

Ch 9. Cooperation

If thou wouldst get a friend, **prove him first**, and be not hasty to credit him. For some man is a friend **for his own occasion**, and will not abide **in the day of thy trouble**....Again, some friend is a companion at the **table**, and will not continue in the day of **affliction**....If thou be **brought low**, he will be **against thee**, and will hide from thy face....A faithful friend is a **strong defense**: and he that hath found such a one hath found himself a treasure. Nothing doth countervail a faithful friend. -- Ecclesiastes 6

The Problem of Altruism

- Enhanced reproduction of recipient at the cost of reduced reproduction of the altruist
- Expressed cross-culturally
- Common in hunter-gatherer societies
Thought to reflect ancestral conditions during EEA
- Expressed in other primates
- Expressed in divergent species

Theory of Reciprocal Altruism

Both parties benefit (across time)

NCUR 2003:

Current hunter-Gatherers:

Probability of Successful hunting -- 1/30

6 males per village

Meat lasts village 5 days

Cost of sharing small (due to spoilage)

Benefit of receiving large

Benefits reciprocal

Gain in Trade: Benefit > Cost for both parties

The Modern Hunter/Gatherer: Beer & Pizza

Reciprocal Altruism

Cosmides & Tooby, 1992: Cooperation between two or more individuals for mutual benefit

Synonyms: Cooperation, reciprocation, social exchange

Reciprocal altruism * Greater reproduction

* Psychological Mechanisms

But how does it start? -- Single mutation in single individual?

Reciprocation? Reproduction?

Adaptive Problem: How to handle cheating?

Cheating?

Prisoners dilemma:

- | | |
|----------------|--|
| Both silent | ✱ both go free (R=3) |
| Rat out other | ✱ you go free & get reward,
other punished (strongly) (T=5) |
| Mutual rat-out | ✱ both punished (less strongly) (P=1) |
| Get ratted-out | ✱ punished strongly (S=0) |

One Trial: $T > R > P > S$ $T > R$ & $P > S$ ⬇ Defect
Partner Partner
Doesn't Does

Number of Trials Unknown?

200 pre-determined trials:

Winning Strategy: “Tit for Tat”

Computer modeling using specified points

1. Cooperate on first play
2. Reciprocate on every play thereafter

Trivers, 1985: “Contingent Reciprocity”

Lloyd, 2004: “Cynical Altruism”

Unknown # of trials:

1. Tit-for-Tat won
2. When used to model natural selection across generations
Tit-for-Tat was the most successful

Tit-for-Tat, continued

Axelrod, 1984:

1. Never be the first to defect
2. Retaliate only after the other defects
3. Be forgiving

To promote a cooperative society:

- Make sure the last play is never known
- Promote reciprocity to discourage exploitation
- Never strive for more than equity
- Respond quickly to defection
- Develop reputation as a reciprocator (“walk softly”)
- Shun exploiters to foster rehabilitation