

# Can Network Ties Help Facilitate Female Entrepreneurship?

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April 23, 2024

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## Abstract

Despite many skills and entrepreneurship programs, the gender gap in entrepreneurial activities is high in developing countries. This paper focuses on bridging this gap by studying the role of peers in facilitating entrepreneurial growth for women. Peers can provide direct benefits in terms of motivation, skills, and information and indirect benefits in providing access to a wider social network. Through an RCT, we vary if women attend a three-day training program with a randomly matched peer in the network versus alone and whether they attend an additional module in which the indirect value of their matched peer is made salient to them and they are encouraged to pool their network contacts. We measure the impact of the training on outcomes immediately and one year later. While the training significantly improves pro-business outcomes, pairing matters only when the individual is paired with a close friend, and more so if this friend is central in the network. Motivation and the possibility to interact in the future are the main mechanisms that drive the results. Making the indirect value of the network more salient only has modest positive effects.

KEYWORDS: networks, entrepreneurship, RCT, peer effects.

JEL CLASSIFICATION: J16, J24, L14, L26, M53.

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We would like to thank the Weiss Fund for providing funding to conduct the fieldwork. We thank our partner organizations, JPAL and Governance Lab, and the enumerators for the execution of the field project. We are grateful to Abhijit Banerjee and Margherita Comola for their tremendous guidance. We have also benefited from the comments of Marina Agranov, Michael Callen, Horacio Larreguy, Emily Breza, Sylvie Lambert, Karen Macours, Rohini Pande, Simone Schaner, Charles Sprenger, Simon Quinn, and Christopher Woodruff. In addition, we thank the participants of the BREAD Conference 2021, and of seminars at Harvard, MIT, NEUDC, CTN, PSE for their feedback. This field experiment is registered as AEARCTR-0007274 and has received IRB approval at Caltech and DREC approval ECONCIA21-22-49 at Oxford.

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# 1 Introduction

Peers can help individuals make beneficial and risky investments – they can provide information, insure against shocks, and increase aspirations. In particular, social networks can play an important role in boosting entrepreneurship, be it by providing financial support, and motivation, possessing complementary skills, or giving and taking advice. The gender gap in entrepreneurship in developing countries has been in part due to a lack of social networks for women. Business training programs are often prescribed to close the entrepreneurship gap, but evidence suggests that more than this might be needed ([McKenzie & Woodruff 2014](#)). In this paper, we study how leveraging social network ties in conjunction with an entrepreneurship training program can be a potential solution to improve entrepreneurship outcomes and the economic livelihood of women in rural settings.

We conduct an RCT in  $\sim 30$  villages in rural Nepal where we first divide villages into a pure control or treatment group. In treated villages, we either pair women with members in the village (with varying social distances and network centralities) to attend a business training program, or ask them to attend the program alone or not attend it at all. Our sample is primarily employed in agriculture, but we find that 42% express a willingness to open businesses, but 28% do not think they have the capability to do so. Moreover, those who have opened up businesses also have lower risk aversion and higher aspirations. This suggests that a lack of perceived or actual capability, aspirations, and risk-taking can affect decisions to open businesses. In line with this, we provide a short three-day training program for which women would either be treated alone or treated in randomly chosen pairs. The training taught them how to do basic accounting, develop a business plan, and provided information on market access. Additionally, the training included a video on how being an entrepreneur made lives better for women in a similar context to improve aspirations.

We ask whether training women alone or in randomly formed network pairs can increase their likelihood of taking various steps to set up businesses. Moreover, we also randomise the implementation of an additional “connections module” in which we emphasize the importance of pooling network contacts to open businesses. In particular, paired trainees are asked to pool their network contacts and think of ways these contacts can help each other. This allows us to compare the direct value of a peer in terms of being trained with them with the indirect value of being able to access their network contacts. The key experimental variation we focus on is whether women attend the training alone versus paired randomly with a person chosen from their social network and whether or not they attended the connections module.

Our paper focuses on measuring the potential impact that network-sourced pairs have on improving entrepreneurship outcomes and increasing aspirations. Moreover, we leverage the

random variation in the identity of the peer to study if the treatment effect differs as a function of the network position of the peer. It has been shown that using documentaries of success stories from similar backgrounds helps increase aspirations (Bernard et al. 2014). In terms of business trainings, Field et al. (2016) shows that training in the presence of a friend helps improve business outcomes. In our paper, we disentangle this peer effect by randomly varying the network position of the peer and using social distance (i.e., how socially close the peer is) and centrality (i.e., how connected the peer is) as two explanatory factors. We provide a theoretical framework to think through the interaction between centrality and social distance. We hypothesize that support between pairs increases with social distance (Goeree et al. 2010). The effect of centrality is complex, where connecting to central people may give access to more opportunities, boost aspirations, and help improve risk-sharing outcomes. At the same time, central people might not be incentivized to support individuals who are not friends.

We measure various immediate and long-term outcomes (after one year) to test the effect of the treatments. We measured the immediate outcomes at the end of the three training days. We measure aspirations (along various dimensions), willingness to open a business, take up of loans and savings accounts, and business knowledge. First, we find that across the board, training significantly improves outcomes. Second, we find that while the connections module has a higher treatment effect in terms of magnitude for most outcomes, the additional impact is only sometimes significant. This is despite the fact that women in this treatment arm pool about 6 contacts on average. This suggests that peers mainly have direct value. Third, we find that being paired did not significantly improve outcomes on average except for certain pair types depending on their network position. Interestingly, pairing is always beneficial when the matched person is a friend.<sup>1</sup> Moreover, when we interact this with the “centrality” of the peer i.e. how connected they are in the network, we find that pairing matters only when individuals are paired with a close friend who is central. Individuals paired with a central friend report a significantly higher willingness to open a business and are more likely to take-up additional resources to help with setting a business. This finding can help bridge the gap between training and take up of entrepreneurship by using a community-based approach. This is also largely in line with the literature on networks where central individuals exert greater influence over others.

One year later, we find that only 3% of our sample has opened up businesses with significantly but only slightly higher (but insignificant) treatment effects for those who were treated alone when compared to the pure control. Importantly, these effects are statistically indistinguishable from the effect on those who were paired with a random person. We also

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<sup>1</sup>We define a friend as a person who has a network distance less than or equal to 2 i.e. strictly lower than the median social distance equal to 3.

continue to detect significant effects of the training in that those who were trained are significantly more likely to have opened up a new savings account, taken a loan, and saved more compared to those in pure control villages. Further, the treatment groups are significantly more likely to report having spoken about opening businesses with their peers in the last year. Finally, those who were paired are significantly more willing to sign up for a potential commitment savings account from which they would only be able to withdraw funds for business expenses. This suggests that while the effects of the training are modest, treated individuals have taken steps and are still willing to take steps toward opening businesses even one year later.

The observed benefit from training with a peer can arise due to multiple mechanisms. We contribute to understanding possible mechanisms that can drive these peer effects and find that the effect is primarily due to motivation and the ability to collaborate and help each other in the future. First, while we show that being paired with a friend, particularly one central in the network, led to a significant increase in the willingness to open a business and in the take-up index compared to being treated alone, it is important to explore if this effect can be explained by the peer’s demographic characteristics. We show that the effects of being matched with a central friend, compared to being treated alone, are larger than other pair-categories for most outcomes and significant for take-up of additional assistance, even after controlling for similarity between the peers along other dimensions such as age, caste, education, marital status, and income. Moreover, the effect of network distance and centrality is large and significant even when we control for peers having a higher value in these dimensions than the individual.

Next, we find that the pairs did not necessarily learn better together. To this effect, we find that knowledge during and after the training is similar between treated and control groups, irrespective of whether women were paired or not. In line with this, we also do not see any impact on performance (i.e., profits) in a business game conducted during the training. Instead, we provide evidence that suggests that central friends might provide motivation and encouragement. In line with this, we find that the treatment significantly benefits those who had low-income aspirations in the baseline. Moreover, the majority of paired participants revealed that motivation was the reason why they thought pairing was beneficial. Finally, having a friend as a training partner can help strengthen the existing network, which can be relied on in the future. This is even more true when individuals are matched with a central friend, as they are significantly more likely to report wanting to meet and collaborate in the future. In line with this, we find effects one year later that the 38% of those matched with a peer reported reaching out to each other for advice, borrowing-lending money, and discussing ideas about forming a business.

Our paper contributes to experimental literature on peer effects on learning and the impact

of business training programs. Peer effects are important in various settings, from adopting new technology (Beaman et al. 2021) to learning about financial products (Banerjee et al. 2013, Jack & Suri 2014) and classroom interactions (Duflo et al. 2011, Zárate 2023). For example, Duflo et al. (2011) shows how ability-based peer effects exist, while Zárate (2023) shows that more socially central peers help better with academic performance. Similar to the latter, we show the importance of central and proximate peers for women’s entrepreneurship in developing countries. With a novel design, we aim to tease apart why peer effects can improve the willingness to open a business. In the entrepreneurship literature, Lerner & Malmendier (2013) find that peer type matters in MBA class. Being exposed to peers with prior business experience reduces unsuccessful entrepreneurial attempts. In our paper, we classify peer types depending on their network position: social distance and centrality and comment on this channel by showing if peers can provide skills or motivation to increase the number of entrepreneurial attempts and their success.

There is significant heterogeneity in existing literature regarding the effect of business training programs (McKenzie & Woodruff 2014, McKenzie et al. 2021). Particularly looking at training with peer interactions, Cai & Szeidl (2017) illustrate the significant effects of being paired with higher quality peers on firms’ sales and profits. They highlight how indirect peer effects through access to larger networks benefited the treated individuals. In our paper, we are able to measure the direct effect of being paired with a peer given that we mapped the underlying village network and comment on the indirect effect explicitly including a treatment arm to do so. Field et al. (2016) establish how training with a friend as a partner improves business outcomes. We explore if this effect is limited to friends by randomly varying social distance and the peer’s centrality and commenting on the mechanisms through which peers could have positive effects. We find that the impact is limited to being paired with friends, particularly central ones. This finding suggests that social networks play an essential role in the decision to be an entrepreneur. Moreover, we find modest effects of training that emphasize the importance and potential of social ties in sharing risk and providing skills, thereby allowing us to contrast between the direct and indirect value of peers that existing work has not done. Stronger replications of this treatment arm that strengthen community ties can be a first step towards bridging the gender gap.

The rest of the paper is organized as follows. Section 2 describes the experiment and the data, followed by Section 3, which looks at the estimation strategy. Section 4 sketches a possible framework to understand our intervention. Section 5 presents the results and Section 6 concludes.

## 2 Data and Experimental Design

We conduct our surveys and experiments in 30 villages in rural Nepal including a baseline sample with about 2800 women, the RCT and endline survey with 1200 women, and a follow-up survey with about 750 women.<sup>2</sup> We outline the various components of our data below.

### 2.1 Baseline Networks and Demographics

We conducted a detailed baseline survey with about 2800 women across all villages in our sample. We collected data on demographic characteristics such as age, caste, education, aspirations, wealth, source of income and marital status. Data on aspirations were collected in line with the procedure outlined in [Bernard & Seyoum Taffesse \(2014\)](#). We measured aspirations around agricultural investments, non-agricultural investments, and income. Finally, we also collected a list of women whom the individual reports being inspired from.

On average, a village comprised 70 households, with an average of 100 women per village. We used a village census to administer the network survey to every woman in the village ending up with a sample of  $\sim 2800$  women aged 18-60 years.

In addition to this, we require detailed network data to ensure experimental variation in the nature of pairs in the training. The networks questionnaire included questions designed to elicit information about social networks, inspired by [Banerjee et al. \(2013\)](#). These questions are meant to collect data on whom individuals report being friends with. The average number of connections in the undirected friendship network is  $\sim 5$  links.

### 2.2 Baseline Findings

Baseline summary statistics are presented in Table [A.1](#). The average age of women in our sample is 31 and 92% of them are married. Around 46% of our sample has no education. In the village network, we see that on an average women have five friends.

On average, women are seen to be risk averse with a risk-aversion level of around 4.6 where

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<sup>2</sup>We focus on networks of only women, due to the high emigration rate of men either to Kathmandu or abroad, as shown by our pilot experiment conducted in spring 2018. In the districts we worked in, social networks are often gender-specific and women play an important role: they are responsible for households' finances, agricultural production and their children.

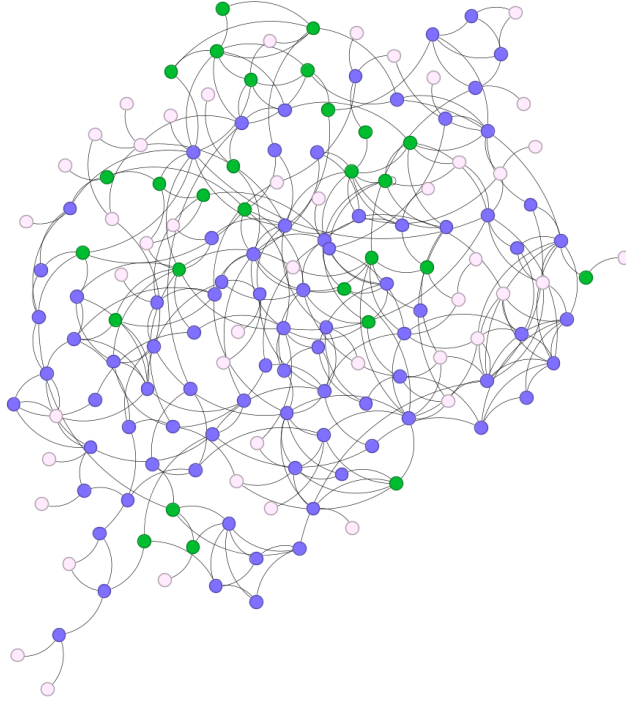


Figure 1: Women with and without an existing business in an example village.

6 stands for very risk averse and 1 stands for risk loving. Risk preferences were elicited using a choice experiment involving a series of lotteries and a fixed payment. We find that roughly 22% of women report having opened businesses already but 42% report a willingness to do so. 84% aspire to earn an income higher than their current income while 23% aspire to spend more on non-agricultural business expenditures than their current investment.

### 2.2.1 What are the barriers that prevent women from opening up businesses?

We find that women with a business have on average 20% higher income than the ones with no business. We correlate whether or not they have opened businesses already with their baseline characteristics. These results are shown in Table A.2. One of the main characteristics determining business ownership is age. Younger women are more likely to report having a business. Similarly, women who are more educated are more likely to have a business ownership – those with higher education are more likely to and those with no education are less likely. This is in line with what we would expect. Women who already have a business are also less risk averse. Naturally, they also have higher aspirations for investment in non-agricultural business.

When those who haven't opened up businesses were asked about why they haven't done so

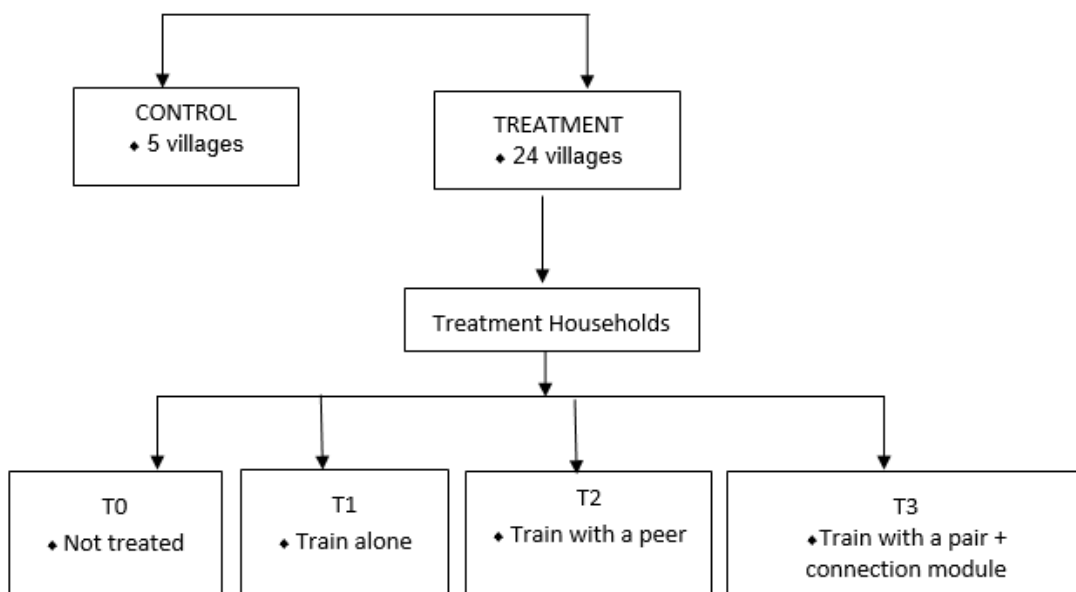
already, we find that 28% say that they feel they are not capable and 23% say that they lack the financial ability. We correlate willingness to open businesses with baseline demographics, networks, aspiration, and other variables such as risk aversion. These results are shown in Table A.3 and highlight how peers can help along various dimensions. We find that those who are more risk averse are correlated with not being willing to open businesses suggesting that risk-sharing with peers might assist in opening up businesses. Moreover, those who are more educated are correlated with being more likely to open businesses suggesting that skill complementarities with peers might be helpful as well. Finally, those who have higher aspirations are more willing to open businesses suggesting that peers can potentially be used to motivate and boost aspirations that can then be channelled into opening businesses.

## 2.3 Experimental Design

We conducted our experiment in September 2022 which consisted of a three-day entrepreneurship training motivated by the ILO SYIB module. The training typically lasted 3 hours per day and individuals were given 100 Rs/day (1 euro) for participation. The training focused on building a business plan, setting savings goals, increasing aspirations and market access.

Figure 2 represents our two-step randomisation design. First, we allocated villages to Pure Control and Treatment. Those in treatment villages were then randomly allocated either to the control group or one of the three treatment arms across all villages at an individual level.

Figure 2: Experimental design





From the universe of all women in the village, we exclude the ones that already have a non-agricultural business. The others get randomly allocated into one of the four groups.

- T0: No Training: This group of women do not receive training but live in Treatment villages. They can be thought of as groups to study potential spillovers with.
- T1: Women attend the training and set savings goals alone.
- T2: Women attend the training with a pair and set savings goals together. The pair vary in centrality and distance from each other.
- T3: Women attend the training with a pair and set savings goals together. In addition, the pair are provided with a 30-minute connection module that highlights the importance of networks and sharing contacts for entrepreneurship. The pair vary in centrality and distance from each other.

The Treatment with the connection module (T3) is identical to T2 except for the connection module. The connection module presents the participants with a list of reasons why relying on social networks is important to starting a business and asked them to pool their network contacts. We highlight three main reasons: i) Information ii) Complementarity in skills and iii) Risk pooling. The pairs in addition list their contacts that could potentially help them in opening up a business together. In addition to the direct value of being paired with a friend, T3 explores the indirect value by encouraging pairs to share contacts of people in their network they could rely on for opening a business. In addition to the 2-hour training, the connection module lasted for 30 minutes where we highlighted the indirect value of connections: financial support, advice and risk sharing.

Finally, we randomise individuals into T2 and T3 by stratifying along social distance and differences in centrality. This is to ensure that we were powered to detect heterogeneous effects by these characteristics and to ensure that T2 and T3 are balanced along these lines.

### 3 Theoretical Framework

In this theoretical framework, we specifically focus on the role of heterogeneity in the network characteristics of the pair on their outcomes when they attend the training together. There are two variables of interest: distance between the participant and the person they are matched with i.e.  $d_{ij}$  and the network centralities of the pair i.e.  $\phi_i$  and  $\phi_j$ . This can be interpreted as the number of connections they have in the underlying social network.

Consider the following utility function where agent  $i$  chooses the level of effort (savings, business effort etc) depending on private and social returns.

$$\begin{aligned}
U(e_i) = & \underbrace{\theta_0 e_i}_{\text{private returns to effort}} + \underbrace{\theta_1 \alpha(d_{ij})(e_i e_j)}_{\text{returns depending on peer effort}} + \underbrace{\beta_0 \phi_j e_i}_{\text{direct effect of peer centrality}} \\
& + \underbrace{\beta_1 f(\phi_i - \phi_j) e_i}_{\text{effect of gap between centralities}} + \underbrace{\lambda \alpha(d_{ij}) f(\phi_i - \phi_j) e_i}_{\text{interaction between distance and centrality}} - \underbrace{c(e_i)}_{\text{cost of effort}}
\end{aligned}$$

where  $c''(e_i) > 0$ .  $d_{ij}$  is the network distance between  $i$  and  $j$ . (Degree) Centrality of  $i$  and  $j$  is  $\phi_i$  and  $\phi_j$ . Note that  $\alpha : R^+ \rightarrow R^+$  and  $f : R \rightarrow R^+$  are functions that map network characteristics to positive scalars. Note the following additional assumptions:

1.  $\theta_0 > 0$  : i.e. there are positive private returns to effort.
2.  $\theta_1 > 0$  and  $\alpha' < 0$  i.e. there are positive complementarities falling with distance.
3. We will not make any further assumptions on the shape of  $f$  but without loss of generality, assume that  $\beta_1 > 0$  and  $\lambda > 0$ .

We do not make assumptions on  $\beta_0$ . This can be positive if getting matched with a more central partner is inspirational, for example. Alternatively, it can be negative, if getting matched to a central partner implies that the partner may not be able to help out in future as they are more likely to be busy etc.

Let us first derive an expression for optimal effort  $e_i^*$ .

$$c'(e_i^*) = \theta_0 + \theta_1 \alpha(d_{ij}) e_j + \beta_0 \phi_j + \beta_1 f(\phi_i - \phi_j) + \lambda \alpha(d_{ij}) f(\phi_i - \phi_j)$$

### 3.1 Effects of Treatment Arms

Let's consider the differences in treatment effects across arms. Let us assume, without loss of generality, that costs are quadratic in effort so  $c(e_i) = e_i^2$ . T3 likely increases  $\beta_1$  to  $\beta_1'$  and  $\lambda$  to  $\lambda'$  by making the scope for social support and sharing of contacts more salient among the pairs. Then, the optimal effort for individuals in different treatment arms is as follows:

1. T1:  $e_i^* = \frac{1}{2}\theta_0$
2. T2:  $e_i^* = \frac{1}{2}(\theta_0 + \theta_1\alpha(d_{ij})e_j + \beta_0\phi_j + \beta_1f(\phi_i - \phi_j) + \lambda\alpha(d_{ij})f(\phi_i - \phi_j))$
3. T3:  $e_i^* = \frac{1}{2}(\theta_0 + \theta_1\alpha(d_{ij})e_j + \beta_0\phi_j + \beta'_1f(\phi_i - \phi_j) + \lambda'\alpha(d_{ij})f(\phi_i - \phi_j))$

Under the assumptions made so far, it is already clear that  $e_{iT1}^* < e_{iT2}^* < e_{iT3}^*$ .

### 3.2 Heterogeneous Effects of Distance and Centrality

Consider the following proposition.

**PROPOSITION 1.**

$$\frac{\partial e_i^*}{\partial d_{ij}} = \theta_1\alpha'(d_{ij})e_j + \lambda\alpha'(d_{ij})f(\phi_i - \phi_j) < 0.$$

This directly follows from our assumption that  $\alpha$  falls with network distance i.e.  $\alpha' < 0$ . The direct effect of distance (via effort complementarities) and the interaction effect (via interaction with peer centrality) is higher when the matched person is closer.

**PROPOSITION 2.**

$$\frac{\partial e_i^*}{\partial \phi_j} = \beta_0 + \beta_1 \frac{\partial f(\phi_i - \phi_j)}{\partial \phi_j} + \lambda\alpha(d_{ij}) \frac{\partial f(\phi_i - \phi_j)}{\partial \phi_j} > 0$$

*under the above cases if and only if:*

1.  $f'_{\phi_j} < 0$  and  $\beta_0 > \tau(\phi_i, \phi_j, d_{ij}) > 0$  where  $\tau$  is a threshold depending on agent's absolute centralities and the distance between them. It is easy to check that this threshold is equal to  $-\beta_1 f'_{\phi_j} - \lambda\alpha(d_{ij})f'_{\phi_j} > 0$  in this case.
2.  $f'_{\phi_j} > 0$  and  $\beta_0 > \tau(\phi_i, \phi_j, d_{ij})$  where  $\tau$  is a threshold depending on both agent's centralities and the distance between them and  $\tau < 0$ .

The effect of centrality is more involved. The derivative can be computed as above. The sign of the above derivative depends on the shape of  $f$  and the magnitude and sign of  $\beta_0$ . Under the first condition,  $\beta_0$  i.e. the direct return from peer's centrality (eg: inspiration,

perceived social support in future etc) must be positive and large enough. Under the second condition,  $\beta_0$  doesn't have to be large and positive and can be negative as well. However, it should not be too negative i.e. must not fall below the specified threshold.

### 3.2.1 Intuition behind Proposition 2

In order to understand what the proposition implies intuitively, consider the following cases depending on the shape of  $f$ .

1. Case 1: Only incentives to share contacts matter i.e.  $\frac{\partial f(\phi_i - \phi_j)}{\partial(\phi_i - \phi_j)} < 0$  : In this case, individuals do not wish to share contacts or socially support those who are different to them in terms of centrality as there are no incentives to share or support. Support can also involve being willing to collaborate with the person in future or motivate them and boost their aspirations.

Example:

$$f = k - (\phi_i - \phi_j)^2 \text{ where } k > 0.$$

2. Case 2: Only altruism matters i.e.  $\frac{\partial f(\phi_i - \phi_j)}{\partial(\phi_i - \phi_j)} > 0$  : In this case, individuals wish to share contacts or socially support those who are more different to them in terms of centrality as they are altruistic and want to help others in their community.

Example:

$$f = k + (\phi_i - \phi_j)^2 \text{ where } k > 0.$$

3. Case 3: Both matter i.e.  $\frac{\partial f(\phi_i - \phi_j)}{\partial(\phi_i - \phi_j)} < 0$  until a threshold value of  $\phi_i - \phi_j$  after which  $\frac{\partial f(\phi_i - \phi_j)}{\partial(\phi_i - \phi_j)} > 0$  : In this case, individuals wish to share contacts or socially support those who are similar to them in terms of centrality (as there are incentives to share) but become altruistic if the other person's centrality falls below a threshold.

Example:

$$f = (|\phi_i - \phi_j| - k)^2 \text{ where } k > 0.$$

Let us analyze the proposition for Case 1.

$f'_{\phi_j} > 0$  if and only if  $\phi_i > \phi_j$ . In that case, condition 2 of the proposition applies and higher centrality of peer is beneficial. This makes sense: if my centrality is very high, then in a world where only incentives matter, my matched peer's centrality must also be very high for me to share contacts and provide social support. The direct effect of my peer's centrality (i.e.  $\beta_0$ ), if negative, (due to peer being more busy etc) should not be too negative otherwise a higher centrality of peer will decrease optimal effort.

Case 2 is analogous and the reverse of this. In that case,  $f'_{\phi_j} < 0$  if and only if  $\phi_i > \phi_j$  since  $i$ 's altruism is more likely to be at work if  $j$  is less central than  $i$ . Condition 1 of the proposition applies.  $\beta_0$  must be very large and positive for the peer's centrality to have a positive effect on optimal effort.

The third case is a combination of cases 1 and 2 and depends on the threshold gap between the two centralities. If the gap is too high, case 2 will apply and altruism will be at work. If the gap is low, then case 1 will apply and incentives will matter more.

As a result, we can predict the effect of distance and centrality under all possible cases. For example, if we find that those matched to central peers choose higher business effort, then we know that the conditions in proposition 2 must be true. We can then check if pairs with different centralities shared fewer contacts with each other under T3 (to assess the shape of  $f$ ) and if higher centrality is beneficial for those in T2 (to assess the sign of  $\beta_0$ ).

## 4 Estimation Strategy

We measure the impact of the training using various specifications that help us understand if the training is helpful in general, if it has higher returns for those who were paired, if it has higher returns for those who attended the connections module, and if it works for pairs with specific network and demographic characteristics.

### 4.1 Endline Outcomes

We will look at the effect of the treatment on four major endline outcomes measured immediately after the training. This includes the Business Aspirations Index, Readiness to Invest, Business Index, Take up Index. We measure these outcomes with our end-line survey. In each case, we construct a weighted average using the inverse-weighting method proposed in [Anderson \(2008\)](#). We create the following indices:

1. **Business Aspirations Index:** We compute a measure of business related aspirations including yearly non-agricultural investment, aspirations for monthly income, and savings. We elicit aspirations by following the procedure in [Bernard & Seyoum Taffesse \(2014\)](#). We ask individuals the minimum and maximum of the relevant variables in their neighbourhood, how much they currently do, and how much they wish to do in the corresponding time frame. We construct the weighted average of the individual's aspirations on all of these dimensions to create the index.

2. **Business Index:** For the business index, we construct a weighted average of various variables including whether the individual thinks they have the skills to open a business, on a scale of 1 to 5 how ready they are to start a business, if they are willing to submit their business plan for a hypothetical competition, whether they want to take a loan for the business, and whether they want to open a savings account for their business. These questions were framed as hypothetical questions.
3. **Takeup Index:** The takeover index is constructed by taking a weighted average of variables that indicate that the individual seeks additional assistance to set up a business. We ask the following questions related to the hypothetical takeover of options. We ask if individuals would take up the opportunity of additional paid trainers and mentoring workshops in the next year. If so, we ask how much they would be willing to pay for each of those opportunities. We also ask if they were willing to take advice from members of their community regarding opening a business. All these variables are used to construct the take-up index.

In addition to this, we also measure the impact of the treatment on the the binary variable **Ready to Invest** indicating whether the respondent reported that they were willing to invest in a business.

## 4.2 Follow-up Outcomes

In addition to the endline outcomes, we measure outcomes comparing the treatment, spillover, and control groups one year after the training. These outcomes include whether or not the individual has opened a business, their monthly income, whether they have opened a new savings account, the amount of money they save, and whether they have taken a loan. In addition to these main economic outcomes, we also measure other outcomes including income aspirations, whether individuals sign up for a potential commitment savings account for their business from where they cannot take out funds unless they use it for business-purposes, record-keeping for agriculture, and other outcomes regarding community interactions.

## 4.3 Empirical Specifications

We outline the various empirical specifications below.

### 4.3.1 Impact of Training

In the main specification where we study the impact of the treatments, our outcome variables are regressed on the treatment dummies using the specification described below:

$$Y_i = \alpha + \beta_1 T1_i + \beta_2 T2_i + \beta_3 T3_i + \epsilon_i$$

$Y_i$  is an outcome measure for individual  $i$ ,  $T1_i$  is a dummy variable that takes value 1 if the individual was treated alone and 0 otherwise. Similarly,  $T2_i$  is a dummy variable that takes value 1 if the individual was treated with a pair and  $T3_i$  is a dummy variable that takes value 1 if the individual was treated with a pair and an additional connection module that emphasizes the importance of networks. Importantly, in all specifications that follow, we compare the treatment groups with individuals in the pure control group for the main specification. Standard errors are clustered at the level of the village.

### 4.3.2 Impact of Training with Peer

In this specification, we club treatment 2 and 3 together and create an indicator variable that is equal to 1 for all women who are treated in a pair. We regress outcome variables on the treatment dummies using the specification described below:

$$Y_i = \alpha + \beta_1 T1_i + \beta_2 (T2_i + T3_i) + \epsilon_i$$

$Y_i$  is an outcome measure for individual  $i$ ,  $T1_i$  is a dummy variable that takes value 1 if the individual was treated alone,  $T2_i + T3_i$  is a dummy variable that takes value 1 if the individual was treated with a pair. Standard errors are clustered at the level of the village.

### 4.3.3 Impact of peer types

We consider differences in outcomes for different pairs in treatments 2 and 3 compared to treatment 1. Let  $d_{ij}$  be the network distance between  $i$  and  $j$  and let  $\phi_i$  be the network centrality (eg: number of connections) of agent  $i$ . First, we combine  $T2$  and  $T3$  and split individuals into friends and non-friends. We defined friends as pairs with social distance equal to 1 or 2 ( $d_{ij}=\{1,2\}$ ). Then, we estimate the following regression:

$$Y_{iv} = \alpha + \beta_1 \textit{Friend} + \beta_2 \textit{NonFriend}$$

We exclude the control group in the above specification so that we can compare the effect of being trained with a friend or non-friend to being trained alone.

Then, in another specification, we classify peer type into four categories: friendcentral, friendnoncentral, nonfriendcentral and nonfriendnoncentral. For any pair  $ij$ ,  $j$  is assigned to the category friend-central if their pair  $i$  has weakly higher degree centrality compared to  $j$ , i.e.  $\phi_i - \phi_j \geq 0$  and  $j$  and  $i$  have a network distance less than or equal to 2.

$$\begin{aligned} Y_{iv} = & \alpha + \beta_1 \textit{FriendXCentral} + \beta_2 \textit{FriendXNonCentral} \\ & + \beta_3 \textit{NonFriendXCentral} + \beta_4 \textit{NonFriendXNonCentral} + \epsilon_v \end{aligned}$$

As before, we exclude the control group and compare the effect of being trained with a specific pair type to being trained alone. Note that this regression specification nests both the effects of centrality and distance.

## 5 Results

### 5.1 Balance

Before proceeding with the results, we first check for balance in baseline characteristics among the control and treatment groups. We check for balance on baseline variables including demographic, network, and business characteristics such as willingness to open a business, age, education, caste, network connections (i.e. degree centrality), and aspirations for income and non-agricultural expenditure. Standard errors are clustered at the village level for all regressions used to test for balance. First, we compare individuals in the pure control villages with treated individuals in treatment villages. We do this separately for each treatment status in Table B.2. We find that individuals in the pure control group and various treatment groups are similar along most characteristics. However, in order to ensure that our results are robust, we will present a robust version of all the above specifications where we use post double selection Lasso using the method in [Belloni et al. \(2014\)](#).



Next, we check for balance between all individuals in pure control and treated villages. This is going to be critical, especially for the results of the 1 year follow-up survey where we will separately compare the pure control group with the various treatment groups. Table B.1 shows that individuals in pure control and treatment villages are similar across almost all characteristics. Table B.1 shows that individuals in pure control and treatment villages are similar across almost all characteristics suggesting that imbalance is not a concern.

## 5.2 Endline Results

In this section, we look at the impact of the training immediately after the end of the third day of training. As seen from Table 1, the treatments do not affect business aspirations but Treatment 3 significantly increases an individual’s stated readiness to invest in a business by 14 percentage points. The effect is insignificant for T1 and significantly lower than the effect of T3 (at 10%).

The treatments also lead to a significant increase in the business index and take-up index. Note that the differences between Treatment 1,2, and 3 are not statistically significant for almost all outcomes implying (a) that pairing, on average, does not lead to a higher treatment effect, and (b) the connection module while leading to a treatment effect of higher magnitude in most cases, does not have a significant additional impact. This is despite the fact that individuals in T3 group shared 6 contacts on average. As shown in Table D.4 in the appendix, more connections were pooled among individuals in the same caste.

Table 1: Impact of the training

VARIABLES	(1) Business Aspirations	(2) Ready to invest	(3) Business Index	(4) Take-up Index
Treatment 1	-0.0454 (0.0641)	0.0680 (0.0474)	0.387*** (0.0989)	0.240*** (0.0835)
Treatment 2	-0.0483 (0.0582)	0.0940* (0.0467)	0.344*** (0.112)	0.307*** (0.0900)
Treatment 3	0.0236 (0.0726)	0.141*** (0.0392)	0.443*** (0.0867)	0.253*** (0.0763)
Constant	-0.0768* (0.0433)	0.704*** (0.0283)	-0.153* (0.0792)	-0.113* (0.0622)
Observations	1,201	1,199	1,186	1,183
R-squared	0.001	0.016	0.036	0.028
Treatment 1=2	0.968	0.635	0.706	0.415
Treatment 2=3	0.288	0.432	0.379	0.534
Treatment 1=3	0.434	0.0910	0.455	0.829

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Notes: This regression treats the control group as the base category. Standard errors are robust and clustered at the village level.

### 5.2.1 Training with a peer is marginally better

As seen above, we find that on average, being paired does not necessarily help improve the outcomes of the training. Table 2 shows that this is true even when we combine Treatment 2 and 3 into one indicator variable that is equal to 1 if the individual is in either arm. We find that pairing does not lead to significant additional improvement in endline outcomes when compared to Treatment 1, even though the effect is always larger in magnitude than that of not being paired. For example, being paired leads to a 12 percentage point increase (significant at 1%) in readiness to invest compared to a 7 percentage point increase (insignificant) for being treated alone. However, this difference is not statistically significant.

Table 2: Does being paired help have better outcomes?

VARIABLES	(1) Business Aspirations	(2) Ready to invest	(3) Business Index	(4) Take-up Index
Treatment 1	-0.0454 (0.0641)	0.0680 (0.0474)	0.387*** (0.0989)	0.240*** (0.0835)
Treatment 2 and 3	-0.0132 (0.0564)	0.117*** (0.0314)	0.392*** (0.0837)	0.280*** (0.0718)
Constant	-0.0768* (0.0433)	0.704*** (0.0283)	-0.153* (0.0791)	-0.113* (0.0621)
Observations	1,201	1,199	1,186	1,183
R-squared	0.000	0.015	0.035	0.027
Treatment 1==Pair	0.660	0.212	0.949	0.478

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Notes: This regression treats the control group as the base category. Standard errors are robust and clustered at the village level.

Table 3 shows the types of businesses individuals would want to open after being trained, conditional on being ready to invest. We find that those who are paired together during the training are more likely to want to open an agricultural business together when compared to the control group.

Table 3: Types of Businesses that individuals are willing to open

VARIABLES	(1) Agricultural Business	(2) Sewing	(3) Shop/Parlor	(4) Other Business
Treatment 1	0.0368 (0.0470)	0.0370 (0.0341)	-0.0923* (0.0494)	0.0184 (0.0173)
Treatment 2 and 3	0.116** (0.0436)	-0.0269 (0.0243)	-0.0956* (0.0471)	0.00681 (0.0119)
Constant	0.513*** (0.0335)	0.116*** (0.0175)	0.346*** (0.0401)	0.0239** (0.00961)
Observations	915	915	915	915
R-squared	0.011	0.006	0.010	0.002

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Notes: This regression treats the control group as the base category. Business type is equal to 1 if the individual reports wanting to open such a business and reports being ready to invest. Standard errors are robust and clustered at the village level.

### 5.2.2 Being trained with someone who is socially close is better

We now use the randomness in the identity of the matched peer in order to understand the conditions under which pairing can be helpful. We first distinguish between being paired with someone who is a friend.<sup>3</sup>

Table 4: Being paired with someone close in comparison to control

VARIABLES	(1) Business Aspirations	(2) Ready to invest	(3) Business Index	(4) Take-up Index
Treatment 1	-0.0601 (0.0624)	0.0589 (0.0467)	0.362*** (0.0921)	0.219*** (0.0754)
Paired (Friend)	-0.0695 (0.0608)	0.144*** (0.0337)	0.428*** (0.0891)	0.254*** (0.0751)
Paired (Not Friend)	-0.0301 (0.0644)	0.0811** (0.0384)	0.326*** (0.0911)	0.258*** (0.0663)
Constant	-0.0620 (0.0427)	0.713*** (0.0268)	-0.128* (0.0713)	-0.0913 (0.0563)
Observations	1,201	1,199	1,186	1,183
R-squared	0.001	0.015	0.033	0.023
Treatment 1== Paired with friend	0.905	0.0882	0.445	0.615
Treatment 1==Paired with nonfriend	0.713	0.579	0.707	0.517
Paired with friend==Paired with nonfriend	0.558	0.109	0.227	0.915

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: This regression treats the control group as the base category. Treated with a friend implies observations in Treatment 2 and Treatment 3 that are paired with someone with a social distance less than equal to two. Standard errors are robust and clustered at the village level.

As seen from the table above, being paired with a socially close individual is larger in magnitude than being paired with a non-friend for two crucial outcomes: readiness to invest and the business index. However, we are not powered to show that these differences are statistically significant. However, the difference between being paired with a socially close peer and being trained alone is significant for readiness to invest. On the contrary, the effect of being paired with an individual who is not socially close is not significantly different from being trained alone for any of the outcomes. In the robustness section, we run the same regression but use the characteristics of peers to classify pairs. We see that the effect of friendship is not driven by caste, education, wealth or age. This is important given the assortative nature of networks.

<sup>3</sup>We define an individual as a friend (or as socially close) if the network distance between them is strictly less than the median distance, equal to 3.

### 5.2.3 Being trained with a socially close and central person helps.

We further investigate who benefits from the intervention by considering the centrality of the individual, a person is matched with. As discussed before, this implies a two by two categorisation by social distance and centrality i.e. Socially close peers that are more central than the individual, socially close peers that are less central, non-close individuals that are more central and non-close individuals that are less central. We see that the training is more successful when individuals are paired with socially close individuals who are central in the social network. This is seen in Table 5 where we compare the pairs with Treatment 1 instead of the control group. "Friend X More Central" is an indicator variable that takes the value 1 if the pair is socially close and more central than  $i$  whereas "Friend X Less Central" is an indicator variable that takes the value 1 if the pair is socially close and less central than  $i$ .

Table 5: Impact of training with different friend type

VARIABLES	(1) Business Aspirations	(2) Ready to invest	(3) Business Index	(4) Take-up Index
Friend x More Central	-0.00151 (0.109)	0.114* (0.0653)	0.153 (0.156)	0.119* (0.0651)
Friend x Less Central	-0.0109 (0.0683)	0.0506 (0.0467)	-0.0583 (0.0850)	-0.0140 (0.0729)
Not Friend x More Central	-0.0173 (0.0843)	0.0159 (0.0570)	0.0117 (0.154)	0.0665 (0.0696)
Not Friend x Not Central	0.0519 (0.102)	0.0250 (0.0360)	-0.0724 (0.0878)	0.0372 (0.0741)
Constant	-0.0606 (0.0999)	0.741*** (0.0612)	0.0580 (0.128)	0.107 (0.0845)
Observations	681	682	671	670
R-squared	0.002	0.009	0.011	0.005
friendnoncentral==friendcentral	0.904	0.258	0.222	0.0514
friendnoncentral==nonfriendnoncentral	0.402	0.494	0.870	0.456
friendnoncentral==nonfriendnoncentral	0.940	0.518	0.645	0.199
central==noncentral	0.699	0.495	0.214	0.115
friend==nonfriend	0.727	0.132	0.401	0.980

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: This regression treats Treatment 1 as the base category. Friend includes pairs that have social distance less than or equal to two and nonfriend includes pairs with social distance greater than two. Friend x More Central equals 1 when the individual the respondent is matched with is a friend and more central than the respondent. Standard errors are robust and clustered at the village level.

The effect of having a friend who is central in the pair positively affects readiness to invest, and take-up index when compared to Treatment 1– the difference is significant at 10%.

#### 5.2.4 Robustness:

First, as shown in Table E.1 and E.2 the main results (studying the impact of the various treatment arms on endline outcomes) are largely robust to accounting for imbalance in baseline characteristics using the post double selection Lasso method in Belloni et al. (2014).  $T2$  does not have an effect on readiness to invest anymore but the remaining effects are significant as in the main specification. Further, as shown in Table E.3 we find that the effect of being matched with a peer who is close and more central is still significantly higher for readiness to invest when we account for any imbalance in baseline characteristics using the post double selection Lasso method in Belloni et al. (2014).

### 5.3 Long Term Effects after one year of Training

In the section above, we presented results based on immediate outcomes. In this section, we will be looking at outcomes based on a phone survey conducted in October 2023, one year after the training with a random subset of the original sample. We will compare the treatment group with those in the pure control villages while including a binary variable controlling for those in the spillover group i.e. control individuals in treated villages, as spillovers are likely to be active over this long time frame. To ensure that the pure control villages are not systematically different from the treated villages, we show a balance test in Table B.1 where we find that almost all characteristics are balanced between individuals in these villages. Crucially, this includes balance in baseline willingness to open businesses, education, and aspirations.

Table 6: Long-term effect of the training: Paired vs non paired

VARIABLES	(1) Opened Business	(2) Monthly Income	(3) New Savings Account	(4) Savings Amount	(5) Commitment Savings	(6) Taken a loan
Spillover	-0.0395** (0.0158)	-1,120 (3,732)	0.0471 (0.0426)	2,499 (1,792)	0.0327 (0.0620)	0.0502 (0.0424)
Treated alone (T1)	0.00591 (0.0212)	1,145 (3,955)	0.107*** (0.0376)	3,513** (1,582)	0.0633 (0.0677)	0.0874** (0.0381)
Treated with a pair	-0.00955 (0.0185)	5,311 (4,803)	0.0267 (0.0340)	2,526 (1,696)	0.127** (0.0561)	0.0759** (0.0322)
Constant	0.0395** (0.0158)	25,339*** (3,322)	0.197*** (0.0277)	3,913*** (1,244)	0.446*** (0.0490)	0.0674*** (0.0186)
Observations	750	749	752	744	751	752
R-squared	0.007	0.003	0.008	0.009	0.011	0.010
Spillover=T1	0.0126	0.357	0.151	0.520	0.607	0.417
Paired=Nonpaired	0.407	0.214	0.0698	0.515	0.200	0.752
Spillover=Paired	0.00923	0.110	0.658	0.985	0.0681	0.496

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Notes: This regression treats individuals in the pure control villages as the base category. Standard errors are robust and clustered at the village level.

We find that about 3% of individuals opened up businesses after one year of training. As shown in Table 6, we find that those who were treated alone were not any more likely to have opened up businesses when compared to those in pure control villages. However, this effect is significantly larger than the effect on the spillover group. We detect negative spillovers in this group in terms of whether they have opened businesses.

We do not find any effects of the training on monthly income. However, we find that those who have been treated are also significantly more likely to have opened up savings accounts, taken a loan, and saved significantly more. They are also more likely to report a willingness to sign up for our hypothetical commitment savings product where they can deposit an amount and will only be able to withdraw it for business expenses, as shown in Table C.2 in the appendix. Importantly, the effect on commitment savings is only significant for the treatment groups where individuals were paired together. As with all other outcomes, the effect of pairing is not significantly different from being treated alone.

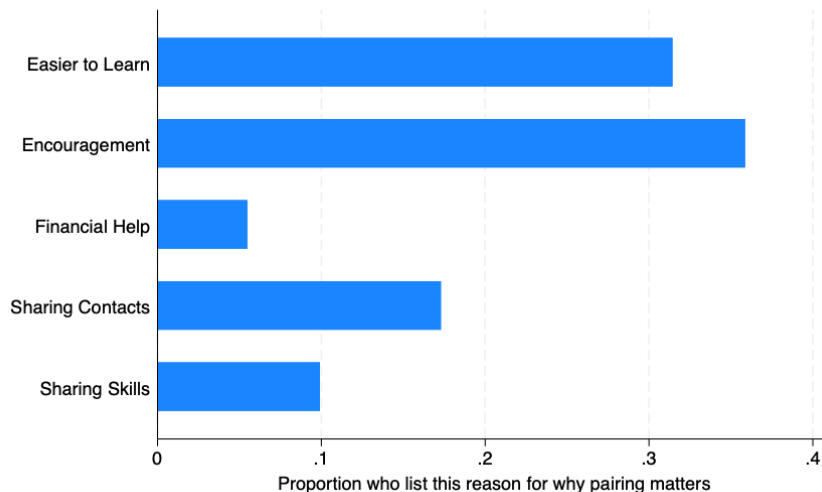
Finally, we combine treatment arms 2 and 3 and split them into four categories as above, depending on the distance and centrality of the matched pairs. We did not find any differences in long-term outcomes in terms of the type of peer an individual was matched with during the training. These results are presented in Table C.1 in the appendix.

We will now discuss the mechanisms behind the various results that we have seen so far.

## 6 Mechanisms

We observe that, on average, being paired does not significantly improve outcomes in the training. It is only being with a central friend that helps. In order to study the role of these pairs and understand why pairing doesn't work on average, we look at different potential mechanisms. First, we asked the perceptions of women who attended the training in pairs as to how pairing was useful rather than training alone. Figure 3 shows the responses to this question. Most of them reported receiving encouragement and support from their pair was a credible channel. 33% of women paired report having received encouragement from their partnered peer. This is followed by 31% of the women who report the training was easier to grasp due to being paired in the training.

Figure 3: Why does pairing matter?



Before proceeding with disentangling these mechanisms, we first look at various characteristics beyond centrality to understand if there is any confounder that may be driving the effect of being paired with a central friend.

### 6.1 Alternative explanations for the friend-central effect

First, we construct a similarity index to assess if the similarity between the peers along various characteristics leads to stronger treatment effects. An individual in T2 or T3 is more similar to their peer if they are in the same income group, age group, caste, marital status, or



education. We construct an index of these variables.<sup>4</sup> Table 7 shows these results where we compare T1 to various pair types and additionally control for similarity which is normalised to be between 0 and 1.<sup>5</sup> We find that the effect of being matched with a peer who is central on readiness to invest, business index, and take-up is still higher in magnitude than all other categories and is still significant for the take-up index.

Table 7: Effect of being matched with a Central Friend after controlling for Similarity

VARIABLES	(1) Business Aspirations	(2) Ready to invest	(3) Business Index	(4) Take-up Index
Friend x More Central	0.00640 (0.117)	0.139 (0.0988)	0.311 (0.190)	0.182** (0.0875)
Friend x Less Central	-0.0283 (0.0924)	0.0895 (0.0839)	0.175 (0.131)	0.0494 (0.0991)
Not Friend x More Central	0.00175 (0.0993)	0.0349 (0.0697)	0.138 (0.145)	0.128 (0.0877)
Not Friend x Not Central	0.0434 (0.137)	0.0602 (0.0689)	0.141 (0.125)	0.104 (0.0882)
Similarity Index	0.00756 (0.120)	-0.0485 (0.116)	-0.312 (0.265)	-0.133 (0.124)
Constant	-0.122** (0.0554)	0.772*** (0.0403)	0.234*** (0.0621)	0.127** (0.0527)
Observations	685	686	675	674
R-squared	0.001	0.009	0.006	0.005
friendnoncentral==friendcentral	0.646	0.357	0.406	0.0417
friendnoncentral==nonfriendnoncentral	0.386	0.409	0.780	0.205
friendnoncentral==nonfriendnoncentral	0.639	0.218	0.675	0.436
central==noncentral	0.953	0.720	0.521	0.0973
friend==nonfriend	0.628	0.0885	0.248	0.988

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: This regression treats Treatment 1 as the base category. We additionally control for the "Similarity Index" which is a weighted index of similarity along characteristics including income, age, caste, marital status, and education.

Next, we show in Table D.2 that the effect magnitude of being matched with a central friend is higher than Treatment 1 (and significantly so for readiness to invest and the business index), especially if the matched peer is not in the upper caste, is unmarried, is older, and has lower income. In other words, the centrality of the peer improves outcomes relative to attending training alone if the peer is not privileged to open businesses along with other characteristics.

We now proceed with disentangling various mechanisms that can explain why a central friend

<sup>4</sup>As before, we use the method proposed in Anderson (2008).

<sup>5</sup>This implies that similarity is equal to 1 for the most similar pairs in the sample.

can help over and above being trained alone.

## 6.2 Do pairs learn better together?

Learning can be a potential mechanism driving friends to be able to help each other learn better. We ask five questions that measure knowledge gained in the course of the training and take the proportion of correct responses to be the index. We collect this measure for both treatment and control groups. The questions are as follows: (a) What do you understand by a business, (b) What characteristics are required to be a successful entrepreneur, (c) What do you mean by fixed assets, (d) What sector does a beauty parlour come under, and (e) Above what break even percentage does the business become risky? The measure of knowledge is kept brief due to logistical constraints and is therefore likely to be noisy. The knowledge index is composed of the responses to these questions.

We also measure knowledge gained by the training by two additional variables measured during the training: game profit and yearly profit. Game profit records the performance on the first day of the training where women played an investment and saving game. Yearly Profit on the other hand was measured on the last day of the training, which is the amount of profit made in the exercise involving the business plan. Table 8 shows that these outcomes do not differ by whether the individual was trained alone or with a peer.

Table 8: Effect on Learning during and after the training.

VARIABLES	(1) Knowledge Index	(2) Profit (Game)	(3) Profit (Business Plan)
Treatment 1	0.724*** (0.0954)		
Treatment 2 and 3	0.671*** (0.102)	-6.208 (83.79)	465,002 (459,637)
Constant	-0.0690 (0.0847)	299.0*** (71.94)	458,013** (173,290)
Observations	1,110	725	723
R-squared	0.115	0.000	0.002
Treatment 1==Pair	0.470		

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: This regression treats the Control Group as the base category in Column 1 and Treatment 1 as the base category in Column 2. Standard errors are robust and clustered at the village level.

It can also be the case that women who attended the training with a friend may have been able to better discuss the material being taught. If this is the case then women treated with

a friend should perform better in the knowledge and performance in the training. We see in table D.3 that within  $T2$  and  $T3$ , there was no differential effect on these outcomes as a function of being matched with a friend, with a central individual, or any combination of the two.

### 6.3 Do pairs encourage each other?

Another possible channel driving peer effects could be encouragement. This effect is in line with the fact that friends who have more friends are likely to be ‘popular’ and, therefore, are better at encouraging. As seen from Table 9, women with lower baseline aspirations tend to benefit more from the training when they are paired. Women in  $T2$  and  $T3$  who had lower baseline aspirations had a significantly higher treatment effect on their readiness to invest and business index when compared to women who had higher baseline aspirations. This provides evidence that pairing perhaps helps women with lower baseline aspirations.

Table 9: Treatment effect by Baseline Aspirations

VARIABLES	(1) Business Aspirations	(2) Ready to invest	(3) Business Index	(4) Take-up Index
Treatment 1	-0.0289 (0.0850)	0.0829* (0.0474)	0.437*** (0.108)	0.259** (0.0971)
Treatment 2 and 3	-0.0446 (0.0688)	0.119*** (0.0381)	0.371*** (0.0997)	0.255*** (0.0808)
Income Aspirations	2.21e-08 (2.96e-08)	3.07e-08*** (6.11e-09)	7.52e-08*** (2.30e-08)	-6.50e-09 (1.62e-08)
t1 x Income Aspirations	-8.05e-08 (7.19e-08)	-2.31e-08 (1.31e-07)	-1.61e-08 (1.48e-07)	1.79e-07*** (5.65e-08)
t2t3 x Income Aspirations	-4.74e-08 (2.96e-08)	-1.07e-07*** (7.73e-09)	-1.32e-07 (8.48e-08)	-5.84e-08 (4.12e-08)
Constant	-0.0740 (0.0512)	0.706*** (0.0317)	-0.136 (0.0870)	-0.113 (0.0714)
Observations	933	930	920	919
R-squared	0.001	0.021	0.039	0.028

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Notes: This regression treats the Control Group as the base category. Standard errors are robust and clustered at the village level.

## 6.4 Do pairs provide indirect value in terms of access to network connections?

**Impact of Treatment 3:** Contact pooling and access to connections is the third channel that we look at. Treatment 3 i.e. where women were paired during the training and a connection module was designed to check if this is at work. This treatment does fare better in terms of magnitude but the effects are not significantly different compared to Treatment 2. On an average, women in Treatment 3 pool 6 friends. Moreover, we find that there is no difference as a function of age, degree, education and income of the peer, as shown in Table D.4. Being in the same caste leads to one additional friend being listed in the connection module. Further, we do not find heterogeneous effects by a number of contacts pooled in Treatment 3 as shown in Table D.5.

**Alternative Measures of Centrality:** We also do not find effects of a peer being more central when we use eigenvector centrality as a measure of influence. This also suggests that risk-sharing might not be a relevant mechanism. As seen from Table D.7, friend central defined differently using eigenvector centrality does not have differential effects compared to the other categories.

**Heterogeneity by Risk Aversion:** In addition to this, we do not find any heterogeneous effects by baseline risk aversion of the peer. As seen in Table D.6, being paired with a peer that is less risk-averse does not impact the outcomes of the training.

## 6.5 Are pairs likely to collaborate in future?

Lastly, friends may be more likely to want to open a business together if paired. As shown in Table 10, We find that individuals are more likely to report being willing to open business with a friend rather than a random individual. When asked to report if they were likely to open a business with the individual they were paired with, being friends has a strong and significant effect. This reinforces the argument that distance between pairs matters as they make plans together.

Table 10: Wanting to start a business together.

VARIABLES	(1)	(2)
	Pairs will meet in Future	Pairs will start Business Together
Friend x More Central	0.113** (0.0444)	0.143** (0.0655)
Friend x Less Central	0.105*** (0.0357)	0.155** (0.0559)
Not Friend x More Central	0.0122 (0.0268)	0.0742 (0.0563)
Degree	0.00496 (0.00427)	0.0116 (0.0131)
Constant	0.813*** (0.0461)	0.229** (0.0942)
Observations	436	435
R-squared	0.029	0.022
friendnoncentral==friendcentral	0.795	0.858
friendnoncentral==nonfriendnoncentral	0.0436	0.219
friendnoncentral==nonfriendcentral	0.0436	0.219
central==noncentral	0.671	0.470
friend==nonfriend	0.0107	0.0320

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Notes: This regression treats the Control Group as the base category. Both the variables are self-reported willingness to meet and start a business together respectively, as measured during the endline survey. Standard errors are robust and clustered at the village level.

Further, we find that one year later, individuals who are in the treatment group are also significantly more likely to report discussing business-related concerns with their social networks. This is shown in Table 11. 35% of individuals in treatment 2 and 42% of individuals in treatment 3 report meeting their matched peer. When asked what they spoke about, 85% report speaking to the peer for advice, 10% report interacting to borrow/lend money, and 5% report speaking about setting up businesses.

Table 11: Follow-up survey and Network Communication

VARIABLES	(1) Talk to anyone about business	(2) Talk to matched peer about business
Spillover	0.0194 (0.0273)	
Treated alone (T1)	0.0548* (0.0280)	
Treated with a pair	0.0874*** (0.0297)	
Treated with a friend + module (T3)		0.0571 (0.0588)
Constant	0.0226 (0.0154)	0.356*** (0.0506)
Observations	751	267
R-squared	0.019	0.003
Spillover=T1	0.320	
Paired=Nonpaired	0.325	
Spillover=Paired	0.0229	

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Notes: This regression treats the Pure Control Group as the base category. Both the variables are self-reported and show whether an individual talked to anyone or to the matched peer about businesses during the one year after the intervention. Standard errors are robust and clustered at the village level.

## 7 Conclusion

Peer effects are important, especially in helping women succeed as entrepreneurs. We document that training with a central friend helps improve willingness to open a business. One of the potential factors hindering women entrepreneurs is a lack of peer support. In this paper, we first study whether pairing women together for business training improves outcomes and if so, what kind of pairs are most helpful in terms of their network centrality and social distance. Firstly, we find that being paired with a friend helps increase people’s aspirations towards entrepreneurship. This effect lasts and people trained with friends are more likely to have taken loans for business.

Our field experiment is carefully designed to study the effect of having different peers from the network. Similar to the existing literature on networks that emphasize the role of central monitors (Banerjee et al., 2019) to influence people and spread information, in our setting, friends are more effective in supporting. In contrast, being paired with a central peer does not improve post-training or long-term outcomes unless the central peer is also a friend. Unlike in Breza & Chandrasekhar (2019) where the reputation effect is amplified by a central monitor,

in our context of learning from a business training, centrality does not play a role. This could be potentially because central people are busy and can be effective information spreaders but not necessarily supporters unless they happen to also be network peers.

We compare the direct value of friends to the indirect value in terms of providing access to the wider network using a treatment arm which makes the wider network of the peer more salient and asks the pair to share contacts. While the treatment arm that initiates network contact pooling is more effective on certain outcomes, we do not find that it is significantly stronger compared to the arm where individuals are paired without pooling contacts. This suggests that the direct value of being connected with a friend is more important than indirect in terms of increasing the effectiveness of the training program.

One's position in the network as a central individual has the strategic advantage of being connected to more people. This effect can primarily benefit their direct connections rather than everyone in the network. By connecting the business training literature to social networks, we find that adding a central- friend component to training helps women.

# Appendix

## A Baseline Tables

Table A.1: Summary Statistics

	(1)	
Age	37.98	(10.85)
Divorced	0.00141	(0.0375)
Married	0.918	(0.274)
Unmarried	0.0669	(0.250)
Widow	0.0134	(0.115)
Higher Education (Class 11, 12)	0.104	(0.305)
Informal_education	0.126	(0.332)
No Education	0.326	(0.469)
Primary (Class 1-5)	0.155	(0.362)
Secondary (Class 6-10)	0.249	(0.432)
University	0.0402	(0.196)
Belongs to Upper Caste	0.334	(0.472)
Degree Centrality	4.604	(2.167)
Eigen Vector Centrality	0.00966	(0.0130)
Own Non Agr. Business (Yes/No)	0.220	(0.415)
Feel not Capable	0.277	(0.448)
Willingness to Open		
Non Agr. Business	0.419	(0.494)
Risk Aversion (1-6)	4.610	(1.406)
Aspirations- Annual Non Agr. Investments	592607.8	(2991506.9)
Aspirations- Monthly Income	556120.4	(13902715.0)
Aspirations- Annual Agr. Investments	307888.2	(1716845.5)
Income Aspirations > Current Income	0.845	(0.362)
Non Agr Exp Asp > Current Exp	0.246	(0.431)
Observations	2840	



Table A.2: Who have already opened businesses?

	(1)
	Own Non Agr. Business (Yes/No)
Age	-0.0944***
Divorced	0.00270
Married	-0.0354
Unmarried	0.0499**
Widow	-0.0250
Higher Education (Class 11, 12)	0.129***
Informal_education	-0.00791
No Education	-0.181***
Primary (Class 1-5)	0.00828
Secondary (Class 6-10)	0.00354
University	0.221***
Belongs to Upper Caste	-0.00835
Degree Centrality	-0.0563**
Eigen Vector Centrality	-0.0569**
Risk Aversion (1-6)	-0.0910***
Aspirations- Annual Non Agr. Investments	0.138***
Aspirations- Monthly Income	0.0127
Aspirations- Annual Agr. Investments	-0.0244
Income Aspirations > Current Income	-0.0303
Non Agr Exp Asp > Current Exp	0.374***

Table A.3: Who are willing to open businesses?

	(1) Willingness to Open Non Agr. Business
Age	-0.391***
Divorced	0.0187
Married	-0.0508*
Unmarried	0.0965***
Widow	-0.0826***
Higher Education (Class 11, 12)	0.167***
Informal_education	-0.104***
No Education	-0.300***
Primary (Class 1-5)	0.0367
Secondary (Class 6-10)	0.251***
University	0.100***
Belongs to Upper Caste	-0.0558**
Degree Centrality	0.0157
Eigen Vector Centrality	0.00563
Own Non Agr. Business (Yes/No)	0
Feel not Capable	-0.00718
Willingness to Open Non Agr. Business	1
Risk Aversion (1-6)	-0.103***
Aspirations- Annual Non Agr. Investments	0.104***
Aspirations- Monthly Income	-0.0188
Aspirations- Annual Agr. Investments	0.0428*
Income Aspirations > Current Income	0.0129
Non Agr Exp Asp > Current Exp	0.212***

Table A.4: Who are well connected?

	(1) Degree Centrality
Age	-0.00765
Divorced	0.0460*
Married	0.0823***
Unmarried	-0.0857***
Widow	-0.0250
Higher Education (Class 11, 12)	-0.0422*
Informal_education	0.0439*
No Education	-0.0731***
Primary (Class 1-5)	0.0189
Secondary (Class 6-10)	0.0858***
University	-0.0588**
Belongs to Upper Caste	0.0700***
Own Non Agr. Business (Yes/No)	-0.0563**
Willingness to Open Non Agr. Business	0.0157
Risk Aversion (1-6)	-0.0690***
Aspirations- Annual Non Agr. Investments	-0.0322
Aspirations- Monthly Income	-0.0255
Aspirations- Annual Agr. Investments	0.00108
Income Aspirations > Current Income	-0.0163
Non Agr Exp Asp > Current Exp	-0.0290

## B Balance Checks

Table B.1: Balance test comparing Control and Treated Villages

	Control	Treatment	p-value
Willing to Open Business	0.404	0.412	0.883
Income	22517.415	25922.361	0.162
Age	39.533	39.128	0.760
Elementary Education	0.185	0.161	0.339
Higher Education	0.077	0.086	0.736
Informal Education	0.324	0.293	0.471
Univeristy Education	0.007	0.010	0.697
Secondary Education	0.268	0.261	0.820
Degree	4.619	5.082	0.025
Brahmin	0.052	0.088	0.565
Chhetri	0.216	0.296	0.581
Dalit	0.059	0.020	0.289
Newar	0.460	0.395	0.755
Other	0.010	0.043	0.066
Tamang	0.202	0.159	0.679
Non. Agr. Aspirations	2.99e+05	3.44e+05	0.587
Income Aspirations	93230.769	87803.801	0.896

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B.2: Balance test for Treatment Arms (Control v/s Treatment)

	0	1	2	3	(0) vs. (1), p-value	(0) vs. (2), p-value	(0) vs. (3), p-value	(1) vs. (2), p-value	(1) vs. (3), p-value	(2) vs. (3), p-value
Willing to Open Busi- ness	0.362	0.426	0.434	0.470	0.143	0.187	0.046	0.870	0.345	0.560
Income	23199.708	26253.382	24382.716	28570.368	0.299	0.573	0.065	0.488	0.457	0.167
Age	40.040	39.496	37.613	38.940	0.653	0.036	0.347	0.055	0.537	0.100
Elementary Education	0.165	0.173	0.177	0.154	0.749	0.631	0.692	0.921	0.539	0.493
Higher Edu- cation	0.079	0.077	0.091	0.094	0.906	0.680	0.521	0.598	0.299	0.889
Informal Ed- ucation	0.319	0.282	0.292	0.291	0.451	0.399	0.470	0.838	0.879	0.964
Univeristy Education	0.006	0.004	0.021	0.009	0.720	0.079	0.767	0.076	0.554	0.273
Secondary Education	0.242	0.270	0.267	0.291	0.404	0.508	0.175	0.946	0.527	0.527
Degree	4.502	5.373	5.264	5.202	0.001	0.002	0.002	0.689	0.409	0.793
Brahmin	0.061	0.085	0.086	0.107	0.560	0.491	0.303	0.921	0.390	0.211
Chhetri	0.228	0.323	0.284	0.321	0.306	0.528	0.339	0.277	0.962	0.334
Dalit	0.048	0.028	0.012	0.009	0.467	0.172	0.157	0.404	0.382	0.687
Newar	0.443	0.371	0.403	0.393	0.574	0.764	0.711	0.328	0.561	0.678
Other	0.017	0.048	0.070	0.021	0.137	0.046	0.645	0.530	0.240	0.114
Tamang	0.205	0.145	0.144	0.150	0.408	0.347	0.385	0.979	0.910	0.876
Non. Agr. Aspirations	2.74e+05	3.29e+05	3.60e+05	4.28e+05	0.567	0.537	0.185	0.831	0.477	0.684
Income Aspi- rations	75609.254	72021.422	1.14e+05	1.12e+05	0.917	0.224	0.570	0.460	0.315	0.983

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B.5: Correlation of Follow-up Survey Attrition with Treatment Status

<hr/>	
	(1)
VARIABLES	Attrition
<hr/>	
Spillover	-0.0449
	(0.0508)
Treated alone (T1)	-0.0501
	(0.0448)
Treated with a pair	-0.0540
	(0.0431)
Constant	0.425***
	(0.0335)
Observations	1,204
R-squared	0.002
Spillover==T1	0.0576
T1=T3	0.347
T1=T2	0.288
T2=T3	0.188
<hr/>	

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## C Follow-up Results

Table C.1: Long-term effect of the training by friendtype

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Opened Business	Monthly Income	New Savings Account	Savings Amount	Taken a loan	Commitment Savings
Spillover	-0.0386** (0.0151)	-2,978 (3,973)	0.0499 (0.0438)	2,037 (1,771)	0.0475 (0.0452)	0.0262 (0.0631)
Treated alone (T1)	0.0132 (0.0231)	767.8 (4,250)	0.104** (0.0388)	2,942* (1,648)	0.101** (0.0407)	0.0535 (0.0662)
Friend x More Central	0.0479 (0.0399)	1,977 (7,030)	-0.0699 (0.0620)	4,158 (2,778)	0.0870 (0.0560)	-0.0425 (0.0833)
Friend x Less Central	-0.0287* (0.0149)	6,676 (5,332)	0.0548 (0.0471)	1,642 (2,492)	0.0808 (0.0502)	0.0943 (0.0674)
Not Friend x More Central	-0.0285 (0.0223)	11,272 (13,643)	0.0294 (0.0676)	3,037 (2,156)	0.0170 (0.0441)	0.251*** (0.0704)
Not Friend x Not Central	0.0102 (0.0304)	-1,729 (4,012)	0.0565 (0.0438)	1,167 (1,970)	0.134** (0.0560)	0.111 (0.0699)
Degree	-0.00484** (0.00210)	252.2 (858.2)	-0.00135 (0.00634)	56.26 (290.9)	-0.00588 (0.00711)	0.0101 (0.00905)
Constant	0.0598*** (0.0194)	24,285*** (5,675)	0.204*** (0.0455)	3,966** (1,678)	0.0894** (0.0406)	0.400*** (0.0746)
Observations	711	710	712	704	712	711
R-squared	0.022	0.008	0.012	0.009	0.019	0.024
t1==friendcentral	0.421	0.848	0.0216	0.633	0.837	0.176
friendnoncentral=friendcentral	0.0579	0.542	0.0784	0.294	0.935	0.0995
friendnoncentral=nonfriendnoncentral	0.0918	0.0314	0.976	0.808	0.296	0.807
friendnoncentral=nonfriendcentral	0.990	0.757	0.724	0.525	0.293	0.0512
central==noncentral	0.380	0.612	0.0826	0.0682	0.329	0.976
friend=nonfriend	0.390	0.955	0.385	0.630	0.781	0.0179

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table C.2: Long-term effect of the training: Paired vs non paired

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Keeps Business Records	Keeps Agriculture Records	business_self_efficacy	Likely invest	Income Aspirations
Spillover	-0.0254 (0.0649)	-0.0804 (0.0539)	-0.0861 (0.277)	0.153 (0.324)	-9,020** (4,156)
Treated alone (T1)	-0.0304 (0.0553)	0.00348 (0.0515)	0.0946 (0.271)	0.388 (0.292)	2,052 (5,270)
Treated with a pair	0.0551 (0.0551)	-0.0124 (0.0413)	0.0853 (0.241)	0.304 (0.278)	2,840 (4,409)
Constant	0.362*** (0.0429)	0.719*** (0.0299)	2.725*** (0.223)	2.138*** (0.253)	51,520*** (3,308)
Observations	750	752	752	735	749
R-squared	0.006	0.004	0.001	0.006	0.010
Spillover=T1	0.937	0.207	0.454	0.287	0.00662
Paired=Nonpaired	0.0987	0.663	0.963	0.611	0.858
Spillover=Paired	0.166	0.211	0.347	0.409	0.0129

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table C.3: Long-term effect of the training by friendtype

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Keeps Business Records	Keeps Agriculture Records	business_self_efficacy	Likely invest	Income Aspirations
Spillover	-0.0207 (0.0684)	-0.0918* (0.0530)	-0.109 (0.281)	0.107 (0.334)	-9,541** (4,347)
Treated alone (T1)	-0.0249 (0.0560)	-0.0212 (0.0529)	-0.00301 (0.286)	0.348 (0.313)	2,352 (5,640)
Friend x More Central	0.0862 (0.0753)	0.0168 (0.0781)	-0.207 (0.351)	0.123 (0.426)	1,979 (6,959)
Friend x Less Central	0.0782 (0.0756)	-0.0300 (0.0738)	0.226 (0.312)	0.378 (0.368)	6,779 (6,508)
Not Friend x More Central	0.0314 (0.0888)	0.0153 (0.0571)	0.194 (0.298)	0.267 (0.323)	-2,884 (7,384)
Not Friend x Not Central	0.0787 (0.0630)	-0.0474 (0.0492)	-0.241 (0.286)	0.217 (0.319)	3,411 (7,569)
Degree	-0.00698 (0.0114)	0.0128 (0.00970)	0.0536 (0.0339)	-0.00701 (0.0295)	-595.9 (744.2)
Constant	0.393*** (0.0678)	0.668*** (0.0561)	2.532*** (0.278)	2.228*** (0.295)	54,522*** (4,112)
Observations	710	712	712	697	710
R-squared	0.008	0.009	0.010	0.005	0.013
t1==friendcentral	0.0929	0.637	0.465	0.477	0.958
friendnoncentral=friendcentral	0.919	0.678	0.142	0.529	0.566
friendnoncentral=nonfriendnoncentral	0.994	0.789	0.0652	0.522	0.616
friendnoncentral=nonfriendcentral	0.636	0.624	0.911	0.700	0.294
central==noncentral	0.758	0.503	0.998	0.713	0.424
friend=nonfriend	0.626	0.829	0.880	0.970	0.402

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

## D Mechanisms

Table D.1: Effect of being matched with a Peer with Varying Characteristics

	(1)	(2)	(3)	(4)
VARIABLES	Business Aspirations	Ready to invest	Business Index	Take-up Index
Peer is Upper Caste	0.0717 (0.106)	0.0345 (0.0379)	0.143 (0.0964)	0.0604 (0.0732)
Peer has higher Education	-0.0707 (0.0503)	-0.0591 (0.0577)	-0.0619 (0.120)	-0.0180 (0.0781)
Peer has higher Income	-0.157** (0.0678)	0.0725* (0.0375)	0.0879 (0.0785)	-0.0152 (0.0561)
Peer is Married	0.120 (0.0955)	0.0358 (0.0431)	0.0282 (0.119)	0.0726 (0.0724)
Peer is Younger	-0.0559 (0.0650)	-0.100** (0.0468)	-0.296*** (0.0983)	-0.0912 (0.0947)
Peer has higher aspirations	-0.0915 (0.0638)	0.0321 (0.0288)	-0.00414 (0.0989)	-0.0320 (0.0542)
Constant	-0.109** (0.0518)	0.788*** (0.0361)	0.267*** (0.0511)	0.125** (0.0489)
Observations	600	599	588	588
R-squared	0.014	0.027	0.026	0.006

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table D.2: Effect of being matched with a Central Friend after controlling for Other Characteristics

VARIABLES	(1)	(2)	(3)	(4)
	Business Aspirations	Ready to invest	Business Index	Take-up Index
Friend x More Central	0.149	0.266**	0.476*	0.0259
	(0.147)	(0.0999)	(0.252)	(0.115)
Friend x Less Central	0.152	0.236**	0.439*	-0.104
	(0.139)	(0.0940)	(0.223)	(0.129)
Not Friend x More Central	0.191	0.172*	0.483*	-0.0246
	(0.124)	(0.0862)	(0.249)	(0.126)
Not Friend x Not Central	0.213	0.182**	0.338	-0.0529
	(0.143)	(0.0856)	(0.220)	(0.106)
Peer is Upper Caste	0.0697	0.0142	0.135	0.0716
	(0.108)	(0.0363)	(0.0986)	(0.0805)
Peer has higher Education	-0.0995*	-0.0771	-0.0986	-0.0222
	(0.0508)	(0.0574)	(0.124)	(0.0767)
Peer has higher Income	-0.164**	0.0563	0.0443	-0.0271
	(0.0677)	(0.0397)	(0.0820)	(0.0588)
Peer is Married	-0.0133	-0.114	-0.280	0.123
	(0.102)	(0.0856)	(0.220)	(0.0955)
Peer is Younger	-0.0760	-0.124**	-0.362***	-0.0780
	(0.0717)	(0.0449)	(0.0984)	(0.0793)
Peer has higher aspirations	-0.120	0.0239	0.00149	-0.0172
	(0.0748)	(0.0297)	(0.101)	(0.0567)
Constant	-0.122**	0.772***	0.234***	0.127**
	(0.0557)	(0.0405)	(0.0625)	(0.0530)
Observations	585	585	575	574
R-squared	0.018	0.039	0.037	0.010
friendnoncentral==friendcentral	0.977	0.612	0.833	0.0608
friendnoncentral==nonfriendnoncentral	0.543	0.156	0.174	0.599
friendnoncentral==nonfriendnoncentral	0.636	0.144	0.729	0.374
central==noncentral	0.836	0.775	0.411	0.104
friend==nonfriend	0.548	0.0862	0.646	0.994

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table D.3: Learning by type of pair

	(1)	(2)	(3)
VARIABLES	Knowledge Index	Profit (Game)	Profit (Business Plan)
Friend x More Central	-0.0664 (0.138)	-1.962 (74.80)	682,606 (874,267)
Friend x Less Central	-0.0794 (0.110)	16.26 (70.38)	211,627 (665,521)
Not Friend x More Central	0.00213 (0.0954)	-6.177 (61.78)	310,990 (700,767)
Degree	0.0250** (0.00954)	11.53 (8.075)	87,444 (99,411)
Constant	0.519*** (0.0623)	241.8*** (61.89)	190,533 (553,798)
Observations	684	684	683
R-squared	0.006	0.006	0.004
friendnoncentral==friendcentral	0.921	0.572	0.211
friendnoncentral==nonfriendnoncentral	0.467	0.774	0.926
friendnoncentral==nonfriendcentral	0.467	0.774	0.926
central==noncentral	0.926	0.750	0.434
friend==nonfriend	0.449	0.878	0.732

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Table D.4: Correlation of Number of Contacts Pooled and Similarity with Peer

VARIABLES	(1)
	Number of links pooled in T3
Same age group	-0.155 (0.710)
Same Caste	1.346** (0.619)
Peer has same education	0.187 (0.405)
Same Income (Quartile)	-0.0959 (0.578)
Same Marital Status	-0.474 (0.591)
Constant	5.881*** (0.730)
Observations	216
R-squared	0.068

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table D.5: Heterogeneous Treatment Effects by Number of Contacts Shared

	(1)	(2)	(3)	(4)
VARIABLES	Business Aspirations	Ready to invest	Business Index	Take-up Index
Treatment 1	-0.0454 (0.0642)	0.0680 (0.0474)	0.387*** (0.0990)	0.240*** (0.0835)
Treatment 2	-0.0483 (0.0582)	0.0940* (0.0467)	0.344*** (0.112)	0.307*** (0.0900)
Treatment 3	-0.0323 (0.178)	0.137* (0.0801)	0.471** (0.181)	0.169 (0.170)
T3 X Number of contacts pooled	0.0809 (0.250)	0.0314 (0.108)	0.00726 (0.216)	0.127 (0.227)
Constant	-0.0768* (0.0433)	0.704*** (0.0283)	-0.153* (0.0792)	-0.113* (0.0622)
Observations	1,188	1,184	1,171	1,168
R-squared	0.001	0.019	0.039	0.029

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Table D.6: Effect of Peer Risk Aversion

	(1)	(2)	(3)	(4)
VARIABLES	Business Aspirations	Ready to invest	Business Index	Take-up Index
Treatment 1	-0.0109 (0.0131)	-0.00888 (0.0739)	0.110 (0.0972)	0.0726 (0.0796)
Treatment 2 and 3	0.0213 (0.0176)	0.0541 (0.0505)	0.0758 (0.0619)	0.0625 (0.0646)
Risk Averse	0.00881 (0.0160)	-0.0560 (0.0577)	-0.129 (0.0822)	-0.155** (0.0716)
t1 X Risk Averse	-0.00330 (0.0215)	0.0387 (0.0826)	0.0553 (0.120)	0.0909 (0.106)
t2t3 X Risk Averse	-0.00810 (0.0335)	-0.0150 (0.0638)	0.00374 (0.101)	0.0567 (0.0866)
Constant	-0.0966*** (0.00769)	0.803*** (0.0480)	0.139** (0.0609)	0.0894* (0.0503)
Observations	872	868	857	856
R-squared	0.004	0.026	0.077	0.063

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Table D.7: Impact of friend type (by eigen vector centrality)

	(1)	(2)	(3)	(4)
VARIABLES	Business Aspirations	Ready to invest	Business Index	Take-up Index
Friend x More Central	-0.0279 (0.0924)	0.0723 (0.0557)	0.0332 (0.108)	0.0256 (0.0682)
Friend x Less Central	0.00261 (0.0833)	0.0782 (0.0459)	0.0536 (0.0905)	0.0575 (0.0782)
Not Friend x More Central	0.000900 (0.0846)	0.00589 (0.0550)	-0.100 (0.131)	0.110 (0.0803)
Not Friend x Not Central	0.0577 (0.112)	0.0354 (0.0367)	-0.0102 (0.0997)	-0.0103 (0.0717)
Eigen	0.551 (3.403)	1.605 (1.188)	0.849 (2.424)	0.854 (1.470)
Constant	-0.128** (0.0600)	0.756*** (0.0501)	0.243*** (0.0809)	0.107* (0.0517)
Observations	681	682	671	670
R-squared	0.002	0.012	0.004	0.005
friendnoncentral==friendcentral	0.641	0.880	0.849	0.671
friendnoncentral==nonfriendnoncentral	0.576	0.236	0.440	0.555
friendnoncentral==nonfriendnoncentral	0.985	0.142	0.218	0.245
central==noncentral	0.551	0.533	0.488	0.520
friend==nonfriend	0.547	0.159	0.257	0.841

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1



## E PDS Lasso Results

### E.1 Endline Outcomes

Table E.1: Impact of the training (Main Effects)

	(1)	(2)	(3)	(4)
VARIABLES	Business Aspirations	Ready to invest	Business Index	Take-up Index
Treatment 1	-0.0385 (0.0624)	0.0593 (0.0489)	0.329*** (0.0970)	0.231*** (0.0803)
Treatment 2	-0.0369 (0.0566)	0.0691 (0.0453)	0.248** (0.103)	0.261*** (0.0863)
Treatment 3	0.0246 (0.0706)	0.123*** (0.0375)	0.363*** (0.0797)	0.231*** (0.0713)
Constant	-0.0732* (0.0423)	0.984*** (0.0662)	0.499*** (0.125)	0.666*** (0.136)
Observations	1,201	1,199	1,186	1,183
Number of groups	0	0	0	0
Treatment 1==2	0.981	0.860	0.466	0.697
Treatment 2==3	0.319	0.343	0.257	0.706
Treatment 1==3	0.461	0.130	0.645	0.994

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table E.2: Impact of the training (Paired vs T1)

	(1)	(2)	(3)	(4)
VARIABLES	Business Aspirations	Ready to invest	Business Index	Take-up Index
Treatment 1	-0.0410 (0.0617)	0.0604 (0.0490)	0.329*** (0.0968)	0.231*** (0.0803)
Treatment 2 and 3	-0.0120 (0.0544)	0.0977*** (0.0319)	0.304*** (0.0782)	0.246*** (0.0685)
Constant	-0.0660 (0.0420)	0.975*** (0.0683)	0.490*** (0.125)	0.667*** (0.135)
Observations	1,201	1,199	1,186	1,183
Number of groups	0	0	0	0
Treatment 1 == Pair	0.684	0.357	0.759	0.783

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table E.3: Impact of the training by friend type

	(1)	(2)	(3)	(4)
VARIABLES	Business Aspirations	Ready to invest	Business Index	Take-up Index
Friend x More Central	-0.00400 (0.106)	0.0964* (0.0584)	0.122 (0.147)	0.0813 (0.0683)
Friend x Less Central	-0.00957 (0.0662)	0.0455 (0.0484)	-0.0669 (0.0807)	-0.0350 (0.0745)
Not Friend x More Central	-0.0238 (0.0829)	0.00319 (0.0573)	0.00362 (0.144)	0.0314 (0.0700)
Not Friend x Not Central	0.0581 (0.0981)	0.0283 (0.0352)	-0.0597 (0.0899)	0.0249 (0.0669)
Constant	-0.0463 (0.0988)	1.126*** (0.0494)	0.598*** (0.138)	0.587*** (0.138)
Observations	685	686	675	674
Number of groups	0	0	0	0
friendnoncentral==friendcentral	0.941	0.300	0.222	0.0576
friendnoncentral==nonfriendnoncentral	0.348	0.610	0.621	0.347
friendnoncentral==nonfriendnoncentral	0.858	0.414	0.914	0.288
central==noncentral	0.606	0.729	0.257	0.188
friend==nonfriend	0.712	0.130	0.500	0.899

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

## E.2 Follow up Outcomes

Table E.4: 1 Year Impact of the training (Main Effects)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Opened Business	Monthly Income	New Savings Account	Savings Amount	Taken a loan	Commitment Savings
Spillover	-0.0403*** (0.0151)	-1,720 (3,569)	0.0497 (0.0421)	2,463 (1,697)	0.0480 (0.0418)	0.0421 (0.0605)
Treated alone (T1)	0.0104 (0.0203)	400.3 (3,721)	0.105*** (0.0362)	3,576** (1,552)	0.0911** (0.0385)	0.0511 (0.0659)
Treated with a friend (T2)	-0.0157 (0.0179)	5,022 (6,486)	-0.00587 (0.0431)	2,612 (2,085)	0.0580* (0.0334)	0.107* (0.0613)
Treated with a friend + module (T3)	0.00711 (0.0212)	3,822 (4,329)	0.0596 (0.0422)	2,517 (1,768)	0.104*** (0.0383)	0.134** (0.0655)
Constant	0.0648*** (0.0188)	25,874*** (4,248)	0.185*** (0.0416)	4,263*** (1,488)	0.0883*** (0.0337)	0.381*** (0.0726)
Observations	750	749	752	744	752	751
Number of groups	0	0	0	0	0	0
Spillover==T1	0.00251	0.370	0.181	0.407	0.352	0.866
T1=T3	0.887	0.324	0.351	0.457	0.761	0.144
T1=T2	0.0951	0.394	0.0231	0.615	0.385	0.307
T2=T3	0.169	0.855	0.230	0.959	0.172	0.630

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table E.5: 1 Year Impact of the training (Pair vs T1)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Opened Business	Monthly Income	New Savings Account	Savings Amount	Taken a loan	Commitment Savings
Spillover	-0.0402*** (0.0151)	-1,718 (3,571)	0.0496 (0.0421)	2,463 (1,696)	0.0479 (0.0419)	0.0421 (0.0605)
Treated alone (T1)	0.0106 (0.0203)	398.1 (3,721)	0.105*** (0.0363)	3,575** (1,552)	0.0912** (0.0385)	0.0511 (0.0659)
Treated with a pair	-0.00519 (0.0177)	4,475 (4,557)	0.0239 (0.0330)	2,568 (1,715)	0.0788** (0.0317)	0.119** (0.0565)
Constant	0.0652*** (0.0189)	25,862*** (4,254)	0.185*** (0.0417)	4,261*** (1,492)	0.0887*** (0.0334)	0.381*** (0.0725)
Observations	750	749	752	744	752	751
Number of groups	0	0	0	0	0	0
Spillover=T1	0.00242	0.372	0.180	0.406	0.351	0.866
Paired=Nonpaired	0.369	0.217	0.0451	0.484	0.729	0.154
Spillover=Paired	0.00186	0.102	0.571	0.940	0.403	0.0888

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Table E.6: 1 Year Impact of the training by friendtype

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Opened Business	Monthly Income	New Savings Account	Savings Amount	Taken a loan	Commitment Savings
Spillover	-0.0390*** (0.0149)	-3,636 (3,767)	0.0584 (0.0439)	1,959 (1,756)	0.0449 (0.0440)	0.0392 (0.0603)
Treated alone (T1)	0.0129 (0.0229)	89.69 (3,979)	0.112*** (0.0381)	2,866* (1,637)	0.0987** (0.0397)	0.0528 (0.0641)
Friend x More Central	0.0507 (0.0393)	1,463 (6,705)	-0.0669 (0.0578)	4,106 (2,768)	0.0869 (0.0551)	-0.0403 (0.0783)
Friend x Less Central	-0.0240* (0.0144)	6,001 (5,085)	0.0603 (0.0473)	1,570 (2,475)	0.0799 (0.0490)	0.100 (0.0667)
Not Friend x More Central	-0.0308 (0.0223)	10,530 (13,346)	0.0341 (0.0679)	2,962 (2,145)	0.0167 (0.0441)	0.249*** (0.0726)
Not Friend x Not Central	0.00973 (0.0306)	-2,753 (3,776)	0.0687 (0.0449)	1,048 (1,968)	0.131** (0.0551)	0.115 (0.0712)
Degree	-0.00528** (0.00213)	254.5 (841.1)	-0.00108 (0.00605)	55.65 (285.2)	-0.00603 (0.00697)	0.00802 (0.00893)
Constant	0.0674*** (0.0201)	25,296*** (5,473)	0.190*** (0.0471)	4,089** (1,673)	0.0936** (0.0397)	0.359*** (0.0677)
Observations	711	710	712	704	712	711
Number of groups	0	0	0	0	0	0
t1==friendcentral	0.366	0.821	0.00498	0.620	0.854	0.156
friendnoncentral=friendcentral	0.0435	0.538	0.0414	0.276	0.925	0.0542
friendnoncentral=nonfriendnoncentral	0.122	0.0166	0.876	0.784	0.301	0.827
friendnoncentral=nonfriendcentral	0.681	0.753	0.699	0.514	0.288	0.0530
central==noncentral	0.407	0.579	0.0413	0.0530	0.329	0.947
friend=nonfriend	0.272	0.984	0.305	0.604	0.743	0.0134

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Table E.7: 1 Year Impact of the training (Other Outcomes)

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Keeps Business Records	Keeps Agriculture Records	business_self_efficacy	Likely invest	Income Aspirations
Spillover	-0.0195 (0.0632)	-0.0746 (0.0526)	-0.0101 (0.267)	0.205 (0.308)	-9,824** (4,267)
Treated alone (T1)	-0.0296 (0.0520)	-0.00602 (0.0496)	0.0146 (0.270)	0.360 (0.279)	1,308 (5,354)
Treated with a friend (T2)	-0.00203 (0.0535)	-0.0331 (0.0439)	-0.0839 (0.256)	0.101 (0.273)	844.3 (6,007)
Treated with a friend + module (T3)	0.108* (0.0570)	-0.00331 (0.0469)	0.114 (0.240)	0.445 (0.271)	2,919 (5,646)
Constant	0.706*** (0.0777)	0.665*** (0.0504)	3.373*** (0.420)	3.120*** (0.382)	53,640*** (3,942)
Observations	750	752	752	735	749
Number of groups	0	0	0	0	0
Spillover==T1	0.868	0.275	0.920	0.477	0.00251
T1=T3	0.0327	0.955	0.636	0.611	0.761
T1=T2	0.552	0.478	0.657	0.210	0.936
T2=T3	0.0449	0.525	0.280	0.0660	0.777

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Table E.8: 1 Year Impact of the training (Other Outcomes): Paired v/s T1

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Keeps Business Records	Keeps Agriculture Records	business_self_efficacy	Likely invest	Income Aspirations
Spillover	-0.0197 (0.0633)	-0.0746 (0.0526)	-0.0102 (0.267)	0.204 (0.308)	-9,830** (4,264)
Treated alone (T1)	-0.0294 (0.0518)	-0.00597 (0.0496)	0.0147 (0.270)	0.359 (0.279)	1,311 (5,353)
Treated with a pair	0.0481 (0.0484)	-0.0195 (0.0390)	0.00602 (0.232)	0.257 (0.257)	1,789 (4,561)
Constant	0.706*** (0.0765)	0.665*** (0.0502)	3.367*** (0.421)	3.108*** (0.384)	53,666*** (3,921)
Observations	750	752	752	735	749
Number of groups	0	0	0	0	0
Spillover=T1	0.873	0.274	0.919	0.478	0.00247
Paired=Nonpaired	0.114	0.709	0.965	0.534	0.909
Spillover=Paired	0.212	0.266	0.924	0.771	0.00764

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table E.9: 1 Year Impact of the training by friendtype (Other Outcomes)

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Keeps Business Records	Keeps Agriculture Records	business_self_efficacy	Likely invest	Income Aspirations
Spillover	-0.00619 (0.0673)	-0.0888* (0.0527)	-0.0752 (0.275)	0.153 (0.324)	-10,235** (4,478)
Treated alone (T1)	-0.0235 (0.0540)	-0.0205 (0.0551)	-0.0385 (0.277)	0.284 (0.304)	1,448 (5,716)
Friend x More Central	0.0816 (0.0698)	0.0136 (0.0778)	-0.239 (0.331)	0.0561 (0.372)	1,339 (6,854)
Friend x Less Central	0.0802 (0.0691)	-0.0319 (0.0718)	0.209 (0.310)	0.328 (0.360)	5,902 (6,585)
Not Friend x More Central	0.0251 (0.0788)	0.0111 (0.0603)	0.131 (0.297)	0.127 (0.316)	-3,901 (7,362)
Not Friend x Not Central	0.0801 (0.0574)	-0.0444 (0.0515)	-0.263 (0.278)	0.152 (0.314)	2,051 (7,582)
Degree	-0.00929 (0.0111)	0.0133 (0.00956)	0.0468 (0.0350)	-0.0167 (0.0278)	-563.0 (736.9)
Constant	0.680*** (0.0885)	0.663*** (0.0577)	2.386*** (0.278)	3.145*** (0.424)	55,493*** (4,333)
Observations	710	712	712	697	710
Number of groups	0	0	0	0	0
t1==friendcentral	0.0993	0.658	0.449	0.406	0.987
friendnoncentral=friendcentral	0.985	0.668	0.0912	0.440	0.573
friendnoncentral=nonfriendnoncentral	0.998	0.841	0.0504	0.471	0.553
friendnoncentral=nonfriendcentral	0.514	0.635	0.793	0.504	0.269
central==noncentral	0.630	0.517	0.896	0.563	0.429
friend=nonfriend	0.572	0.863	0.811	0.808	0.335

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

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