

A “Roadmap” to Sender-Receiver Games

An Extremely Personal Perspective

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* I thank Kun Zhang from ASU for a helpful discussion

Information Economics

Blackwell experiments?

Information transmission?

Cheap talk?

Bayesian persuasion?

...

Lemon's market?

Adverse selection?

Moral hazard?

Nash/Bayesian mechanisms?

...

They are not isolated

A quote from Crawford and Sobel (1982)

he receives. Since $U_{11}^R(\cdot) < 0$, the objective function in (2) is strictly concave in y ; therefore, R will never use mixed strategies in equilibrium.

Our model departs from the non-strategic signaling literature (see, for example, Spence [15]) principally in the nature of its signaling costs. Signaling models typically have exogenously given differential signaling costs, which allow the existence of equilibria in which agents are perfectly sorted. Our model has no such costs. But R 's equilibrium choice of action rule generally creates endogenous signaling costs, which allow equilibria with partial sorting. This shows that exogenous differential signaling costs are not always needed for informative signaling.

Our model is closely related to that of Green and Stokey [3], who study strategic information transmission using a definition of equilibrium that differs

Outline

A uniform-quadratic example (Krishna Morgan 2008)

How I locate information transmission models

Ways to generate new ideas?

I. A Uniform-Quadratic Example

State: $\theta \sim U[0,1]$

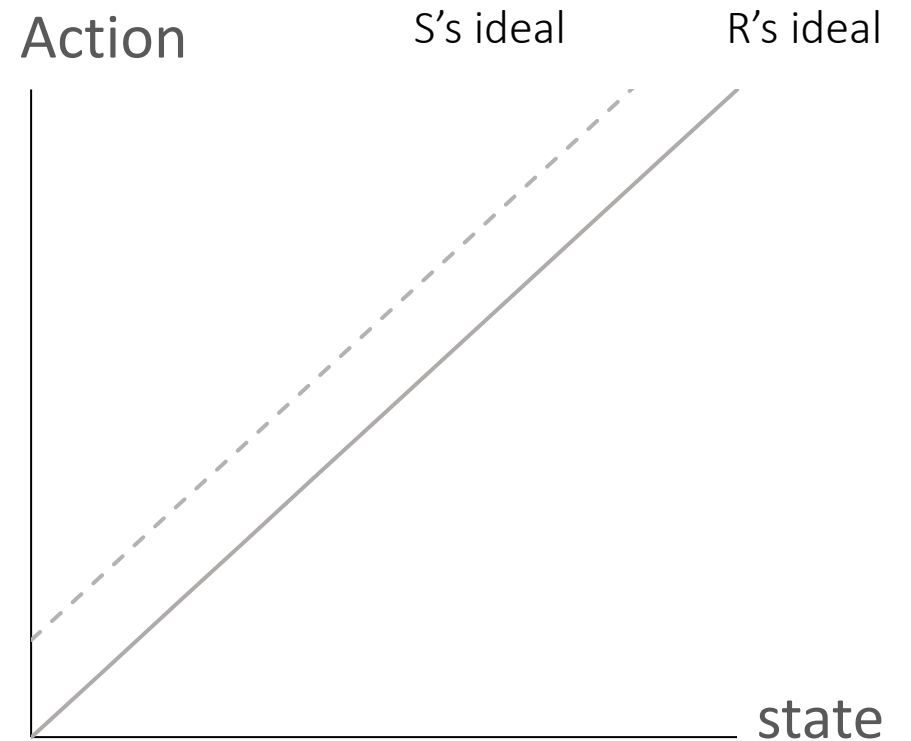
Action: $y \in R$

Sender: $u(y, \theta) = -(y - \theta - b)^2$

Receiver: $v(y, \theta) = -(y - \theta)^2$

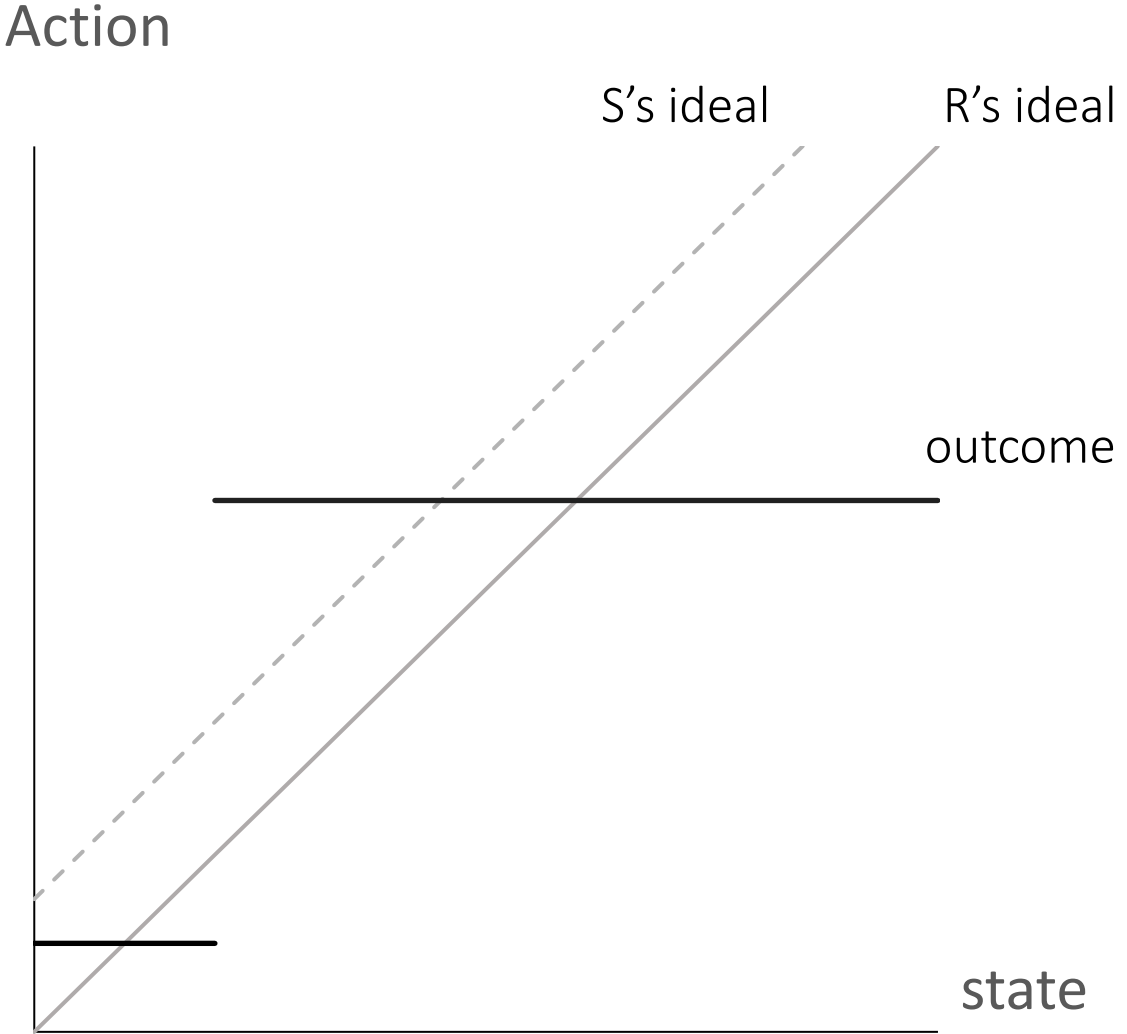
S observes state and sends message m

R observes message m and takes action y



Cheap Talk

S sends m
R chooses y

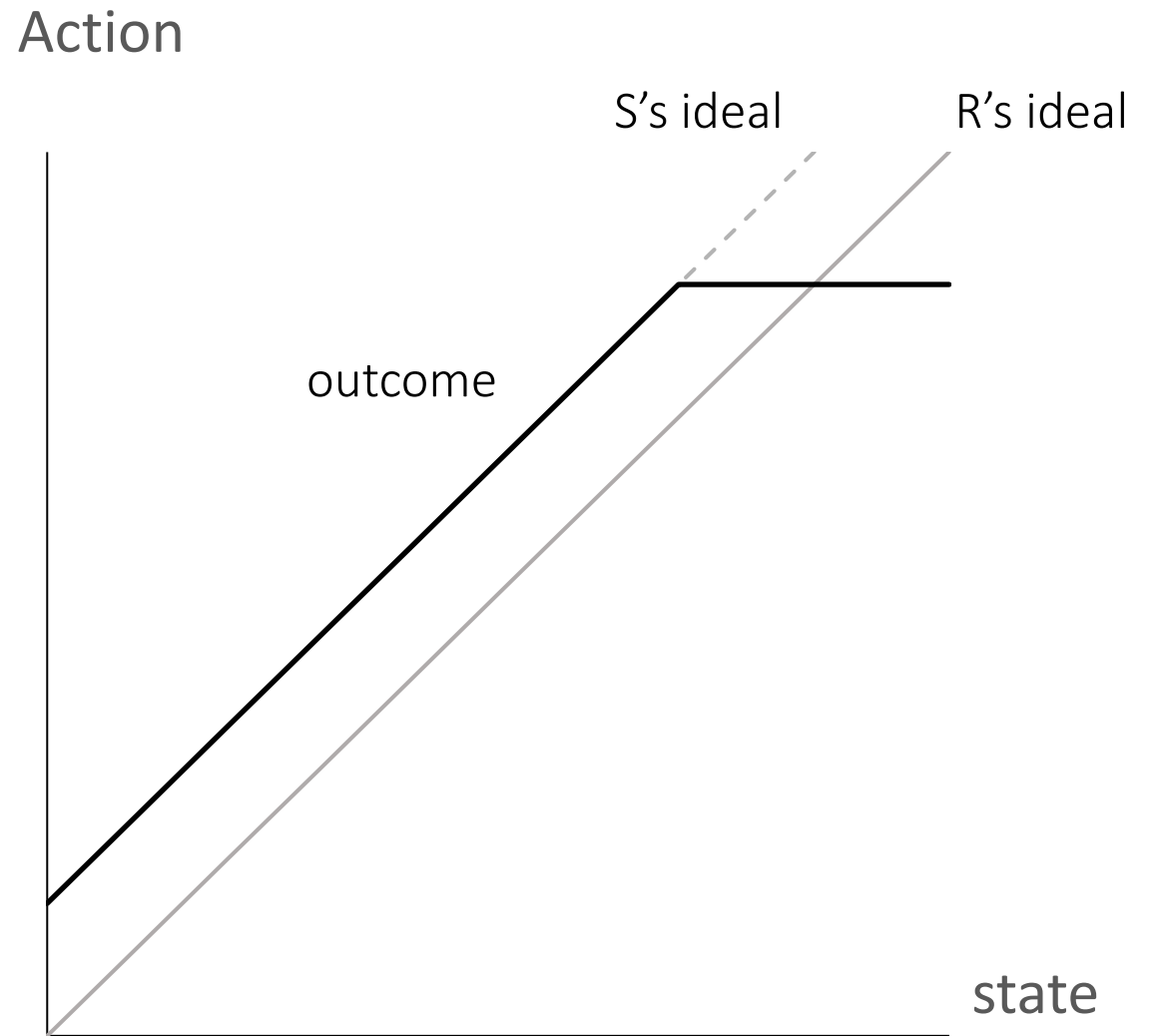


Delegation

R offers $y(m)$

S sends m

R implements $y(m)$

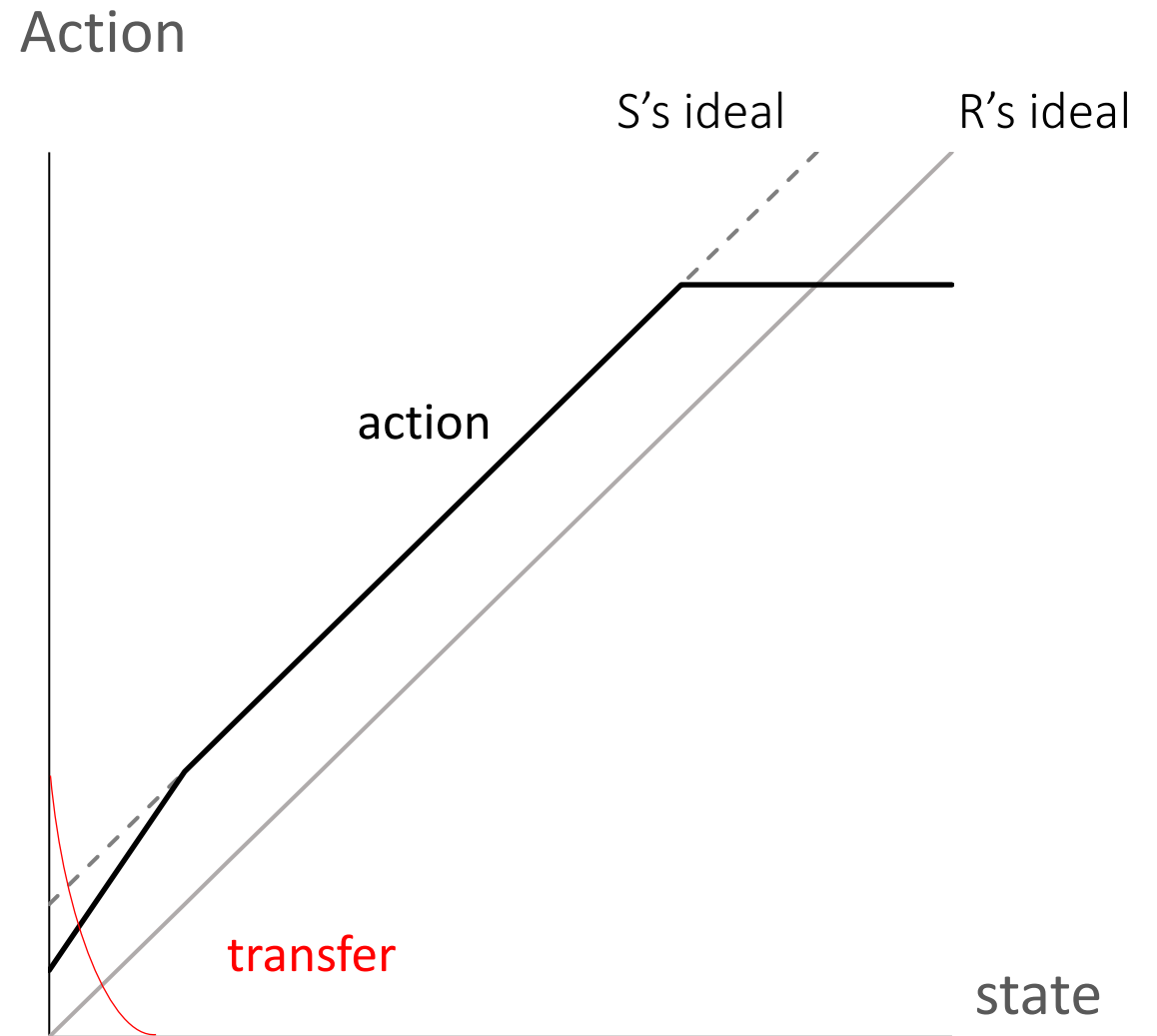


Screening

R offers $(y(m), t(m))$

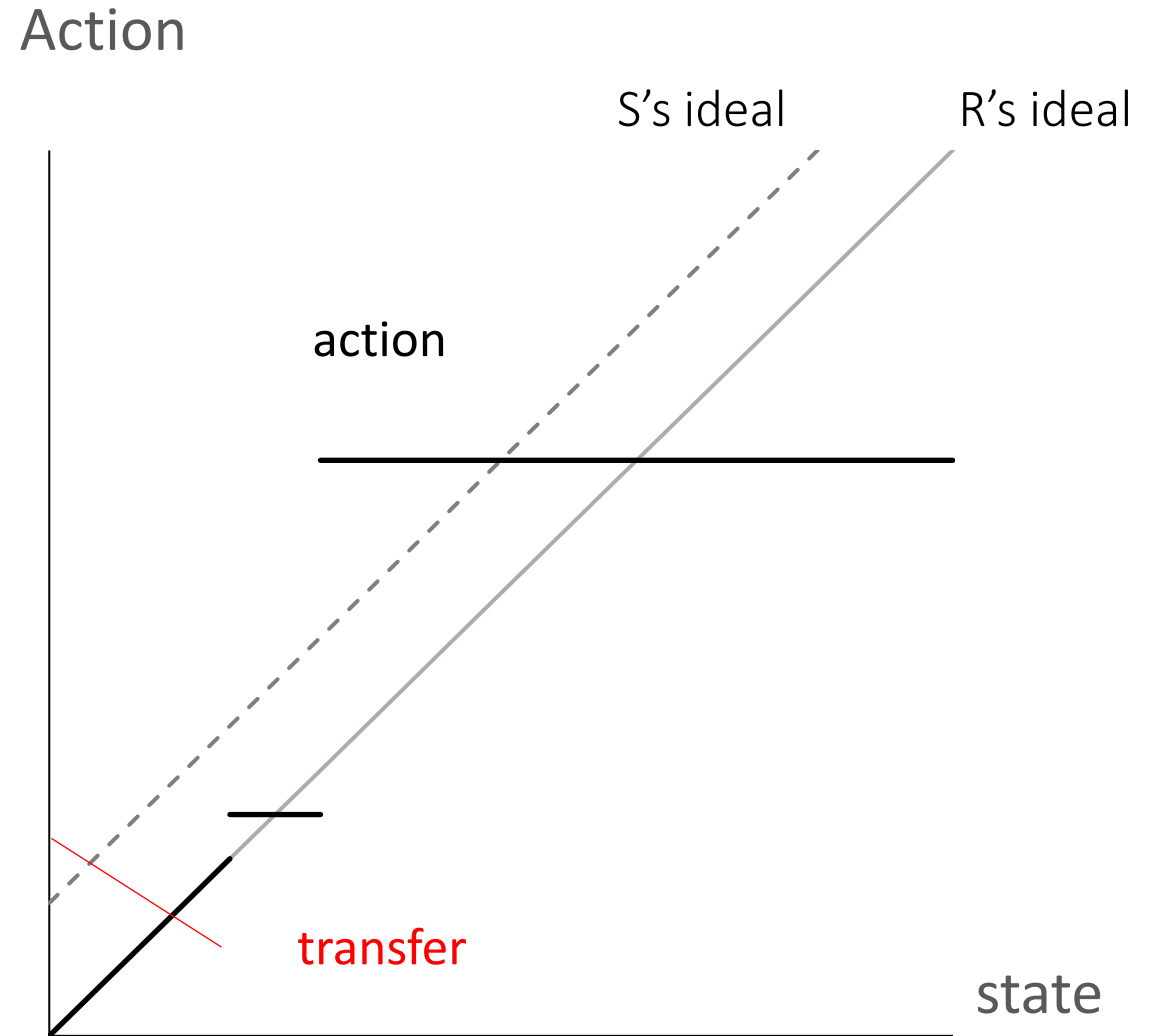
S sends m

R implements $(y(m), t(m))$



Compensation

R offers $t(m)$
S sends m
R chooses y and
implements $t(m)$



II. How I locate the models

[A paper list](#)

any comments, changes, adds are highly urged

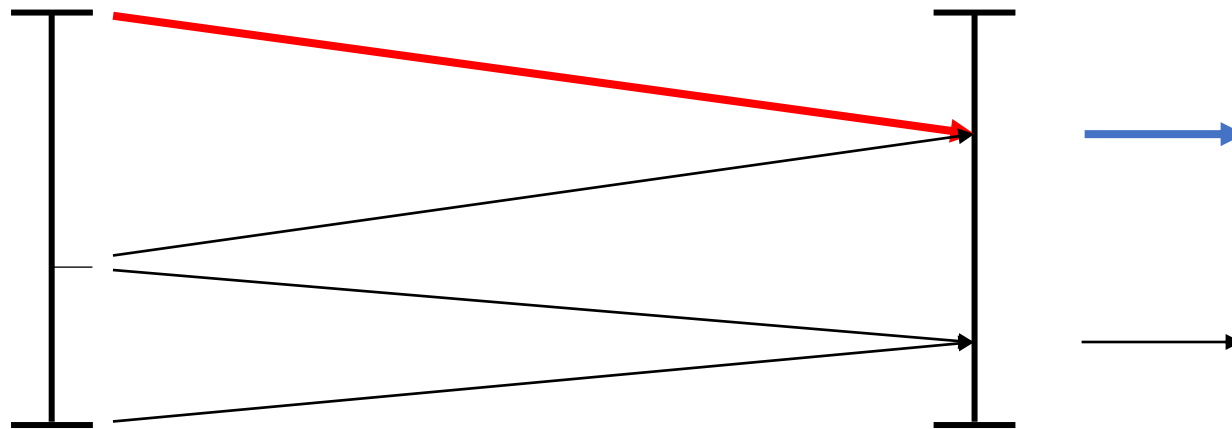
Cheap talk (bi-partition eqm)

Sender (Agent) θ

Receiver (Principal) m

message (costless)

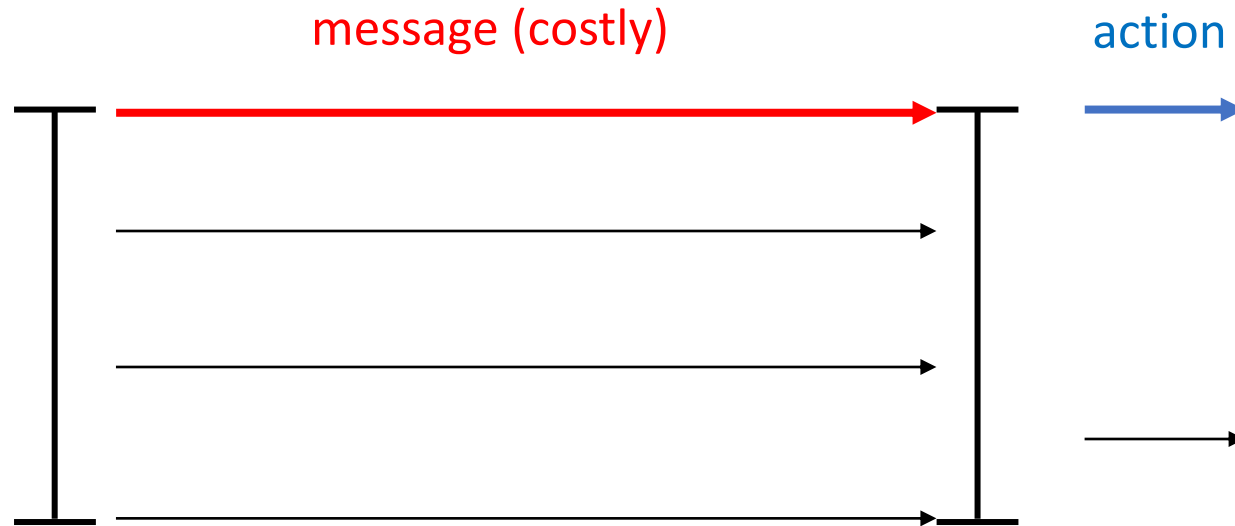
action



Signaling (separating eqm)

Sender (Agent) θ

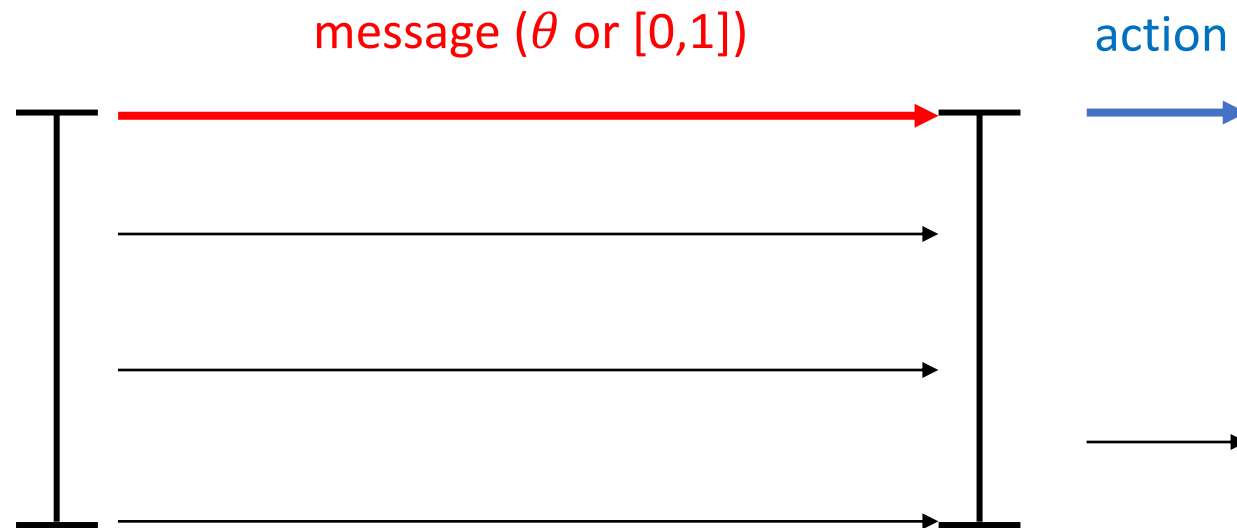
Receiver (Principal) m



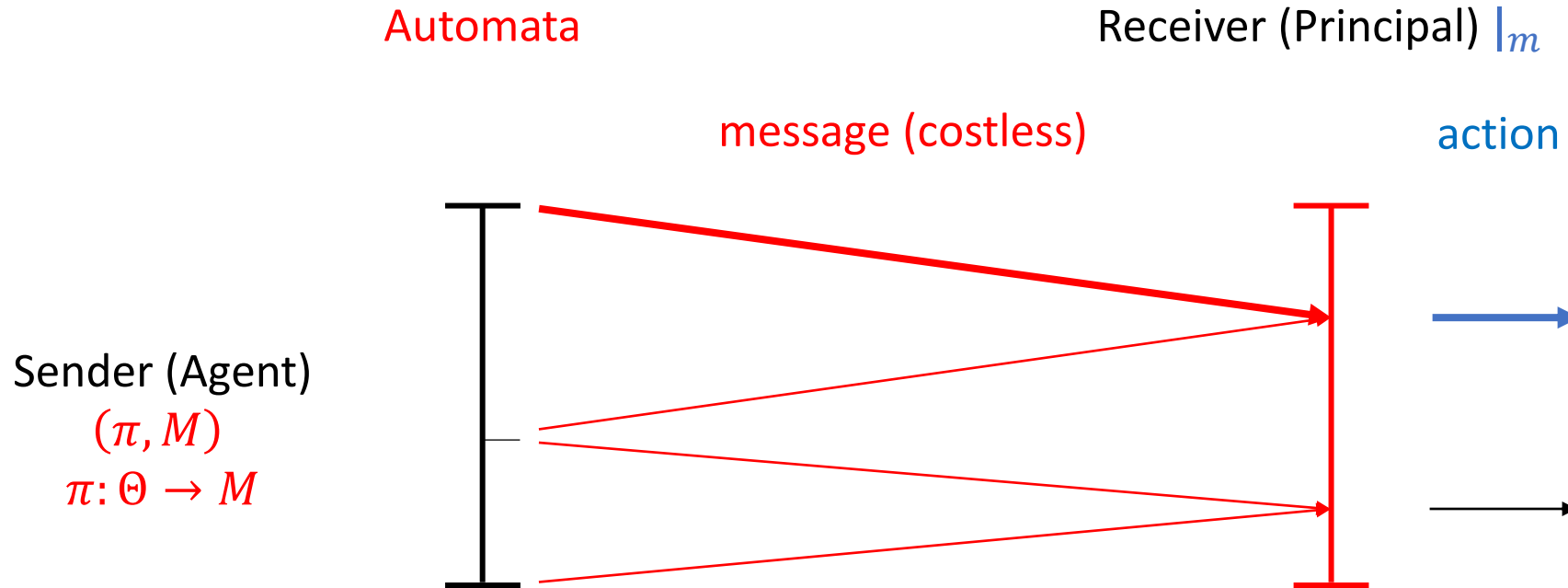
Disclosure (separating eqm)

Sender (Agent) θ

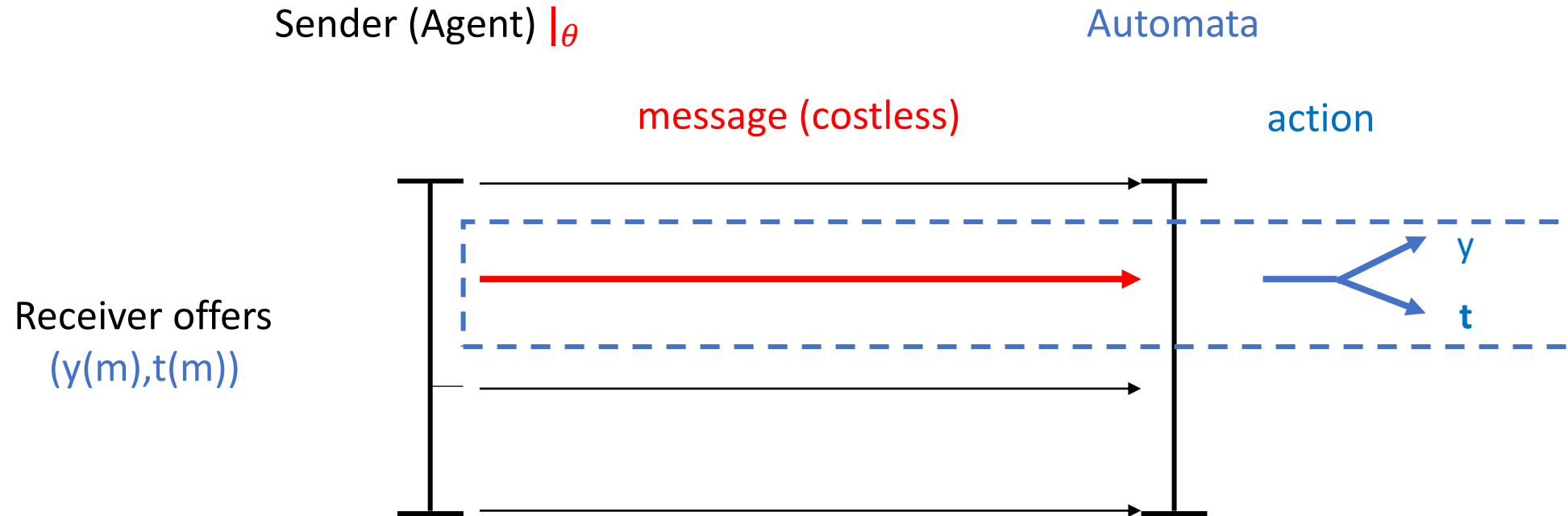
Receiver (Principal) m



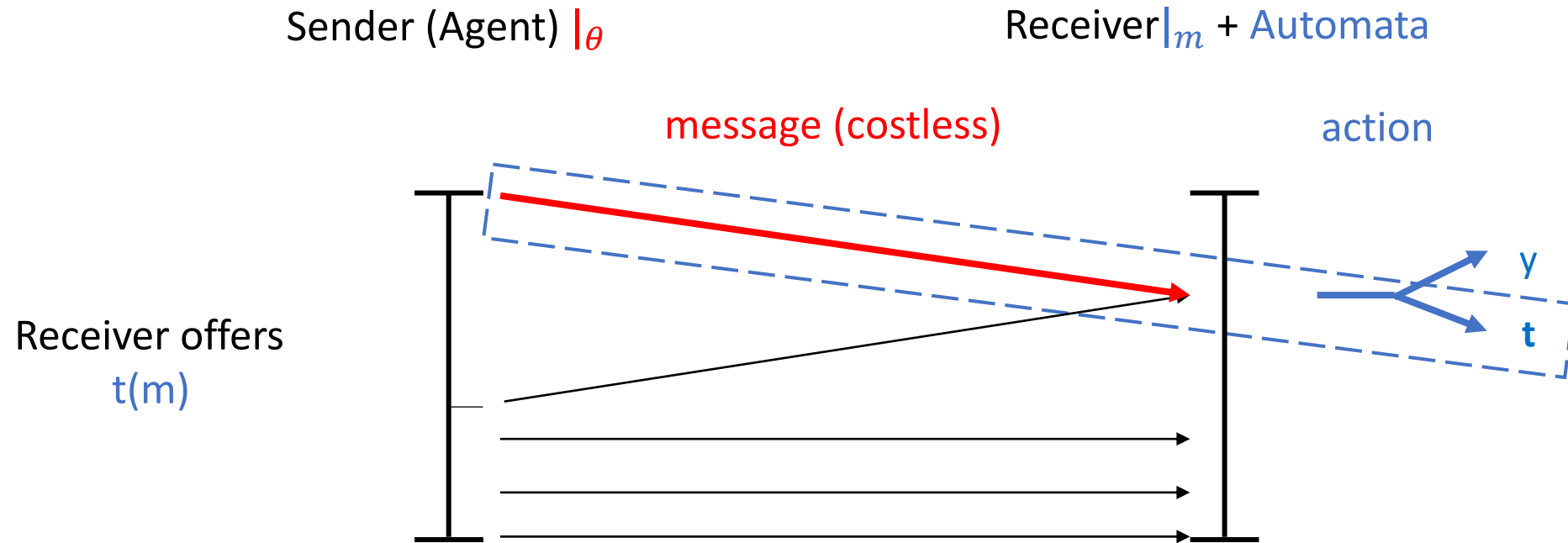
Bayesian Persuasion (bi-partition eqm)



Mechanism design (commitment)



Mechanism design (partial commitment)



III. Ways to generate ideas?

Application

Combination

Incorporation

Appropriation

Application (signaling in auctions)



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Reserve price signaling

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Abstract

In a general auction model in which bidders' signals are affiliated, we characterize the unique separating equilibrium in which the seller can use reserve prices to credibly signal her private information. When the buyers' signals are independent, the optimal reserve price is shown to be increasing in the number of bidders under certain conditions. We also demonstrate that the probability that the item is sold at the reserve price can increase as the number of bidders increases, which indicates a more central role for reserve prices than perceived in the standard auction models.

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JEL classification: D44; D80; D82

Keywords: Auctions; Reserve price; Signaling

Combination (persuasion + disclosure)

EVIDENCE ACQUISITION AND VOLUNTARY DISCLOSURE*

Denis Shishkin[†]

December 30, 2019

[\(click here for the latest version\)](#)

Abstract

A sender seeks hard evidence to persuade a receiver to take a certain action. There is uncertainty about whether the sender obtains evidence. If she does, she can choose to disclose it or pretend to not have obtained it. When the probability of obtaining information is low, we show that the optimal evidence structure is a *binary certification*: all it reveals is whether the (continuous) state of the world is above or below a certain threshold. Moreover, the set of low states that are concealed is non-monotone in the probability of obtaining evidence. When binary structures are optimal, higher uncertainty leads to less pooling at the bottom because the sender uses binary certification to commit to disclose evidence more often.

Incorporation (contract on information structure)

Designing Incentives for Heterogeneous Researchers*

Nathan Yoder[†]

October 22, 2020

Abstract

A principal (e.g., a bond issuer) contracts with a researcher of unknown quality (e.g., a credit rating agency) to conduct a costly experiment, either to inform the principal or to persuade a decision maker. This contracting problem has a novel feature that captures the difference between the form of an experiment and the strength of its results: researchers face a problem of information design, rather than optimal effort. Using a novel comparative static for Bayesian persuasion settings, I characterize the optimal contract and show how experimentation is distorted by adverse selection. Moreover, I show that there is no loss from contracting on the experiment's result rather than the experiment itself. This optimal results-based contract takes the form of reimbursement for contractible costs, at a rate which is lower for stronger results, plus a (piecewise) two-part tariff.

Keywords: Adverse Selection, Bayesian Persuasion, Information Acquisition

Incorporation (contract by information structure)

Kolotilin, Anton, et al. "Persuasion of a privately informed receiver." *Econometrica* 85.6 (2017): 1949-1964.

$\pi(v)$ in place of $y(v)$ in delegation

Wei, Dong, and Brett Green. "(Reverse) Price Discrimination with Information Design." (2020).

$(\pi(v), t(v))$ in place of $(y(v), t(v))$ in screening

Xu, Shuo. "Information Obfuscation." (2020).

$(\pi(v), c(v))$ in place of $(y(v), c(v))$ in "money burning"

Appropriation (divide-and-conquer)

Global Manipulation by Local Obfuscation *

Fei Li[†] Yangbo Song[‡] Mofei Zhao[§]

December 5, 2019

Abstract

We study information design in a regime change context. A continuum of agents simultaneously choose whether to attack the current regime and will succeed if and only if the mass of attackers outweighs the regime's strength. A designer manipulates information about the regime's strength to maintain the status quo. The optimal information structure exhibits local obfuscation, some agents receive a signal matching the true strength of the status quo, and others receive an elevated signal professing slightly higher strength. Public signals are strictly sub-optimal, and in some cases where public signals become futile, local obfuscation guarantees the status quo's survival.

Keywords: Bayesian persuasion, coordination, information design, obfuscation, regime change

JEL Classification: C7, D7, D8.

Appropriation (divide-and-conquer)

Similar insights in different contexts

Entry games:

- Rasmusen, Eric B., J. Mark Ramseyer, and John S. Wiley Jr. "Naked exclusion." *The American Economic Review* (1991): 1137-1145.

Labor contract:

- Winter, Eyal. "Incentives and discrimination." *American Economic Review* 94.3 (2004): 764-773.

III. Ways to generate ideas?

Application

Combination

Incorporation

Appropriation

Thanks