Wrap-Up

Our approach: combine game theory with evolutionary dynamics to understand people's puzzling preferences, beliefs, ideologies, and heuristics

Some of the puzzles we tackled:

Where do rights come from?
Why do North Indians find long fingernails beautiful?
Why do we give to Habitat for Humanity?
Why do people have taboos?
Why do we care about principles?
Why do we care so much about symbolic gestures?
Why do we consider omission less bad than commission?
Why do we use innuendos?
Why do we have norms against chemical weapons?

Note how powerful this framework is:

Taught us about…
-rights
-emotions
-beauty
-altruism
-symbolism
-ethics
-communication

Not just posthoc explanation, but also…
-novel predictions
-prescriptions
-clarifies age old debates

New predictions,e.g.:

-The uncorrelated asymmetries we condition rights on have to be evident (e.g. not size but who comes first)

-We will care if people are "principled" when temptation is large but rare

-we will see categorical norms moreso in international than domestic law

-direct speech with "noise" works differently than innuendos

New Policy Implications, e.g.:

-Taboos should not be respected in public policy

-domestic law should ignore omission/commission.

Clarifies:

-Our sense of rights isn't God-given, natural, absolute. Rather, it implements the Bourgeois equilibrium

-is beauty completely culturally construed?

-are norms completely arbitrary?

-is proscial behavior motivated by warm glow? Or is it altruistic?

Some of the methods we used:

-animals
-cross cultural variation
-reinterpret old experiments
-new lab experiments
-field experiments
-computer simulations
-mathematical proofs
-current events, history, literature, philosophy

Models:

-nash
Replicator dynamic
-reinforcement learning
-wright fisher
-moran
-extensive form games
-information structures

Let's do a brief overview of the models we focused on:

Hawk-Dove

Costly Signaling

Repeated-PD

CWOL

Common Knowledge

Let's remind you about them one at a time

Hawk-Dove

Puzzle

Where do rights come from? Are they God-given, natural, absolute?

Model

Two players compete for a contested resource
Each can play Hawk, Dove, or Bourgeois (H if arrive first, D o/w)
It is an equilibrium to attend to uncorrelated asymmetries

Key insight

Our sense of rights isn't God-given, natural, absolute. Rather, it implements this equilibrium

Hawk-Dove

Main lesson

>Resolves an age-old puzzle

Also, novel prediction

>We later learned that the uncorrelated asymmetries we condition rights on have to be evident

Technique highlighted

>Animal evidence

One big open question

>Why are rights "growing" over time?

Next…

Costly Signaling

Puzzle

Why do peacocks have big tails? Why do North Indians find long fingernails beautiful? Why do we find white shoes beautiful? Where does our sense of beauty come from?

Model

Two kinds of senders: low/high
Can't convey quality; can send otherwise useless signals of different "strengths"
Receivers decide whether to match w/ senders based on signal
It is an equilibrium for senders to send these wasteful signals

Key insight

Peacock's tails are costly signals; we find costly signals beautiful

Costly Signaling

Main lesson

Explains really puzzling phenomenon

Techniques highlighted

Simulations
Proofs

Next…

Repeated Prisoner's Dilemma

Puzzle

Why do we give to Habitat for Humanity? Why is altruism so "weird"?

Model

Can pay cost c to benefit other by b; c < b
Repeat w/ probability δ
Any cooperative equilibrium has two traits: reciprocity and b/c > δ

Key insight

Altruistic preferences implement cooperative equilibrium; they exhibit these two traits

AND not other traits, like efficiency

Repeated Prisoner's Dilemma

Main lesson

       Practical application: we can increase prosocial behavior!

Novel predictions/prescriptions

       Now that we've talked about CK, we can add a third condition: b, c and δ must be CK, and can only reward/punish behavior that is ck (e.g. can't punish omission)

       We can interpret and organize the behavioral economics literature

Techniques highlighted

       Field experiment (PG&E): demonstrate feasibility

Next…

Cooperating Without Looking

Puzzle

      Why do people attend to thoughts, not just cooperative actions

Model (Envelope Game)

      Low or high temptation chosen
      Player 1 chooses whether to look at temptation
      Player 1 chooses whether to cooperate
      Player 2 chooses whether to continue
      CWOL/Attend to Looking is a Nash equilibrium

Key Insight

      People that don't look can be trusted. Principles, taboos, etc. keep us from looking

Cooperating Without Looking

Main lesson

Explains puzzle cooperation lit couldn't

Novel predictions/prescriptions

When does looking/attending to looking matter? When temptation is large but rare, and costly

Taboos should not be respected in public policy

Open question

We neeeeeeeeeeeeeed evidence!

Next (and last)…

Common Knowledge

Puzzles

    Why do we care so much about symbolic gestures?
    Why do we consider omission less bad than commission?
    Why do we use innuendos?
    Why do we have norms against chemical weapons?

Model

    In game with multiple equilibria, can only condition behavior on evident events (i.e. when there is ~CK)

Key Insights

    Symbolic gestures are evident
    Categorical norms condition behavior on evident events
    An act of commission is an evident event but an act of omission is not
    Innuendo is not evident

Main lesson:

Benefit of formalizing: gained a lot of insight, such as…

Novel predictions

Provides a definition for innuendos
We'll care about the omission/commission when coordination is more important   (international vs. domestic; coordinated punishment vs. partner choice)
Omission/commission distinction should be ignored in domestic law
We wouldn't have realized that some norms aren't effective in the first place
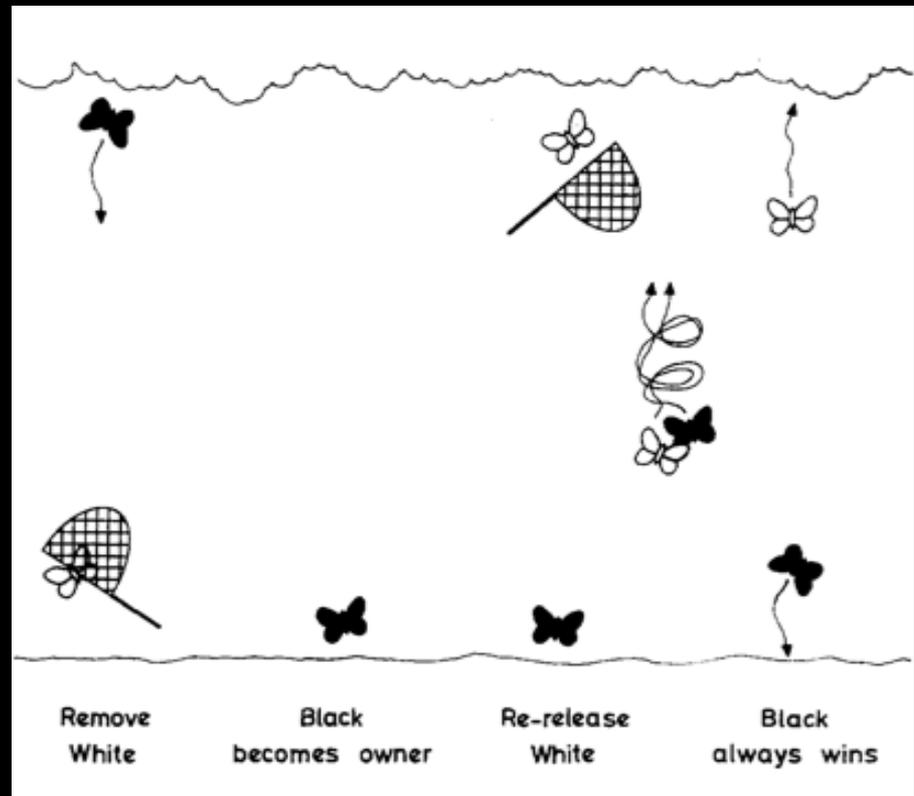
Technique highlighted

Testing novel predictions w/ experiments (a.k.a. Jill is awesome)

Let's talk (even) big(ger) picture…

We used and learned a wide variety of techniques to implement this approach. Here are some key ones…

Animal evidence

Establishes that explanation is "deep" and "parsimonious"

Remove White — Black becomes owner — Re-release White — Black always wins

Cross-Cultural Variation

Test comparative statics (long fingernails aren't an equilibrium here)

Image courtesy of Thomas Stromberg on Flickr CC BY-NC

Examples from history, current events, literature, media

Provide evidence, demonstrate puzzle, elucidate puzzles, rule out alternatives

See The Oatmeal comic about chemical weapons.

Reinterpret experimental evidence

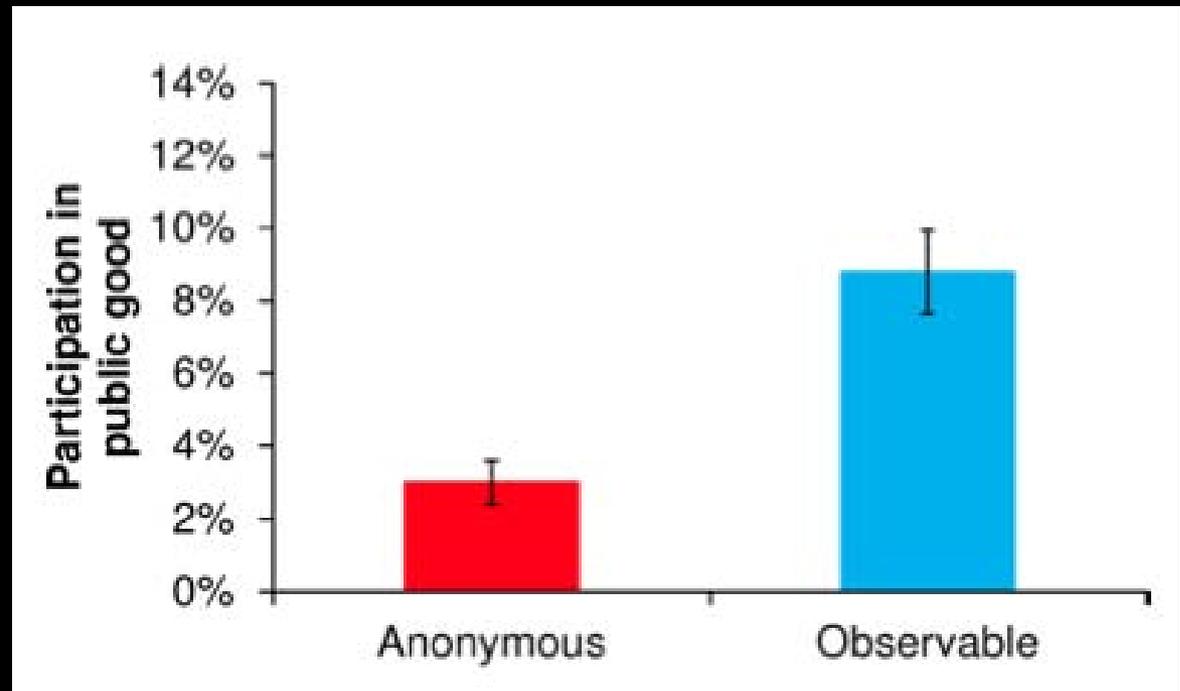Comparative statics and testing assumptions

Run lab experiments

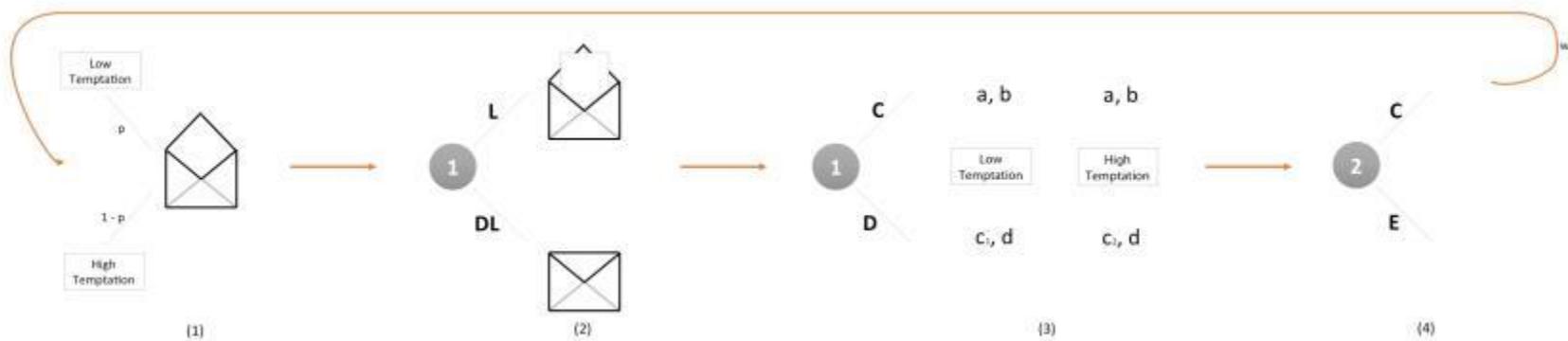# Comparative statics and testing assumptions

Run field experiments

Demonstrate feasibility

Reprinted by permission from Macmillan Publishers Ltd: Nature.
Source: Rand, David G., Joshua D. Greene, and Martin A. Nowak. "Spontaneous Giving and Calculated Greed." *Nature* 489 (2012): 427-30. © 2012.

Modeling

Prevent confusion/ambiguity, verify intuition, show which assumptions depends on, show how general it is, derive new predictions

Dynamics

Show that applies to emotions, beliefs, preferences, ideologies… i.e. when people aren't rational; equilibrium selection
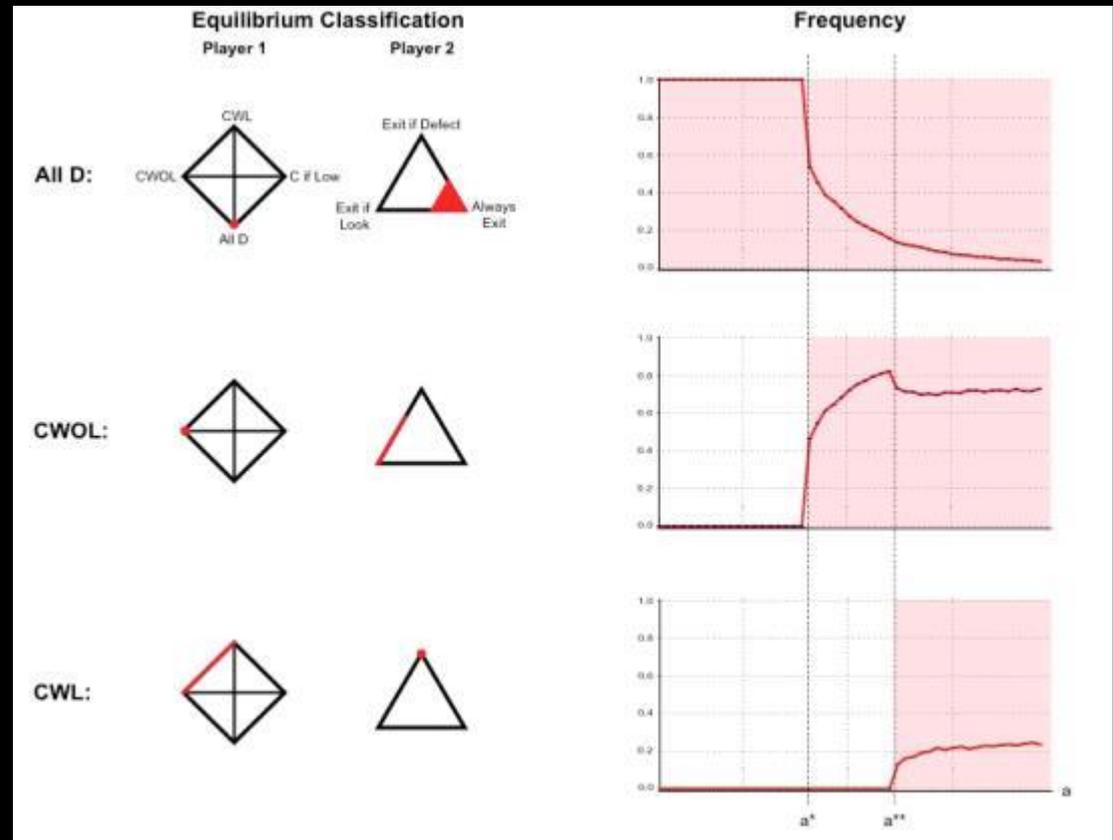
$$\dot{x}_A = x_A * (f_A(x_A, x_B) - f(x_A, x_B))$$

Current frequency of strategy

Own fitness relative to the average

Simulations

Investigate dynamics when can't solve

That's a lot to learn in one semester. Nice work!!

That's a lot to learn in one semester. Nice work!!

Thank you for…

      … challenging the arguments
      … providing evidence
      … extending the arguments

… and generally being an incredible class!

STAY IN TOUCH!

14.11 Insights from Game Theory into Social Behavior
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