Opinion Malleability in r/changemyview

Julian McClellan

Social Science Division | Computational Social Science

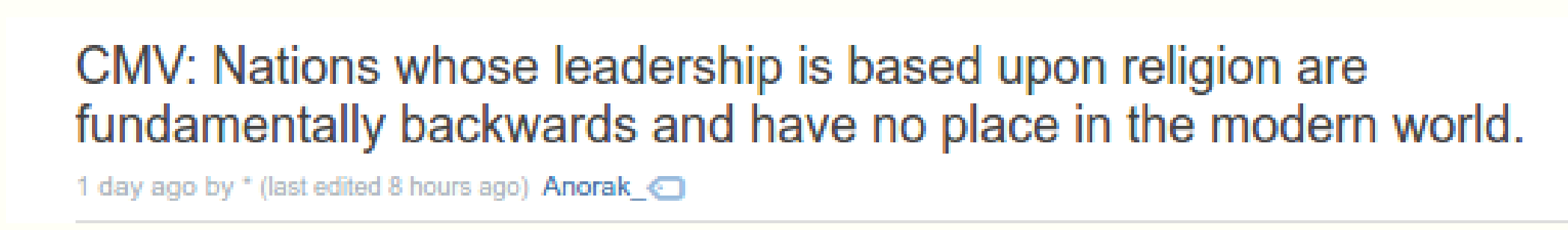## Background
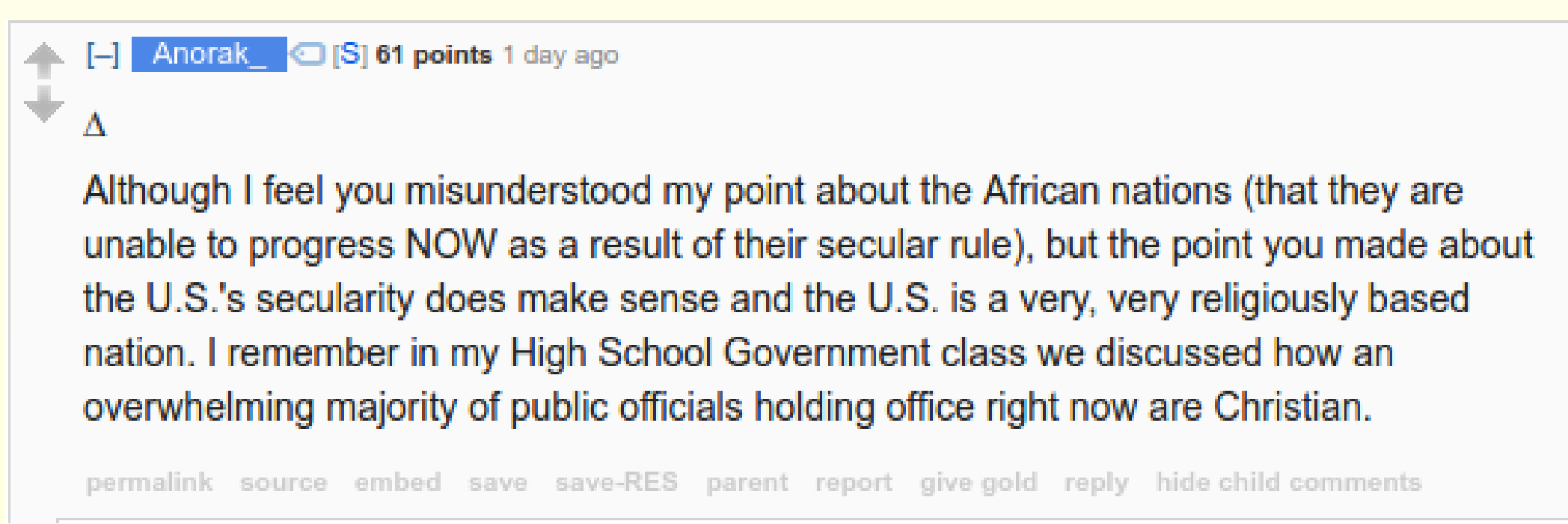
- r/changemyview is a subreddit where the original posters (OPs) typically submit opinions (with supporting reasoning):

  CMV: Nations whose leadership is based upon religion are fundamentally backwards and have no place in the modern world.
  1 day ago by * (last edited 8 hours ago) Anorak_

- Other Reddit users then attempt to change the view of the OP.

- The OP is free to interact with the responses, and if they decide a comment has changed their opinion, they can award a "Δ" (delta) with a brief explanation:

  Anorak [S] 61 points 1 day ago
  Δ
  Although I feel you misunderstood my point about the African nations (that they are unable to progress NOW as a result of their secular rule), but the point you made about the U.S.'s secularity does make sense and the U.S. is a very, very religiously based nation. I remember in my High School Government class we discussed how an overwhelming majority of public officials holding office right now are Christian.
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- The accurate identification of changed and stable opinions can assist in the study of properties of *opinions* and *authors* that are more malleable and open minded, respectively.

Specific Aims

Utilize an author's past submission history and other *a priori* information, i.e. only information available at the moment an opinion is posted to:

- Determine how accurately opinion malleability can be predicted before any interaction takes place.

- Discover what the properties of malleable opinions and open-minded authors are.

- Extend self-affirmation theory to "older" experiences.

Methods

- Feature Engineering:

  - Valence Aware Dictionary and Sentiment Reasoner (VADER) for sentiment analysis

  - Flat Topic Clustering (k=10)

  - Evidence of self-affirmation:

    - First person pronouns (singular and plural)

    - Submission Scores

  - Miscellaneous Submission History

    - "Average" Statistics

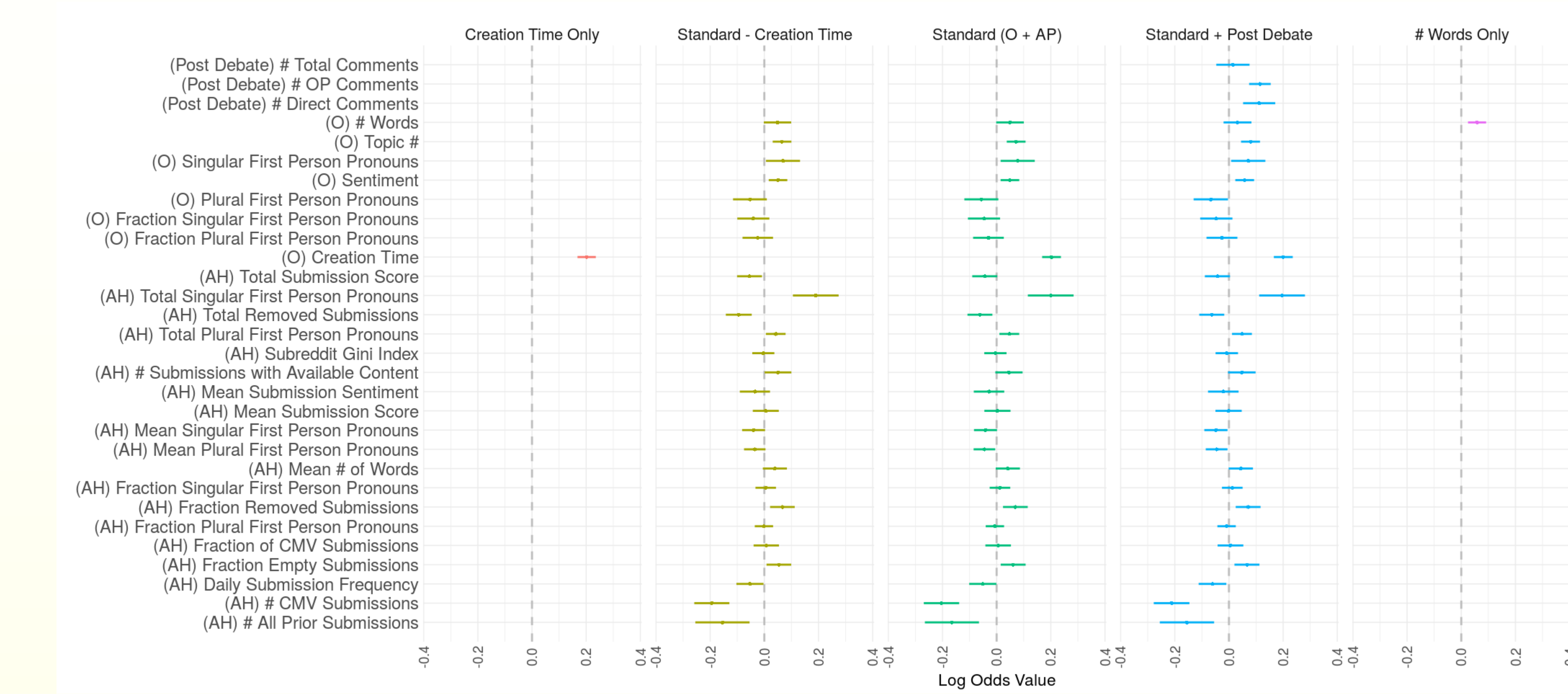   - "Lifetime" Statistics

- Prediction:

  - Weighted Logistic Regression

    - 20 repeats 10-fold cross-validation per model

Data

- The data encompasses the *earliest* r/changemyview submission from each unique author in 2016, as well as that author's entire submission history, for a total of 3,622 submissions/authors.
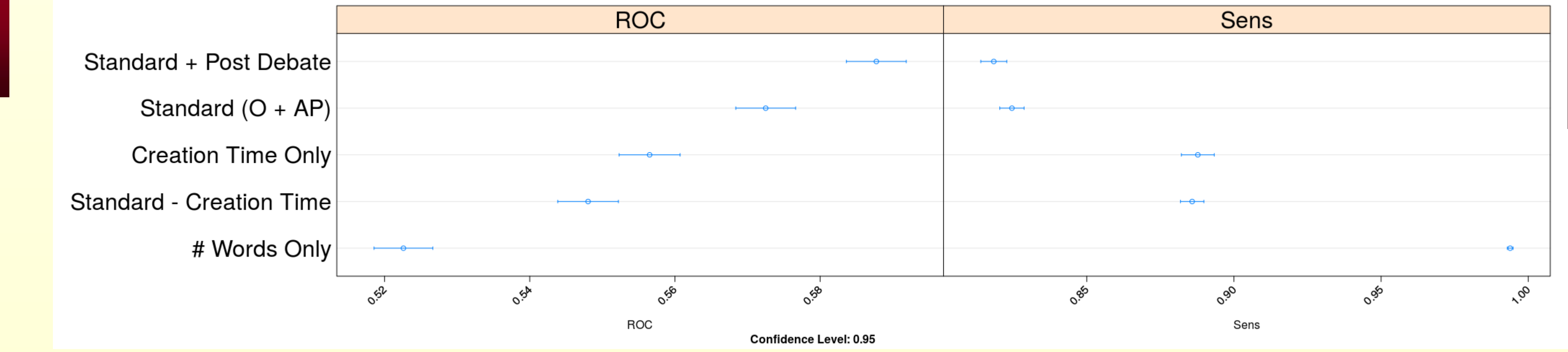
2016 r/changemyview Unique Author Opinion Features

Statistic	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
(O) Creation Time	16,975.5	105.0	16,801.3	16,883.0	17,066.8	17,166.0
(Post Debate) # OP Comments	13.1	15.2	0	4	16	274
(Post Debate) # Direct Comments	13.2	14.2	0	6	15	224
(Post Debate) # Total Comments	130.0	233.0	0	34	129	4,903
(O) Plural First Person Pronouns	1.8	3.3	0	0	2	43
(O) Fraction Plural First Person Pronouns	0.005	0.01	0.0	0.0	0.01	0.1
(O) Singular First Person Pronouns	1.1	2.0	0	0	1	26
(O) Fraction Singular First Person Pronouns	0.003	0.01	0.0	0.0	0.005	0.1
(O) # Words	368.1	294.4	1	180	457	3,785
(O) Sentiment	0.2	0.8	−1.0	−0.9	1.0	1.0
(O) Topic #	6.9	2.9	0	4	9	9
(AH) # All Prior Submissions	107.9	171.0	1	14	124	1,804
(AH) Mean Submission Score	52.4	169.8	0.0	7.0	41.5	5,271.2
(AH) Subreddit Gini Index	0.4	0.2	0.0	0.2	0.5	0.9
(AH) Fraction Removed Submissions	0.1	0.1	0.0	0.02	0.1	0.8
(AH) Fraction Empty Submissions	0.4	0.2	0.0	0.2	0.6	1.0
(AH) Mean Submission Sentiment	0.1	0.2	−1.0	0.04	0.2	1.0
(AH) Daily Submission Frequency	0.03	0.2	0.0	0.000	0.005	7.7
(AH) Number of CMV Submissions	1.1	4.0	0	0	1	91
(AH) Fraction of CMV Submissions	0.03	0.1	0.0	0.0	0.01	1.0
(AH) Mean Singular First Person Pronouns	0.9	1.9	0.0	0.2	1.0	80.0
(AH) Fraction Singular First Person Pronouns	0.01	0.01	0.0	0.002	0.01	0.1
(AH) Mean Plural First Person Pronouns	0.6	1.3	0.0	0.1	0.7	24.0
(AH) Fraction Plural First Person Pronouns	0.003	0.004	0.0	0.001	0.004	0.1
(AH) # Submissions with Available Content	50.9	84.8	1	7	58	1,096
(AH) Mean Number of Words	159.8	152.3	1	79.8	190.6	3,464.0

Results
(A)uthor (H)istory, (O)pinion, and Post Debate Features

- The creation time of an opinion is a relatively strong predictor, even on its own.

- Other significant features include some of self-affirmation features like total first person singular/plural pronouns in the author's submission history and current post, as well as Reddit specific features.

- Despite the high sensitivity for detecting unstable opinions, detecting opinion malleability is still a difficult task.

Filtering Process | Missing Data

- There were actually 5,311 opinions posted in 2016.

  - Only the first submission an author made are included to reduce collinearity.

  - Authors with no previous submission history are omitted as well.

- Some submissions may have been removed or deleted by their authors or moderators.

  - These instances are tracked.

Conclusion

- Importance of the scant self-affirmation features and other aspects of Reddit history motivate the inclusion of some more nuanced variables describing author history:

  ➢ Comments and the sentiment and scores of their contexts

  ➢ Factors for specific subreddit participation effects

Limitations

- Submissions are limited to 2016.

- Authors have the ability to remove the content of their previous submissions.

- Use of throwaway accounts either obfuscates or negates the ability to analyze author history.

- Past comments not included.

Browse r/changemyview

Explore Submissions and Authors

References

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