Attention Management

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Information is costly to process

nutritional details

loan contracts

drugs' side effects

retirement plans

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Question: When should this affect disclosure choices?

Fancy-ass quotations

> *Because disclosers can proffer, and disclosees can receive, only so much information, mandated disclosures effectively keep disclosees from acquiring other information.*

"The Failure of Mandated Disclosure"

Ben-Shahar & Schneider

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"The Failure of Mandated Disclosure"

Ben-Shahar & Schneider

The real design problem is not to provide more information to people…but [to design] intelligent information-filtering systems.

"The Sciences of the Artificial"

Simon

Model

First, without math

Principal chooses information to give to agent

Agent chooses garbling to acquire, at a cost

Agent sees signal realization

Agent makes decision, generating material benefit

Principal only values material benefit

$$\mu \in \Delta\Theta, \qquad u : A \times \Theta \to \mathbb{R}, \qquad c : \Delta\Theta \to \mathbb{R}$$

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Principal chooses $p \in \Delta\Delta\Theta$ with $\int \nu \, \mathrm{d}p(\nu) = \mu$

Agent chooses a garbling $q \in \Delta\Delta\Theta$ with $q \preceq_{\text{MPS}} p$

Bears cost $C(q) = \int c \, \mathrm{d}q$

Agent sees realized signal $\nu \in \Delta\Theta$ drawn via q

Agent makes choice $a \in A$

Material benefit $\int u(a, \cdot) \, \mathrm{d}\nu$

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A, Θ compact metrizable; u, c continuous; c convex

The principal's problem

Principal-optimal equilibrium

Define interim (indirect) payoff functions $U_A, U_P : \Delta\Theta \to \mathbb{R}$ via

$$\begin{aligned} U_P(\nu) &:= \max_{a \in A} \int u(a, \cdot)\, \mathrm{d}\nu \\ U_A(\nu) &:= U_P(\nu) - c(\nu) \end{aligned}$$

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Then agent's best responses $G^* : \Delta\Delta\Theta \rightrightarrows \Delta\Delta\Theta$ given by

$$G^*(p) := \arg \max_{q \preceq_{\mathrm{MPS}} p} \int U_A \, \mathrm{d}q$$

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So principal's problem is

$$\max_{p,q \in \Delta\Delta\Theta:\ \int \nu \, \mathrm{d}p(\nu) = \mu} \int U_P \, \mathrm{d}q \quad \text{s.t. } q \in G^*(p)$$

A simpler program

Lemma

(p^*, q^*) solves the principal's problem for some p^* if and only if q^* solves

$$\max_{q \in \Delta\Delta\Theta} \int U_P \, \mathrm{d}q$$

$$\text{s.t.} \quad (i) \quad \int \nu \, \mathrm{d}q(\nu) = \mu$$

$$(ii) \quad q \in G^*(q).$$

Moreover, there exists a solution q^* which, if $|\Theta| < \infty$, has affinely independent support.

When is full disclosure optimal?

Main theorem

Let $p^F \in \Delta\Delta\Theta$ have $p^F(\{\delta_\theta\}_{\theta\in\hat{\Theta}}) := \mu(\hat{\Theta})$

Theorem

Given Θ, the following are equivalent:

- (p^F, q) solves the principal's problem for some q, given any $\langle A, \mu, u, c\rangle$.
- $|\Theta| \leq 2$.

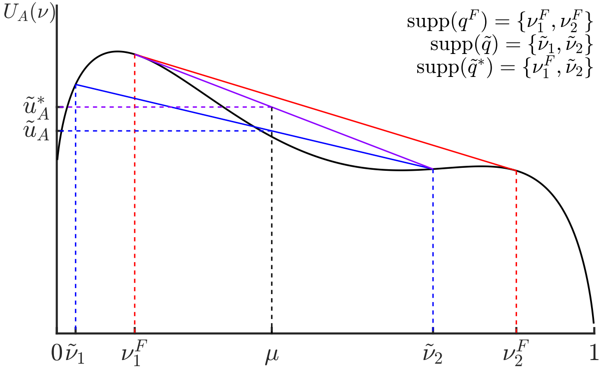
Key idea: multiple issues

Let q^F be agent's best-response to full information

- Provide $p \succ_{\text{MPS}} q^F \implies$ will be ignored
- Provide $p \prec_{\text{MPS}} q^F \implies$ will be harmful
- Benefit to providing Blackwell-incomparable p

Binary uncertainty

Proof sketch



Any $\tilde{q}$ incomparable to q^F cannot have $\tilde{q} \in G^*(\tilde{q})$.

A three-state example

Three ordered states with an action tailored for each

$$\Theta = A = \{-1, 0, 1\}$$

"Guess-the-state" preferences

$$u(a, \theta) = -(a - \theta)^2$$

Symmetric prior

$$\mu = \left(\frac{1-\mu_0}{2}, \mu_0, \frac{1-\mu_0}{2}\right) \text{ for some } \mu_0 \in (0, 1)$$

Shannon cost

$$c(\nu) = \kappa \left[H(\mu) - H(\nu)\right] \text{ for some } \kappa > 0$$

Auxiliary problem: restricted action

For $\varnothing \neq B \subseteq A$, consider what would happen if principal could restrict agent's behavior to B while providing p^F?

Let $v_i(B)$ be player i's value from this auxiliary problem

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Claim 1

There exist (μ_0, κ) such that

1. $v_A\{-1, 1\} > v_A\{0\}$
2. $v_P\{-1, 1\} > v_P\{-1, 0, 1\}$

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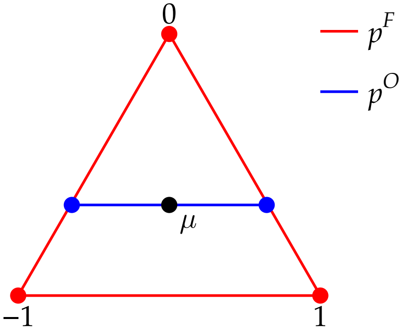
Related to Szalay's (2005) "Extreme Options" paper

Endogenously restricting actions

Claim 2

Let (μ_0, κ) be as in Claim 1 and p^O be as drawn. Then

1. There is a unique $q^F \in G^*(p^F)$ and $q^O \in G^*(p^O)$
2. $\int U_P \, \mathrm{d}q^O > \int U_P \, \mathrm{d}q^F$



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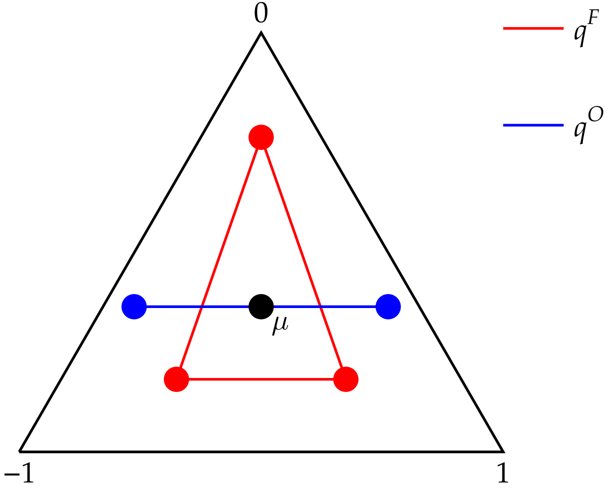

What we've seen

Can't always rely on listener to process available information

Framework to think about feedback on provided information

Limiting information helps, even absent a persuasive motive

One-issue environments are special

Thanks!