

“I Want to Talk About, Again, My Record
On Energy...”

Modeling Agendas and Framing in
Political Debates and Other
Conversations

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Computational Social Science
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- Noah Smith
- Justin Gross
- Kris Miler



“Magic is a rich and largely untapped source of insight into perception and awareness. Insofar as the understanding of behaviour and perception goes, there are specific cases in which the magician's intuitive knowledge is superior to that of the neuroscientist.”

Syntactic framing

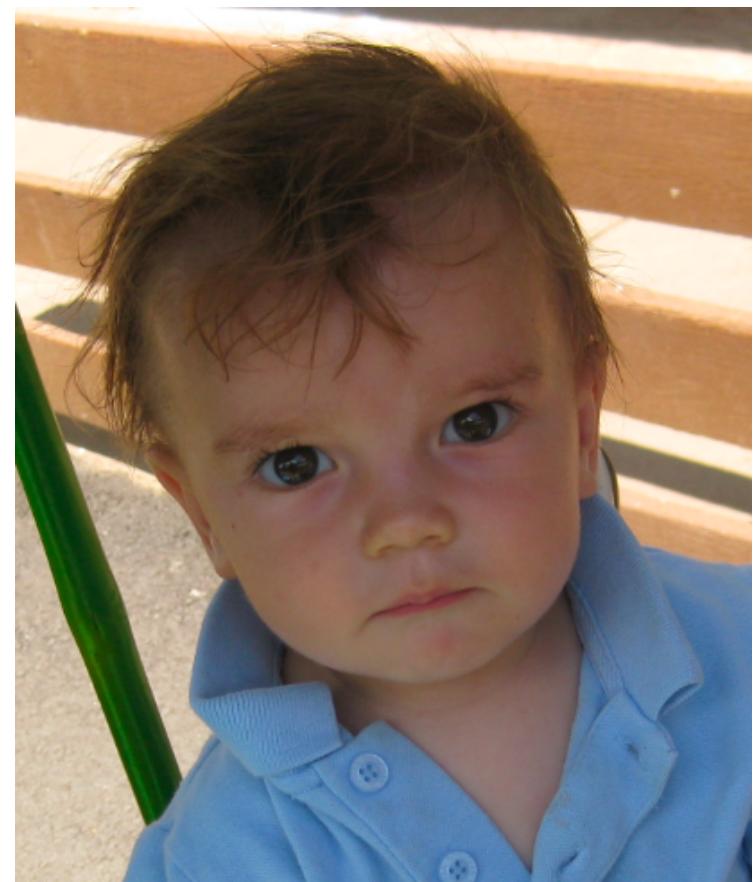
“Mistakes were made.”

Ronald Reagan, January 27, 1987

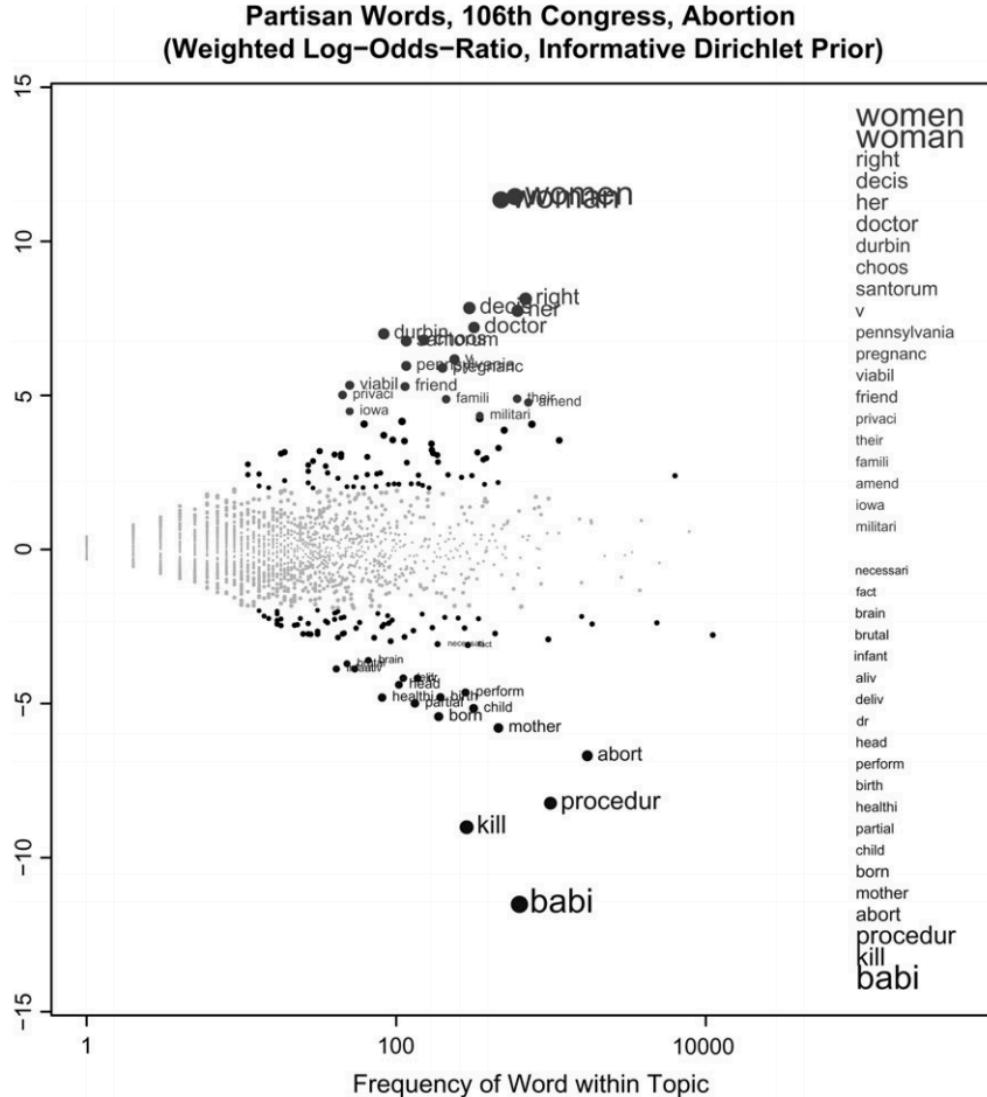


“My toy broke.”

Jay Resnik, frequently



Lexical framing



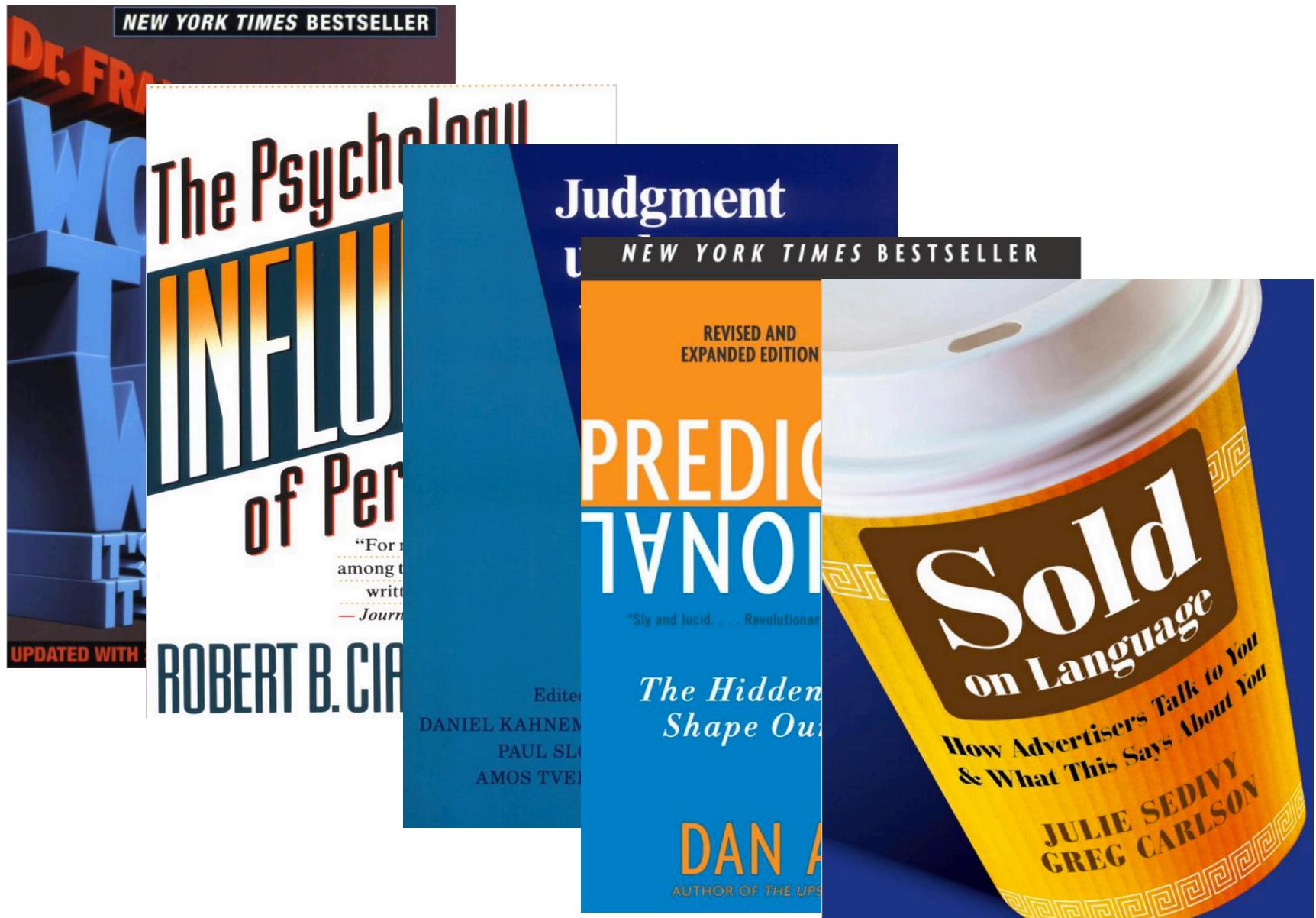
“pro-choice”

“pro-life”

What framing does is to "**select some aspects of a perceived reality and make them more salient in a communicating text**, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described."

Entman, R.M. (1993). "Framing: Toward clarification of a fractured paradigm". Journal of Communication 43 (4): 51–58.

Framing language → Thought processes



Syntactic framing

Suffocation kills 24-year-old woman
Man suffocates 24-year-old woman

Dowty Proto-Role Property	Hopper and Thompson Component
Volitional involvement in the event or state	<i>Volition</i>
<i>Sentience (and/or Perception)</i>	
<i>Cause change of state in object</i>	<i>Agency</i>
<i>Cause event</i>	<i>Agency</i>
<i>Movement relative to the position of another participant</i>	<i>Kinesis</i>
<i>Exists independently of the event</i>	
<i>Undergoes change of state, Causally effected by another participant</i>	<i>Affectedness of Object</i>
<i>Does not exist independently of the event</i>	
<i>Stationary relative to movement of another participant</i>	<i>Kinesis</i>
	<i>Object individuation</i>
<i>(Exists independently of the event?)</i>	<i>Subject-object individuation</i>
<i>(Incremental Theme?)</i>	<i>Punctuality</i>
	<i>Aspect (Telicity)</i>

Semantic ratings: averaged across 18 subjects

Sympathy ratings: averaged across 31 subjects

Strong correlations

– Volition: $r = -.78$

– Sentience: $r = -.76$

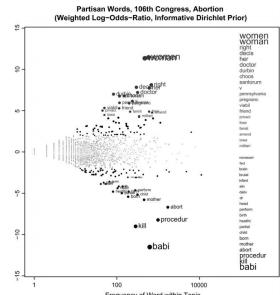
– Kinesis/movement: $r = -.75$

Syntax → Semantics → Sympathy

Janyce Wiebe and Lingjia Deng (2014).
An Account of Opinion Implicatures .
arXiv:1404.6491 [cs.CL].

Corpus-level modeling

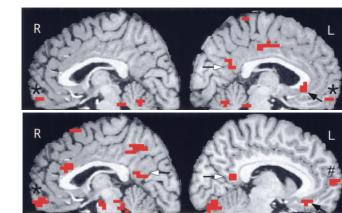
Richer modeling at the language level



Language

Eliciting judgments using psycholinguistic methods

Capturing real-time reactions to language

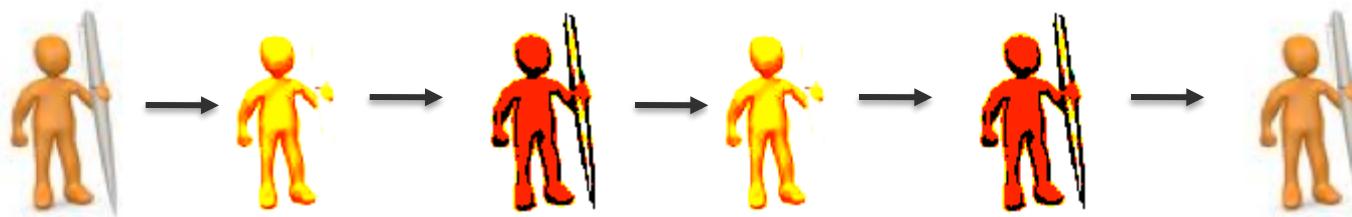


Cognition

Agenda setting and influence

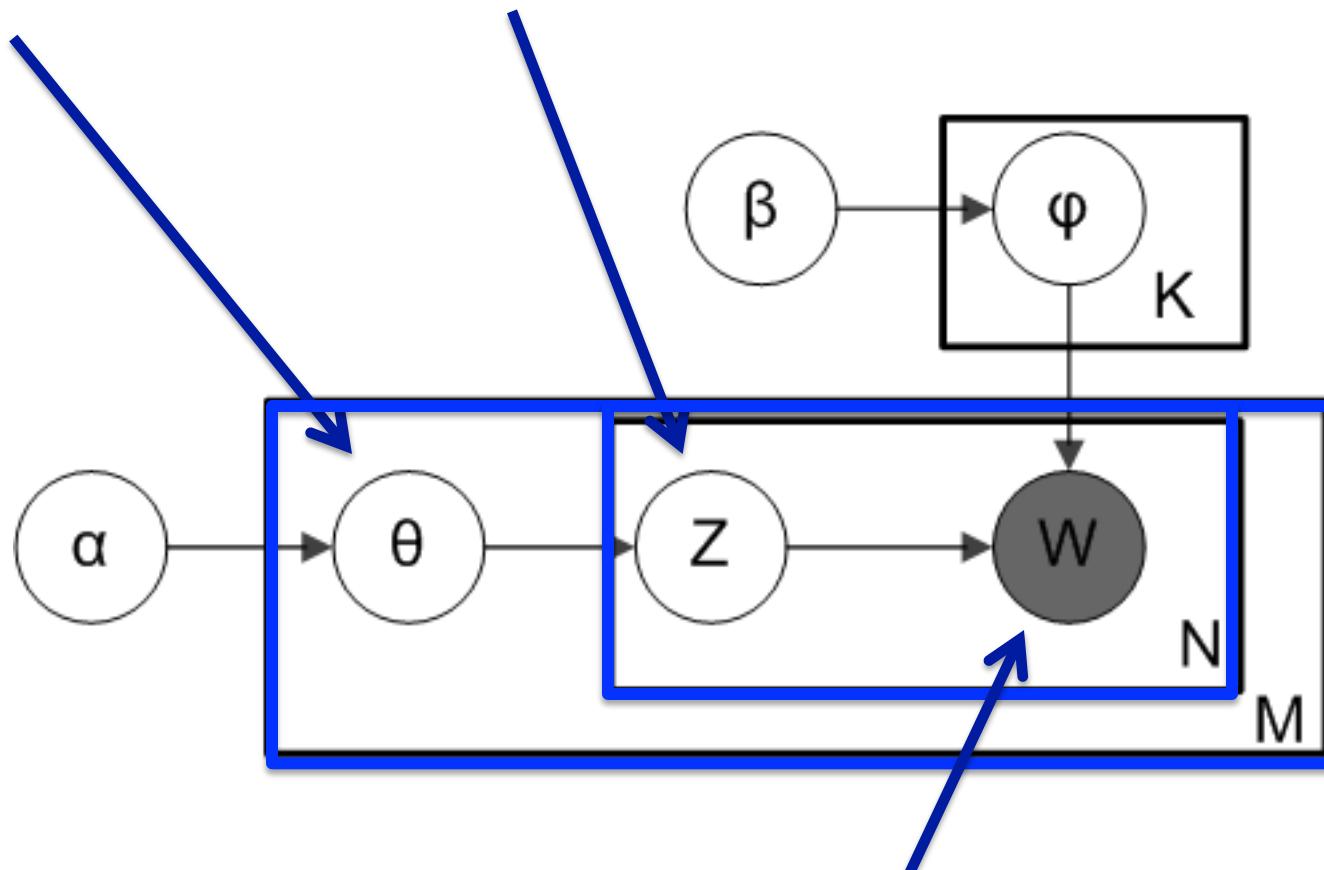
“The ability to change topical focus, especially given strong cultural and social pressure to be relevant, means having enough interpersonal power to take charge of the agenda.”

Palmer MT (1989) Controlling conversations: Turns, topics and interpersonal control. *Communication Monographs* 56(1):1–18



For every document,
pick the mixture of
topics that will be
used.

For every word
position, pick a topic
for that word.



Generate a word
associated with that
topic.

For every turn in the conversation, we know who the author is and what words they used.

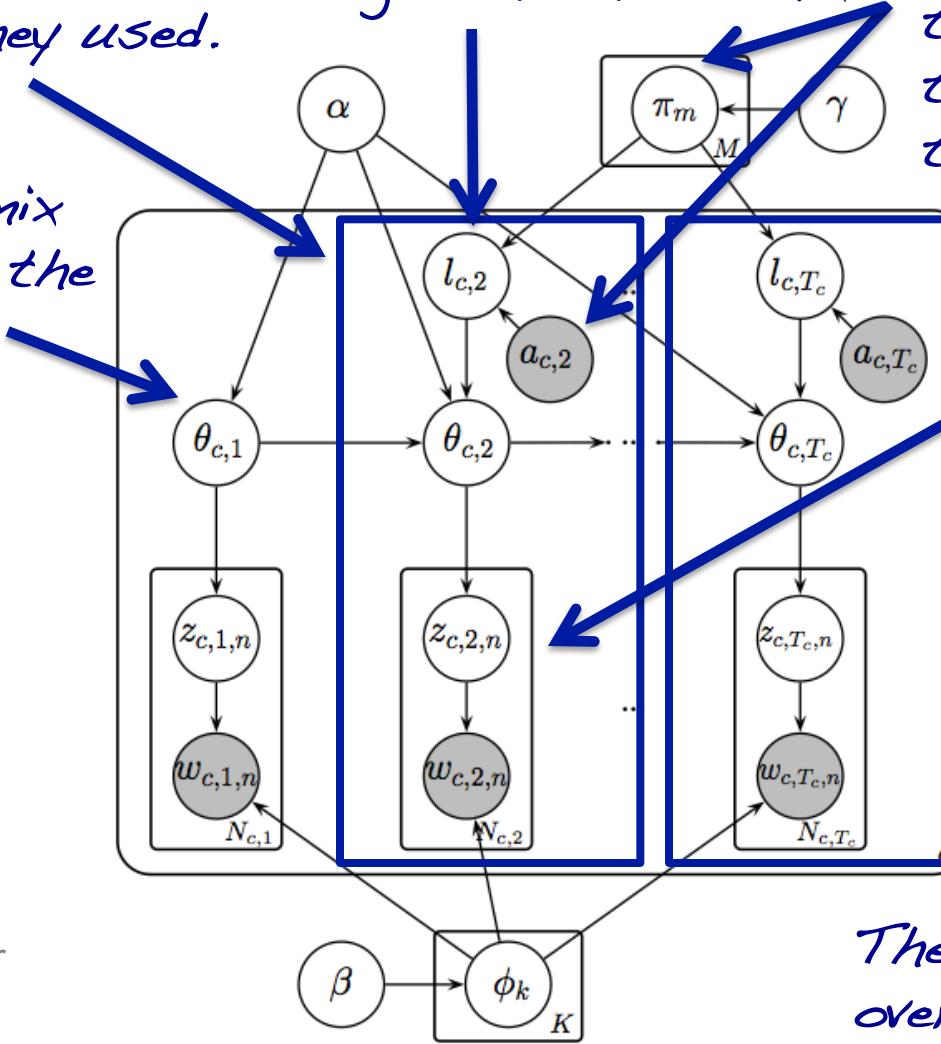
We have some mix of topics from the previous turn.

Speaker Identity for Topic Segmentation

V. Nguyen, J. Boyd-Graber, and P Resnik.
SITS: A Hierarchical Nonparametric Model using Speaker Identity for Topic Segmentation in Multiparty Conversations.
ACL 2012

For this new turn, we decide whether to keep the old mix of topics, or generate a new mix.

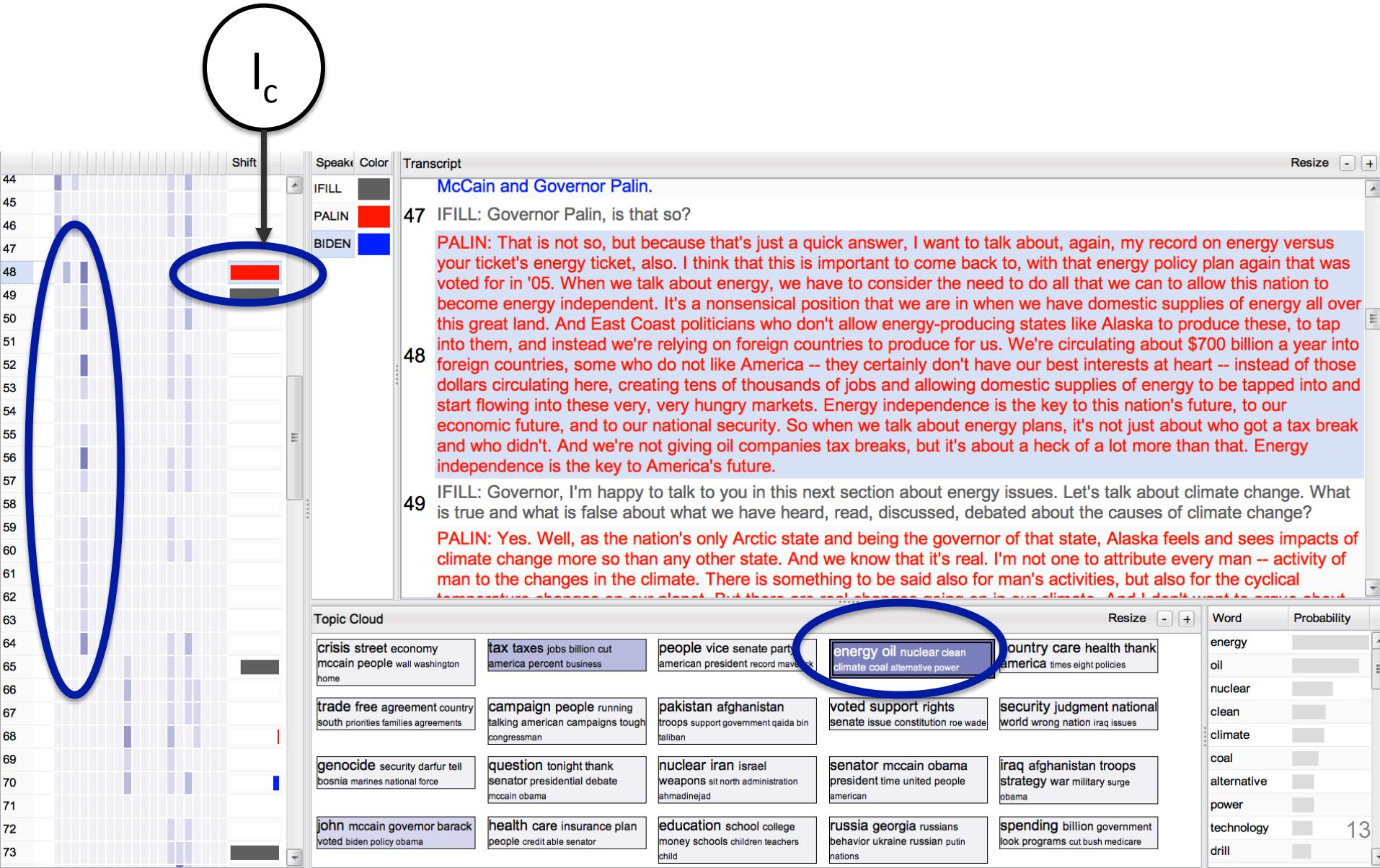
That choice depends on the author of this new turn and their tendency to change the topic.



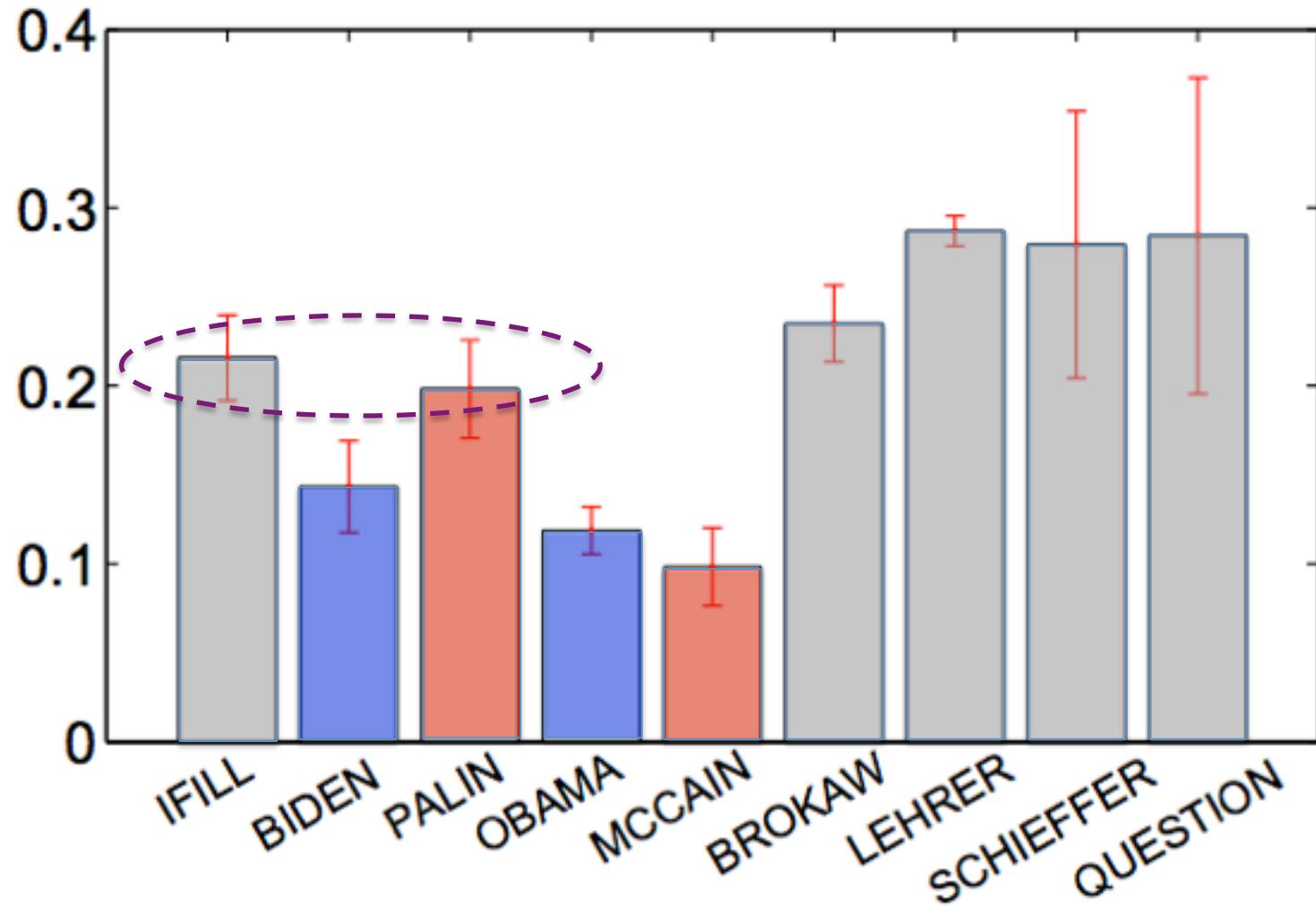
Once we have the topic mix for this turn, we generate words according to that mixture of topics.

Then we do it all over again with the next turn.

Model: detecting topic shifts



Model: topic shift tendency



Your VP debate wrapup in four bullet points

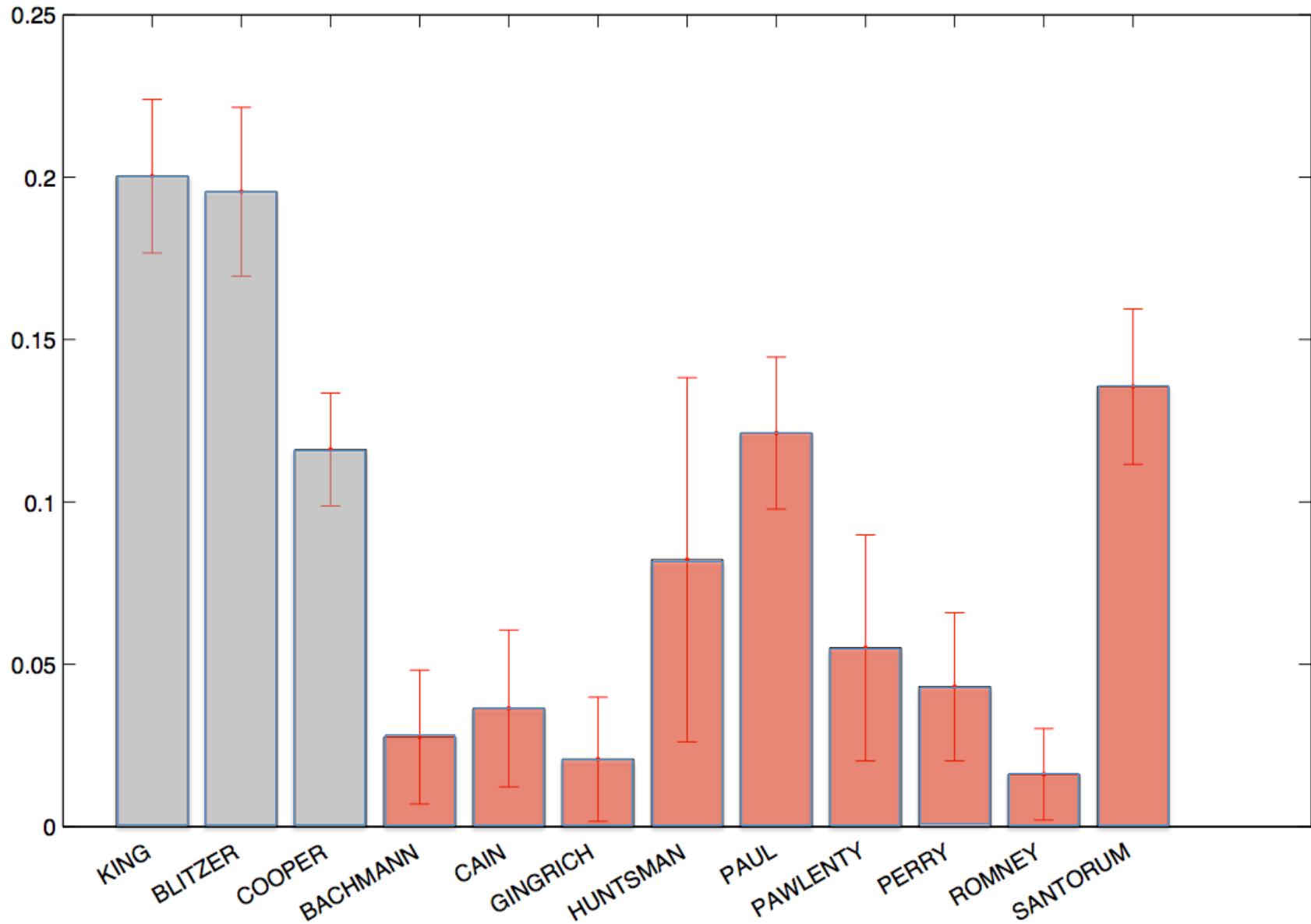
OCT 2 2008, 10:45 PM ET



JAMES FALLOWS - James Fallows is a national correspondent for *The Atlantic* and has written for the magazine since the late 1970s. He has reported extensively from outside the United States, and once worked as President Carter's chief speechwriter. His latest book, *China Airborne*, will be published in May.

- **Ifill**, moderator: *Terrible*. Yes, she was constrained by the agreed debate rules. But she gave not the slightest sign of chafing against them or looking for ways to follow up the many unanswered questions or self-contradictory answers. This was the big news of the evening. Katie Couric, and for that matter Jim Lehrer, have never looked so good.
- **Palin**: she has moderated previous either haven't been
bullying in the beginning, he was commanding and authoritative - from his side's perspective - on issues of foreign policy and constitutional balance. And to all appearances sincere in his choking-up near the end when talking about having a child in peril. Overall, don't see how he could have balanced all the conflicting pressures on him much better.
- **Biden**: have never looked so good.
- **The race**: No fundamental change. Which is better news for Obama than McCain.

Model: topic shift tendency



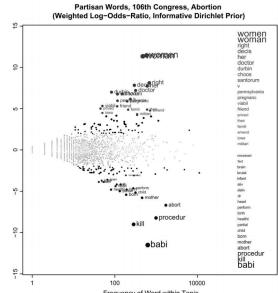
Agenda setting → Influence

	Ranking methods	F_1	AUC-ROC	AUC-PR
Crossfire	Num. of turns ◊	.736	.795	.726
	Total turn lengths ◊	.716	.782	.730
	Total topic shifts ★	.806 ± .0122	.858 ± .0068	.865 ± .0063
	Weighted topic shifts ★	.828 ± .0100	.869 ± .0078	.873 ± .0057
Wikipeida	Num. of turns ◊	.367	.730	.291
	Total turn lengths ◊	.306	.732	.281
	Total topic shifts ★	.552 ± .0353	.752 ± .0144	.377 ± .0284
	Weighted topic shifts ★	.488 ± .0295	.749 ± .0149	.379 ± .0307

Modeling Topic Control to Detect Influence in Conversations
using Nonparametric Topic Models
Viet-An Nguyen, Jordan Boyd-Graber, Philip Resnik,
Deborah A. Cai, Jennifer E. Midberry, Yuanxin Wang
Machine Learning Journal, October 2013

Corpus-level modeling

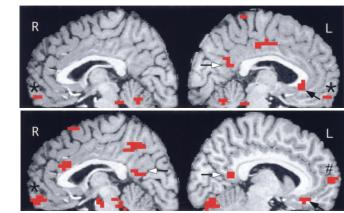
Richer modeling at the language level



Language

Eliciting judgments using psycholinguistic methods

Capturing real-time reactions to language



Cognition

Agenda-setting

~ **Topics**

What gets talked about

Framing

~ ??

How things get talked about

An approach

Framing = second-level agenda setting



Swine flu surfaces at Texas-Mexico border among illega...

Washington Times - 10 hours ago

The first case of swine flu has been found among the scores of illegal children who have been crossing into America at the Texas-Mexico ...

The swine flu finding only fuels fears from law enforcement along the border who say **the illegal immigrants are not being properly screened for diseases and contagious sicknesses** before moving along to other facilities for holding across the nation.

“Some of the children who have come to this country may not have a valid legal basis to remain, but some will. Yet, **it is virtually impossible for a child to assert a valid claim under immigration law in the absence of legal representation.** ... It is a fantasy to believe that unrepresented children have a fair shot in an immigration proceeding”

--Rep. Hakeem Jeffries, D-N.Y.

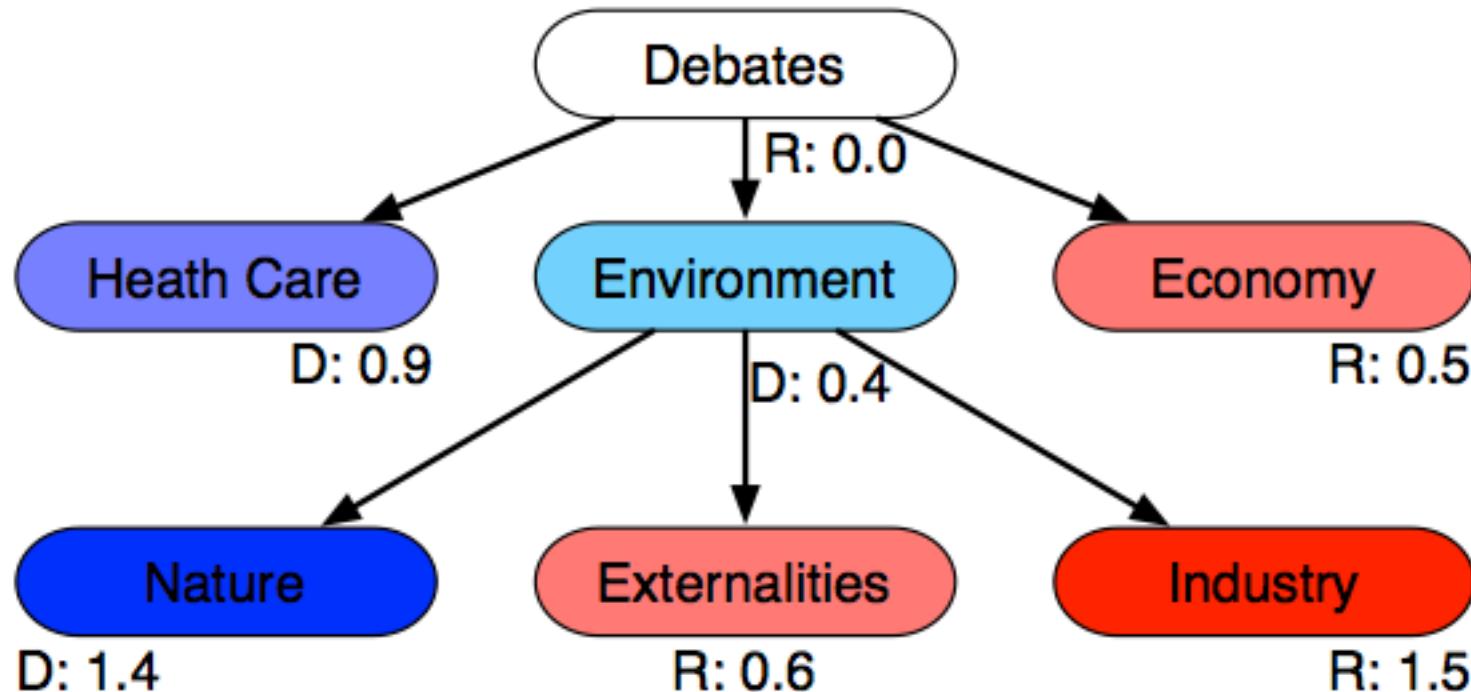
Immigration

Healthcare

Immigration

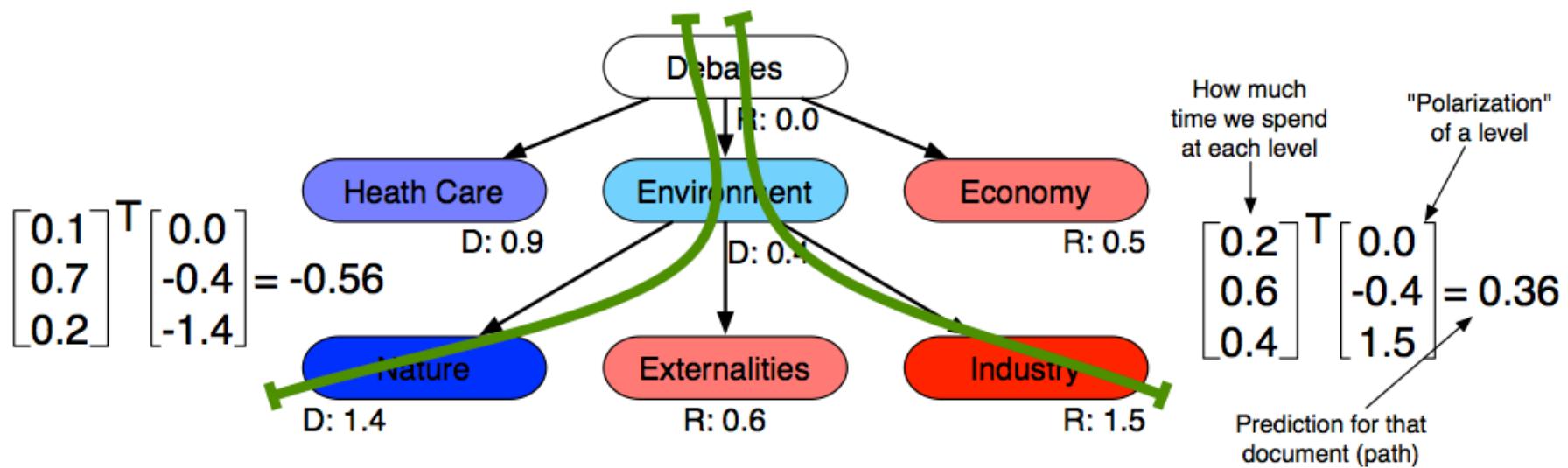
Legal process

Supervised Hierarchical LDA (SHLDA)

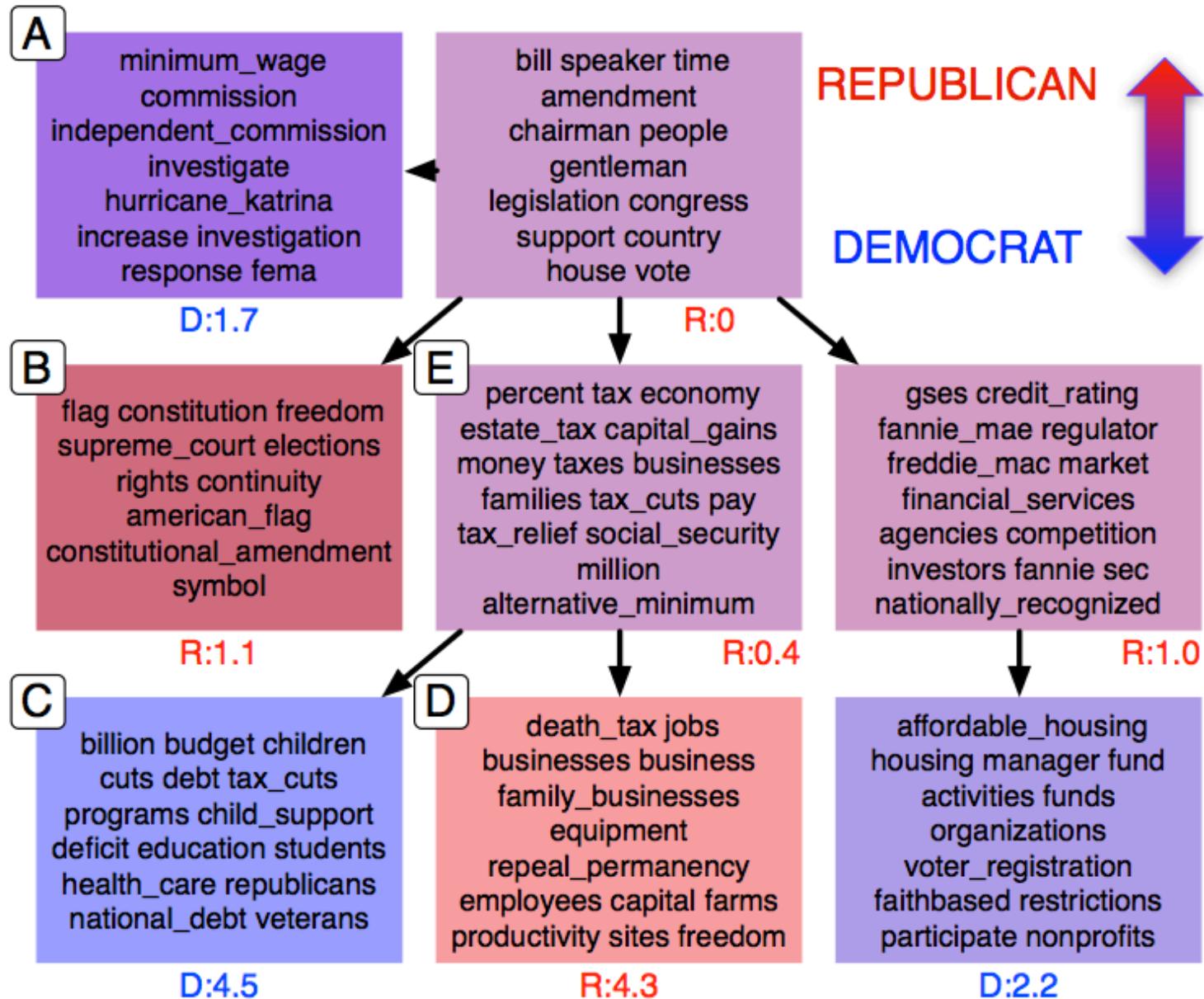


Lexical and Hierarchical Topic Regression
Viet-An Nguyen, Jordan Boyd-Graber, Philip Resnik
Advances in Neural Information Processing Systems
(NIPS 2013), Lake Tahoe, NV

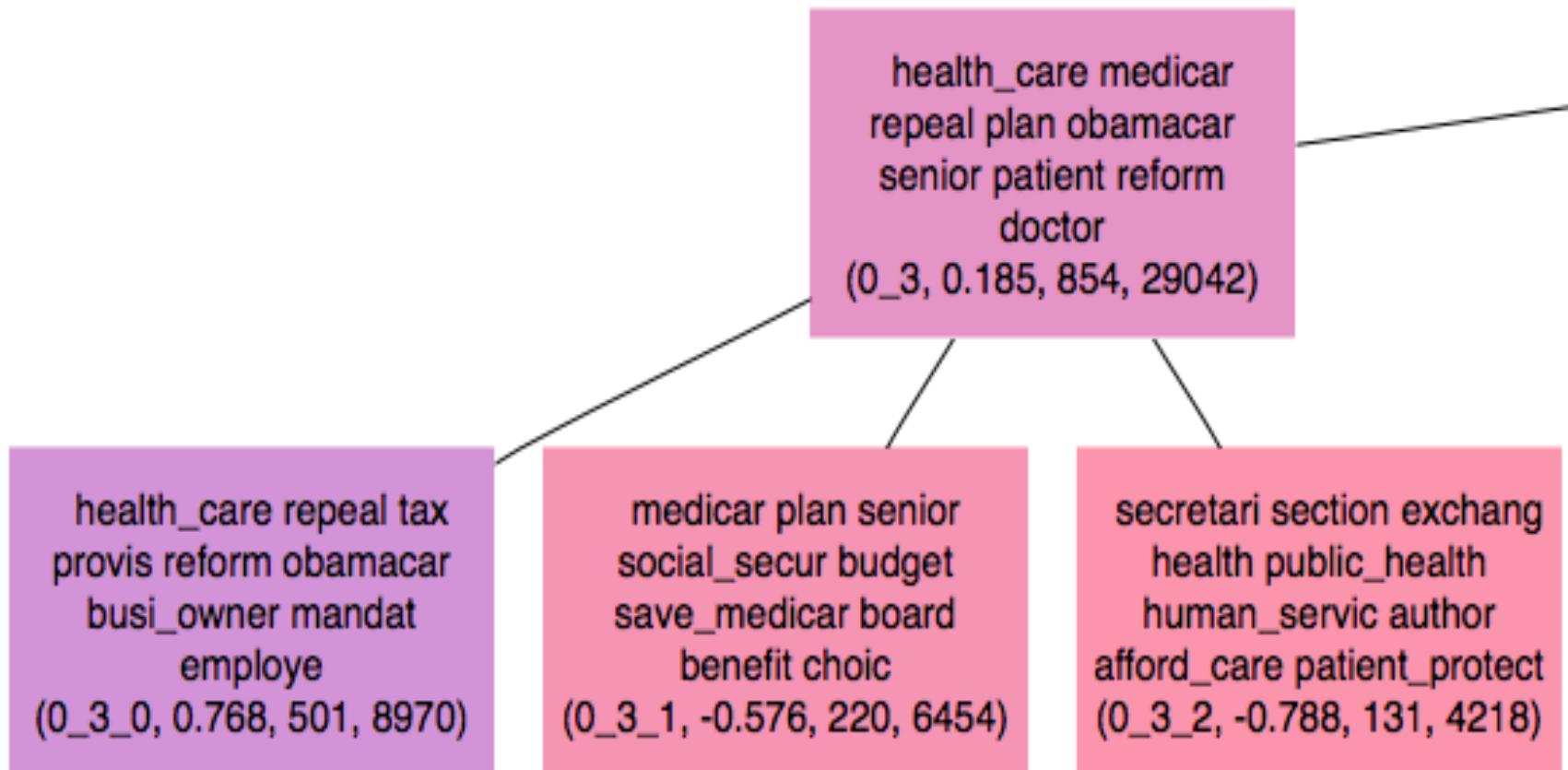
Supervised Hierarchical LDA (SHLDA)



Supervised Hierarchical LDA (SHLDA)



Tea Party example

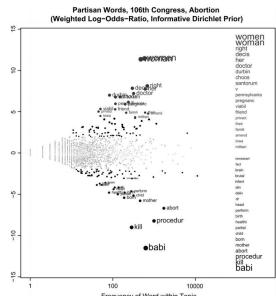


Corpus-level
modeling

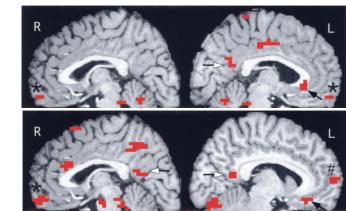
Richer modeling at the
language level

Eliciting judgments using
psycholinguistic methods

Neurolinguistics



Capturing real-time
reactions to language



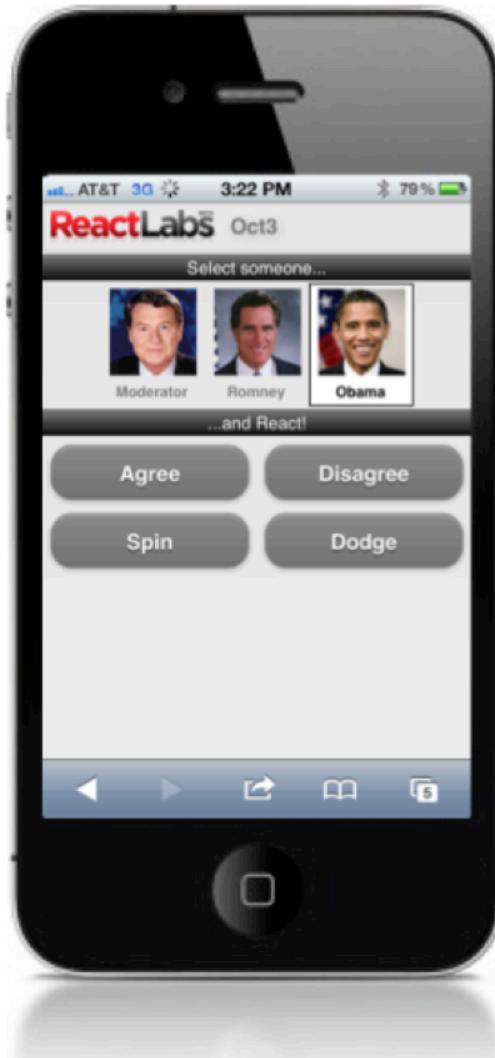
Language

Cognition

Connecting language and reactions

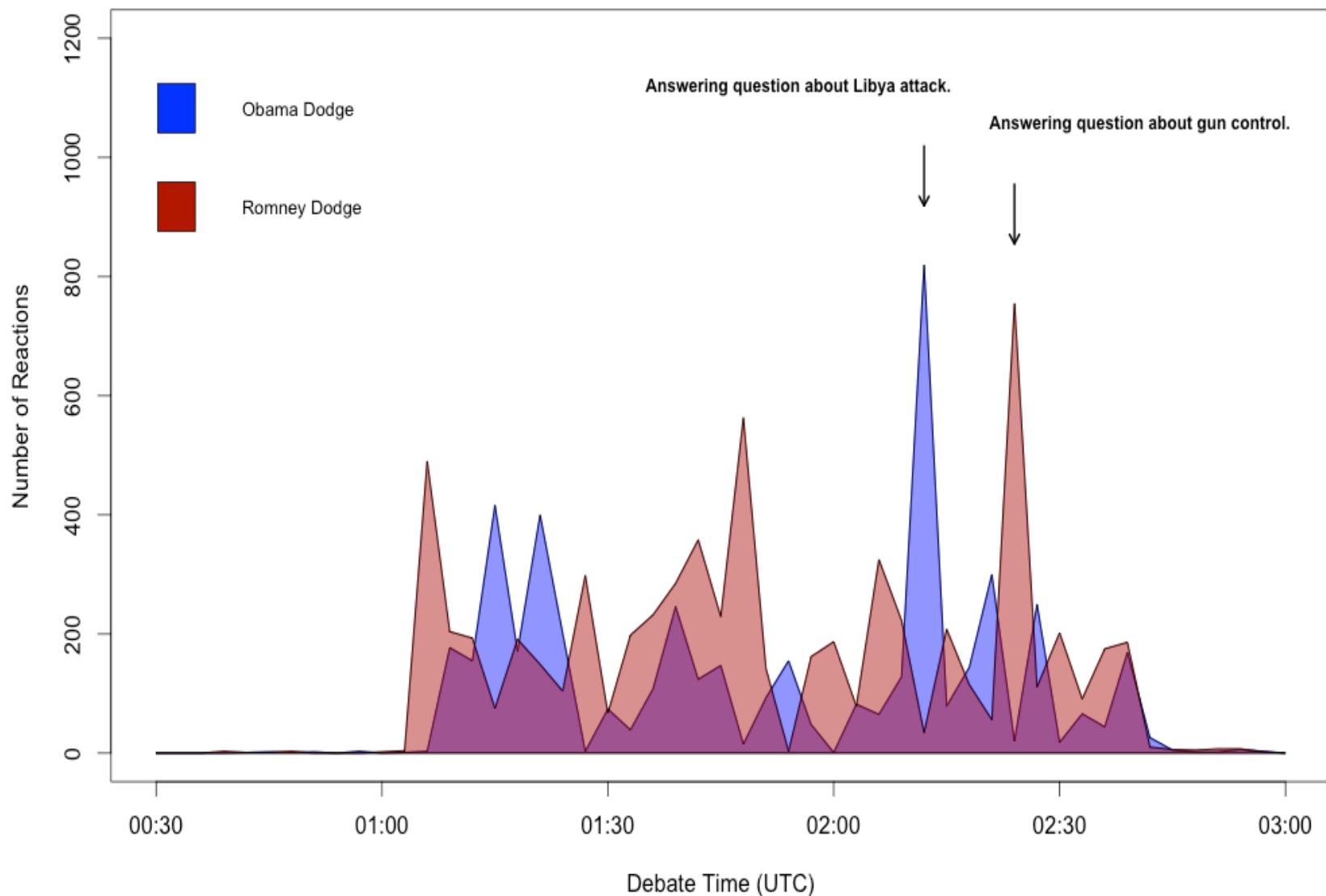
- How do we measure **effects** of language?
- Coding is expensive and labor intensive,
- And we would like *unmediated, interpretable reactions on a large scale*

Connecting language and reactions

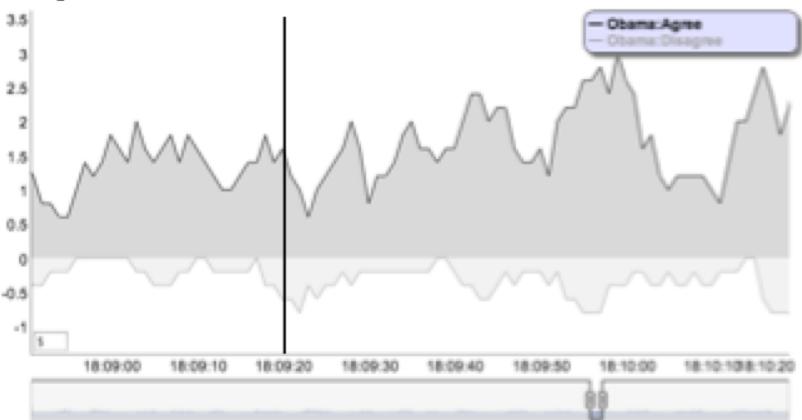
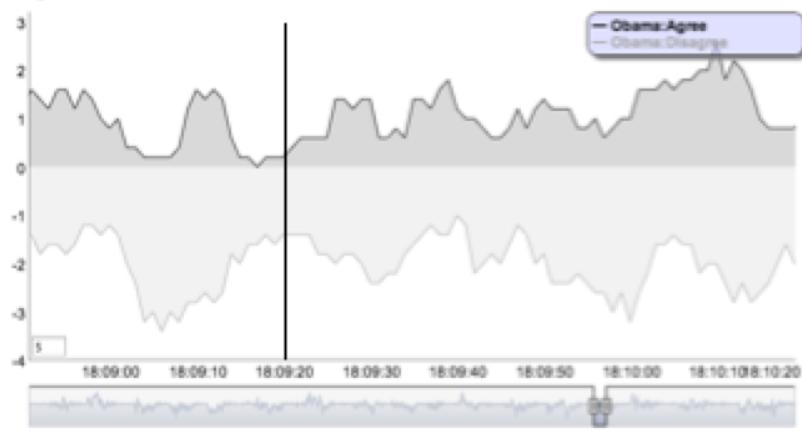
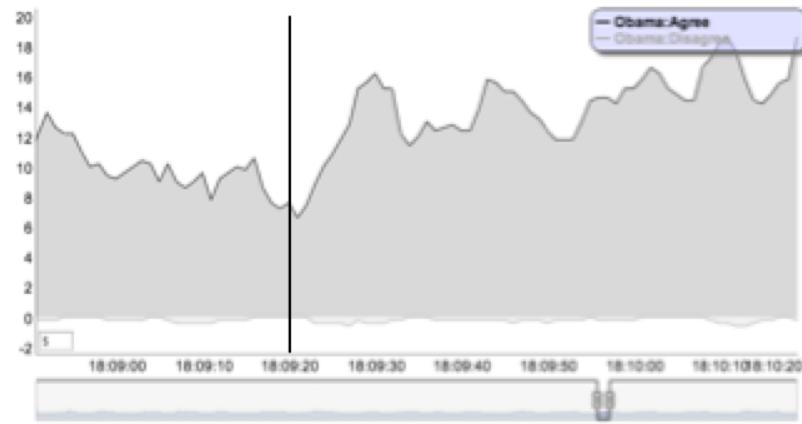


Boydston, Amber E., Rebecca A. Glazier, Matthew T. Pietryka, and Philip Resnik. In Press. "The Role of Individual Issue Priorities: Evidence from Real-Time Reactions to a 2012 Presidential Debate." *Public Opinion Quarterly*.

Who Dodges the Question?



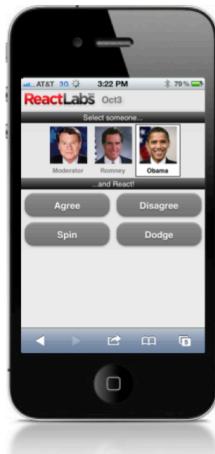
To consider: potential connections with experimental psychology approaches, e.g. Todd Rogers and Michael Norton, *The Artful Dodger: Answering the Wrong Question the Right Way*, Journal of Experimental Psychology: Applied, June 2011, Vol. 17 Issue 2, p139.



Agree and disagree clicks for Obama using a **LEGAL** frame, by viewer party.

“What your plan does is to duplicate what's already the law, which says if you are out of health insurance for three months, then you can end up getting continuous coverage and an insurance company can't deny you if you've -- if it's been under 90 days. But that's already the law.”

As the figure shows, the statement received much agreement and little disagreement from Democratic viewers. **Surprisingly, however, Republicans were roughly divided in their reactions, registering almost as much agreement as disagreement—an uncommonly positive net engagement for Obama among Republicans in our data.**



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for excellence in television political journalism

NewsChannel8/Politico/WJLA

The Washington Post PostTV Politics Opinions Local Sports National World Business

Ask The Post

Engaging readers with our journalism

Archives



How to use your smartphone as a real-time reaction tool for Md. governor's race debate

BY SARA CAROTHERS May 6 at 1:48 pm

The Post is partnering with [React Labs](#) to offer a new way for Maryland voters to respond on smartphones, tablets, or laptops as they watch the top Democratic contenders for Maryland governor debate, which starts at 7 p.m. Wednesday.

Using [React Labs](#) as a second-screen tool, you can respond moment-by-moment, letting us know what you support and don't support, what you believe and disbelieve. Just go to post.reactlabs.com to log in during the live broadcast (airing on NBC4 or Maryland Public Television).



Frank N. Magid Associates, Inc.

Closing thoughts

Framing language → Thought processes



Illegal children likely to remain in U.S. for years

Washington Times - 12 hours ago

The Obama administration acknowledged Wednesday that most of



DHS: 'Mass Exodus' of Children Illegally Crossing Bord...

Washington Free Beacon - by Adam Kredo - Jun 24, 2014

The number of **illegal children** crossing the border has more than



CA Native Can't Cross Border While Hundreds of **Illegal**...

Breitbart News Network - Jun 13, 2014

Obama: The **Illegal Children** are Our Future

RushLimbaugh.com (subscription) - Jun 13, 2014

RUSH:

an asset

ermission to
the fact that he



Hillary Clinton: Deport The **Illegal Children** Back To Ce...

Daily Caller - Jun 17, 2014

Probable Democratic presidential nominee Hillary Clinton broke with President Obama on a key policy issue Tuesday, claiming the ...

Closing thoughts

Thought processes → Framing language

“It is not pleasant to experience **decay**, to find yourself exposed to the ravages of an almost **daily** rain, and to know that you are **turning into** something feeble, that **more and more of you** will blow off with the first strong wind, making you **less and less**.

— Andrew Solomon, *The Noonday Demon: An Atlas of Depression*

“[Despair], owing to some evil trick played upon the sick brain by the inhabiting psyche, comes to resemble the diabolical **discomfort** of being **imprisoned** in a fiercely **overheated** room. And because no breeze stirs this cauldron, because there is no escape from this **smothering confinement**, it is entirely natural that the victim begins to think ceaselessly of oblivion.”

— Dr. Kay Redfield Jamison, *Night Falls Fast: Understanding Suicide*

“Ptsd is like being **nailed to the cross** over and over and over until each body surface, organ and area has had its countless repetitive turns at **assaults**: has been **split and punctured** wide open and then left to **fry alive** in tossed blame, and another’s abandoned shame”

— PTSD discussion board

(See ACL 2014 Workshop on Computational Linguistics and Clinical Psychology!)

Thanks!