Econ 211

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Reciprocity

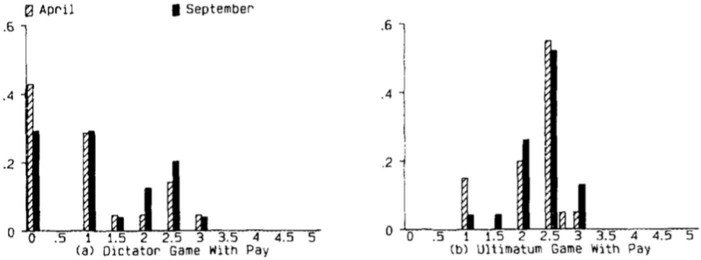
Motivating Evidence

- Recall dictator game from Forsythe et al (1994)
- What if we allow recipient to have some say in the matter?
  - 45 additional subjects drawn from same overall population
  - As before, one player proposes at division of a $5 endowment
  - New treatment: recipient can either accept or reject the offier
  - If reject, they both get $0
  - This is called the *ultimatum game*
- Expected results from classical preferences?
  - Selfish responders should never reject a non-zero offer
  - Knowing this, proposer should offer smallest non-zero amount

Ultimatum Game: Responder Behavior

- Rejections do happen, though not very often
  - 8 out of 45 (18%) of offers were rejected in total
- Rejection likelihood increases as offers get smaller
  - No offers of $2.50 (ie 50% of pie) or higher were rejected
  - 5 of 6 (83%) of offers less than $2.00 were rejected
- Rejection is a form of *costly punishment*

Ultimatum Game: Proposer Behavior



- Proposals below \$2.00 extremely rare
- Stronger peak at \$2.50 (50-50 split)
- So rejections are rare because low offers are rare

Explaining Rejections

- Recall Fehr-Schmidt model from last lecture:

$$U(x_1, x_2) = \begin{cases} x_1 - \beta(x_2 - x_1) & \text{if } x_1 \leq x_2 \\ x_1 - \alpha(x_1 - x_2) & \text{if } x_1 > x_2 \end{cases}$$

- Let $\beta = 1$ and $\alpha = \frac{1}{2}$, assume Player 1 is responder
- What is utility of rejecting?
  - $U(\$0, \$0) = 0$
- Will player 1 accept payoffs $(\$2, \$3)$?
  - $U(\$2, \$3) = 2 - (3 - 2) = 1 \implies$ accept
- Will player 1 accept payoffs $(\$1, \$4)$?
  - $U(\$1, \$4) = 1 - (4 - 1) = -2 \implies$ reject
- Responder's desire for equity leads to decision that decreases both players' payoffs

Explaining Rejections, cont

- Where is switch from rejecting to accepting offer?
  - Let x be amount given to responder, so $5 - x$ is amount kept by proposer
  - Then utility is $x - \beta(5 - x - x)$, assuming proposer given less than half
  - Set equal to zero to find $x = \frac{5\beta}{1+2\beta}$
  - Eg, if $\beta = 1$, switch at \$1.67
- If we observe switch from rejecting to accepting at offer x, what can we say about β?
  - Use $x - \beta(5 - x - x) = 0$, but solve for β
  - Solve to find $\beta = \frac{x}{5-2x}$
  - Eg, if someone will accept any offer bigger than \$1.50, they must have $\beta = 0.75$

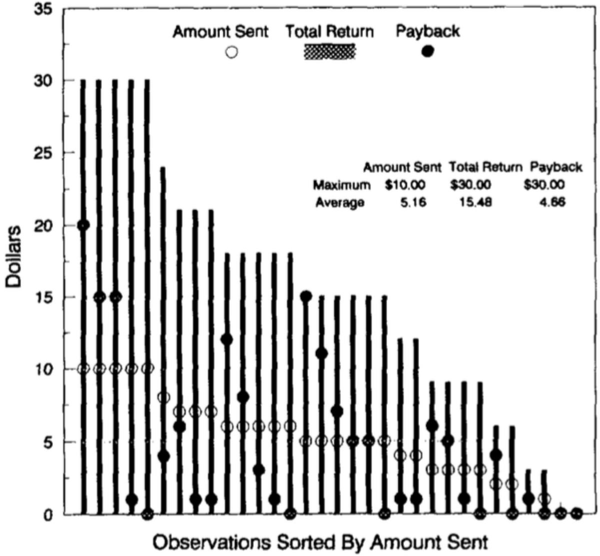
The Trust Game

- The ultimatum game is fairly limited in that it only allows the responder a binary choose: accept or punish
- What if we allow responder more variety in their choice, so they can not only punish, but also reward?
- The *trust game* accomplishes this
  - One player, the *trustor* starts out with $\$X$
  - Passes some amount $\$I \in [0, \$X]$ to other player, the *trustee* (so far, just like dictator/utlimatum)
  - Trustee gets $R \cdot \$I$ for $R > 1$, ie the passed amount is multiplied by interest rate R before trustee receives it
  - Trustee then can return some amount $\$P \in [0, R \cdot \$I]$ to trustor
- We say amount passed indicates how *trusting* the trustor is, and the amount passed back indicates how *trustworthy* the trustee is

Trust Game: Evidence

- Berg et all (1995)
- Trustors start with $10
- Trustors and trustees in different rooms
- $R = 3$, ie if trustor passes $1 it becomes $3 for trustee
- Expected classical results?
  - Purely selfish trustees should return nothing
  - Therefore purely selfish trustors should pass nothing

Trust Game: Results



Explaining Trustee Behavior

- Let $\beta = 1$ and $\alpha = \frac{3}{4}$ in Fehr-Schmidt model for trustee
- How much will trustee pass back if trustor passes $10?
  - Note there is $30 total now
  - Splitting equally ($15 each) is optimal for trustee, since keeping any additional dollar beyond this point would cause *two* dollars worth of inequality
  - So pass back rate is 50%
- How much will trustee pass back if trustor passes $1?
  - Note there is $12 total now
  - Note also that equality is not possible
  - Trustee will try to minimize inequality as much as possible, meaning they do not pass anything back
  - Pass back rate is 0%

Trust Game: Discussion

- Did the average trustor make a profit by passing money to the trustee?
  - Average amount sent: $5.16
  - This get multiplied to $15.48
  - Trustors only send back average of $4.86
  - Therefore average trustor would have been better off passing nothing
- Any limitations to design?
  - Trustees see amount passed, then make just one decision
  - Would be better to use *strategy method*
    - Trustee tells experimenter what they would pass back for every possible level of income, before seeing actual pass made by trustor