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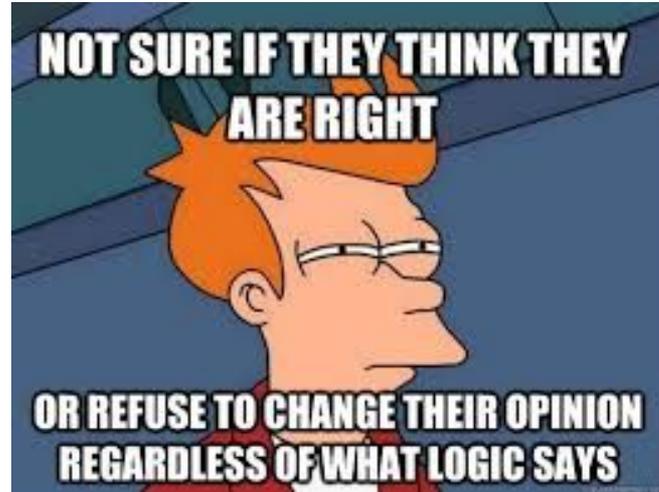
# Winning Arguments: Interaction Dynamics and Persuasion Strategies in Good-faith Online Discussions

Chenhao Tan, Vlad Niculae, Cristian  
Danescu-Niculescu-Mizil, and Lillian Lee

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We are always trying to change someone else's opinion.  
But it is hard...



WI



# /r/changemyview

- **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 forseeing? [+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]  
[URL]



Very interesting. I'll give a  $\Delta$  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]



10 more comments

# Original Post

**CMV: the Tontine should be legalized and made a common retirement strategy.**  
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Original post

 The Social Security system is basically one giant Tontine [...+13 words] So it's already legal. **B.1**

 There are some key differences though. First, Social Security is defined by the government [...+36 words] **B.2**

 I'd imagine the tontine as a secondary system to social security though, one that is optional for people to do, not mandatory like social security. [...+11 words] **B.12**

 And a tontine would be defined by your bank [...+79 words] **B.3**

 ... →  ... →  ... →  ... } **B.4—B.10**

 [...]oh, ok[...] ←  ... ←  ...

 Good points. I still am not sold [... > 100 words] **B.11**

 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. **A.1**  
People's income needs in retirement generally fall as they age. [...+35 words]  
[URL]

 Very interesting. I'll give a  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] **A.2**

 [DeltaBot] Confirmed: 1 delta awarded to  **A.3**

 Then your back to needing actuaries, to predict [...+11 words] **A.4**

 Depends how exact you need to be [...+33 words] **A.5**

# Root Reply

## Original post

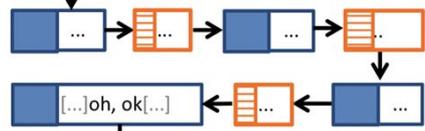
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**A.2**  
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**A.3**  
[DeltaBot] Confirmed: 1 delta awarded to [red]

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# Subtree

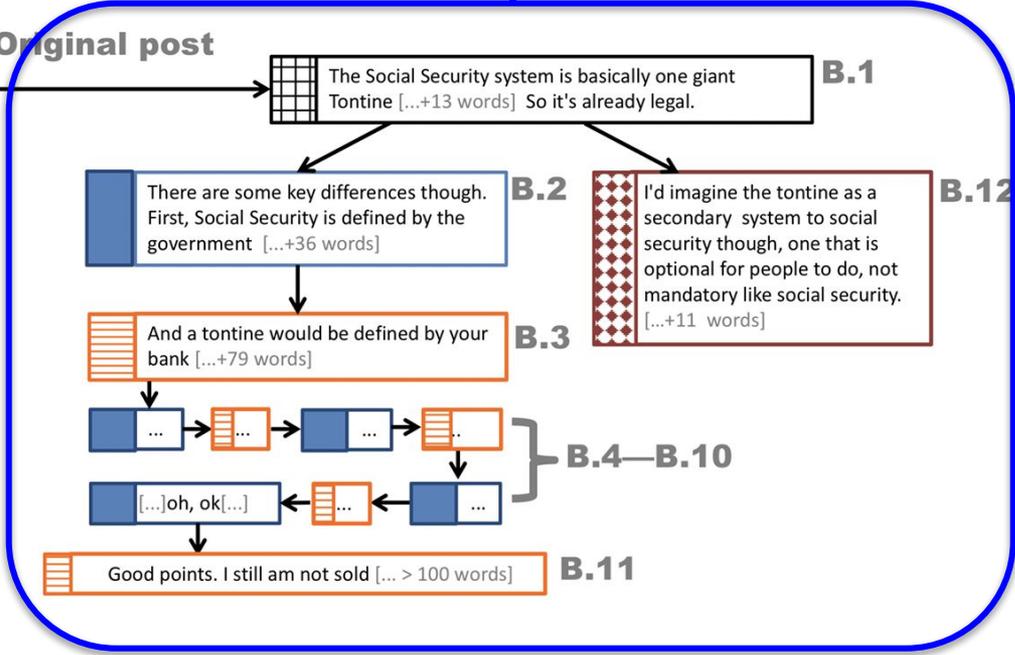
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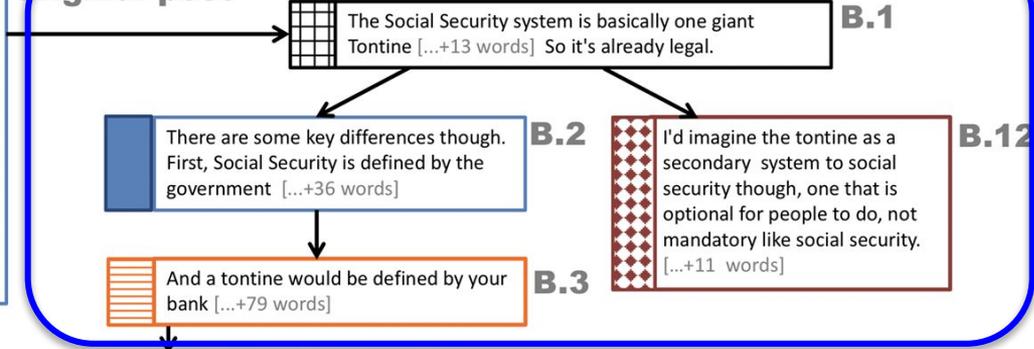
**A.4**  
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Depends how exact you need to be [...+33 words]

# Path

## Original post

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People's income needs in retirement generally fall as they age.  
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Very interesting. I'll give a  $\Delta$  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]

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**A.4**  
Then your back to needing actuaries, to predict [...+11 words]

**A.5**  
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# Successful Argument

*Is delta  $\Delta$  a good proxy for success of arguments?*

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# Original opinion Argument

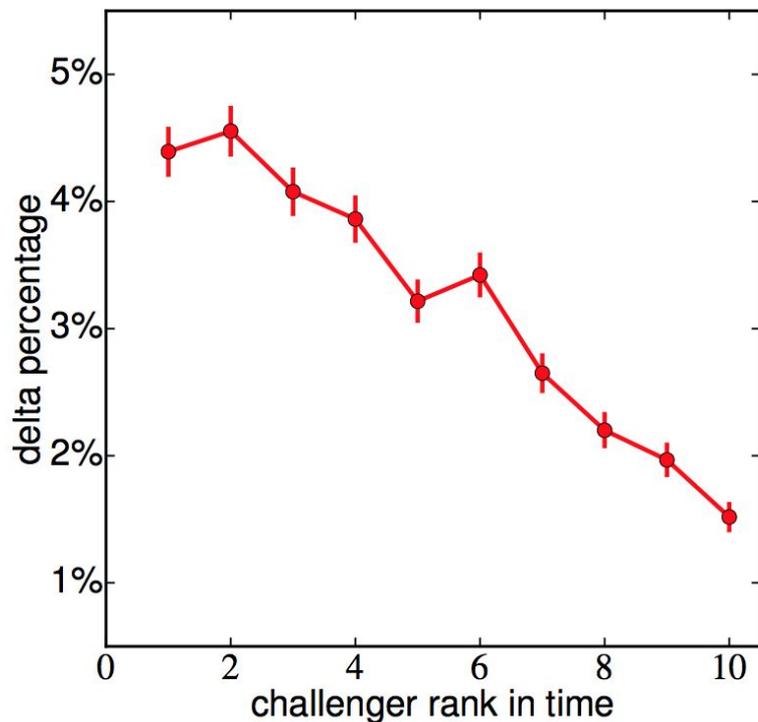
## Interaction dynamics

- The entry time of the challenger
- The number of back-and-forth exchanges
- The number of challengers
- ...

# Discussion Questions

- What are the benefits and drawbacks of using CMV?
- What other platforms/datasets do you think would be interesting to study persuasion?
- Why is it important to study persuasion?

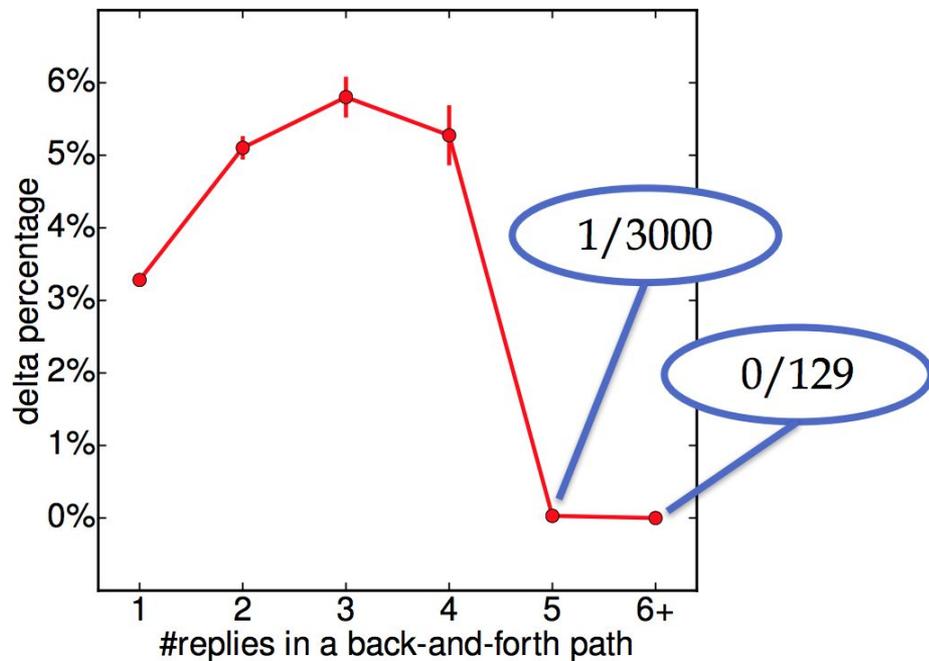
# Interaction Dynamics (1): Challengers' Entry Time



*Early entry is more likely to win a delta.*

Delta percentage is the fraction of discussion trees in which the OP awarded a delta

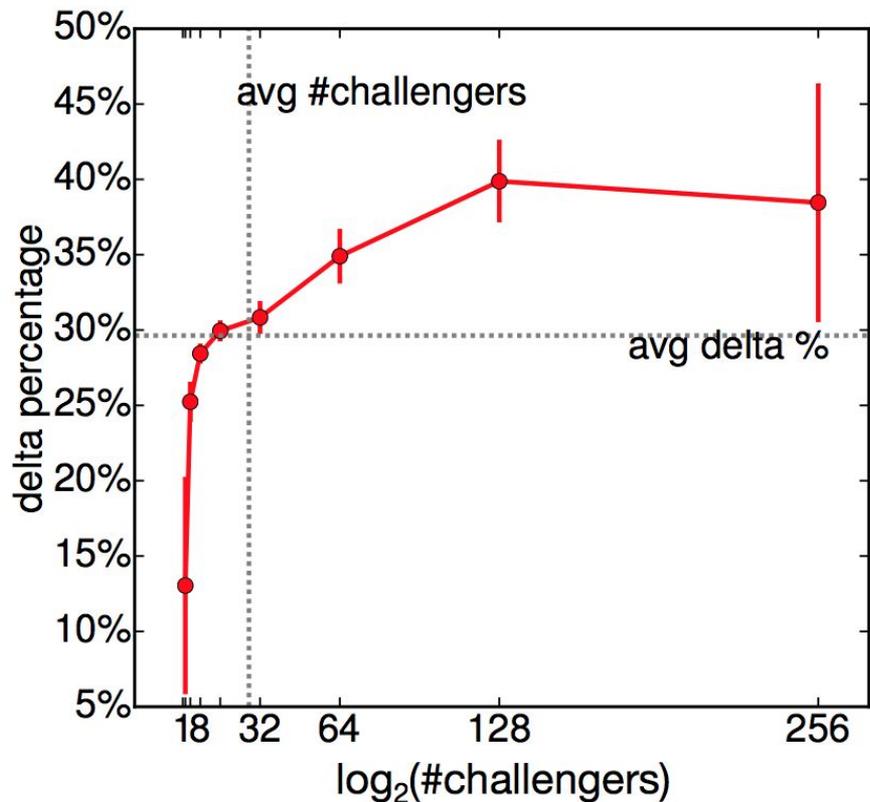
## Interaction Dynamics (2): Back and Forth Exchange



*Non-monotonic relation*

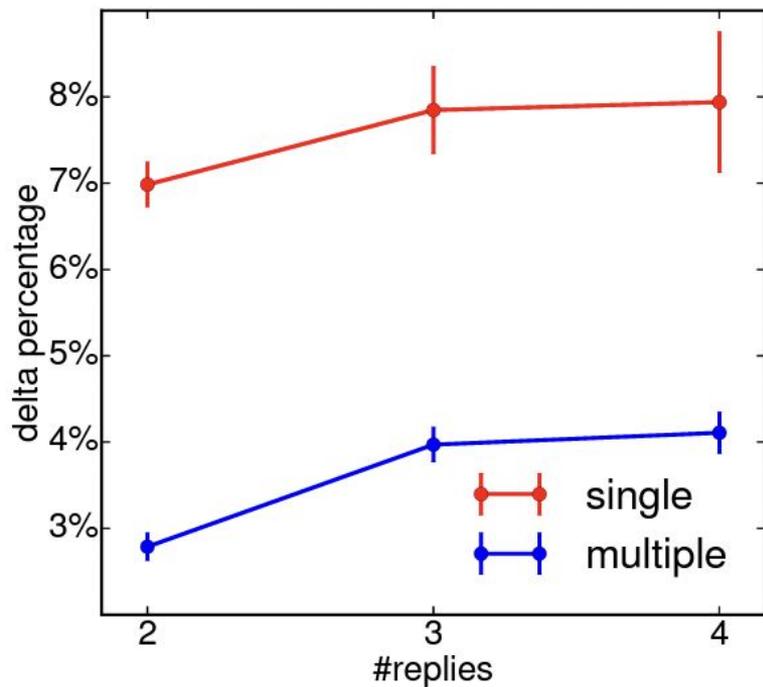
*Too much engagement can indicate futile insistence*

## Interaction Dynamics (3): The Number of Challengers



*OP's conversion increases with the number of unique challengers*

# Sheer number of challengers or diversity of counterarguments?



*Controlling for the number of replies, single-challenger subtrees consistently outperform multi-challenger subtrees in terms of conversion rates*

# Discussion Question

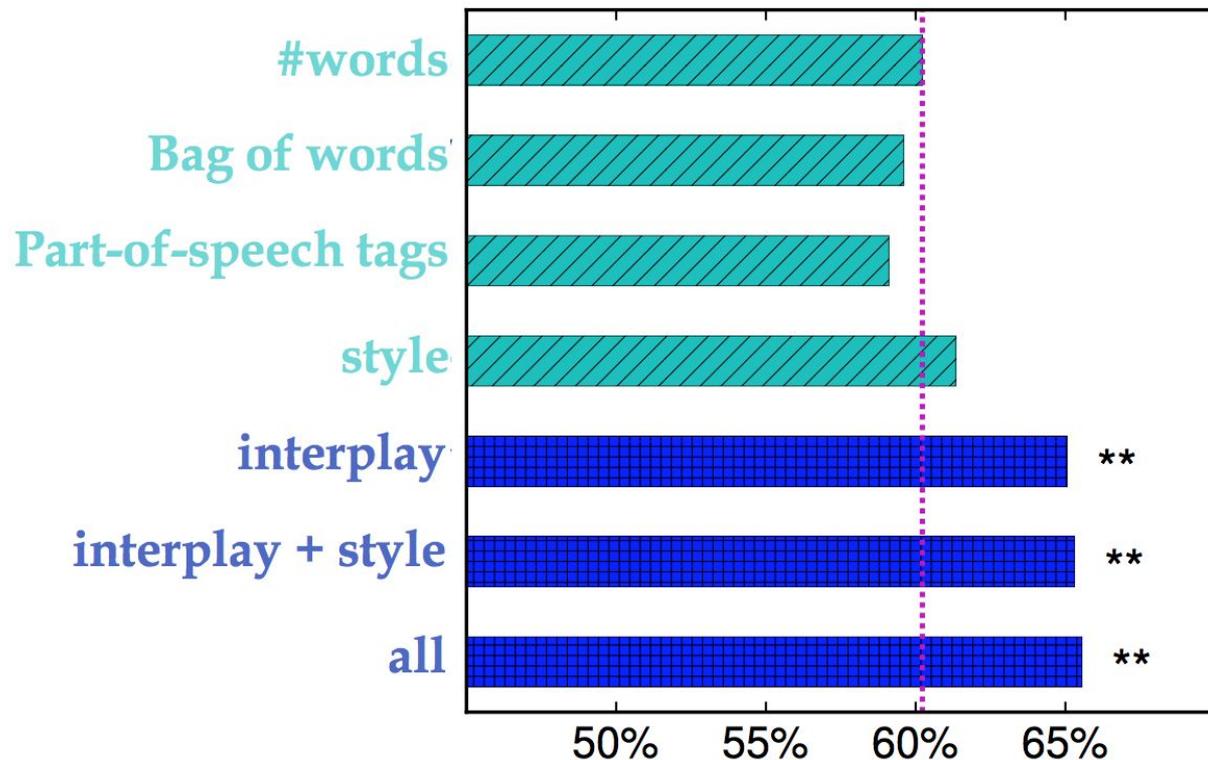
- Are these findings unique to CMV? If not, what can these findings tell us about persuasion online?
- Extension: what ties could these findings have to mis- and disinformation campaigns?

**Original opinion**  **Effective Argument**  
**Argument**  
**Ineffective Argument**

Stylistic choices in arguments

- Variations of setup
  - Root reply: only use a challenger's opening argument in a rooted path-unit
  - Full path: consider the text in all replies within a rooted path-unit
  - Truncated: forcefully remove all length effects since length can be predictive

# Predicting the Effectiveness of Root Replies



# Root Replies Interplay with Original Post

	Effective?
Jaccard similarity in <b>content words</b>	 (p < 0.0001)
Jaccard similarity in <b>stopwords</b>	 (p < 0.0001)

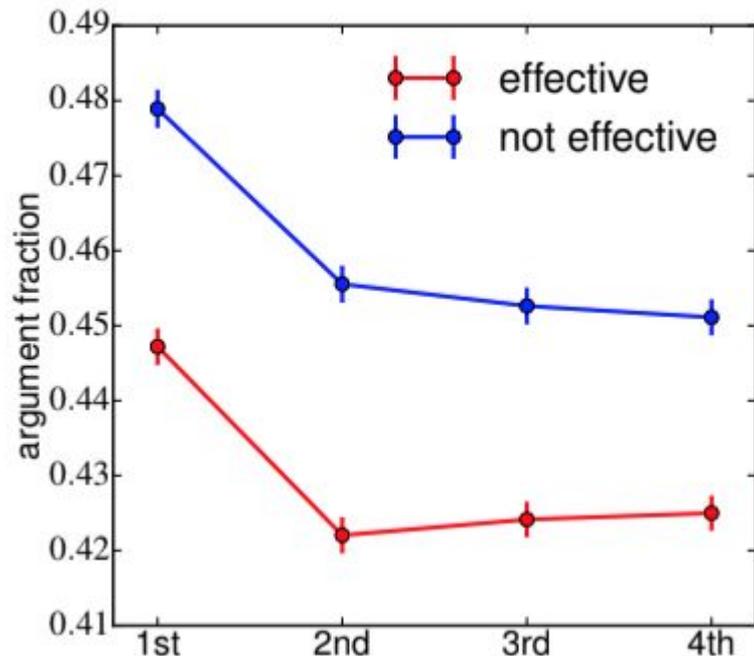
*Successful arguments are less similar to the original post in content words*

# Argument-only features - do they make intuitive sense?

Feature name	<i>root reply</i>	<i>full path</i>
#words	↑↑↑↑	↑↑↑↑
<b>Word category-based features</b>		
#definite articles	↑↑↑↑	↑↑↑↑
#indefinite articles	↑↑↑↑	↑↑↑↑
#positive words	↑↑↑↑ ( $T^R$ )	↑↑↑↑
#2 <sup>nd</sup> person pronoun	↑↑↑↑	↑↑↑↑
#links	↑↑↑↑ ( $T$ )	↑↑↑↑
#negative words	↑↑↑↑	↑↑↑↑
#hedges	↑↑↑↑	↑↑↑↑
#1 <sup>st</sup> person pronouns	↑↑↑↑	↑↑↑↑
#1 <sup>st</sup> person plural pronoun	↑↑↑↑	↑↑↑↑
#.com links	↑↑↑↑ ( $T$ )	↑↑↑↑
frac. links	↑↑↑↑ ( $T$ )	↑↑↑↑
frac. .com links	↑↑↑↑ ( $T$ )	↑↑↑↑
#examples	↑	↑↑↑↑
frac. definite articles	↑ ( $T$ )	↑↑
#question marks	↑ —	↑↑↑↑
#PDF links	↑	↑↑↑
#.edu links		↑
frac. positive words	↓	
frac. question marks	—	↓
#quotations		↑↑↑↑

Feature name	<i>root reply</i>	<i>full path</i>
<b>Word score-based features</b>		
arousal	↓ ( $T$ )	↓↓↓
valence	↓	
<b>Entire argument features</b>		
word entropy	↑↑↑↑	↑↑↑↑
#sentences	↑↑↑↑ —	↑↑↑↑
type-token ratio	↓↓↓↓ ( $T^R$ )	↓↓↓↓
#paragraphs	↑↑↑↑ —	↑↑↑↑
Flesch-Kincaid grade levels	—	↓↓↓
<b>Markdown formatting</b>		
#italics	↑↑↑↑ —	↑↑↑↑
bullet list	↑↑↑↑ —	↑↑↑↑
#bolds	↑↑ —	↑↑↑↑
numbered words	↑	↑↑↑↑
frac. italics	↑ —	↑

# Language Indications of Persuasive Arguments



Similarity between each quarter of an argument and the entire original post

*Both effective and ineffective arguments start off more similar with the OP*

*effective arguments remain less similar overall*

# Discussion Question

- Which additional features would you have included?
- What other methods and tools could the researchers have used to better understand the effectiveness of persuasion?

# Malleability of the Original Opinion

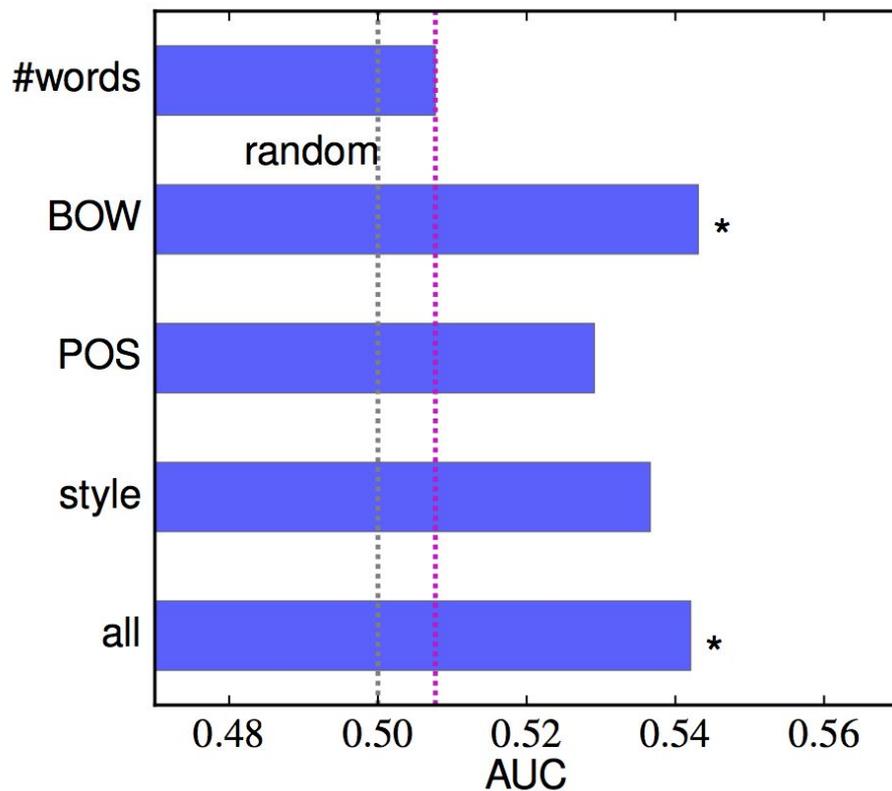
**Original opinion**  **Argument**

Resistance to Persuasion

Original opinion features

- Stylistic features
- BoW
- POS tags

# Predicting the Malleability of the Original Opinion



A harder task

# Predicting the Malleability of the Original Opinion

*I* think that there should not be speed limit

*We* think that there should not be speed limit

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	Malleable?
First person <b>singular</b> pronoun	 (p < 0.0001)
First person <b>plural</b> pronoun	 (p < 0.01)

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# Predicting the Malleability of the Original Opinion

Feature name	More malleable?
#1 <sup>st</sup> person pronouns	↑↑↑↑
frac. 1 <sup>st</sup> person pronoun	↑↑↑↑
dominance	↑↑↑↑
frac. 1 <sup>st</sup> person plural pronoun	↓↓↓
#paragraphs	↑↑
#1 <sup>st</sup> person plural pronoun	↓↓
#bolds	↑
arousal	↓
valence	↑
bullet list	↑

# Discussion Questions

- Why does the malleability of original opinion matter?
- How could these findings help us design better and safer platforms?
- There have been significant breakthroughs in NLP during the past few years. How would you do the analysis today with the powerful deep learning methods at your disposal? Would you be concerned about the interpretability of the results?