CS 103: Lecture 10 Network Exchange Theory

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October 20, 2015

Announcements

- HW 3 due Thursday
- Office hours
  - Dan Tues. 4–5
  - Areeba Tues. 7–8
  - Tiffany Wed. 8–9
  - **Poll**: are you planning to come?
- Midterm
  - Tuesday Nov 3 (two weeks from today)
  - Parts I–IV of book (Chapters 1–12, excluding 11)
  - More info on topics/format to come

Plan for today (and Thursday)

- Network Exchange Theory
  - Motivation
  - Experiments
  - Theory (Nash bargaining)

Power

Relationships produce value
- Friendship
- Business
- Political

Social exchange: how is this value divided between participants?

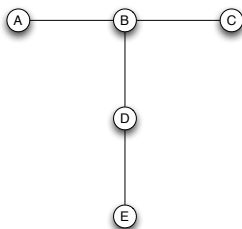Division may be unequal $\rightarrow$ one party gets more value.

Why do some parties have more **power** in relationships?
- Intrinsic strength?
- Strong position in the network?

Network Exchange Theory

Network exchange theory (sociology): way that positions of individuals in a social network lend *power* and lead to *social imbalance*

Example: who is powerful in this network? who is not?

Network Exchange Theory

How can we model this?

A simple exchange model:
- Value of $1 per edge
- Each node exchanges with at most one other node
- In each exchange, the parties negotiate how to split value

Examples: two-node path, three-node path

Network Exchange Theory

How do sociologists study this?
- Lab experiments
- Theory

Our plan
- Experiments (activity)
- Theory

Activity

- Everyone assigned to a node
- $1 per edge
- Negotiate with immediate neighbors
  - With whom to exchange
  - How to split
- Repeat for ~10 minutes and record results
- **Goal**: maximize your profit. Take home average over all rounds.

Discussion

- Draw networks on board
- Review results
- Discuss: why are some nodes more powerful?

Theory

Can we develop a theory to predict the outcomes of network exchanges?

Model development on board
- Outcome
- Stability
- Discussion of stability

Review

Review
- We introduced the ideas of network exchange and power in networks
- We conducted experiments to see how networks confer power
- We started developing a mathematical model to predict outcomes of network exchange experiments
  - Outcomes
  - Stability

Next time: balanced outcomes