

# Social Competition and Economic Consequences: Theory and Experiment

Xueheng Li<sup>1</sup> Michael Muthukrishna<sup>2</sup> Robin Schimmelpfennig<sup>3</sup>

<sup>1</sup>School of Economics  
University of Nottingham

<sup>2,3</sup>Department of Psychological and Behavioural Science  
London School of Economics and Political Science

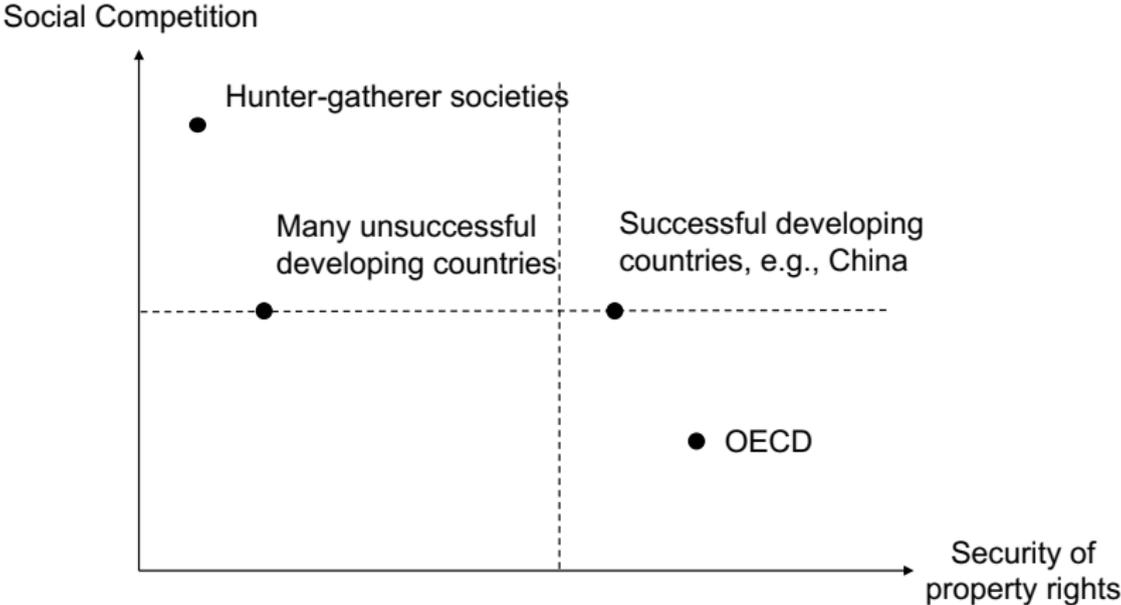
Inaugural Cultural Evolution Society Conference  
September 2017

# Introduction

- ▶ **Social competition**—social status, relative wealth—matters.
  - ▶ Biology: West-Eberhard (1979, 1983).
  - ▶ Psychology: Festinger (1954), Taylor and Lobel (1989). Suls and Wheeler Eds. (2013), Suls, Martin and Wheeler (2002).
- ▶ We re-visit the issue from an economic perspective:
  - ▶ social competition affects the incentives for different behaviors, interactions between individuals, and aggregate results.
- ▶ “Economics is all how people make choices. Sociology is all about why they don’t have any choice to make. ” –James S. Duesenberry (1960)

# Conclusion

Our results help understand the diversity of the world:



# Introduction

- ▶ Questions
  - ▶ How does social competition leads to **conflicts** and shapes **consumption, productivity, and inequality** of individuals?
  - ▶ How do the institutions of a society—e.g., **security of property rights**—interact with social competition to shape aggregate outcomes?
- ▶ We analyze theoretically and provide experimental evidence for the **two sides** of social competition:
  - ▶ Constructive side: improve some individuals' motivation and productivity;
  - ▶ Destructive side: a) conflicts targeted at the rich, b) conspicuous consumption, c) suppression of productivity of the high-ability.
  - ▶ Security of property rights affects the trade-off between the two sides critically.

# Outline

## The two sides of social competition

1. Theoretical analysis
2. Experiment

# Theoretical analysis

Consider a population of individuals.

Each individual

- ▶ is endowed some level of **ability**,
- ▶ **chooses** how much effort for **production**, and
- ▶ how much income to spend on **(conspicuous) consumption**.

Assumptions:

- ▶ Social competition: **relative production** matters.
- ▶ **Incomplete information**: people **only observe the consumptions** of each other, not income, nor ability.

⇒ Conflicts, conspicuous consumption, dramatic distortion of productivity.

# Theoretical analysis

Baseline:

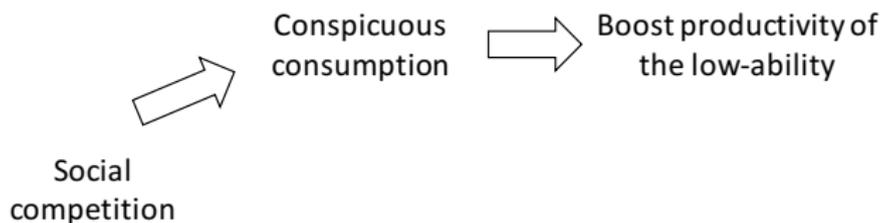
- ▶ If only individual production—not relative production—matters, then

$$\text{Consumption} = \text{Production} = \text{Ability.}$$

- ▶ Incomplete information does not matter in this case.

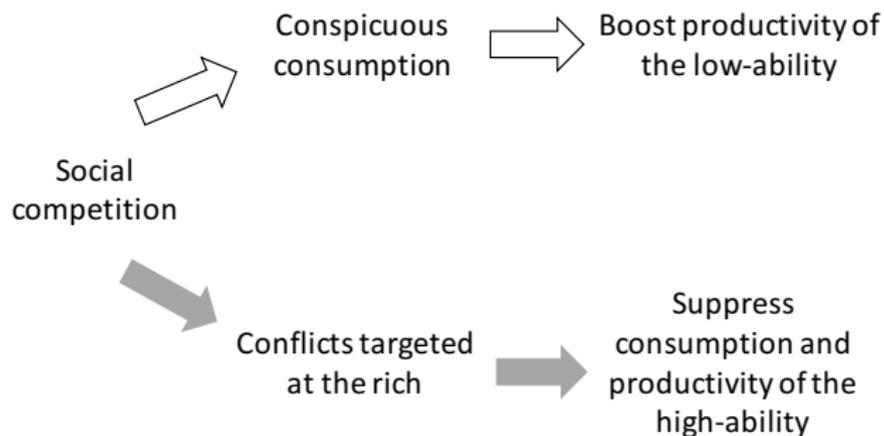
# Theoretical analysis

Extending the model of Bernheim (1994), we formally show:



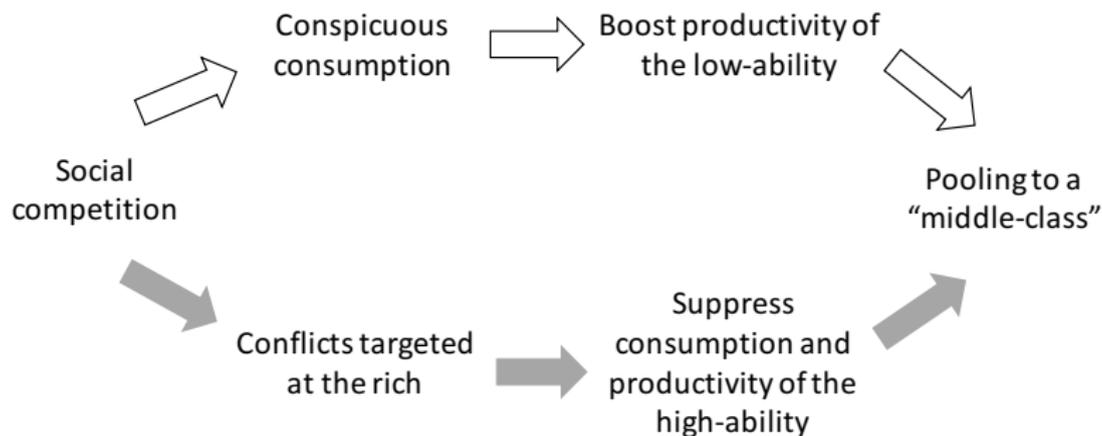
# Theoretical analysis

Extending the model of Bernheim (1994), we formally show:



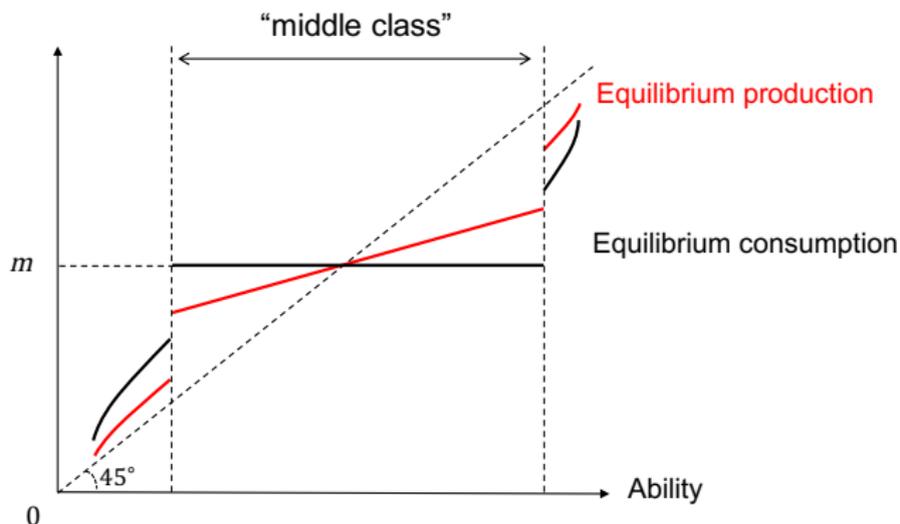
# Theoretical analysis

Extending the model of Bernheim (1994), we formally show:



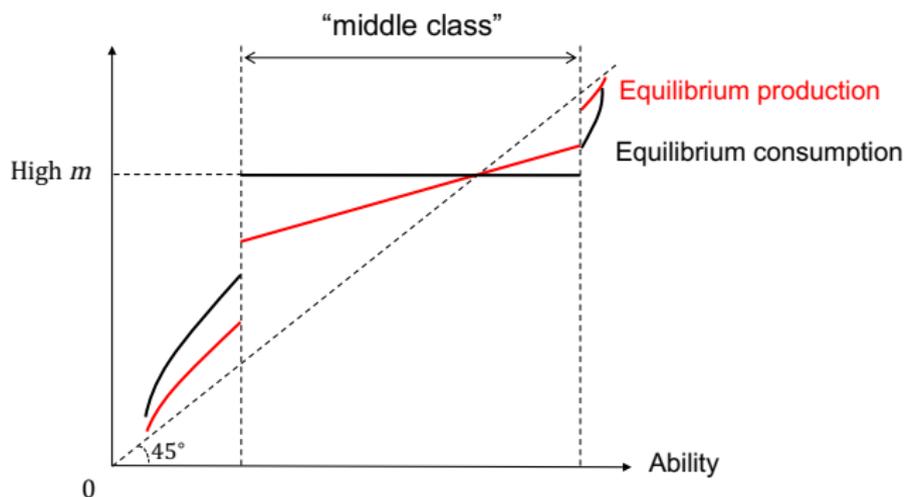
# Theoretical analysis

- ▶ If social competition is sufficiently strong, then:
  - ▶ emergence of a homogeneous “middle class”, and
  - ▶ dramatic distortions in consumption and productivity.



## Theoretical analysis

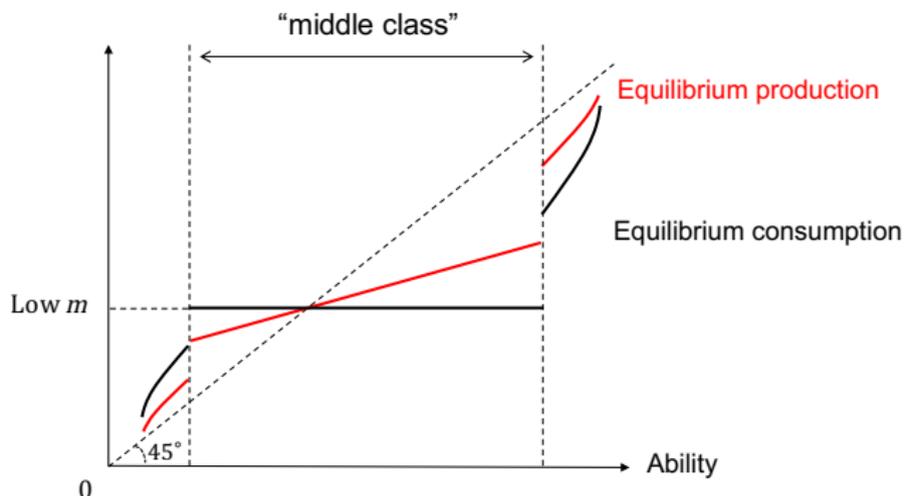
- ▶ High security of property rights  $\implies$  Less conflicts (threats)  $\implies$  a rich middle-class



- ▶ Example: China, and maybe other successful developing countries.

## Theoretical analysis

- ▶ Low security of property rights  $\implies$  More conflicts (threats)  $\implies$  a poor middle-class



- ▶ Example: Hunter-gatherer societies.

# Outline

## The two sides of social competition

1. Theoretical analysis
2. Experiment

## Experiment: design

Participants are matched into pairs to play an experimental game:

- Stage 1.** Each player endowed with some time to start with (about 30 seconds); they can **add** to, or **subtract** from, the other's production time at a personal cost;
- Stage 2.** Do a **slider task**;
- Stage 3.** **Report** the number of correct sliders; need not be the actual one, but misreporting is costly;

Total payoffs =

- ▶ correct sliders +
- ▶ bonus points based on **reported** corrected sliders **relative to the other.**

# Experiment: design

## Test Period - Stage 2

Time left to complete this page: ⌚ 0:19

You have 28.2 seconds to position the 24 sliders at 25. You will be automatically transferred to the next stage if you have placed all sliders correctly, or you ran out of time.

0 points earned



## Experiment: design

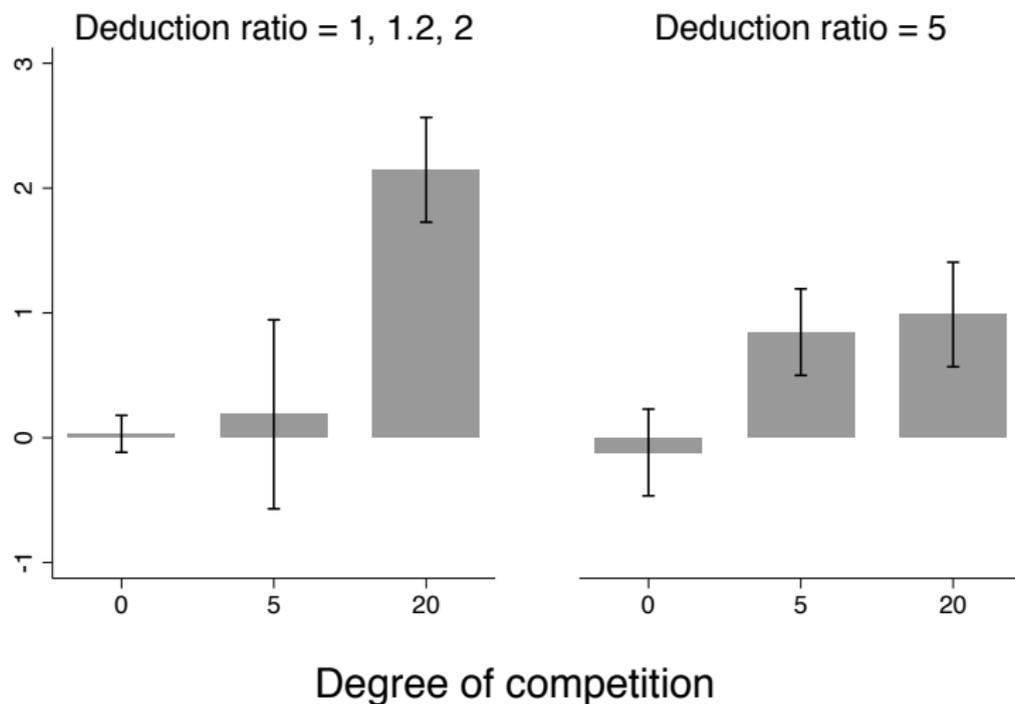
- ▶ Between-subject design
- ▶ Two treatment variables:
  - ▶ Degree of competition  $\lambda = 0, 5, 20$ ;
  - ▶ Deduction ratio  $r = 1, 1.2, 2, 5$ .
- ▶  $3 \times 4 = 12$  treatments in total.

Table: Summary statistics

	Mean	SD
Destruction (assigned reduction time)	0.58	4.37
Correct sliders	6.47	3.32
Correct sliders per 30 seconds	6.81	3.28
obs.	144	20

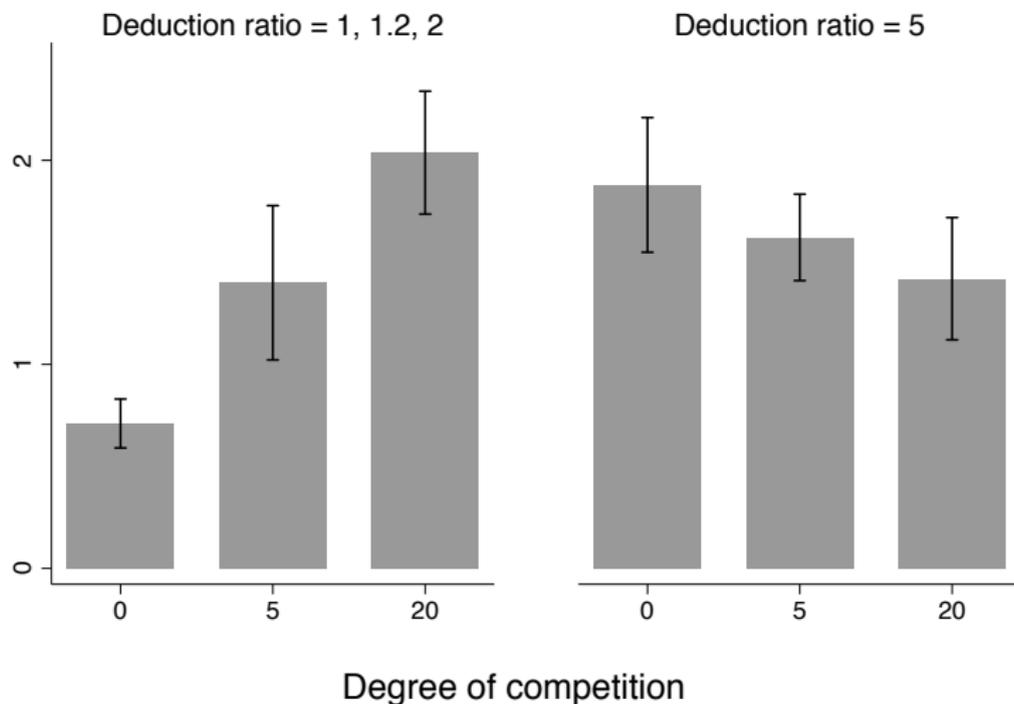
# Experiment: results

## Destruction

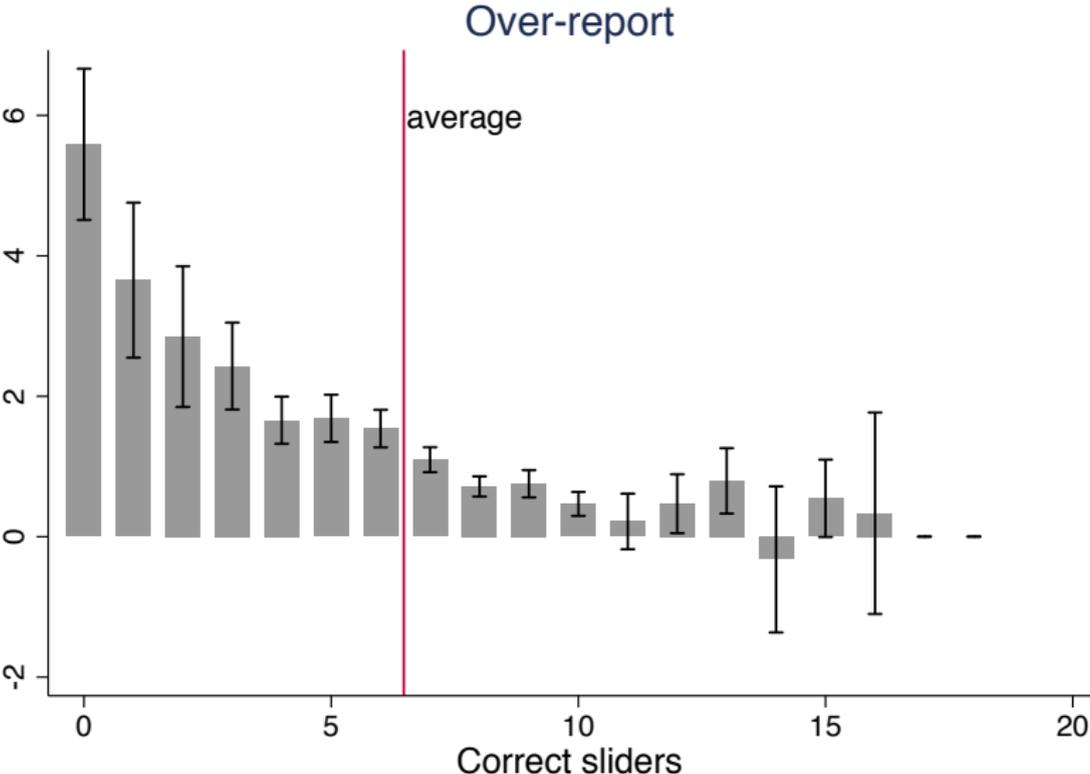


# Experiment: results

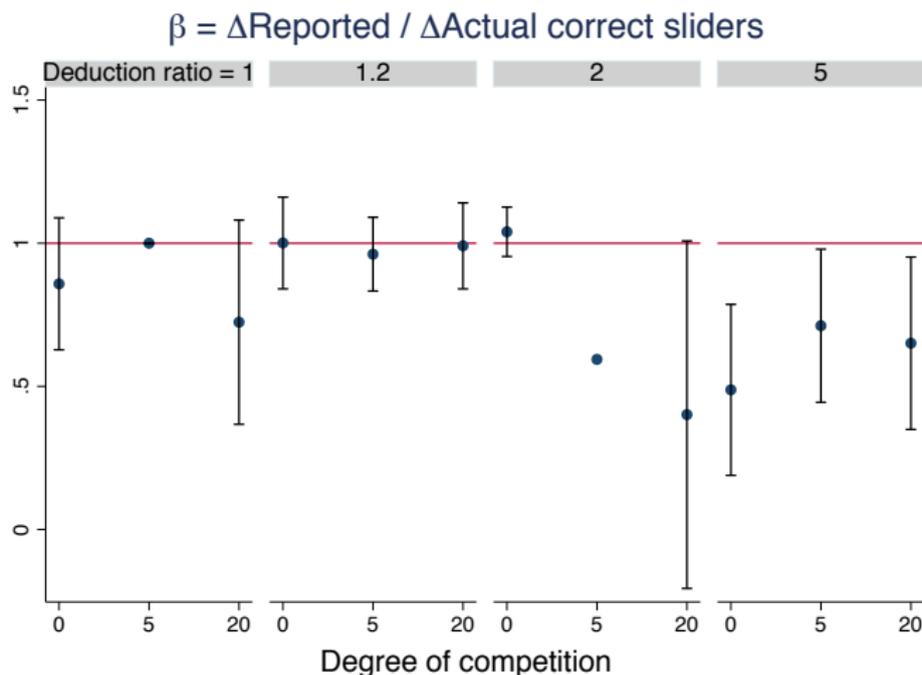
## Over-report of correct sliders



# Experiment: results



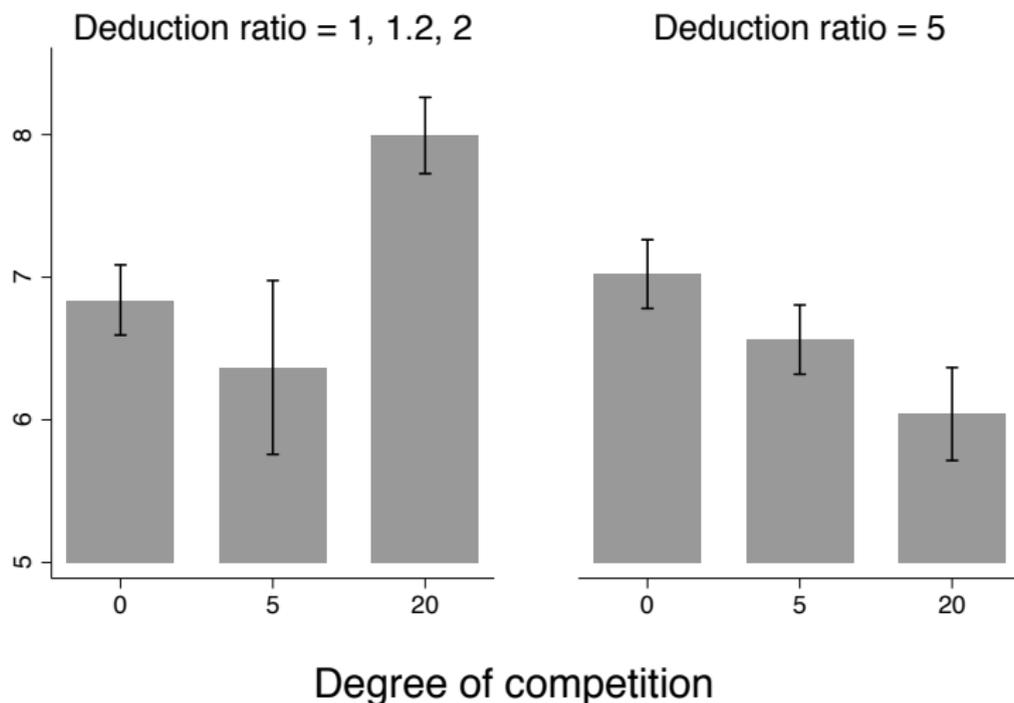
# Experiment: results



Note: The marginal effects are obtained from ols regressions with robust errors clustered by participants; including controls: period dummies, age, gender, country dummies.

## Experiment: results

Productivity (correct sliders per half min)



# Conclusion

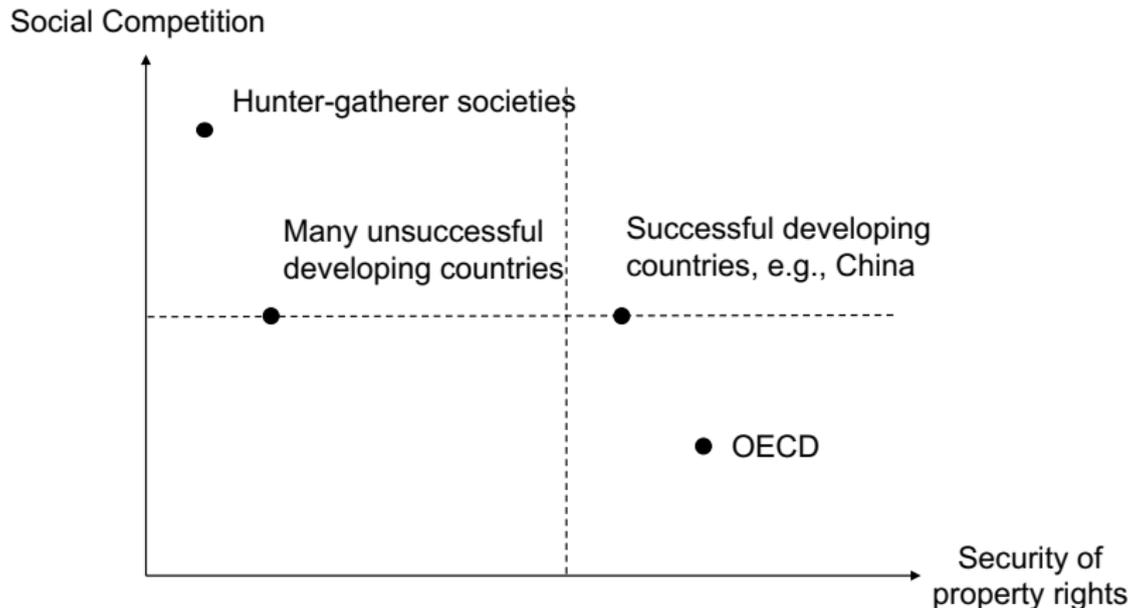
The **two sides of social competition**.

- ▶ Constructive side:
  - ▶ improve overall productivity, but only when property rights are secure.
- ▶ Destructive side:
  - ▶ (Threat of) conflicts,
  - ▶ conspicuous consumption of the low-ability,
  - ▶ suppression of consumption and productivity of the high-ability.

**Security of property rights** is an important determinant of the trade-off between the two sides.

# Conclusion

Our results help understand the diversity of the world:



# Appendix

## Test Period - Stage 4

---

You reported **0 points**. Based on the **Reported Scores**, you received **8 Bonus Points** this period.

The other player reported **12 points**. Based on the **Reported Scores**, they received **92 Bonus Points** this period.

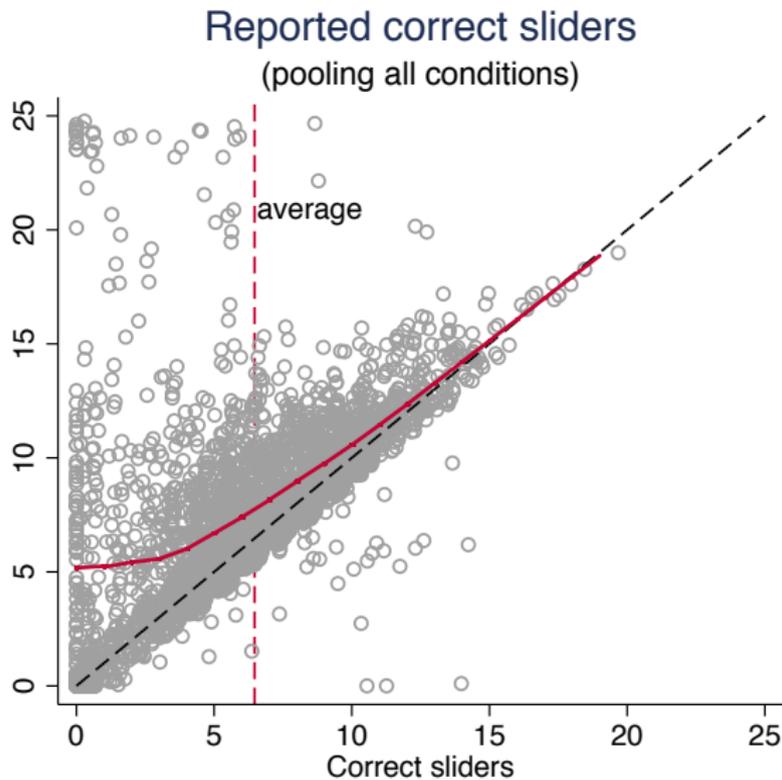
*Note: This does not include the Score they earned in the previous stage, or any cost of reporting above this Score.*

	Score	Bonus Points	Cost of reporting	Total Points
Your received	0	8	0	8

**Total Points = Score + Bonus Points - Cost of reporting**

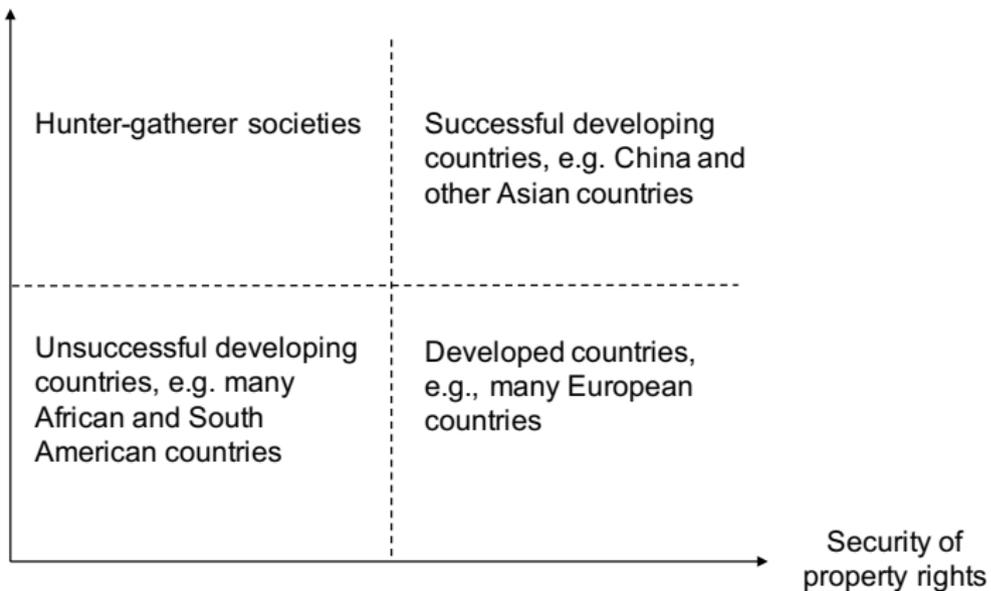
Next

# Appendix

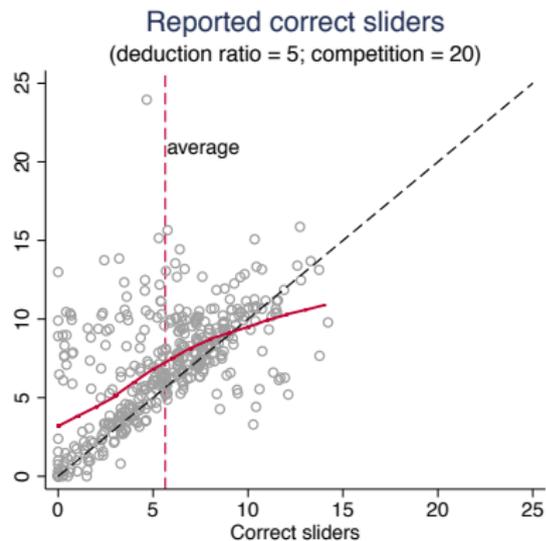
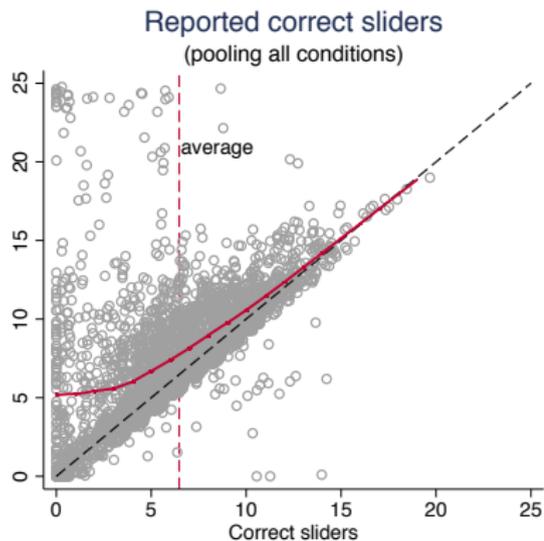


# Appendix

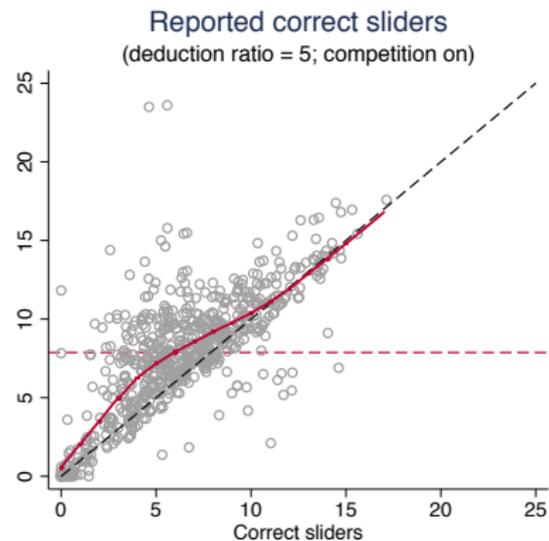
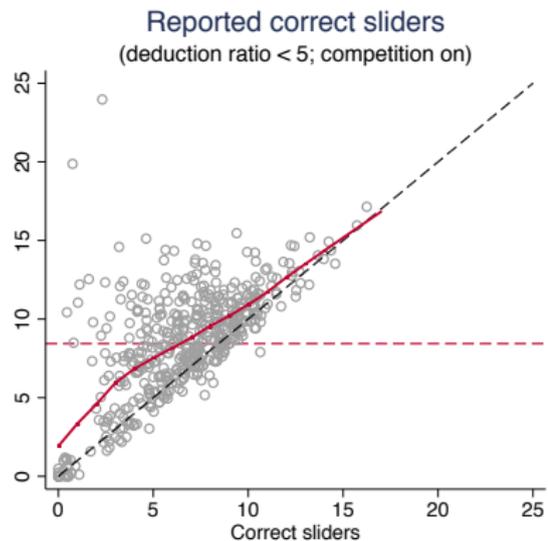
Strength of  
social competition



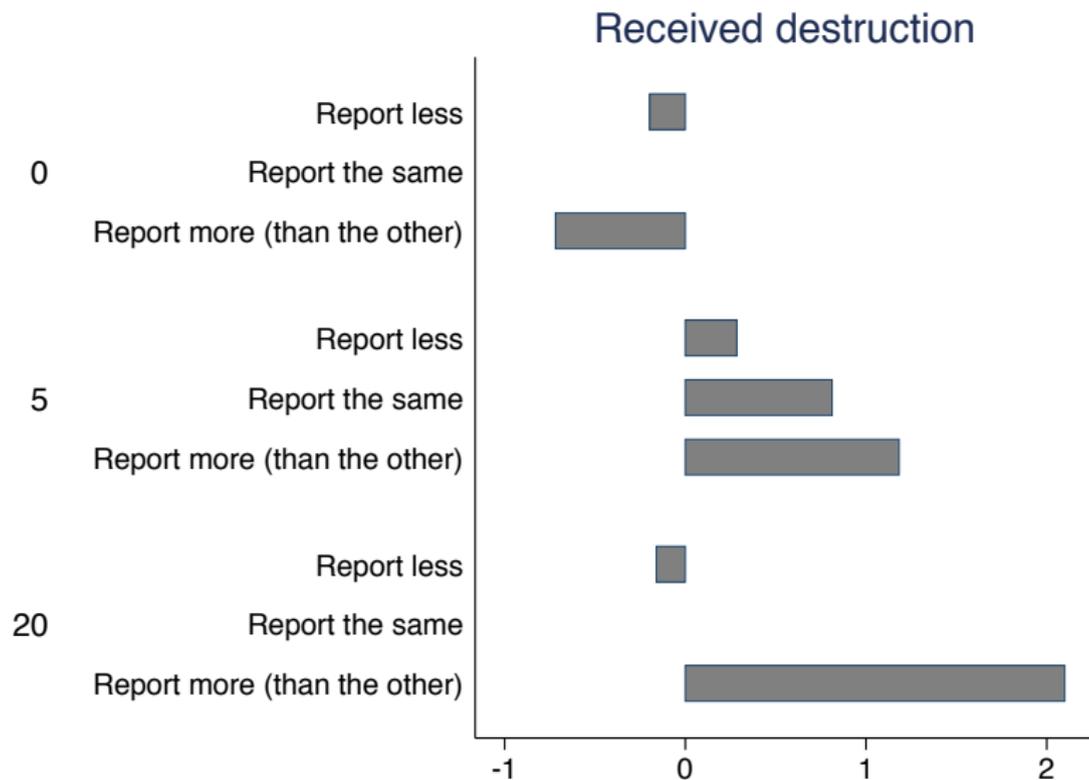
# Appendix



# Appendix



# Appendix



## Appendix: Theoretical analysis

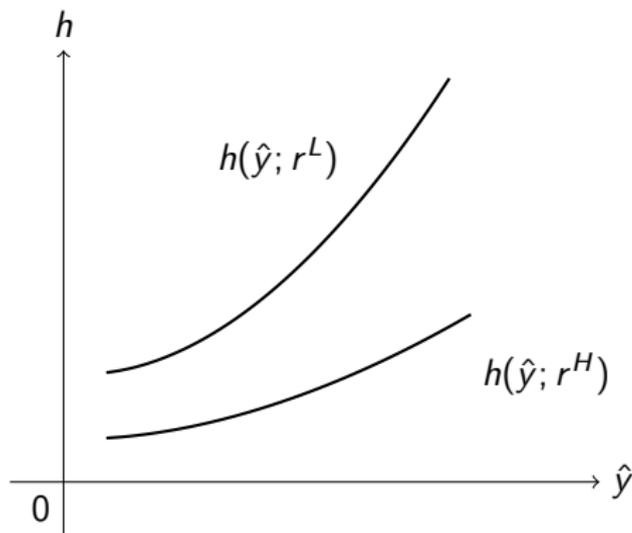
We analyze the following model (a signaling game) analogous to our experiment

- ▶ Two individuals, Ann and Bob
  1. **Ann** knows her **ability**,  $a$ , and decides
    - ▶ **production**,  $y$ ;
    - ▶ **(conspicuous) consumption**,  $c$ ;
  2. **Bob** decide whether or not and how much to **harm** Ann,  $h$ .
- ▶ Critically, **Bob only sees** Ann's consumption  $c$ .
- ▶ Social competition + Incomplete information  $\implies$  conflicts, conspicuous consumption, and substantial distortion of productivity.

## Appendix: Theoretical analysis

Consider Bob.

- ▶ draws inference  $\hat{y}$  based on Ann's consumption;  $\hat{y}$  is Ann's **social image**.
- ▶ then chooses how much to harm Ann based on  $\hat{y}$ :  $h(\hat{y})$ .



## Appendix: Theoretical analysis

Consider Ann.

- ▶ Private payoffs:

$$V(c, y, a) = (c - y)^2 + (y - a)^2.$$

- ▶ Social payoffs:

$$S(\hat{y}) = \hat{y} - d(\hat{y}).$$

- ▶ Ann seeks to maximize the weighted sum of the two:

$$U(c, y, a, \hat{y}) = V(c, y, a) + \lambda S(\hat{y}),$$

where  $\lambda$  is the **strength of social competition**.

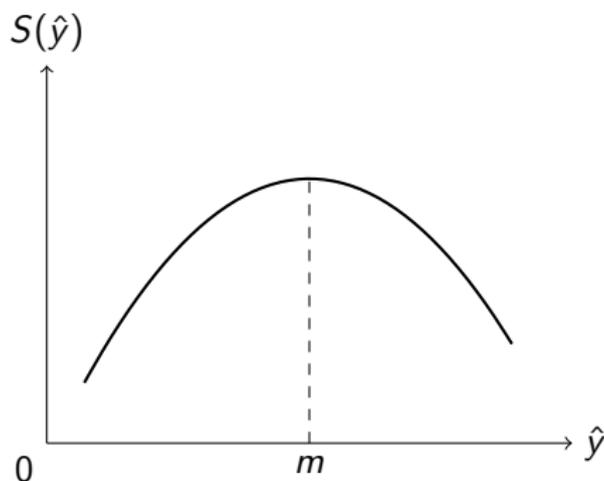
## Appendix: Theoretical analysis

If no social competition, Ann would take

$$\textit{Consumption} = \textit{Production} = \textit{Ability}.$$

## Theoretical analysis

- ▶ However, social competition  $\Rightarrow$  people may want to manipulate their social image:
  - ▶ **The rich** concerned with potential conflicts  $\Rightarrow$  they want to lower their social image  $\hat{y}$ .
  - ▶ **The poor** not worried about conflicts  $\Rightarrow$  they want to earn higher social image  $\hat{y}$ .



## Appendix: Theoretical analysis

- ▶  $r^H$  : High security of **property rights**
- ▶  $r^L$  : Low security of **property rights**

