Can network ties help women in pursuing entrepreneurship?

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Individuals rely on "local connections" and personalized relationships for risk sharing, public good provision and information delivery.

Behavior of individuals depends on their network position
- Socially close individuals have greater trust and thus cooperate better (Binzel & Fehr 2013, Zhang et al., 2016)
- Trust based networks based for informal contract enforcement (Karlan et al., 2009)

The literature on entrepreneurship => importance of entrepreneurs’ networks for easier access to capital, skills, risk sharing (Grandori 1997), information, advice and opportunities.

In this paper we combine entrepreneurship and network position
Background: Baseline networks

Figure – Women with and without a business
Measuring networks

In October 2021, we conducted a baseline survey and network elicitation in 30 villages in Nepal.

- Who do you take advice, borrow money from, seek help during emergencies, spend time with

- Demographic Outcomes, Existing Businesses, Willingness to Open Businesses, Risk Aversion, and Aspirations.
Out of the 2840 women we sampled, 22% had opened a business already
- Out of the 78% that did not have a business, 42% were interested in opening one
- Main barrier—Lack of skills and capability
- Therefore we designed a 3 day entrepreneurship training program
Why think about peer effect in entrepreneurship?

- We know pairing matters in entrepreneurship training (Field et al. 2016)
  - Training with a friend peer improves financial outcomes

In our paper, we randomly pair individuals stratified by varying centrality and social distance.
What do we do?

We use novel network data to pair individuals randomly in groups of two to attend a three day entrepreneurship training program.

![Figure – Training with a peer vs alone](image)

We focus on why pairing matters to facilitate entrepreneurship: Introduce a connection module to tease out various mechanisms.
Research questions

Using network to solve low take up of entrepreneurial activities despite large number of skill and entrepreneurship development programs.

- Why does pairing matter for training: is delivered to local central (friends) v/s global central in network members who set goals together?
  - Exchange of information about entrepreneurs
  - Creation of extra link provides greater insurance against risk (contacts)

- Does having a connection module improve outcomes?
Networks

1. Main Networks: Whom an individual borrows money from, spends time with, or seek advice from.

2. Aspirations Networks: Potential role models who inspire them as they are perceived to be financially independent.

3. Popularity: People perceived to be popular in the village.

4. Gossip: People perceived to be spread information fast.
Example of a Village Network

(a) Main Network
Randomization

We randomize at two different levels:

- Some communities randomized to get some treatment
- Who within the treatment community gets the program is randomized at individual level
- This is an effective way to measure spillovers

We stratify women by their centrality in the network
Experimental Design

Out of the 30 villages we have

- **T0**: 5 Control villages

- **T1**: 25 Treatment villages.
  - **T1.0**: No Training
  - **T1.1**: Training without Peers
  - **T1.2**: Training + Matching with Partner
  - **T1.3**: Training + Matching with Partner + connection module
A three day training course that focuses on the following components:

1. Day 1: Business intro + Game I
2. Day 2: Macro Micro selection
3. Day 3: Business Plan
What is the connection module?

- Highlight how pairs could potential help each through
  - Information
  - Complimentary in skills
  - Financial risk sharing and advice
Outline of the model

Two variables of interest: \( d_{ij} \) distance between participants and the centralities of the pair i.e. \( \phi_i \) and \( \phi_j \).

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

\[
U(e_i) = \theta_0 e_i - c(e_i) + \theta_1 \alpha(d_{ij})(e_i e_j) + \beta_0 \phi_j e_i + \beta_1 f(\phi_i - \phi_j)e_i + \lambda \alpha(d_{ij})f(\phi_i - \phi_j)e_i
\]

- \( \theta_0 \) and \( \theta_1 \) are parameters.
- \( c(e_i) \) represents the cost of effort.
- \( \alpha(d_{ij}) \) represents the interaction between participants.
- \( \beta_0 \phi_j e_i \) represents peer centrality.
- \( \beta_1 f(\phi_i - \phi_j)e_i \) represents centrality gap.
- \( \lambda \alpha(d_{ij})f(\phi_i - \phi_j)e_i \) represents distance interaction.
Identification Strategy

\[ Y_{iv} = \alpha + \beta_1 T_{1i} + \beta_2 T_{2i} + \beta_3 T_{3i} + \epsilon_v \]

where \( T_i \) is the treatment status of the individuals
In addition to treatment effects, we are interested in looking at heterogeneity as a function of network position

\[ Y_{iv} = \alpha_v + \beta_1 d_{ij} + \beta_4 T_2i + \beta_5 T_2i d_{ij} + \beta_7 T_3i + \beta_8 T_3i d_{ij} + \epsilon_v \]

where \( \phi_j \) is centrality and \( d_{ij} \) is distance between individuals
Identification strategy : Heterogeneity

- In addition to treatment effects, we are interested in looking at heterogeneity as a function of network position

\[ Y_{iv} = \alpha_v + \beta_1 d_{ij} + \beta_4 T_2 i + \beta_5 T_2 i d_{ij} + \beta_7 T_3 i + \beta_8 T_3 i d_{ij} + \epsilon_v \]

where \( \phi_j \) is centrality and \( d_{ij} \) is distance between individuals

\[ Y_{iv} = \alpha_v + \beta_2 \phi_j + \beta_4 T_2 i + \beta_6 T_2 i \phi_j + \beta_7 T_3 i + \beta_9 T_3 i \phi_j + \epsilon_v \]
We measure takeup of business related services
Impact of takeup

No difference across treatments
Distance heterogeneity
Degree heterogeneity

Results: On Takeup

Treatment 1
T2: Peer degree is higher
T2: Peer degree is lower
T3: Peer degree is higher
T3: Peer degree is lower

Mentoring  Advice  Trainer
Willingness to open a business
Impact on Business outcome

No significant impact of the treatments on an average
Distance heterogeneity
Degree heterogeneity

Results: Business Outcomes

Treatment 1
T2 (Distance<=2)
T2 (Distance>2)
T3 (Distance<=2)
T3 (Distance>2)

Loans  Savings  Skills  Business Likelihood  Ready to invest  Submit plan
We measure aspiration on agricultural activity, non agricultural business, income and savings
Standardize aspiration

Drawing from the literature Tanguy et al (2015)

\[
(a_i)_{std} = \frac{a_i^k - \mu_k}{\sigma_k}
\]

where \( k \) is the attribute, \( \mu_k \) is mean in the village and \( \sigma_k \) is the standard deviation
Impact on Aspiration

No significant impact of the treatments on an average
Distance heterogeneity

Income aspirations and self efficacy higher when paired with close friends
Degree heterogeneity

No significant impact of degree centrality across the pairs
Conclusion and more to come

- Pairs matter in particular with distance $\leq 2$
- Comparing T2 and T3, the story seems to be less about risk sharing, more about support (more evidence to come)
- There is heterogeneity in treatment effect as a function of social distance and degree centrality