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# Playlist

“That’s Incentive”, Death Cab for Cutie

“The New Pollution”, Beck

“Signal”, Laura Jansen

“Screen”, Brad

“Contribution”, Jurassic 5

“Bargain”, The Who

# Signaling

Jeff MacKie-Mason

SI 680: Information Economics

# Some applications

- Health insurance
- Graduate school applicants (U cares about reputation)
- Social clubs
- Marriage
- Professional contractors
- Product sellers
- Political candidates

# What's the problem?

- Good types *want* you to know they are good.  
Why is the “good” characteristic hidden?
- Well...the bad types also want you to know that they are “good” 😊

“The truth is only half of what is needed; the other half is called **believability.**”

- J. Saramago

How to signal that you  
are high quality?

Do something a *weak* firm  
would not do



Suppose: Entrepreneur  
agrees to pay a fine if  
startup goes bankrupt

How?

For example, pledge  
house as collateral

Then, high debt level  
signals a *good* firm!

High debt costs more to  
owner of poor firm

# ● Recall Ferguson

- Used personal wealth for original financing
- Willing to give up consulting to be full-time

Why might low entry  
pricing signal a good firm?

● Consumers will find out if goods are low quality, and won't buy many in future

■ Low initial pricing won't be made up later if product quality low

■ High quality products **will** make up for early discounts through higher sales at higher prices later





# Screening

**Signaling:** Agent chooses  
action before contract  
offered

**Screening:** Contract offered,  
specifies screen action that  
agent must perform

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### [Human spit contains 1,116 unique proteins](#)

news.yahoo.com — U.S. researchers have identified all 1,116 unique proteins found in human saliva glands, a discovery they said on Tuesday could usher in a wave of convenient, spit-based diagnostic tests that could be done without the need for a single drop of blood. [More...](#) (General Sciences)

[digg it](#)

[0 Comments](#) | [Share](#) | [Bury](#) | geekchic made popular **1 min ago**

35

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### [See The World's Lightest Cell Phone](#)

huffingtonpost.com — The Guinness World Records named the Modu phone as the lightest cell phone in the world. At just 1.5 ounces and 2.8 by 1.4 by 0.3 inches, the Modu is a full ounce lighter than the already miniature Pantech C300. Without a doubt, it's the tiniest cell phone I've seen outside of Zoolander. [More...](#) (Gadgets)



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Digg benefits  $\pi_T > \pi_L$  from each contribution  
( $\pi_L < 0$  permissible)

Simple proposal

(UCC metadata)

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Digg chooses  $\{\phi, \bar{\rho}\}$  to maximize its value

# Signal distribution

Assume  $\rho_\tau \sim f(\mu_\tau, \bar{\sigma}^2)$ , with

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Then  $\Pr(\rho \leq \bar{\rho} | \tau) = F_\tau(\bar{\rho})$ , which is the probability of losing deposit

$$F_L(\bar{\rho}) \geq F_T(\bar{\rho})$$



**Optimization problem** Users get  $EU_\tau = v_\tau - \phi F_\tau(\bar{\rho})$

Digg solves

$$\max_{\bar{\rho}, \phi} p(\pi_T + \phi F_T(\bar{\rho})) + (1 - p)(\pi_L + \phi F_L(\bar{\rho}))$$

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$$\max_{\bar{\rho}, \phi} p(\pi_T + \phi F_T(\bar{\rho})) + (1 - p)(\pi_L + \phi F_L(\bar{\rho}))$$

$$\text{s.t. } \begin{aligned} v_T - \phi F_T(\bar{\rho}) &\geq 0 && \text{(particip. constraints)} \\ v_L - \phi F_L(\bar{\rho}) &\geq 0 \end{aligned}$$

if both types  $\tau \in \{T, L\}$  are participating

## Result 1

If  $\pi_L + v_L < 0$  then set  $\phi\bar{p}$  high enough to exclude participation by Liars.

Occurs if the contribution is sufficiently polluting ( $\pi_L < -v_L$ ).

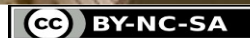
## Result 2

If  $\pi_L + v_L > 0$ , then set  $\phi\bar{p}$  so that polluters just willing to participate

Digg collects all of their surplus.



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Why ever let Liars  
participate?

And why when  
**polluting:**

$$v_L > -\pi_L > 0?$$

Digg may get negative  
value from content...



...but willing to publish if  
price is right

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YAHOO!

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