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

Modeling Agendas and Framing in Political Debates and Other Conversations

Philip Resnik
University of Maryland

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Collaborators

- Jordan Boyd-Graber
- Viet-An Nguyen
- Deborah Cai
- Amber Boydstun
- Rebecca Glazier
- Matt Pietryka
- Tim Jurka
- Stephan Greene
- 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

Partisan Words, 106th Congress, Abortion
(Weighted Log-Odds-Ratio, Informative Dirichlet Prior)

“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."

Framing language → Thought processes
Syntactic framing

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

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

Semantic ratings: averaged across 18 subjects

Sympathy ratings: averaged across 31 subjects

Strong correlations

- Volition: $r = -0.78$
- Sentience: $r = -0.76$
- Kinesis/movement: $r = -0.75$

Syntax $\rightarrow$ Semantics $\rightarrow$ Sympathy


Eliciting judgments using psycholinguistic methods

Capturing real-time reactions to language

Richer modeling at the language level
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.”

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.

LDA, Blei et al. (2003)
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.

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.

Speaker Identity for Topic Segmentation

Model: detecting topic shifts

PALIN: That is not so, but because that's just a quick answer, I want to talk about, again, my record on energy versus your ticket's energy ticket, also. I think that this is important to come back to, with that energy policy plan again that was voted for in '05. When we talk about energy, we have to consider the need to do all that we can to allow this nation to become energy independent. It's a nonsensical position that we are in when we have domestic supplies of energy all over this great land. And East Coast politicians who don't allow energy-producing states like Alaska to produce these, to tap into them, and instead we're relying on foreign countries to produce for us. We're circulating about $700 billion a year into foreign countries, some who do not like America -- they certainly don't have our best interests at heart -- instead of those dollars circulating here, creating tens of thousands of jobs and allowing domestic supplies of energy to be tapped into and start flowing into these very, very hungry markets. Energy independence is the key to this nation's future, to our economic future, and to our national security. So when we talk about energy plans, it's not just about who got a tax break and who didn't. And we're not giving oil companies tax breaks, but it's about a heck of a lot more than that. Energy independence is the key to America's future.

PALIN: Yes. Well, as the nation's only Arctic state and being the governor of that state, Alaska feels and sees impacts of climate change more so than any other state. And we know that it's real. I'm not one to attribute every man -- activity of man to the changes in the climate. There is something to be said also for man's activities, but also for the cyclical temperature changes on our planet. But there are real changes going on in our climate. And I don't want to argue about...
Model: topic shift tendency
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.

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Palin, on the other hand, played in a way that displayed in previous debates that she either didn't know the answers or they haven't been following the debates.

Biden was solid as well, 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.

**The race:** *No fundamental change*. Which is better news for Obama than McCain.
Model: topic shift tendency
### Agenda setting → Influence

<table>
<thead>
<tr>
<th>Ranking methods</th>
<th>$F_1$</th>
<th>AUC-ROC</th>
<th>AUC-PR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crossfire</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Num. of turns ◇</td>
<td>.736</td>
<td>.795</td>
<td>.726</td>
</tr>
<tr>
<td>Total turn lengths ◇</td>
<td>.716</td>
<td>.782</td>
<td>.730</td>
</tr>
<tr>
<td>Total topic shifts ★</td>
<td>.806 ± .0122</td>
<td>.858 ± .0068</td>
<td>.865 ± .0063</td>
</tr>
<tr>
<td>Weighted topic shifts ★</td>
<td>.828 ± .0100</td>
<td>.869 ± .0078</td>
<td>.873 ± .0057</td>
</tr>
<tr>
<td><strong>Wikipedia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Num. of turns ◇</td>
<td>.367</td>
<td>.730</td>
<td>.291</td>
</tr>
<tr>
<td>Total turn lengths ◇</td>
<td>.306</td>
<td>.732</td>
<td>.281</td>
</tr>
<tr>
<td>Total topic shifts ★</td>
<td>.552 ± .0353</td>
<td>.752 ± .0144</td>
<td>.377 ± .0284</td>
</tr>
<tr>
<td>Weighted topic shifts ★</td>
<td>.488 ± .0295</td>
<td>.749 ± .0149</td>
<td>.379 ± .0307</td>
</tr>
</tbody>
</table>

Modeling Topic Control to Detect Influence in Conversations using Nonparametric Topic Models
Eliciting judgments using psycholinguistic methods

Richer modeling at the language level

Capturing real-time reactions to language

Language

Cognition

Corpus-level modeling

Neurolinguistics
Agenda-setting

*What* gets talked about

Framing

*How* things get talked about

An approach

Framing = second-level agenda setting
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”

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)

\[
\begin{bmatrix}
0.1 \\
0.7 \\
0.2
\end{bmatrix}^T
\begin{bmatrix}
0.0 \\
-0.4 \\
-1.4
\end{bmatrix} = -0.56
\]

How much time we spend at each level

"Polarization" of a level

Prediction for that document (path)
Supervised Hierarchical LDA (SHLDA)
Tea Party example

health care medicar repeal plan obamacar senior patient reform doctor (0.3, 0.185, 854, 29042)

- health care repeal tax provis reform obamacar busi owner mandat employe (0.3_0, 0.768, 501, 8970)
- medicar plan senior social secur budget save medicar board benefit choic (0.3_1, -0.576, 220, 6454)
- secretari section exchang health public health human servic author afford care patient protect (0.3_2, -0.788, 131, 4218)
Eliciting judgments using psycholinguistic methods

Richer modeling at the language level

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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

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.
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).
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 asse

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.


“[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!