Ostracism and Forgiveness

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February 1, 2016

Bilateral Enforcement:
Each relationship is independent of others.

Multilateral Enforcement:
Each relationship influenced by others.

os•tra•cism | ˈästrəˌsizəm |

noun

1 exclusion from a society or group: *the family suffered social ostracism.*

2 (in ancient Greece) temporary banishment from a city by popular vote.

Common modeling devices:

- Perfect monitoring of every relationship in society.
- Reputational labels that adjust after each interaction.

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But interactions are *private* $\Rightarrow$ communication is essential.

Focus on *gossip* and *word-of-mouth communication*.

motivating question

Do individuals have an incentive to communicate truthfully?

lessons

Assume players must be truthful (regardless of incentives):

Permanent Ostracism = Most Cooperative Equilibrium.

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Permanent ostracism $\approx$ Bilateral Enforcement.

Forgiveness fosters communication.

Temporary ostracism $>>$ Permanent ostracism.

context and agenda

Repeated Games: Focus often is on payoffs rather than behavior.

Typical inquiry: "what payoffs are achievable as $\delta \to 1$?"

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Reasons to take an *atypical* approach:

a) Behavior is at least as interesting as efficiency: can we understand the rationale for social norms seen in practice?

b) Patience is a primitive: how should we design social conventions to cope with our impatience?

modeling community enforcement

Figure: Targeted versus Contagious Punishments

targeted punishments

Punish defectors but cooperate with non-defectors.

But how are defectors identified?

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- Perfect monitoring: everyone sees everything.
- Reputational labels: player's guilty / innocent labels are automatically updated based on behavior.
- Mechanical communication: innocent players reveal all info.

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But how are defectors identified?

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Econ: Kandori (1992), Okuno-Fujiwara and Postlewaite (1995)....

Soc: Implicit in Coleman's work; Raub and Wessie (1990).

Bio: Work on indirect reciprocity by Nowak and Rand.

Poli Sci: Bendor and Mookherjee (2006).

contagious punishments

If players are anonymous, cannot distinguish defectors from non-defectors.

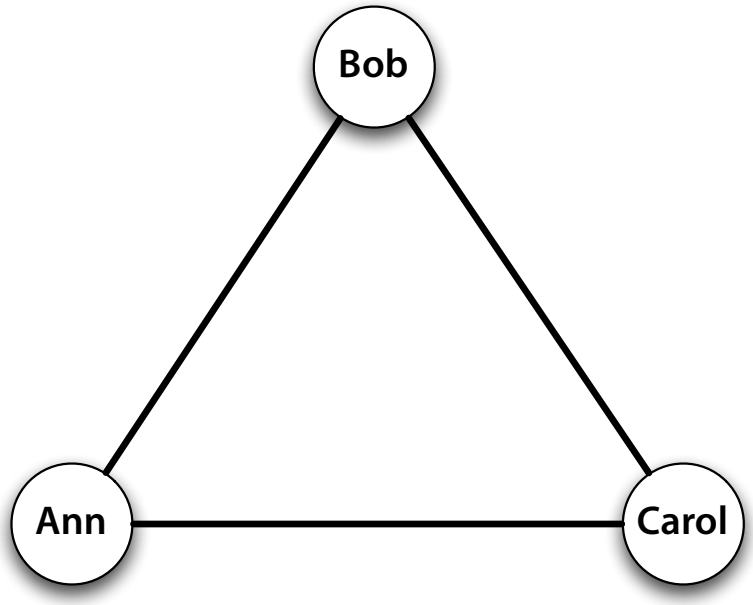
Solution: punish everyone.

Approach is powerful and parsimonious. But is it realistic?

1. Community enforcement in communities: players can be identified.
2. Reputation often is individual and not collective.
3. Intuitively compelling that players avoid punishing the innocent.

Citations: Kandori (1992), Ellison (1995), Deb (2012), Deb and Gonzalez-Diaz (2014).

outline



Players interact repeatedly in continuous time:

- discount rate: $r > 0$.
- link selected at (Poisson) rate $\lambda > 0$.
- when link ij is selected, i and j play a Prisoners' Dilemma.

Each player observes activity only on her own links.

extensive-form of each interaction

i) *Talk*

ii) *Select stakes*

iii) *Play a Prisoners' Dilemma with those stakes*

extensive-form of each interaction

i) *Talk*

- Partners exchange messages sequentially, in random order.
- Message space = Lists of past interactions.
- Evidentiary communication: verifiable, but concealable.

ii) *Select stakes*

iii) *Play a Prisoners' Dilemma with those stakes*

extensive-form of each interaction

i) *Talk*

ii) *Select stakes*

- Partners announce their desired stakes simultaneously.
- Stakes are set to the minimum of their announcements.

iii) *Play a Prisoners' Dilemma with those stakes*

extensive-form of each interaction

i) *Talk*

ii) *Select stakes*

iii) *Play a Prisoners' Dilemma with those stakes*

	Work	Shirk
Work	ϕ, ϕ	$-\phi^2, \phi^2 + \phi$
Shirk	$\phi^2 + \phi, -\phi^2$	$0, 0$

Stakes measure level of cooperation.

lower bound: bilateral enforcement

Work with a partner if and only if she has never shirked on you.

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Highest bilateral stakes are $\phi_B = \lambda/r$.

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Either assume monitoring is perfect or all players mechanically forced to reveal histories.

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Highest stakes are $\phi_{PM} = 2\lambda/r$.

Off-path behavior

Suppose Ann shirks with Bob.

- Bob and Carol set $\phi = 0$ with Ann.
- Bob and Carol must work $\Rightarrow$ Stakes in off-path history $\leqslant \phi_B$.

Important for permanent ostracism that stakes are flexible.

who conceals information?

No incentive to self-report since that induces immediate punishment.

Hope: Victim (Bob) communicates.

- Equilibrium: Report Ann, work at ϕ_B forever with Carol.
- Deviation: Conceal interaction, shirk at ϕ.

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$\Longrightarrow$ $\underline{\phi \leqslant \phi_B}$!

extensions

- *More players* + network architecture.
- *General functional forms.*
- *Discrete time.*
- *Make equilibrium stakes sensitive to communication flow.*
- Communication without interaction.
- Simultaneous communication.
- General bilateral games.

outline

$n+1$ players $\implies$ $G = \frac{n(n+1)}{2}$ partnerships.

Each period is of length Δ: players interact at $\{0, \Delta, 2\Delta, ...\}$.

- Society is *inactive* with probability $e^{-G\lambda\Delta}$.
- If society is *active*, a link is selected with prob $\frac{1}{G}$.

Each link is selected with probability $p_\Delta \equiv \frac{1-e^{-G\lambda\Delta}}{G}$.

Payoffs discounted at rate r: $\delta = e^{-r\Delta}$.

Convergence to continuous-time: $\lim_{\Delta\to 0} \frac{p_\Delta}{\Delta} = \lambda$.

extensive-form

1) Communication phase:
   Players send messages sequentially; each goes first with prob $\frac{1}{2}$.

2) Stake Selection phase:
   Player $\mathfrak{i}$ proposes stakes in $[0, \overline{\phi}]$. Minimum of two proposals selected.

3) Effort phase:
   Each simultaneously chooses to work (W) or shirk (S).

prisoners' dilemma

	Work	Shirk
Work	ϕ, ϕ	$-V(\phi), T(\phi)$
Shirk	$T(\phi), -V(\phi)$	$0, 0$

T and V are smooth, non-negative, and strictly increasing.

a) $T(0) = V(0) = 0$

b) T is strictly convex and $T'(0) = 1$ and $\lim_{\phi \to \infty} T'(\phi) = \infty$.

For talk: $T(\phi) = V(\phi) = \phi + \phi^2$.

private monitoring

Players observe only their own interactions.

Interaction = (Names, Time, Messages, Stakes, Effort Choices).

Player $\mathtt{i}$'s history at time $\mathtt{t}$ is set of all of her interactions before $\mathtt{t}$.

communication and language

$M(h_i^t)$ = available messages in history h_i^t.

Communication is:

- mechanical if $M(h_i^t) = \{h_i^t\}$.
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History includes n^{th} hand information.

outline

bilateral enforcement

- Each link is strategically independent
- i decides whether to shirk on j:

$$\phi^2 \leqslant \frac{p_\Delta}{1-\delta}\phi$$

Maximum is

$$\phi_B(\Delta) \equiv \frac{p_\Delta}{1-\delta} \to \frac{\lambda}{r}.$$

mechanical communication

Player $\mathfrak{i}$ is guilty at history $\mathfrak{h}$ if she "deviated" at an interaction in $\mathfrak{h}$.

Otherwise she is innocent.

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What "deviated" means: *shirk, or propose off-path stakes.*

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Otherwise she is innocent.

Strategy for innocent player $\mathtt{i}$:

- Partner $\mathtt{j}$ is innocent at $\mathtt{h}_{\mathtt{i}}^{\mathtt{t}} \cup \mathtt{h}_{\mathtt{j}}^{\mathtt{t}} \implies$ propose ϕ^* and work.
- Otherwise, set zero stakes.

incentives in mechanical communication

$$\phi_{ij}^2(h) \leqslant \sum_{k \text{ is innocent in } h} \frac{\delta p_\Delta}{1-\delta} \phi_{ik}.$$

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$$\underbrace{\phi^2_{ij}(h)}_{\substack{\text{Temptation to}\\ \text{shirk today}}} \leqslant \sum_{k \text{ is innocent in } h} \underbrace{\frac{\delta p_\Delta}{1-\delta}\phi_{ik}}_{\substack{\text{Foregone future}\\ \text{cooperation payoffs}}} .$$

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There exists a permanent ostracism eqm in which on path stakes

$$\overline{\phi}(\Delta) = \frac{n\delta p_\Delta}{1-\delta} \xrightarrow{\Delta \to 0} \frac{n\lambda}{r}.$$

No mutual effort equilibrium supports more effort.

why variable stakes?

Impossible with *fixed stakes* in usual 2×2 prisoners' dilemma.

Either

- Mutual effort can be supported with 2 innocent players, or
- Permanent ostracism isn't an equilibrium.

Variable stakes shifts focus from *technology* to *incentives*.

strategic communication

Now assume *evidentiary communication*.

Three ways to be seen as guilty in history $\mathfrak{h}$:

a) Shirking.

b) Proposing off-path stakes.

c) Clearly concealing an interaction.

permanent ostracism

Strategy for innocent player i:

- Reveal history to partner j if j is innocent at h_i^t
- Work at strictly positive stakes if j is innocent at $h_i^t \cup m_j^t$
- Otherwise, set zero stakes.

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Permanent ostracism is straightforward if $\phi_{ij}(h)$ depend only on set of innocent players.

- analogue of Markov Perfect Equilibrium.
- doesn't condition on amount of info shared or private details.

Theorem. For every $\Delta \geqslant 0$, no straightforward permanent ostracism equilibrium supports stakes greater than $\phi_{\mathrm{B}}(\Delta)$.

Proof.
PBE $\Rightarrow$ sequential rationality at every history.

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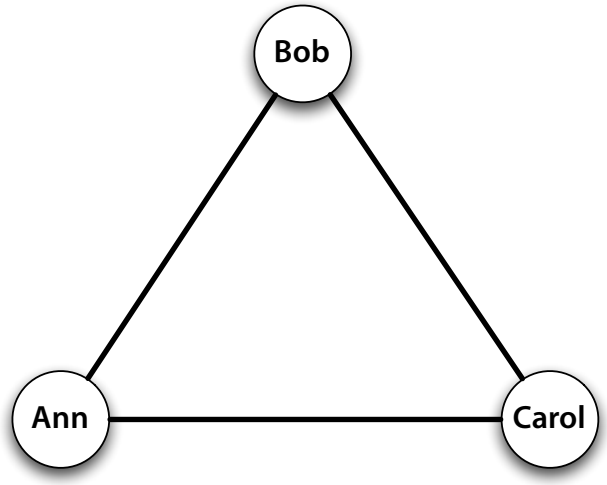
Proof.

PBE $\Rightarrow$ sequential rationality at every history.

1. Suppose that ij meet at time t, and all players appear innocent.
2. From $t+1$ to $t+n-1$, player i is shirked upon by every player other than j.
3. The two meet again at $t+n$: player i reveals the truth if and only if $\phi_{ij} \leqslant \phi_B(\Delta)$.

□

nonstraightforward equilibria



Perhaps stakes should hinge on amount of information revealed?

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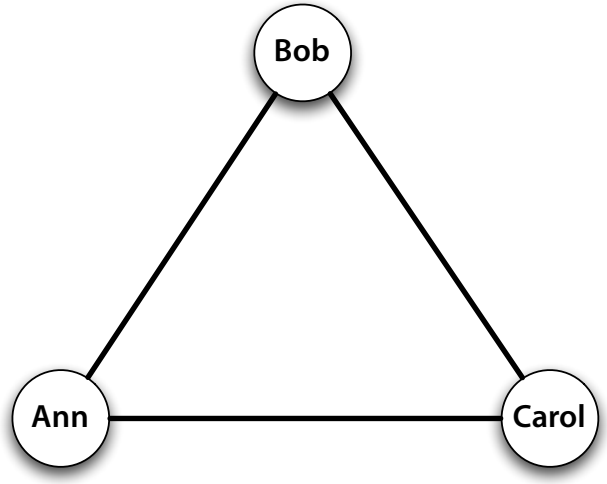

Perhaps stakes should hinge on amount of information revealed?

- Working interaction at $t - \Delta \Rightarrow$ work at $\phi > \phi_B(\Delta)$ at t.
- Otherwise, work at $\phi_B(\Delta)$.

Off-path communication incentives are satisfied.

But as $\Delta \to 0$, probability of successive meetings $\searrow 0$.

a key lemma for all equilibria

Lemma. In every permanent ostracism equilibrium,

$$\mathsf{E}[\phi_{ij} \mid m_i^t, m_j^t] \leqslant \phi_B(\Delta)$$

for any pair of reported histories (m_i^t, m_j^t) in which there is no interaction at or after $t - (n-1)\Delta$.

Suppose otherwise $\Rightarrow$ players have incentive to hide others' shirking.

main result

Theorem. In the continuous-time limit ($\Delta = 0$), stakes cannot exceed $\phi_B(0)$ in any history in a permanent ostracism equilibrium.

Moreover, for every $\epsilon > 0$, there exists $\overline{\Delta}$ such that if $\Delta < \overline{\Delta}$, the highest continuation payoffs in any permanent ostracism equilibrium is within ϵ of private bilateral enforcement.

outline

why forgiveness helps

Permanent ostracism destroys "social collateral."

Temporary ostracism $\rightarrow$ future social collateral.

But reducing punishment relaxes incentives to work.

Forgiveness must balance these effects.

Intuition is simple but construction is challenging:

- Lots of private information.
- A guilty player may want to mimic innocent players to slow down how quickly his bad reputation spreads.

For each player, there is an independent public forgiveness signal, Poisson rate μ.

Forgiveness $\Rightarrow$ Innocent again.

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Forgiveness $\Rightarrow$ Innocent again.

Only first victim communicates with others. $\Rightarrow$

1) Guilty player shirks on all once he has shirked once.
2) We can easily calculate rate of flow of information.

Deviating player can profitably shirk only if she meets 3^{rd}-party sooner than victim.

$\Rightarrow$ For $\mu \in (0, \overline{\mu})$, W is better than S, even if $n - 1$ are guilty.

Theorem. If $r < 2\lambda(n-2)$, there exists a temporary ostracism equilibrium that yields payoffs exceeding permanent ostracism.

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Forgiveness facilitates communication in community enforcement.

Contrast with other motives for temporary punishments:

- Renegotiation (Bernheim & Ray; Farrell & Maskin)
- Imperfect monitoring (Green & Porter; APS)
- Below-Nash punishments (Fudenberg & Maskin)
- Contagion punishments (Ellison)

outline

Consider graphs of buyers and sellers (e.g. in trade or labor).

Economic relation with other side, informational with own side.

Results.

2-sided problem $\Rightarrow$ permanent ostracism $\approx$ bilateral trade.

1-sided problem $\Rightarrow$ permanent ostracism $\approx$ maximum trade.

two-sided vs. one-sided incentives

	Work	Shirk
Work	$1, 1$	$-1, 2$
Shirk	$2, -1$	$0, 0$

	Buy	No Buy
High	$1, 1$	$-1, 0$
Low	$2, -1$	$0, 0$

Figure: Prisoners' Dilemma and the Product Choice Game.

self-enforcing trade

s sellers interact with b buyers; each pair meets at λ intensity.

Seller chooses q at cost $c(q)$.

Buyer chooses payment $p \geqslant 0$.

Actions chosen *simultaneously*: each side wishes to shirk.

Payoffs are $p - c(q)$ for seller and $q - p$ for buyer.

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Payoffs are $p - c(q)$ for seller and $q - p$ for buyer.

Each side can instantaneously communicate to own side.

two-sided incentives: negative result

A player's incentive to work comes from number of innocent players on other side.

Theorem. No straightforward permanent ostracism equilibrium supports more trade than bilateral.

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> Theorem. No straightforward permanent ostracism equilibrium supports more trade than bilateral.

Intuition:

- Two-sided incentives + permanent ostracism require communication between buyers and sellers.
- Once all but one seller is guilty, buyer has no incentive to not shirk on remaining seller.

one-sided incentives: positive result

suppose that the buyer pays first, and then the seller chooses q.

buyer now has no incentive to shirk.

after payment, seller wishes to renege $\Rightarrow$ *Hold-up problem.*

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Intuition:

- Only sellers have incentives to lie and cheat; buyer has neither.
- Use communication only from buyers.
- Equivalent to game with 1 seller and $\mathfrak{b}$ buyers.

Question Options

plantr690813

Community Member

Posts: 1
Registered: 08-15-2012

Report Inappropriate Content
(2,741 Views)

Do I wait for payment before I ship an item or do i ship the item and wait for payment? How do I know how they will pay me?
on 08-15-2012 06:06 AM

New Seller on Ebay?

Options

Comments (0)

0 Kudos

Other Answers: 6

ok_so_im_50
(88 ★)
View Listings

Community Member

Posts: 1,466
Registered: 05-16-2006

Report Inappropriate Content
(2,700 Views)

Answered

Options

in reply to plantr690813 on 08-15-2012 07:40 PM

If you have to ask, you are not ready to sell. You should have read the selling policies in Customer Support before you listed anything. Ignorance of the policies can be costly.

Comments (0) Permalink

0 Kudos +

katieaaronalexander

Community Member

Posts: 39
Registered: 03-15-2011

Report Inappropriate Content
(2,700 Views)

Answered

in reply to plantr690813 on 08-15-2012 06:12 AM

Options

Wait for payment > ship item > leave feedback for buyer

Comments (0) Permalink

1 Kudo +

outline

what we learned

Prior literature *assumes* exogenous information diffusion.

But the choice to communicate and monitor is *strategic*.

In modeling strategic communication, we see that

- Permanent ostracism doesn't give victims incentives to tell the whole truth
- Temporary ostracism fosters communication by preserving social capital

These results offer new foundations for temporary punishments.

what we would like to learn

Dichotomy between community enforcement and legal enforcement is useful, but perhaps false.

- Even with legal enforcement, punishers punish lest they themselves be punished.
- Many institutional structures live in between:- e.g., informational intermediaries.

Understand community enforcement at a more granular level.