Winning Arguments: Interaction Dynamics and Persuasion Strategies in Good-faith Online Discussions

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https://chenhaot.com/pages/changemyview.html
We are always trying to change someone else’s opinion

Reviewer #2 must be stopped
It is difficult to change someone else’s mind.
YOU CAN NEVER CHANGE A MAN'S MIND BY ARGUMENT.

ONLY BY BEER.
Original opinion  ↔  Argument

• Certainty of the holder  
  [Pomerantz et al. 1995, Tormala and Petty 2002]
• Importance of the belief  

• Properties such as intensity, valence, framing  
• Social aspects such as authority  
  [Chaiken 1987, Cialdini et al. 1999, etc]

What can the World Wide Web offer?
CMV: the Tontine should be legalized and made a common retirement strategy.

[Reference URL omitted] Basically, today we have a huge problem with retirement [...+73 words]
A tontine for retirement looks like [...+56 words] The yearly sum is divided evenly for all the surviving participants [...+25 words].
The key advantages as I see it are:
* We don't need actuaries [...+29 words...]
* Management fees can be quite low [...+22 words]
* [Another reason]
* [Another reason]
But CMV. Are there major risks I am not foreseeing? [+2 more questions]

A tontine is a pretty crappy retirement vehicle for most people. It pays out the least when you need the most, and the most when you need the least.
People’s income needs in retirement generally fall as they age. [...+35 words]

Very interesting. I'll give a Δ because I didn't have any idea that was true and changes my idea of how the tontine should work. That said, I don't think it's unsolvable [...+44 words]

The Social Security system is basically one giant Tontine [...+17 words]
CMV: I think I would be better off without a smartphone.

I'm starting to think that it does more harm than good. Here are my reasons:

1. The period of time when I was cut off from the internet was really nice. I assumed that not having internet would mean I would have to spend my time much more productively.

2. I did find new ways to waste it. Naps in the afternoon, TV, playing old video games set aside.

3. I agree. The problem is that I'm having trouble replacing it when I'm caught up in

Paul Miller from the Verge actually spent a year completely for that matter, I just thought you might find it an interesting [after-a-year-without-the-internet](https://www.theverge.com/2015/5/16/8692214/after-a-year-without-the-internet) (this is his post after the of

Thank you for this. Reading this article was what fully sold me on the idea that the basic principles of my behavior wouldn't change in a lasting way just by getting rid of my smartphone unless I found a way to change my habits in a fundamental way (which can be done with or without owning a smartphone).
Original opinion ↔ Argument

But first: interaction dynamics

- The entry time of the challenger
- The number of back-and-forth exchanges
- The number of challengers
  and possibly more …
Success of a comment vs. the challenger’s entry time

![Graph showing the relationship between delta percentage and challenger rank in time. The x-axis represents the challenger rank in time, ranging from 0 to 10, and the y-axis represents the delta percentage, ranging from 5% to 0%. The graph indicates a decreasing trend in delta percentage as the challenger rank increases.]
Success of a comment vs. the number of back-and-forth exchanges

![Graph showing the success rate of comments versus the number of replies in a back-and-forth path. The graph has a y-axis labeled 'delta percentage' ranging from 0% to 6%, and an x-axis labeled '#replies in a back-and-forth path' with values 1, 2, 3, 4, 5, 6+. There are data points at 1/3000 and 0/129.]
Probability that opinion was changed vs. the number of challengers

![Graph showing the probability of opinion change vs. the number of challengers. The x-axis represents the logarithm of the number of challengers, while the y-axis shows the delta percentage. The graph illustrates that the probability increases as the number of challengers increases, with a peak around 25 delta percentage at an average of 64 challengers.]
Stylistic choices in arguments

- Variations of setup
  - Root reply
  - Full path
  - Truncated
Interplay with original opinion:
• similarity in different vocabularies

Argument-only features:
• Stylistic features
• Bag-of-words
• Part-of-speech tags
Performance overview

- **#words**
- **Bag of words**
- **Part-of-speech tags**
- **style**
- **interplay**
- **interplay + style**
- **all**

Accuracy:
- 50%
- 55%
- 60%
- 65%

**Significance:**
- **:** Significant effect
- **:** Very significant effect
Interplay with the original opinion

Original opinion  ⟷  Argument

similarity in different vocabularies

<table>
<thead>
<tr>
<th>Effective?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaccard similarity in content words</td>
</tr>
<tr>
<td>Jaccard similarity in stopwords</td>
</tr>
</tbody>
</table>

There is some complexity regarding length, talk to me offline or see the paper.
Argument-only: stylistic features

- Word category-based features (first person pronouns, positive, negative, etc)
- Word score-based features (arousal, concreteness, dominance, valence) [Warriner et al. 2013]
- Characteristics of the entire argument (#sentences, #paragraphs, type token ratio, etc)
- Formatting (Markdown related, e.g., bold, italic, etc)
## Word category-based features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Effective?</th>
</tr>
</thead>
<tbody>
<tr>
<td>#definite articles</td>
<td>(p &lt; 0.0001)</td>
</tr>
<tr>
<td>fraction of definite articles</td>
<td>(p &lt; 0.05)</td>
</tr>
<tr>
<td>#positive words</td>
<td>(p &lt; 0.0001)</td>
</tr>
<tr>
<td>fraction of positive words</td>
<td>(p &lt; 0.05)</td>
</tr>
<tr>
<td>#quotations</td>
<td></td>
</tr>
</tbody>
</table>
## Word score-based features

<table>
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</thead>
<tbody>
<tr>
<td>arousal (dull vs. terrorism)</td>
<td>(p &lt; 0.05)</td>
</tr>
<tr>
<td>concreteness (hamburger vs. justice)</td>
<td></td>
</tr>
<tr>
<td>dominance (dementia vs. completion)</td>
<td></td>
</tr>
<tr>
<td>valence (murder vs. sunshine)</td>
<td>(p &lt; 0.05)</td>
</tr>
</tbody>
</table>

[Warriner et al. 2013]
Structure of an argument

concreteness (hamburger vs. justice)
Structural differences between original opinions and arguments

concreteness (hamburger vs. justice)
Malleability of the original opinion

Original opinion features:
• Stylistic features
• Bag-of-words
• Part-of-speech tags
A much harder task

![Bar chart showing AUC values for different features: #words, random, BOW, POS, style, and all. The y-axis represents features, and the x-axis represents AUC values ranging from 0.48 to 0.56. The chart indicates significant differences (*).]
First person singular pronoun vs. first person plural pronoun

*I* think that there should not be speed limit

*We* think that there should not be speed limit

<table>
<thead>
<tr>
<th>Malleable?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>First person <strong>singular</strong> pronoun</td>
<td>↑↑↑ (p &lt; 0.0001)</td>
</tr>
<tr>
<td>First person <strong>plural</strong> pronoun</td>
<td>↓↓ (p &lt; 0.01)</td>
</tr>
</tbody>
</table>
Other things that we have thought about/ tried but not reported in the paper

- Experience level of challengers
- Topics of original opinions and arguments from topic models
- Word embedding based approach
- Structure of arguments based on conjunction words
I hope that I have changed your view and convinced you that

/r/changemyview is an interesting dataset to look into the problem of persuasion!

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Data available at https://chenhaot.com/pages/changemyview.html