

Challenges & Opportunities for SBE

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• Low-information elections

assumptions of this model into the Bayes–Nash statement. Let \bar{M} denote the message space which is $\{0, 1\}$ times the space defined in Table 2.

$\forall (k, j) \in \bar{M}$, let $A(k, j) = \{X: s_1 = k, \text{ and } M_2(s_2) = j\}$ be the set of all setter types that send message $M(s, X) = (k, j)$.

In a Bayes–Nash equilibrium, $\forall X \in [0, 1]$, the setter chooses $s \in \{0, 1\} \times [0, 1]$ to maximize

$$\phi(s, v_1, \dots, v_n | X, T_1, \dots, T_n),$$

and each voter $i \in N$ and $T_i \in [0, 1]$ chooses $v_i(T_i)$ to maximize

$$\int U_i[\phi(s_2, v_i(T_i, M(s, X)), v_{-i}(T_{-i}, M(s, X))), T_i]$$

$dF(X) dG(T_{-i})$.

The first difference between our equilibrium concept and Bayes–Nash is that we assume that voters always vote as if they are the pivotal voters (i.e., they adopt strategies that are weakly dominant with respect to the strategies of other voters); that is, $v_i^* \in S_i$ is weakly dominant if

$$\forall v_i \in S_i, v_{-i} \in S_{-i}, s \in S_{\phi}, T_i \in [0, 1], \text{ and } T_{-i} \in [0, 1]^{n-1}$$

$$\int U_i[\phi(s_2, v_i(T_i, M(s, X)), v_{-i}(T_{-i}, M(s, X))), T_i]$$

$$\geq \int U_i[\phi(s_2, v_i(T_i, M(s, X)), v_{-i}(T_{-i}, M(s, X))), T_i],$$

with strict inequality for some T_i, T_{-i}, v_{-i} , and s . If v_i^* is dominant, it must be the case that

$$\int U_i[\phi(s_2, v_i(T_i, M(s, X)), v_{-i}(T_{-i}, M(s, X))), T_i]$$

$$dF(X) \geq \int U_i[\phi(s_2, v_i(T_i, M(s, X)),$$

$$v_{-i}(T_{-i}, M(s, X))), T_i] dF(X),$$

with sometimes strict inequality, which implies

$$\sum_{(j,k) \in \bar{M}} \int_{A(j,k)} U_i[\phi(s_2, v_i(T_i, j, k), v_{-i}(T_{-i}, j, k)),$$

$$T_i] dF(X) \geq \sum_{(j,k) \in \bar{M}} \int_{A(j,k)} U_i[\phi(s_2, v_i(T_i, j, k), v_{-i}$$

$$(T_{-i}, j, k), T_i) dF(X).$$

Note that for all $v_{-i} \in S_{-i}$ and $T_{-i} \in [0, 1]^{n-1}$, it can only affect the outcome of the election if

$$\sum_{i' \in (N-i)} v_{i'}(T_{i'}, (j, k)) \in [0, 1].$$

In this case

$$\phi(s, v_i(T_i, M(j, k), v_{-i}(T_{-i}, M(j, k))))$$

$$= \begin{cases} s_2 & \text{if } v_i = 1 \\ sQ & \text{if } v_i = -1. \end{cases}$$

Hence

$$v_i =$$

$$1 \text{ if } \int_{A(j,k)} U_i(s_2, T_i) dF(X) > \int_{A(j,k)} U_i(sQ, T_i) dF(X)$$

$$-1 \text{ if } \int_{A(j,k)} U_i(s_2, T_i) dF(X) \leq \int_{A(j,k)} U_i(sQ, T_i) dF(X)$$

is a dominant strategy for voter i . But v_i can be rewritten as

$$v_i =$$

$$\begin{cases} 1 & \text{if } \int_{A(j,k)} U_i(s, T_i) dF(X) > U_i(sQ, T_i) \int_{A(j,k)} dF(X) \\ -1 & \text{if } \int_{A(j,k)} U_i(s, T_i) dF(X) \leq U_i(sQ, T_i) \int_{A(j,k)} dF(X) \end{cases}$$

$$v_i = \begin{cases} 1 & \text{if } \int_0^1 U_i(s, T_i) dF(X|j, k) > U_i(sQ, T_i) \\ -1 & \text{if } \int_0^1 U_i(s, T_i) dF(X|j, k) \leq U_i(sQ, T_i), \end{cases}$$

where

$$f(X|k, j) = \begin{cases} \frac{f(x)}{\text{pr}(k, j)} & \text{if } x \in A(k, j) \\ 0 & \text{otherwise.} \end{cases}$$

I can therefore restate the equilibrium concept for the direct legislation model (which is now more similar to the sequential equilibrium concept of Kreps and Wilson 1982 than Bayes–Nash) as a set of strategies $s \in S_{\phi}, v_i \in S_{\phi}$ and voter beliefs $f(X|k, j)$, such that for each $(k, j) \in \bar{M}$,

$$\text{SETTER } \forall X, s = (s_1, s_2) \text{ satisfies } \max_{s \in \{0,1\} \times \{0,1\}}$$

$$[U_i[\phi(s_2, v_i(T_i, M(s, X)), \dots, v_n(T_n, M(s, X)), X)] - (K \times s_1)].$$

$$\text{VOTERS } \forall T_i (i \in N), \text{ and } \forall (k, j) \in \bar{M}, v_i(T_i, k, j)$$

satisfies

$$v_i = 1 \text{ if } \int_0^1 U_i(s_2, T_i) dF(X|k, j) > U_i(sQ, T_i)$$

$$v_i = -1 \text{ otherwise.}$$

• Coalition bargaining

LEMMA 10. If the consequence of the first party's failure to make an acceptable offer is a coalition between the second and out-parties made under the threat of an election, then

Additional Contingency	First's Offer	Result
$\left(1 - \frac{b_1 - E_1 - s_1}{s_1^2}\right) s_1^2 > \left(1 - \frac{1 - \frac{b_2 - E_2 - s_2}{s_2^2}}{s_1^2}\right) s_1^2 - K_1$	$\frac{b_1 - E_1 - s_1}{s_1^2}$	first and out coalesce
$\left(1 - \frac{b_1 - E_1 - s_1}{s_1^2}\right) s_1^2 \geq K_1$	$\frac{b_1 - E_1 - s_1}{s_1^2}$	first and second redistribute
$\left(1 - \frac{1 - \frac{b_2 - E_2 - s_2}{s_2^2}}{s_1^2}\right) s_1^2 \geq \max\left[\left(1 - \frac{b_2 - E_2 - s_2}{s_2^2}\right) s_1^2, K_1\right]$	$\frac{b_1 - E_1 - s_1}{s_1^2}$	first and second redistribute
$K_1 > \max\left[\left(1 - \frac{1 - \frac{b_2 - E_2 - s_2}{s_2^2}}{s_1^2}\right) s_1^2, \left(1 - \frac{b_2 - E_2 - s_2}{s_2^2}\right) s_1^2\right]$	none	second and out coalesce

LEMMA 11. If the consequence of the first party's failure to make an acceptable offer is a coalition between the second and out-parties made under the threat of the status quo, then

Additional Contingency	First's Offer	Result
$(1 - \epsilon) s_1^2 > \left(1 - \frac{(1 - \epsilon) s_1^2 - K_1}{s_1^2}\right) s_1^2$ and $(1 - \epsilon) s_1^2 \geq K_1$	ϵ	first and out coalesce
$\left(1 - \frac{(1 - \epsilon) s_1^2 - K_1}{s_1^2}\right) s_1^2 \geq \max\{(1 - \epsilon) s_1^2, K_1\}$	$\frac{(1 - \epsilon) s_1^2 - K_1}{s_1^2}$	first and second redistribute
$K_1 > \max\left[\left(1 - \frac{(1 - \epsilon) s_1^2 - K_1}{s_1^2}\right) s_1^2, (1 - \epsilon) s_1^2\right]$	none	second and out coalesce

LEMMA 12. If the consequence of the first party's failure to make an acceptable offer is the status quo, then

Additional Contingency	First's Offer	Result
$(1 - \epsilon) s_1^2 - K_1 > c_1 s_1^2$	ϵ	first and out coalesce
$c_1 s_1^2 \geq (1 - \epsilon) s_1^2 - K_1$	none	status quo

where

$$\frac{b_1 - E_1 - s_1}{s_1^2}$$

is the minimum offer that party i will accept from party j under the threat of an election.

CONDITION C. No offering party prefers the best acceptable offer it can make to the status quo.

$$(1 - \epsilon) s_1^2 - K_1 \leq c_2 s_1^2 \text{ and } (1 - \epsilon) s_1^2 - K_1 \leq c_3 s_1^2,$$

where $\epsilon > 0$ is very small.

Proof of Theorem 1. Notice that the only conditions under which the event can lead to dissolution are specified in Lemma 8. Conditions A and B specify the full set of such conditions.

Now suppose that dissolution does not necessitate A. Since at least one set of two parties must have enough seats to constitute a majority, not A implies that neither

$$(b_1 - E_1) > s_1 + c_1 s_1^2 \text{ and } b_2 - E_2 > s_2 + c_2 s_2^2$$

nor

$$(b_1 - E_1) > s_1 + c_3 s_1^2 \text{ and } b_2 - E_2 > s_2$$

nor

$$(b_2 - E_2) > s_2 + c_3 s_2^2 \text{ and } b_1 - E_1 > s_1.$$

Thus, if not A, then there exists no majority that prefers an election to the status quo. Since a majority is required to defeat the vote of confidence and since a defeated vote of confidence is required for dissolution, dissolution necessitates A.

Seeking SBE's Advice



Not just academic



- Photo: Scientific American

Not just academic







Why on earth would taxpayers or legislators support federal funding of social science?

Taxes are not voluntary

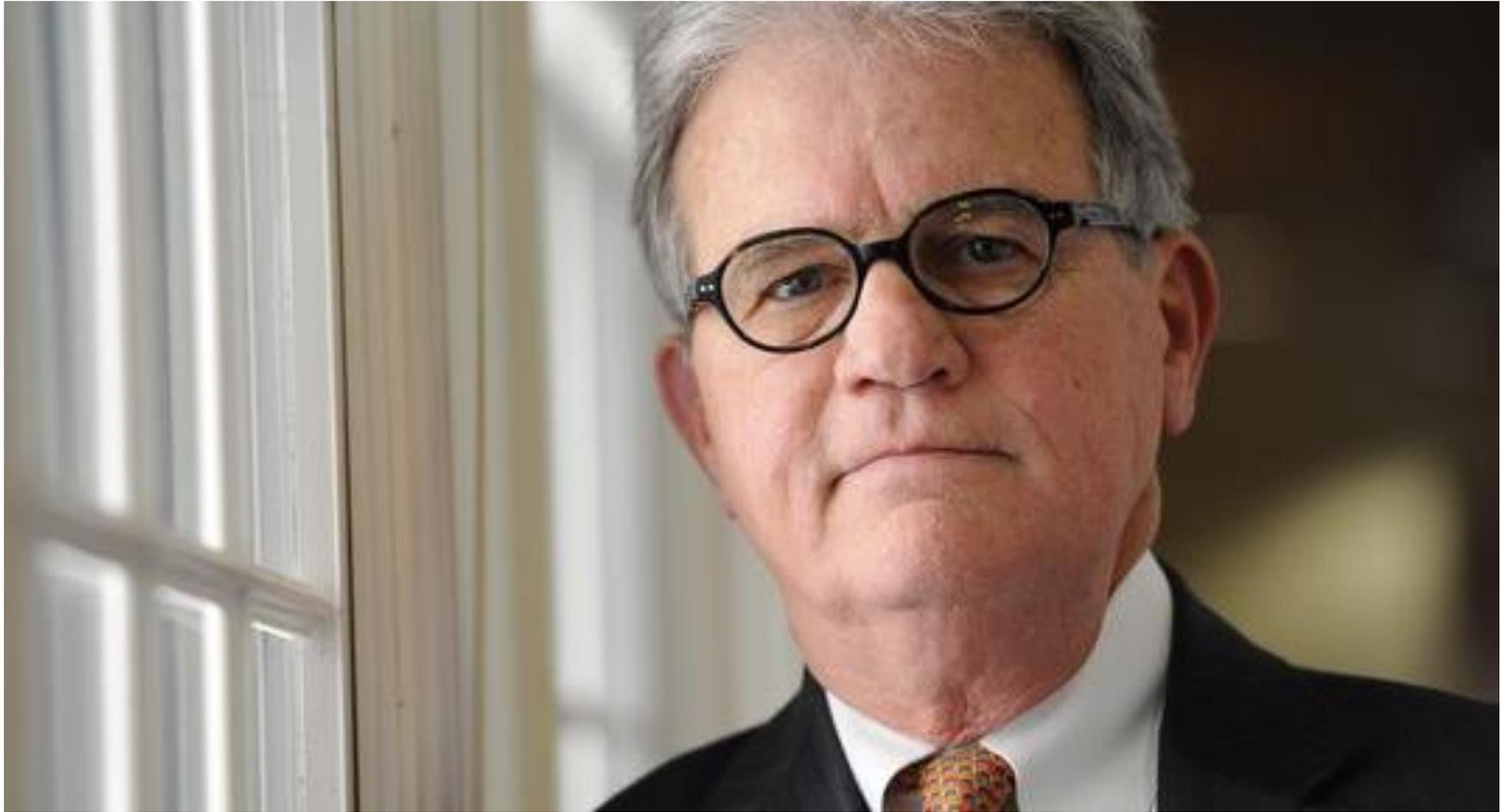
Taxpayers with Questions



Reasonable Questions

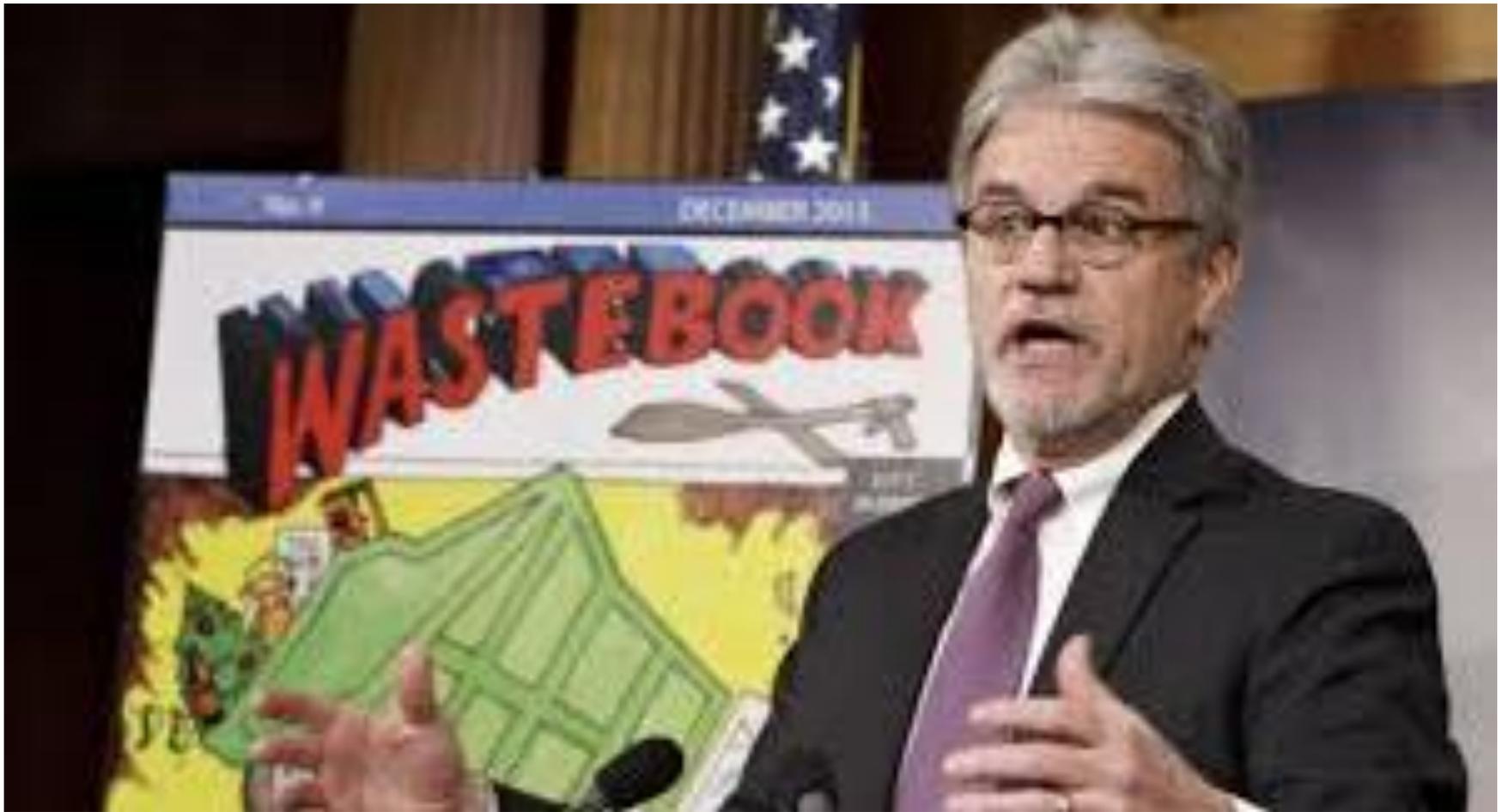
- To what end?
- Of what value?
- To whom?

Senator Coburn



What is the **value** of
social science research?

Wastebook



They have legitimate concerns.

Concerns & Complaints

- We speak in **jargon**.
- We are **slow**.
- We are **expensive**.
- We are **ideological rentseekers**.

This story gets worse before it gets better....



- <http://static.guim.co.uk/sys-images/Guardian/Pix/pictures/2013/7/23/1374573546005/Pile-of-smart-phones-008.jpg>

What is the **value** of
social science research?

An ivory tower perspective



“They don’t understand how valuable we are.”



Things that are “over” (at least for a while)

- Universities’ 1000-year near monopoly on certain kinds of information provision
- Blank checks from Congress.

Our Grand Challenge

Provide greater service

Of more value

To more people

What is
the public **value** of social science?

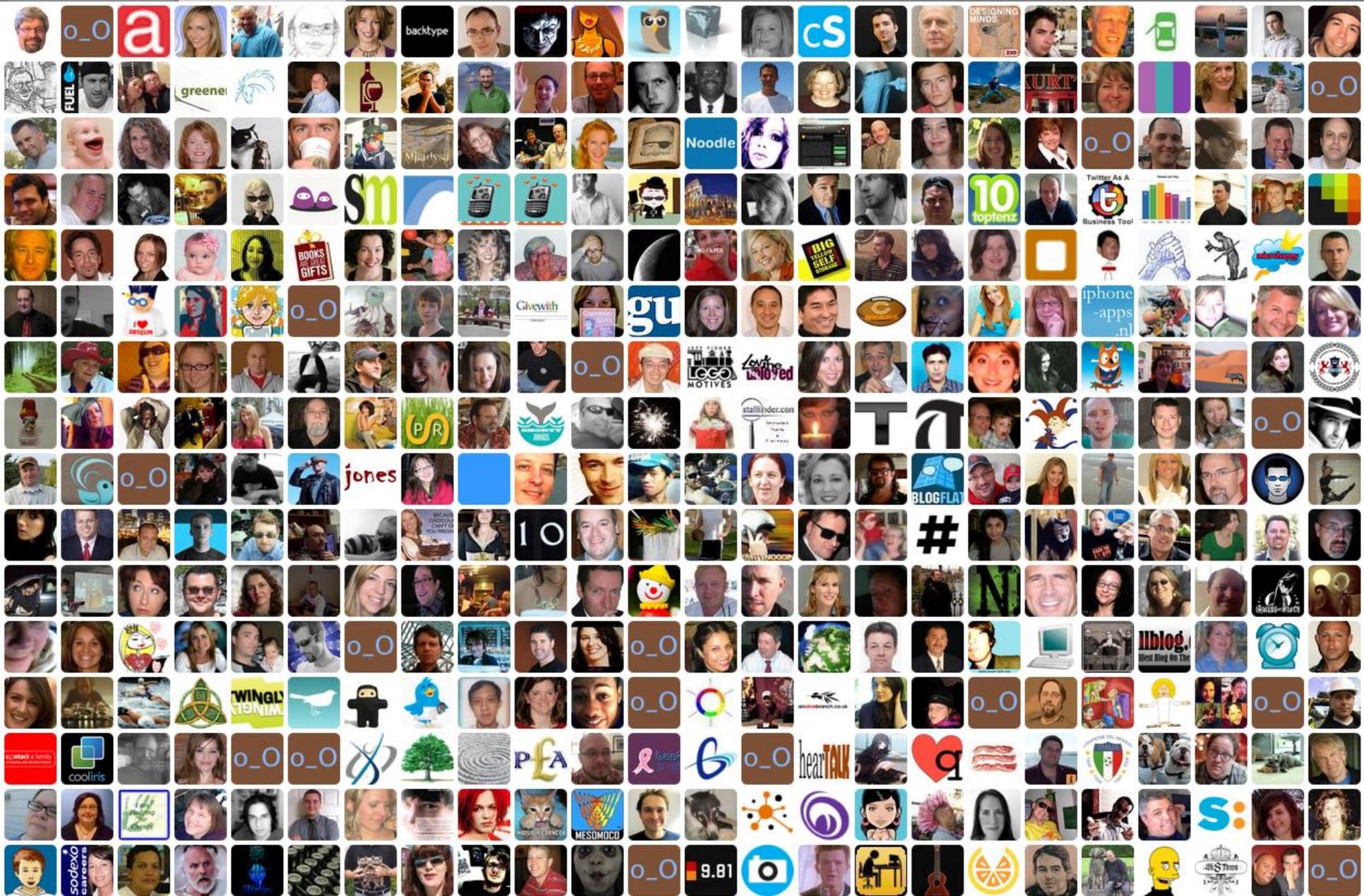
It is a source for **credible and
legitimate evaluations.**

Strategy: Science as service

- How can **we increase the value of SBE** to people who can benefit from it?
- How can SBE **more effectively serve** more social constituents?

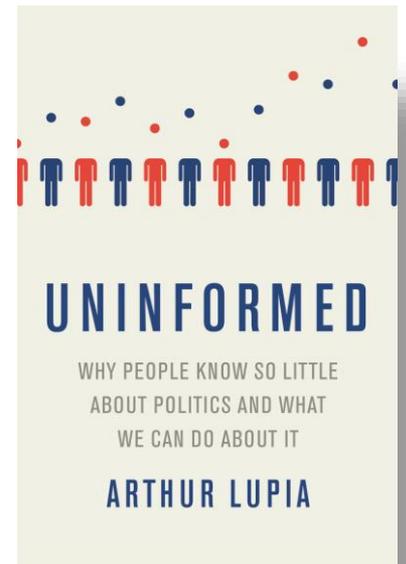
Three Factors

- Improve **communication***
- Improve **stakeholder engagement**
- Improve **trust**



Proposal

- NOT: Dumb down
- YES: Smarten up about how to convey our knowledge base in ways that earn others' attention and provide value to them



Our Grand Challenge

Provide greater service

Of more value

To more people

Proposals from the NAS RT

- **Develop a searchable database of case studies using SBE to address important problems.**
- **Communication tools for improving relations with policymakers/public.**
- **Create forums where producers can listen to stakeholders.**
- **Workshop on K-12 education.**
- **How to Make [State and Local Government] More Effective.**
- **The role of diversity in technological advancement.**





Thank you!