

Reciprocal Altruism and Cooperation

Reciprocal Altruism (Trivers 1971)

- Why are we altruistic to non-kin?
- Types of Social Interaction

Type of Social Interaction	Fitness Effect on:	
	Actor	Recipient
Selfish	+	-
Mutualistic	+	+
Altruistic	-	+
Spiteful	-	-

- If you're selfish pass on your genes. Why be altruistic?
- If you are altruistic and paid back then both people benefit.
- Reciprocal altruism formula: $C < Bw$
 - where: C = cost to actor
 - w = the likelihood that the actor will receive a benefit in the future
 - B = benefit to recipient
- We keep track of costs and benefits (keep score).
- Sometimes best outcome is to mutually cooperate.
- But what happens to those that cheat?
- Need repeated interactions between people to get benefits.

Prisoner's Dilemma

- Game of when best to cheat vs. cooperate.
- police could prosecute 2 criminals if one confessed and incriminated the other.
- Do they risk being silent (both would do better) or give up their partner (who might give them up).



		Yo u	
		C	D
Me	C	even benefit	me=Sucker (jail) you=benefit (free)
	D	me=benefit (free) you=Sucker (jail)	no benefit

How do you play the game?

- In a one-time game you should defect because the average payoff is greater.
- If the game is to be repeated many times (life), both player's gain more in the long-term to cooperate.
- Tit-for-tat best strategy : cooperate on the first move then do what your opponent did in the last play.
- **Types of Altruism:** Dangerous activities, food, sick, tools, information.



Preconditions of Altruism

- Long Life
- Low Dispersal
- Life in small, stable social group
- Aka- high degree of altruism (demand sharing). Why?
- Big cities- not as much altruism. Why? But what about smaller groups?



Examples of Reciprocal Altruism

- War Veterans
- Financial Aid
- others?



How does Culture Regulate Altruism and Cheaters?

- **Social Norms**
 - Repeated interactions set up reputations.
 - **Norm:** a regularly followed behavioral pattern in a given context.
- **Social Norms sometimes codified into law.**
- **Punishment of social norms by others either through ridicule or law.**
- **Without punishment the social norm cannot be maintained in a culture.**



Cooperation in Large Groups

- **Copy common behaviors.**
- **Repeat wins and change behavior if you lose.**
- **Copy winners (high status).**
- **Watch others to see how they play the game.**
- **Don't cooperate with defectors (cheaters).**
- **Punish Cheaters by damaging reputation.**
- **Advertise your future behavior.**
- **Urge others to commit to future cooperation.**

Evolutionary Stable Strategy

- a behavioral strategy that, once it dominates in a population, cannot be displaced by any alternative strategies.
- costs of the strategy increase as more people compete.
- At some point a non-competitive strategy will provide more benefit.
- Hawk and Dove Strategies.
- Any behavior can become stable if there are widespread norms, socially imposed costs and benefits, and punishment of cheaters.

Enforced norms

- Military draft (US)
- Wearing a suit and tie (US business)
- Only men can own cattle (Masai)
- Religious practices
- Caste system in India
- others?
- **Enforcement of Norms**

$P_{\text{defect}} > C_{\text{conform}}$

- Individuals will conform if the Punishment to defect is worse than the Cost of conforming.



Reciprocal Altruism and Evolved Psychological Mechanisms

- Trivers postulates that in order for reciprocal altruism to develop must be able to:
- detect cheaters.
- to enforce altruism in others.
- abilities to estimate the costs and benefits.

Evolved Emotions and Reciprocal Altruism

- internalization of moral rules.
- the feeling of liking and disliking of individuals.
- moralistic aggression.
- gratitude and sympathy degrees depending on the altruistic act.
- feel the need to make amends if discovered cheating.
- cheating leading to attempts at manipulation of others.
- detection of the cheater.
- ability to change one's behavior depending on the history of interactions.

Cooperation: Coalitions and Alliances

What are we playing for in the game of life?

- Direct reproductive competition.
- Indirect Reproductive Competition
 - material resources and their tokens (food, etc).
 - social resources and their tokens: status, alliances or coalitions.

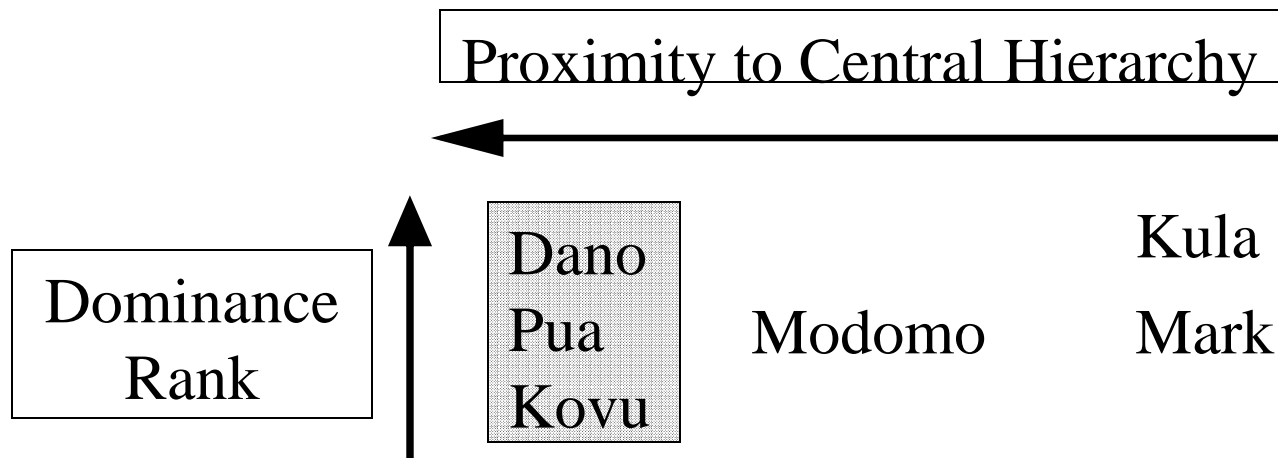
Requirements for Coalitions

- **Social Intelligence**

- Kula-Dano Power struggle.

- Kovu is using strategic intelligence** (Cut-throat).

- Triadic Awareness:** Understand how relationships between 3 people will affect other people's actions.



- **Chimp Coalitions**

- Male friendship is more important than kinship because most related by only .25.

- Mom with 4 year birth interval so brothers too old or young to come to coalitional aid.

- **Bonobo Coalitions**

- Female friendship more important than kinship because none related.

- Male kinship not as important because related by .25.



Are Ants Intelligent?

- Large coalitions, complex division of labor, agriculture, domestication, slavery, warfare, and architecture.
- Solved the cooperation problem.
- share the same reproductive interests- the queen.
- Changes the payoff.
- To defect is like defecting on oneself.



Sexual reproducers require social intelligence to form and maintain coalitions.

- **Ability to make complex social cost-benefit calculations**
 - interaction histories, measure units of cost and benefits, Tit-for-tat strategies.
- **Manipulation and counter-manipulation arms race.**
- **Trust**
- **Triadic Awareness**
- **Theory of other minds:** what others may be thinking.
- **Consciousness:** by-product of competition.

Social Contracts and the Logic of Detecting Cheaters

- **Wason Selection Task (Leda Cosmides)**
- study of Beer-drinking and detecting cheaters vs. non-social contract of letters and numbers.
- **We are good at social contract problem because we have been doing it for millions of years, but we have no familiarity with abstract problems in our evolutionary history.**
- **Critique?**
- **Cosmiti's response:** could detect cheaters but not altruists in unfamiliar problem.
- Evolved to pick out cheaters: arms race between better cheater and better cheat detection.

Other examples of reciprocal altruism:

- Vampire Bats
- a full bat will regurgitate blood meal into the mouth of bats that haven't had a meal.
- only share with bats that share with you.



Evolution of Altruism

- Initially all acts were mutualistic.
- Then kin selection on top of mutualism.
- Then started reciprocal altruism.
- Must piggy-back this way to evolve reciprocal altruism. Why?

Social Contract Theory

- Cognitive mechanisms necessary for forming and policing social contracts.
- **Recognize and distinguish all the individuals within the scope of the contract.**
- **Scorekeeping.**
- **Communicate your wants to others.**
- **Understand wants of others.**
- **Ability to calculate costs and benefits.**

How do we deliver benefits to others?

- **Irreplaceability**
 - become a specialist within your group, or befriend those that can provide things that others can't.
- **Fair-weather Friends**
 - who can you really, really, really trust!
- **Friendship Niches**
 - Should be choosy.
 - Those that provide special benefits by association.
 - those that anticipate your needs.
 - those that need you.
 - shared interests.

The Function of Language

- **Benefits of Language**
 - Long distance communication.
 - Keep track of interaction histories.
- **Why did language develop?**
Social Gossip Hypothesis
- -2/3 of conversation time is devoted to social topics.
- -monitor others behaviors.
- -Reputation management.
- -Human group size is stable at 150- efficiently police cheaters.
- -Problem with language- we need non-verbal cues.

