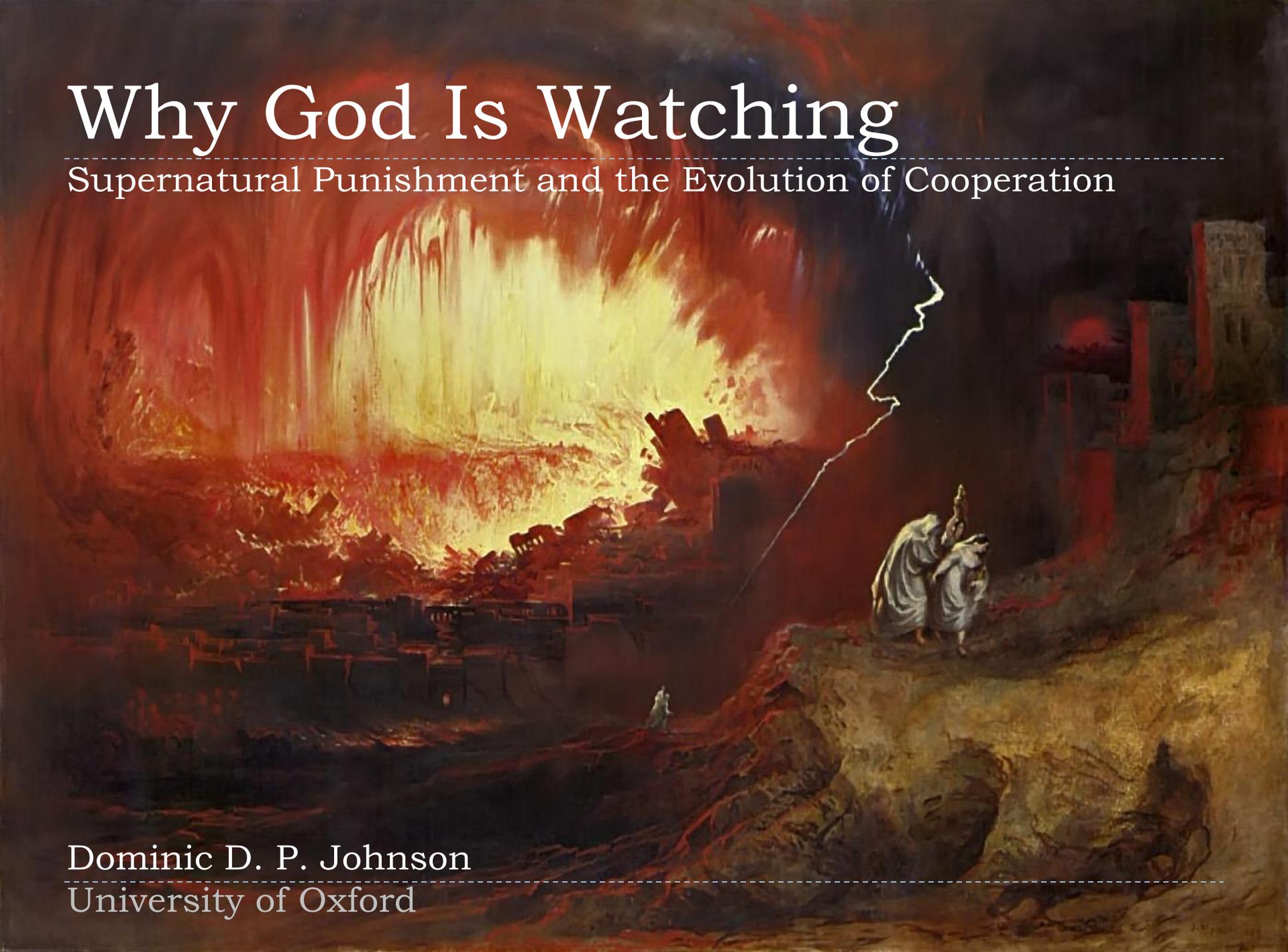


# Why God Is Watching

Supernatural Punishment and the Evolution of Cooperation

Dominic D. P. Johnson  
University of Oxford



# The Puzzle of Religion



Massimo Mastorillo / Corbis



AP Photo / Sakuchi Lait



# Evolutionary Theories of Religion

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## Non-Adaptive Theories

- ▶ By-product
- ▶ Maladaptation

## Adaptive Theories

- ▶ Cultural parasite
- ▶ Group-level adaptation
- ▶ Individual-level adaptation

# Talk Outline

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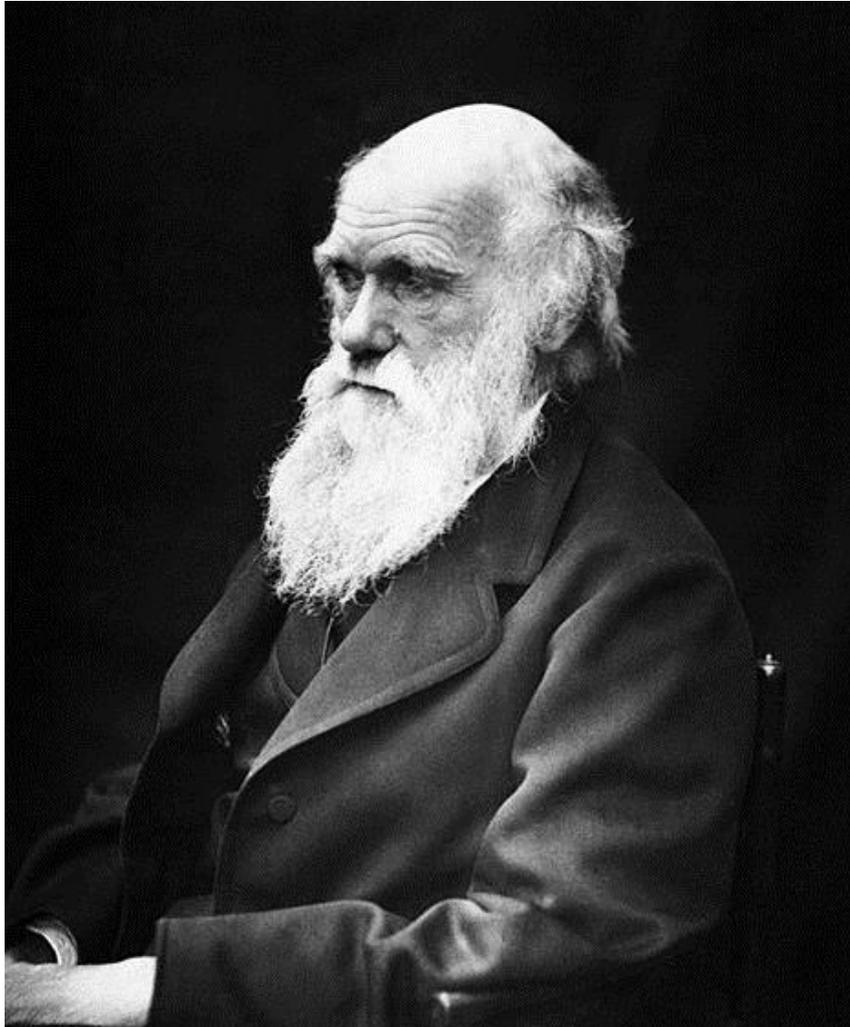
- ▶ Why focus on punishment?
  - ▶ Do people fear supernatural punishment?
  - ▶ Does a fear of supernatural punishment alter behavior?
  - ▶ Why do people fear supernatural punishment ?
  - ▶ Basic game theoretical framework
  - ▶ Atheists
  - ▶ Criticisms
  - ▶ Conclusions
-

# Talk Outline

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- ▶ **Why focus on punishment?**
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-

# The Puzzle of Cooperation



		Effect on Other	
		+	-
Effect on Self	+	Mutualism	Selfishness
	-	Altruism	Spite

- ▶ Solutions to the puzzle
  - ▶ Kin-selection (Hamilton)
  - ▶ Reciprocal altruism (Trivers)
  - ▶ Indirect reciprocity (Alexander)
  - ▶ Costly signaling (Zahavi)
- ▶ These mechanisms explain
  - ▶ Most animal cooperation
  - ▶ Much human cooperation, **but not all**

# The Puzzle of Human Cooperation

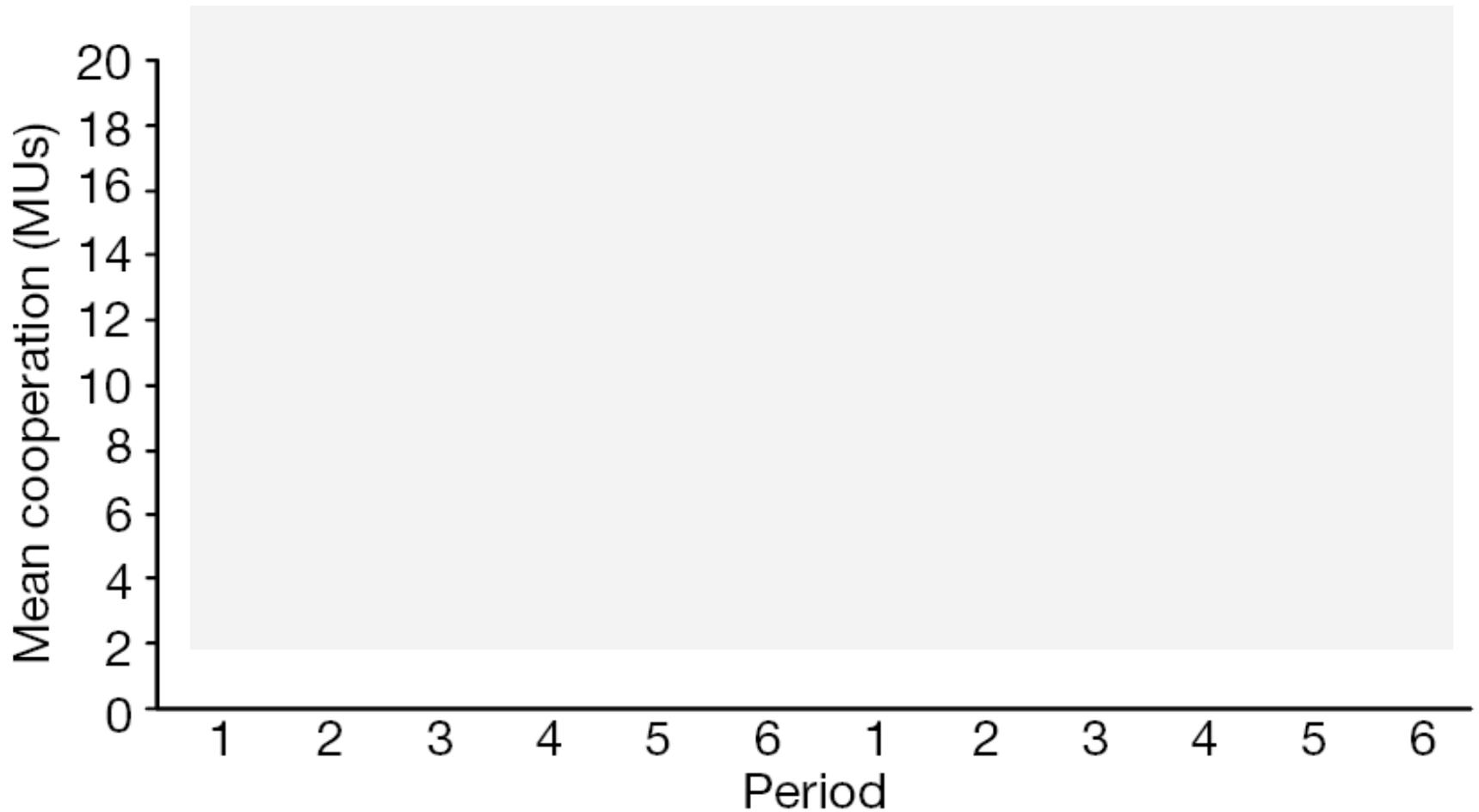
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- ▶ Humans cooperate even in large groups with
  - ▶ No kin
  - ▶ No reciprocity
  - ▶ No reputation
  - ▶ No signaling
- ▶ So what explains our remarkable voluntary, costly cooperation?

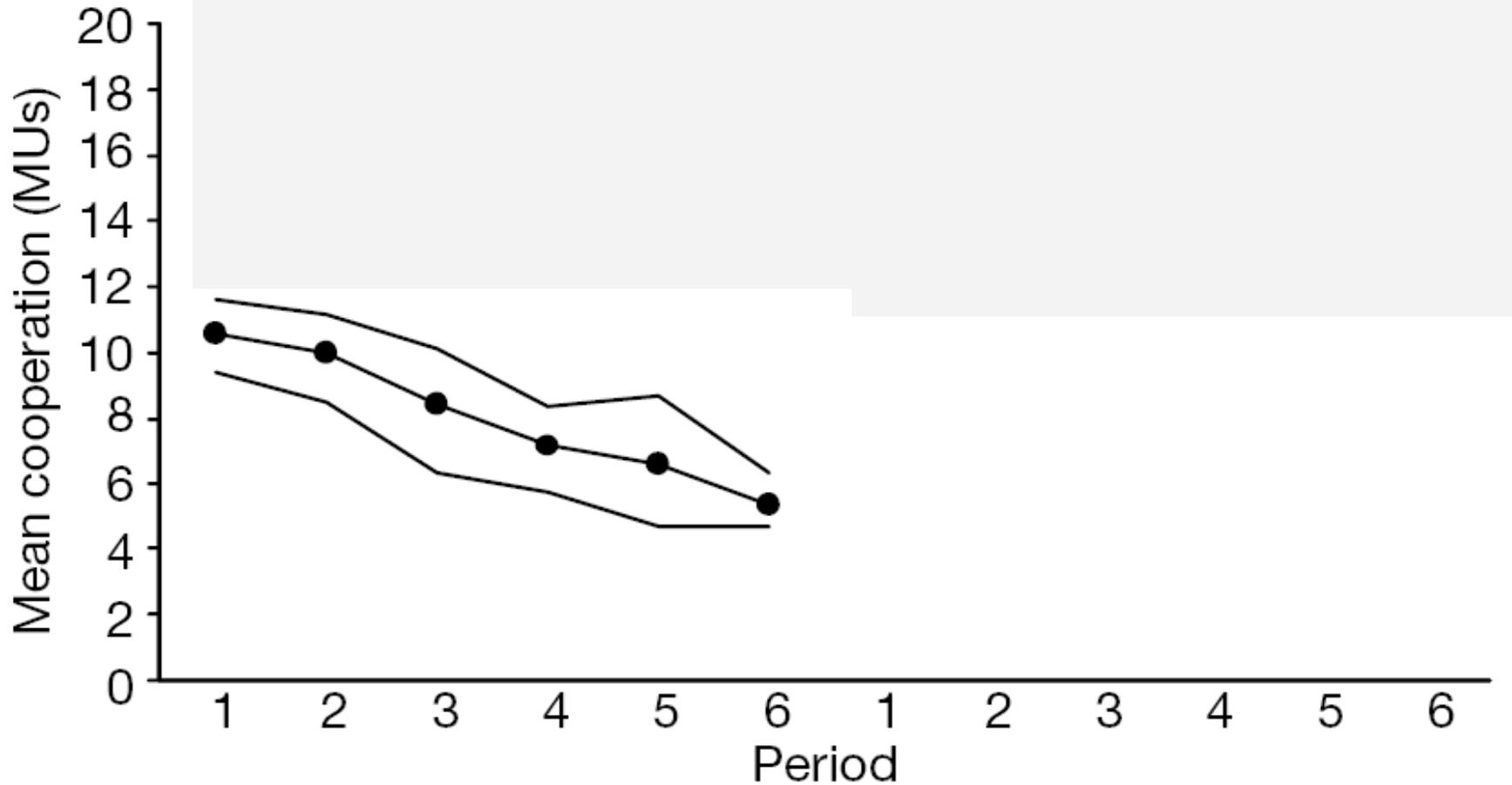
# Cooperation in Public Good Games

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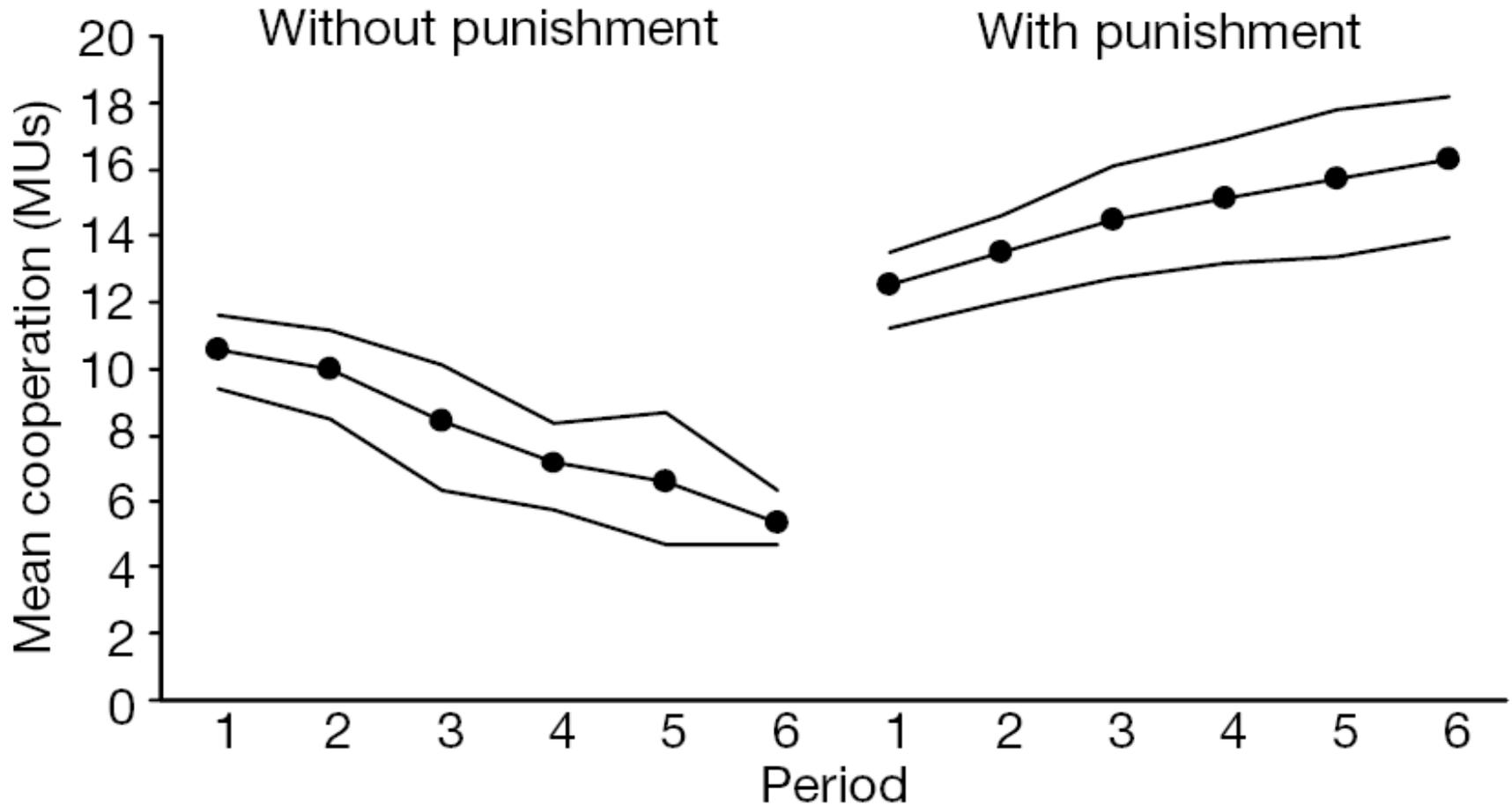
# Cooperation in Public Good Games

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# Punishment Promotes Cooperation

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# Punishment Beats Rewards

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## Game Theory

- **REWARDS** induce some to cooperate, but cannot prevent all from cheating (any undermine cooperation)
- **PUNISHMENT** raises the cost of defection above the cost of cooperation (cheating no longer profitable)



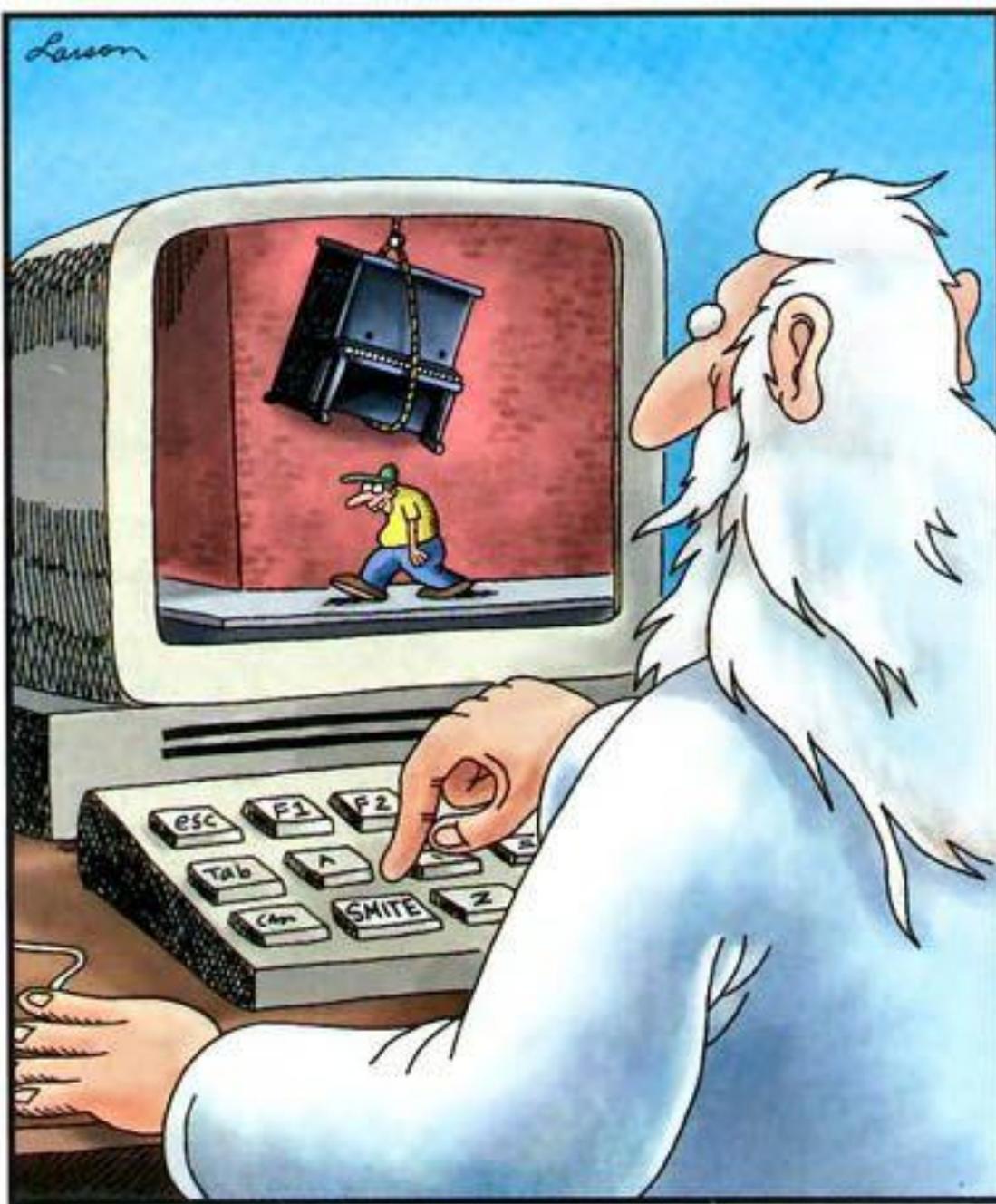
## Psychology

- Greater sensitivity to negative events (“Bad is stronger than good”, Baumeister et al. 2001)
  - More likely to attribute agency as the cause of negative events (Morewedge 2009)
-

# The Problem With Punishment

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- ▶ Punishment is costly
  - ▶ Hence “second-order free riders” emerge
    - ▶ Do contribute to public good
    - ▶ Do not contribute to punishment
  - ▶ So how can punishment be maintained?
    - ▶ External institution punishes? (not always present)
    - ▶ Punishment not costly after all? (cost always  $> 0$ )
    - ▶ Punishers punish non-punishers etc? (not credible)
    - ▶ “Altruistic punishment”? (hotly disputed)
  - ▶ What about supernatural punishment?
-



God at His computer

# God as Game Theorist

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- ▶ No second-order free rider problem
- ▶ No reprisals against punishers
- ▶ Cheats automatically detected
- ▶ Cheats automatically punished
- ▶ Fewer first-order free riders

# Applies Across Supernatural Agents

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- ▶ God
  - ▶ Gods
  - ▶ spirits
  - ▶ ancestors
  - ▶ witches
  - ▶ sorcerers
  - ▶ karma (agency)
-

# Anecdotal Evidence

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# Talk Outline

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- ▶ Why focus on punishment?
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  - ▶ Criticisms
  - ▶ Conclusions
-

# Zogby International Poll

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% stating they “will suffer negative consequences if they disobey their religion” (N ~600 in each case):

Muslims (India, Saudi Arabia)	> 95%
Hindus (India )	> 80%
Catholics (Peru)	> 80%
Catholics (US)	> 60%
Christians (South Korea)	> 60%
Born-again Christians (US)	> 60%

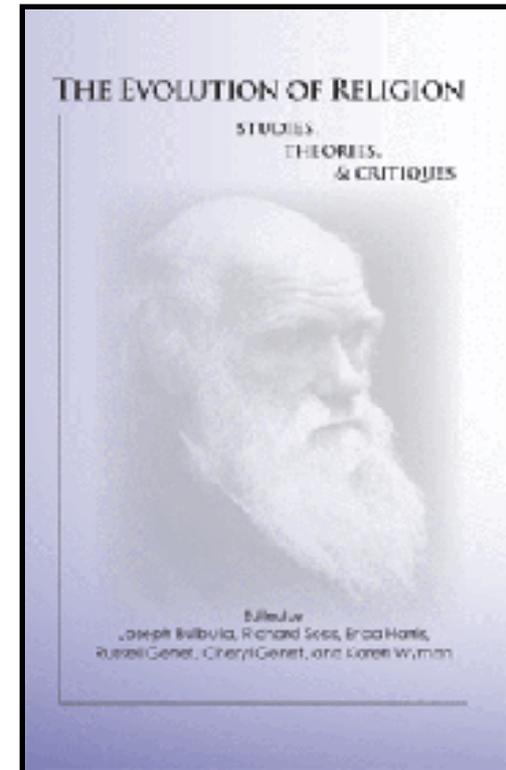
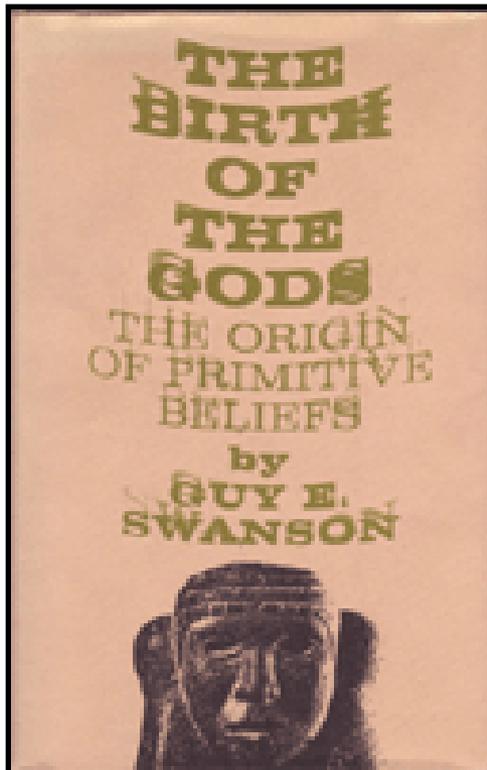
# Recurrent Cross-Cultural Features of Religion

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Afterlife	Ritual exegesis
Beings with special powers	The sacred
Signs and portents	Deference
Creationism	Moral obligation
Spirit possession	Punishment and reward
Rituals	Revelation

# Ethnographic Data

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# Cross-Cultural Studies

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- ▶ **Swanson (1960) 50 societies**
    - ▶ 92% had at least one of these:
      - ▶ “high” (moralizing) gods
      - ▶ “active ancestral spirits” (who influence the living)
      - ▶ reincarnation
      - ▶ supernatural sanctions on health
      - ▶ supernatural sanctions on afterlife
      - ▶ supernatural sanctions on accidents/misfortunes
  - ▶ **Murdock (1980) 186 societies**
    - ▶ 100% of SCCS societies attributed illness to supernatural cause
  - ▶ **Boehm (2008) 18 late-Pleistocene models**
    - ▶ 100% supernatural sanctions “to enforce local moral codes”
    - ▶ 12 state importance of supernatural punishment “in general”
    - ▶ 16 state specific offenses (all anti-social)
-

# Summary So Far

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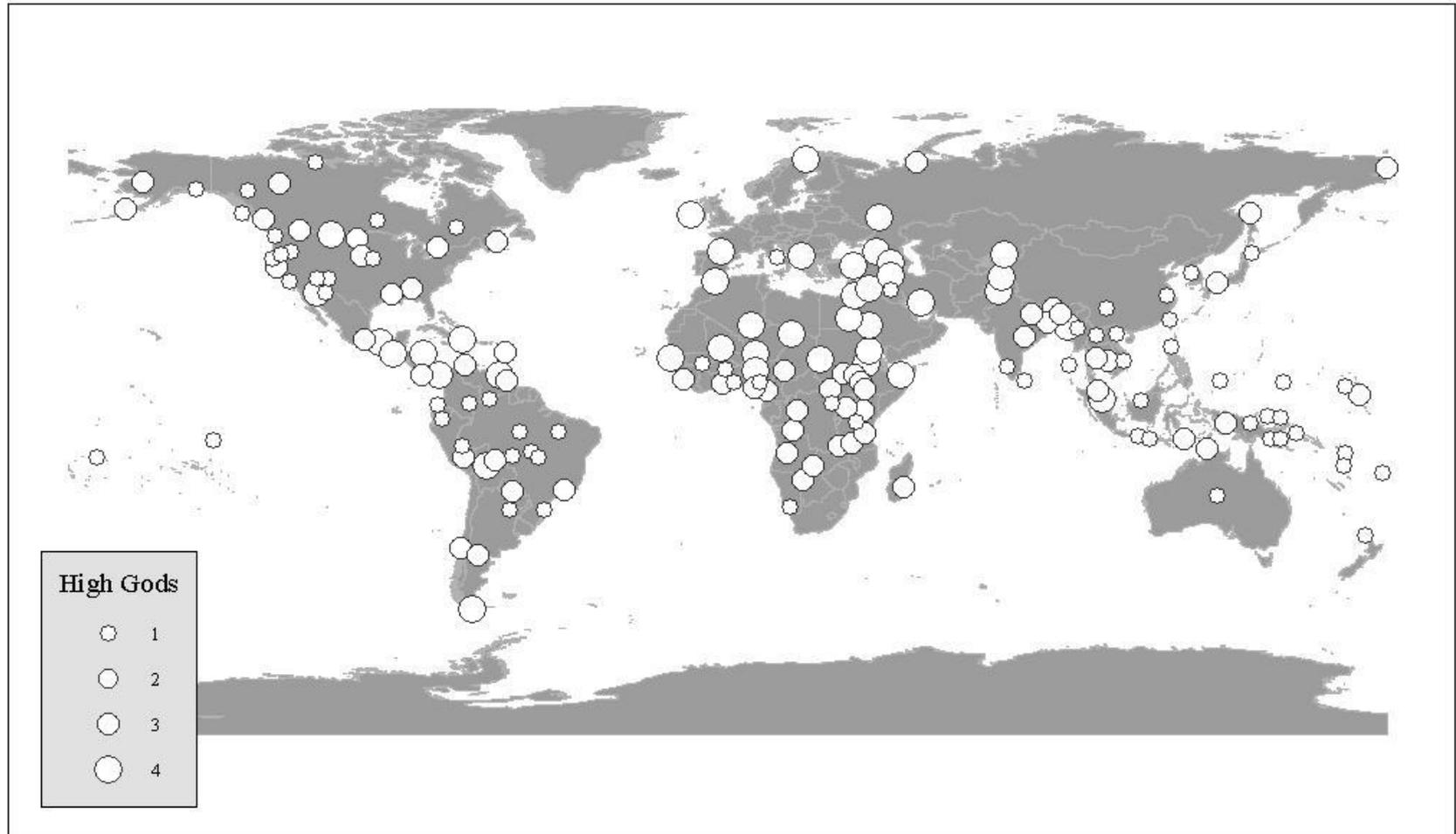
- ▶ Supernatural punishment...
  - ▶ Common across modern and pre-industrial societies
  - ▶ Has diverse sources (not always “God”; gods, ancestors, spirits, witches, sorcerers etc.)
  - ▶ Linked to fitness critical events (reproduction, disease, food, hunting, crops, public goods, “crimes”, weather, seasons, etc.)
  - ▶ Whether real or not—important if people believe it
-

# Talk Outline

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- ▶ Why focus on punishment?
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  - ▶ **Does fear of supernatural punishment alter behavior?**
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-

# Study of World Cultures Data



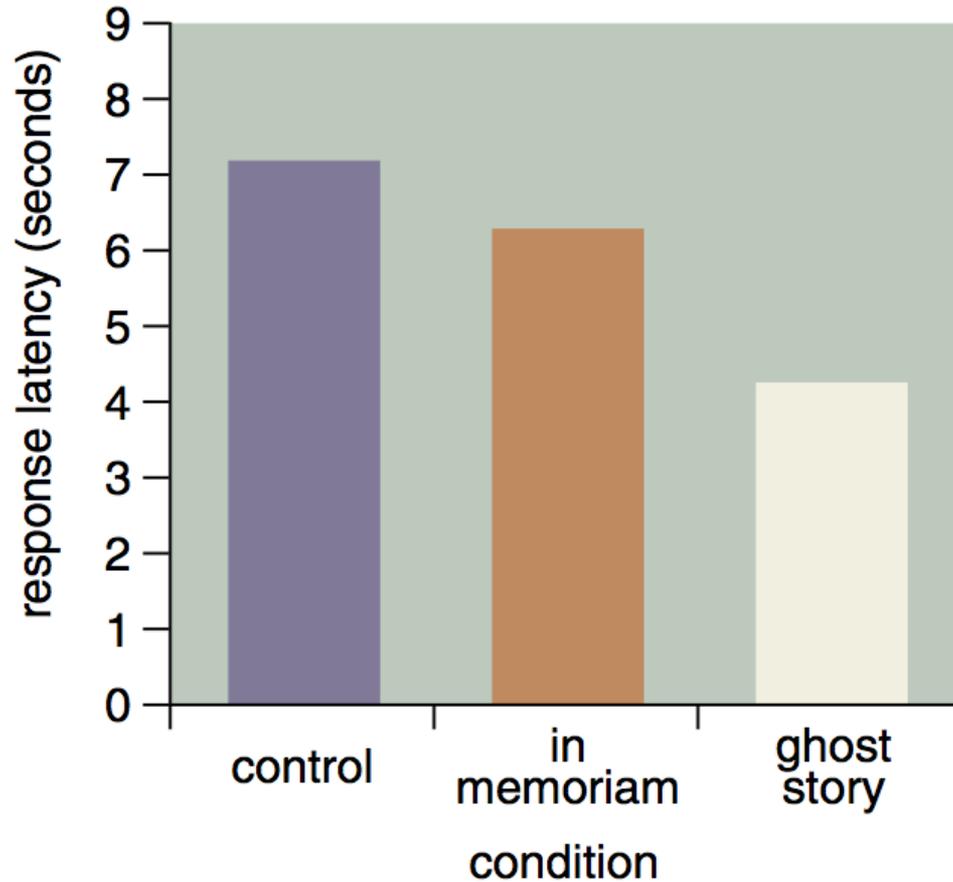
# Results

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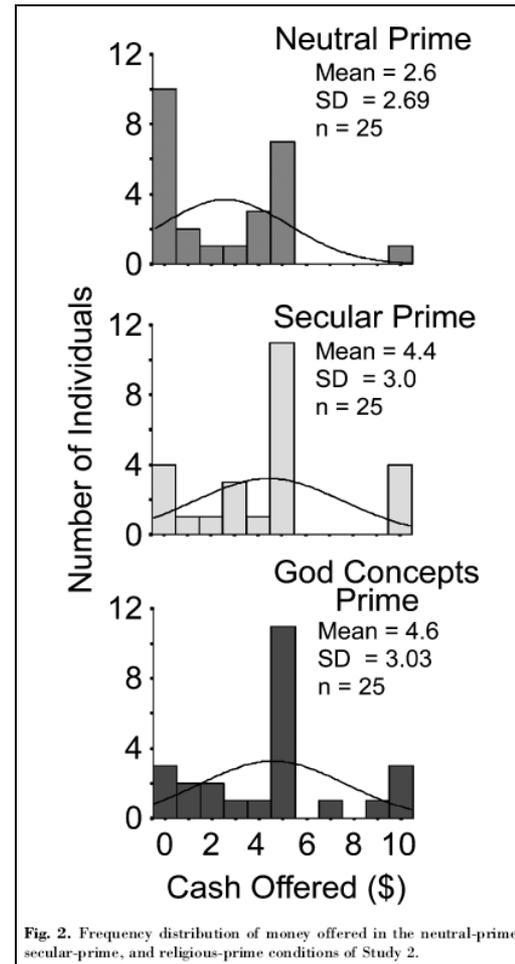
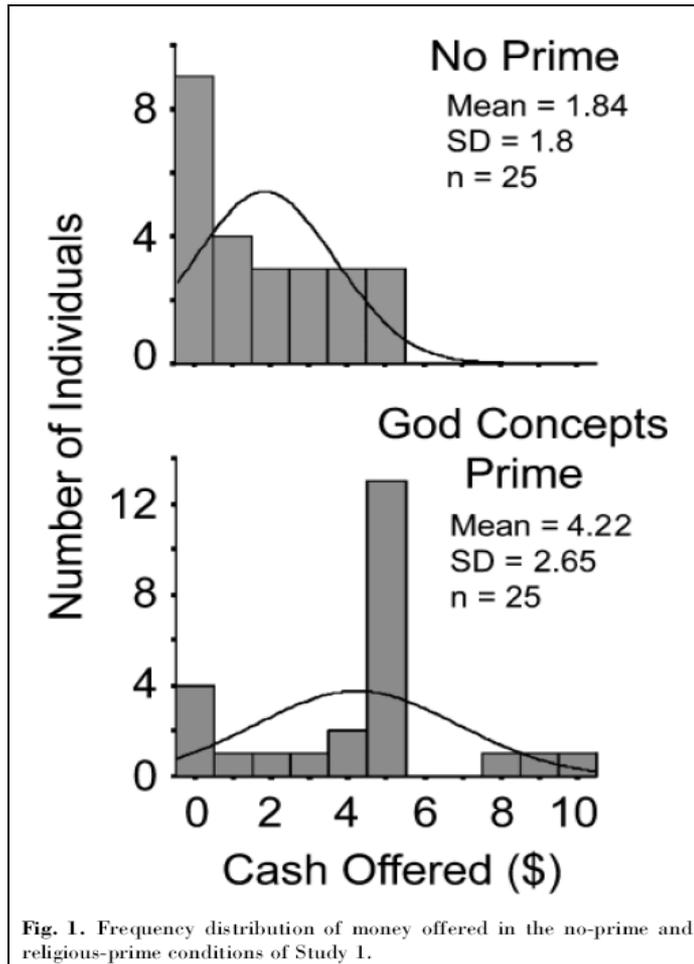
- ▶ **High Gods a correlate of several indices of cooperation:**
  - ▶ Larger groups
  - ▶ Norm compliance (in some tests)
  - ▶ Loans and use of abstract money
  - ▶ Central sanctions, police
  - ▶ Payment of taxes
- ▶ **Controls for region and influence of western religions**

# Cheating in the Presence of a “Ghost”

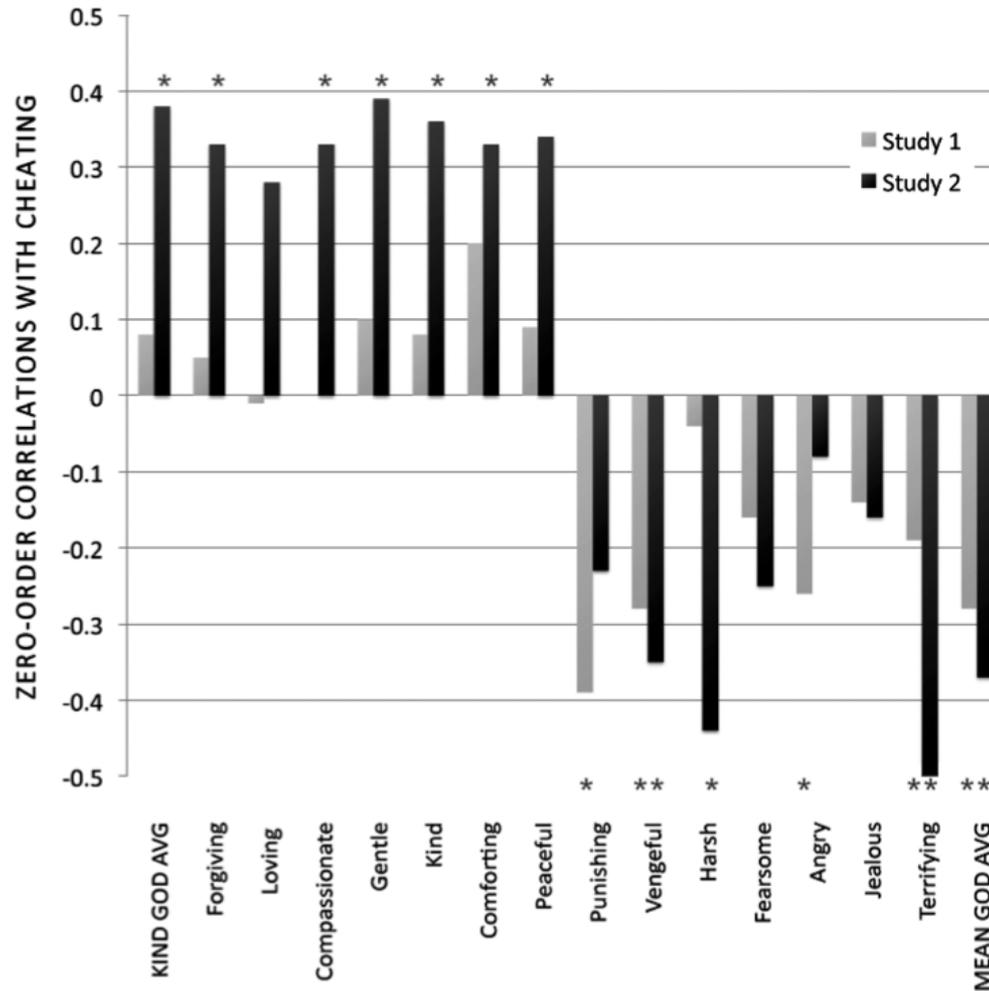
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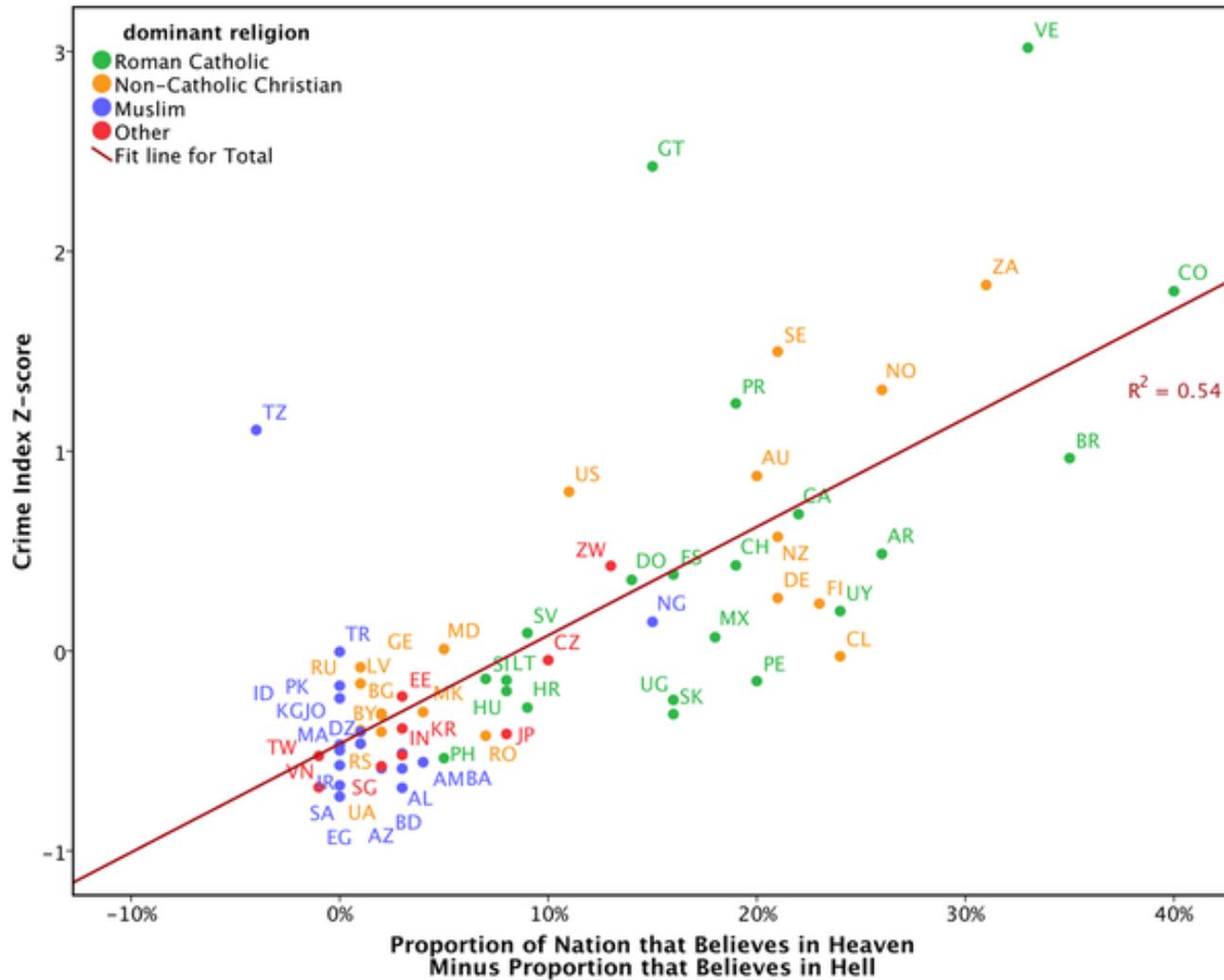
# Generosity With Religious Primes



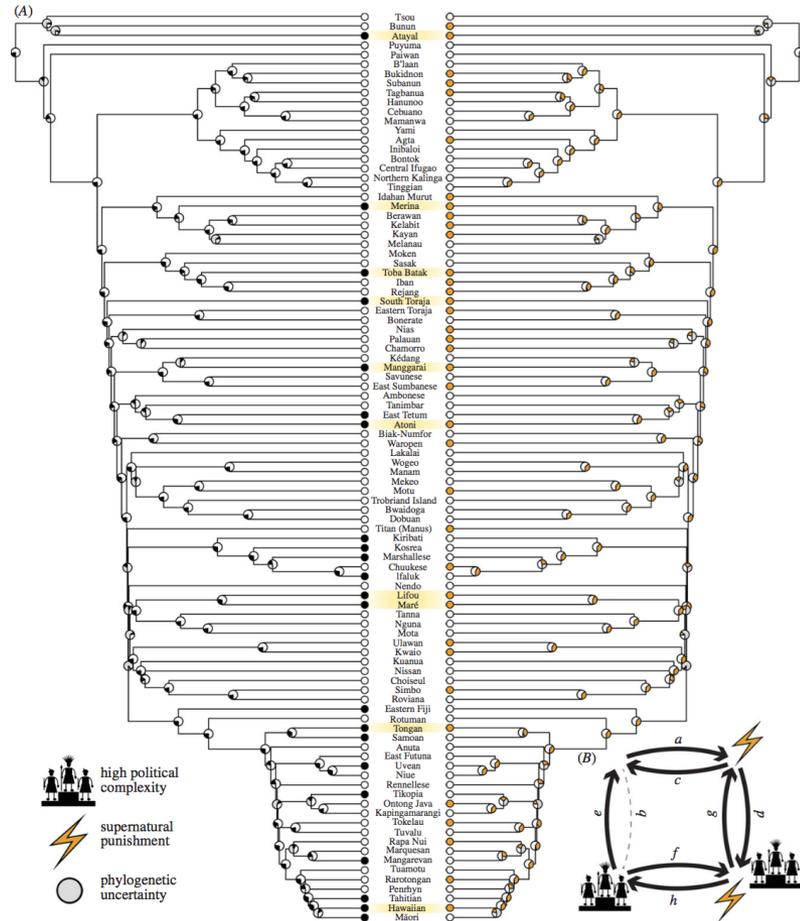
# Mean Gods and Cheating



# Afterlife Beliefs and Crime



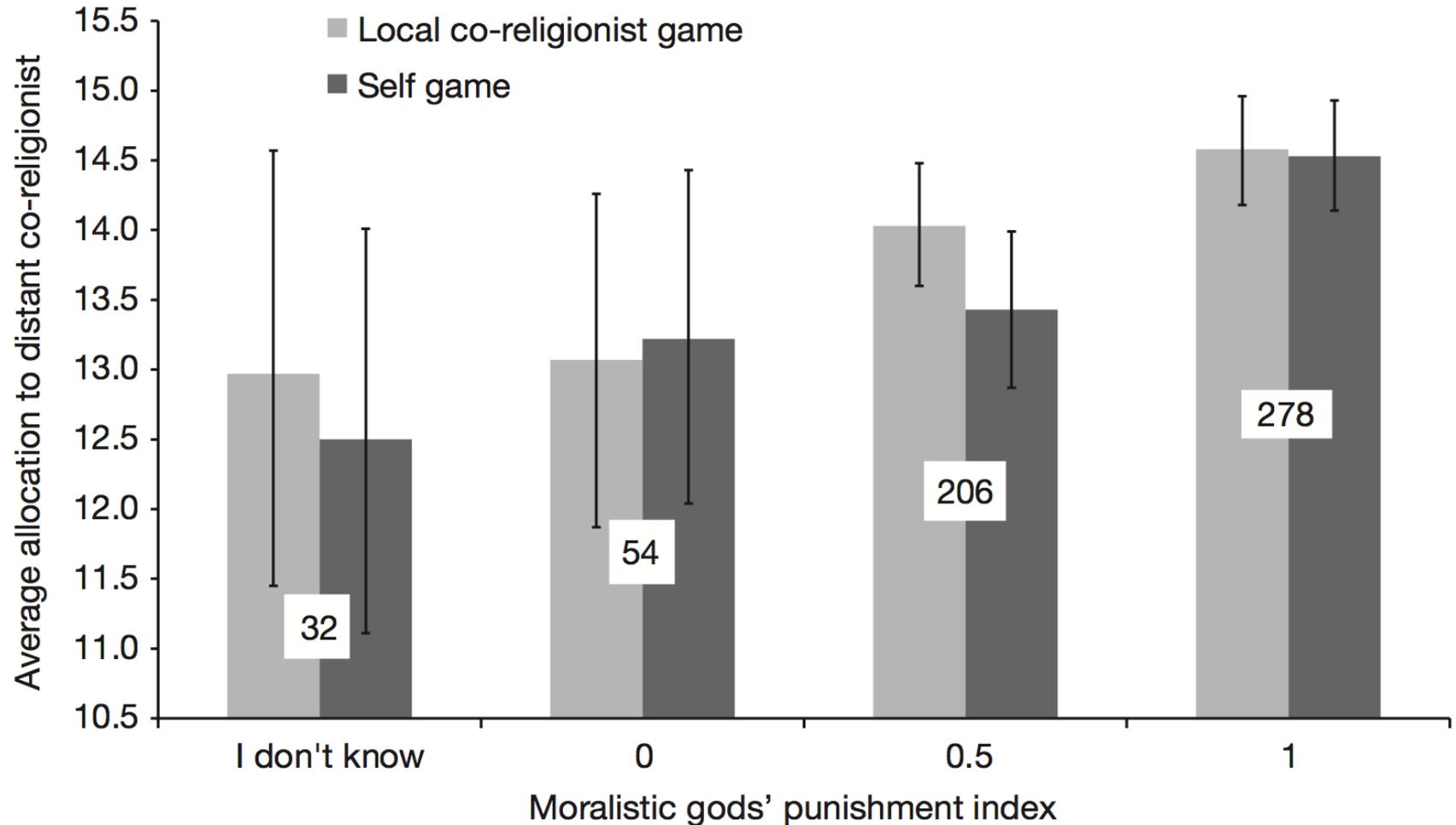
# Religion and Political Complexity



- ▶ 96 Austronesian societies
- ▶ Method
  - ▶ Galton's problem
  - ▶ Sequence of events
- ▶ Supernatural punishment drives political complexity
- ▶ Moralizing High Gods follow political complexity

**Figure 2.** (A) Political complexity and beliefs in BSP reconstructed on a maximum clade credibility consensus tree of Austronesian cultures. Cultures with both high political complexity and beliefs in BSP are highlighted. (B) Transition rate matrix for the coevolution of political complexity and beliefs in BSP, widths of arrows are proportional to rates of change (see electronic supplementary material, table S7 for values). The probability of a low complexity cultures gaining or losing BSPs are represented by rates  $a$  and  $c$ , respectively. The probability of high complexity cultures gaining or losing BSPs are presented by rates  $f$  and  $h$ , respectively. The probability of cultures without BSP gaining and losing political complexity are represented by rates  $b$  and  $e$ , respectively. The probability of cultures with BSP

# Generosity Towards Strangers



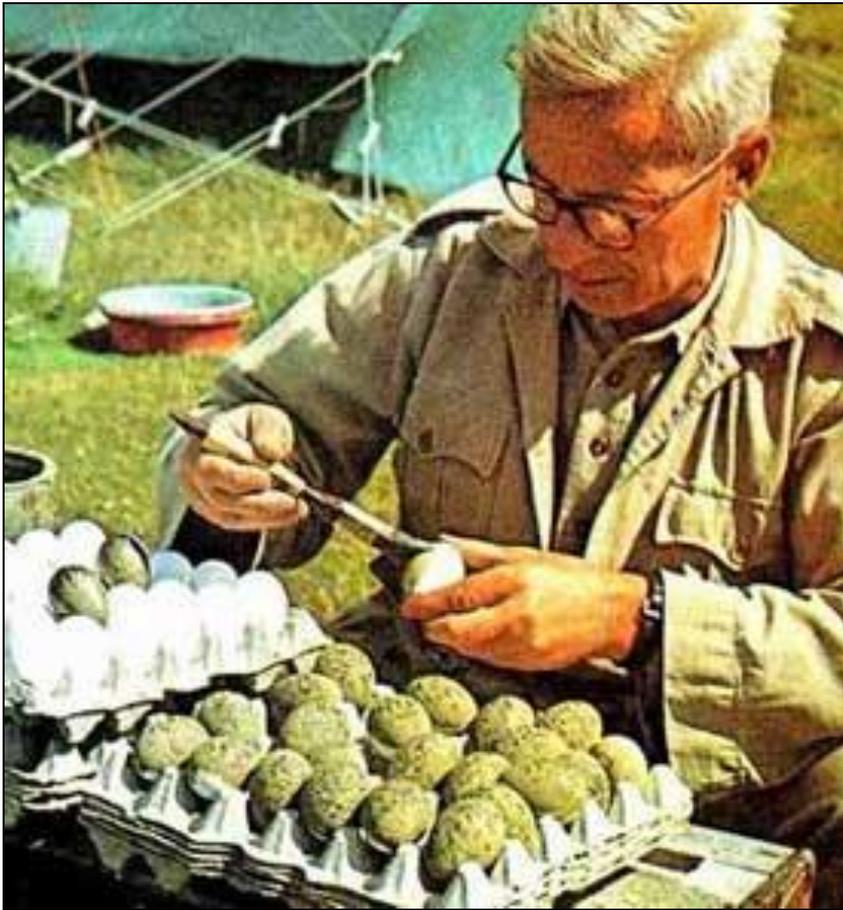
# Talk Outline

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- ▶ Why focus on punishment?
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-

# Tinbergen's Four Levels of Explanation

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- ▶ Proximate
- ▶ **Ultimate**
- ▶ Developmental
- ▶ Phylogenetic

# Effects of Belief on Fitness

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- ▶ Believers incur costs
    - ▶ Resources
    - ▶ Time
    - ▶ Constraints on behavior
  - ▶ Atheists do not
    - ▶ Avoid costs
    - ▶ Exploit believers (free-ride on their cooperation)
  - ▶ So atheists should out-compete believers, unless:
    - ▶ Believers *gain* some additional benefit
    - ▶ Believers *avoid* some additional costs...
-

# Novel Social Environment

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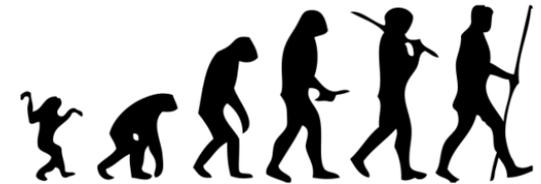
- ▶ Turning point in human evolutionary history:
- ▶ Theory of Mind
  - ▶ A knows that B knows that C... knows X
  - ▶ Responses to others' knowledge now subject to natural selection
- ▶ Complex language
  - ▶ Social exchange of information among A, B, C, D...etc.
  - ▶ Absent third-parties can hear, discover, infer, hypothesize, exploit, ally, and retaliate, even long after the event
- ▶ Unique to humans (though **Frans de Waal**)
- ▶ Novel selection pressures and adaptive responses
  - ▶ E.g. murdering witnesses, blackmail, suicide
  - ▶ But good side too (confession, guilt, shame, empathy—which require theory of mind to be well developed)

# Consequences

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- ▶ **Evolutionarily Novel Costs of Selfishness**
    - ▶ Increased importance of reputation
    - ▶ Increased probability of detection
    - ▶ Increased severity of punishment
      - ▶ Third-party retaliation (even long after the event)
      - ▶ Cheap punishment (alliances, projectiles)
  - ▶ **Selection for counter-mechanisms (may be several)**
  - ▶ **Including belief in supernatural punishment**
    - ▶ Moderate selfish motives (e.g. sex, hunger, status)
    - ▶ **Avoid real-world punishment by group members**
-

# Costs of Selfish Behavior



Baseline Level of Selfishness

Ancestral State



Selfishness Became Increasingly Costly

**Causes:**

Theory of Mind

Complex Language



Selection for Counter-Mechanisms

**A Solution:**

Belief in Supernatural Punishment

# Talk Outline

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- ▶ Why focus on punishment?
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  - ▶ **Basic game theoretical framework**
  - ▶ Atheists
  - ▶ Criticisms
  - ▶ Conclusions
-

# Competing Strategies

Strategy	Theory of mind & complex language	Probability of detection ( $p$ )	Cost of punishment ( $c$ )	Cost of missed opportunities ( $m$ )	Payoff
Ancestral	No	High	Same	None	Lowest
Atheist	Yes	High	Same	None	Highest (if $pc < m$ )
God-fearing	Yes	Low	Same	Some	Highest (if $pc > m$ )

# Implications

---

- ▶ “God-fearing” can evolve under certain conditions
  - ▶ But hinges on empirical values of  $p$ ,  $c$ ,  $m$ 
    - ▶ We don’t know what they are
    - ▶ Likely to vary with context (social and ecological setting)
-

# Talk Outline

---

- ▶ Why focus on punishment?
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  - ▶ Criticisms
  - ▶ Conclusions
-

# 2005 Ashes

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- ▶ “I sat on a small mat in my sitting room whilst watching the Ashes and I could only leave it at the end of an over ... I also cut my lawn during the lunch break so that it was back to the same condition as during the Trent Bridge Test.”
  - ▶ “When England really needed to take a wicket, I switched off both the television and radio for a few minutes. It worked more often than not.”
  - ▶ High stakes → more important
-

# “Secular” Supernatural Punishment

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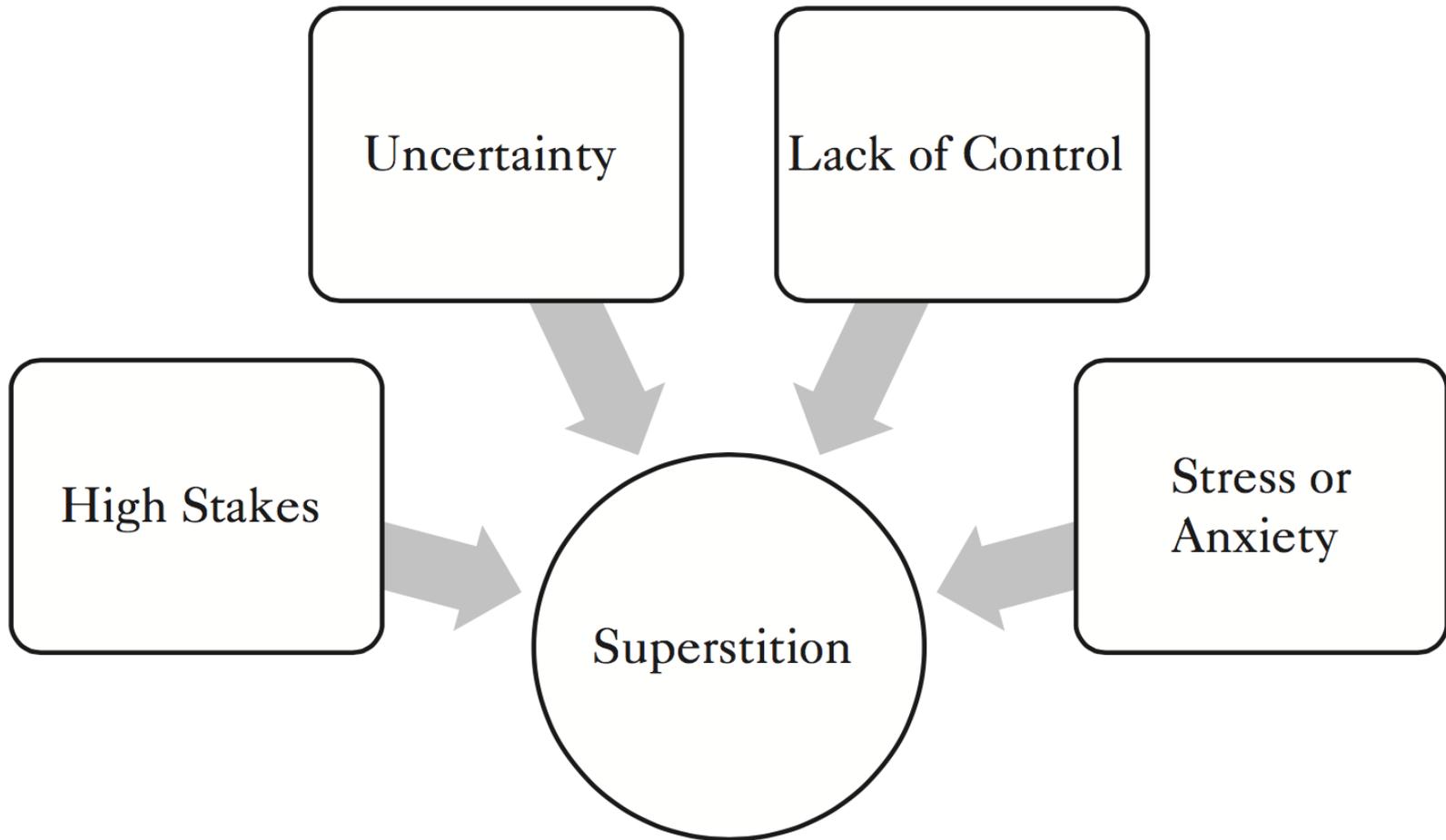
- ▶ Superstition
- ▶ Folklore
- ▶ Karma
- ▶ Just world beliefs
- ▶ Modes of thought  
(comeuppance, just desserts, what goes around comes around)

## ▶ Common Properties

- ▶ Theory of mind / intentionality system implicated
  - ▶ Expectation of “supernatural” consequences
  - ▶ Similar underlying cognitive processes
-

# Conditions Promoting Superstition

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# Talk Outline

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  - ▶ **Criticisms**
  - ▶ Conclusions
-

# Why Bring God into it?

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# Why Bring God into it?

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- ▶ Why not just reduce selfishness some other way?
  - 1. God is a formidable deterrent (even if imperfect)
    - ▶ No second-order free riders
    - ▶ Cheats automatically detected
    - ▶ Cheats automatically punished
    - ▶ Fewer first-order free riders
  - 2. God may be better than alternatives (e.g. conscience)
    - ▶ SP has consequences; conscience does not
    - ▶ SP bolstered by community/events; conscience is individual
    - ▶ Empirical evidence that religion best promoter of cooperation
  - 3. Even atheists expect “supernatural” punishment (so a general theory about human nature, not just religion)
  - 4. EMT bias to over-estimate detection may be adaptive
-

# Talk Outline

---

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  - ▶ Criticisms
  - ▶ **Conclusions**
-

# Conclusions

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- ▶ ***Supernatural* punishment missing in cooperation literature**
    - ▶ Empirically important for billions of people (**practice vs. doctrine**)
    - ▶ Theoretically interesting (God as game theorist)
    - ▶ Psychologically interesting (cognitive science of religion; negativity bias)
  - ▶ **Adaptive for individual fitness**
    - ▶ Benefits of collective action
    - ▶ Avoids unique costs of human selfishness
  - ▶ **Clear conditions for selection**
  - ▶ **Growing empirical support**
  - ▶ **Work to do (Schloss & Murray 2011)**
    - ▶ Account for (significant) variation in supernatural punishment beliefs
-

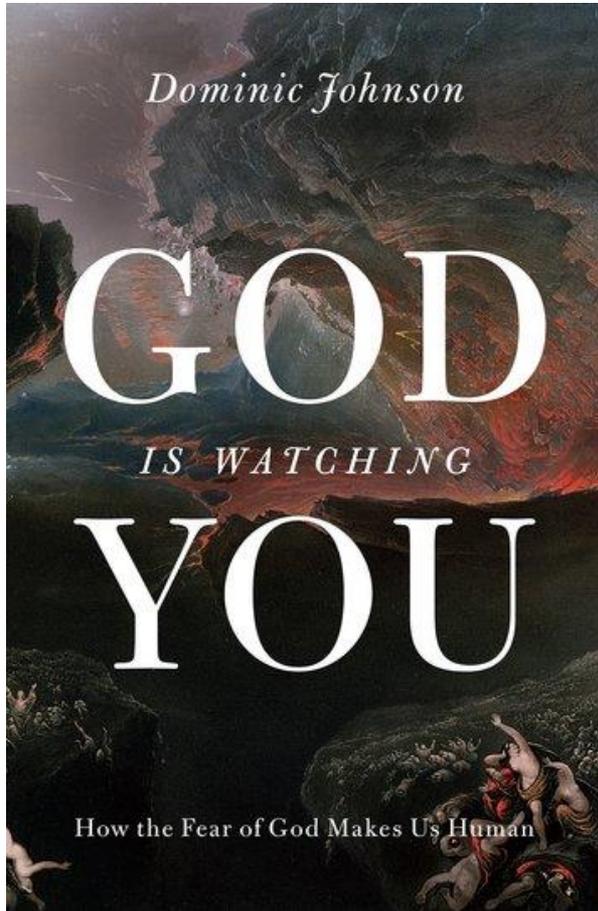


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*Justice and Divine Vengeance Pursuing Crime, Pierre-Paul Prud'hon (1808)*

# Thank You

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New book out (OUP 2016)

More info and papers at  
[DominicDPJohnson.com](http://DominicDPJohnson.com)

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