Title: Effect of Skilled Labor Market Opportunity on Intra-Household Bargaining - Evidence from Gujarat, India

Corresponding authors:

Dr. Yvonne Jie Chen

Address: Lee Kuan Yew School of Public PolicyNational University of Singapore, 469C Bukit Timah Road, Singapore 259772

Email: sppcj@nus.edu.sg

Telephone: (+65) 6516 1051

Fax: (+65) 6468 4186

Dr. Namrata Chindarkar

Address: Lee Kuan Yew School of Public Policy, National University of Singapore, 469C Bukit Timah Road, Singapore 259772

Email: namrata.chindarkar@nus.edu.sg

Telephone: (+65) 6516 8360

Fax: (+65) 6468 4186

Effect of Skilled Labor Market Opportunity on Intra-Household Bargaining - Evidence from Gujarat, India

Abstract

Using primary survey data collected in two sub-districts of Sabarkantha, Gujarat, on a unique training program for rural women with low human capital and low income, we examine the effect of skilled labor market opportunity on intra-household bargaining. We find that participating in the training program significantly increases women's expenditure on jewelry and clothing; increases their participation in household spending decisions, but only from the women's perspective and not husband or adult son's perspective; and enhances their overall well-being. Consequently, expanding women's labor market opportunities can have positive effects on their intra-household bargaining ability.

Keywords: skilled labor, female autonomy, intra-household bargaining

Acknowledgements

We thank Ms. Reema Nanavaty and Ms. Bharti Bhavsar from the Self-Employed Women's Association (SEWA) for providing us the opportunity to conduct this research. We thank Dennis Wichelns, Marc Jeuland, Mukul Asher and seminar audiences at the Lee Kuan Yew School of Public Policy Research Seminar, National University of Singapore Economics Department Special Interest Group, Human Development and Capabilities Association 2014 Conference, and Conference on Rural Issues and Development Economic for their helpful comments. We thank Ms. Shilpa Sathe for her excellent research assistance. We are grateful for the financial support offered by the Lee Kuan Yew School of Public Policy and the Institute of Water Policy at the National University of Singapore. The findings, interpretations, conclusions, and any errors are entirely those of the authors.

1. INTRODUCTION

The World Development Report (WDR) 2012 highlights that gender gaps persist in employment in several developing countries. Particularly in India, the share of female workers in the total work force has remained stable at around 33 percent between 1983 to 2008 with some fluctuations (Himanshu 2011). This has been attributed to social norms, caregiving responsibilities, increased educational enrollment of females, and withdrawal of female labor force owing to improved household economic conditions (Sudarshan and Bhattacharya 2009). A further issue concerning female workers is lack of skills development and limited creation of opportunities in the non-farm sectors (Thakur 2012). Empirical evidence suggests that countries with higher gender inequality in human capital experience slower economic growth (Dollar and Gatti 1999). In addition, increasing female labor force participation in the economy can result in significant productivity gains (Loko and Diouf 2009). Bringing women into the labor force, creating alternative employment opportunities for them, and upgrading their skill levels are therefore of significant policy concern for India.

A gap in the literature is understanding the intra-household gains to women from participating in skilled labor market. Specifically, there is limited evidence on how such labor market opportunities affect women's ability to bargain within the household. Previous studies have examined at least four main mechanisms that affect women's intra-household bargaining ability. The first mechanism is the income effect. Evidence in this area is broadly divided into the effect of earned income and unearned income. Studies on the effect of earned income argue that women's bargaining power is determined by their share of or contribution towards household income (Browning et al. 1994, Hoddinott and Haddad 1995). An important finding here is that it is not employment per se but employment outside the husband's farm that increases women's bargaining ability (Anderson and Eswaran 2009). Unearned income refers to the effect of dowry brought into the marriage and inheritance. Fafchamps and Quisumbing (2002, 2005) find that dowry is positively correlated with women's bargaining power. Heath and Tan (2014) find that an increase in unearned income through inheritance increases the probability of women participating in high-paying jobs outside home.

The second channel is employment opportunities, which, in the developing country context, usually refer to employment opportunities available to women outside their household farm. Jensen (2012) provides evidence on the effect of employment opportunity, specifically skilled employment, on women's bargaining ability. Examining experimental data on a recruitment program for young rural women in India to seek employment in the business process outsourcing (BPO) industry, he finds that skilled labor opportunity has a significant negative effect on these women's likelihood of early marriage and child-bearing. In addition, he finds that these women are also more likely to work outside their households. The sample of women in Jensen (2012) study was restricted to those with secondary school degree, basic English language ability,

and experience with computers. Therefore, there is still a gap in understanding the effect of skilled labor market opportunity on women with low human capital.

A third mechanism identified in the empirical literature is control over assets and property rights. Agarwal (1997) places specific emphasis on ownership of arable land or land rights held by women. In her qualitative exposition she finds that women in South Asian communities that practiced matrilineal inheritance enjoyed greater freedom of movement and interaction outside the household and also controlled food stocks within the household. Wang (2014) provides rigorous empirical evidence on property rights and household bargaining in China. She finds that when housing ownership rights were given to women there is a significant reduction in male-favored goods such as cigarettes, alcohol, and tea and a significant improvement in investment towards health of the girl child. And the fourth mechanism is the effect of 'extra environmental parameters' (EEPs) such as divorce laws, social norms, workplace discrimination, and social network support. It is argued that changes in EEPs in favor of women have a positive effect on their bargaining ability (McElroy 1990).

This paper contributes to the understanding of the second mechanism outlined above, which we refer to as the 'labor market opportunity effect'. We study the effects of having access to skilled labor market opportunities through a program run by the Self-Employed Women's Association (SEWA) on intra-household bargaining. The program provides access to off-farm skilled employment opportunity by training women to repair village water handpumps. In order to correct for self-selection bias in program participation, we exploit the exogenous variation in program roll-out in two sub-districts in Gujarat. Exogenous variation in off-farm skilled labor market opportunities is induced by the operational nature of the program in two ways. First, a woman needs to be a SEWA member in order to qualify for the training program. And second, the handpump repair contracts are assigned by the local governments through a tendering process. Due to program budget concerns, SEWA usually conducts training sessions in the sub-district where contracts were obtained. Hence, women living in the sub-district where contracts were more often obtained are more likely to be trained. The size of the repair team is upper bound based on the size of the contract so as to make the monetary returns attractive for the women. Therefore, not all trained women get an actual repair job.

Our study contributes to the literature in two ways. First, we estimate the effect of off-farm skilled labor market opportunities on intra-household bargaining for middle aged, low-income, and low-human capital women as the program is specifically targeted towards this group. The average age of women in our sample is 44 years with only 2 years of education. Second, in addition to conventional measures of consumption and income, our survey also directly measures the effect on bargaining in terms of women's autonomy and family relationships, especially, between the husband and wife or between mother and adult son. We operationalize autonomy as participating in household spending decisions and family relationships as prevalence and frequency of domestic disputes.

We find that participating in the barefoot mechanics training program significantly increases expenditure on jewelry and clothing for women. We further find that the program has a positive autonomy effect, which is manifested through an increase in women's participation in household spending decisions. However, the autonomy effects are significant only from the women's perspective and not husband or adult son's perspective. We also find limited evidence that trained women report an increase in the frequency of quarrels. Again however, this is not reflected in the husband or adult son's responses. Further, we find that the bargaining outcomes operate through the employment and EEP channel. Specifically, participating in the program increases the probability of the women being engaged in employment other than the household farm, which is consistent with the findings in Anderson and Eswaran (2009) and Jensen (2012). In addition, it results in a significant increase in their self-reported life satisfaction. Thus, our results indicate that providing skilled labor market opportunity to middle-aged, low-income, and low-human capital women is likely to increase their autonomy within the household, improve their opportunities for employment other than the household farm, and also enhance their overall well-being.

2. THE 'BAREFOOT MECHANICS' PROGRAM

We examine the effect of the 'barefoot mechanics' program, which provides off-farm skilled labor market opportunity to women. The program is operated by SEWA, which is a trade union set up in 1972 and has about 600,000 members in the state of Gujarat. The two main objectives of the organization are to create employment opportunities for women and promote self-reliance. Membership can be obtained by depositing a negligible amount of Rs.5.[1] SEWA members are mostly from the low-income and marginalized social groups. Most of its members either completely lacked employment opportunities or did not have access to meaningful work prior to taking up membership.

SEWA's barefoot mechanics program is a unique intervention that operates in the Sabarkantha district in Northern Gujarat known for its water scarcity. The organization has about 30,000 members in this district. The region is highly dependent on monsoons and groundwater for agriculture as well as household purposes. Piped water is a rarity in most villages in the district and majority of the households depend on handpumps to access groundwater during the dry season.[2] Recognizing the importance of handpumps, the Gujarat Water Supply and Sewerage Board (GWSSB) installed nearly 10,000 handpumps across the state to improve village water access. Handpumps need regular maintenance as mud and other foreign particles from the groundwater tend to deteriorate the machinery over time. In this region particularly, the water also has high degree of salinity, which means that the inner parts of the handpump need to be fixed and replaced relatively more frequently. Therefore, even with the installation of more handpumps, access to water can

remain patchy and unpredictable if they are not serviced on a regular basis. It is logistically difficult for GWSSB to centrally oversee handpump maintenance. Therefore, GWSSB has been inviting tenders from contractors and awarding annual contracts. Contracts are offered for each sub-district within Sabarkantha. Therefore, within the larger district (Sabarkantha) several different contractors may be undertaking the handpump repair jobs (one contractor in each sub-district). A single contractor may or may not be awarded contracts for different sub-districts.

To recognize the role of women in domestic water management, raise women's awareness of access to safe drinking water, and aid in establishing community sources of water, SEWA launched the 'Women, Water, and Work' campaign in Gujarat. Under this umbrella program, SEWA has been training women to repair handpumps since 1998 in two sub-districts of Sabarkantha – Bayad and Dhansura. This was an unconventional intervention as handpump repairwork, which entails technical understanding as well as handling of heavy parts and tools, is considered to be a 'man's job'. To be able to bid for GWSSB tenders, SEWA set up a trust called 'Khedut Mandal' (Farmers' Association) in which all the repairwomen have a direct stake.

SEWA invites all interested members to participate in the training program and roughly 250 women members have been trained so far in the Sabarkantha district. Being called upon for an actual repair job depends on the location of the village from where a complaint has been registered and the availability of the trained women at that time. Further, as there is a significant transportation cost involved for SEWA in getting the repairwomen to the service locations, trained women residing close to those villages are more likely to be called in for the repair jobs. Therefore, the repair team is not fixed and can rotate among several trained women. GWSSB reimburses all costs associated with the repairs and pays these repairwomen a *fixed fee for each handpump repaired*. As per the 2013 contract, SEWA receives Rs.420 for each handpump in the sub-district. The payment does not differ by number of times each handpump is repaired but rather is *fixed per handpump*. Under the contract, SEWA is responsible for 516 GWSSB handpumps in the Bayad sub-district. Further, the contract requires them to do a full servicing (overhaul) of each handpump and then attend to complaints as and when they are received.

The fixed nature of the payment under the contract needs to be highlighted. The total amount that SEWA received in 2013 is Rs.216,720 (516*420). In this budget SEWA must pay the repairwomen their wages as well as cover any additional costs not reimbursed by GWSSB. This has meant that only a small group of women can be assigned to actual repair jobs for the economic returns from the job to be significant and meaningful. Typically, the number of women in the team is between 12 to 15. In addition to this, SEWA earns a small interest on the deposit that it is required to pay to GWSSB upon winning the bid. In 2013, the deposit amount was Rs.7,700 and it earned an annual interest rate of 6.5 percent. SEWA receives the

entire deposit amount back with interest if there are no penalties or additional costs imposed by GWSSB.

The aggregate amount available to the repair women is the net balance remaining after fixed expenses are subtracted from the total receipts from the contract (Rs.216,720). Thus, the repair women are allowed to keep all the money they receive, net of payments and costs. SEWA reimburses the women for their training cost and transportation to the work sites, in addition to the time they spend working on the handpumps. The income that each repairwoman makes from this work therefore depends on the number of women in the repair team as well as the number of days they work. GWSSB disburses the payments every quarter. Unlike agricultural income however, there is less uncertainty associated with the amount as well as timing of the wages. Another aspect of the barefoot mechanics program that needs to be highlighted is its seasonality. While the contract is awarded for an entire year, there are some peak and lean months. Villages tend to use handpumps more often during dry (non-monsoon) months leading to higher frequency of complaints in these months. During other months the repairwomen may be conducting only routine overhauling. Therefore, for the repairwomen, this program is for generating alternative livelihoods rather than being the main occupation.

2.1. The tendering process

Our identification strategy, which we discuss in Section 4, is closely linked to the bidding process for the contracts and therefore needs elaboration. GWSSB invites tenders for the handpump repair and maintenance contracts on an annual basis. Prior to 2006, all tenders were submitted offline. However, since 2006, they have to be submitted online through the e-procurement system. Tender advertisements are placed in newspapers such as 'Divya Bhaskar', which is the largest circulated daily in Gujarat, and also on State Government of Gujarat e-procurement system www.nprocure.com. Tender advertisements clearly specify the geographical and technical scope of the work, estimated cost value, tender fees, deadline for tender submission, and weblink to the e-procurement system. Tender documents can be accessed either by logging on to the e-procurement system or offline. However, bids must be submitted online. Once a bid has been submitted, tender fees need to be paid through an online gateway facilitated by major nationalized and private banks. Only after the tender fees are paid is the bid included in the competition. A submitted bid is encrypted to ensure security and is opened only by an authorized 'Tender Opening Committee' nominee on the specified date and time. A tender submitted through the e-procurement system can be rejected if the documentation is incomplete or has several errors. The success of a bid depends on matching the price with the estimated cost value as well as other aspects such as cost sharing of incidentals, transportation, number of overhauls per handpump that the contractor offers and so on.

Even with the e-procurement system in place, direct negotiation and lobbying continues to play a crucial

role in securing contracts. Once a bid has been submitted, contractors can resort to negotiation to get their bid approved. However, direct negotiation still does not guarantee that a bid will be approved as there are annual audits of contracts awarded. Interviews with SEWA suggested that auditors have the authority to reject a bid if they suspect that the bidding process has not been fair or terminate channels for direct negotiation if they suspect favouritism. SEWA has been able to use direct negotiation with GWSSB to secure handpump repair contracts as their objective is not personal or institutional profit, but rather women's livelihoods and empowerment. As previously pointed however, their negotiations have not always been successful. The process of successfully winning contract therefore is fairly random owing to the bidding process as well as the 'luck' factor introduced by the auditors, which may hamper direct negotiations.

2.2. Nature of the 'barefoot mechanics' training program

A pre-requisite to participating in the training program is that the woman has to be a SEWA member. SEWA does not have a fixed schedule to conduct membership drives. Typically, women who join SEWA start off as 'kamdaar' or regular volunteers and go on to become 'agyavans' or leaders. The kamdaars and agyavans are mainly responsible for disseminating information on SEWA and its programs. In our study area as well, enrolment is done all year round through kamdaars and agyavans.

SEWA has conducted two waves of training – first generation and second generation – with a total of six training sessions across Bayad and Dhansura. The first generation was trained from 1998 to 2002 while the second generation was trained in 2011. To generate interest among its women members, SEWA conducted the first session in December 1998 after which it bid for and successfully secured a repair contract in 1999. Thereafter, SEWA has conducted training sessions only when it has felt the need to expand the repair team. As the jobs typically require only 12 – 15 women to be actively working during a contract year, SEWA does not train women on a continuous basis out of concern that they may not be able to provide them the actual opportunity to work.

GWSSB provides assistance in conducting the training sessions and ensuring that its repair and maintenance standards are met. Training consists of both theory and practical elements and spans over three days. The different components of the handpump and their functions are explained in the theory session and women are asked to assist on an actual repair job for the practical session. Over the years, there have been changes in handpump technology. Whenever such changes were introduced, the SEWA repairwomen picked up the skills on-the-job and separate training sessions were not held. A key feature of the training program as well as the actual repair jobs is that it requires women to work closely in teams as the equipment and the repair process needs considerable physical ability and coordination.

3. THEORETICAL MODEL

In this section we develop a simple model to illustrate the effect of labor market opportunity on intra-household resource allocation and women's bargaining power. The model we develop aims to illustrate potential mechanisms through which labor market opportunities affect household outcomes.[3] Following Browning and Chiappori (1998) and Chiappori (1992, 1997), consider a household with two individuals m and f, and each individual is endowed with T unit of time. The household's production function is given by $F(L; A)$ where A includes the fixed factors at the beginning of production cycle such as land size, quality, and household assets. Each individual consumes one private good c_i at price p_i and leisure l_i. The farming household's problem is:

$$\begin{aligned} & \max_{c_i, l_i} \lambda u_f(c_f, l_f) + (1-\lambda) u_m(c_m, l_m) \\ s.t. \quad & p_m c_m + p_f c_f \leq F(L_f + L_m + L_h; A) - wL_h + w(L_f^o + L_m^o) \\ & L_f + L_f^o + l_f = T; L_m + L_m^o + l_m = T \end{aligned} \tag{1}$$

The household's maximization problem is with respect to individual consumption(c_f, c_m), leisure(l_f, l_m), hired labor(L_h), labor supplied to household farm(L_f, L_m) and labor supplied to the market(L_f^o, L_m^o). λ is the Pareto weight and it reflects the bargaining power between household members. λ is determined by total expenditure(x), price vector $(\boldsymbol{p})$ as well as EEP (v) as characterized by McElroy and Horney (1981).[4] For simplicity we assume the prices of hired labor L_h and household labor L_f, L_m all equal to w. Household labor and hired labor are perfect substitutes and there is no differentiation between female and male labor.

Under separability, the budget constraint in equation (1) is equivalent to:

$$p_m c_m + p_f c_f + w(l_f + l_m) \leq \Pi^*(w; A) + 2wT$$

where $\Pi^*(w; A)$ is the maximized profit from household production by maximizing $F(L; A) - wL$ with respect to L. Denote $\Pi^*(w; A) = Max_L F(L; A) - wL$.

Suppose a female's labor market opportunity is capped at $\bar{L_f^o}$ and this constraint is binding. This means the female can only supply up to $\bar{L_f^o}$ unit of time outside her household farm. Separability no longer holds under this scenario and household's budget constraint is revised to:

$$\begin{aligned} & p_m c_m + p_f c_f \leq F(L_m + L_f + L_h; A) - wL_h + w\bar{L_f^o} + wL_m^o \\ \Rightarrow\ & p_m c_m + p_f c_f + wl_m + w^* l_f \leq \Pi^*(w, w^*; A) + w^*(T - \bar{L_f^o}) + wT + w\bar{L_f^o} \end{aligned} \tag{2}$$

where $\Pi^*(w, w^*; A) = Max_{\{L_m, L_f, L_h\}} F(L_m + L_f + L_h; A) - wL_h - wL_m - w^*L_f$ and w^* is the shadow wage of female labor. Equation (2) means that when female labor market opportunity is capped at $\bar{L_f^o}$, the female household member will supply $\bar{L_f^o}$ unit of time to the labor market at market wage w. The amount of labor that she supplies to the household farm depends on the household production function as well as her preference over consumption and leisure. In other words, when off-farm labor supply is binding, the female labor supply to household farm L_f is determined by the parameters of the model.

Denote total expenditure of the household as $x = p_m c_m + p_f c_f$. Assume that the constraint $\bar{L_f^o}$ has no effect on commodity prices and wages, that is, $\partial \boldsymbol{p} / \partial \bar{L_f^o} = 0$. The effect of $\bar{L_f^o}$ on the Pareto weight $\lambda(x, \boldsymbol{p}, v)$ can be written as follows:

$$\frac{d\lambda}{d\bar{L_f}^o} = \frac{\partial \lambda}{\partial x} \frac{\partial x}{\partial \bar{L_f}^o} + \frac{\partial \lambda}{\partial v} \frac{\partial v}{\partial \bar{L_f}^o} \tag{3}$$

Following Browning and Chiappori (1998), demand functions for each consumption good can be denoted as $c_i = c_i(\boldsymbol{p}, x, \lambda(\boldsymbol{p}, x, v)) = c_i(\boldsymbol{p}, x, v)$. Hence the effect of $\bar{L_f^o}$ on expenditures on female private good $p_f c_f$ can be written as:

$$\frac{dp_f c_f}{d\bar{L_f}^o} = p_f \left(\frac{\partial c_f}{\partial x} \frac{\partial x}{\partial \bar{L_f}^o} + \frac{\partial c_f}{\partial v} \frac{\partial v}{\partial \bar{L_f}^o} \right) \tag{4}$$

Without specifying the underlying bargaining models, we do not know how sharing rules would change in response to an increase in $\bar{L_f^o}$. Therefore, the effect of $\bar{L_f^o}$ on λ is ambiguous as the sign of $\partial \lambda / \partial x$ is ambiguous (Browning and Chiappori 1998). The effect of $\bar{L_f^o}$ on $p_f c_f$ is also ambiguous for similar reasons. However, equations (3) and (4) specify two potential channels through which the labor market opportunity constraint affects intra-household resource allocation: the income channel and the EEP channel.

In our subsequent empirical analysis, we assume that participation in the training program can effectively increase $\bar{L_f^o}$. The change in labor market opportunity mainly comes from two sources. First is the direct employment opportunity provided by the training program. However, as mentioned in section 2, due to the small operation capacity, the actual size of the repair team is rather small. Second, women that participate in the training program could form certain social networks that share employment information or help each other identify other employment opportunities. This is the indirect employment opportunity generated by the training program.

Note that in our model, $\partial x / \partial \bar{L_f^o} \neq 0$ only if $\bar{L_f^o}$ is a binding constraint. On the other hand, following Chang et al. (2012), an exogenous increase in $\bar{L_f^o}$ leads to an increase in income "...only if the market wage is higher than the decrease in on-farm income resulting from a reallocation of family labor from on-farm work

to off-farm employment".[5] This proposition means that it is possible to observe women whose labor supply pattern, L_f and L_f^o, was affected by an increase in $\bar{L_f^o}$, while leaving income or income share unchanged. We shall classifly the change in labor supply patterns, holding household income constant, as an EEP as well.[6]

4. DATA AND EMPIRICAL STRATEGY

4.1. Survey and sampling information

Data for this study were collected by the authors in two sub-districts in Sabarkantha, Gujarat namely Bayad and Dhansura during December 2013. As indicated in Figure 1, these two are adjacent sub-districts that share similar climate and geological features including rainfall and groundwater. SEWA submits a bid for a contract in these two sub-districts every year. Table 1 summarizes contracts that have been awarded to SEWA historically in these two sub-districts. It should be noted that until 2003, Bayad and Dhansura sub-districts formed only one sub-district, which was known as Bayad. As observed, till 2003, SEWA won contracts to service handpumps in all the villages in the unified Bayad sub-district except in the year 2000. Since then however, SEWA has only won contracts in the delimited Bayad sub-district. The most recent service contract was awarded to SEWA in September 2013 for Bayad sub-district.

<Figure 1 here>

<Table 1 here>

Table 2 summarizes the breakdown of our survey sample. Our sample contains a total of 212 SEWA members of which 109 women had participated in the barefoot mechanics program and the other 103 women are SEWA members who had never participated. Among the 109 participants, 15 women were 'trained and currently working' as handpump repairwomen during the time of the survey, 59 were 'trained and used to work' as repairwomen, and 35 were 'trained but had never worked' on an actual repair job. It should be noted that the 15 'trained and currently working' repairwomen form the entire sampling universe for this category. Due to the operational capacity limit discussed in section 2, the team of 'trained and currently working' women is always small. The 35 'trained and never worked' women and 59 'trained and used to work' were randomly drawn from a list of all trained members provided by SEWA. For every trained woman, we surveyed three other SEWA members from her village of residence following a snowball sampling method. For every woman in our sample, we also surveyed their husband or adult son if the husband was not available or not alive. Out of the 212 women, 135 reside in Bayad and 77 in Dhansura. The total number of villages covered in our sample is 37. Given the sampling frame, our sample is neither representative at the village- or sub-district-level. Hence any generalization of the results needs to be made with caution.

<Table 2 here>

4.2. Empirical strategy

In this section we develop an empirical model that estimates the effect of participating in the training program on women's outcomes. While the barefoot mechanics program trains women to repair handpumps as well as creates opportunities for the trained women to secure actual repair jobs, our analysis focuses only on estimating the effect of training. A key reason why we do not estimate the effect of 'working' as a barefoot mechanic in a regression framework is statistical power, which is due to the limited sample size of 'trained and currently working' women. To estimate the impact of the barefoot mechanics training on intra-household bargaining, we start with a basic specification as follows:

$$Y_{ijd} = \beta_0 + \beta_1 Trained_{ijd} + \beta_2 X'_{ijd} + \varepsilon_{ijd} \tag{5}$$

where, Y_{ijd} is an outcome for woman i in village j and sub-district d. $Trained_{ijd}$ is a binary variable and equals 1 if a woman is trained under the barefoot mechanics program and 0 otherwise. X'_{ijd} is a vector of individual and household control variables. If training status were to be randomly assigned and if everyone perfectly complied, coefficient β_1 would estimate the average treatment effect (ATE) without controlling for X'. However, in our case, training status was not randomly assigned and estimation for β_1 is likely to be biased. One of the concerns is the self-selection bias. One way to correct for the selection bias is to control for observables. By including control variables at individual- and household-level, selection bias due to observables can be reasonably reduced. However, adding control variables cannot mitigate selection bias due to selection on unobservables. Although the socio-economic characteristics of trained and non-trained women do not differ significantly, as shown in Table (4), women who participated in the training might have had more autonomy at home to begin with. These women might also have higher innate ability or be more driven. We hence resort to exploiting the exogenous variation in program roll-out using an instrumental variable approach. Specifically, we estimate the following model:

$$Trained^*_{ijd} = Z'_{ijd}\alpha + \mu_{ijd} \tag{6}$$

$$Y_{ijd} = \beta_0 + \beta_1 Trained_{ijd} + \beta_2 X'_{ijd} + \varepsilon_{ijd} \tag{7}$$

where, $Trained^*_{ijd}$ is the latent variable that represents the net benefit of participating in the barefoot mechanics training program for woman i in village j and sub-district d. Z'_{ijd} is a vector of observables and μ_{ijd} is a random error. The above system can be identified if at least one variable in Z'_{ijd} is not included in X'_{ijd}.

Our IV for program exposure is a triple interaction term of a given year (Y), training location (L), and whether a woman was a SEWA member in that given year (M) as the instrument for training. We denote the instrument as $Y \times L \times M$ hereafter. More specifically, Y is a dummy for each year from 1998-2013, training location L is a dummy variable that takes the value 1 if a training program was conducted in the sub-district where a woman resides in a given year, and M is a dummy variable that takes the value 1 if a woman was a SEWA member in a given year. The interaction term therefore generates exogenous variation over time and location. For instance, a woman living in Bayad and who has been a SEWA member since 1998, her exposure to the program or treatment status is $Y \times L \times M = 1$ (because training sessions have been conducted in Bayad since 1998). For a woman living in Dhansura and who has been a SEWA member since 2002, her exposure to the program is $Y \times L \times M = 0$ (because no training sessions have been conducted in Dhansura after 2001). SEWA conducts barefoot mechanic training programs in each sub-district rather than centrally so that it can attract more participants. Table 3 summarizes all the training programs conducted by SEWA up-to-date. As shown in Table (3), the last training program conducted in Dhansura was in June 2001. Since then all training programs have been conducted in Bayad only, which is mainly because the training sessions are contingent upon winning contracts.

<Table 3 here>

The program exposure IV $Y \times L \times M$ classifies our sample into two categories - (i) women who live in Dhansura and became a SEWA member before 2001 and women who live in Bayad and became a SEWA member before 2011, who would all take value equals 1 and (ii) all other women who would take value equal to 0.[7] The exclusion restriction needs to satisfy the condition that program exposure is correlated with probability of being trained but uncorrelated with the error term in the regression specification. There are two potential threats to validity to our choice of instrument. First is if the *contract winning location is non-random*. In such a case, it is plausible that women with a SEWA membership migrate from one sub-district to the other in anticipation that a contract will be won and there would be a training session conducted in the destination sub-district. However, this scenario is very unlikely in the area of our study. Overall in the state of Gujarat, between-district migration (including rural-urban and seasonal migration) seems to be more prevalent rather than within-district (or between sub-districts/villages) (Government of India 2001). In the absence of panel data, we assume that there is very limited between sub-districts/villages migration. In other words, we assume that a woman's current residence location is the same as where she lived in 1998 when SEWA first started this program.[8] In this case, it is also possible that SEWA devotes more resources to a particular sub-district such as a stronger membership campaign so that they can recruit more women. However, we find that even this is unlikely as membership campaigns are run in both the sub-districts all year round and in our sample we do not observe any systematic correlation between membership and contract

years.

The second potential threat to validity is that the *contract winning time is non-random.* In this case, non-members may enrol to become SEWA members in anticipation of a successful bid and a training session. However, as mentioned above, there is no systematic correlation between membership and contract years as it is subject to the tendering process whose outcome is fairly random as observed in Table (1). Here again, it is plausible that SEWA may devote more resources in a particular sub-district if it can accurately predict the timing of the contract. This is unlikely for the same reasons pertaining to membership campaigns that we discuss above.

Coefficient β_1 estimated using the instrumental variable approach outlined above provides the local average treatment effect (LATE) of training on outcomes. Comparing to the total number of SEWA members, participation in the barefoot mechanics training program is very limited. Hence it is difficult to generalize our estimate to the average treatment effect (ATE) of the training program on the entire SEWA member population. Given the heterogeneity within our sample of trained women it is possible that the LATE estimates from the program exposure IV substantially exceed the ATE estimates. This may be because the LATE averages the treatment effect only over a small and unique group whose participation decision was altered by the IV (Card 2001, Oreopoulos 2006).

We investigate two sets of outcome variables in our analyses: the consumption outcomes and direct measures of autonomy. The consumption outcomes we examine include expenditure on female private goods, male private goods, and household public goods. Female private good consumption is measured using expenditure on jewelry and clothing for the respondent herself, male private good consumption is measured using expenditure on paan (betel leaf) and tobacco, and household public good consumption is measured using expenditure on daughter's education, expenditure on son's education, and household medical expenditure. All consumption outcomes are continuous variables transformed to the logarithmic form.

Autonomy includes household spending decisions and household relationships, that is, prevalence and frequency of conflict between wife and husband or mother and adult son. The outcomes include whether the respondent participates in household spending decisions (equals 1 if respondent makes decisions herself or jointly with her husband/adult son and 0 otherwise), whether the respondent is the first to compromise when there is a conflict between her and her husband or adult son (equals 1 if respondent always compromises first and 0 otherwise), whether the respondent quarrels often with her husband or adult son (equals 1 if quarrels more than once per month or once every few months and 0 otherwise), and whether the respondent gets along with her husband and adult son (equals 1 if gets along 'very well' or 'well' and 0 otherwise). The autonomy analyses are also performed using answers from similar questions asked to the husbands or adult sons.

We include three types of variables in X' based on the theoretical model outlined in section 3. The first set is the preference variables, which includes women's age, education, caste, cognitive ability, and years of SEWA membership. The second set of variables captures household's production function, which includes agriculture land size, other assets, and household size. And the third set of variables are proxies for baseline bargaining power, which includes age at marriage, whether the woman married into a wealthier household, whether respondent lives with husband or adult son, and the age and education of the husband or adult son. We do not control for income (total or per capita) in our reduced form specifications as it is likely to be endogenous and may depend on household characteristics and women's bargaining power (Anderson and Eswaran 2009). As the objective of our analysis is to evaluate the effect of the barefoot mechanics program and not the direct effect of income on intra-household bargaining, it is beyond the scope of our analysis to develop a structural model to assess the effects of income.

5. RESULTS

5.1. Summary statistics

Table (4) reports the individual and household level characteristics of trained and non-trained women. We observe that women in the trained and non-trained group share very similar socio-economic characteristics. Table (5) shows that there are no significant differences between the consumption patterns of trained and non-trained women except for expenditure on son's education. For the autonomy variables, trained women compromise more and seem to get along better with their husband/adult son when compared to the non-trained women. The husbands/adult sons of trained women are less likely to discuss work and spending with their wives/mothers. Further, trained women are more likely to be employed outside their household farm. We will investigate the employment mechanism in section 6. These simple unconditional mean comparisons seem counterintuitive mainly due to the fact that there could be selection bias into the program. We correct this bias using the instrumental variable approach outlined in section 4.

<Table 4 here>

<Table 5 here>

5.2. Effect of training

We begin by reporting the first stage results in equation (6). In Table (6), columns (1) and (2) report the linear probability results and columns (3) and (4) report probit regression results. Coefficient for program exposure is positive and statistically significant in both specifications. The R-squared value for the linear model with full set of controls is 0.229 and the F-stat with full set of controls is 8.923. The results suggest a strong correlation between the program exposure IV and probability of being trained.

<Table 6 here>

We first estimate the regression model outlined in equation (5). There are two types of outcome variables that we investigate: the consumption outcomes and direct measures of autonomy. The consumption outcome variables are all continuos and transformed to the logarithmic form hence we estimate these regressions using OLS. Household spending decisions and household relationship variables are dichotomous hence probit regressions are used. We compute marginal effects from the probit model coefficients, which are evaluated at the sample mean of the independent variables. All our regression outputs are presented in two separate panels - Panel A controls for a shorter set of variables which includes the preference variables and household production function variables while Panel B controls for baseline bargaining power and husband and adult son characteristics in addition to all variables in Panel A. Results in Panel B are therefore estimates after dropping women-only households from the sample.

Results for consumption patterns are reported in Table (7). Panel A column (2) shows that trained women spend nearly ten times more on jewelry and clothing for themselves as compared to non-trained women. When controlling for husband and son characteristics, the effect is about six folds. We do not find any significant effects either on male private good consumption or household public good consumption. The magnitude of the coefficients on jewelry and clothing seems large. However, we argue that the increase in jewelry and clothing not only captures the improved autonomy of women on household spending decisions, but also savings for themselves. Less than a quarter of the women in our study have a bank account with their names on it and we do not observe any significant difference between trained and non-trained women in terms of bank account ownership.[9] Therefore one possible channel for these women to build up their own savings is through investment in jewelry and clothing. However, a concern here is that jewelry and clothing can be investments for the household and not private savings especially since it is common in India to save in gold and clothing, more so if there are daughters of marriageable age in the household. We address this concern by estimating the model after including number of daughters of marriageable age in the household. The coefficient of jewelry and clothing reduces in magnitude but continues to remain significant.[10] We do not have data to differentiate the investment and consumption motives of the increased jewelry expenditure in this study. However, if it is true that the training program has also improved women's autonomy for household saving decisions, the asset building process would have a upward spiral effect as improved control over assets can further increase women's bargaining power. Another reason for the large coefficient might be the LATE sample selection issue we discuss in section 4.

<Table 7 here>

Table (8) reports the probit regression results for autonomy and household relationship variables from the woman respondent's perspective. Panel A column (2) shows that trained women are 46 percentage points

more likely to participate in household spending decisions as compared to non-trained women while Panel B column (2) shows that they are 38 percentage points more likely to participate in household spending decisions as compared to non-trained women. In Panel A column (6) we also find that trained women are 40 percentage points more likely to quarrel with their husband or adult son but this result disappears when we control for baseline bargaining power and husband or adult son's characteristics. This increase in intra-household conflict is consistent with previous studies which find that increased economic opportunity or labor supply of women is associated with an increase in domestic violence (Eswaran and Malhotra 2011, Heath and Tan 2014). Table (9) reports the probit regression results for autonomy and household relationship variables from the husband or adult son's perspective. We do not find any significant effects on household spending decisions and household relationships suggesting that the male perception of changes in autonomy are potentially different.

<Table 8 here>

<Table 9 here>

5.3. Robustness checks

A potential concern with our results is that they may be driven by the 'trained and currently working' respondents. We therefore estimate our regression models after dropping these respondents. Tables (10), (11), and (12) below report the 2SLS and IV probit results. The results are consistent suggesting that being trained in itself has a significant effect on intra-household bargaining outcomes and it is not conditional upon current working status as a repairwoman. This finding brings our attention back to the unique nature of the barefoot mechanics training program. The training is highly technical and requires women to step outside their household and work in teams unlike programs that train women for home-based businesses such as sewing or handicrafts. Therefore, the training program might be instilling confidence among the participants to work outside their household and promoting interaction with other SEWA members in addition to opening up employment opportunities, which might underly the results we observe. We investigate these underlying mechanisms in the next section.

<Table 10 here>

<Table 11 here>

<Table 12 here>

6. MECHANISMS

The significant causal results that emerge from our estimation are that participating in the barefoot mechanics training program significantly increases women's expenditure on jewelry and clothing for them-

selves and has a significant positive effect on participation in household spending decisions from the woman respondent's perspective. We find limited evidence that program participation significantly increases the probability of quarrels between wife and husband or mother and adult son from the woman respondent's perspective. We do not find any evidence supporting decrease in expenditure on male private consumption goods, increase in household public expenditure, and increased autonomy and change in household relationships from the husband's or adult son's perspective. Having established these causal relationships, we now turn to examining the mechanisms that underly our results.

Our theoretical model identifies two potential channels - the income channel and the extra-environmental parameters (EEP) channel, where labor market opportunities could affect women's autonomy at home. We first examine the income channel by estimating the effect of the training on household income. Table (13) columns (1) reports the IV estimation of training on household income over the past twelve months. No statistically significant effect is observed. This result indicates that household income for the trained women is not statistically different from non-trained women. Therefore, it is unlikely that the observed improvement autonomy among trained women arises from the income channel.

We then investigate the EEP channel. We first examine two income-related EEP variables that have been widely used in the literature: income and income share earned by the women. Results are reported in Table (13) columns (2) and (3). No statistically significant effect of training on income or income share is observed. The next set of EEP variables that we examine are employment patterns. In particular, we are interested in employment outside household farms. Note that, as discussed in section 3, it is possible to observe women whose labor supply pattern was affected by the training program, while leaving their income or income share unchanged. Such employment effect is also classified as EEP in our framework. Columns (5) and (6) estimate the effect of training on the probability of being currently employed outside household farm and the probability of being employed by non-SEWA related jobs. Both models show a positive and significant effect of training on employment. In column (5), we find that training significantly increases the probability of being employed in any occupation other than household farm by 46 percentage points. A more accurate reflection of employment might be jobs other than household farm and SEWA repairwork but including other agriculture and related jobs. As measured in column (6), we find that training significantly increases the probability of being employed in occupations other than household farm and SEWA repairwork by 48 percentage points. These results suggest that the training encourages women to increase their labor supply outside the household farm more generally. In column (8), we also find that trained women are more likely to generate income for their households during lean seasons. These results are robust when log household income is included as a control variable.[11]

It is possible that the intra-household bargaining effects are driven by the institutional influence that

SEWA has on its members. To examine this we compute the difference between respondents' current overall life satisfaction and their life satisfaction before they became SEWA members, both of which are measured on a 10-point scale. This difference reflects the change in their perceived well-being since joining SEWA. As all the women in our sample are SEWA members, our hypothesis is that those who benefitted from the barefoot mechanics training program might report a higher level of perceived well-being as compared to members who did not participate This 'SEWA effect' is an EEP, which might be owing to the self-confidence that the training program generates and the teamwork aspect through which the members might develop social networks. In column (4) we observe that training has a marginally significant positive effect on change in life satisfaction. However, as we do not map out the social networks in our study, this result needs to be interpreted with caution.

<Table 13 here>

7. CONCLUSION

In this study we aim to examine the effect of skilled labor market opportunity on women with low human capital and from low-income families. We find that participating in the barefoot mechanics training program significantly increases expenditure on jewelry and clothing for women. We further find that the program has a positive autonomy effect, which is manifested through an increase in women's participation in household spending decisions. However, the autonomy effects are significant only from the women's perspective and not husband or adult son's perspective. We also find limited evidence that trained women report an increase in the frequency of quarrels. Again however, this is not reflected in the husband or adult son's responses. Our results are robust to alternative regression specifications.

Exploring the underlying mechanisms, we find that the bargaining outcomes operate mainly through the employment channel. Specifically, participating in the program increases the probability of them being engaged in employment other than the household farm by 46 percentage points and the employment channel is durable as many respondents were exposed to the training sessions several years ago. We also find a significant increase of nearly 4 points in their self-reported life satisfaction as a result of the training program. This might capture the effect of training on bargaining via the EEP channel. A limitation of our study is that we do not map the social networks shared by the respondents in our sample in detail and also do not conduct specific tests for assessing the psychological effects of the training such as confidence building and team dynamics. There is therefore potential for further research in unpacking these mechanisms that may affect women's intra-household bargaining ability. Methodologically, the specific instrument we use only allows us to estimate the LATE and our results are therefore not generalizable beyond the selected sample.

Further, as we do not have information on social networks, we cannot estimate plausible spillover effects from trained to non-trained women in the same village. If there indeed is some spillover then our estimates would be downward biased. Yet another limitation is the restricted sample size, which may result in measurement errors and statistical power issues.

Our findings bring us back to the issue we raise at the beginning of the paper. A critical policy problem facing India is low female labor force participation, lack of skills among female labor, and creating opportunities for women in the non-farm sectors. Programs such as SEWA's handpump repair training can address this policy issue by creating skilled labor market opportunities for rural women, who possess limited education and income. A key finding is that such programs can enable women with low human capital to build assets for themselves, which may further enhance their bargaining ability. Our study provides the theoretical understanding and quasi-experimental evidence on the positive effects that such programs can have on women's labor market opportunities and bargaining ability. Therefore, there is further research potential in studying, possibly through a randomized experiment, the effects of a similar intervention on larger groups of women.

Notes

[1]1 Indian Rupee approximate equals 0.02 US Dollars.

[2]Other surface water sources such as lakes and ponds are accessible during and immediately after the monsoon season.

[3]The unitary household models assume households have a unified budget constraint and household members either have identical preferences or one individual dominates the allocation process. However, this claim is challenged by economic theorists who argue that households are collective and not unitary decision making entities. They posit that household members reach a cooperative or non-cooperative solution of resource distribution through a bargaining process (McElroy and Horney (1981),Browning et al. (1994),Chiappori (1988, 1992, 1997) and Haddad L and Alderman (1997)). This section does not intent to test the unitary models versus collective models, nor does it intend to derive testable restrictions on labor supply or private consumptions under the collective household models

[4]See section 1 for description of EEP

[5]Chang et al. (2012)Proposition 8

[6]An analogy to this is classifying income share as an EEP, while holding income constant. See Browning et al. (2006) for further discussion on classification of EEP

[7]Every SEWA member who lives in Bayad and became a member before 2011 has been exposed to the program. A SEWA member who lives in Dhansura would only have been exposed to the program if she became a member before 2001.

[8]The main reason why these women are likely to move from one sub-district to another is marriage. However, we did not ask the respondents their place of birth and when they moved to their current location.

[9]Results available upon request

[10]Results available upon request.

[11]Results available upon request

Agarwal, B. (1997). 'bargaining' and gender relations: Within and beyond the household. *Feminist Economics*, 3(1):1–51.

Anderson, S. and Eswaran, M. (2009). What determines female autonomy? evidence from bangladesh. *Journal of Development Economics*, 90(2):179–191.

Bank, W. (2012). World development report: Gender equality and development. Technical report, The World Bank, Washington, D.C.

Browning, M., Bourguignon, F., Chiappori, P.-A., and Lechene, V. (1994). Income and outcomes: A structural model of intrahousehold allocation. *Journal of Political Economy*, 102(6):1067–1096.

Browning, M. and Chiappori, P.-A. (1998). Efficient intra-household allocations: A general characterization and empirical tests. *Econometrica*, 66(6):1241–1278.

Browning, M., Chiappori, P.-A., and Valer (2006). Collective and unitary mmodel: A clarification. *Review of Economic Household*, 4:5–14.

Card, D. (2001). Estimating the return to schooling: Progress on some persistent econometric problems. *Econometrica*, 69(5):1127–1160.

Chang, Y.-M., Huang, B.-W., and Chen, Y.-J. (2012). Labor supply, income and welfare of the farm household. *Labour Economics*, pages 427–437.

Chiappori, P.-A. (1988). Rational household labor supply. *Econometrica*, 56:63–89.

Chiappori, P.-A. (1992). Collective labor supply and welfare. *Journal of Political*, 100:437–467.

Chiappori, P.-A. (1997). Introducing household production in collective model of labor supply. *Journal of Political Economy*, 105:191–209.

Dollar, D. and Gatti, R. (1999). Gender inequality, income, and growth: Are good times good for women? Technical report, World Bank.

Duflo, E. and Udry, C. (2004). Intrahousehold resource allocation in cote d'ivoire: Social norms, separate accounts and consumption choices.

Eswaran, M. and Malhotra, N. (2011). Domestic violence and women's autonomy in developing countries: Theory and evidence. *Canadian Journal of Economics*, 44(4):1222–1263.

Fafchamps, M. and Quisumbing, A. (2002). Control and ownership of assets within rural ethiopian households. *Journal of Development Studies*, 38(6):47–82.

Fafchamps, M. and Quisumbing, A. (2005). Assets at marriage in rural ethiopia. *Journal of Development Economics*, 77(1):1–25.

Government of India (2001). Census of india.

Gray, J. (1998). Divorce-law changes, household bargaining, and married women's labor supply. *American Economic Review*, 88(3):628–642.

Haddad L, J. H. and Alderman, H., editors (1997). *Intrahoushold Resource Allocation in Developing Countries*. The Johns Hopkins University Press.

Heath, R. (2014). Women's access to labor market opportunities, control of household resources, and domestic violence: Evidence from bangladesh. *World Development*, 57:32–46.

Heath, R. and Tan, X. (2014). Intrahousehold bargaining, female autonomy, and labor supply: Theory and evidence from india.

Himanshu (2011). Employment trends in india: A re-examination. *Economic & Political Weekly*, 46(37):43–59.

Hoddinott, J. and Haddad, L. (1995). Does female income share influence household expenditures? evidence from cote d'ivoire. *Oxford Bulletin of Economics and Statistics*, 57(1):77–96.

Jejeebhoy, S. and Sathar, Z. (2001). Women's autonomy in india and pakistan: The influence of religion and region. *Population and Development Review*, 27(4):687–712.

Jensen, R. (2012). Do labor market opportunities affect young women's work and family decisions. *Quarterly Journal of Economics*, 127(2):753–792.

Jensen, R. and Thornton, R. (2003). Early female marriage in the developing world. *Gender & Development*, 11(2):9–19.

Loko, B. and Diouf, M. A. (2009). Revisiting the determinants of productivity growth: What's new? Technical report, International Monetary Fund.

McElroy, M. (1990). The empirical content of nash-bargained household behavior. *Journal of Human Resources*, 25(4):559–583.

McElroy, M. and Horney, M. J. (1981). Nash-bargained household decisions: Toward a general theory of demand. *International Economic Review*, 22(2):333–349.

Oreopoulos, P. (2006). Estimating average and local average treatment effects of education when compulsory schooling laws really matter. *American Economic Review*, 96(1):152–175.

Sudarshan, R. and Bhattacharya, S. (2009). Through the magnifying glass: Women's work and labour force participation in urban delhi. *Economic & Political Weekly*, 44(48):59–66.

Thakur, A. (2012). Why india is not on the job?

Wang, S.-Y. (2014). Property rights and intra-household bargaining. *Journal of Development Economics*, 107:192–201.

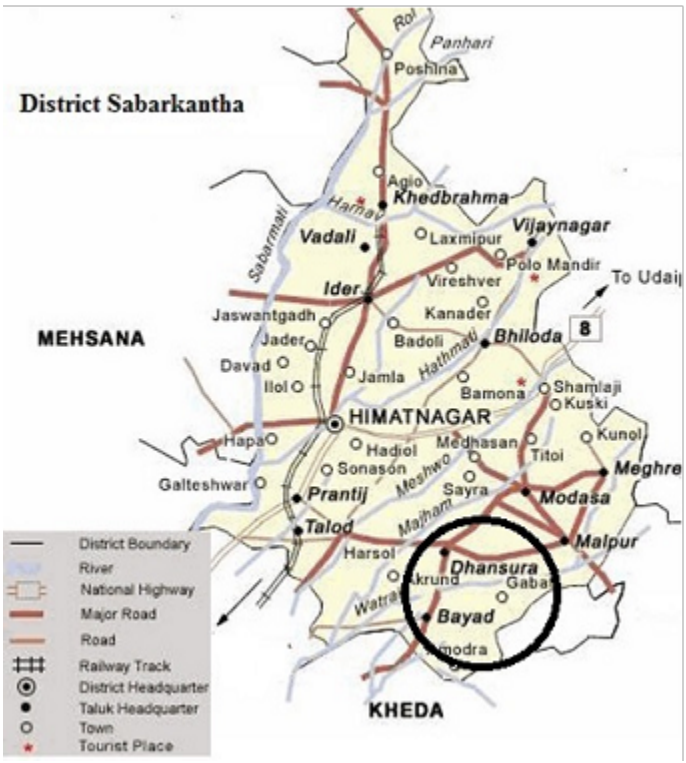

Figure 1: Survey sites

Table 2: Survey sample

Category	**Women sample**	**Husband/adult son sample**
Trained and currently working	15	13
Trained and used to work	59	52
Trained and never worked	35	34
Other SEWA women	103	94
Total	**212**	**193**
Total sample		**405**
Total Villages		**37**

Notes: Husband and adult son sample size differs as these questionnaires were not administered to women-only households.

Table 1: Chronology of SEWA handpump repair contracts in Bayad and Dhansura

Date of contract	Bayad	Dhansura
Sep-27-1999	Yes	Yes
2000	No	No
Oct-03-2001	Yes	Yes
Dec-31-2002	Yes	Yes
Nov-14-2003	Yes	Yes
Jan-29-2004	Yes	No
2005	No	No
Feb-22-2006	Yes	No
2007	No	No
2008	No	No
2009	No	No
Nov-04-2010	Yes	No
Dec-07-2011	Yes	No
May-30-2012	Yes	No
Sep-03-2013	Yes	No

Source: SEWA internal document

Table 3: Roll-out of Barefoot Mechanics Training Program

Year	Month	No. of Women	Target SEWA Members
1998	December	40	Women in Bayad & Dhansura
2000	September	35	Women in Bayad
2001	June	60	Women in Dhansura
2001	September	40	Women in Bayad
2002	October	40	Women in Bayad
2011	September	35	Women in Bayad

Table 4: Summary Statistics

Variables	**Trained**	**Non-Trained**	**Difference in Means**
Respondent Characteristics			
Years of education	2.385	2.107	0.279
	(2.054)	(1.841)	(0.268)
Age	45.900	42.830	3.064*
	(10.930)	(11.230)	(1.523)
Years of SEWA membership	8.817	10.05	-1.232*
	(4.790)	(4.396)	(4.633)
Age at first marriage	18.060	17.230	0.828
	(6.305)	(5.221)	(0.801)
Respondent married into a wealthier family	0.346	0.313	0.033
	(0.478)	(0.466)	(0.067)
Other Household Variables			
Log per capita income	8.674	8.711	-0.037
	(0.620)	(0.709)	(0.092)
Asset	25.760	23.580	2.179
	(11.790)	(11.280)	(1.585)
Size of agriculture land (bighas)	3.184	4.553	-1.369
	(2.695)	(8.793)	(0.904)
Household size	5.477	5.369	0.108
	(2.570)	(2.417)	(0.343)
Age of husband/adult son	45.300	42.910	2.388
	(12.920)	(11.360)	(1.749)
Years of education of husband/adult son	4.303	3.862	0.441
	(2.256)	(2.345)	(0.332)
Number of unmarried daughters	0.248	0.505	-0.257*
	(0.611)	(0.948)	(0.110)
Number of observations	**109**	**103**	

Notes: All expenditures are calculated in log. Standard deviations and standard errors of t-statistic in brackets. *p<0.1, **p<0.05, p<0.001***.

Table 5: Summary Statistic - Outcome Variables

Autonomy Variables	**Trained**	**Non-Trained**	**Difference in Means**
Expenditure on jewelry and clothing	2.874	2.390	0.484
	(2.994)	(3.001)	(0.412)
Household medical expenditure	1.504	1.412	0.092
	(1.462)	(1.706)	(0.219)
Education expenditure on daughter	3.592	3.101	0.490
	(2.120)	(1.957)	(0.280)
Education expenditure on son	3.450	2.834	0.616*
	(2.421)	(2.065)	(0.309)
Expenditure on tobacco	4.735	4.470	0.265
	(1.203)	(1.035)	(0.154)
Respondent makes spending decisions	0.617	0.670	-0.053
	(0.489)	(0.473)	(0.070)
Respondent has to compromise	0.716	0.579	0.137*
	(0.453)	(0.496)	(0.069)
Respondent quarrels with husband/adult son	0.179	0.137	0.042
	(0.385)	(0.346)	(0.053)
Respondent gets along with husband/adult son	0.832	0.684	0.147*
	(0.376)	(0.467)	(0.062)
Husband/adult son discusses work with respondent	0.596	0.816	-0.219***
	(0.493)	(0.390)	(0.061)
Husband/adult son discusses spending with respondent	0.615	0.816	-0.201**
	(0.489)	(0.390)	(0.061)
Respondent participates in spending decisions for husband's income	0.431	0.553	-0.122
	(0.498)	(0.500)	(0.069)
Respondent participates in spending decisions for her own income	0.560	0.495	0.065
	(0.499)	(0.502)	(0.069)
Husband/adult son gets along with respondent	0.798	0.806	-0.001
	(0.403)	(0.397)	(0.055)
Employed outside household farm	0.743	0.563	0.180**
	(0.439)	(0.498)	(0.065)
Number of observations	**109**	**103**	

Notes: All expenditures are calculated in log. Standard deviations and standard errors of t-statistic in brackets. *p<0.1, **p<0.05, p<0.001***.

Table 6: First Stage Results of Program Exposure on Training

	(1)	(2)	(3)	(4)
Outcome variable=Trained	**OLS**	**OLS**	**Probit**	**Probit**
Program Exposure	0.170*	0.233**	0.180**	0.230***
	(0.091)	(0.094)	(0.083)	(0.081)
N	212	189	212	189
R-Squared	0.151	0.229		
F-stat	6.094	8.923	.	.

Notes: Robust standard errors clustered at village level in parentheses.
Probit coefficients are marginal effects evaluated at the sample mean of the independent variables. Odd number regressions control for respondent's age, age squared, education, marital status, caste, cognitive ability, and years of SEWA membership as well as landholding size, other assets, and household size. Even number regressions also include baseline bargaining conditions, including age at first marriage, whether respondent is married into a wealthier family, whether the respondent lives with her husband or adult son, and husband's/adult son's age and education. Even number regressions exclude women-only households.
*p<0.1, **p<0.05, p<0.001***.

Table 7: Effect of Training on Household Consumption Patterns - OLS and IV

Outcome variable	**Jewelry & Clothing**		**Tobacco & Paan**		**Medical**		**Daughter's Education**		**Son's Education**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Models	**OLS**	**IV**	**OLS**	**IV**	**OLS**	**IV**	**OLS**	**IV**	**OLS**	**IV**
Panel A	0.530	11.150*	0.291*	1.378	0.062	-0.232	0.548*	2.050	0.629*	0.656
(N = 212)	(0.724)	(6.086)	(0.148)	(1.163)	(0.281)	(1.323)	(0.318)	(2.409)	(0.313)	(1.594)
R-squared	0.072		0.075		0.224		0.156		0.191	
Panel B	0.950	6.951**	0.330*	0.860	-0.056	0.609	0.467	2.048	0.544*	0.894
(N = 189)	(0.683)	(2.797)	(0.178)	(0.900)	(0.281)	(1.146)	(0.439)	(1.769)	(0.305)	(1.137)
R-squared	0.156		0.100		0.275		0.186		0.278	

Notes: Robust standard errors clustered at village level in parentheses.
Panel A regressions control for respondent's age, age squared, education, marital status, caste, cognitive ability, and years of SEWA membership as well as landholding size, other assets, and household size. Panel B regressions include all regressors in Panel A plus baseline bargaining conditions, including age at first marriage, whether respondent is married into a wealthier family, whether the respondent lives with her husband or adult son, and husband's/adult son's age and education.
Regressions in Panel B exclude women-only households.
*p<0.1, **p<0.05, p<0.001***.

Table 8: Effect of Training on Household Relationships - Probit (Woman Respondent's Questions)

Outcome variable	**Spending Decision**		**Compromise**		**Quarrel**		**Get Along**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Models	**Probit**	**IV Probit**	**Probit**	**IV Probit**	**Probit**	**IV Probit**	**Probit**	**IV Probit**
Panel A	-0.123*	0.459***	0.088	-0.196	0.046	0.395**	0.141*	-0.0371
	(0.067)	(0.107)	(0.093)	(0.391)	(0.069)	(0.184)	(0.072)	(0.463)
N =	186	186	188	188	188	188	187	187
Panel B	-0.116*	0.384**	0.095	-0.177	0.060	0.296	0.126*	-0.070
	(0.060)	(0.174)	(0.077)	(0.344)	(0.066)	(0.248)	(0.064)	(0.403)
N =	183	183	185	185	185	185	184	184

Notes: Robust standard errors clustered at village level in parentheses.
Probit coefficients are marginal effects evaluated at the mean of the independent variable. Panel A regressions control for respondent's age, age squared, education, marital status, caste, cognitive ability, and years of SEWA membership as well as landholding size, other assets, and household size.
Panel B regressions include all regressors in Panel A plus baseline bargaining conditions, including age at first marriage, whether respondent is married into a wealthier family, whether the respondent lives with her husband or adult son, and husband's/adult son's age and education.
Regressions in Panel B exclude women-only households.
*p<0.1, **p<0.05, p<0.001***.

Table 9: Effect of Training on Household Relationships - Probit (Husband/Adult Son Question's)

Outcome variable	**Discuss Work**		**Discuss Spending**		**Spending Decision (Husband's Earned Income)**		**Spending Decision (Respondent's Earned Income)**		**Get Along**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Models	**Probit**	**IV Probit**	**Probit**	**IV Probit**	**Probit**	**IV Probit**	**Probit**	**IV Probit**	**Probit**	**IV Probit**
Panel A	-0.198***	0.279	-0.172**	0.332	-0.136	0.235	0.074	-0.056	-0.012	-0.309
(N=193)	(0.074)	(0.224)	(0.080)	(0.233)	(0.083)	(0.378)	(0.085)	(0.461)	(0.053)	(0.413)
Panel B	-0.163**	0.098	-0.140**	0.208	-0.143*	-0.202	0.079	-0.281	-0.027	-0.238
(N=189)	(0.065)	(0.153)	(0.062)	(0.234)	(0.081)	(0.256)	(0.078)	(0.263)	(0.049)	(0.354)

Notes: Robust standard errors clustered at village level in parentheses.
Probit coefficients are marginal effects evaluated at the mean of the independent variable. Panel A regressions control for respondent's age, age squared, education, marital status, caste, cognitive ability, and years of SEWA membership as well as landholding size, other assets, and household size.
Panel B regressions include all regressors in Panel A plus baseline bargaining conditions, including age at first marriage, whether respondent is married into a wealthier family, whether the respondent lives with her husband or adult son, and husband's/adult son's age and education.
Regressions in Panel B exclude women-only households.

*p<0.1, **p<0.05, p<0.001***.

Table 10: Effect of Training on Household Consumption Patterns - After Dropping 'Trained and Currently Working' Respondents

Outcome variable	**Jewelry & Clothing**		**Tobacco & Paan**		**Medical**		**Daughter's Education**		**Son's Education**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Models	**IV**	**IV w/o TCW**	**IV**	**IV w/o TCW**	**IV**	**IV w/o TCW**	**IV**	**IV w/o TCW**	**IV**	**IV w/o TCW**
Panel A	11.150*	10.446*	1.378	1.377	-0.232	-0.361	2.050	1.732	0.656	-0.051
	(6.086)	(5.713)	(1.163)	(1.150)	(1.323)	(1.387)	(2.409)	(2.149)	(1.594)	(1.668)
N =	212	197	212	197	212	197	212	197	212	197
Panel B	6.951**	7.307**	0.860	0.934	0.609	0.372	2.048	1.902	0.894	0.242
	(2.797)	(2.920)	(0.900)	(0.990)	(1.146)	(1.257)	(1.769)	(1.708)	(1.137)	(1.274)
N =	189	177	189	177	189	177	189	177	189	177

Notes: Robust standard errors clustered at village level in parentheses.
Odd numbered regressions report 2SLS results for both trained and trained currently working women. Even number regressions report 2SLS results after dropping the 'trained and currently working' respondents. All regressions exclude households with only female household members. Results for the full sample are consistent and are available upon request. All regressions control for respondent's age, age squared, education, marital status, caste, cognitive ability, years of SEWA membership, landholding size, other assets, household size, age at first marriage, whether respondent is married into a wealthier family, whether the respondent lives with her husband or adult son, and husband's/adult son's age and education.

*p<0.1, **p<0.05, p<0.001***.

Table 11: Effect of Training on Household Relationships - Probit (Woman Respondent's Questions) After Dropping 'Trained and Currently Working' Respondents

Outcome variable	**Spending decision**		**Compromise**		**Quarrel**		**Get Along**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Models	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**
		w/o TCW		**w/o TCW**		**w/o TCW**		**w/o TCW**
Panel A	0.459***	0.485***	-0.196	-0.234	0.395**	0.478***	-0.037	-0.023
	(0.107)	(0.098)	(0.391)	(0.418)	(0.184)	(0.130)	(0.463)	(0.500)
N =	186	174	188	176	188	176	187	175
Panel B	0.384**	0.414**	-0.177	-0.231	0.296	0.417**	-0.070	-0.069
	(0.174)	(0.177)	(0.344)	(0.379)	(0.248)	(0.211)	(0.403)	(0.440)
N =	183	171	185	173	185	173	184	172

Notes: Robust standard errors clustered at village level in parentheses.
Probit coefficients are marginal effects evaluated at the mean of the independent variable. Odd numbered regressions report 2SLS results for both trained and trained currently working women. Even number regressions report 2SLS results after dropping the 'trained and currently working' respondents. All regressions exclude households with only female household members. Results for the full sample are consistent and are available upon request. All regressions control for respondent's age, age squared, education, marital status, caste, cognitive ability, years of SEWA membership, landholding size, other assets, household size, age at first marriage, whether respondent is married into a wealthier family, whether the respondent lives with her husband or adult son, and husband's/adult son's age and education.

*p<0.1, **p<0.05, p<0.001***.

Table 12: Effect of Training on Household Relationships - Probit (Husband/Adult Son Question's) After Dropping 'Trained and Currently Working' Respondents

Outcome variable	**Discuss work**		**Discuss spending**		**Spending decision**		**Spending decision**		**Get Along**	
					(Husband's earned income)		**(Respondent's earned income)**			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Models	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**	**IV Probit**
		w/o TCW		**w/o TCW**		**w/o TCW**		**w/o TCW**		**w/o TCW**
Panel A	0.279	0.079	0.332	0.225	0.235	0.182	-0.056	0.099	-0.309	-0.284
	(0.224)	(0.203)	(0.233)	(0.278)	(0.378)	(0.440)	(0.461)	(0.471)	(0.413)	(0.431)
N =	193	165	193	180	193	180	193	180	193	180
Panel B	0.098	0.041	0.208	0.149	-0.202	-0.222	-0.281	-0.219	-0.238	-0.242
	(0.153)	(0.148)	(0.234)	(0.248)	(0.256)	(0.285)	(0.263)	(0.313)	(0.354)	(0.378)
N =	189	162	189	177	189	177	189	177	189	177

Notes: Robust standard errors clustered at village level in parentheses.
Probit coefficients are marginal effects evaluated at the mean of the independent variable. Odd numbered regressions report 2SLS results for both trained and trained currently working women. Even number regressions report 2SLS results after dropping the 'trained and currently working' respondents. All regressions exclude households with only female household members. Results for the full sample are consistent and are available upon request. All regressions control for respondent's age, age squared, education, marital status, caste, cognitive ability, years of SEWA membership, landholding size, other assets, household size, age at first marriage, whether respondent is married into a wealthier family, whether the respondent lives with her husband or adult son, and husband's/adult son's age and education.

*p<0.1, **p<0.05, p<0.001***.

Table 13: Effect of Training on Income, Life Satisfaction, Hours of Work, and Employment

Outcome Variables	**Log HH Income**	**Log Income earned by women**	**Income Share**	**Change in Life Satisfaction**	**Employment**	**Non-SEWA Employment**	**Non-SEWA Employment w/o TCW**	**Income in Lean Season**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Models			**IV**			**IV Probit**		
Training	-0.374	2.647	1.510	4.894*	0.458*	0.481**	0.447**	0.447*
	(0.904)	(1.797)	(1.209)	(2.894)	(0.121)	(0.078)	(0.146)	0.158
N =	212	212	212	212	212	212	197	212

Notes: Robust standard errors clustered at village level in parentheses.
All regressions control for respondent's age, age squared, education, marital status, caste, cognitive ability, years of SEWA membership, landholding size, other assets, household size,
age at first marriage, whether respondent is married into a wealthier family, whether the respondent lives with her husband or adult son, and husband's/adult son's age and education.
Regressions (1)-(4) report 2SLS results. Regressions (5)-(8) report IV probit results. All regressions instrument Trained using $Y \times L \times M$. See section 4 for further discussion.
*p<0.1, **p<0.05, p<0.001***.