Experimental Economics

- **Social Preferences**
  - Models of social preferences
    - Outcome-based models
      - Inequality
      - Efficiency
      - Fairness or envy?
    - Intention-based models
      - Intentions and reciprocity
      - Second-order beliefs

Fairness & Reciprocity

- **Fairness**
  - Unconditional behavior
  - Relative to a reference standard
- **(Strong) Reciprocity**
  - Positive reciprocity
    - Rewarding kind behavior at a cost (and without strategic incentives)
  - Negative reciprocity
    - Punishing unkind behavior at a cost (and without strategic incentives)

Fairness or Selfishness?

- **Ultimatum game**
  - Lots of fairness?
    - High offers: 38%
    - High rejection rates: 50%
    - Low inequality: 1.6 (proposer/responder earnings ratio)
- **Ultimatum game with competition** **Fischbacher et al. 2003**
  - 1 responder more
    - Offers went down: 31%
    - Rejection rates went down: 33%
    - Inequality went up: 2.2 (proposer/responder earnings ratio)
  - 4 responders more
    - Offers are even lower: 16%
    - Rejection rates too go down: 7%
    - Inequality is even higher: 5.2 (proposer/responder earnings ratio)

Outcome-based models

- **Background**
  - The standard model successfully explains behavior in many games:
    - Double-auction markets, ultimatum games with proposer/responder competition, auctions, markets with Bertrand competition, voting games, repeated public good games, minimum-effort games, etc.
  - But not in others:
    - Ultimatum game, trust game, moonlighting game, public good games with punishment, gift exchange game, prisoner's dilemma games, rent-seeking games.
  - But even then, the standard model can explain some of the behavior in this games
    - Proposers in ultimatum games, trustors in trust games, cooperation in public good games with punishment, firms in gift exchange games, etc.
  - Maybe we just need to tweak the standard model a bit.

Outcome-based models

- **Modeling fairness**
  - Assume social preferences

$$U_i = U_i(\pi_i, \pi_{-i})$$

  - Utility depends on *own* and others' payoffs
  - Heterogeneity with regard to the importance given to fairness
    - Types of players (selfish and non-selfish)

Outcome-based models

- **Modeling fairness**
  - Examples
    - Altruism
      - Andreoni (1989) Cox, Friedman and Gjerstad (2004)
    - Inequity aversion
      - Fehr and Schmidt (1999) Bolton and Ockenfels (2000)
    - Quasi-maximin preferences
      - Rawls(1971) Charness and Rabin (2002)
    - Spitefulness
      - Levine (1998)
    - Reciprocity
      - Rabin (1993) Dufwenberg and Kirchsteiger (2004) Falk and Fischbacher (2006)
    - Social emotions and guilt aversion
      - Bowels & Gintis (2000) Charness and Dufwenberg (2004)

Models of inequity aversion

- **Fehr and Schmidt (1999) (F&S)**
  - Dislike differences between *my* income and the income of others
    - The dislike of disadvantageous inequality is greater than the dislike of advantageous inequality

$$U_i = \pi_i - [\alpha_i \sum_{j \neq i} \max\{\pi_j - \pi_i, 0\} - \beta_i \sum_{j \neq i} \max\{\pi_i - \pi_j, 0\}]/(N-1)$$

- **Bolton and Ockenfels (2000) (B&O)**
  - Dislike differences between *my* income and the mean income of others

$$U_i = U_i(\pi_i, \pi_i / \sum_j \pi_j)$$

Models of inequity aversion

- **What they explain (F&S, B&O)**
  - Ultimatum game: rejection of low offers and proposers making high offers
  - Trust game: trust and trustworthy behavior
  - Gift exchange game: high wages and high effort
  - Public goods games: low contributions without punishment and high contributions with punishment
  - Ultimatum game with competition (and other markets): Subjects "accept" more inequity so standard prediction prevails.

- **These models are surprisingly accurate across many games using the same set of parameters!**

Models of inequity aversion

- **Comparing F&S and B&O**
  - What is the right reference agent for income comparisons?
  - F&S: compares to each other individual in the group
  - B&O: compares to the average other individual in the group

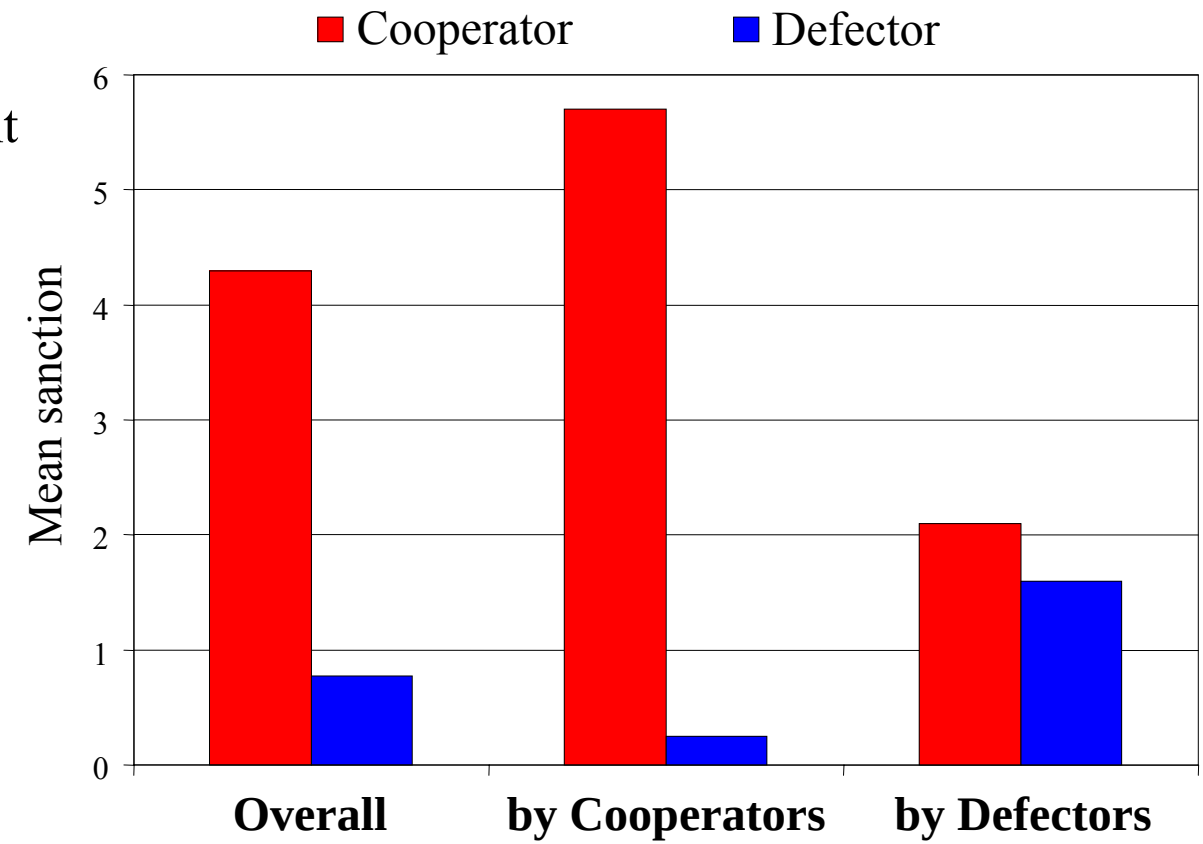
- **Who is the sanctioning target?** Falk et al. 2005
  - 120 subjects, one-shot game, strategy method
  - Groups of 3 subjects, play an 3-person prisoners dilemma with punishment

	0 cooperate	**1 cooperates**	**2 cooperate**
Cooperate	**12**	**24**	**36**
Defect	**20**	**32**	**44**

  - Sanctions: cheaper to sanction cooperators!
    - costs 1 point to sanction a cooperator by 3.33 points
    - costs 1 point to sanction a defector by 2.50 points

Models of inequity aversion

- **Who is the sanctioning target?** Falk et al. 2005
  - Sanctions: cheaper to sanction cooperators!
    - F&S: cooperators punish defectors
    - B&O: cooperators punish cooperators
  - Results:
    - Mostly punishment of defectors
    - But defectors do punish



Models of quasi-maximin preferences

- **Charness and Rabin (2002)**
  - People care for:
    - Own payoff
    - Sum of payoffs (efficiency)
    - The payoff of the poorest (Rawlsian concerns)

$$U_i = (1-\gamma)\pi_i + \gamma[\,\delta \min\{\pi_1, \ldots, \pi_N\} + (1-\delta)(\pi_1 + \ldots + \pi_N)\,]$$

    - They even suggest γ and δ can depend on how closely the other parson complies with an optimal welfare criterion.

Inequity aversion or quasi-maximin preferences

- **Comparing F&S and C&R**
  - Is it really income differences?
  - In most games equality coincides with efficiency and Rawlsian concerns

- **Disentangling the fairness motives?** Englemann & Strobel 2004
  - 120 subjects, one-shot game, between-subjects
  - Groups of 3 subjects, one subject is a dictator and allocates money among the other two subjects

	Choice A	Choice B	Choice C
Dummy 1	17	18	19
Dictator	10	10	10
Dummy 2	9	5	1
Fairness Concept	Inequity Efficiency Maximin		

Inequity aversion or quasi-maximin preferences

- Disentangling the fairness motives? Englemann & Strobel 2004

All	Choice A	Choice B	Choice C
Dummy 1	**17**	**18**	**19**
Dictator	**10**	**10**	**10**
Dummy 2	**9**	**5**	**1**
Fairness Concept	**All**		
% Choices	83.8%	10.3%	5.9%

Inequity	Choice A	Choice B	Choice C
Dummy 1	**16**	**13**	**10**
Dictator	**8**	**8**	**8**
Dummy 2	**5**	**3**	**1**
Fairness Concept	**Efficiency Maximin**		**Inequity**
% Choices	70.0%	26.7%	3.3%

Maximin	Choice A	Choice B	Choice C
Dummy 1	**11**	**8**	**5**
Dictator	**12**	**12**	**12**
Dummy 2	**2**	**3**	**4**
Fairness Concept	**Efficiency Inequity**		**Maximin**
% Choices	26.7%	20.0%	53.3%

Efficiency	Choice A	Choice B	Choice C
Dummy 1	**21**	**17**	**13**
Dictator	**9**	**9**	**9**
Dummy 2	**3**	**4**	**5**
Fairness Concept	**Efficiency**		**Maximin Inequity**
% Choices	40.0%	23.3%	36.7%

Inequity aversion or quasi-maximin preferences

- **The economists effect?** Fehr et al. 2006
- Englemann & Strobel (2004) use only business and economics subjects
- With other subjects (mostly other social sciences) F&S does better
- **In summary**
  - For allocation decisions there are many possible fairness considerations.
  - Both inequity aversion and inefficiency aversion can be important.
  - Note that these are dictator games, thus they probably depend a lot on framing.

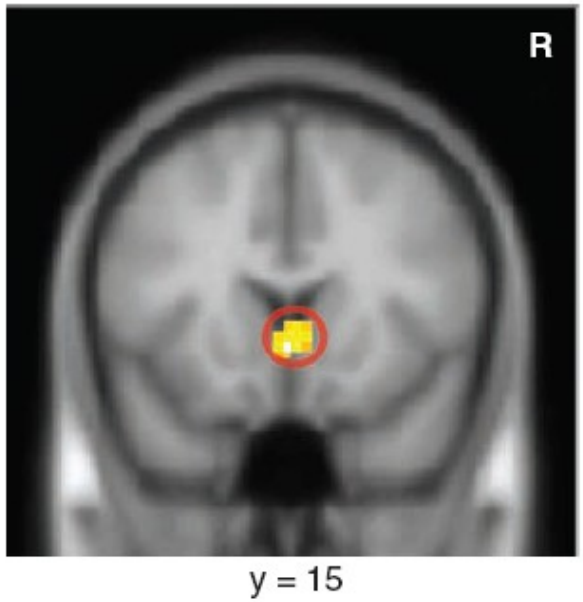
Econ	Choice A	Choice B	Choice C
Dummy 1	**14**	**11**	**8**
Dictator	**4**	**4**	**4**
Dummy 2	**5**	**6**	**7**
Fairness Concept	**Efficiency**		**Inequity**
% Econ	53.5%	15.5%	31.0%
% non-Econ	32.7%	15.4%	51.9%

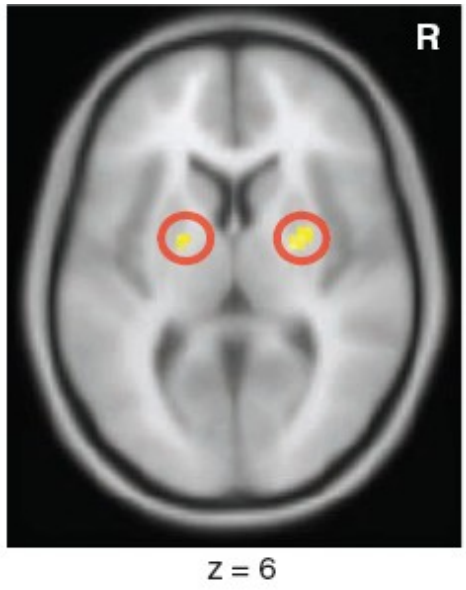
Inequity aversion vs. efficiency

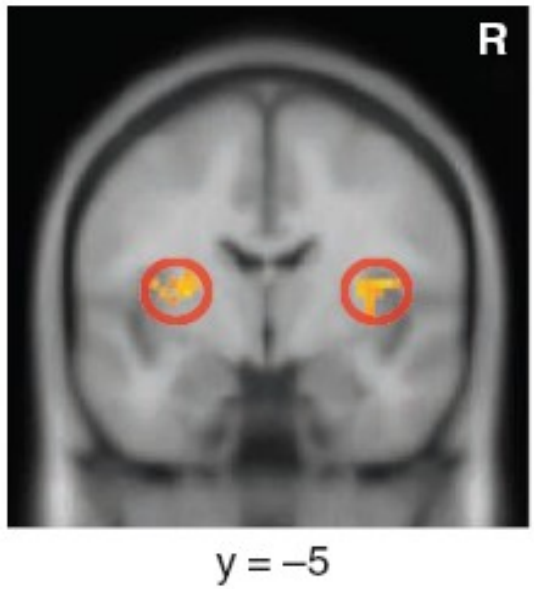
- **Neural correlates of other-regarding concerns** Hsu et al. 2008
- Are there differences in how we take into account the different other-regarding concerns: efficiency vs. inequality
- **Allocating food to the poor**
  - Subjects make many decisions where they have a tradeoff:
    - Making 2 children slightly worse off (large total)
    - Making 1 children considerable worse off (smaller total)
  - 26 subjects
  - fMRI scan at three moments
    - Display: Choices are displayed
    - Switch: Subject makes the decision
    - Hit: Decision is implemented

Inequity aversion vs. efficiency

- **Neural correlates of other-regarding concerns** Hsu et al. 2008
  - Correlates of both increases in efficiency and equality
    - Caudate/septal region (during hit)
  - Correlates of increases in efficiency
    - Putamen/striatum (during display)
  - Correlates of increases in equality
    - Insula (during display and switch)







Outcome-based models

- **Is this really about social norms**
  - Is punishment driven by violations to norms such as equality & efficiency?

- **The role of envy** Leibbrandt & López-Pérez 2007
  - 165 subjects, series of games (one paid at random), within-subjects
  - Groups of 3 subjects:
    - Dictator: allocates money between himself and the dummy player
    - Dummy: does nothing
    - Punisher: can spend money to punish the other players (costs 1 to reduce by 3)

	Choice A	Choice B
Dictator	560	120
Dummy	60	140
Punisher	200	200
Fairness Concept	Efficiency	Equity

Outcome-based models

- **The role of envy** Leibbrandt & López-Pérez 2007

	Choice A	Choice B
Dictator	560	120
Dummy	60	140
Punisher	200	200
Fairness Concept	Efficiency Envy	Equity
Punishment	14.65	0.84

	Choice A	Choice B
Dictator	280	390
Dummy	240	240
Punisher	200	200
Fairness Concept	Equity Envy	Efficiency Envy+
Punishment	3.60	7.71

	Choice A	Choice B
Dictator	250	110
Dummy	150	290
Punisher	200	200
Fairness Concept	Equity Envy	
Punishment	4.95	1.28

- **Fairness norms?**
  - Punishment in experiments might not be related to fairness at all
  - Models that incorporate envy (F&S) do quite well explaining punishment

Intention-based models

- **Is all punishment driven by outcomes?**
  - Intentions ought to be important
  - What determines kindness?
  - Kindness depends on how nice I think you will treat me depending on (my expectation of) your belief of my action.
- **Rabin (1993) and Dufwenberg and Kirchsteiger (2004)**
  - Fairness is the midpoint of possible (efficient) actions.

$$U_i = \pi_i + \rho_i \sum_{j \neq i} \sigma_{ij}[\pi_j(s_i, b_{ij}) - \pi^e{}_j(s_i, b_{ij})]\ \lambda_{iji}[\pi_i(b_{ij}, b_{iji}) - \pi^e{}_i(b_{ij}, b_{iji})]$$

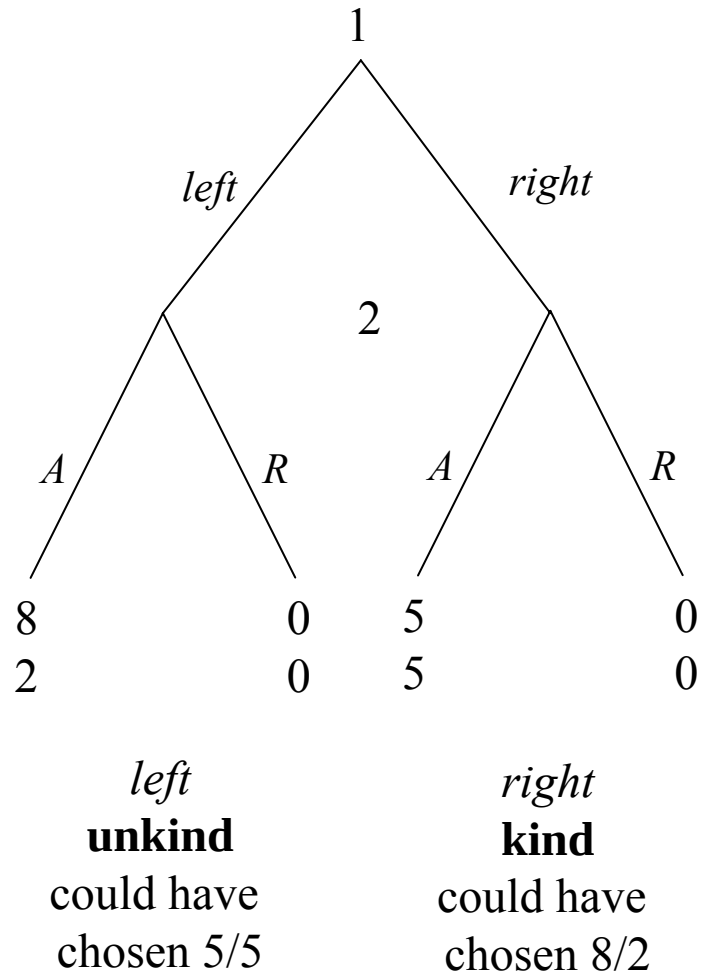
- **Falk and Fischbacher (2006)**
  - Kindness is the midpoint of possible (efficient) actions.

$$U_i = \pi_i + \rho_i \sum_{j \neq i} \sigma_{ij}[\pi_j(s_i, b_{ij}) - \pi_j(b_{ij}, b_{iji})]\ \lambda_{iji}[\pi_i(b_{ij}, b_{iji}) - \pi_j(b_{ij}, b_{iji})]$$

$$\upsilon(\pi_i, \pi_j)$$

Intention-based models

- **Falk and Fischbacher (2006)**
  - What determines kindness
    - How your action affects our relative incomes: $\pi_i - \pi_j$
    - What are the intentions behind your action
      - Intentionally kind
        - not advantageous position and had any alternative to be less generous
      - Intentionally unkind
        - advantageous position and had a reasonable alternative to be more generous



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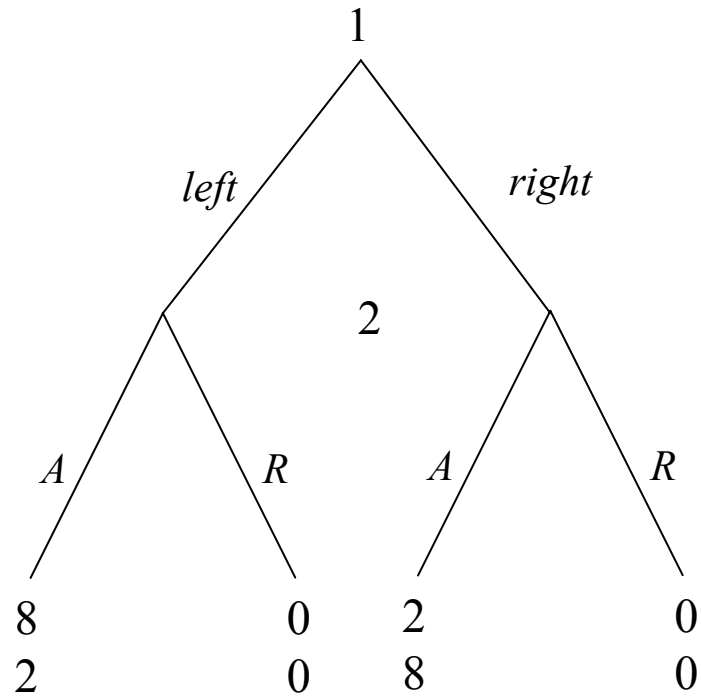

left
neither kind nor unkind
choosing 2/8 is unreasonable

right
kind
could have chosen 8/2

Intention-based models

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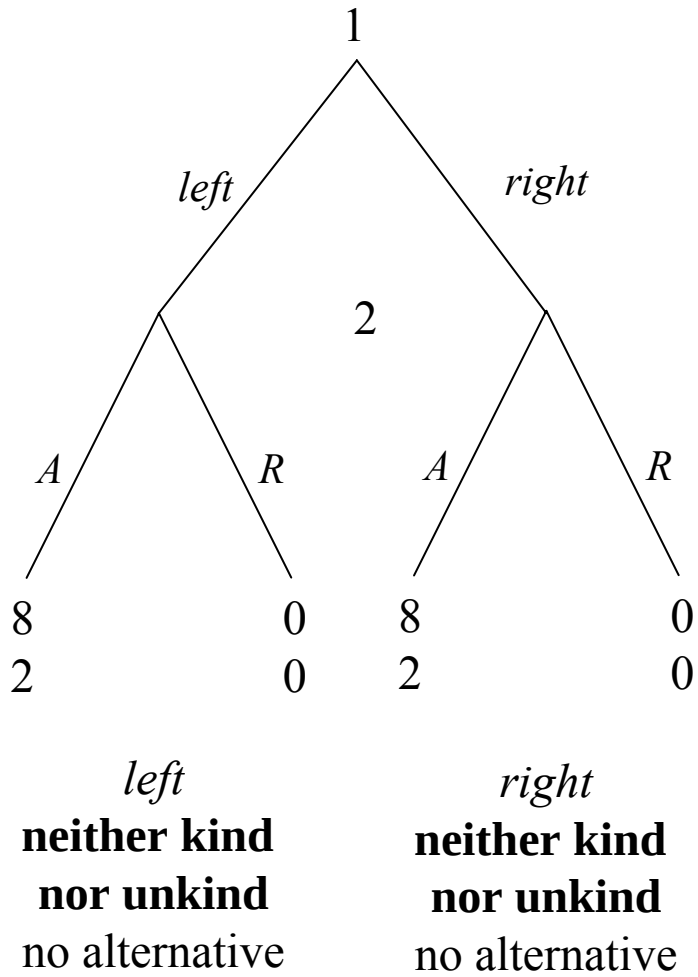

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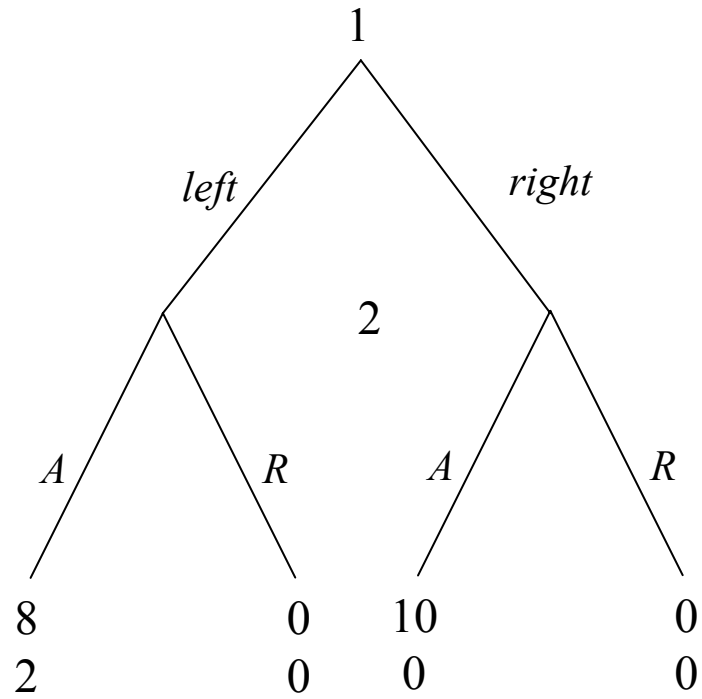
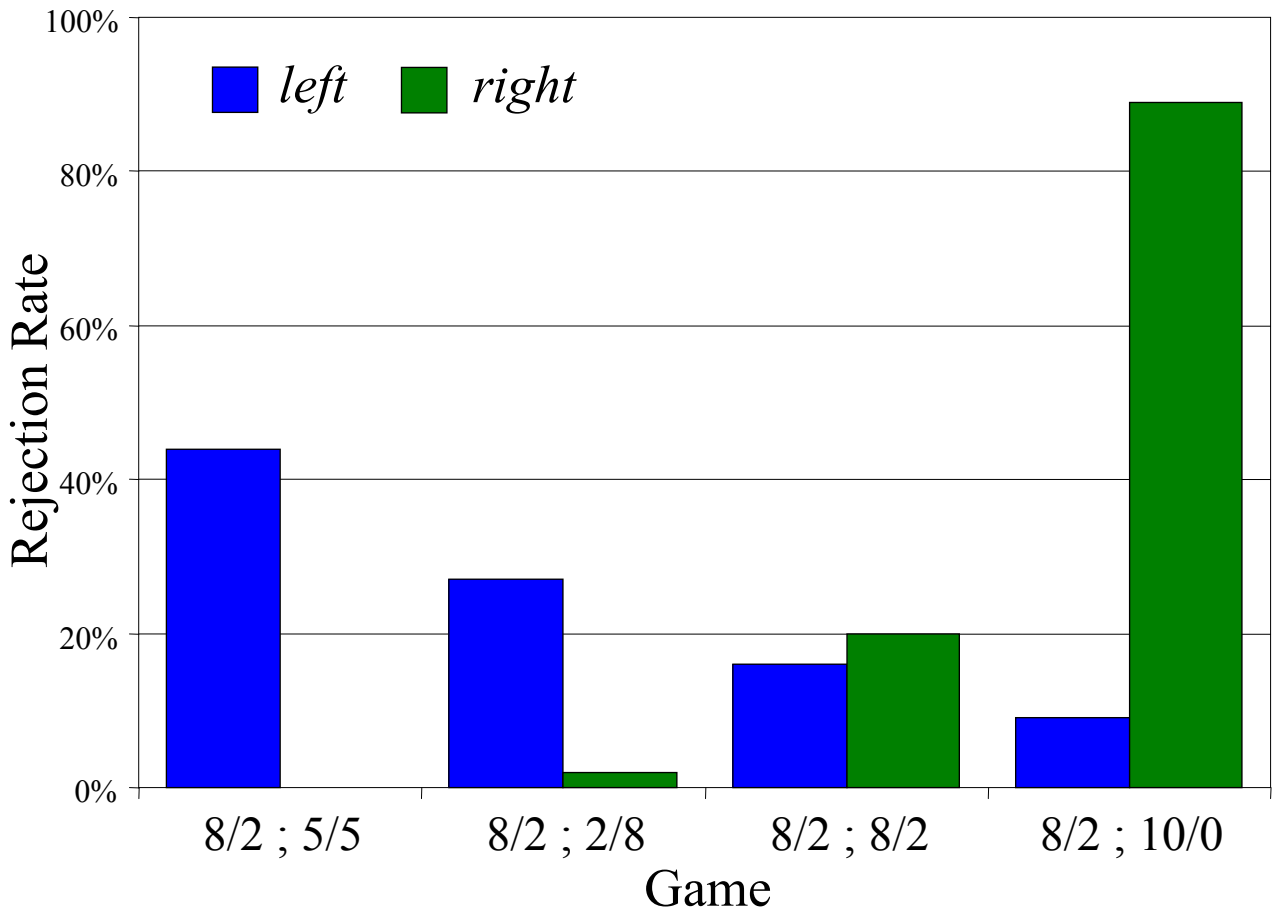


left
neither kind nor unkind
8/2 is an advantageous to 1

right
unkind
could have chosen 8/2

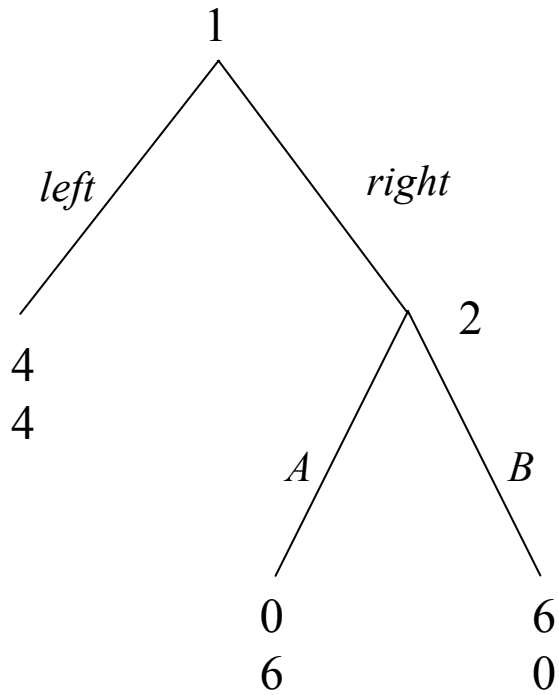
Intention-based models

- **Alternatives matter** Falk et al. 2003
- 90 subjects, series of games (one paid at random), within-subjects, strategy method
- **Results**
  - Rejections rates for 8/2 vary by as much as 40 percentage points depending on the alternative!
- Additional evidence from games with computer-generated actions



Intention-based models

- **Importance of beliefs** Dufwenberg and Kirchsteiger 2004
  - If 1 chooses *right*, is he being kind?
    - Depends on his belief of what 2 will do
  - 2nd order beliefs are important
    - Psychological Game Theory Geanakoplos et al. (1989)



Conclusions

- A lot of progress has been done in modeling fairness by incorporating it into the utility function.
- Models help explain when will fairness produce equal outcomes as well when it wont.
- Inequity reduction
  - Good at explaining reciprocity
  - Does less well for pure allocation decisions
- Alternatives and beliefs matter (hard to model)