Social Preferences
社會偏好

Dictator, Ultimatum & Trust Games

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Lecture 4, EE-BGT

Fairness, Reciprocity & Trust 公平互惠信任

- Example: Ultimatum Game (最後通牒談判實驗)
  - Proposer (提議者): makes take-it-or-leave-it offer
  - Responder (回應者): accepts or rejects the offer
- Why should we care about this game?
- People talk about Fairness and Trust
  - 一般人常把公平和信任掛在嘴邊 vs. Stigler說自利動機最後總是佔上風
- Stigler (1981): self-interest theory will win.
- Results = price tag on negative reciprocity
  - 實驗結果 = 把「報復性正義」標上價格

Political History Example 美國政治史的例子

- 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..."
    - 新的州民和我們一樣會為自己州感到驕傲自豪。因此，如果他們不能和我們享受同樣的權利，他們若非不願加入，就是加入後很快就會退出
- Fear of rejection or Fairness? (害怕拒絕 vs. 追求公平)
  - Can we apply this to China-Taiwan relations?

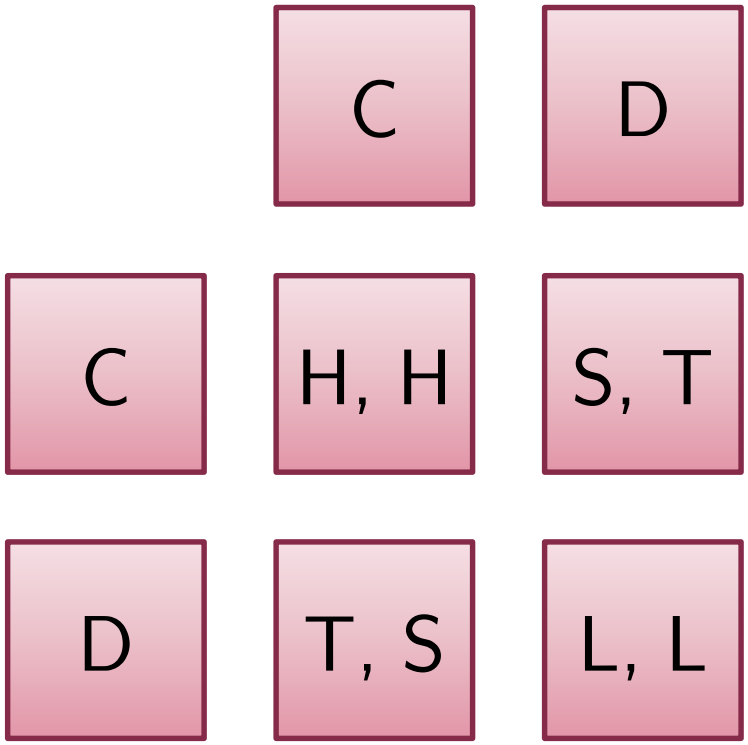
Self-Interest or Not? 人到底是不是自利的？

- Self-interest (自利): What you first learn in Principles of Economics (經原第一堂課)
  - What about altruism? (那「利他」怎麼解釋？)
- Standard response:
  - Monetary payoff of your friends enter into your utility function (so you still Max. U)
  - 你的效用函數包括你「朋友」的金錢報酬，因此利他就是自利
- Why don't we see this later?
  - Because the 1st Welfare Theorem will fail!
- Do people really only care about themselves?

Games on Social Preferences 社會偏好的賽局

- Prisoners' Dilemma (PD, 囚犯的兩難)
- Public Goods Game (PG, 自願捐輸賽局)
- Ultimatum Game (最後通牒談判)
- Dictator Game (獨裁分配): responder cannot reject
- Trust Game (互信賽局): Dictator game where responder invests first to determine pie size
  - Measure of Trust: Amount of investment
  - Measure of Trustworthiness: Amount of repayment
- Centipede (蜈蚣賽局): Multi-stage trust game
- Gift Exchange (禮尚往來): Multiplayer trust game

Prisoners' Dilemma (PD) 囚犯的兩難



(T > H > L > S)

- Each player pick (每人選擇)
  - C or D
- The Dilemma (兩難的抉擇):
  - Both cooperate (C) is Pareto dominant
  - Defect (D) against C better
  - 雙方合作(都選C)對大家最好，但給定對方合作，你背叛(D)比合作更好
- Only Equilibrium (唯一均衡):
  - (D, D)

Prisoners' Dilemma (PD) 囚犯的兩難

- 1-shot games Baseline: (只做一次的基準實驗)
  - Play C 50% of the time (選擇合作(C)的比例高達50%)
- Changing payoffs:
  - Lowering T (raising S) increases cooperation
  - 降低背叛的好處或被背叛的損失(降低T/提高S)會促進合作
- Pre-play communication raises cooperation
  - 事先溝通會促進合作
- Random Re-Matching:
  - Dwindle to only few cooperate
  - 隨機配對重複做幾次，越來越多人背叛，最後只剩少數還堅持合作

Public Goods Game (PG) 自願捐輸賽局

- N players
- Invest c_i from personal endowment e_i
- Total contribution $c_{all} = \sum_{i=1}^{N} c_i$
- Payoff $= e_i - c_i + \frac{m}{N} \cdot c_{all}$
  - Total contribution is multiplied by m and divided among all players
- Like PD:
  - Cooperation is good; want to free-ride

Public Goods Game (PG) 自願捐輸賽局

- 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
- Punishment Effect: Fehr & Grachter, AER00'
  - Even though one can free ride other's punishing
- Cooperation seems to be Reciprocal

Fehr and Grachter (AER 2000)

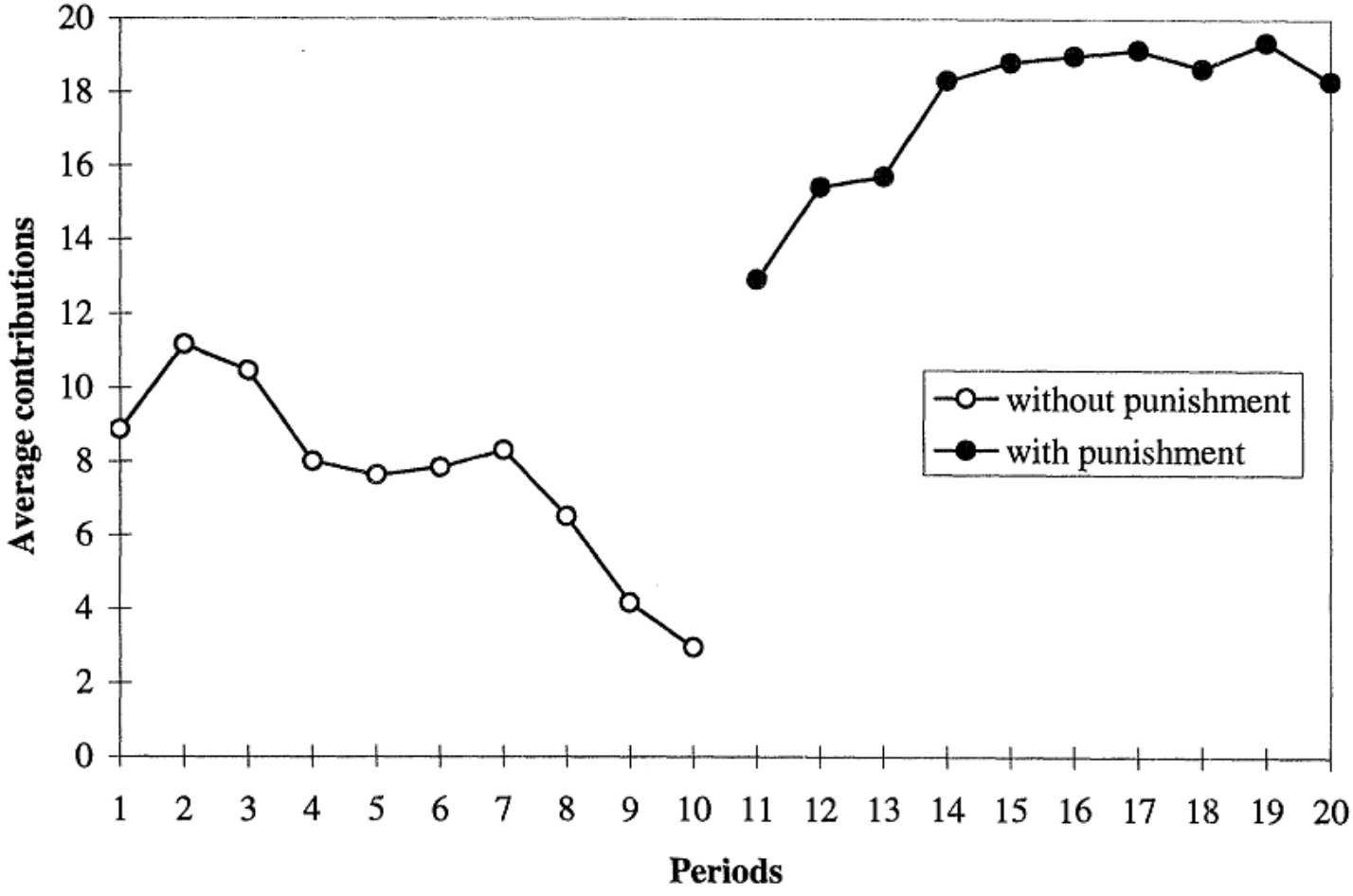


FIGURE 3B. AVERAGE CONTRIBUTIONS OVER TIME IN THE PARTNER-TREATMENT (SESSION 5)

Pure/Impure Altruism

- Example: $$U_i(X) = x_i + \alpha \cdot x_{-i}$$
- Can explain (C,C) in PD
- Homework: Can this explain PG (with or without punishment)?
- Altruistic giving crowded out if others give
- Cannot 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)
- PG: heterogeneous contribution
  - some 0 vs. some positive
- Punishments in PG

Classroom Public Goods Game (Principles 08F)

Round	Cards Donated	# of Groups	Total in Pool	Pool Score	Your Score	Memo
1	0	30	24	0.89	2.89	
	1	23			1.89	
	2	1			0.89	
2	0	38	22	0.81	2.81	
	1	10			1.81	
	2	6			0.81	
3	0	15	40	1.48	3.48	A student gave speech to promote donating 1 card.
	1	38			2.48	
	2	1			1.48	
4	0	27	55	2.04	4.04	Same student gave speech to promote donating 2 cards among contributors.
	1	6			3.04	
	2	21			2.04	

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: Social Preferences (BGT, 2.8) and Limited Strategic Thinking (BGT, Ch.5)
- Problem with PD/PG: Defect is dominant
  - Can't tell 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%

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
- Ultimatum – Rejections, Fair offers
- Can Altruism also explain rejection / offers?
  - No (so it is less parsimonious; inferior to G-E!)

ERC (Envy, Reciprocity, Competition)

- Bolton and Ockenfels (2000)

$$U_i(X) = U\left(x_i, \frac{x_i}{\sum_{k=1}^{n} x_k}\right)$$

  - Care about relative share
  - No individual comparison; Only total comparison
- Homework: Can this model also explain PD and Ultimatum rejection/offers?
- What game can distinguish this from G-E?

Dictator Game

- An Ultimatum Game without 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
  - Homework: Try to "fix" this by adding concavity
- What are more plausible theories?
  - ERC: More sophisticated theory of altruism
  - Fear of rejection + Self-interest
- Homework: Show how ERC or fear of rejection can explain dictator game results

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)

X: Methodological Variables

- Repetition
  - Experience effect (low offers/rejects) is small
  - Unless played with self-interest robots
  - Is the small effect a satiation of emotion? Try to restart
- Stakes
  - Very large changes (N month wage) only have a modest effect on rejections; no effect on offers
  - Match contribution: 1/2 selfish, 1/3 Leontief, 1/6 utilitarian
- Anonymity and Experimenter "Blindness"
  - Demand effect vs. Double-blind design:
  - Mean is 10%; half gave 0 in dictator; no effect in ultimatum

Y: Demographic Variables

- Gender: No simple main effect
  - Reject less in ultimatum; punish smartly
- Race: Few results (political correctness?)
  - White male repay less to Asians! (Social status?)
- Major: Mixed results on Econ-Majors
- Age: Self-interest → strict equality → equity
  - Kindergartners accept 1 penny 70% (vs. 30-60%)
- Brains, Biology and Beauty
  - Strongness: High-T reject more, offer generously
  - Many women give >50% to attractive men

Z: Culture

- Methodological Issues (and Solutions):
- Stakes: Equal purchasing power; N-day wage
- Language: Back translation
- Experimenter Effects: Bilingual, seen as equal
  - Each should run a session in one culture
- Confounds: Match two cultural samples on demographics and measure uncontrollables

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...

XX: Descriptive Variables Labeling & Context

- Self-interest is okay in the market: A buyer-seller story lowers ultimatum offers by 10% but does not affect rejection rates
- Claiming shared resources creates common ownership: Both become more generous
- Priming: Prompting instructions ("What would you do if you were the other side?") increase fear of rejection
- General principles of Framing? TBD!

YY: Structural Variables

- Identity, Communication, Entitlement
  - More generous to known recipient (student, well-known charity) or if introduced
  - Winning right to propose lowers offers by 10%
- Outside Option
  - Offer less if need to earn X to go to next round
  - U(reject) = (2,3): Multiple focal points; disagree
- Information about Amount being Divided
  - Incline to reject since low offer could be fair
- Multiperson Game: Competition drive offers
- Intentions: Can only choose (8,2) or (10,0)?

Can G-E, ERC, Explain These?

- Homework: How can G-E explain ultimatum game w/ competing proposers/respondents?
- Homework: How can ERC predicts "ignoring allocation to the inactive Recipient" in Guth and Van Damme (1998):
  - Proposer offers (x, y, z) to Two Responders
  - Active Responder sees y/z/yz; accepts or rejects
  - See y/yz: Offer y=30-40%, z=5-10%, reject~5%
  - See z: Offer z=12-15%, keep most, reject~5%

ERC vs. Guilt-Envy

- Other games: ERC match data less well than G-E
  - People care about inequality among others: Charness and Rabin (2000), punishment in PG
  - Absolute difference still matters: (see below)
- But, both models assume separability
  - Are utilities of terminal-node payoffs separable from game tree path and unchosen payoffs? (Some evidence against this, but might be a good approximation)
- Both models do not capture reciprocity
  - "I like to do good to those good to me, but do bad to those bad to me."

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:

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

Fairness Equilibrium

- 1's kindness toward 2:

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

- 1's perceived kindness of 2 to 1:

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

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: $a_1 = b_1 = c_1$
- Example 1: PD
- Example 2: Chicken Game
- Extensive-Form Fairness Equilibrium
  - Falk and Fischbacher (1998)

ERC, G-E vs. Fairness Equilibrium

Offer	Accept	Reject	Reject (%)	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?

Trust

- How do I know you will hold up your end of the deal?
  - Legal Contracts, Third-party assurance,
  - Family solidarity, threats of violence
- These are costly; Trust is cheap!
  - Lending a truck to strangers in Iowa
  - Tokyo's lost and found center (72% returned)
- Firms prefer to lay off rather than cut wages

Trust

- Trust (Social Capital) explains growth
- Putnam (1995)
  - "Since trust is so central to a theory of social capital, it would be desirable to have strong behavioral indicators of trends in social trust or misanthropy. I have discovered no such behavioral measures."

Trust Game

- Investor decides how much to invest
  - Amount invested is multiplied by m
- Trustee decides how much repay investor
- How much would you invest?
- How much would you repay?
- Provides a measure of Social Capital:
  - Trust: Amount invested
  - Trustworthiness: Amount returned

Trust Game

- Berg, Dickhaut and McCabe (1995)
  - Double-blind; $10, m=2
- Investor put in about 50% of endowment
- Trustee repay about 95% of $ invested
- Replicate: Invest 40-70%, Repay 110-150%
  - Various Studies (Lowest: 55% @ corrupt Kenya)
- Except: Van Huyck, Battalio Walters (95/01)
  - Peasants (invest little) vs. Dictator Landlords (take all)

Trust Game: Why Trust?

- Is Trustworthiness Reciprocity or Altruism?
- Altruism: Dictator game offer
- Reciprocity: Difference between
  - % repay in Trust game & % Dictator game offer
- Dufwenberg and Gneezy (2000):
  - 30% vs. 33% (insignificant) - Altruism alone?
- Cox (1999):
  - 10% more (statistically significant but small)

Trust Game: Direct vs. Indirect

- Matching Design:
  - Pair → Foursome → Society
- Buchan, Croson and Dawes (2000)
  - Trust: 64% → 48% → 39%
  - Trustworthiness: 35% → 19% → 20%
- Dufwenberg et al. (2000)
  - Trust: 60% → 53%
  - Trustworthiness: 28% → 37%

Trust Game: Other Extensions

- History Effect in sequential trust game:
  - Donate 250 (at cost 150)
  - See past 6 rounds donation history
- Seinen and Schram (1999)
- 25% → 70% (Show Donor History)

Trust Game: Other Extensions

- Multistage Trust Games
  - Like centipede games: but terminal node=(0,0)
  - Selfish guys can't mimic nice guys who all pass
- Ho and Weigelt (Management Sci. 2005)
  - 4 moves; pass doubles pie; strategy approach
  - 30% (50%) player 1/2s take 95% at first node
- Rapoport et al. (GEB 2003):
  - 3 person; 9 nodes; up to $1,500
  - 1/3 of the games ended at the first two nodes

Trust at Work: Gift Exchange?

- Fehr et al.; Fehr and Gachter (JEP 2000)
- 8 workers and 6 firms
- Firms offer wage w to worker (suggest e')
- Workers (if accept) chose effort e
- Payoffs: Firms earn $(q - w)e$
- Workers earn $w - c(e)$
  - $c(.)$ convex on 0.1-1.0
- What would you choose/offer?

Trust at Work: Gift Exchange

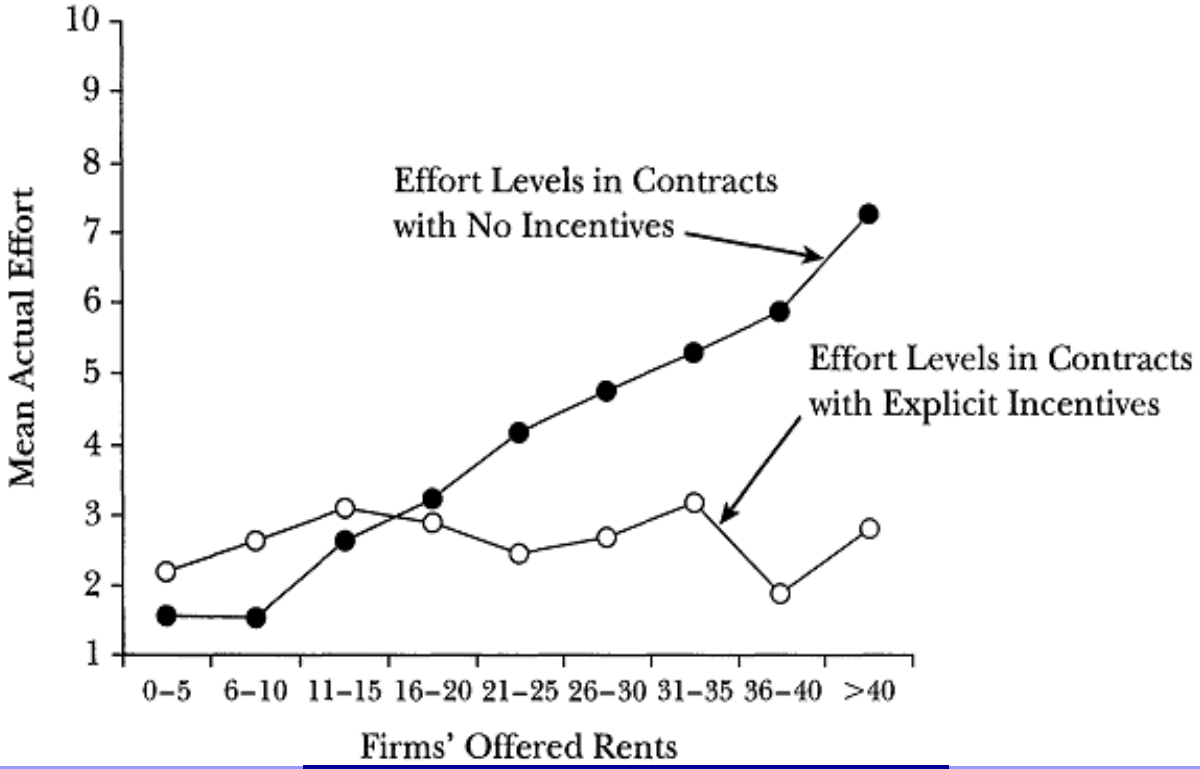
- Standard Game Theory Predictions:
  - Workers will choose minimum effort
  - Firms offer low wage
- Gift Exchange (Akerlof, 1982)
  - Workers reciprocate high wage with high effort
- Efficient Wages
  - High wage creates a job rent of $w - c(e')$ that workers might lose if they are caught shirking
- Hard to separate GE and EW in the field

Trust at Work: Gift Exchange

- Fehr and Gachter (JEP 2000) support GE

Figure 3

Actual Effort-Rent Relation in the Absence and Presence of Explicit Performance Incentives



Trust at Work: Gift Exchange

- Other papers show less gift exchange
- Gneezy and List (2006): Initial gift exchange effect goes away after a few hours in field
  - Putting Behavioral Economics to Work: Testing for Gift Exchange in Labor Markets Using Field Experiments, Econometrica, 74(5), 1365-1384.
  - "We experimented with the individual-specific variables found to be important in Landry [et al.] (2006) and found that their inclusion does not change the qualitative insights."

Trust Game: Where we stand?

- How robust is gift exchange in the labor market (experimental or empirically)?
- This is still an active field of research
- Question: Where does trust come from?
  - Kosfeld, Heinrichs, Zak, Fischbacher and Fehr (2005), Oxytocin increases Trust in Humans, Nature 435, 2 June 2005, 673-676.

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
  - Do not blindly propose to run another one!
  - Check literature first! (BGT, ch.2, Handbook)
- Is there a parsimonious theory to explain all this (and make new predictions)?

致謝

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  - Simon Gachter & Ernst Fehr, 2000. "Cooperation and Punishment in Public Goods Experiments," *American Economic Review*, American Economic Association, vol. 90(4), pages 980-994, September
  - Fehr, Ernst, and Simon Gachter. 2000. "Fairness and Retaliation: The Economics of Reciprocity." *Journal of Economic Perspectives*, 14(3): 159-181.