

Problems of Group Living

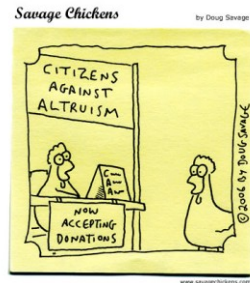
The Evolution of Cooperation

The problem of altruism

- Definition of reproductive altruism:
 - An individual behaves in such a way as to enhance the reproduction of another individual, at a cost to its own fitness.

The problem of altruism

- How could patterns of friendship and altruism evolve among non-relatives, given the selfish designs that tend to be produced by natural selection?



Evidence suggesting a long evolutionary history of altruism

- Social exchange occurs across human cultures, including hunter gatherers
- Other species engage in social exchange
- Primates engage in reciprocal helping



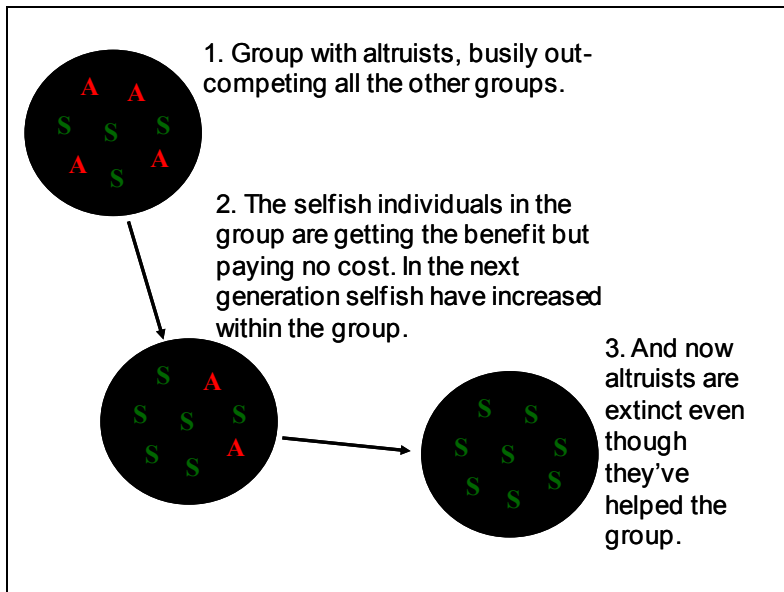
The Problem

- How did selection shape adaptations for altruism?

One Theory: Group Selection

- Altruistic restriction of own reproduction to avoid overpopulation and depleting group's resources.
- Groups containing such individuals would survive, while groups without them would starve and go extinct.





- To be favored by selection, the gene causing the altruistic behavior has to benefit from the altruistic behavior.
- How can we meet that condition?

Another Potential Solution: Help kin

- Direct the benefits to genetic relatives.
- The closer the genetic relatedness, the more beneficial the altruism
- Lots of evidence for kin altruism—from ground squirrels to humans

But there's another way

- **Reciprocal Altruism**
 - You scratch my back, I'll scratch yours.



Theory of reciprocal altruism

Definition: Adaptations to provide benefits to non-relatives can evolve as long as the delivery of benefits is reciprocated at some point in the future [example: meat from hunting]

"Gains in Trade"

– Each party receives more in return than it costs to deliver the benefit

Strategies of Reciprocal Altruism: Overview of Topics

- The prisoner's dilemma
- Tit for Tat
- Three features that represent keys to the success of the Tit for Tat strategy
- Strategies for promoting cooperation

The Prisoner's Dilemma

<u>Payoffs to P1/P2</u>	Player 2 chooses cooperate	Player 2 chooses defect
	Player 1 chooses cooperate	Both go free
Player 1 chooses defect	1 - reward + set free 2 – longer sentence	<u>Light sentence</u>

Iterated prisoner's dilemma games

- Players do not know when game will end
- **Tit for Tat**
 - 1. Cooperate on the first move
 - 2. Reciprocate on every move thereafter



Iterated prisoner's dilemma games

- Three features that represent keys to the success of the Tit for Tat strategy
 - Never be the first to defect
 - Retaliate only after other defects
 - Be forgiving



Strategies for promoting cooperation

- Enlarge the shadow of the future
- Teach reciprocity
- Insist on no more than equity
- Respond quickly to provocation
- Cultivate reputation as reciprocator

Limitations of Iterated Prisoner's Dilemma

- It does not allow participants to communicate
- It does not allow participants to opt out of game and switch partners

Examples of Cooperation in Nature

- Vampire bats
 - Vampire bats must feed frequently or die; those that succeed share food with those that don't.
 - The donors are really giving up something.
 - But their neighbor may feed them in return.

Calls for help in vervet monkeys

- Most attentive to calls for help from unrelated reciprocators

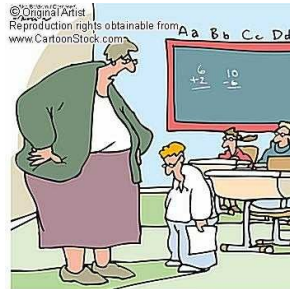


Social contract theory—dealing with cheaters

- Capacities to motivate cooperation and avoid cheaters
 - 1. Recognize different humans
 - 2. Memory for aspects of interactions with others
 - Reciprocator or cheater?—**people remember cheaters!**
 - Who owes whom?
 - 3. Communicate your values to others

Capacities Needed to Motivate Cooperation and Avoid Cheaters

- 4. Understand the specific needs of others
- 5. Represent costs and benefits of items exchanged



"Remember, cheaters never prosper.
Unless they're celebrities."

Test of Social Contract Theory – Wason Selection Task

Each card has a letter on one side and a number on the other side.



Indicate which of these cards you would have to turn over in order to determine whether the following claim is true:

If a card has a vowel on one side, then it has an odd number on the other side.

Why are people bad at pure logic tasks?

- We didn't evolve to solve pure logic problems
- We did evolve to solve problems of social exchange
 - People do well when they are looking for cheaters
 - 75–92% correct

Test of Social Contract Theory – Wason Selection Task



Indicate which of these cards you would have to turn over in order to determine whether the following claim is true:

If you give me money, I will raise your grade by 20 points.

Altruist Detection

- Studied with Wason selection task
- Same patterns as found in detecting cheaters
- Evidence for 2 adaptations to facilitate cooperation
 - 1. Cheater detection
 - 2. Cooperator (altruist) detection

Final Comments on Cheater Detection

- For reciprocal altruism to evolve, humans must have solved the problem of cheaters.
- But . . . do humans have a single cheater-detection adaptation?

Cheating in Different Relationships

- _____: Failing to reciprocate
- _____: Failing to reciprocate may not be “cheating”; committing suicide might be!
- _____: Having sex with someone else is often “cheating,” but not true in friendships
- Hierarchical relationships: Failing to “pay respect”

The Psychology of Friendship

- Friendships might not be based on reciprocal exchange
- Should altruism be defined according to the cost incurred?

Human Intuitions About Friendship

- People become angry when told that their friendships are based on explicit reciprocity
- People experience pleasure when they help others in need, with no expectation of future reward
- When people insist on immediately paying us back for a favor, we interpret this as a lack of friendship.

The Evolution of Benefit-Delivering Adaptations

- The more costly it is to deliver benefits, the more selection will disfavor adaptations to deliver them.
- The less costly it is to deliver benefits, the more widespread they will be.
- Selection will act to minimize costs of delivering benefits.

The Banker's Paradox



How does a person become irreplaceable?

- Recognize attributes valued by others
- Promote reputation highlighting exceptional attributes
- Cultivate specialized skills
- Seek out groups that will appreciate you
- Avoid groups that won't appreciate you
- Drive off competitors for your unique niche

True Friends vs. Fair Weather Friends



- Problems created by modern living

Limited Niches for friendships

- Factors that determine your choice of friends
 1. Number of slots filled
 2. Who emits positive externalities
 3. Good mind readers
 4. Irreplaceable
 5. Same wants

Deep Engagement vs. Reciprocal Exchange

In Sum, Several Possible Paths to Benefit-Bestowing Adaptations

- 1. Hamiltonian's rule
- 2. Reciprocal altruism
- 3. Deep engagement
- 4. "Indirect" reciprocity and reputation

Costs and Benefits of Friendship

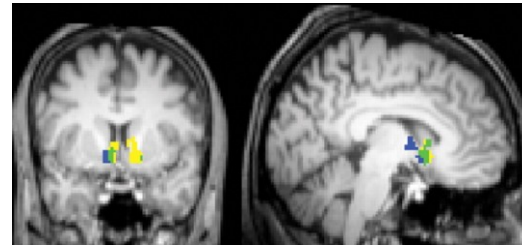
- Same sex vs. Opposite sex friendships
 - Protection
- Sexual access
- Back up mates
- Attraction

Cooperative Coalitions

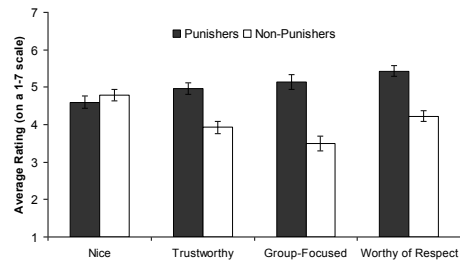
- **Problems**
 - Defection
 - Free-riding: “Punishment” as solution

People Feel Pleasure While Punishing Free Riders

- fMRI studies—dorsal striatum activated while punishing free riders, a brain region linked with reward and satisfaction



Feelings Toward Altruistic Punishers



Potential Solutions to the Problem of Free-Riders in Coalitions

- **Altruistic punishment** – reputation benefits
- **Shunning free riders** – a low-cost way to punish free riders
- **Ostracism** – expel free-riders from the group

