

MEASURING AGENDA-SETTING POWER IN POLITICAL DISCOURSE

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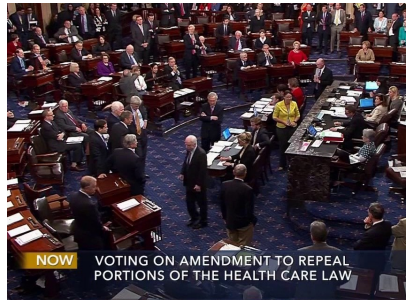
February 22, 2019

Motivation

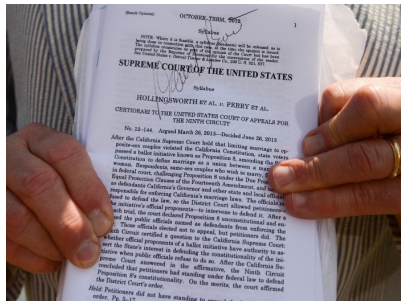
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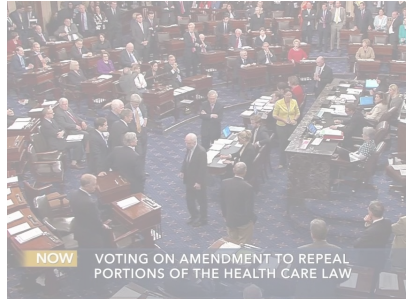
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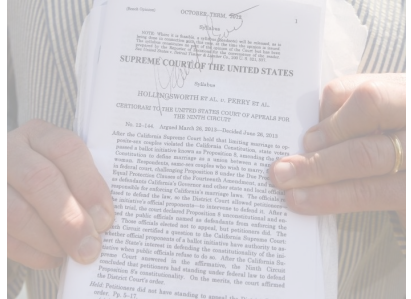
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1. Define power in interactive communications as ability to set the agenda
2. Measurement
 - texts as data
 - identify when changes in topic occur
3. Validation
 - simulation study
 - debates
 - deliberations

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Agenda-setting as power in a social interaction



Agenda-setting as power in a social interaction

Agenda-Setting is a dimension of power (Bachrach and Baratz 1962; Lukes 1974)

- distinct from decision-making power
- ability to control what issues are and are not considered
- in social interaction → gain and maintain others' immediate attention

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- mass media's influence on the importance of issues
(e.g., McCombs and Shaw 1972)
- government's influence on the importance of issues
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- setting a formal agenda via institutions
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Agenda-setting in an interactive communication → latent

Text to learn

- speakers' agenda-setting (i.e., topic changing) abilities
 - where topic changes occur
 - what topics are discussed

→ Add latent variables to topic model

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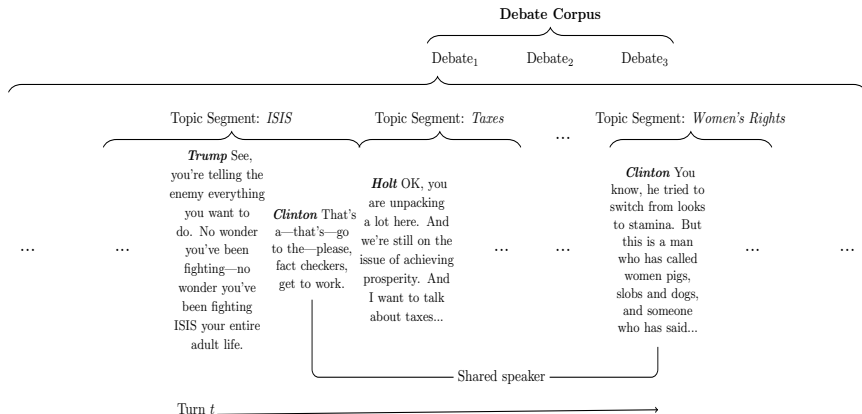
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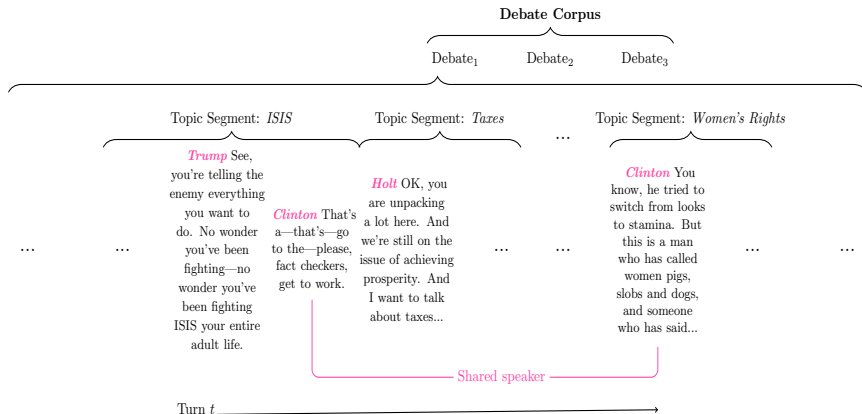
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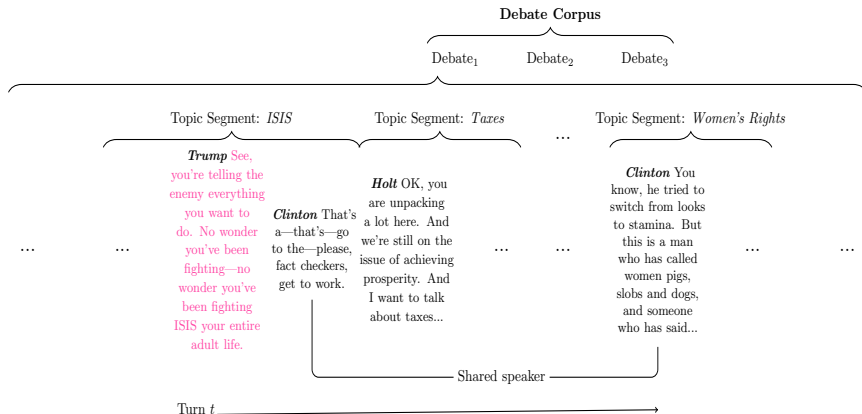
Features of an interactive text



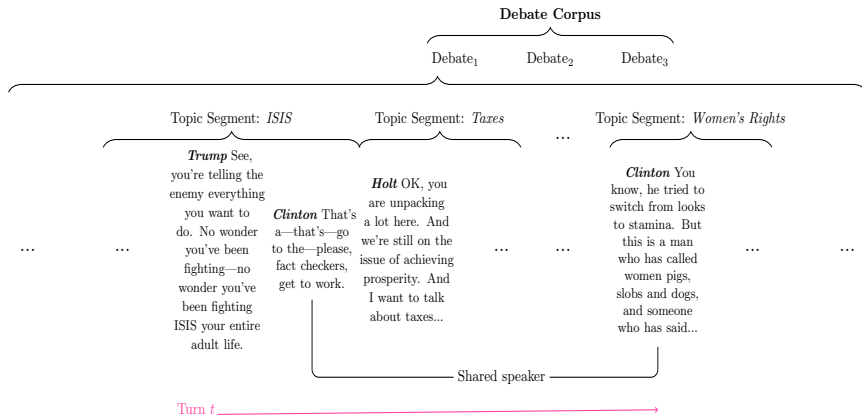
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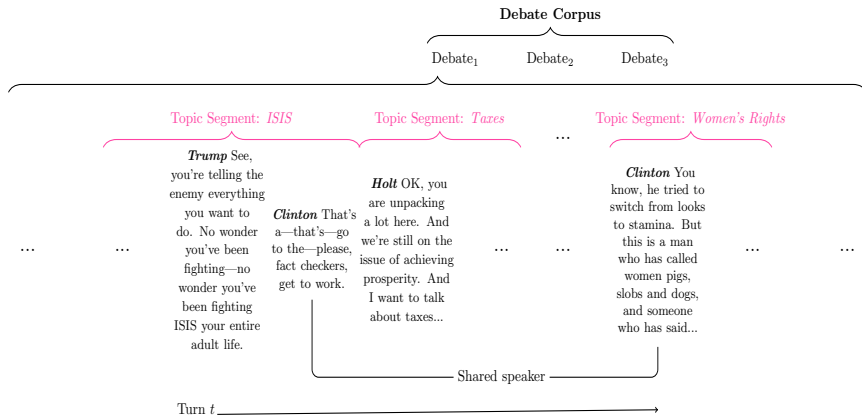
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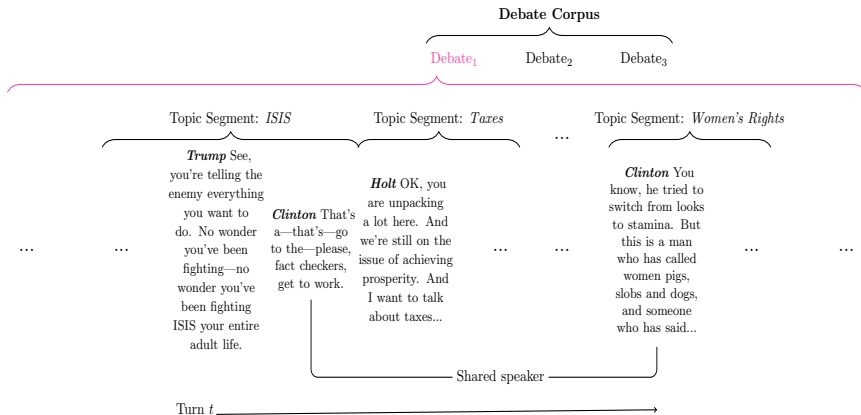
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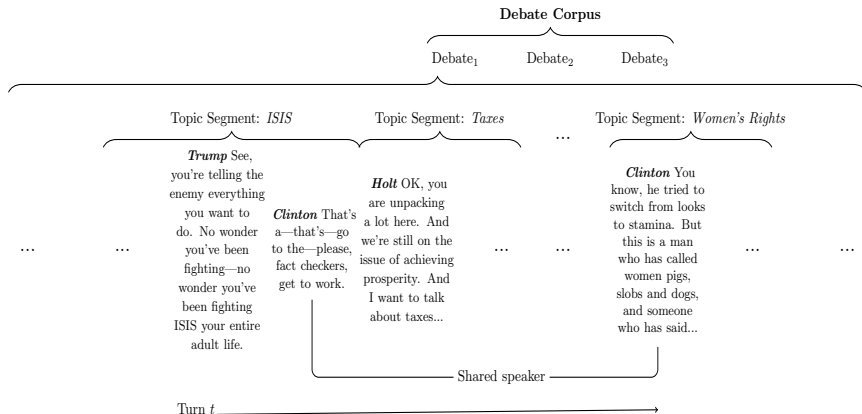
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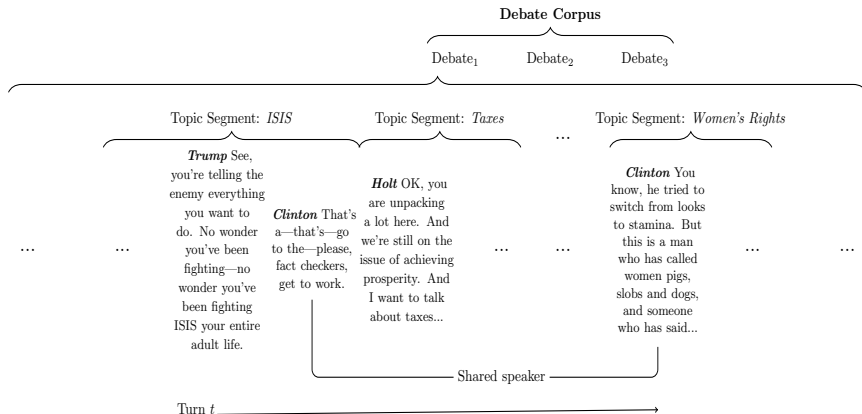
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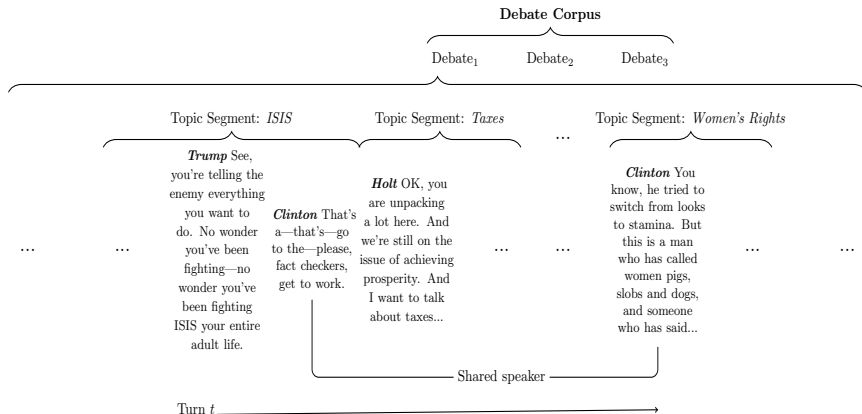


Features of an interactive text



1. Structural information

Features of an interactive text



1. Structural information
2. Social game

LDA (Blei et al. 2003) $\rightarrow$ SITS (Nguyen et al. 2014)

- For each $k \in [1, K]$, draw a topic $\phi_k \sim \text{Dir}(\beta)$
- For each turn $t \in [1, T_d]$, in each discussion $d \in [1, D]$
 - Draw $\theta_{d,t} \sim \text{Dir}(\alpha)$
 - For each word index $n \in [1, N_{d,t}]$:
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$\rightarrow$ estimated via collapsed Gibbs sampler

Validation

1. Simulation

- other text as data tools fail to identify topic changes

2. Debates

- face validity

3. Deliberations

- contrast agenda-setting with participation measures
- agenda-setting's relationship with attitude change

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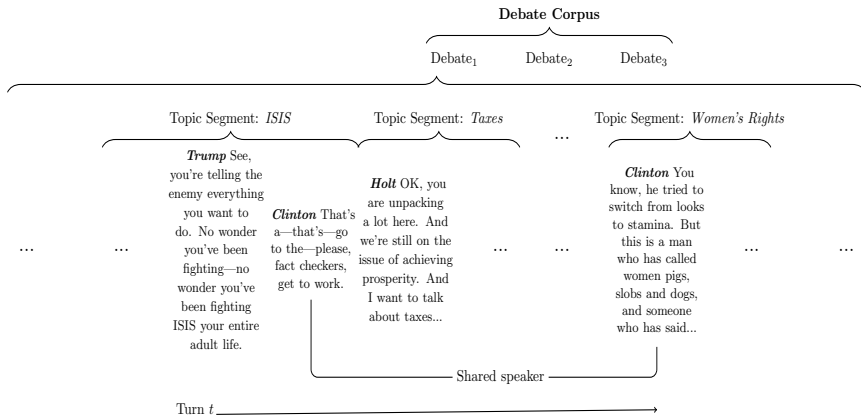
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Simulation with commonly used text as data methods

Commonly used text as data tools fail at identifying topic changes in text (in order to measure agenda-setting abilities).

→ Tried to find consecutive turns that are sufficiently different to say they changed topic

Features of an interactive text



Simulation with commonly used text as data methods

1. Simulate a corpus according to SITS

- 5 speakers
- 10 discussions
- 25 turns per discussions
- 50 words per turn
- 750 unique terms
- $K = 10$ topics

Simulation with commonly used text as data methods

2. Estimate SITS with 10 sets of randomly drawn hyperparameters $(K, \alpha, \beta, \gamma)$ from reasonable ranges

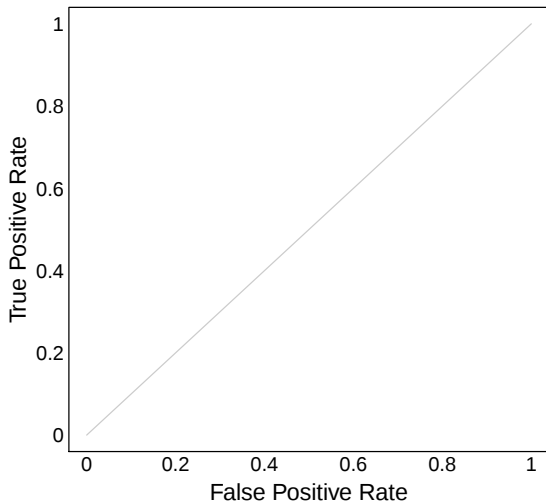
Simulation with commonly used text as data methods

3. Identify topic shifts with familiar methods

Pick a representation of text + similarity measure

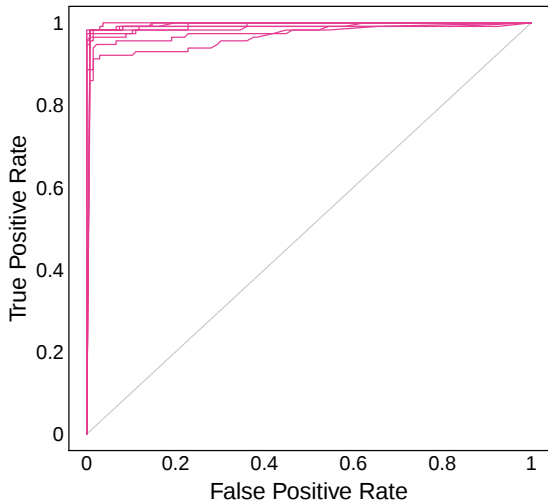
- $\mathbf{w}_{d,t}, \mathbf{w}_{d,t-1}$ from DTM + cosine similarity
- $\theta_{d,t}, \theta_{d,t-1}$ from LDA + Hellinger's distance

Simulation with commonly used text as data methods



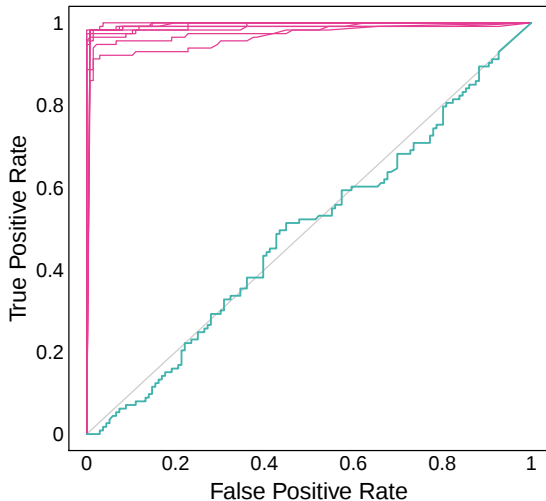
- Simulations of model with random hyperparameters
- Cosine similarity with DTM
- Hellinger's distance with LDA $\theta_{d,t}$

Simulation with commonly used text as data methods



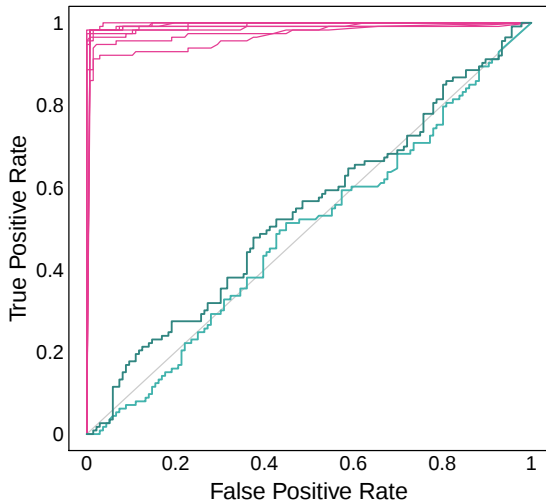
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Fighting over the agenda

Debates provide a setting for construct and face validity as a political event in which the fight over the agenda is particularly evident

Identifying topic shifts

Pr(Shift)	Speaking Turn
.003	<i>Holt</i> The quote was, "I just don't think she has the presidential look."
0.99	<i>Trump</i> You have—wait a minute. Wait a minute, Lester. You asked me a question. Did you ask me a question? You have to be able to negotiate our trade deals. You have to be able to negotiate, that's right, with Japan, with Saudi Arabia. I mean, can you imagine, we're defending Saudi Arabia? And with all of the money they have, we're defending them, and they're not paying? All you have to do is speak to them. Wait. You have so many different things you have to be able to do, and I don't believe that Hillary has the stamina.
0.0	<i>Holt</i> Let's let her respond.
0.01	<i>Clinton</i> Well, as soon as he travels to 112 countries and negotiates a peace deal, a cease-fire, a release of dissidents, an opening of new opportunities in nations around the world, or even spends 11 hours testifying in front of a congressional committee, he can talk to me about stamina.

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Identifying topic shifts

Pr(Shift)	Speaking Turn
-----------	---------------

1.0	Trump The world—let me tell you. Let me tell you. Hillary has experience, but it's bad experience. We have made so many bad deals during the last—so she's got experience, that I agree. But it's bad, bad experience. Whether it's the Iran deal that you're so in love with, where we gave them \$150 billion back, whether it's the Iran deal, whether it's anything you can—name—you almost can't name a good deal. I agree. She's got experience, but it's bad experience. And this country can't afford to have another four years of that kind of experience.
-----	---

0.0	Holt We are at—we are at the final question.
-----	---

0.0	Clinton Well, one thing. One thing, Lester.
-----	--

0.0	Holt Very quickly, because we're at the final question now.
-----	--

Identifying topic shifts

Pr(Shift)	Speaking Turn
1.0	<i>Clinton</i> You know, he tried to switch from looks to stamina. But this is a man who has called women pigs, slobs and dogs, and someone who has said pregnancy is an inconvenience to employers, who has said...
0.0	<i>Trump</i> I never said that.
0.15	<i>Clinton</i> women don't deserve equal pay unless they do as good a job as men.
0.0	<i>Trump</i> I didn't say that.
0.27	<i>Clinton</i> And one of the worst things he said was about a woman in a beauty contest. He loves beauty contests, supporting them and hanging around them. And he called this woman "Miss Piggy." Then he called her "Miss Housekeeping," because she was Latina. Donald, she has a name.

Construct validity of agenda-setting measure

Fox News, *Special Report with Bret Baier* (9/27/16)

“Look, overall, I thought Mrs. Clinton did better than I expected...I think his main problem was she put him on defense a lot on his business stuff. He spent a lot of time defensive and explaining himself”
(Bill McGurn, The Wall Street Journal)

Construct validity of agenda-setting measure

Fox News, *Special Report with Bret Baier* (9/27/16)

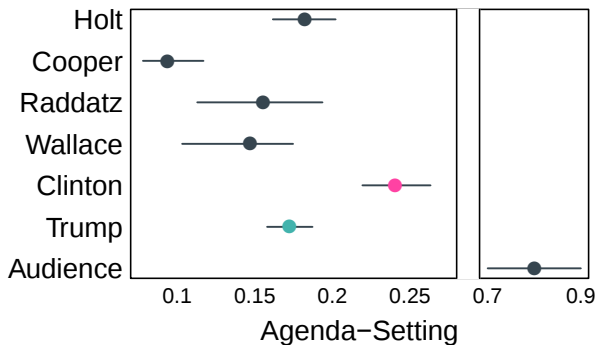
“He missed a lot of opportunities to change the course of the debate back to what he’s comfortable talking about... he didn’t seem prepared to take these attacks and move on” (Caitlin Huey-Burns, RealClearPolitics)

Construct validity of agenda-setting measure

Fox News, *Special Report with Bret Baier* (9/27/16)

"He has a tendency that doesn't work in his favor. It's not helpful when extends the life of a story that is not helpful to him... he should not have fallen for her bait. Clearly at the end of the debate she had that talking point prepared about women. And since Lester Holt didn't bring it up... she felt she needed to interject it... And it was a problem because he felt that then he had to address that" (Monica Crowley, The Washington Times)

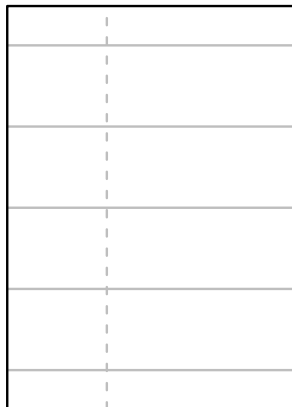
Agenda-setting of debate participants



Clinton's agenda

Women's Rights

stand roe wade disagre decis



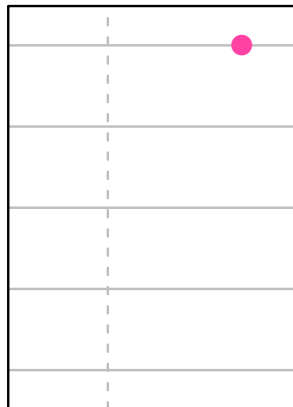
Top Topic Proportions in Topic
Shifting Turns, Relative to Corpus

● Clinton ● Trump

Clinton's agenda

Women's Rights

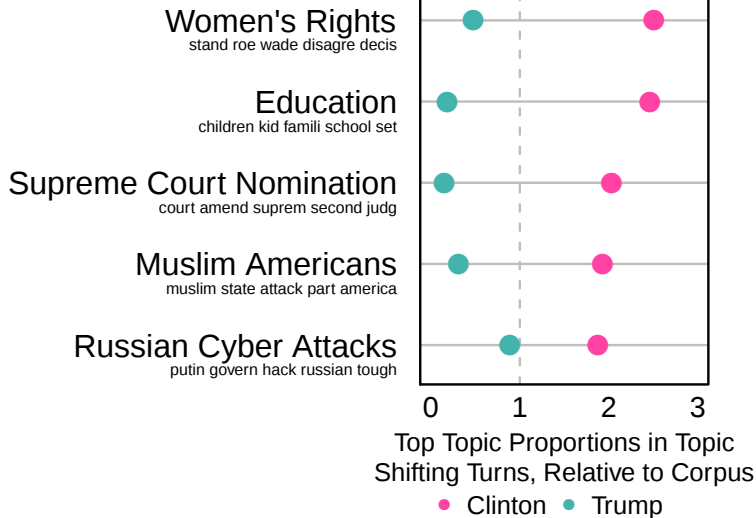
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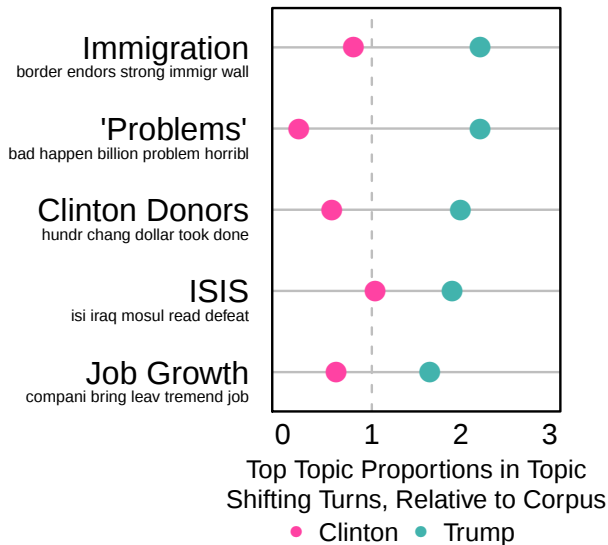
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Clinton's agenda



Trump's agenda



Quantity vs. quality of participation in deliberations

Agenda-setting is distinct from commonly used measures of participation in the literature.

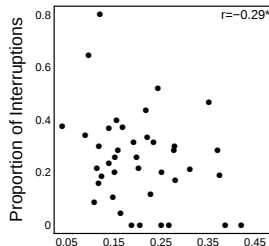
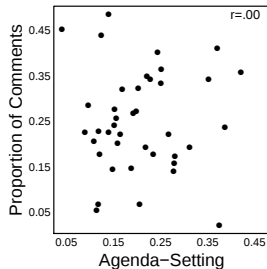
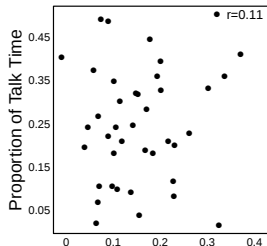
"Agenda-setters" are less likely to change their attitudes as a result of the deliberation.

Quantity vs. quality of participation in deliberations

Data

- Deliberation texts from lab experiment (generously shared by Chris Karpowitz and Hans Hassell)
- BYU students and community members discussed Dress and Grooming Standards

Quantity vs. quality of participation in deliberations



Agenda-setters have less attitude change

	<i>Dependent variable:</i>			
	Attitude Change			
	(1)	(2)	(3)	(4)
Agenda-setting	-0.763** (0.345)			
Proportion of comments		-0.167 (0.294)		
Proportion of talk time			-0.276 (0.246)	
Proportion of interruptions				0.245 (0.175)
Constant	0.390*** (0.076)	0.276*** (0.079)	0.302*** (0.067)	0.174*** (0.054)
Observations	39	39	39	39
R ²	0.120	0.009	0.034	0.052

Note: *p<0.1; **p<0.05; ***p<0.01

Clustered standard errors by deliberation group

Conclusions

Contributions

- systematic measurement of power within interactive communications
- innovation to topic model for short, interactive texts
- latent variable approach

Future Directions

- run experiments using real-time chat software to validate that "agenda-setters" achieve their preferred outcomes

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Thank you!
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Appendix

Macro vs. micro agenda-setting

Measures

Estimation

Estimation Details

Simulation

Simulations Details

Debates

Debate estimation details

Deliberations

Deliberation estimation details

Deliberation convergence

Macro vs. micro agenda-setting

How the legislative agenda changes over time
(Quinn et al. 2010)

"Burstiness" of terms over months/years attributed to MPs
(Eggers and Spirling 2018)

Newspaper coverage of actors and offices
(Ban et al. 2018)

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Estimation Details

No term weighting scheme yet $\rightarrow$ TF-IDF does not perform well with short texts

- Words that occur both only in a few documents within the corpus (IDF), and that occur often within a single document (TF), are upweighted.
- But with a short document, words rarely occur more than once.

Sampler

- An iteration samples $l_{d,t}$ and $z_{d,t,n}$
 - π_m , $\theta_{d,t}$, and ϕ_k estimated from posteriors of $l_{d,t}$ and $z_{d,t,n}$

Initial values

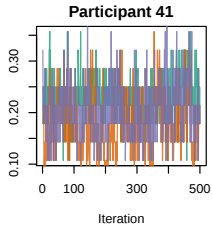
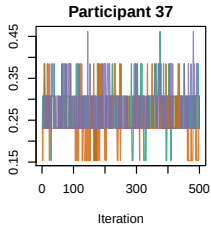
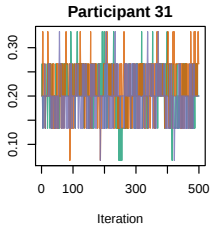
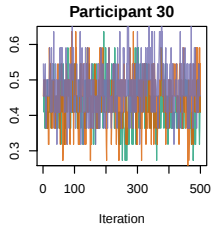
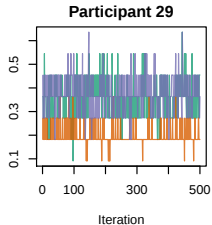
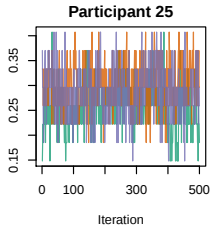
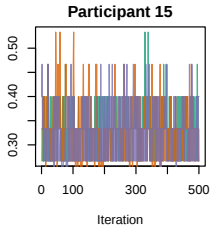
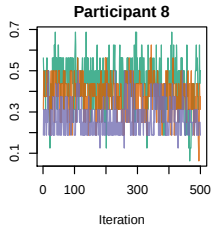
- Randomly assign 1 in 10 turns a shift $l_{d,t} = 1$, else $l_{d,t} = 0$
 - vary this frequency to vary starting values for multiple chains
- Random draw topic assignments $z_{d,t,n} \in [1, K]$

Deliberation Estimation Details

Three chains of the Gibbs sampler for 250,000 total iterations with 200,000 burn in iterations, lagging samples by every 10 iterations with $\alpha = .125$, $\beta = .01$, $\gamma = 1$, and $K = 8$.

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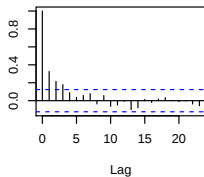
Deliberation Convergence



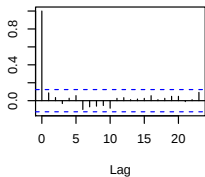
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Deliberation Autocorrelation

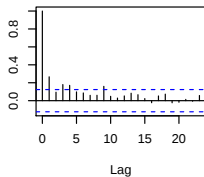
Participant 8



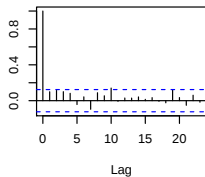
Participant 15



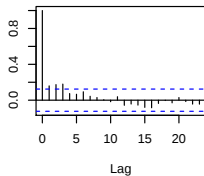
Participant 25



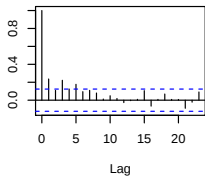
Participant 29



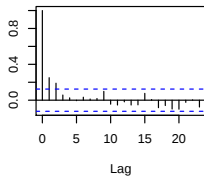
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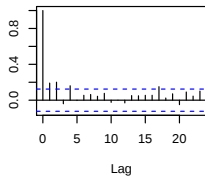
Participant 31



Participant 37



Participant 41



Additional thinning every 25th observation → 250 samples

Debate Estimation Details

Three chains of the Gibbs sampler for 250,000 total iterations with 200,000 burn in iterations, lagging samples by every 10 iterations with $\alpha = .1$, $\beta = .01$, $\gamma = 1$, and $K = 30$.

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Simulation Details

Hyperparameters $\alpha = .1$, $\beta = .1$, $\gamma = 1$, and $K = 10$. One chain of 25,000 iterations per model with 20,000 burn in iterations and lagging samples every 10 iterations.

For LDA estimation, I provided the model these exact hyperparameters. Used `stm` package as well as a collapsed Gibbs sampler approach so I could specify the same number of iterations. Results are the same with either estimation.

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