highest ability women select out. This does however imply that one must be slightly careful about the implications of the treatment on the likelihood of job search.

[9]The attrition rates found here are comparable to other papers in this literature. For example, Attanasio, Kugler, and Meghir (2011) are unable to follow around 18.5 percent of their baseline sample after about $13 - 15$ months after the conclusion of their program and Card, Ibarraran, Regalia, Rosas, and Soares (2011) are unable to track around 20 percent of their baseline sample $18 - 24$ months after their initial application into the program.

interacted coefficients give us the difference between the attritors and non-attritors at the baseline. A test of the joint significance of the *attrite* dummy and the interaction terms tells us whether the attriting women are different from the non-attriting women at the baseline. The results are presented in Tables A-2 and A-3 in the Appendix. The null hypothesis that the attriting women are no different from the non-attriting women (the joint test of the *attrite* dummy and the interaction terms) is rejected in only 3 out of the 7 labor market outcome variables and for 1 out of the 5 other outcome variables, indicating that in general attriting women are no different from the non-attriting women in terms of the outcome variables of interest at the baseline. Additionally the coefficient estimate associated with the interaction term $treatment \times attrite$ is never statistically significant in any of the 12 regressions reported in Tables A-2 and A-3.[10]

Table 4 presents the pre and post training differences in the outcome variables of interest. Here the pre-training sample is restricted to women who are surveyed in both 2010 and 2011. Notice that while pre-training differences between the treatment and control group is small and never statistically significant, the corresponding post-training differences between the groups increases substantially, in particular, for all labor market outcomes and ownership of sewing machine. These differences are corroborated using multivariate regressions (see Section 5). A few other related points worth noting. While it is true that women who receive the *TRAINING* are significantly more likely to search for a job post-training, there is no evidence that they were significantly more likely to search for a job in stitching and tailoring related occupations ($p - value = 0.16$). This appears to suggest that the benefit of the program was not only in providing with skills to earn and contribute to household income, but also to instill a sense confidence in them that makes them more willing to venture out of their home and search for a job, any job, not necessarily one related to stitching and tailoring. Indeed as we show below (see Panel D Table 6), women who receive the *TRAINING* are significantly more confident of their relative ability, compared to women in the control group. This is manifested in an increased likelihood of job search. In terms of actual employment however, women who receive the *TRAINING* are significantly more likely to be employed (both in casual wage employment and in full-time wage employment) in stitching and tailoring related occupations.

[10]We also computed the inverse probability weighted regressions to correct for the potential selection bias due to attrition (in the cases where the F-statistics is jointly significant). These inverse probability weighted regressions (available on request) are almost identical to those presented in Table 6 below.

3 Barriers to Program Completion

One of the reasons for low cost-effectiveness of the labor market training programs in developed countries and a potential challenge in low-and-middle income countries as well, has been the low rates of program completion. Only 60% of all program participants reach the finish line - the average program completion rate in the United States job training and partnership program (JTPA) is 58%. Similar, low rates of program completion are observed in other developed and developing countries as well - Germany (69%), Dominican Republic (60%), Uruguay (51%), and Peru (60%) (see Kluve, Card, Fertig, Gora, Jacobi, Jensen, Leetmaa, Nima, Patacchini, Schaffner, Schmidt, van der Klaauw, and Weber, 2007; Ibarraran and Rosas., 2009; Card, Ibarraran, Regalia, Rosas, and Soares, 2011).

In our sample, 55% percent of all women assigned to the treatment group in our panel sample were program completers, i.e., completed the entire program and received a certificate at the end of the program. The main reasons for non-completion include own sickness, sickness of other members in the family, child care options not available, other family members were not happy or did not give permission, very time consuming and other. On an average program completers (hereafter *TRAINED*) attended more than seventy percent of all classes in comparison to program non-completers who attended only four percent of all classes during the training period. In panels A and B in Figure 3 we present the average monthly attendance for program completers and non-completers respectively. We find that among program completers, average attendance is typically more than 70%, except in November when it falls to 60% due to the popular religious festival of Diwali. Average monthly attendance among program non-completers starts out at around 18% in the beginning of the program in August 2010 and steadily declines to 4% towards the end of the program in January 2011. This suggests that the majority of the drop-outs occurred right at the beginning of the program. Figure 4 shows that there is a strong negative relationship between the time taken to walk to the training center and the likelihood of program completion.[11]

To examine the barriers to skill accumulation and program completion further, we compute and present in Table 5 the marginal effects from a probit regression, where the dependent variable (*TRAINED*) takes the value of 1 if the woman (in the treatment group) completed

[11]The time taken to walk to the training center is not self-reported. It is the time taken by an employee of Pratham to walk from each respondent's home to the training center she is assigned to. Therefore this measure does not suffer from self-reporting bias.

the entire program and received a certificate at the end of the program and 0 if she dropped out. The sample here is restricted to women who were assigned to receive the *TRAINING* i.e., women in the treatment group. Women who have completed secondary schooling are 21 percentage points more likely to complete the training program. Women who have completed secondary schooling are more likely to be able to internalize the benefits of training and gain more from the program. Lack of childcare options appear to have had a significant impact on program completion. Relative to unmarried women, married women with mother-in-law present in the household are 25 percentage points more likely to complete the program. Co-resident mother-in-laws can provide low cost childcare. This is a common arrangement in many developing countries. Distance to the training center captured by the time taken to walk to the training center is a significant barrier to skill accumulation – a 10 minute increase in the time taken to walk to the training center results in a 1 percentage point reduction in the likelihood of program completion.

4 Program Impacts: Estimation Strategy

The panel dimension of the data along with the randomized evaluation design implemented here allows us to estimate the causal effect of the training program on a range of outcome variables of interest. We estimate the following model to control for baseline differences in the outcome variables and also for any pre-program differences between the treatment and the control group.

$$Y_i = \beta_0 + \beta_1 TRAINING_i + \sum_{j=1}^{K} \gamma_j \mathbf{X}_{ij} + \epsilon_i \tag{1}$$

Here Y_i is an outcome of interest for woman i; $TRAINING_i$ is a dummy variable that takes the value 1 if the woman is offered the training (i.e., is assigned to the treatment group); 0 otherwise. So β_1 measures the causal effect of the vocational training program on the outcome variables of interest. Note that even if a woman dropped out through the course of the program, she remains assigned to the treatment group, as a result, β_1 captures the intent to treat (ITT) effect of the program. $\mathbf{X}$ is a set of additional individual and household level characteristics that control for any remaining pre-intervention differences between women in the two groups. The $\mathbf{X}$'s also include baseline (lagged) outcome variables to control for path dependence in labor market outcomes, which further improves the precision of the estimates. Finally, ϵ_i is a random i.i.d. disturbance term.

We use a version of equation (1) to estimate heterogeneous program effects by restricting the sample to particular sub-groups (see section 5.3).

The set of pre-treatment (baseline) explanatory variables that we control for in the regressions include: *Age* of the woman in years, *Completed secondary school* (= 1 if the woman completed ten grades of schooling; 0 otherwise), *SC* (= 1 if the respondent belongs to a scheduled caste; 0 otherwise), *Hindu* (= 1 if religion = Hindu; 0 otherwise), *Experience* in stitching and tailoring, a self-reported measure of prior experience in stitching and tailoring service (=1 if the woman had any prior experience; 0 otherwise), *Married* (= 1 if the woman is married; 0 otherwise), *Dependency ratio* defined as the ratio of the number of children under age 5 to the number of adult females in the household, and a dummy for residence in *North Shahdara*.

5 Program Impacts: Results

5.1 Effect of *TRAINING*: ITT Estimates

The intent-to-treat (ITT) estimates are reported in Table 6.[12] The coefficient estimates reported in Panel A capture the causal effect of being assigned to the treatment group (*TRAINING*) on a number of different labor market outcomes. The likelihood of casual employment, self-employment, any employment, hours worked, job search and monthly wage earnings; all of which are statistically significantly higher for women who were offered the *TRAINING*. The program increases the likelihood of casual wage employment and self-employment by 5 percentage points, increases the likelihood of any employment by 6 percentage points, increases the likelihood of job search by 6.4 percentage points, hours worked by almost 2 hours, and monthly wage earnings by Rs 135. Notice that for women who were not offered the *TRAINING*, the average hours worked is 1.18 and average monthly wage earnings is Rs 80. *TRAINING* therefore doubles the hours worked and increased the monthly wage earnings by more than 150 percent. The effect of *TRAINING* on the likelihood of obtaining full-time wage employment are also positive, though the effect is not statistically significant. We do however need to bear in mind that while in percentage terms these effects are large and statistically significant, in absolute terms they

[12] In the regression results that are reported in Table 6 we do not include center fixed effects. The results remain very similar when we do and are hence not reported in this paper – they are however available on request.

are small.

Turning to hours worked and monthly wage earnings; conditional on working for casual wage, full-time and or self-employed, we find that *TRAINING* results in a significant increase in hours worked and a positive but not a statistically significant effect on the monthly wage earnings. The conditional effects on hours worked and on monthly wage earnings are both large: the average hours worked in the week prior to the survey is 23 hours for women in the control group; women who receive *TRAINING* work roughly 10 hours more per week. Similarly, women in the control group earn Rs 1600 per month on an average; *TRAINING* increases monthly wage earnings by almost Rs 900 per month, which is almost 60% of the wage earnings of those women in the control group. A comparison of the conditional and unconditional effects suggest that the main effect operates through increased participation rather than through an increase in productivity (and wage rate). However, given the extremely small sample size (very few women report being employed/working), one must be careful in interpreting these numbers.

TRAINING has a positive and statistically significant effect on ownership of capital goods and entrepreneurship - women who receive the *TRAINING* are 15 percentage points more likely to own a sewing machine (see Panel B in Table 6). This increase in the likelihood of owning a sewing machine could be viewed as a measure of entrepreneurship. During informal conversations with the applicants, we asked why they wished to participate in the program. A large proportion responded saying, "we want to use this skill to increase income or set up our own small businesses"; purchasing a sewing machine can be viewed as the first step in this direction. On the other hand *TRAINING* has no effect on empowerment and happiness at home or work (see Panel B in Table 6).

The effects on labor market participation and hours worked that we obtain are similar to those obtained for the female sample by Attanasio, Kugler, and Meghir (2011), particularly when we look at the effects on the probability of employment and on hours worked. However, we obtain much stronger effects on earnings. The effects are systematically higher compared to those obtained by Card, Ibarraran, Regalia, Rosas, and Soares (2011), who find very small effects on employment and only about a 10% increase in monthly earnings. Of course one must bear in mind that these programs are all very different - implemented in very different parts of the world, with very different target populations and by different organizations – and so any direct comparison of the impacts is almost impossible.

In the follow-up survey conducted in July-August 2011 (six months after the completion of the program) we asked whether the applicants planned to participate in any stitching and tailoring related activities in the next six months - for example stitch for others and charge money for it, work in a factory that makes clothes, be an apprentice with a local tailoring shop or provide private tuition in stitching and tailoring. The strongest effect is on the likelihood of stitching for others and charging money for it: almost 12% of women who had access to the *TRAINING* report that they are likely to stitch for others and charge money for it (thereby contributing to household income). A large fraction of women who applied to the program (more than 44%) reported (prior to the survey) that the primary reason for applying to the program was to increase future earnings. Behavior post-training is consistent with this desire.

Women appear to be using the skills that they have accumulated productively. Almost 23% of women in the treatment group *TRAINING* report that they had stiched something on their own in the six months prior to the follow-up survey; 4% of women in the treatment group *TRAINING* had stitched at least one item of men's clothing in the month prior to the follow-up survey, 21% had stitched at least one item of woman's clothing and 6% had stitched at least one item of children's clothing in the month prior to the follow-up survey. The corresponding percentages for women in the control group are 3, 7, and 1 percent respectively.

5.2 Inference with Multiple Outcomes

Since we are interested in the impact of the training program for over 12 outcome variables of interest, the probability of a false positive, that is, Type I error increases in the number of outcomes tested. To rule this out we examine the ITT effects of the training program on summary indices using the approach outlined in Kling, Liebman, and Katz (2007). Similar to Karlan and Zinman (2009) we construct: (a) an overall index using 11 of the 12 outcome variables of interest, and (b) summary indices constructed over domains of related outcomes. The specific domains of interest to us are - labor market outcomes index (casual wage employment, full-time employment, self-employment, hours worked, job search, monthly wage earnings and ownership of sewing machine), and empowerment and life satisfaction index (control over resources, rosca participation, happy at home, and happy at work). The index method requires all variables to be converted into z-scores. The z-scores are constructed for each outcome variable using the mean and the

standard deviation of the control group as the reference group. A higher value of the z-score necessarily implies an improvement. We take an equally weighted average of all the standardized outcomes within a domain to construct the indices.

We re-estimate equation (1) using the index measures as the outcome variables of interest. The coefficient estimates associated with *TRAINING* on the index variables reported in Panel C of Table 6 indicate a strong positive and statistically significant impact of the training program on labor market outcomes, on an average, assignment to the treatment status improve labor market outcomes by almost 0.30 standard deviation. However, the training program has no impact on measures of empowerment and happiness. The overall index rejects the null hypothesis that the training has no effect on the outcome variables of interest at 1% significance level alleviating concerns relating to incorrect inference that comes with the use of multiple outcome variables, as done in this paper.

5.3 Sub-group Average Treatment Effects

The results presented in Table 6 give us the ITT estimates of the program for the full sample. However, it is worth investigating whether the effects are different across different sub-groups. For example, Field, Jayachandran, and Pande (2010) explore how traditional religious and caste institutions in India that impose restrictions on women's behavior influence their business activity. Caste and religion could impose significant restrictions on mobility and social interactions of these women, which in turn can result in significant differences in outcomes. Similarly, one can argue that more educated women or women with prior experience in stitching and tailoring can better internalize the potential benefits of *TRAINING*. From a policy perspective, it is useful to identify whether the benefits of this program accrue to all or only certain individuals belonging to specific socioeconomic groups. To examine this, we compute sub-group average treatment effects by estimating the following equation (this is an extended version of equation (1)):

$$Y_i = \beta_0 + \beta_1 TRAINING_i + \beta_2 (TRAINING_i \times \mathbf{Z}_i) + \sum_{j=1}^{K} \gamma_j \mathbf{X}_{ij} + \epsilon_i \qquad (2)$$

where

$$\mathbf{Z}_i = \{\text{Hindu, SC, Completed secondary schooling, Experience in stitching and tailoring, Dependency ratio}\}$$

where β_1 gives us the effect of the *TRAINING* program for women not belonging to the sub-group $z \in \mathbf{Z}$ and β_2 gives us the differential (treatment − control) effect for women belonging to sub group z. The estimated coefficients for β_1 and β_2 are presented in Table 7. We present the results corresponding to the labor market and entrepreneurship variables.[13]

The interaction terms are almost never statistically significant, which suggest that the impact of the training is homogenous. The exception include – hours worked, which is significantly lower for SC women receiving the *TRAINING*; though the effect is quite weak, significant at 10 percent level of significance. The lower hours worked is however not reflected in lower monthly wage earnings. On the other hand, a SC woman who receives *TRAINING* is 19 percentage point more likely to own a sewing machine compared to a non SC woman who receives *TRAINING*. Finally, experienced women (with prior experience in stitching and tailoring) who receive *TRAINING* are 15 percentage points more likely to search for jobs compared to women without prior experience and receive *TRAINING*. Finally women residing in households with a high dependency ratio are less likely to own a sewing machine, that is, are significantly less likely to be entrepreneurial.

5.4 Effect of Program Completion: Treatment on the Treated (TOT)

As described in Section 3 above, not everyone assigned to the treatment group completed the program and received the certificate at the end of the program. Program completers attended on an average 89 days of classes, while the non-completers attended on an average 10 days. This implies that the intensity of the training is likely to be considerably higher for those women who completed the training. The labor market, empowerment, entrepreneurship, and life satisfaction measures are also likely to vary by the intensity of training. To examine this issue we estimate two versions of equation (1) to obtain the impact of the treatment on the treated (TOT) estimates for both program completion and attendance separately. Our estimation strategy exploits random assignment to

[13]The results for empowerment and happiness are available on request.

the treatment, i.e., being offered the training program. We examine the impact of program completion (*TRAINED*) on all the outcome variables of interest, instrumenting for *TRAINED* using initial assignment to the treatment status and its interaction with age and marital status as instruments. The first stage F-statistics on the excluded instruments are always greater than 10 and the Hansen J-statistics are never statistically significant indicating that the excluded instruments are both strongly correlated with the endogenous regressor and uncorrelated with the error term in the main specification. The estimated effects for *TRAINED* are presented in Table 8.

It is not surprising that the TOT estimates are systematically higher compared to the ITT estimates. The results presented in Panel A in Table 8 suggest that the effect of being offered the *TRAINING* is significantly higher for the program completers. The *TRAINED* experience a 9 percentage point increase in the likelihood of obtaining casual wage employment and self-employment; an 11 percentage point increase in the likelihood of obtaining any employment; an 11 percentage point increase in the likelihood of job search; a 3.5 hour increase in hours worked during the last week and a Rs 245 increase in monthly wage earnings (an increase of more than 300 percent, relative to the control). Again it is important to note that these are unconditional effects. While the likelihood of obtaining full-time employment is both higher for the *TRAINED* the effects are not statistically significant. Finally, the likelihood of owning a sewing machine is 28 percentage points higher for the *TRAINED* (see Panel B in Table 8).

Program completion involves receiving a certificate from Pratham and Satya stating that the woman completed a course on stitching and tailoring. So it is worth examining whether the program impacts presented in Table 8 is indeed the result of skill accumulation or is it because of the fact that the program completers are offered a certificate i.e., is this simply a *certificate effect* or a *sheepskin effect*?[14] To examine this we estimate the following equation

$$Y_i = \beta_0 + \beta_1 ATTENDANCE_i + \beta_2 (ATTENDANCE_i \times TRAINED_i) + \sum_{j=1}^{K} \gamma_j \mathbf{X}_{ij} + \epsilon_i \tag{3}$$

Here the estimated coefficient estimate β_1 gives the effect of increased attendance for the

[14]The idea of *sheepskin effect* is very common when analyzing the returns to education. Employers have used the education level of applicants as a way of delineating who is qualified for what kinds of jobs. The preference for college and graduate school degrees is known as the *sheepskin effect*, so named because the degree dresses up an applicant but does not necessarily change his/her skills or overall value. The *sheepskin* is the actual diploma.

non-completers while the β_2 is the differential effect for the program completers. A positive and statistically significant β_2 implies obtaining the certificate has an additional effect, over and above that of skill accumulation, which is measured by the *ATTENDANCE* variable (proportion of days attended). Even within the set of program completers, there is considerable variation in the number of days attended (the standard deviation is more than 28 days). Equation (3) is estimated using IV. The coefficient estimates for β_1 and β_2 are presented in Table A-4. Notice that β_2 is never statistically significant, indicating that controlling for attendance, program completion (i.e., obtaining the certificate) does not have an additional effect on any of the outcome variables of interest.

6 Behavioral Impacts

The results so far suggest that there are significant gains from participating in the vocational training program. The next question is what are some of the possible pathways through which training increases labor market outcomes? For instance, it is possible that labor market training programs increase wage earnings not only through skill accumulation but also by increasing participants' overall confidence level and/or intrinsic competitiveness, which can further explain some of the variation in wage earnings. As we have seen, women who receive the *TRAINING* are much more likely to search for any job, not necessarily related to stitching and tailoring. This is possibly an indicator of an increase in overall confidence level, *caused* by the program. Therefore, in addition to the presence of such direct effects, training programs could also potentially generate substantial positive externalities by altering participants' behavioral traits, which can influence various other dimensions of well being as well.

In order to examine if the training program resulted in changes in behavioral characteristics which would imply that the ITT effects of the program would be over estimated; we requested a randomly selected sample of the applicants to participate in a set of behavioral experiments prior to randomization, that is, before learning their treatment status and 6 months after the training program.[15] Due to operational constraints and safety considerations, the behavioral experiments could only be conducted in South Shahdara. The experiments were conducted in the Pratham office located in South Shahdara, a prominent and convenient place for all the participants. Pratham employees were hired to recruit

[15]The experiments that we conducted fall under the category of artefactual field experiments, using the categorization developed by Harrison and List (2004).

for the behavioral experiments but the team of recruiters had no information about these experiments. To be more specific, neither of the NGOs involved had any information on the behavioral experiments when they conducted the information sessions to advertise for the training program. Of the 224 women residing in South Shahdara who applied for the program, 153 participated in these behavioral experiments in 2010. However not all the women who participated in the behavioral experiments actually participated in the baseline survey and we have complete baseline data (both experimental and survey) for 135 women. The program participants were later (after the behavioral experiments) randomly allocated into the treatment or the control group.

In May-June 2011, approximately five months after the training program was completed, we invited all the women who participated in the experiments in 2010 back to the Pratham office to participate in a similar set of experiments as in the previous year. Attempts were made to track and invite every woman who was in our final 2010 sample. Despite all effort, we were unable to trace around 15% of the participants in 2010. However, there are no systematic differences in the attrition rates across the two groups.

In each year, subjects participated in only one session where an average session lasted for about 2 hours. Each subject participated in two behavioral games. The basic structure of each game is similar to the games used in previous studies (see for example Gneezy, Leonard, and List, 2009). The first game was designed to evaluate subjects' attitudes towards risk (*investment game*). In this game, participants were endowed with Rs 50 and had the option of allocating any portion of their endowment to a risky asset that had a 50 percent chance of quadrupling the amount invested. The invested amount could also be lost with a 50 percent probability. The subjects retained any amount that they chose not to invest. The second game was designed to investigate the intrinsic competitiveness of the subjects (*competition game*). The subjects were required to participate in a real-effort task, which determined their payoffs in the experiment. The real-effort task consisted of filling up 1.5 fl oz. zip lock bags with beans in one minute. Prior to the task each subject had to choose one of two possible methods of compensation. First, a *piece-rate* compensation method, which depended solely on her own performance and she would receive Rs 4 for each correctly filled bag. Second, a *competition-rate* compensation method where her earnings would depend on how she performed relative to a randomly chosen subject in the same session. A subject received Rs 16 per bag if she filled more bags than her matched opponent. If she filled fewer bags than her opponent, she received nothing. When choosing

their compensation method, the subjects also had to guess their performance in the game, by answering questions on the number of bags they expected to be able to fill (a measure of individual/absolute confidence), and their expected rank based on their performance in the task (a measure of relative confidence).[16] In each session, only one of the games was chosen for payment purposes. We chose the payoffs such that the returns from choosing the riskier alternative were comparable in the two games. In both the games, choosing the riskier outcome gave four times higher payoffs compared to the riskless option.[17]

Finally in the main survey – both in the baseline and in the follow-up, we collected information on time preference. Subjects were asked whether they would prefer Rs 100 today or Rs 150 in a months time and whether they would prefer Rs 100 today and Rs 200 in a months time.[18] We use this information to define two different measures of time preference: *Willing to Wait 150*, which is a dummy variable that takes the value of 1 if the woman prefers Rs 150 in a month and *Willing to Wait 200*, which takes the value of 1 if the woman prefers Rs 200 in a month. Note that these choices are not incentivized and are essentially hypothetical choices. Also since this information was collected using the socio-economic survey, we have the time preference data for the entire sample.

The primary question that we examine is: Does *TRAINING* cause changes in the behavioral/intrinsic characteristics of the women? As before, the panel dimension of the data on behavioral characteristics along with a randomized evaluation design implemented here allows us to measure the causal effects of the vocational training program on behavioral outcomes. We estimate a variant of equation (1).

$$B_i = \beta_0 + \beta_1 TRAINING_i + \sum_{j=1}^{K} \gamma_j \mathbf{X}_{ij} + \epsilon_i \tag{4}$$

B_i is decision of made woman i in the behavioral experiment. The remaining variables are

[16] See Dasgupta, Gangadharan, Maitra, Mani, and Subramanian (2012) for more details on the experiment.

[17] We made small changes to the above described game in 2011 to disentangle the effect of familiarity with these games to changes in behavior. In the investment game, instead of using a coin toss to determine the success or failure of the investment, we chose to roll a die where if $\{1, 2, 3\}$ determined success of the investment and $\{4, 5, 6\}$ resulted in failure of the investment. In the competition game, we slightly changed the size of the zip lock bag and the type of bean used in the real effort task to make it difficult for participants to use last years' performance as a benchmark.

[18] Specifically the question was: *Suppose you have won a lottery today. You are given two options of how you can receive your prize. Would you prefer a prize of Rs 100 guaranteed today or a prize of Rs 150 guaranteed in one month. You do not have to be afraid that you might not receive the money if you postpone the payment. The prizes are a sure thing today and in one month. Please make your decisions based on how you expect you would answer if the choice were actual and not hypothetical.* We had a follow-up question where the alternatives were Rs 100 today or Rs 200 in a month.

defined as in equation (1). The full set of outcome variables that we consider are presented in Panel C in Table 1.

Columns 2 and 3 of in Panel C of Table 2 report the sample averages for the treatment and control group respectively. Column 4 reports mean differences between the treatment and the control group. There are very little systematic differences between the treatment and control women in terms of both socioeconomic and behavioral characteristics. Women in the treatment group (receiving *TRAINING*) are older and are more likely to be married though the difference in both these cases is quite weak. Women in the treatment group are more confident about their relative abilities, that is, their perceived rank within the group is significantly higher compared to that of women in the control group. Finally, compared to women in the control group, women in the treatment group appear to be less willing to wait a month irrespective of the returns at the end of the month, though the difference is statistically significant only when the alternative is Rs 150 after a month. What is interesting is that the majority of women are present biased - overall only around 30% of the women in the sample (applicants) would be willing to wait for a month to receive Rs 150 by giving up Rs 100 today. Not surprisingly, the proportion willing to wait is higher when the returns from waiting is higher, but even this is less than 50%. Finally Panel C of Table 4 summarizes pre and post training differences in the outcome variables of interest. Assigned to *TRAINING*, it appears, has almost no impact on the intrinsic characteristics. Below we see whether this result holds once we control for a set of observable characteristics and the lagged outcome variable of interest.

Panel D of Table 6 reports these regression results. They suggest that while there is very little effect of *TRAINING* on the proportion invested in the risky asset, choice of the competitive payment option in the competition game and self assessment about the number of bags that the woman can fill (absolute confidence) and time preference (irrespective of the returns from waiting), there is a positive and statistically significant effect on relative confidence (captured by self ranking): women who receive the *TRAINING* expect to do better in the real effort task, relative to the other women in her session. One implication is that the program can affect outcomes not only through skill accumulation, but it can also affects certain behavioral traits like relative confidence, which can in the long run have a multiplier effect of labor market performance. This can also influence other aspects of the individual's happiness. This spillover effect associated with this kind of labor market training programs have not been investigated previously.

7 Do Behavioral Traits Matter?

There now exists a fairly large experimental literature that suggests that intrinsic traits like risk preferences, competitiveness, confidence, and patience can have potentially strong effects on wage earnings and occupational choice. Niederle and Vesterlund (2007) use differences in competitiveness to explain wage gaps between men and women. Gneezy, Leonard, and List (2009) and Andersen, Ertac, Gneezy, List, and (2010) examine the evolution of gender differences in competitiveness. Castillo, Petrie, and Torero (2010) provide evidence using artefactual field experiments that differences in risk preferences have significant implications for occupational choices. Liu (2008) finds that more risk averse (or more loss averse) farmers in rural China delay adoption of Bt cotton, a relatively newer technological improvement. It has also been documented that the level of confidence can affect wage rates (Fang and Moscarini, 2005) entrepreneurial behavior (Koellinger, Minniti, and Schade, 2007) and behavior in financial markets (Biais, Hilton, Mazurier, and Pouget, 2005). Given this background, it is worth examining whether the returns to *TRAINING* depend on these baseline intrinsic characteristics. To do this we estimate a version of equation (2) where we subdivide the sample on the basis of baseline (pre-program) intrinsic characteristics using the experiments conducted in 2010.[19] In this case we estimate the following equation

$$Y_{it} = \beta_0 + \beta_1 TRAINING_i + \beta_2 (TRAINING_i \times \mathbf{Z}_i) + \sum_{j=1}^{K} \gamma_j \mathbf{X}_{ij} + \epsilon_{it} \qquad (5)$$

where

$$\mathbf{Z}_i = \{\text{Risk Tolerance Low, Competitive, Self Assessment High, Self Rank High Willing to Wait 150, Willing to Wait 200}\}$$

Here *Risk Tolerance Low* is a dummy variable that takes a value 1 if the proportion invested in the risky asset in the investment game is less than 0.5 and 0 otherwise; *Competitive* is a dummy variable that takes a value 1 if the woman chose the competitive payment scheme in the competition game and 0 otherwise; *Self Assessment High* is a dummy variable that

[19] There now exists a fairly large literature that suggests that behavior in a laboratory setting is a good predictor of behavior outside the laboratory environment. For example Karlan (2005) finds that individuals identied as more trustworthy in a laboratory setting are more likely to repay their loans one year later. Fehr and Goette (2007) find that workers who exhibit loss aversion in a laboratory setting are more likely to reduce effort in response to higher wages in an experiment on bicycle messengers.

takes a value of 1 if the woman expected to fill 4 or more bags in the competition game and 0 otherwise. Finally *Self Ranking High* is a dummy variable that takes a value 1 if the woman expects her rank in the competition game will be in the top two quantiles and 0 otherwise. The corresponding estimates are presented in Table 9. Again, the coefficient of interest is that associated with the interaction term, which captures the differential impact. While the differential impact with respect to high self assessment is never statistically significant, it is so for women who are more tolerant of risk, more competitive and are more confident of their relative ability at the baseline; they have better labor market outcomes post *TRAINING*. The likelihood of obtaining casual wage employment, full-time employment, self-employment, any employment, job search and hours worked, and likelihood of owning a sewing machine are all systematically lower for women who are less tolerant of risk. Monthly earnings are also lower for women who are more less tolerant of risk, though the effect is not statistically significant.

The likelihood of obtaining casual wage employment, full-time employment, any employment and hours worked are all significantly higher for women who are competitive; the likelihood of obtaining full-time employment, self-employment, any employment, hours worked and finally the earnings from self-employment are significantly higher for women who can be categorized as being confident of their relative ability. The differential effects (where significant) are also quite large. For example women who are less tolerant of risk who receive the *TRAINING* are 26 percentage points less likely to be employed and work for 4 less hours compared to women who are more tolerant of risk women who receive the *TRAINING*; competitive women who receive the *TRAINING* work for 7 more hours compared to the non competitive women who receive *TRAINING*; Women who are more confident of their relative abilities and receive *TRAINING* are close to 20 percentage points more likely to be employed, are likely to work for 4 more hours in the week and earn Rs 500 more from self-employment compared to women who are less confident of their relative abilities and receive *TRAINING*. Absolute confidence and patience at the baseline does not however have a statistically significant effect on the post program outcomes. The results presented in Table 9 therefore suggest that intrinsic traits are important and can have significant impacts on the effectiveness of the *TRAINING* program. Indeed, behavioral traits at the baseline can explain a large part of the heterogeneity of outcomes, much more than observables like educational attainment, religion, caste, dependency ratio and prior experience.

8 Ability Bias?

Random allocation of applicants to the treatment and control group enables us to (partially) address the issue of selection bias arising from the fact that individuals of higher ability (which is private information to the individual) choose to apply for the program and therefore resulting in the returns to the training program being over estimated. However a part of the ability bias persists because it is still possible that higher ability women (within the treatment group) continue to do better post-training. So are the results driven by this (unobserved) ability bias? Since ability is not observable to the researcher, it is typically difficult to obtain a measure of the extent of this ability bias. Unfortunately no test was conducted at the baseline to measure the true ability of the applicants: what ever information we have on ability at the baseline was self-reported prior experience in stitching and tailoring.

Recall however that the women had to fill bags with kidney beans in the specific real effort task that the women had to participate in as a part of the experiment. Women in India are used to handling the beans regularly they take them out in bowls, clean and cook them, and all our participants are likely to be equally familiar with this particular task. Performance in the specific real effort task (number of zip lock bags filled in one minute) at the baseline could be used as an (imperfect) measure of ability. We estimate the following equation

$$Y_{it} = \beta_0 + \beta_1 TRAINING_i + \beta_2 (TRAINING_i \times \#ofBags_i) + \sum_{j=1}^{K} \gamma_j \mathbf{X}_{ij} + \epsilon_{it} \qquad (6)$$

Once again the coefficient of interest is β_2. It gives us the marginal effect of an additional bag filled at the baseline on the post training outcome variable. The regression results presented in Table 10 show that the coefficient estimate β_2 is never statistically significant, indicating that the outcomes are not affected by baseline ability. There is no evidence of ability bias driving the results.

9 Cost-Benefit Analysis

We present cost-benefit comparisons under two scenarios: first, for replicating the program at a different location and second, for continuation of the existing program. Under the first scenario, the NGO's total cost of the underlying vocational training program amounts

to Rs 1810 per person[20], including both fixed cost (e.g: machinery) and variable cost (e.g: teacher salary and rent). The ITT effects of the program reported in Table 6 indicate that the program increases annual earnings by Rs 1620. To compute the present discounted value of future earnings, we assume the following: (a) the working life of these women to be 40 years given that the average age of the respondent in our sample is 22 years, (b) 5 percent discount rate, (c) no appreciation or depreciation in annual earnings and (d) zero opportunity cost of participation in the training program given that less than 1 percent of the sample was employed in the pre-training period. Based on our ITT estimates and these assumptions, we obtain the present discounted value of future earnings stream for a participant to be Rs 29160. This amounts to a net benefit of Rs 27350 per participant. The total cost of the program can be recovered in less than two years.

The TOT estimates of the program are much larger and generate an income stream of Rs 52920 over the participant's working life. Given that approximately 50 percent of all individuals who had access to the training program did not complete the program, the per unit cost of the program increases to Rs 4232 per person and yet the associated net benefit of the program remain substantially higher at Rs 48688. The net benefits computed using both the ITT and TOT estimates suggest that there are large benefits from replicating this program in other regions as long as the regional labor markets are distant from one another. However, it needs to be noted that that these estimates do not reflect general equilibrium costs and benefits of the vocational training program. Incorporating the general equilibrium impacts are likely to change the returns, though it is not clear in which direction. On the one hand, as more and more women are trained and enter the labor market, the premium on training is likely to go down; on the other hand, if returns to training are convex, then not incorporating this kind of non-linearity implies that the returns to the program are likely to be under estimated.

Under the second scenario, the NGO only incurs variable cost such as teacher salary, rent and equipment maintenance; all of which sum up to Rs 1538 per person. Under these new cost calculations, the ITT estimates generate a net benefit of Rs 27622 and the TOT estimates generate a net benefit of Rs 51382. There are considerable gains from both continuing the program in the same location and replicating the program in a different location.

The net benefits summarized here possibly represent lower bounds for the benefits of

[20] 1USD = Rs 50 (approximately)

the vocational-education program as they are based on short-run effects of the program, and do not account for gains from savings on clothing expenditure, and empowerment. Increase in women's labor force participation and earnings can have an impact on children's human capital, and these potential intergenerational effects have not been accounted in our computations.

10 Discussion

Youth underemployment, especially among less educated populations perpetuates poverty. The situation is particularly dire for women in low income households, despite the well known fact that increasing the income level of women will have a strong positive impact on both current welfare and the welfare of the next generation. For example children (particularly daughters) of skilled mothers are likely to be more educated and are likely to be healthier. However, little is known about how to best help women in low income households and communities in developing countries to acquire skills, find jobs and increase self-employment.

There are a number of potential different policy options. One would be to inject credit and reduce the credit constraints that appear to hamper the ability of women to take advantage of their entrepreneurial skills. Indeed the entire microfinance revolution was built around this model - provide microloans that will serve as working capital for setting up small businesses leading to increased income over time. However, recent results are increasingly skeptical of the success of such a model of development (see for example Karlan and Valdivia, 2011). Using a field experiment in Sri Lanka de Mel, McKenzie, and Woodruff (2009) find that while the average returns to capital injection to microenterprises is very high (considerably higher than the average interest rates charged by microlenders), the effects are significantly gender biased. They argue that the capital injections generated large profit increases for male microenterprise owners, but not for female owners. Similar gender biased results are obtained by Fafchamps, McKenzie, Quinn, and Woodruff (2011) and Berge, Bjorvatn, and Tungodden (2011). This finding has potentially serious implications for development policy because most microlending organisations target women. They argue that cash injections directed at women could be confiscated by their husbands and other members of their household leading to considerable inefficiencies.

One alternative tool for expanding the labor market opportunities in these settings is

vocational training or skills training, which could help individuals learn a trade and acquire the skills needed to take advantage of employment opportunities, and create successful small businesses. One additional advantage to this kind of training is that it results in human capital that is specific to the person undertaking the training. However, little is known about the actual benefits of participating in vocational training programs in developing countries.

This paper adds to this very limited literature by examining the short run impacts of participating in a vocational training program on labor market outcomes and on measures of empowerment, entrepreneurship, and life satisfaction. The short-run effects of the program presented in this paper are extremely encouraging. We find that the program in a very short time has generated substantial improvement in labor market outcomes for these women. In particular, we find that women who were randomly offered the training program are almost five percentage points more likely to be employed, six percentage points more likely to look for a job, and on an average work two additional hours in the post-training period compared to those who were not offered the training. We also find that during the post-training period, women in the treatment group earn almost twice as much as women in the control group. There is a also a large increase in ownership of sewing machine in the post-training period. The program impacts are much larger for women who completed the training program. There are also significant externalities associated with the program - women who receive the *TRAINING* are likely to be relatively more confident of their ability and this in turn can have significant effects on other dimensions of their lives. The short-run effects that we obtain here are much larger than those observed in developed countries and are consistent with the rather small but growing literature on vocational training and labor market outcomes in developing countries. Finally, the program is highly cost effective and there are considerable gains from both continuing the program in the current location and replicating it in different locations.

We have also been able to identify two significant barriers to skill accumulation (at least for the target population group) - lack of available childcare options and distance to the training center. These are crucial constraints and any active labor market training program needs to accommodate these constraints.

Training programs of this kind therefore have significant benefits both for the program participants and also firms (since they now have access to a more skilled workforce). The returns to initiating such programs can therefore be substantial. This obviously leads

us to the next set of questions: why are there so few programs of this kind? Why are there no private initiatives, or why are the firms themselves not offering programs for skill development, particularly since they are complaining about skill shortage? Why are there no formal apprenticeship programs? What about government initiatives? From a policy point of view these are crucial questions.

There are possibly a number of different explanations for the absence of such programs. First, there is very little incentive for firms/entrepreneurs themselves to offer this kind of programs aimed at skill development. This is because the skill that participants attain as a part of such a program is not a firm specific skill. Therefore, it is difficult for firms and entrepreneurs to recover the cost of providing this training.

Second, historically India has had a system of education that strongly resembles the so called apprentice system that is common in many parts of the world. This was the *Gurukul* system where the student (or disciple or the *shishya*) would reside at the house of the *guru* (the teacher) and learn from him. Indeed one could even argue that the caste system in India formalized the apprenticeship system of learning: occupations were caste specific and one had to be born into a particular caste to be allowed to work in particular occupations and one became an apprentice almost from birth. Labor markets in India have historically been organized along caste lines. An important feature of these caste networks is that they are typically the most active in working class (or blue collar) occupations, dominated by lower caste men. Women historically did not participate in the labor market and hence did not benefit from these caste networks. This also meant that when women chose to enter the labor market, they did not have the caste based apprentice system to depend on. The implications could be very varied. Indeed Munshi and Rosenzweig (2006) using data from Mumbai argue that women actually benefitted because of this. They were not constrained by caste based occupations and could choose occupations that would provide them with the highest return and benefit the most from the process of globalization. This was not the case for men. On the other hand it could also be that in the absence of any security (provided by caste based occupational networks) women choose to exit the labor market. This in turn has significant implications for growth policy.

Third, one issue that was repeatedly re-iterated to us in informal conversations with the different stake holders was the importance of local access. Women in India, particularly those belonging to the socio-economic class where the program applicants are drawn from typically face a large number of restrictions on mobility (they need permission to use pub-

lic transport, often need permission to visit family and friends and so on). So while there are indeed similar programs offered by private organizations and the governments, these programs are often centralized, implying that participants have to travel longer distances to the training centers. This increases the cost of program attendance, which can act as a barrier to skill accumulation. That convenient access and distance to (or time taken to travel to) the training center is crucial made clear in Figure 4, which shows a negative relationship between the time taken to walk to the training center and the likelihood of program completion. Additionally, similar programs offered by government or private organizations can be expensive. It is not always clear that potential participants in programs like this have a very good idea about the future returns and are therefore unwilling to invest (even though we have shown that the full cost of the program can be recovered in about two years). Programs therefore need to be accompanied by information/advertisement campaigns specifically aimed at the target population, which highlight the returns from such programs. Of course as a first step, one needs to get proper estimates of returns from such programs, which is the primary aim of this paper.

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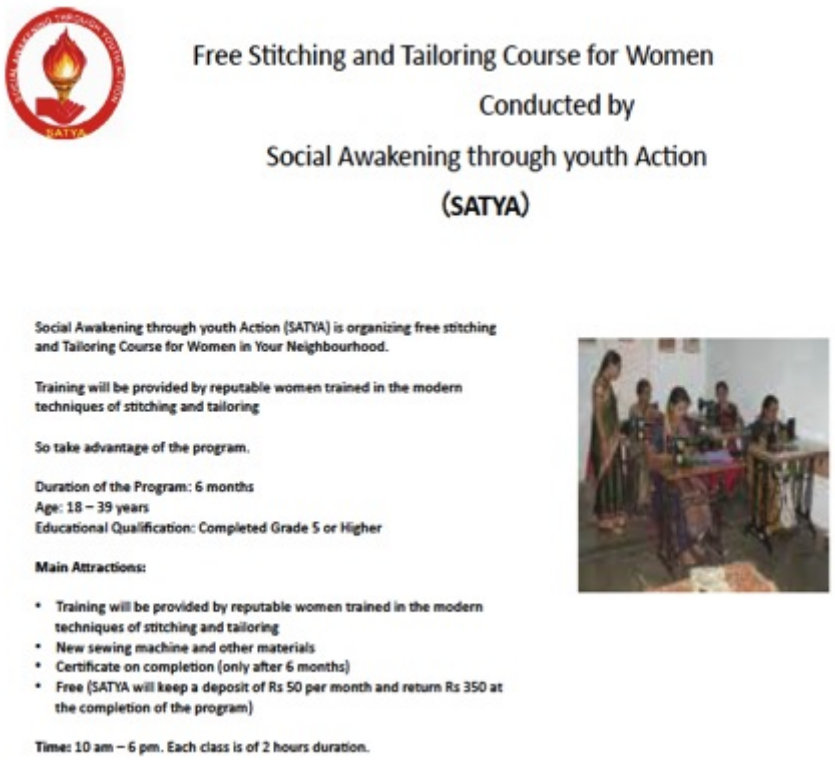
Figure 1: The Advertisement Campaign of the Program



Free Stitching and Tailoring Course for Women

Conducted by

Social Awakening through youth Action

(SATYA)

Social Awakening through youth Action (SATYA) is organizing free stitching and Tailoring Course for Women in Your Neighbourhood.

Training will be provided by reputable women trained in the modern techniques of stitching and tailoring

So take advantage of the program.

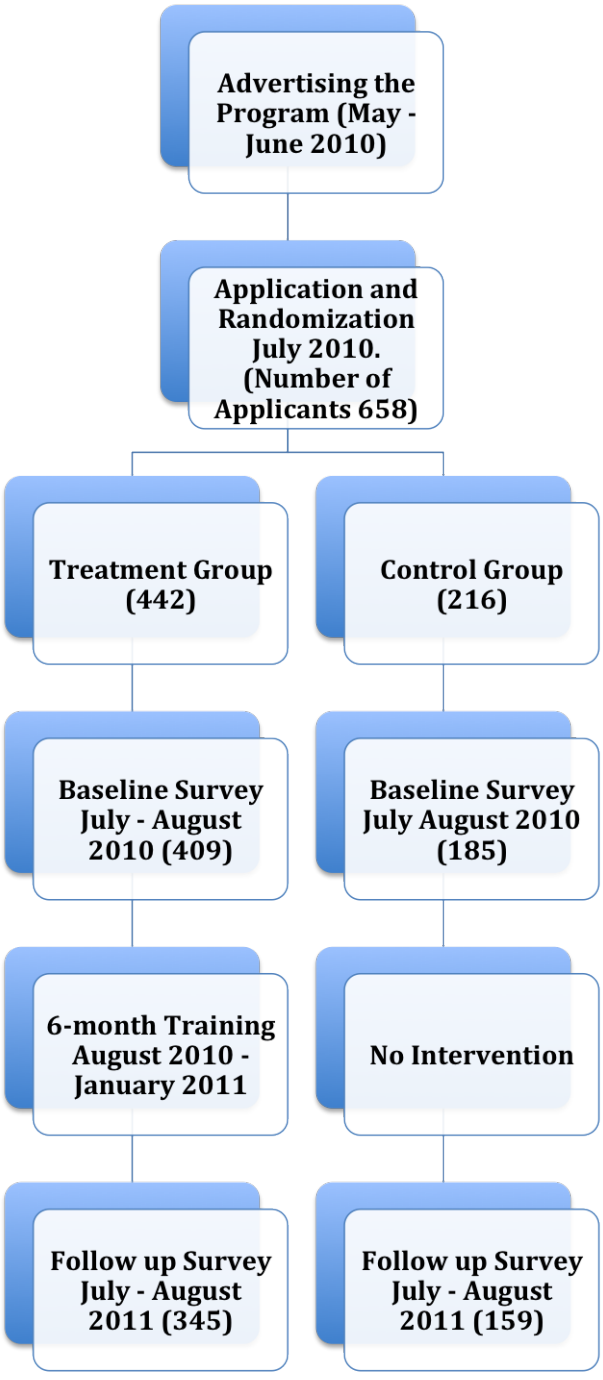
Duration of the Program: 6 months
Age: 18 – 39 years
Educational Qualification: Completed Grade 5 or Higher

Main Attractions:

- Training will be provided by reputable women trained in the modern techniques of stitching and tailoring
- New sewing machine and other materials
- Certificate on completion (only after 6 months)
- Free (SATYA will keep a deposit of Rs 50 per month and return Rs 350 at the completion of the program)

Time: 10 am – 6 pm. Each class is of 2 hours duration.

Figure 2: Chronology of Events



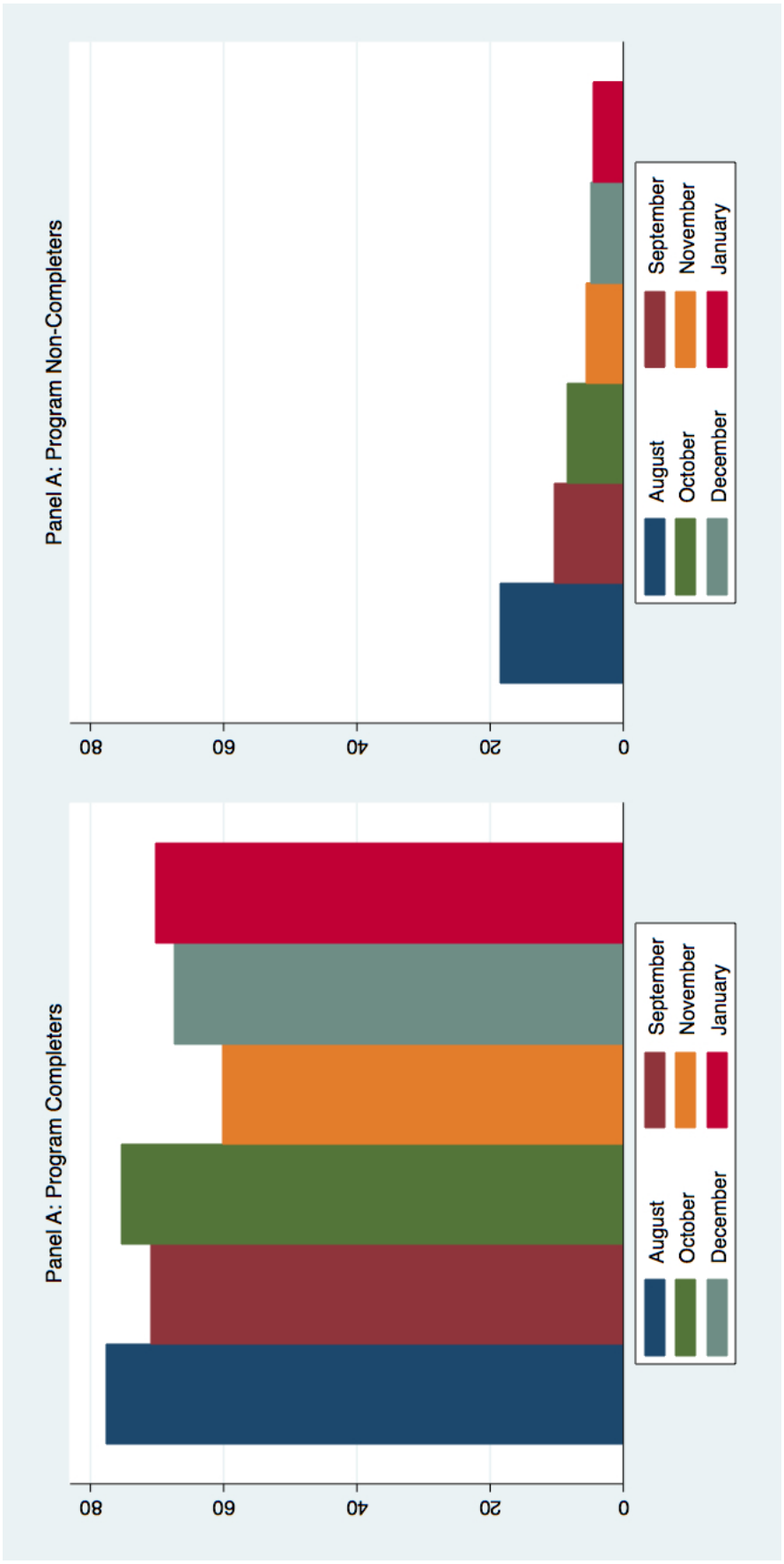


Figure 3: Average Monthly Attendance

Table 1: Outcome variables included in our analysis

Panel A: Labor Market Outcomes	
Casual wage employment:	= 1 if the respondent is employed for casual wage
Full-time employment:	= 1 if the respondent is employed full-time
Self-employment:	= 1 if the respondent is self-employed
Any employment:	= 1 if the respondent is employed (casual, full-time, and or self)
Hours worked:	number of hours worked during the last week, where hours worked is a continuous variable
Job search:	= 1 if the respondent spends any time looking for more work during the last week
Monthly wage earnings:	total monthly earnings from casual, full-time, and or self employment during the last month
Panel B: Entrpreneurship, Empowerment, and Life Satisfaction	
Own sewing machine:	= 1 if the respondent owns a sewing machine at home
Control over resources:	= 1 if the respondents says she has the right to choose/decide how to spend the money she has earned
Rosca membership:	= 1 if the respondent is a member of a Rotating Savings and Credit Association (ROSCA)/chit fund
Happy at home:	A categorical variable taking the following four values: 4 if very satisfied; 3 if moderately satisfied; 2 if moderately dissatisfied; and 1 if not satisfied
Happy at work:	A categorical variable taking the following four values: 4 if very satisfied; 3 if moderately satisfied; 2 if moderately dissatisfied; and 1 if not satisfied
Panel C: Behavioral/Intrinsic Characteristics	
Proportion allocated to the risky option	proportion allocated to the risky option in the investment game
Competitive wage scheme	= 1 if the woman choses the competition wage scheme in the competition game
Self assessment	Number of bags the woman expects to fill in the competition game
Relative rank	Estimate about her relative standing (rank) in the competition game
Bags filled	Number of bags filled in the competition game
Willing to Wait Rs. 150	= 1 if the woman prefers Rs 150 in a month vs. Rs 100 today
Willing to Wait Rs. 200	= 1 if the woman prefers Rs 200 in a month vs. Rs 100 today

Figure 4: Walking time to training center and Program Completion

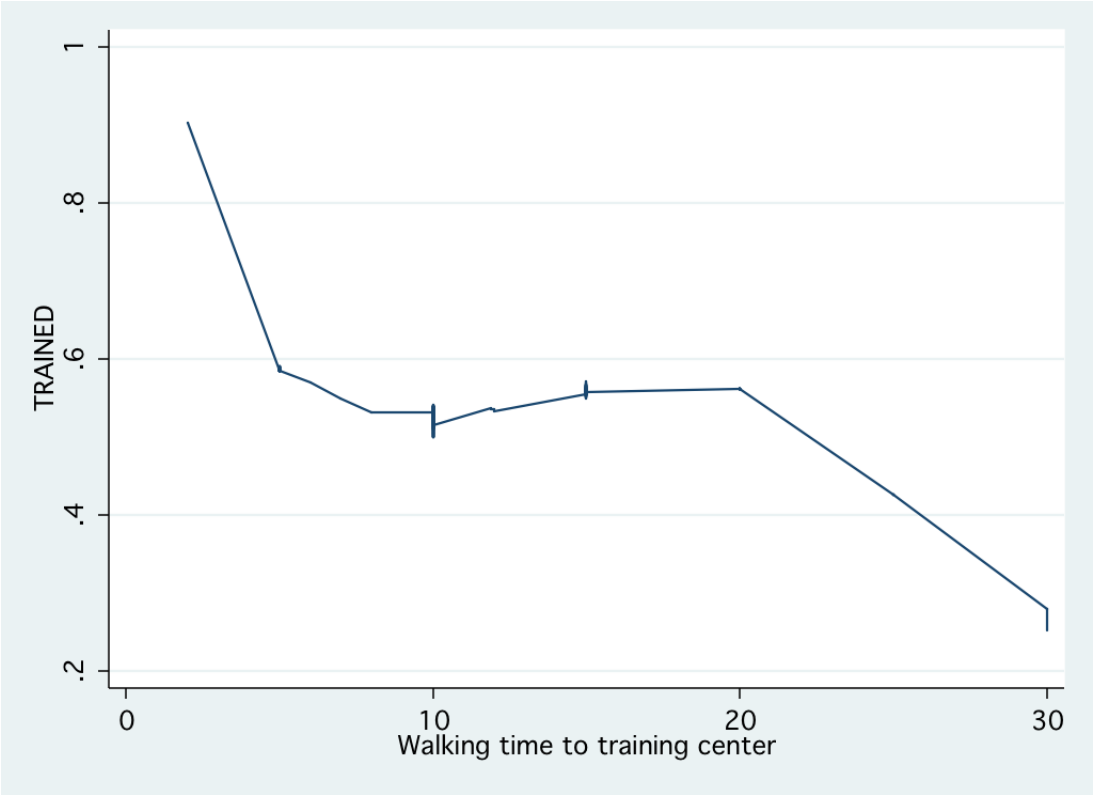


Table 2: Baseline Characteristics

	Full Sample (1)	Treatment (2)	Control (3)	Treatment-Control (4)
Panel A: Labor Market Outcomes				
Casual wage employment	0.010	0.012	0.005	0.007
	[0.10]	[0.11]	[0.07]	(0.008)
Full-time employment	0.032	0.034	0.027	0.007
	[0.17]	[0.18]	[0.16]	(0.016)
Self-employment	0.023	0.024	0.021	0.003
	[0.15]	[0.15]	[0.145]	(0.013)
Any employment	0.049	0.051	0.043	0.008
	[0.21]	[0.22]	[0.20]	(0.019)
Hours worked	0.98	1.10	0.72	0.38
	[5.72]	[6.14]	[4.69]	(0.50)
Conditional hours worked	20.24	21.57	16.75	4.82
	[17.06]	[17.48]	[16.49]	(7.15)
Job search	0.074	0.05	0.13	-0.08***
	[0.26]	[0.21]	[0.33]	(0.02)
Monthly wage earnings	42.18	49.77	25.40	24.37
	[333.01]	[383.85]	[173.99]	(29.51)
Conditional monthly wage earnings	1253	1357.33	940	417.33
	[1365.35]	[1546.75]	[563.91]	(717.67)
Panel B: Entrepreneurship, Empowerment, and Life Satisfaction				
Own sewing machine	0.352	0.313	0.438	-0.125***
	[0.47]	[0.46]	[0.49]	(0.04)
Control over resources	0.411	0.41	0.39	0.02
	[0.49]	[0.49]	[0.49]	(0.04)
Rosca participation	0.114	0.11	0.10	0.01
	[0.31]	[0.32]	[0.31]	(0.028)
Happy at home	3.41	3.415	3.410	0.005
	[0.80]	[0.82]	[0.75]	(0.07)
Happy at work	3.43	3.46	3.35	0.11
	[0.77]	[0.77]	[0.76]	(0.07)
Panel C: Behavioral/Intrinsic Characteristics				
Proportion allocated to the risky option‡	50.68	51.53	48.93	2.59
	[20.50]	[20.52]	[20.56]	(3.64)
Competitive wage scheme‡	0.36	0.36	0.34	0.02
	[0.48]	[0.48]	[0.47]	(0.08)
Self assessment‡	4.33	4.22	4.56	-0.34
	[1.99]	[1.83]	[1.28]	(0.35)
Relative rank‡	4.07	4.20	3.81	0.39*
	[1.007]	[0.93]	[1.11]	(0.17)
Bags filled‡	1.88	1.92	1.80	0.12
	[0.67]	[0.70]	[0.61]	(0.12)

Continued

Table 2 (*Continued*): Baseline Characteristics

	Full Sample (1)	Treatment (2)	Control (3)	Treatment-Control (4)
Panel D: Socioeconomic Characteristics				
Age	22.33	22.40	22.19	0.21
	[5.77]	[5.78]	[5.77]	(0.51)
Completed secondary schooling	0.446	0.449	0.437	0.012
	[0.49]	[0.49]	[0.49]	(0.044)
Experience in stitching and tailoring	0.268	0.22	0.35	-0.13***
	[0.49]	[0.49]	[0.49]	(0.04)
Married	0.335	0.34	0.31	0.03
	[0.47]	[0.47]	[0.46]	(0.04)
SC	0.51	0.51	0.50	0.01
	[0.40]	[0.50]	[0.50]	(0.04)
Hindu	0.471	0.47	0.46	0.01
	[0.49]	[0.49]	[0.50]	(0.044)
Dependency ratio	0.263	0.27	0.24	0.03
	[0.48]	[0.49]	[0.45]	(0.04)
Panel E: Socioeconomic Characteristics				
Age‡	23.72	24.43	22.23	2.20**
	[5.95]	[6.05]	[5.50]	(1.04)
Completed secondary schooling‡	0.41	0.38	0.48	-0.10
	[0.49]	[0.48]	[0.50]	(0.09)
Experience in stitching and tailoring‡	0.49	0.48	0.51	0.03
	[0.501]	[0.502]	[0.505]	(0.09)
Married‡	0.47	0.53	0.36	0.16*
	[0.50]	[0.501]	[0.48]	(0.09)
SC‡	0.57	0.57	0.59	-0.02
	[0.495]	[0.497]	[0.496]	(0.09)
Hindu‡	0.989	0.979	0.978	0.001
	[0.143]	[0.142]	[0.146]	(0.03)
Dependency ratio‡	0.34	0.37	0.30	0.07
	[0.55]	[0.59]	[0.47]	(0.10)

In columns 1-3, standard deviation reports in parentheses
In column 4, standard errors reported in parentheses
Full sample: Sample size = 594; Treatment = 409; Control = 185
Restricted sample‡: Sample size = 145; Treatment = 98; Control = 47
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Differential Attrition between 2010 and 2011

	Treatment			Control			
	Non-attriters (1)	attriters (2)	Difference (3)	Non-attriters (4)	attriters (5)	Difference (6)	Diff-Diff (7) [(3)-(6)]
Casual wage employment	0.014	0.00	0.014	0.006	0.00	0.006	0.008
							(0.009)
Full-time employment	0.041	0.00	0.041	0.025	0.038	-0.013	0.05
							(0.04)
Self-employment	0.026	0.016	0.010	0.025	0.00	0.025	-0.015
							(0.02)
Any employment	0.058	0.016	0.042	0.044	0.038	0.006	0.036
							(0.04)
Hours worked	1.31	0.00	1.31	0.73	0.70	0.03	1.28
							(0.86)
Job search	0.052	0.031	0.021	0.126	0.154	-0.028	0.05
							(0.08)
Monthly wage earnings	59.01	0.00	59.01	23.27	38.46	-15.19	74.20
							(46.06)
Own sewing machine	0.328	0.234	0.093	0.434	0.462	-0.028	0.12
							(0.12)
Control over resources	0.42	0.40	0.02	0.390	0.423	-0.033	0.05
							(0.12)
Rosca participation	0.116	0.125	-0.0090	0.107	0.115	-0.0084	-0.0006
							(0.08)
Happy at home	3.43	3.30	0.13	3.43	3.26	0.17	-0.04
							(0.19)
Happy at work	3.47	3.42	0.05	3.35	3.34	0.012	0.038
							(0.20)
Sample Size	345	64		159	26		

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Summary Statistics: Pre and Post Training Differences in Outcome Variables

	Pre-Training			Post Training			
	Treatment (1)	Control (2)	Difference (3)	Treatment (4)	Control (5)	Difference (6)	Diff-Diff (7) [(6)-(3)]
Panel A: Labor Market Outcomes							
Casual wage employment	0.014	0.006	0.008	0.060	0.012	0.048**	0.04**
							(0.018)
Full-time employment	0.040	0.025	0.015	0.092	0.050	0.042	0.027
							(0.03)
Self-employment	0.026	0.025	0.001	0.06	0.012	0.048**	0.047**
							(0.02)
Any employment	0.057	0.044	0.013	0.13	0.06	0.07**	0.057*
							(0.03)
Hours worked	1.31	0.73	0.58	3.50	1.17	2.33**	1.75*
							(0.92)
Job search	0.052	0.12	-0.073***	0.122	0.069	0.053*	0.126***
							(0.02)
Monthly wage earnings	59.01	23.27	35.74	259.85	79.87	179.98*	144.24*
							(82.67)
Monthly wage earnings (Conditional)	1357.33	925	432.33	2490.27	1587.5	902.77	470.44
							(924.69)
Panel B: Entrepreneurship, Empowerment, and Life Satisfaction							
Own sewing machine	0.32	0.43	-0.11**	0.59	0.47	0.12**	0.23***
							(0.06)
Control over resources	0.42	0.39	0.03	0.45	0.49	-0.04	-0.07
							(0.067)
Rosca participation	0.11	0.10	0.01	0.049	0.038	0.011	0.001
							(0.03)
Happy at home	3.437	3.433	0.003	3.27	3.35	-0.081	-0.083
							(0.098)

Continued

Table 4 (*Continued*): Pre and Post Training Differences in Variables

	Pre-Training			Post Training			
	Treatment (1)	Control (2)	Difference (3)	Treatment (4)	Control (5)	Difference (6)	Diff-Diff (7) [(6)-(3)]
Happy at work	3.47	3.35	0.12	3.33	3.36	-0.03	-0.15
							(0.098)
Panel C: Behavioral/Intrinsic Characteristics							
Proportion allocated to the risky option‡	53.08	50.77	2.31	48.10	54.56	-6.46	-8.77
							(5.93)
Competitive wage scheme‡	0.41	0.36	0.05	0.50	0.38	0.12	0.06
							(0.14)
Self assessment‡	4.38	4.55	-0.17	4.54	4.10	0.44	0.61
							(0.60)
Relative rank‡	4.21	3.82	0.39**	4.01	3.51	0.50**	0.11
							(0.31)
Bags filled‡	1.91	1.74	0.16	2.30	2.05	0.25	0.09
							(0.21)
Willing to wait Rs. 150	0.28	0.33	-0.06	0.33	0.36	-0.03	0.02
							(0.06)
Willing to wait Rs. 200	0.41	0.44	-0.03	0.48	0.53	-0.05	-0.02
							(0.07)

Standard errors reported in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Full sample: Sample size = 504; Treatment = 345; Control = 159
Restricted sample‡: Sample size = 117; Treatment = 78; Control = 39
Sample restricted to non attriting households

Table 5: Determinants of Program Completion (*TRAINED*)

	(1)
Age	-0.006
	(0.008)
Completed Secondary School	0.205***
	(0.055)
Married	0.058
	(0.111)
Married × Mother-in-law present	0.187
	(0.149)
Hindu	-0.119
	(0.086)
SC	-0.048
	(0.056)
Experienced in stitching and tailoring	0.094
	(0.066)
Dependency ratio	0.023
	(0.069)
Walking time to Center (in mins)	-0.010**
	(0.005)
Household size	-0.001
	(0.017)
Years of schooling, household head	-0.003
	(0.007)
Age of household head	0.002
	(0.003)
Resident of North Shahdara	0.128
	(0.084)
Sample Size	345

Marginal Effects presented
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: ITT effects of *TRAINING*

	TRAINING	Mean Control	Sample Size
	(1)	(2)	(3)
Panel A: Labor Market Outcomes			
Casual wage employment	0.052***	0.012	504
	(0.016)		
Full-time employment	0.032	0.05	504
	(0.022)		
Self-employment	0.051***	0.012	504
	(0.016)		
Any employment	0.061**	0.06	504
	(0.027)		
Hours worked	2.03***	1.17	504
	(0.74)		
Job search	0.066**	0.069	504
	(0.029)		
Monthly wage earnings	134.75**	79.87	504
	(68.51)		
Panel B: Entrepreneurship, Empowerment, and Life Satisfaction			
Own sewing machine	0.153***	0.478	504
	(0.046)		
Control over resources	-0.048	0.049	504
	(0.049)		
Rosca participation	0.004	0.065	504
	(0.019)		
Happy at home	-0.078	3.35	504
	(0.064)		
Happy at work	-0.04	3.36	504
	(0.07)		
Panel C: Index Measures			
Labor market outcomes index	0.32***		504
	(0.07)		
Empowerment and life satisfaction index	-0.05		504
	(0.053)		
Overall index	0.183***		504
	(0.052)		
Panel D: Behavioral/Intrinsic Characteristics			
Proportion allocated to the risky option‡	-5.312	54.31	117
	(4.623)		
Competitive wage scheme‡	0.080	0.38	117
	(0.103)		
Self assessment‡	0.152	4.12	117
	(0.416)		
Relative rank‡	0.460**	3.51	117
	(0.223)		

Continued

Table 6 *Continued*

	TRAINING	Mean Control	Sample Size
	(1)	(2)	(3)
Bags filled‡	0.24	2.05	117
	(0.17)		
Willing to wait Rs. 150	-0.031	0.36	504
	(0.047)		
Willing to wait Rs. 200	-0.049	0.53	504
	(0.048)		

Region fixed-effects included
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
‡ : Restricted Sample
Regressions control for a full set of pre-intervention characteristics and lagged outcome variable

Table 7: Sub-group Average Treatment Effects

	Casual wage employment (1)	Full-time employment (2)	Self employment (3)	Any employment (4)	Hours worked (5)	Job search (6)	Monthly wage earnings (7)	Own sewing machine (8)
TRAINING	0.050**	0.034	0.041**	0.051	2.212**	0.069*	50.880	0.119*
	(0.021)	(0.030)	(0.021)	(0.034)	(1.021)	(0.036)	(83.807)	(0.062)
TRAINING×	0.004	-0.006	0.023	0.023	-0.574	-0.006	191.096	0.077
Completed secondary schooling	(0.032)	(0.043)	(0.031)	(0.051)	(1.516)	(0.055)	(193.385)	(0.094)
Joint Test[a]	4.80**	0.77	6.73***	3.40*	2.12	2.11	2.58	7.78***
TRAINING	0.027	0.015	0.046***	0.035	1.065	0.024	46.228	0.150**
	(0.018)	(0.030)	(0.017)	(0.033)	(1.067)	(0.040)	(63.827)	(0.067)
TRAINING× Hindu	0.051	0.035	0.010	0.051	1.824	0.086	180.182	0.006
	(0.033)	(0.044)	(0.032)	(0.051)	(1.444)	(0.053)	(163.195)	(0.094)
Joint Test[b]	8.45***	2.26	4.20**	4.55**	8.00***	8.42***	2.71	5.72**
TRAINING	0.071***	0.061*	0.047*	0.068	3.325**	0.070	57.044	0.058
	(0.025)	(0.035)	(0.028)	(0.041)	(1.296)	(0.047)	(97.905)	(0.065)
TRAINING× SC	-0.038	-0.057	0.008	-0.015	-2.659*	-0.007	151.862	0.186**
	(0.033)	(0.043)	(0.033)	(0.052)	(1.541)	(0.059)	(157.872)	(0.094)
Joint Test[c]	2.7	0.02	9.55***	2.65	0.66	3.40*	3.58*	13.54***
TRAINING	0.049***	0.018	0.031*	0.034	1.777**	0.021	160.785*	0.116**
	(0.014)	(0.027)	(0.016)	(0.030)	(0.843)	(0.034)	(95.086)	(0.057)
TRAINING× Experience in	0.008	0.044	0.064	0.083	0.580	0.145**	-82.078	0.116
stitching and tailoring	(0.042)	(0.048)	(0.044)	(0.060)	(1.709)	(0.062)	(152.384)	(0.098)
Joint Test[d]	2.02	2.34	5.63**	5.05**	2.44	9.77***	0.55	8.57***
TRAINING	0.062***	0.026	0.052***	0.056*	1.714**	0.055*	131.409	0.226***
	(0.017)	(0.024)	(0.019)	(0.030)	(0.801)	(0.031)	(93.188)	(0.052)
TRAINING× Dependency ratio	-0.039	0.021	-0.005	0.017	0.972	0.043	13.181	-0.288***

Continued ...

Table 7 *Continued*

	Casual wage employment (1)	Full-time wage (2)	Self employment (3)	Any employment (4)	Hours worked (5)	Job search (6)	Monthly wage earnings (7)	Own sewing machine (8)
	(0.032)	(0.040)	(0.022)	(0.046)	(1.689)	(0.054)	(139.166)	(0.101)
Joint Test[e]	0.55	1.60	6.99***	3.07*	2.89*	3.64**	2.81*	0.48
Sample Size	504	504	504	504	504	504	504	504

Region fixed-effects included
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Regressions control for a full set of pre-intervention characteristics and lagged outcome variable
[a]: $TRAINING + TRAINING\times$ Completed Secondary School = 0
[b]: $TRAINING + TRAINING\times$ Hindu = 0
[c]: $TRAINING + TRAINING\times$ SC = 0
[d]: $TRAINING + TRAINING\times$ Experienced = 0
[e]: $TRAINING + TRAINING\times$ Dependency Ratio = 0

Table 8: TOT estimates of Program Completion (*TRAINED*)

	TRAINED	First-stage F statistic	Hansen J statistic (p-value)
Panel A: Labor Market Outcomes			
Casual wage employment	0.092***	136.54	0.20
	(0.028)		(0.90)
Full-time employment	0.059	134.75	3.20
	(0.039		(0.20)
Self-employment	0.090***	134.96	2.70
	(0.030)		(0.25)
Any employment	0.110**	135.08	1.66
	(0.047)		(0.43)
Hours worked	3.483***	133.22	1.31
	(1.341)		(0.51)
Job search	0.114**	136.92	5.64*
	(0.051)		(0.06)
Monthly wage earnings	244.411**	133.48	0.53
	(118.132)		(0.76)
Panel B: Entrepreneurship, Empowerment, and Life Satisfaction			
Own sewing machine	0.279***	134.25	1.60
	(0.083)		(0.45)
Control over resources	-0.091	135.43	3.69
	(0.087)		(0.15)
Rosca participation	0.008	131.13	0.45
	(0.033)		(0.79)
Happy at home	-0.136	134.43	0.39
	(0.114)		(0.82)
Happy at work	-0.055	132.27	3.30
	(0.12)		(0.19)
Sample Size		504	

Region fixed-effects included
TRAINED is instrumented with treatment (*TRAINING*), and its interaction with age and marrital status
Regressions control for a full set of pre-intervention characteristics and lagged outcome variable
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Impact of Baseline Behavioral Characteristics

	Casual wage employment (1)	Full-time employment (2)	Self employment (3)	Any employment (4)	Hours worked (5)	Job search (6)	Monthly wage earnings (7)	Own sewing machine (8)
TRAINING	0.104**	0.081*	0.100**	0.116**	2.859**	0.137**	167.444**	0.086
	(0.048)	(0.042)	(0.049)	(0.058)	(1.379)	(0.059)	(76.123)	(0.089)
TRAINING×	-0.151**	-0.158**	-0.216***	-0.265***	-6.118**	-0.161*	-213.114	-0.254**
Risk Tolerance Low	(0.070)	(0.068)	(0.066)	(0.081)	(2.919)	(0.085)	(132.838)	(0.101)
Joint Test[a]	0.94	2.06	3.11*	3.32*	2.05	0.10	0.12	2.09
TRAINING	0.049	0.026	0.088	0.046	0.271	0.142**	48.090	0.050
	(0.046)	(0.041)	(0.056)	(0.062)	(1.159)	(0.069)	(79.319)	(0.096)
TRAINING×	0.149*	0.148*	0.025	0.186**	7.037**	-0.020	327.202	0.089
Competitive	(0.078)	(0.077)	(0.069)	(0.091)	(2.989)	(0.088)	(217.688)	(0.090)
Joint Test[b]	6.18***	5.58**	3.11*	6.94***	6.40**	2.37	3.99**	1.79
TRAINING	0.078	0.127*	0.040	0.094	4.241*	0.049	135.398	0.011
	(0.062)	(0.073)	(0.055)	(0.077)	(2.402)	(0.066)	(114.701)	(0.109)
TRAINING×	0.038	-0.075	0.087	0.029	-2.251	0.130	45.333	0.111
Self Assessment High	(0.075)	(0.086)	(0.065)	(0.091)	(3.081)	(0.079)	(171.352)	(0.096)
Joint Test[c]	3.95**	1.18	4.66**	3.13*	1.29	6.45***	2.72	1.68
TRAINING	0.025	-0.031	-0.040	-0.034	-0.297	0.142	269.651	0.047
	(0.047)	(0.058)	(0.037)	(0.078)	(1.789)	(0.094)	(246.981)	(0.110)
TRAINING×	0.104*	0.150**	0.187***	0.201**	4.185*	-0.011	-143.462	0.047
Self Rank High	(0.062)	(0.073)	(0.051)	(0.089)	(2.314)	(0.098)	(284.316)	(0.097)
Joint Test[d]	5.18**	5.80**	6.51***	6.53***	5.56***	4.23**	2.20	1.00
Sample Size	135	135	135	135	135	135	135	135

Continued ...

Table 9 *Continued*

	Casual wage (1)	Full-time employment employment (2)	Self employment (3)	Any employment (4)	Hours worked (5)	Job search (6)	Monthly wage earnings (7)	Own sewing machine (8)
TRAINING	0.055***	0.037	0.056***	0.069**	2.522***	0.081**	177.390**	0.177***
	(0.018)	(0.024)	(0.019)	(0.029)	(0.916)	(0.032)	(87.552)	(0.049)
TRAINING×	-0.008	-0.011	-0.009	-0.019	-1.774	-0.039	-118.797	-0.098*
Willing to Wait Rs. 150	(0.028)	(0.035)	(0.029)	(0.040)	(1.136)	(0.037)	(117.339)	(0.058)
Joint Test[e]	3.55*	0.56	3.16*	1.67	0.68	1.28	0.42	1.63
TRAINING	0.072***	0.050*	0.062***	0.076**	2.876***	0.060*	196.802*	0.162***
	(0.021)	(0.026)	(0.021)	(0.031)	(0.998)	(0.033)	(101.893)	(0.051)
TRAINING×	-0.045*	-0.040	-0.020	-0.030	-2.063*	0.021	-127.823	-0.032
Willing to Wait Rs. 200	(0.025)	(0.031)	(0.025)	(0.036)	(1.193)	(0.036)	(125.406)	(0.053)
Joint Test[f]	2.32	0.14	4.13**	2.02	0.83	5.29**	0.72	5.33**
Observations[‡]	504	504	504	504	504	504	504	504

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Regressions control for a full set of pre-intervention characteristics and lagged outcome variable
[a]: $TRAINING + TRAINING\times$ Risk Tolerance Low = 0
[b]: $TRAINING + TRAINING\times$ Competitive = 0
[c]: $TRAINING + TRAINING\times$ Self Assessment High = 0
[d]: $TRAINING + TRAINING\times$ Self Rank High = 0
[e]: $TRAINING + TRAINING\times$ *Willing to Wait 150* = 0
[f]: $TRAINING + TRAINING\times$ *Willing to Wait 200* = 0
[‡]: Data from socio-economic survey

Table 10: Ability Bias?

	TRAINING	*TRAINING* × # *Bags filled*	Joint Test	Sample Size
Casual wage employment	0.071	0.017	1.80	135
	(0.108)	(0.052)		
Full-time employment	0.092	-0.007	1.89	135
	(0.111)	(0.057)		
Self-employment	0.214*	-0.062	4.28**	135
	(0.115)	(0.049)		
Any employment	0.126	-0.007	2.19	135
	(0.132)	(0.063)		
Hours worked	1.860	0.495	1.87	135
	(2.943)	(1.534)		
Job search	0.212*	-0.042	4.65**	135
	(0.122)	(0.053)		
Monthly wage earnings	393.018*	-122.432	5.05**	135
	(198.572)	(89.179)		
Own sewing machine	0.036	0.025	0.37	135
	(0.136)	(0.059)		

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Regressions control for a full set of pre-intervention characteristics and lagged outcome variable

A.1 Appendix

Table A-1: Likelihood of Attrition: Marginal Effects from a Probit Regression

	Attrition (ME) (1)
TREATMENT	0.009
	(0.031)
Age	0.008**
	(0.004)
Completed secondary schooling	0.006
	(0.029)
Married	-0.054
	(0.047)
Hindu	-0.053
	(0.043)
SC	0.010
	(0.029)
Experience in stitching and tailoring	-0.055
	(0.033)
Dependency ratio	0.019
	(0.034)
Sample Size	594

Robust standard errors in parentheses
Region fixed-effects included
*** p<0.01, ** p<0.05, * p<0.1

Table A-2: Are Attriting Women Different? Labor Market Outcomes at Baseline

	Casual wage employment (1)	Full-time employment (2)	Self employment (3)	Any employment (4)	Hours worked (5)	Job search (6)	Monthly wage earnings (7)
Treatment	0.007	0.020	0.006	0.021	0.935*	-0.066**	41.407
	(0.010)	(0.018)	(0.015)	(0.021)	(0.499)	(0.028)	(30.050)
Age	0.002	0.005**	0.004*	0.007***	0.141**	0.005	6.714*
	(0.001)	(0.002)	(0.002)	(0.003)	(0.071)	(0.003)	(3.544)
Completed secondary schooling	0.004	0.024	-0.014	0.032	0.913*	-0.030	66.491*
	(0.010)	(0.017)	(0.013)	(0.020)	(0.535)	(0.023)	(36.648)
Married	0.002	-0.042	-0.060**	-0.074**	-0.925	-0.031	-17.173
	(0.018)	(0.027)	(0.024)	(0.033)	(0.960)	(0.039)	(71.604)
Hindu	0.009	0.034	0.014	0.042	1.329	0.004	52.772
	(0.016)	(0.028)	(0.018)	(0.032)	(1.068)	(0.031)	(79.272)
SC	-0.015	-0.006	0.011	-0.002	-0.736	0.085***	-12.533
	(0.011)	(0.017)	(0.014)	(0.020)	(0.528)	(0.022)	(33.641)
Experience in stitching and tailoring	-0.003	0.038*	0.036*	0.061**	1.085	0.078**	56.541
	(0.012)	(0.023)	(0.018)	(0.027)	(0.735)	(0.030)	(50.299)
Dependency ratio	0.012	0.016	0.024	0.019	0.192	0.001	10.302
	(0.019)	(0.023)	(0.019)	(0.024)	(0.779)	(0.027)	(51.531)
Resident of North Shahdara	-0.002	0.000	-0.013	-0.000	0.342	-0.016	47.432
	(0.016)	(0.028)	(0.017)	(0.032)	(1.039)	(0.030)	(68.784)
Attrite	0.032	0.256*	-0.051	0.181	6.048**	0.044	352.783**
	(0.033)	(0.135)	(0.105)	(0.169)	(2.915)	(0.140)	(168.821)
Attrite× *Treatment*	-0.007	-0.055	0.019	-0.032	-1.582**	-0.045	-77.358*
	(0.010)	(0.037)	(0.028)	(0.046)	(0.776)	(0.073)	(44.664)
Attrite×Age	-0.002	-0.010**	-0.004*	-0.013**	-0.230**	-0.003	-11.623**
	(0.001)	(0.005)	(0.002)	(0.006)	(0.109)	(0.007)	(5.777)
Attrite× Completed	-0.004	0.000	0.008	-0.014	-0.470	0.075	-41.901
secondary schooling	(0.010)	(0.029)	(0.017)	(0.033)	(0.678)	(0.062)	(43.368)
Attrite×Married	-0.002	0.135	0.048	0.155	2.608	0.166	110.649
	(0.018)	(0.089)	(0.030)	(0.094)	(1.808)	(0.107)	(111.213)
Attrite×Hindu	-0.009	-0.027	0.085	0.063	-1.215	-0.143**	-46.450
	(0.016)	(0.031)	(0.089)	(0.096)	(1.095)	(0.069)	(80.395)
Attrite×SC	0.015	0.016	0.015	0.038	0.919	-0.057	22.709
	(0.011)	(0.021)	(0.027)	(0.033)	(0.573)	(0.053)	(35.875)
Attrite× Experience in	0.003	-0.058*	0.028	-0.017	-1.433*	0.025	-75.849
stitching and tailoring	(0.012)	(0.030)	(0.059)	(0.066)	(0.815)	(0.094)	(53.965)
Attrite×dependency	-0.012	-0.052	-0.028	-0.058	-0.831	0.094	-45.814

Continued ...

Table A-2 *Continued*

	Casual wage employment (1)	Full-time employment (2)	Self employment (3)	Any employment (4)	Hours worked (5)	Job search (6)	Monthly wage earnings (7)
ratio	(0.019)	(0.040)	(0.021)	(0.042)	(0.975)	(0.074)	(60.963)
Attrite×Resident of	0.002	-0.026	0.104	0.066	-0.810	0.017	-73.441
North Shahdara	(0.016)	(0.039)	(0.084)	(0.093)	(1.147)	(0.064)	(73.903)
Constant	-0.032	-0.123**	-0.054	-0.154**	-3.665*	-0.030	-220.393*
	(0.033)	(0.058)	(0.044)	(0.067)	(1.914)	(0.068)	(116.488)
F-test	0.60	1.59	1.01	1.97**	1.61*	1.90**	1.02
Observations	594	594	594	594	594	594	594

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A-3: Are Attriting Women Different? Empowerment, Entrepreneurship, and Life satisfaction at Baseline

	Own sewing machine (1)	Control over resources (2)	Rosca participation (3)	Happy at home (4)	Happy at work (5)
Treatment	-0.039	0.032	0.022	-0.005	0.109
	(0.043)	(0.046)	(0.031)	(0.074)	(0.072)
Age	-0.000	-0.003	0.001	-0.006	-0.012
	(0.006)	(0.006)	(0.004)	(0.009)	(0.010)
Completed secondary schooling	0.017	0.058	0.057*	0.193***	0.094
	(0.038)	(0.042)	(0.029)	(0.072)	(0.070)
Married	-0.016	0.164**	-0.027	0.231*	0.241*
	(0.069)	(0.081)	(0.043)	(0.123)	(0.123)
Hindu	0.032	0.064	0.042	-0.247**	-0.197*
	(0.060)	(0.061)	(0.043)	(0.118)	(0.116)
SC	-0.002	0.017	0.058**	-0.030	-0.103
	(0.039)	(0.041)	(0.029)	(0.073)	(0.070)
Experienced in	0.515***	0.122**	0.108***	0.032	-0.030
stitching and tailoring	(0.045)	(0.052)	(0.037)	(0.084)	(0.084)
Dependency ratio	-0.002	-0.029	-0.003	-0.062	-0.076
	(0.044)	(0.053)	(0.027)	(0.087)	(0.078)
Resident of North Shahdara	0.047	-0.226***	0.058	-0.251**	-0.082
	(0.060)	(0.064)	(0.042)	(0.120)	(0.120)
Attrite	-0.161	-0.910***	0.159	-0.593	-0.607
	(0.319)	(0.314)	(0.217)	(0.786)	(0.801)
Attrite× *Treatment*	-0.108	0.020	0.019	0.021	-0.023
	(0.105)	(0.115)	(0.082)	(0.199)	(0.203)
Attrite×Age	-0.001	0.020	-0.002	0.011	0.029
	(0.013)	(0.013)	(0.008)	(0.028)	(0.028)
Attrite×Completed	0.099	0.163	0.006	0.256	0.273
secondary schooling	(0.089)	(0.104)	(0.073)	(0.180)	(0.177)
Attrite×Married	0.050	0.010	-0.154	-0.577	-0.639*
	(0.175)	(0.198)	(0.108)	(0.360)	(0.371)
Attrite×Hindu	0.068	0.043	0.009	0.119	-0.016
	(0.158)	(0.172)	(0.094)	(0.357)	(0.349)
Attrite×SC	0.010	0.186*	-0.017	-0.005	0.050
	(0.101)	(0.110)	(0.078)	(0.208)	(0.219)
Attrite× Experience	0.102	0.224*	0.144	-0.075	0.143
in stitching and tailoring	(0.119)	(0.126)	(0.128)	(0.251)	(0.256)
Attrite×Dependency	-0.036	0.107	0.051	0.052	0.096
ratio	(0.102)	(0.115)	(0.055)	(0.181)	(0.178)
Attrite×Resident of	0.204	0.329*	-0.127	0.313	-0.093
North Shahdara	(0.154)	(0.177)	(0.105)	(0.366)	(0.360)
Constant	0.205	0.433***	-0.063	1.295***	1.257***
	(0.135)	(0.144)	(0.087)	(0.222)	(0.233)
F-test	0.87	2.02**	0.81	1.31	0.64
Observations	594	594	594	594	594

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A-4: Certificate Effect?

	ATTENDANCE	*ATTENDANCE* × *TRAINED*	Joint Test	Sample Size
Panel A: Labor Market Outcomes				
Casual wage employment	0.003	-0.002	0.59	504
	(0.013)	(0.014)		
Full-time employment	-0.027	0.031	1.04	504
	(0.036)	(0.039)		
Self-employment	0.018	-0.018	0.07	504
	(0.021)	(0.023)		
Any employment	-0.014	0.017	0.93	504
	(0.031)	(0.034)		
Hours worked	0.267	-0.246	0.10	504
	(0.689)	(0.755)		
Job search	0.055	-0.059	0.58	504
	(0.053)	(0.058)		
Monthly wage earnings	-26.974	33.213	0.44	504
	(98.976)	(108.297)		
Panel B: Entrepreneurship, Empowerment, and Life Satisfaction				
Own sewing machine	-0.046	0.055	2.10	504
	(0.058)	(0.064)		
Control over resources	0.050	-0.057	0.95	504
	(0.065)	(0.072)		
Rosca participation	-0.009	0.010	0.24	504
	(0.022)	(0.024)		
Happy at home	0.004	-0.007	0.18	504
	(0.052)	(0.057)		
Happy at work	-0.027	0.029	0.10	504
	(0.064)	(0.070)		

Region fixed-effects included
ATTENDANCE and *ATTENDANCE* × *TRAINED* are both instrumented
with treatment (*TRAINING*),
and its interaction with age and marrital status
Regressions control for a full set of pre-intervention characteristics and lagged outcome variable
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1