

DO SOME PEERS MATTER MORE THAN OTHERS?  
THE HETEROGENEOUS IMPACTS OF SOCIAL NETWORKS  
ON FEMALE ENTREPRENEURSHIP

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# INTRODUCTION

Peers can help improve economic outcomes. However,

1. The mechanisms through which peers affect outcomes are difficult to disentangle.
  - ▶ Peers can affect outcomes via two distinct channels :
    - ▶ They can have a *direct impact* in terms of access to capital, skill complementarities, financial help, sharing information, advice, motivation, and future opportunities.
    - ▶ They can have an *indirect impact* in terms of access to the wider social network.
2. Existing models usually treat the peer group as a homogenous group.
  - ▶ The magnitude of the peer effect can depend on :
    - ▶ The “*network identity*” of the peer eg : closeness and popularity and “*socioeconomic identity*” of the peer eg : religion, income, and caste.

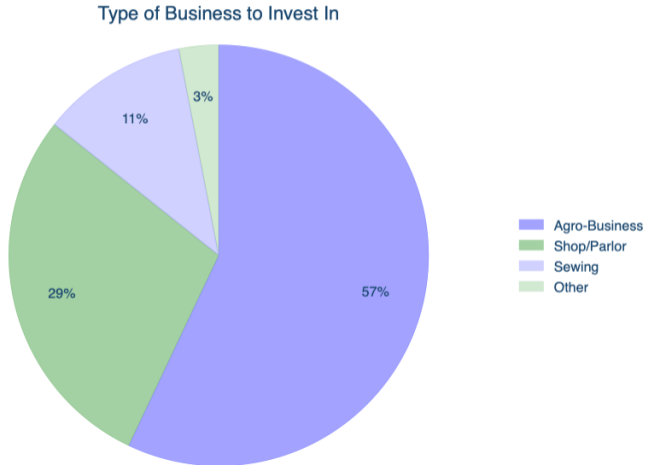
We aim to disentangle the extent to which peers can directly and/or indirectly improve economic outcomes and show how it can depend on the peer's identity.

# INTRODUCTION

- ▶ We work with a sample of women in  $\sim 30$  villages in rural Nepal and leverage peer effects to improve outcomes pertaining to female entrepreneurship.
- ▶ Business training is often prescribed to close the gender gap in entrepreneurship, but evidence suggests that more than this might be needed ([McKenzie & Woodruff 2014](#)).
- ▶ The gender gap has been large in part due to a lack of social networks for women. Social networks  $\Rightarrow$  help women make beneficial and risky investments aspirations.
- ▶ We vary if women attend a three-day business training program with a randomly matched peer in the network versus alone.
  - ▶ 22% had opened a business already and those who had opened a business earned a 13% higher income.

# WHAT TYPE OF BUSINESS ARE WE REFERRING TO ?

- ▶ Majority of women are interested in agriculture-based business.

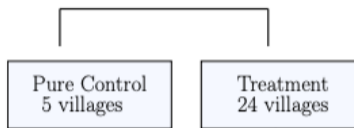


## TWO IMPORTANT QUESTIONS ARE UNANSWERED : FIRST, DOES IT MATTER WHO THE PEER IS ?

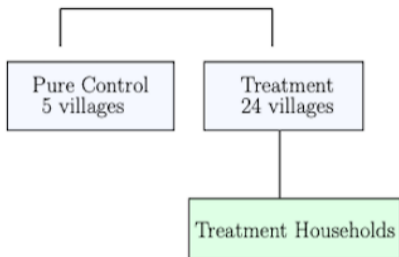
- ▶ Does characteristics of the peer matter ? We know that attending with a friend can improve outcomes (Field et al. 2016)
  - ▶ Socially close individuals have greater trust and cooperate better eg : Binzel & Fehr (2013) but socially far individuals can provide access to inaccessible network ties.
- ▶ How much of the “peer effect” can be attributed to their direct impact as opposed to providing access to a useful social network ?

We vary the network identity of the matched peers and introduce a treatment arm where we test we make the indirect channel more salient.

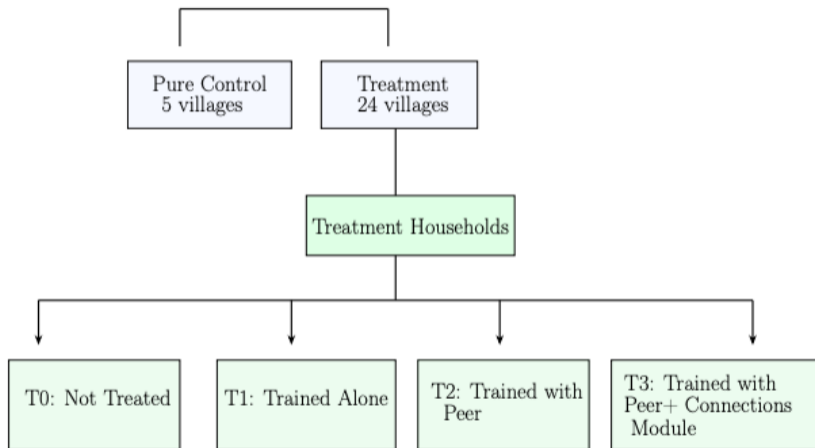
## WHAT DO WE DO ?



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# OUTLINE

1. NETWORK MAPPING

2. EXPERIMENTAL DESIGN

3. RESULTS

4. FOLLOW UP RESULTS

5. MECHANISMS

# CONTEXT AND NETWORK SURVEY

- ▶ **Location** : Rural Makwanpur, Nepal covering 30 mid-hill villages.
  - ▶ Small villages with an average number of 70 households
- ▶ **Sample** : 2800 women between ages 18-60 years
- ▶ **Network Survey** : Questions to cover multi-dimensional relations (advice/financial) described in detail in [Banerjee et al. \(2013\)](#).
  - ▶ We cover all women of eligible age within all 30 villages.
  - ▶ We construct an undirected network i.e. a link exists if any one of them names the other.

# EXAMPLE OF A VILLAGE NETWORK

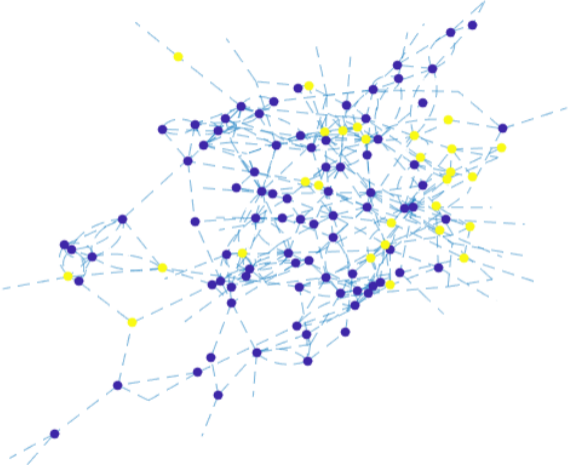


FIGURE – Agents colored in yellow have already opened a business.

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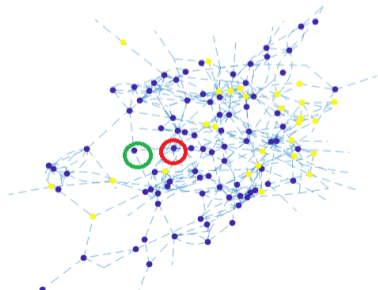
## TWO-STAGE RANDOMIZATION

- ▶ We conduct the experiment with  $\sim 1200$  women in our sample, largely excluding those who have opened up businesses already.
- ▶ Stage I : We first randomize villages as control and treatment.
  - ▶ 5 Control villages.
  - ▶ 25 Treatment villages.
- ▶ Within treatment villages people are randomized into different treatment assignments, including a spillover group.

## PRE EXPERIMENT : ASSIGNING PAIRS

We randomly pair individuals in Treatments 2 and 3. They discuss and solve all tasks of the training together. Importantly, we have random variation in the type of pair.

	Less Central	More Central
Friend	✓	✓
Non friend	✓	✓



# TRAINING

A three day training course that focuses on the following components :

1. Day 1 : Business Introduction + Savings Game
2. Day 2 : Macro-Micro Business Selection + Aspirations Video
3. Day 3 : Business Plan + Connections Module (T3)



## UNDERSTANDING T3 : WHAT IS THE CONNECTIONS MODULE ?



- ▶  $T3 = T2 + \text{Connections Module}$ .
- ▶ Individuals are told how peers can potentially help each through financial risk sharing, complementarity in skills, and information sharing.
- ▶ Then, they share the names of their friends who can help them set up a business and discuss how each of them can do so.



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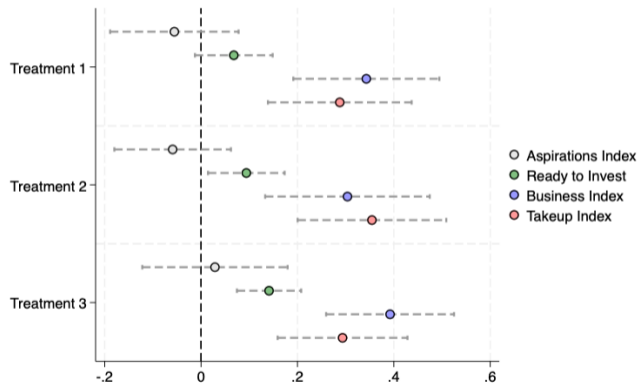
# OUTCOMES

We measure the impact of the training on the following endline outcomes.

1. Aspirations Index.
2. Readiness to Invest.
3. Business Index.
4. Take up Index.

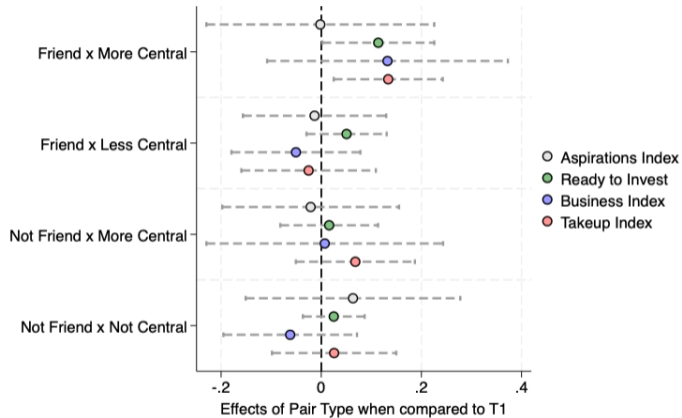
# IMPACT OF THE TRAINING

$$y_i = \alpha + \beta_1 * T1 + \beta_2 * T2 + \beta_3 * T3 + \epsilon_i$$



► Being treated is better but no significant difference across treatments.

# ONLY BEING PAIRED WITH A CENTRAL FRIEND IMPROVES OUTCOMES, RELATIVE TO T1.



► Being paired with a friend that is central is better than being trained alone. ↑ willingness to invest in agricultural business

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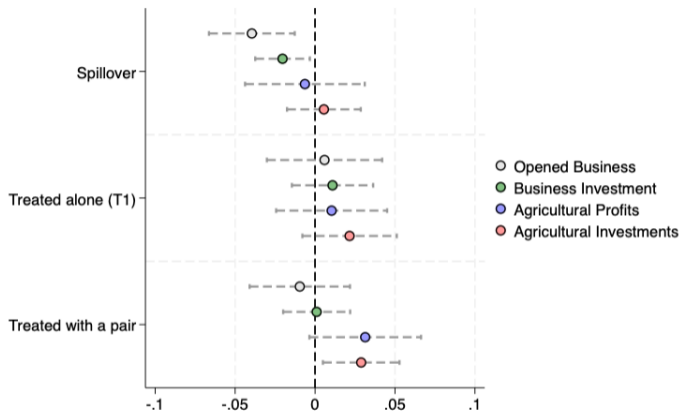
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## FOLLOW UP SURVEY

We measured the following main outcomes for a random subsample of  $\sim 750$  individuals whom we survey 1 year after the training.

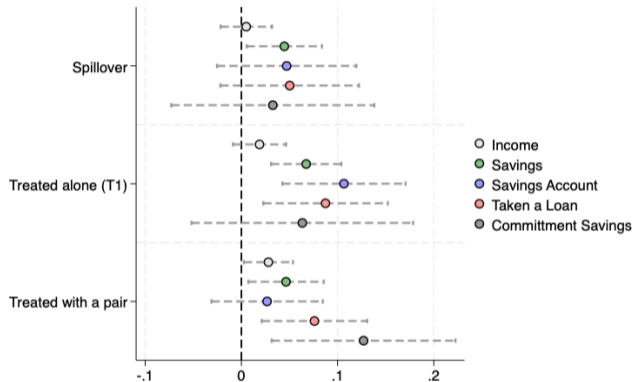
- ▶ We do not detect selective attrition by whether the individual was treated or not.
- ▶ We measure the following main outcomes :
  - ▶ Whether they have opened a business, business investment, their monthly income, agricultural investments, agricultural profits, whether they have opened a new savings account, the amount of money they save, and whether they have taken a loan.
- ▶ We also measure outcomes measuring network interactions around advice-taking and collaborations.

# 1 YEAR IMPACT OF BEING PAIRED



- ▶ Being paired significantly increases agricultural investments (relative to control) and agricultural profits (relative to T1, and T3 relative to control).

# 1 YEAR IMPACT OF BEING PAIRED : ADDITIONAL



- ▶ Being paired leads to a higher monthly income relative to control (at 10%) while treatment 1 does not. Treatments do not affect steps to open a business differently.



## DOES THE EFFECT VARY BY CLOSENESS OF THE PEER ?

VARIABLES	(1) Opened New Business	(2) Agriculture Profits	(3) Investment in New Business	(4) Investment in Agriculture
Paired (Friend)	-0.0105 (0.0230)	38,393** (16,974)	-1,184 (1,882)	3,539 (23,478)
Paired (Not Friend)	-0.0200 (0.0191)	8,578 (11,366)	-1,030 (1,639)	8,165 (21,568)
Constant	0.0773*** (0.0205)	76,564*** (22,753)	6,153*** (2,010)	100,021*** (25,469)
Observations	432	424	432	318
R-squared	0.006	0.020	0.008	0.003
Paired with friend==Paired with nonfriend	0.618	0.202	0.922	0.849

Robust standard errors in parentheses

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

Closeness matters similarly in the short run and long run.

## DOES THE EFFECT VARY BY CENTRALITY OF THE PEER ?

VARIABLES	(1) Opened New Business	(2) Agriculture Profits	(3) Investment in New Business	(4) Investment in Agriculture
Paired (More Central)	-0.0122 (0.0226)	3,668 (10,986)	-2,198 (1,817)	-2,392 (23,923)
Paired (Less Central)	-0.0194 (0.0205)	30,769*** (10,459)	-426.9 (1,792)	11,772 (18,221)
Constant	0.0731*** (0.0221)	80,804*** (23,905)	6,744*** (2,304)	103,988*** (26,379)
Observations	436	428	436	322
R-squared	0.006	0.019	0.010	0.004
Paired with central==Paired with noncentral	0.745	0.0408	0.349	0.416

Robust standard errors in parentheses

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

Less-central friends also have a significantly higher monthly income (at 10 %) compared to T1.  
Centrality has differential short-run and long-run effects.

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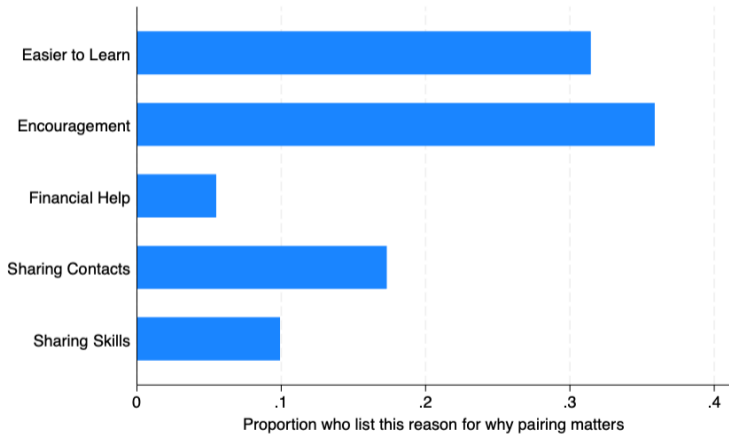
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# WHY SHOULD PAIR COMPOSITION MATTER ?



# POTENTIAL MECHANISMS

We consider various potential mechanisms.

1. Learning
2. Access to Social Networks
3. Risk Sharing
4. Encouragement
5. Collaboration and Long Term Interactions

- ▶ We find that encouragement drives the main results in the endline while the ease to collaborate might be driving the results 1 year later.
- ▶ Centrality of peer is helpful for short-term motivation but not for long-term collaboration.

# CONCLUSION

- ▶ There is notable heterogeneity in the short-run and long-run treatment effect as a function of social distance and degree centrality of the peer.
  - ▶ Being paired during the training matters only if paired with a central friend but centrality has lower returns in the longer term.
- ▶ Pooling network contacts (and making the indirect value of the peer more salient) has no significant additional impact.
- ▶ Treatment groups perform better after one year of training but pairing improves agriculture-specific outcomes. Network-based pairing  $\uparrow$  short-term and long term outcomes by 0.8-0.9 standard deviations respectively compared to random pairing.
- ▶ The differential effects of centrality in terms of motivation v/s ease to collaborate can reconcile these results.

THANK YOU!



## REFERENCES

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