How to “help solve society’s most pressing challenges” (quote from ALI homepage)

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1GaryKing.org
How to Solve Society’s Most Pressing Challenges?
How to Solve Society’s Most Pressing Challenges?

Connections: Sharing data, people, expertise

Methods: Big data is not about the data!

Questions: Pivot freely; let data suggest new questions
How to Solve Society’s Most Pressing Challenges?

Connections

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_connections_

Methods

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Connections: Sharing data, people, expertise
Methods
Questions
How to Solve Society’s Most Pressing Challenges?

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How to Solve Society’s Most Pressing Challenges?

_connections_

_methods_

_questions_
How to Solve Society’s Most Pressing Challenges?
China

United States

Here’s How
Reverse Engineering Censorship in China

How'd we get to do this?

Previous approach: watch a few posts; see what's removed

Data: Download all posts before the Chinese censor them

What Could be the Goal?

1. Stop collective action

Implications: Social Media is Actionable!

Chinese leaders:

- measure criticism: to judge local officials
- censor: to stop events with collective action potential

- We can predict:
  - Officials in trouble, likely to be replaced
  - Dissident arrests; new peace treaties; emerging scandals
  - Disagreements between central and local leaders

Applications:

Mike Smith as Dean of FAS.

What about you?
Reverse Engineering Censorship in China

• How’d we get to do this?

Previous approach:
watch a few posts; see what’s removed

Data:
Download all posts before the Chinese censor them

What Could be the Goal?

1. Stop collective action
   Right
   • Implications: Social Media is Actionable!
     • Chinese leaders:
       • measure criticism: to judge local officials
       • censor: to stop events with collective action potential
   • We can predict:
     • Officials in trouble, likely to be replaced
     • Dissident arrests; new peace treaties; emerging scandals
     • Disagreements between central and local leaders

Applications:
Mike Smith as Dean of FAS.
What about you?
Reverse Engineering Censorship in China

• How’d we get to do this? trying ☢️,
Reverse Engineering Censorship in China

• How’d we get to do this? trying dbName, with dbName,
Reverse Engineering Censorship in China

• How’d we get to do this? trying \( \mathbb{M} \), with \( \mathbb{K} \), \( \leadsto \) ?
Reverse Engineering Censorship in China

- How’d we get to do this? trying (⬜), with (✔), \( \leadsto \) ?
- Previous approach: watch a few posts; see what’s removed
Reverse Engineering Censorship in China

• How’d we get to do this? trying $\mathcal{M}$, with $\mathcal{K}$, $\sim \rightarrow$ ?

• Previous approach: watch a few posts; see what’s removed

• Data: Download all posts before the Chinese censor them
Reverse Engineering Censorship in China

- How’d we get to do this? trying ☺️, with 😐, ⇾❓
- Previous approach: watch a few posts; see what’s removed
- Data: Download all posts before the Chinese censor them
- Everyone knows the Goal:
Reverse Engineering Censorship in China

• How’d we get to do this? trying $\mathcal{M}$, with $\mathcal{K}$, $\rightsquigarrow$ $\mathcal{F}$
• Previous approach: watch a few posts; see what’s removed
• Data: Download all posts before the Chinese censor them
• Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies
Reverse Engineering Censorship in China

- How’d we get to do this? trying \(\mathbb{M}\), with \(\mathbb{K}\), \(\sim\) ?
- Previous approach: watch a few posts; see what’s removed
- Data: Download all posts before the Chinese censor them
- Everyone knows the Goal:
  - Stop criticism and protest about the state, its leaders, and their policies Wrong
Reverse Engineering Censorship in China

- How’d we get to do this? trying \( \mathbb{M} \), with \( \mathbb{K} \), \( \rightsquigarrow ? \)
- Previous approach: watch a few posts; see what’s removed
- Data: Download all posts before the Chinese censor them
- Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies Wrong
- What Could be the Goal?
Reverse Engineering Censorship in China

• How’d we get to do this? trying (M), with (K), \sim \top
• Previous approach: watch a few posts; see what’s removed
• Data: Download all posts before the Chinese censor them
• Everyone knows the Goal: Stop criticism and protest about the state, its leaders, and their policies Wrong
• What Could be the Goal?
  1. Stop criticism of the state
Reverse Engineering Censorship in China

• How’d we get to do this? trying $\mathbb{M}$, with $\mathbb{S}$, $\rightsquigarrow$ ?
• Previous approach: watch a few posts; see what’s removed
• Data: Download all posts before the Chinese censor them
• Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies Wrong
• What Could be the Goal?
  1. Stop criticism of the state
  2. Stop collective action
Reverse Engineering Censorship in China

• How’d we get to do this? trying 代办，with ，⇝ ？
• Previous approach: watch a few posts; see what’s removed
• Data: Download all posts before the Chinese censor them
• Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies Wrong
• What Could be the Goal?
  1. Stop criticism of the state Wrong
  2. Stop collective action
Reverse Engineering Censorship in China

- How’d we get to do this? trying $\mathcal{M}$, with $\mathcal{K}$, $\rightsquigarrow$ ?
- Previous approach: watch a few posts; see what’s removed
- Data: Download all posts before the Chinese censor them
- Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies *Wrong*
- What Could be the Goal?
  1. Stop criticism of the state *Wrong*
  2. Stop collective action *Right*
Reverse Engineering Censorship in China

• How’d we get to do this? trying 🕵️‍♂️, with 🚫, ~⇒❓
• Previous approach: watch a few posts; see what’s removed
• Data: Download all posts before the Chinese censor them
• Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies Wrong
• What Could be the Goal?
  1. Stop criticism of the state Wrong
  2. Stop collective action Right
• Implications: Social Media is Actionable!
Reverse Engineering Censorship in China

• How’d we get to do this? trying \( \mathbb{M} \), with \( \mathbb{X} \), \( \sim \rightarrow ? \)

• Previous approach: watch a few posts; see what’s removed

• Data: Download all posts before the Chinese censor them

• Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies *Wrong*

• What Could be the Goal?
  1. Stop criticism of the state *Wrong*
  2. Stop collective action *Right*

• Implications: Social Media is Actionable!
  • Chinese leaders:
Reverse Engineering Censorship in China

• How’d we get to do this? trying 🔄, with 🔘, → ?
• Previous approach: watch a few posts; see what’s removed
• Data: Download all posts before the Chinese censor them
• Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies Wrong
• What Could be the Goal?
  1. Stop criticism of the state Wrong
  2. Stop collective action Right
• Implications: Social Media is Actionable!
  • Chinese leaders:
    • We can predict:
Reverse Engineering Censorship in China

• How’d we get to do this? trying [MAXN], with  DataTypes, ?
• Previous approach: watch a few posts; see what’s removed
• Data: Download all posts before the Chinese censor them
• Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies Wrong
• What Could be the Goal?
  1. Stop criticism of the state Wrong
  2. Stop collective action Right
• Implications: Social Media is Actionable!
  • Chinese leaders:
    • measure criticism: to judge local officials
• We can predict:
Reverse Engineering Censorship in China

- How’d we get to do this? trying \( \text{folios} \), with \( \text{folios} \), \( \rightsquigarrow \) ?
- Previous approach: watch a few posts; see what’s removed
- Data: Download all posts before the Chinese censor them
- Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies **Wrong**
- What Could be the Goal?
  1. Stop criticism of the state **Wrong**
  2. Stop collective action **Right**
- Implications: Social Media is Actionable!
  - Chinese leaders:
    - measure criticism: to judge local officials
    - censor: to stop events with collective action potential
  - We can predict:
Reverse Engineering Censorship in China

• How’d we get to do this? trying \( \mathcal{M} \), with \( \mathcal{K} \), \( \rightsquigarrow \) \( ? \)
• Previous approach: watch a few posts; see what’s removed
• Data: Download all posts before the Chinese censor them
• Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies \textit{Wrong}
• What Could be the Goal?
  1. Stop criticism of the state \textit{Wrong}
  2. Stop collective action \textit{Right}
• Implications: Social Media is Actionable!
  • Chinese leaders:
    • measure criticism: to judge local officials
    • censor: to stop events with collective action potential
  • We can predict:
    • Officials in trouble, likely to be replaced
Reverse Engineering Censorship in China

- How’d we get to do this? trying $\mathcal{M}$, with $\mathcal{E}$, $\Rightarrow \ ?$
- Previous approach: watch a few posts; see what’s removed
- Data: Download all posts before the Chinese censor them
- Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies **Wrong**
- What Could be the Goal?
  1. Stop criticism of the state **Wrong**
  2. Stop collective action **Right**
- Implications: Social Media is Actionable!
  - Chinese leaders:
    - measure criticism: to judge local officials
    - censor: to stop events with collective action potential
  - We can predict:
    - Officials in trouble, likely to be replaced
    - Dissident arrests;
Reverse Engineering Censorship in China

- How’d we get to do this? trying $\mathcal{M}$, with $\mathbb{K}$, $\rightsquigarrow \,$?
- Previous approach: watch a few posts; see what’s removed
- Data: Download all posts before the Chinese censor them
- Everyone knows the Goal:
  Stop criticism and protest about the state, its leaders, and their policies \textit{Wrong}
- What Could be the Goal?
  1. Stop criticism of the state \textit{Wrong}
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  - Chinese leaders:
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    - censor: to stop events with collective action potential
  - We can predict:
    - Officials in trouble, likely to be replaced
    - Dissident arrests; new peace treaties;
Reverse Engineering Censorship in China

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• What Could be the Goal?
  1. Stop criticism of the state \textit{Wrong}
  2. Stop collective action \textit{Right}

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    • censor: to stop events with collective action potential

  • We can predict:
    • Officials in trouble, likely to be replaced
    • Dissident arrests; new peace treaties; emerging scandals
Reverse Engineering Censorship in China

• How’d we get to do this? trying ὅ, with ὁ, ἀνέβηκε ὁ?
• Previous approach: watch a few posts; see what’s removed
• Data: Download all posts before the Chinese censor them
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  Stop criticism and protest about the state, its leaders, and their policies Wrong
• What Could be the Goal?
  1. Stop criticism of the state Wrong
  2. Stop collective action Right
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    • Dissident arrests; new peace treaties; emerging scandals
    • Disagreements between central and local leaders
Reverse Engineering Censorship in China

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• Data: Download all posts before the Chinese censor them

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  Stop criticism and protest about the state, its leaders, and their policies Wrong

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  • Chinese leaders:
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    • censor: to stop events with collective action potential

  • We can predict:
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    • Dissident arrests; new peace treaties; emerging scandals
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• Applications:
Reverse Engineering Censorship in China

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• Applications: Mike Smith as Dean of FAS. What about you?
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

• Fabricates 450M social media posts a year — by hand!
• Does not argue; does not engage on controversial issues
• Distracts; redirects public attention from criticism and central issues to cheerleading and positive discussions of valence issues

Applications:
How to end a fight?
Reverse Engineering China’s 50c Party

The Government Surreptitiously Fabricating Social Media Posts

• Prevailing view of scholars, activists, journalists, social media participants:
Reverse Engineering China’s 50c Party

The Government Surreptitiously Fabricating Social Media Posts

• Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

• Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies

Existing evidence?
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

- Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies

Existing evidence? A few anecdotes;
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

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Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

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Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

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Existing evidence? A few anecdotes; “no ground truth”; “no successful attempts to quantify” 50c party activity; even several analyses with made up dependent variables!
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The Government Surreptitiously Fabricating Social Media Posts

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Existing evidence? A few anecdotes; “no ground truth”; “no successful attempts to quantify” 50c party activity; even several analyses with made up dependent variables!

Our evidence:
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

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Our evidence:
- with journalists who found leaked archive in 1 county
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

• Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies

Existing evidence? A few anecdotes; “no ground truth”; “no successful attempts to quantify” 50c party activity; even several analyses with made up dependent variables!

Our evidence:
• with journalists who found leaked archive in 1 county
• from fact of leak to reason for 50c
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

• Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies

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Our evidence:
• with journalists who found leaked archive in 1 county
• ? from fact of leak to reason for 50c
• M to systematize messy text, image, email archive
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

• Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies

Existing evidence? A few anecdotes; “no ground truth”; “no successful attempts to quantify” 50c party activity; even several analyses with made up dependent variables!

Our evidence:
• 📜 with journalists who found leaked archive in 1 county
• 🤔 from fact of leak to reason for 50c
• 📜 to systematize messy text, image, email archive
• extrapolated results to all of China
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

• Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies

Existing evidence? A few anecdotes; “no ground truth”; “no successful attempts to quantify” 50c party activity; even several analyses with made up dependent variables!

Our evidence:

• with journalists who found leaked archive in 1 county
• from fact of leak to reason for 50c
• to systematize messy text, image, email archive
• extrapolated results to all of China
• In a poll(!), convinced 50c to acknowledge behavior
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

• Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies Wrong
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

• Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies Wrong
• Fabricates 450M social media posts a year — by hand!
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

• Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies \( \text{Wrong} \)
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• Does not argue; does not engage on controversial issues
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

- Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies *Wrong*
- Fabricates 450M social media posts a year — by hand!
- Does not argue; does not engage on controversial issues
- Distracts; redirects public attention from criticism and central issues to cheerleading and positive discussions of valence issues
Reverse Engineering China’s 50c Party
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• Applications:
Reverse Engineering China’s 50c Party
The Government Surreptitiously Fabricating Social Media Posts

- Prevailing view of scholars, activists, journalists, social media participants: 50c party argues against those who criticize the government, its leaders, and their policies **Wrong**
- Fabricates 450M social media posts a year — by hand!
- Does not argue; does not engage on controversial issues
- **Distracts**; redirects public attention from criticism and central issues to **cheerleading** and positive discussions of valence issues
- **Applications**: How to end a fight?
Externalities: Finding Those Hiding in Plain Sight

Censors can't follow the conversation; with M we can.

(1) Analysts, (2) eDiscovery, (3) Long tail search, (4) Language drift (#BostonBombings ⇝ #BostonStrong), (5) Look-alike modeling, etc.
Externalities: Finding Those Hiding in Plain Sight

Example Substitution 1:
Externalities: Finding Those Hiding in Plain Sight

Example Substitution 1:

自由
Externalities: Finding Those Hiding in Plain Sight

Example Substitution 1:

自由 “Freedom”
## Example Substitution 1:

<table>
<thead>
<tr>
<th>写作</th>
<th>“Freedom”</th>
</tr>
</thead>
</table>

Censors can't follow the conversation; with M we can.

- (1) Analysts,
- (2) eDiscovery,
- (3) Long tail search,
- (4) Language drift (#BostonBombings ⇝ #BostonStrong),
- (5) Look-alike modeling, etc.

⇝ Thresher
Externalities: Finding Those Hiding in Plain Sight

Example Substitution 1:

自由
“Freedom”

目田

Censors can’t follow the conversation; with M we can.

Analysts, eDiscovery, Long tail search, Language drift (#BostonBombings ⇝ #BostonStrong), Look-alike modeling, etc. ⇝ Thresher

China 6/11
Example Substitution 1:

自由
“Freedom”
目田
“Eye field”
Externalities: Finding Those Hiding in Plain Sight

Example Substitution 1:

自由
目田
“Freedom”
“Eye field” (nonsensical)
### Example Substitution 1: Homograph

<table>
<thead>
<tr>
<th>Character</th>
<th>Translation</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>自由</td>
<td>“Freedom”</td>
<td></td>
</tr>
<tr>
<td>目田</td>
<td>“Eye field”</td>
<td>(nonsensical)</td>
</tr>
</tbody>
</table>
**Example Substitution 1: Homograph**

<table>
<thead>
<tr>
<th>自由</th>
<th>“Freedom”</th>
</tr>
</thead>
<tbody>
<tr>
<td>目田</td>
<td>“Eye field” (nonsensical)</td>
</tr>
</tbody>
</table>

Censors can’t follow the conversation; with **M** we can.

- (1) Analysts, (2) eDiscovery, (3) Long tail search, (4) Language drift (#BostonBombings \(\Rightarrow\) #BostonStrong), (5) Look-alike modeling, etc. \(\Rightarrow\) Thresher
Externalities: Finding Those Hiding in Plain Sight

Example Substitution 1: Homograph

自由
目田
“Freedom”
“Eye field” (nonsensical)

Example Substitution 2:
<table>
<thead>
<tr>
<th>Example Substitution 1: Homograph</th>
</tr>
</thead>
<tbody>
<tr>
<td>自由</td>
</tr>
<tr>
<td>目田</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Example Substitution 2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>和谐</td>
</tr>
</tbody>
</table>
Externalities: Finding Those Hiding in Plain Sight

Example Substitution 1: Homograph

自由
自由
“Freedom”

目田
目田
“Eye field” (nonsensical)

Example Substitution 2:

和谐
和谐
“Harmonious [Society]” (official slogan)
Externalities: Finding Those Hiding in Plain Sight

Example Substitution 1: Homograph

自由
“Freedom”

目田
“Eye field” (nonsensical)

Example Substitution 2:

和谐
“Harmonious [Society]” (official slogan)
### Example Substitution 1: Homograph

<table>
<thead>
<tr>
<th>Chinese</th>
<th>English</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>自由</td>
<td>“Freedom”</td>
<td>Censored</td>
</tr>
<tr>
<td>目田</td>
<td>“Eye field”</td>
<td>(nonsensical)</td>
</tr>
</tbody>
</table>

### Example Substitution 2:

<table>
<thead>
<tr>
<th>Chinese</th>
<th>English</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>和谐</td>
<td>“Harmonious [Society]”</td>
<td>(official slogan)</td>
</tr>
<tr>
<td>河蟹</td>
<td></td>
<td>Censored</td>
</tr>
</tbody>
</table>
Externalities: Finding Those Hiding in Plain Sight

Example Substitution 1: Homograph

自由　　自由
自由　　“Freedom”
目田　　“Eye field” (nonsensical)

Example Substitution 2:

和谐　　和谐
和谐　　“Harmonious [Society]” (official slogan)
河蟹　　“River crab”
Example Substitution 1: Homograph

自由
“Freedom”

目田
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河蟹
“River crab” (irrelevant)
Externalities: Finding Those Hiding in Plain Sight

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China

United States

Here’s How
The Effect of the News Media

• What's the evidence?

• We can't randomize!

• Clever alternatives:
  1. New TV tower, behind a hill, in radio shadow;
  2. Before/after studies of "surprise" events; etc.

• Better but ⇝ "Profound biases," > 600% difference from truth

• Estimands: different, of sometimes questionable relevance

• Switch to the obvious (hard)?

• What's required to randomize

• Journalists: total control over what's published & when

• Scientists: total control over what's published & when

48 media outlets let us randomize: …

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8/11
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United States 8/11.
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- We choose a policy area (1 of 11)
The Effect of the News Media

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- Outlets volunteer for a pack of ≈ 3 (with our approval), following “project manager” protocol (e.g., Panama Papers)
The Effect of the News Media

- **We choose a policy area** (1 of 11)
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The Effect of the News Media

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United States 9/11
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Statistical Methods
- Sequential Hypothesis Testing: Saved $ millions & years
- Automated Text Analysis: To measure national conversation

Results
- Causal effects: 1st day: 19.4% increase, Total: 62.7% increase
- Context: 3 small media outlets ⇝ national conversation ⇝ policy agenda ⇝ policy United States

9/11
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Here’s How
How to Solve Society’s Most Pressing Challenges?
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Connections

For more information
GaryKing.org
How to Solve Society’s Most Pressing Challenges?

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