

Social
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Social
dynamics and
CDD

Measurement

Example 1:
Land rental in
Tunisia

A graph or a
matrix

Example 2:
PSAOP
Senegal

The program
Membership
Dyadic
regressions

Example 3:
Gambia
CDDP

Data
The marriage
market

Conclusions

Social Interaction and Community-Driven Development

Jean-Louis Arcand
The Graduate Institute | Geneva,
EUDN and EADI

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CDD and social dynamics

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- The premise
 - CDD programs are likely to affect *social dynamics*
 - participatory nature of CDD \implies mobilization of social dynamics likely to be key ingredient in success / failure
- The questions

CDD and social dynamics

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 - how do different types of social interaction change with treatment status?

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 - how do memberships and assortative matching ("birds of a feather flock together") into various groups in villages vary according to treatment status?

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 - how do different types of social interaction change with treatment status?
 - how do memberships and assortative matching ("birds of a feather flock together") into various groups in villages vary according to treatment status?
 - **are there unintended consequences in terms of social dynamics (such as polarization)?**

Measuring social interaction

- How do we measure social interaction?
 - standard household sample survey data probably **not** appropriate tool
 - need to carry out village **censuses** and look at **links** between households
 - collect *very* synthetic data on household characteristics
 - use indirect / informant / village chief / "arbre à palabre" methods usually used by sociologists and anthropologists
 - this yields village **matrices** / **graphs** of social interaction

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 - huge literature on ERGMs (**Exponential Random Graph Models**)

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 - huge literature on ERGMs (**Exponential Random Graph Models**)
 - economists are just waking up to this....
 - we can display a social network as a **graph....**

Example 1: Land rental relationships in a Tunisian village

The direction of the arrows matters !

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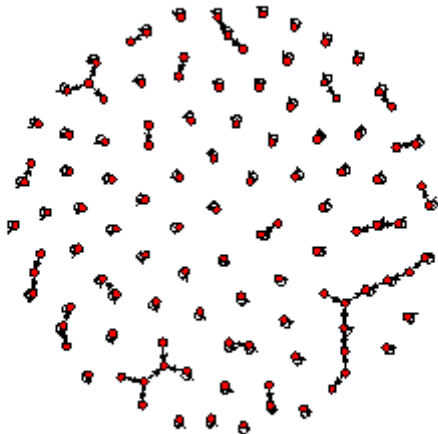
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Example 1: Land rental relationships in a Tunisian village

- or as a **matrix**

Households	id 1	id 2	id 3	id 4	id 5	id 6	...
id 1		1					
id 2	2	3				4	
id 3						5	
id 4	0.5	5		1.5			
id 5					2		
id 6							
:							

Table: Land rental relationships in El Oulja.

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Three types of social interaction matrices

- Upper and lower triangular elements identical + **no** diagonal elements → symmetric. **Example:** membership in various CBO (**C**ommunity **B**ased **O**rganization)

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- **Matrices can be built with 0/1s or they can be cardinal. Example: number of hectares rented out**

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- Matrices can be built with 0/1s or they can be cardinal. **Example:** number of hectares rented out
- **Social interaction matrices may influence each other.** **Example:** "marriage / kinship" matrix may influence "who do you ask for help with authorities" matrix or labor exchange matrix

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Dyadic regression

Estimation

- Economists like regression-based techniques → **dyadic regression**
- A **dyad** m_{ij} is a pair of households i and j

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- A **dyad** m_{ij} is a pair of households i and j
- **Example:** $m_{ij} = 1$ if i and j both belong to a CBO (Community Based Organization) and 0 otherwise
 - The dyad is "turned on" (equal to 1) if both households belong to a CBO, otherwise it is "turned off"

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 - the absolute value of the difference in some characteristic between household i and j
 - the average value of some characteristic of the pair (i, j)
 - ...things get even richer when relationships are **directional** (i.e. (i, j) different from (j, i))

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Dyadic regression

- If people tend to match with others who are **similar** along a given dimension, the likelihood of a match will be a decreasing function of differences in that dimension, and vice versa
 - **Example:** if the likelihood of a match is a **decreasing** function of the difference in ages, this means that people tend to match with others of roughly the same age → the group is **more homogeneous** than the overall population
- Inference
 - Interesting clustering problem (initial work by Conley, 1999)
 - Mathematical sociologists use QAP (**Q**uadratic **A**ssignment **P**rocedure)
 - Economists adjust the variance-covariance matrix

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Example 2: PSAOP I Senegal

The program and the hypothesis

- Motivation for program
 - CDD program: designed to build capacity amongst community-based organizations (CBOs) in Senegal
 - **Motivation:** so many households belong to CBOs in West Africa that they may be an efficient manner of delivering social programs to poor rural households
- **Hypotheses:** will treatment
 - render CBOs more **exclusive** or **inclusive**?
 - lead to stronger or weaker **positive assortative matching** amongst households?
 - policy implication: does treatment increase or decrease **social polarization**?

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Conclusions

- Baseline collected in 2003 (Norwegian Trust Fund)
- Follow-up collected in May-August 2008 (GDN)
- 2,861 households in 160 villages observed twice (before / after)
- Divided roughly 1/3-2/3 between treatment and control households
- Treatment determined at the rural community level (smallest administrative unit in Senegal)
- Treatment status over time determined in 2002 prior to initial program deployment by ASPRODEB and CNCR

Example 2: PSAOP I Senegal

Membership regression

	coef.	se
Household size	0.024	0.239
Age of head	-0.001	0.011
Years education head	-0.029	0.084
PSAOP TREATMENT DUMMY	-1.681	0.967
PSAOP TREATMENT DUMMY:		
× Household size	0.614	0.359
× Age of head	-0.000	0.013
× Years education head	-0.137	0.117
× Distance to village center	0.067	0.017
× Female household head	-0.937	1.169
× Sérère	-0.880	0.712
× Toucouleur	-1.605	0.550
× Peuhl (Fulani)	0.473	0.423
× Ties with village authorities (0-4)	-0.002	0.207
× Log(1 + owned land)	-0.881	0.253

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Dyadic regressions: time-varying pair characteristics and "distance" variables

	coef.	se
Average of pair characteristics		
Household size	0.420	0.030
Age of head	0.006	0.001
Years education head	-0.095	0.012
Absolute value of difference of pair characteristics		
Household size	-0.081	0.046
Age of head	0.000	0.002
Years education head	-0.193	0.016
PSAOP TREATMENT DUMMY:		
× Distance between households	0.014	0.027
× Same ethnic group dummy	-0.255	0.066

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Dyadic regressions...continued: interactions with pair-specific sums

	coef.	se
PSAOP TREATMENT DUMMY:		
Average of pair characteristics		
× Household size	-0.037	0.034
× Age of head	-0.003	0.001
× Years education head	-0.037	0.014
× Distance to village center	-0.018	0.019
× Female household head	0.286	0.072
× Ties with traditional authorities	-0.082	0.017
× Log(1 + owned land)	-0.163	0.024

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Dyadic regressions...continued: and interactions with pair-specific heterogeneity

	coef.	se
PSAOP TREATMENT DUMMY:		
Absolute value of difference of pair characteristics		
× Household size	-0.134	0.054
× Age of head	-0.004	0.002
× Years education head	0.149	0.018
× Distance to village center	-0.005	0.007
× Female household head	-0.070	0.072
× Ties with traditional authorities	-0.005	0.020
× Log(1 + owned land)	-0.082	0.035

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Preliminary conclusions

- Membership regressions: marginally more inclusive
 - Pick up more households on the periphery of villages
 - Get more households with relatively little land
- Dyadic regressions
 - Treated CBOs attract: younger heads, less educated heads, less ties to traditional authorities, less land, female headed
 - Treated CBOs become **more homogeneous** in terms of: household size, age of head, owned land
 - Treated CBOs become **more diverse** in terms of education of head and in terms of ethnicity
- Policy implication: program induces:
 - less social polarization in terms of educational attainment and ethnicity
 - more social polarization in terms of land ownership, CBOs with less ties to traditional authorities
 - \implies implies that relationships with traditional *chefs de terre* is crucial

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Example 3: Gambia CDDP

- Currently carrying out village censuses in 15 treated and 15 control villages

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 - Usually three days per village

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Example 3: Gambia CDDP

- Currently carrying out village censuses in 15 treated and 15 control villages
 - Usually three days per village
 - **Basic household socio-demographic information + membership in various types of CBOs and expertise in traditional medicine**

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 - Usually three days per village
 - Basic household socio-demographic information + membership in various types of CBOs and expertise in traditional medicine
- **Construct social matrices for:**

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- Construct social matrices for:
 - **Kinship**

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Example 3: Gambia CDDP

- Currently carrying out village censuses in 15 treated and 15 control villages
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 - **Tool / productive assets exchange**

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- Construct social matrices for:
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 - Marriage
 - Credit
 - Labor exchange
 - Tool / productive assets exchange
 - Land exchange
 - Provision of public goods / Help with authorities regarding public goods

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Part of the marriage market in Passamasi Fula

Data just in on friday....

household i "gained" x members by marriage from household j

		j										
		hh id	1	2	3	4	5	6	7	8	9	10
i	1				1		1					
	2	1										
	3						1					
	4											
	5											
	6	1										
	7				2							
	8											1
	9								1		1	
	10											

The bottom line

- Relatively straightforward to use methods pioneered by sociologists for measuring social interactions

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- **Very nicely suited to the CDD context where social interactions are likely to be a big part of the underlying story**

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- Relatively straightforward to use methods pioneered by sociologists for measuring social interactions
- Very nicely suited to the CDD context where social interactions are likely to be a big part of the underlying story
- Adapt data collection methodologies from sociology / anthropology to our context

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- Very nicely suited to the CDD context where social interactions are likely to be a big part of the underlying story
- Adapt data collection methodologies from sociology / anthropology to our context
- In different cultural environments, different social matrices will be relevant and / or feasible
- **Estimation and inference methods are available to deal with dyadic data: economists simply need to learn / adapt them**