Social Preferences

Dictator, Ultimatum and Trust Games

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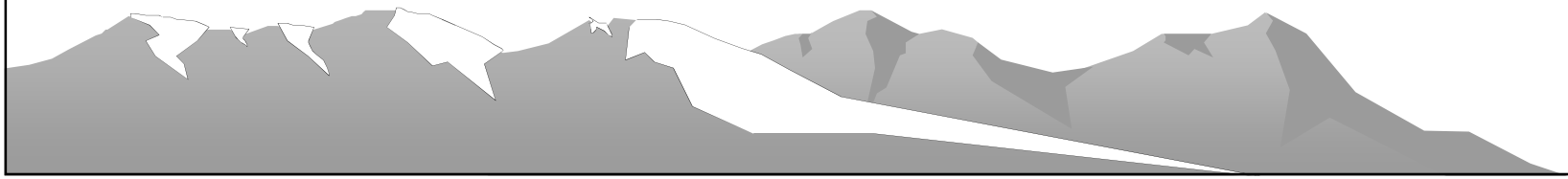
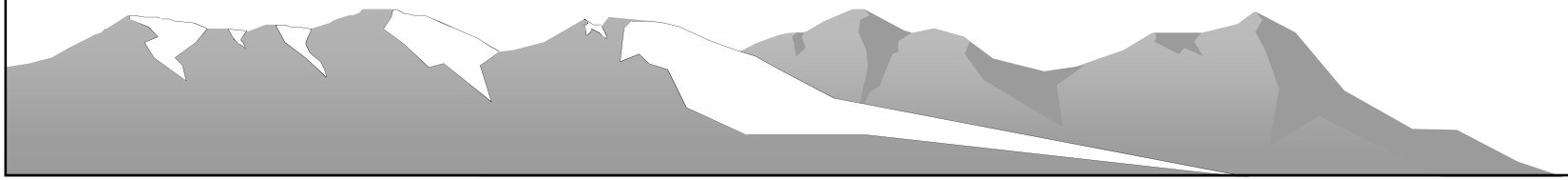


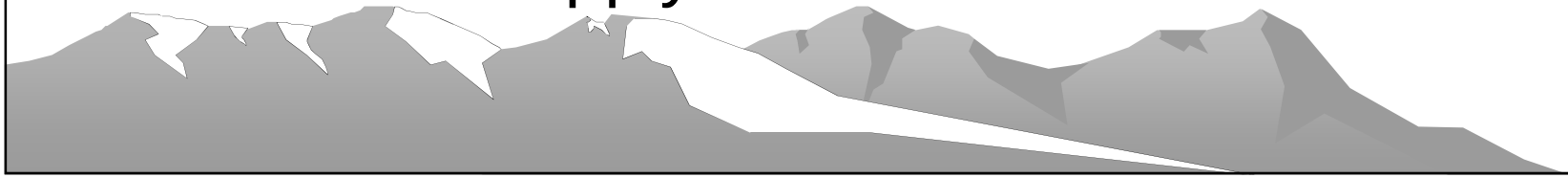
Fairness, Reciprocity, and Trust

- Example: Ultimatum Game
  - Proposer: makes a take-it-or-leave-it offer
  - Responder: accepts or rejects the offer
- Why should we care about this game?
- People talk about Fairness and Trust
- Stigler (1981) “self-interest theory will win.”
- Results = price tag on negative reciprocity



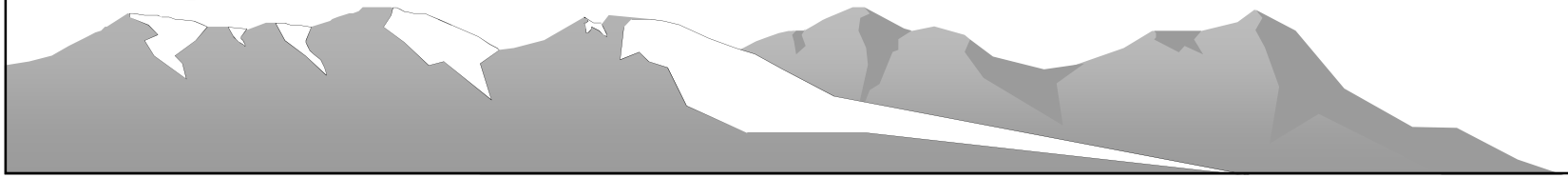
Political History Example

- Federal Convention 1787, Philadelphia
- "Should new states be 2nd rate states?"
  - George Mason: "They will have the same pride and other passions which we have, and will either not unite with or will speedily revolt from the Union, if they are not in all respects placed on equal footing with their brethren…"
- Fear of rejection or Fairness?
  - Can we apply this to China-Taiwan relations?



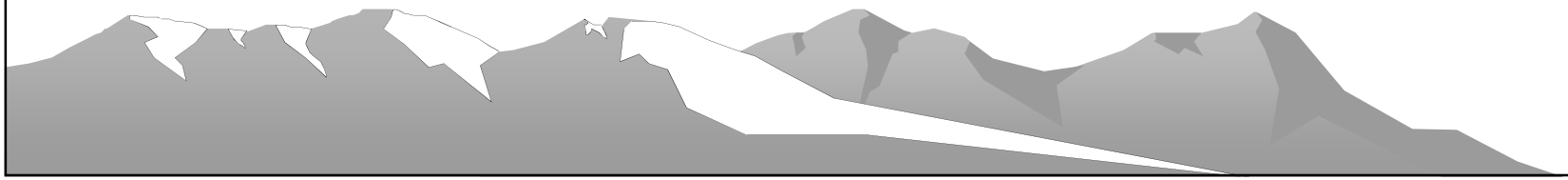
Self-Interest or Not?

- Self-interest: What we first learn in principles
- What about altruism?
- Standard response:
  - Monetary payoff of your “friends” enter into your utility function (so you still Max. U)
- Why don’t we see this later?
  - Because the 1st Welfare Theorem will fail!
- Do people really only care about their own payoffs?



Games on Social Preferences

- Prisoners' Dilemma (PD)
- Public Goods Game (PG)
- Ultimatum Game
- Dictator Game: responder cannot reject
- Other games (not discussed here…)
  - Trust Game: Dictator game where responder "invests" first to determine the pie to allocation
    - Measure of Trust: Amount of investment
    - Measure of Trustworthiness: Amount of repayment
  - Centipede: Multi-stage trust game
  - Gift Exchange: Multiplayer trust game

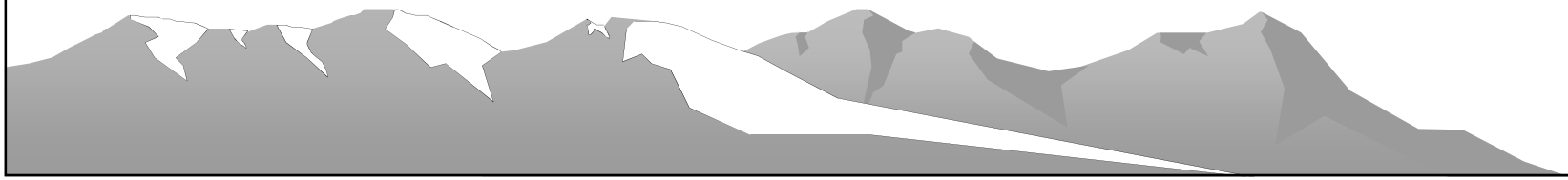


Prisoners' Dilemma (PD)

	C	D
C	H, H	S, T
D	T, S	L, L

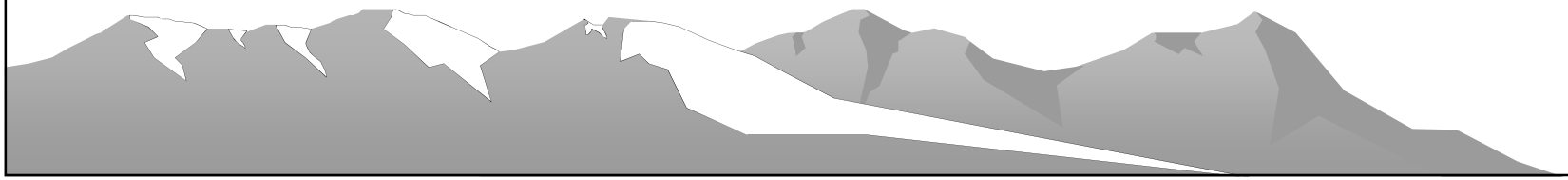
(T > H > L > S)

- Each player pick C or D
- The Dilemma:
  - Both cooperate (C) is Pareto dominant
  - But, defecting (D) against C is better
- Only Equilibrium: (D, D)



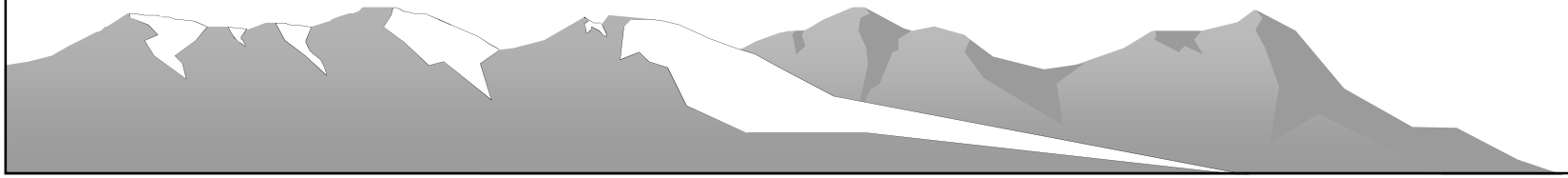
Prisoners' Dilemma (PD)

- 1-shot games Baseline:
  - Play C 50% of the time
- Changing payoffs:
  - Lowering T (raising S) increases cooperation
- Pre-play communication raises cooperation
- Random Re-Matching:
  - Dwindle to only few cooperate



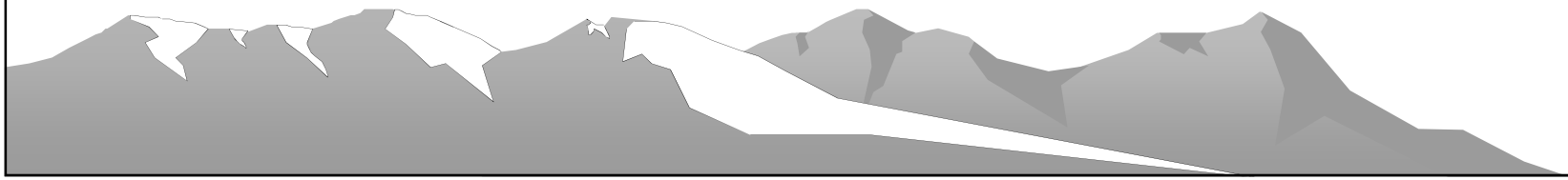
Public Goods Game (PG)

- N players
- Invest c_i from personal endowment e_i
- Total contribution c_{all} = sum of c_i
- Payoff = e_i - c_i + $m * c_{all} / N$
  - Total contribution is multiplied by m and divided among all players
- Like PD:
  - Cooperation is good; want to free-ride



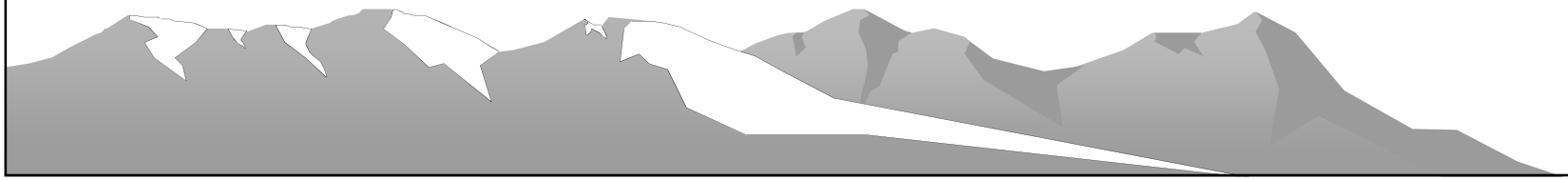
Public Goods Game (PG)

- 1-shot games Baseline:
  - Average contribution = 50% (mostly all or none)
- Changing payoffs:
  - Raising m (marginal return) raises contribution
- Pre-play communication raises cooperation
- (Random) Re-Matching: Contribution dwindles



Public Goods Game (PG)

- Punishment Effect (Fehr and Grachter, AER 2000)
  - Allow subjects to costly punish others after results are revealed
- Converges toward full contribution, since…
- People punish free-riders
  - Even though one can free ride other's punishing
- Cooperation seems to be Reciprocal



Fehr and Grachter (AER 2000)

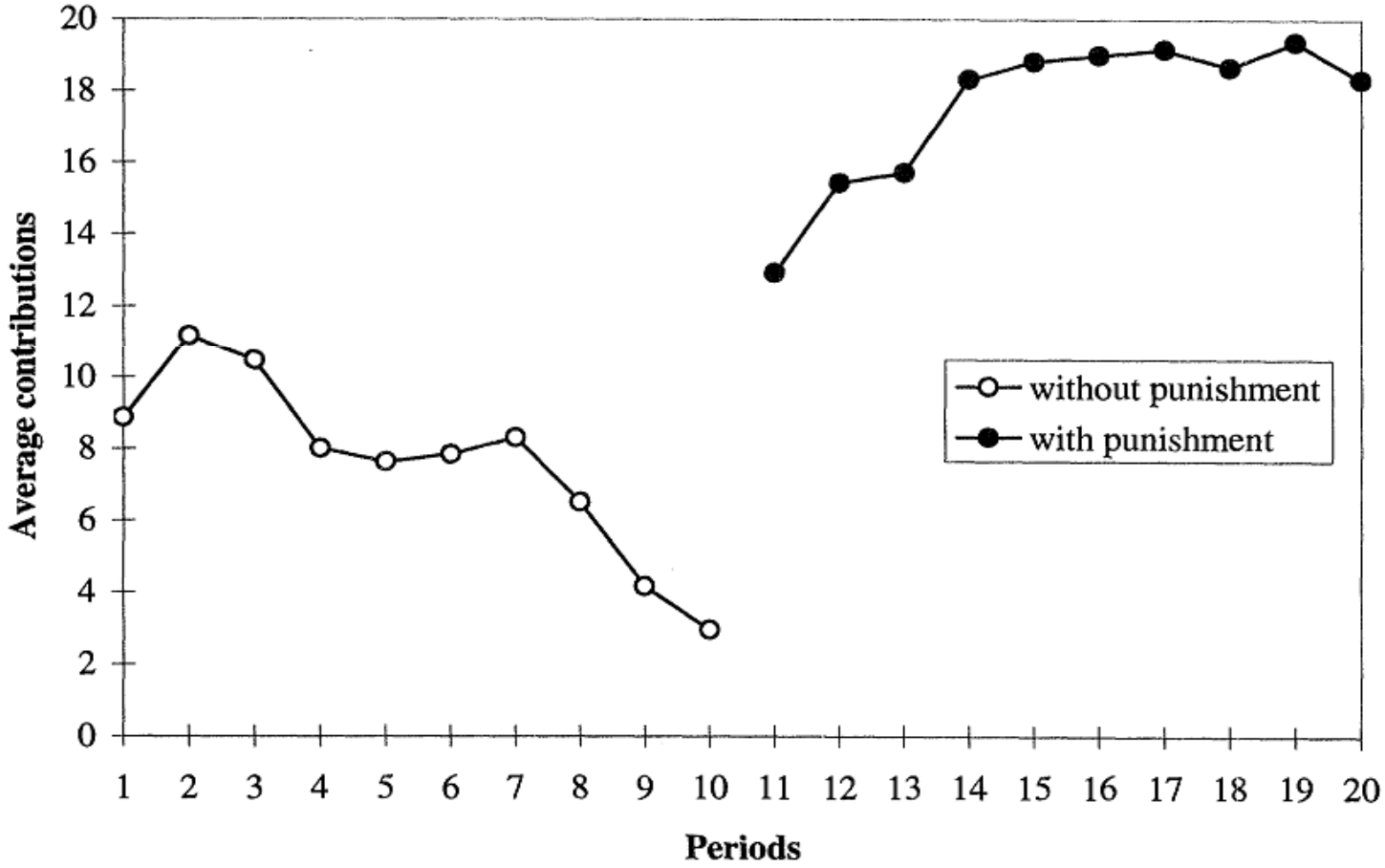


FIGURE 3B. AVERAGE CONTRIBUTIONS OVER TIME IN THE PARTNER-TREATMENT (SESSION 5)

Pure/Impure Altruism Preferences

- Example: $U_i(X) = x_i + \alpha \cdot x_{-i}$
- Can explain (C,C) in PD (T > H > L > S)

$$\alpha \geq \frac{T-H}{H-S}$$

	C	D
C	H, H	S, T
D	T, S	L, L

	C	D
C	H(1+α), H(1+α)	S+αT, T+αS
D	T+αS, S+αT	L(1+α), L(1+α)

Pure/Impure Altruism Preferences

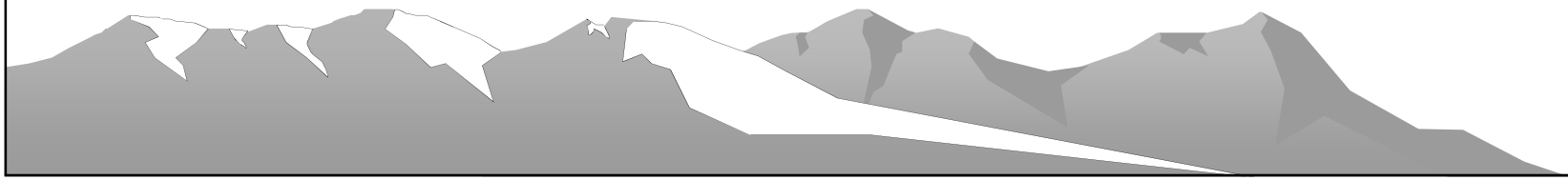
- Example: $U_i(X) = x_i + \alpha \cdot x_{-i}$
- Sustain (C,C) if $\alpha \geq \frac{T-H}{H-S}$
- Can explain why "Lowering T increases cooperation" (but not raising S)

(T > H > L > S)

	C	D
C	H(1+α), H(1+α)	S+αT, T+αS
D	T+αS, S+αT	L(1+α), L(1+α)

Pure/Impure Altruism Preferences

- Example: $U_i(X) = x_i + \alpha \cdot x_{-i}$
- Homework: Can this explain PG (with or without punishment)?
- Altruistic giving is crowded out if others give
- Can't explain reciprocity
  - "I like to do good to those good to me, but do bad to those bad to me ."

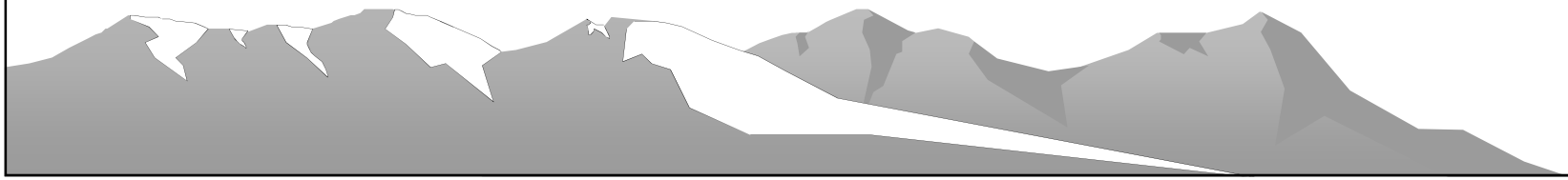


Inequality-Aversion: Guilty-Envy

- Fehr and Schmidt (1999)

$$U_i(X) = x_i - \frac{\alpha}{n-1}\sum_{k\neq i}\max(x_k - x_i, 0) - \frac{\beta}{n-1}\sum_{k\neq i}\max(x_i - x_k, 0)$$

- Envy stronger than guilt $0 \leq \beta \leq 1, \beta \leq \alpha$
- Explains
- PD: sustain cooperative outcome (C,C)



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- PD: sustain cooperative outcome (C,C)
- (T > H > L > S)

$$\beta \geq \frac{T-H}{T-S}$$

	C	D
C	H, H	S, T
D	T, S	L, L

	C	D
C	H, H	S-α(T-S), T-β(T-S),
D	T-β(T-S), S-α(T-S)	L, L

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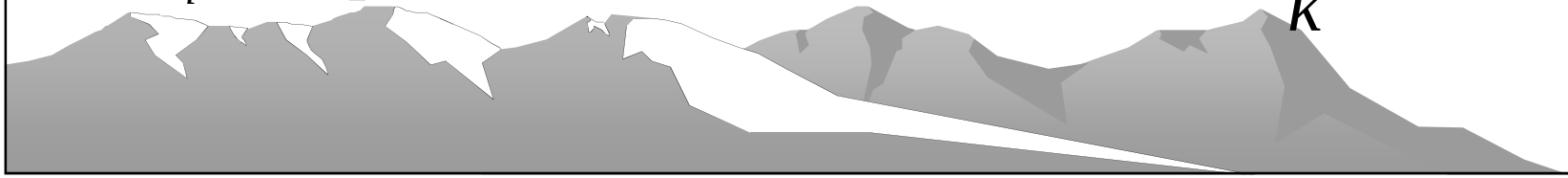
- PG: heterogeneous contribution
  - some 0 vs. some positive (2008 midterm Q4…)
- Punishments in PG

$$U_i(\text{punish}) = x_i - F - \alpha\left[(x_k - kF) - x_i\right] = x_i(1+\alpha) + (\alpha k - 1)F$$

$$\geq U_i(\text{not punish}) \text{ if } (\alpha k - 1) \geq 0 \quad \Rightarrow \alpha \geq \frac{1}{k}$$

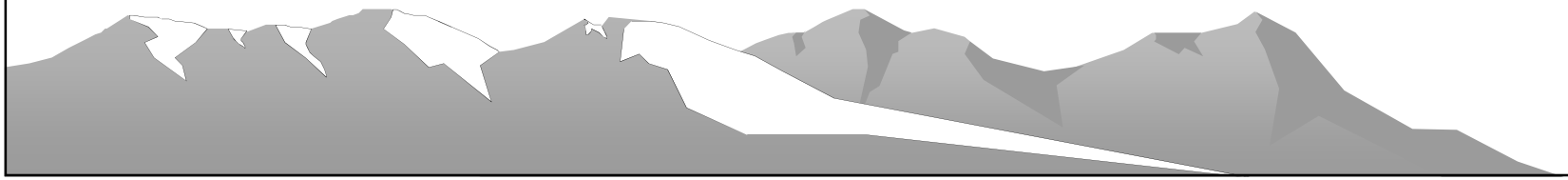


Classroom Public Goods Game

	回合數1			回合數2		
集合總張數	13			5		
集合分配得分	2.6			1		
留下張數	0	1	2	0	1	2
累積組數	3	5	5	0	1	12
本回合分數	2.6	3.6	4.6	5.6	6.6	7.6
累積總數	3	5	5	3	6	4

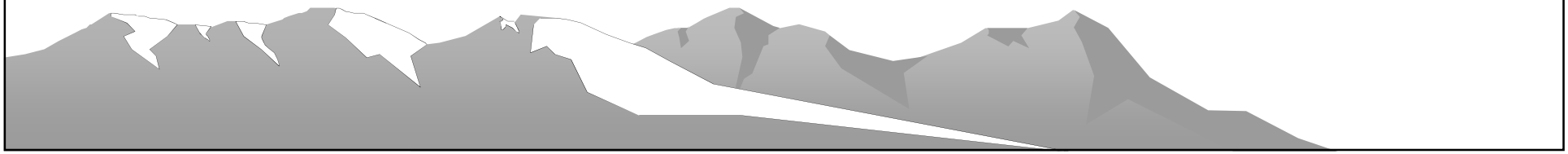
PD and PG: Conclusion

- Experts in these two games:
  - PD: Chun-Lei Yang (Academia Sinica)
  - PG: Li-Chen Hsu (NCCU)
- Do these results falsify game theory?
  - Not quite. They invite for new theory
- New theory in BGT: Social Preferences (BGT, 2.8) and Limited Strategic Thinking (BGT, Ch.6)
- Problem with PD/PG: “Defecting” is dominant
  - Can’t distinguish altruism from conditional cooperation



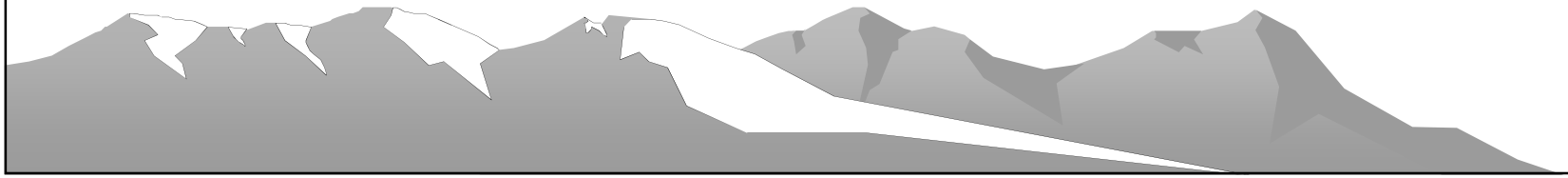
Ultimatum Game

- A “Better” Game: Ultimatum Game
  - Proposer: makes a take-it-or-leave-it offer
  - Responder: accepts or rejects the offer
- Baseline: 1-shot, anonymous, action
  - Random re-matching
  - Strategy Method: Minimum Acceptable Offer (MAO)
- Strategy Method vs. Specific-action Method
  - Is the strategy method too “unnatural”?



Ultimatum Game

- Basic Results (BGT, Table 2.2, 2.3)
- Proposer
  - Mode / median: 40~50%
  - Mean: 30-40%
  - Almost no below 10% or above 50%
  - Fairness or Fear of Rejection?
- Responder
  - Rarely reject offers of 40~50%
  - 50% rejection rate for offers below 20%



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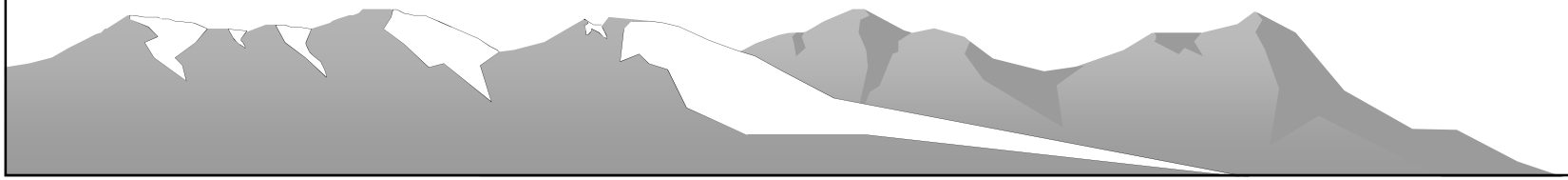
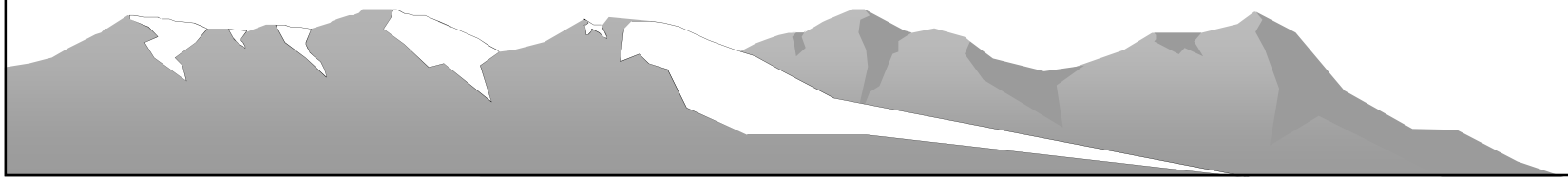
  - Envy stronger than guilt: $0 \leq \beta \leq 1, \beta \leq \alpha$
  - Explains
- Ultimatum – Rejections, Fair offers
- Can Altruism also explain rejection / offers?
  - No (so it's less "parsimonious"; inferior to G-E!)



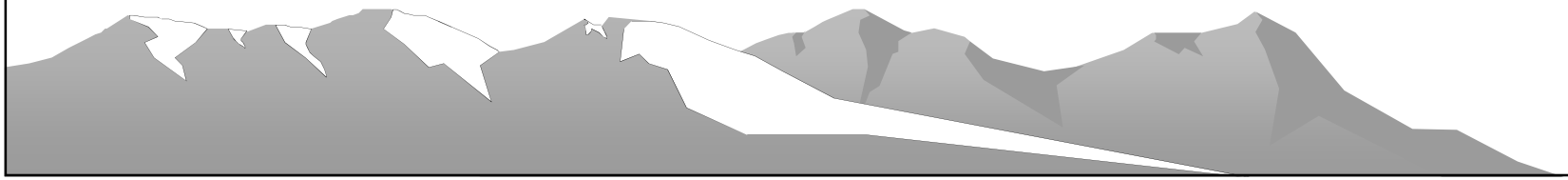
Dictator Game

- An Ultimatum Game with NO rejection
  - Proposer: makes a dictated allocation decision (and the Responder cannot reject it)
  - Distinguish Fairness from Fear of Rejection
- Basic Results: (BGT, Table 2.4)
  - Lower than Ultimatum, but not zero
- Offers are more generous than BR
  - Both Altruism AND Strategic Concerns exist
  - Proposers hold “pessimistic” belief



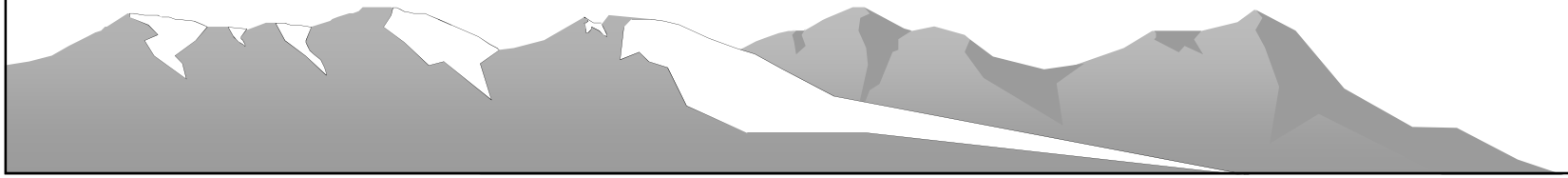
Dictator Game: Guilt-Envy

- Guilt-Envy Prediction for the dictator game:
  - Give 50-50, or nothing
- Not consistent with the dictator game results
  - Can you try to “fix” this by adding concavity
- What are more plausible theories?
  - Fear of rejection + Self-interest



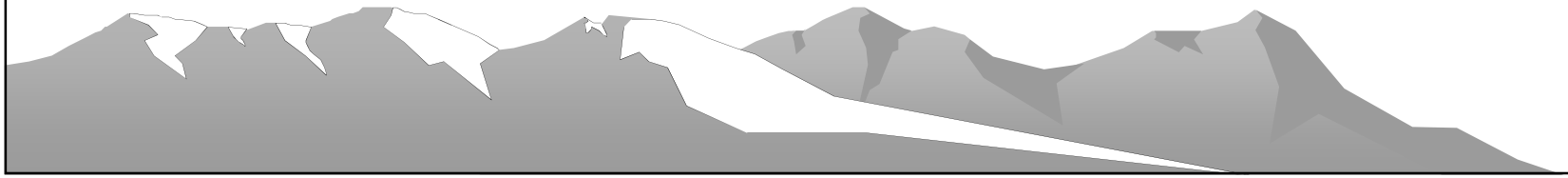
Can XYZ… explain these results?

- X: Methodological Variables
  - Repetition, Stakes, Anonymity & Experimenter “Blindness”
- Y: Demographic Variables
  - Gender, Race, Academic Major, Age,
  - Brains, Biology and Beauty
- Z: Culture
- XX: Descriptive Variables
  - Labeling and Context
- YY: Structural Variables
  - Add a move (see below)



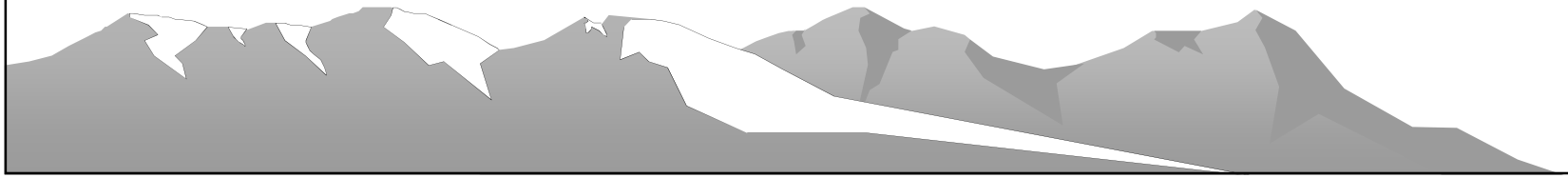
Z: Culture

- Machiguenga Farmers in Peru
  - Offer average 26%; mode 15%
  - Social disconnect; no names for non-relatives
- Henrich et al. (2002): 20 cultural groups
- Hyperfair offers (that are rejected!)
  - Ache headhunters of Paraguay and Lamelara whalers of Indonesia
  - Competitive gift-giving: Accepting a hyperfair offer incurs obligation to repay and is an insult



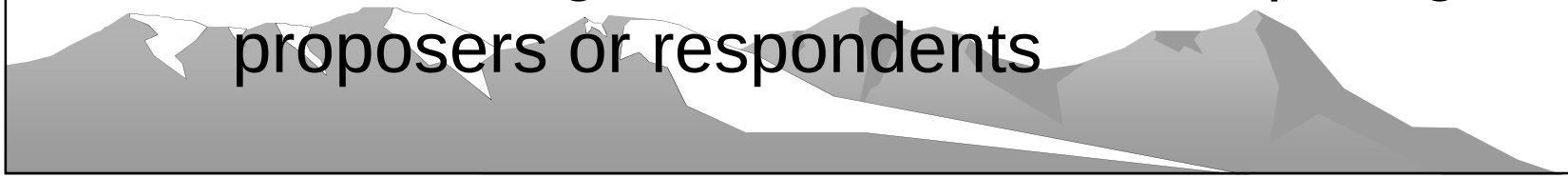
Z: Culture

- Two key determinants ($R^2 = 0.68$):
  - Amount of cooperative activity (economies of scale in production)
  - Degree of market integration
- More cooperative activity and market integration lead to 50-50 sharing norms
  - Active markets and self-interest don't sync!
- This is a real culture study…



YY: Structural Variables

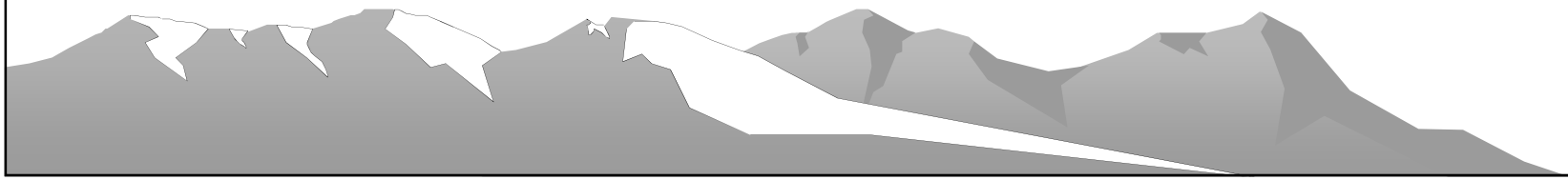
- Multiperson games: Competition drive offers
- Multiple proposers vs. 1 respondent
- Offer → 1-99
- Multiple respondent vs. 1 proposer
- Offer → 99-1
- Can G-E, Explain These?
  - Homework: Show how G-E can explain ultimatum game results with competing proposers or respondents



Fairness Equilibrium

- Psychological Games: Rabin (1993)
- Normal Form Games; Action: a_1
- Belief about other's action: b_2
- Belief about belief: c_1
- 1's kindness toward 2:

$$f_1(a_1, b_2) = \frac{\pi_2(b_2, a_1) - \pi_2^{fair}(b_2)}{\pi_2^{\max}(b_2) - \pi_2^{\min}(b_2)}$$



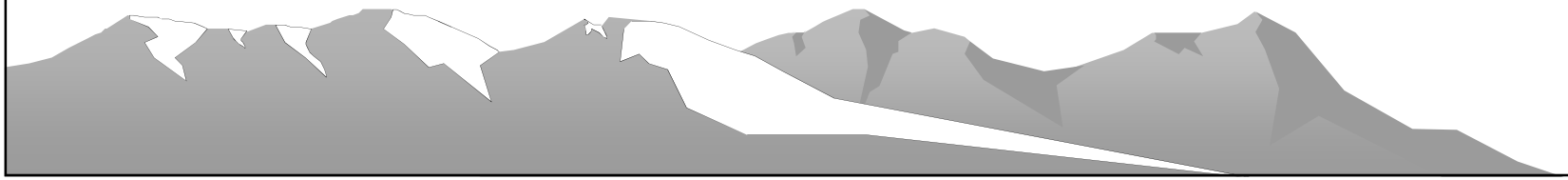
Fairness Equilibrium

- 1's kindness toward 2:

$$f_1(a_1, b_2) = \frac{\pi_2(b_2, a_1) - \pi_2^{fair}(b_2)}{\pi_2^{\max}(b_2) - \pi_2^{\min}(b_2)}$$

- 1's perceived kindness of 2:

$$\tilde{f}_2(b_2, c_1) = \frac{\pi_1(c_1, b_2) - \pi_1^{fair}(c_1)}{\pi_1^{\max}(c_1) - \pi_1^{\min}(c_1)}$$



Fairness Equilibrium

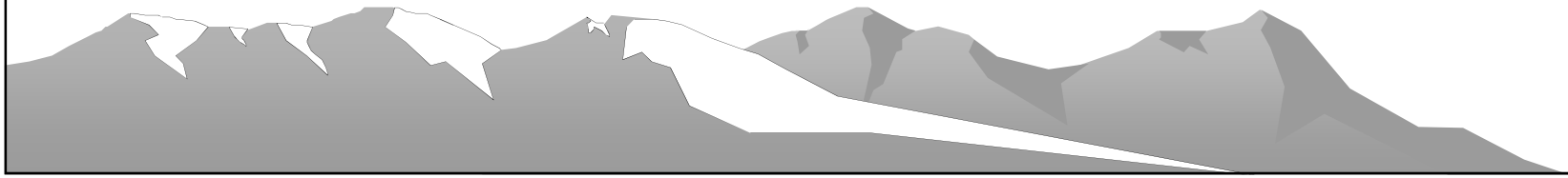
- Player 1's (social) preferences:

$$U_1(a_1, b_2, c_1) = \pi_1(a_1, b_2) + \alpha \cdot \tilde{f}_2(b_2, c_1)$$
$$+ \alpha \cdot \tilde{f}_2(b_2, c_1) \cdot f_1(a_1, b_2)$$

- Rational expectations: $a_1 = b_2 = c_1$
- Example 1: PD
- Example 2: Chicken Game
- Extensive-Form Fairness Equilibrium
  - Falk and Fischbacher (1998)

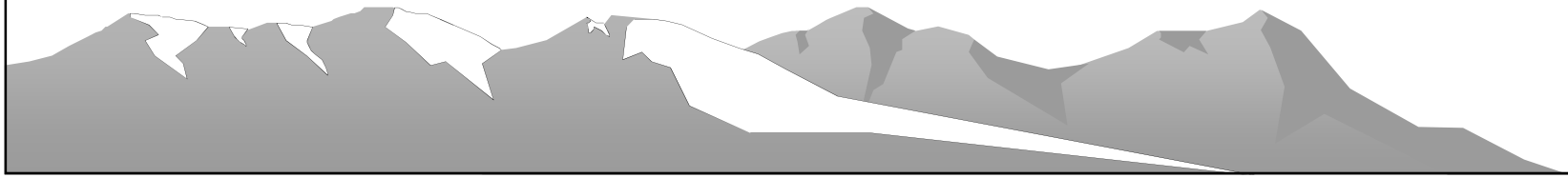
ERC, Guilty-Envy vs. Fairness Eq.

Offer	Accept	Reject	Reject rate	ERC	G-E	Fairness Eq.
Equal	5,5	0.5, 0.5				
Unequal	8,2	0.8, 0.2	38%	None	Some	Some
Equal	5,5	3,3				
Unequal	8,2	6,0	19%	None	None	Some



What did we learn from all this?

- A LOT has been done…
  - Is there a parsimonious theory to explain all?
- Every stone has been turned to disprove Social Preference, but “failed”…
  - People are not strictly self-interest
- Methods: See how careful they did those!
- What makes a result interesting?
  - How can you adopt it in your own design?



Conclusion

- Do people respond to incentives?
  - Yes! But what kind of incentives?
- External (monetary) Incentives: Payoffs
- Internal Incentives: Fairness, Altruism, etc.
- Plenty of experiments on social preferences
  - Don’t blindly propose to run another one!
  - Check literature first! (BGT, ch.2, MGS, ch.12-14)
- Is there a parsimonious theory to explain all this (and make new predictions)?

Public Goods Game Results

	回合數1			回合數2		
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