Political Polarization and Public Opinion in 2016 US Presidential Election

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January 23, 2019

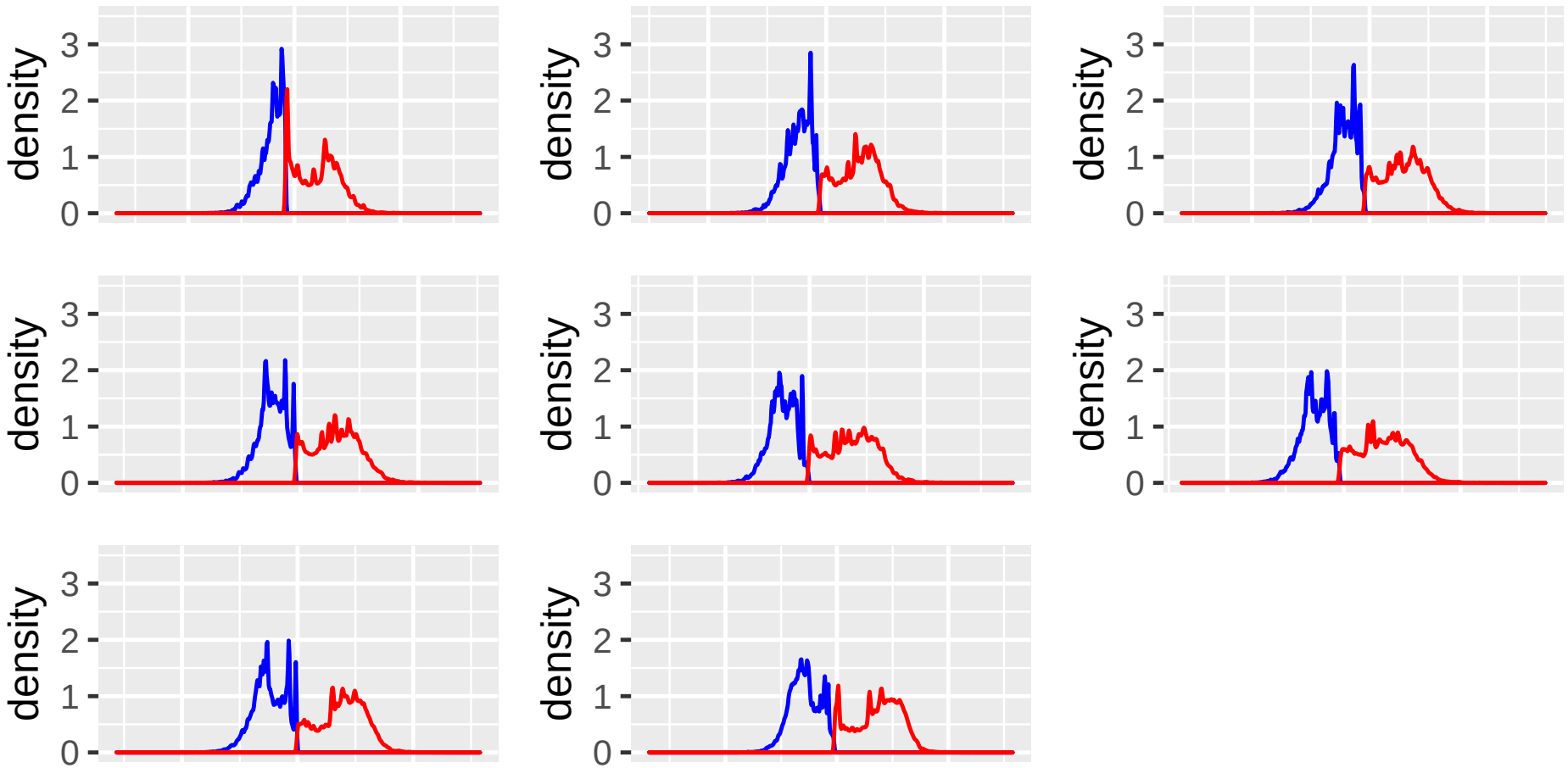
Outline

Ideology Segregation

- Previous Measure: Mean difference
- Problem: Data skewness
- Check skewness and median difference.

Ideology Segregation

Figure 1: Ideology Distribution



Ideology Segregation

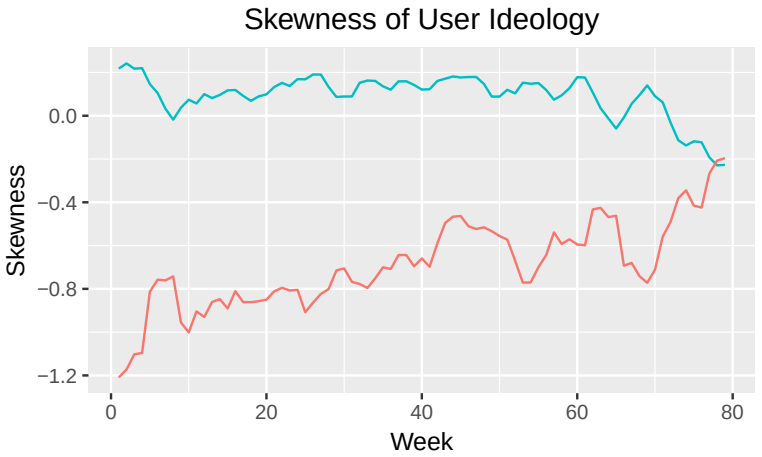


Figure 2: Skewness of Trump and Clinton's Supporters

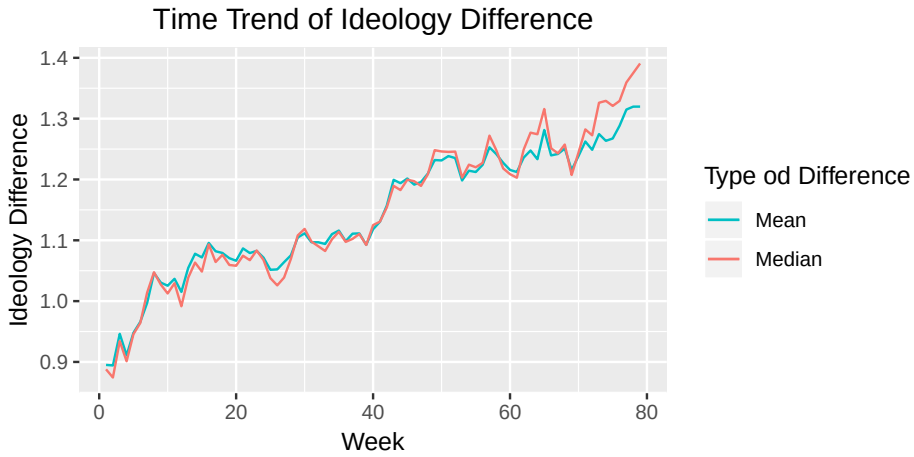


Figure 3: Ideology Segregation

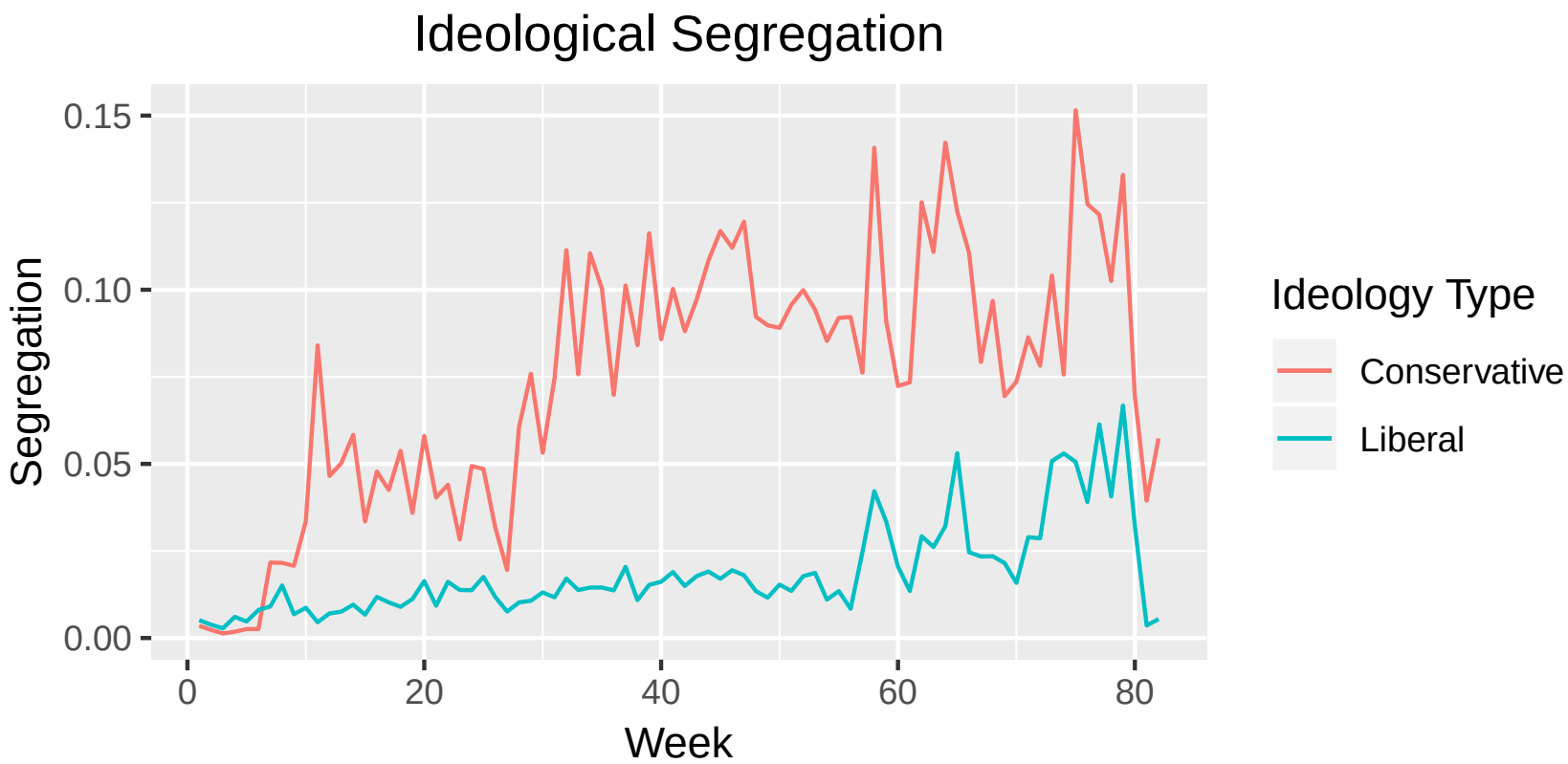
Ideology Segregation

- Following Gentzkow and Shapiro's(2010) index
- Formula:

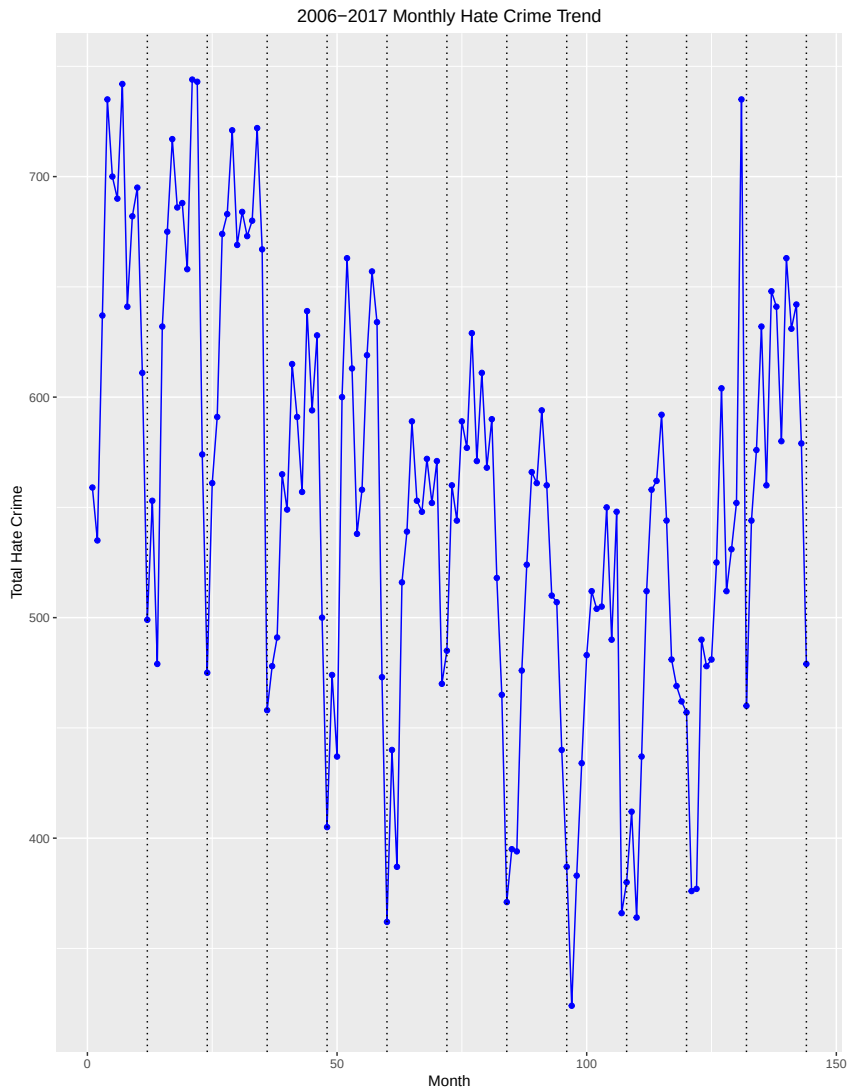
$$S_{Trump} = \frac{cons_{trump}}{cons_{all}} \cdot \frac{cons_{all}}{visit_{all}} - \frac{lib_{trump}}{lib_{all}} \cdot \frac{cons_{all}}{visit_{all}} \tag{1}$$

- Conservative and Liberals are defined by user's candidate leaning.
- To do: Mainstream Media

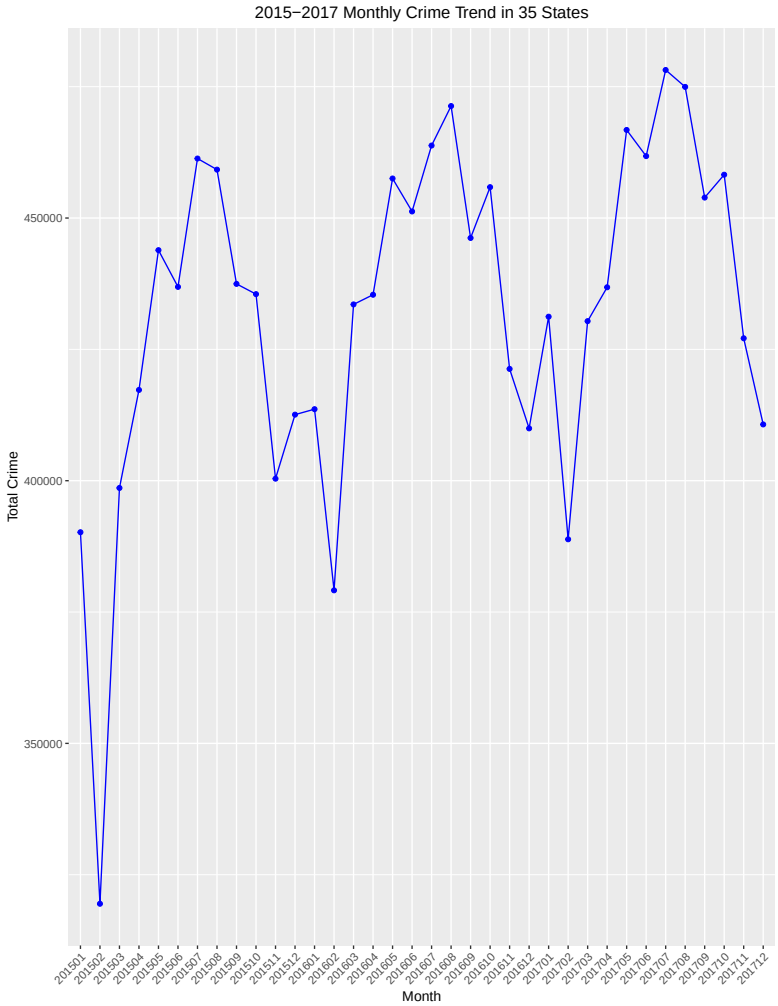
Ideology Segregation

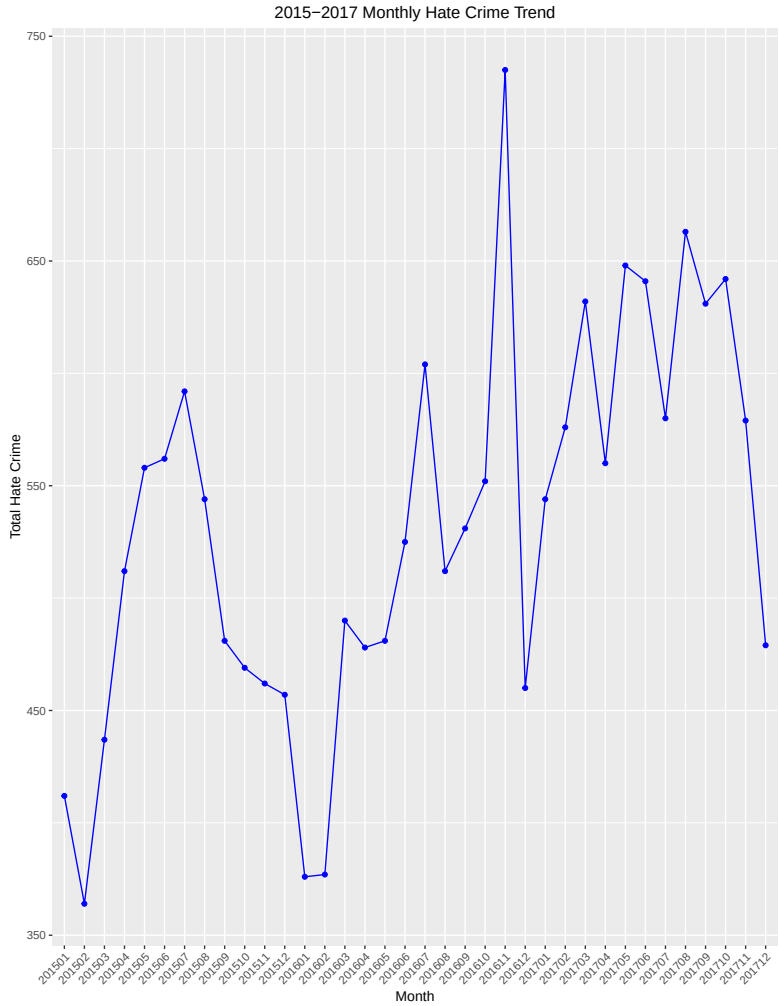


Hate Crime

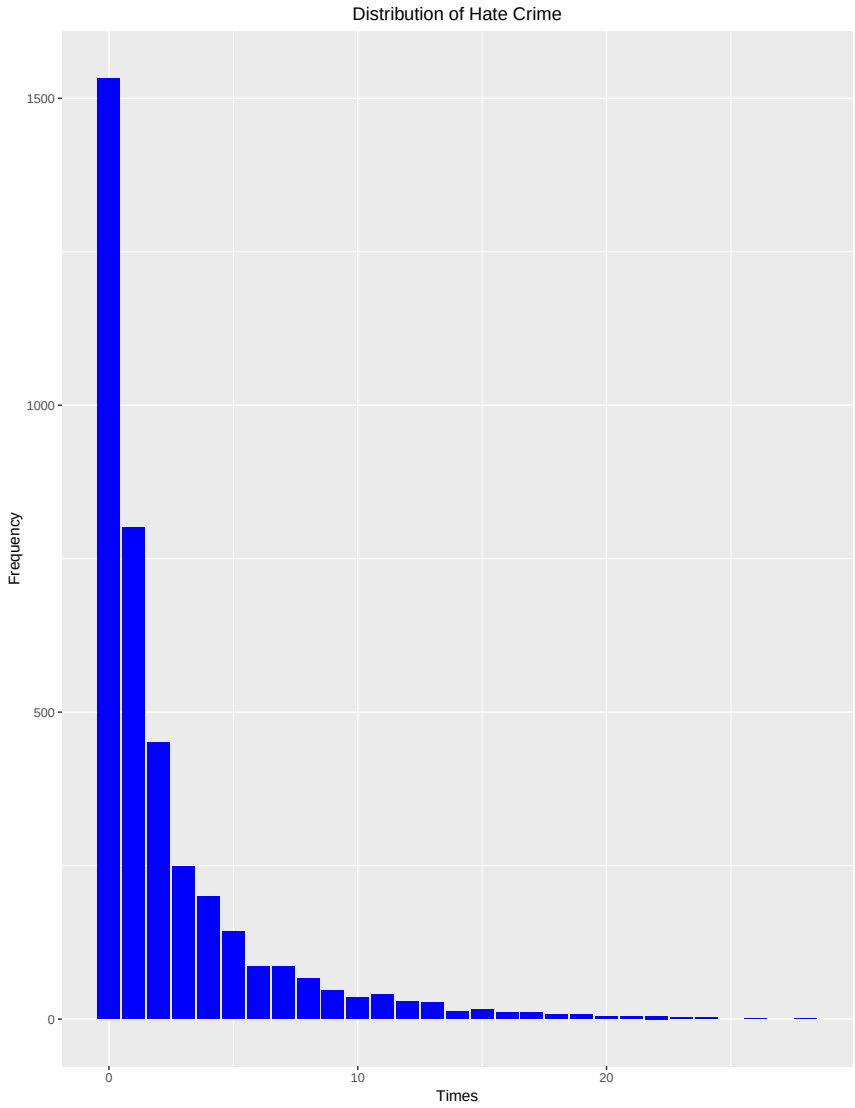

2006−2017 Monthly Hate Crime Trend
Total Hate Crime
700
600
500
400
0
50
100
150
Month

Crime Data

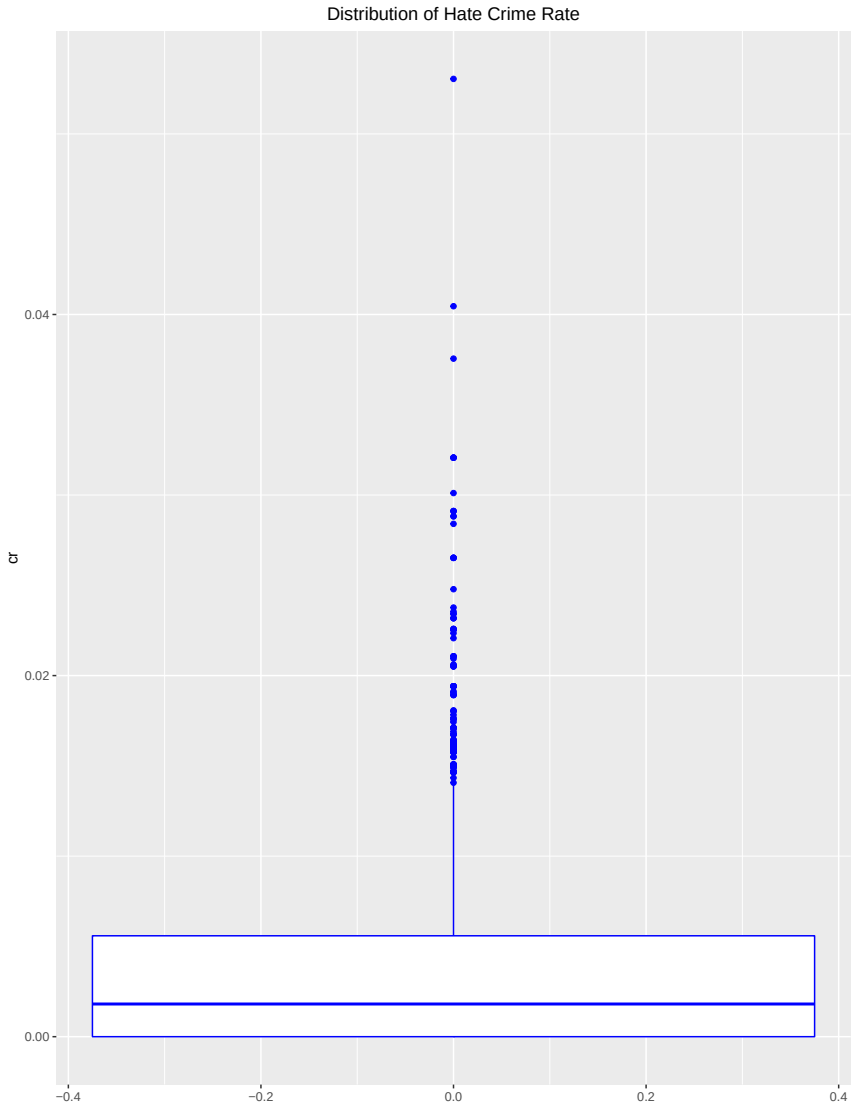

2015−2017 Monthly Crime Trend in 35 States
Total Crime
450000
400000
350000
Month


2015−2017 Monthly Hate Crime Trend
Total Hate Crime
750
650
550
450
350
Month

Summary Statistics



Summary Statistics



Regression

- Regression on Number of Crimes:

$$y_{it} = segregation_{it} + state_i + week_t + candidate_{it} + population_{it} + e_{it} \quad (2)$$

- Regression on Crime Rate:

$$y_{it} = segregation_{it} + state_i + week_t + candidate_{it} + e_{it} \quad (3)$$

Regression

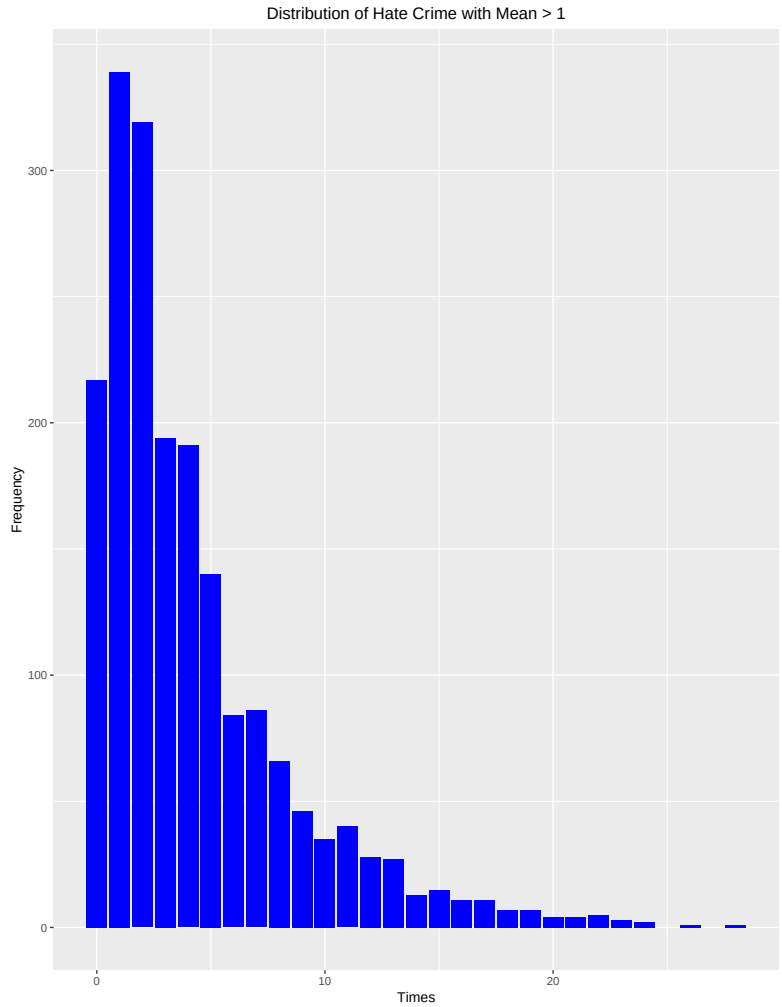
Table 1: Regression

	Crime	Crime Rate	Racial Crime	Racial Crime Rate
OLS	0.81	0.001	0.68	0.001
	(0.80)	(0.003)	(0.65)	(0.002)
Poisson	0.37*		0.51*	
	(0.21)		(0.28)	
Weighted OLS	1.93**	0.001	1.36	0.001
	(0.96)	(0.001)	(0.82)	(0.001)
States	49	49	49	49

Sample Selection

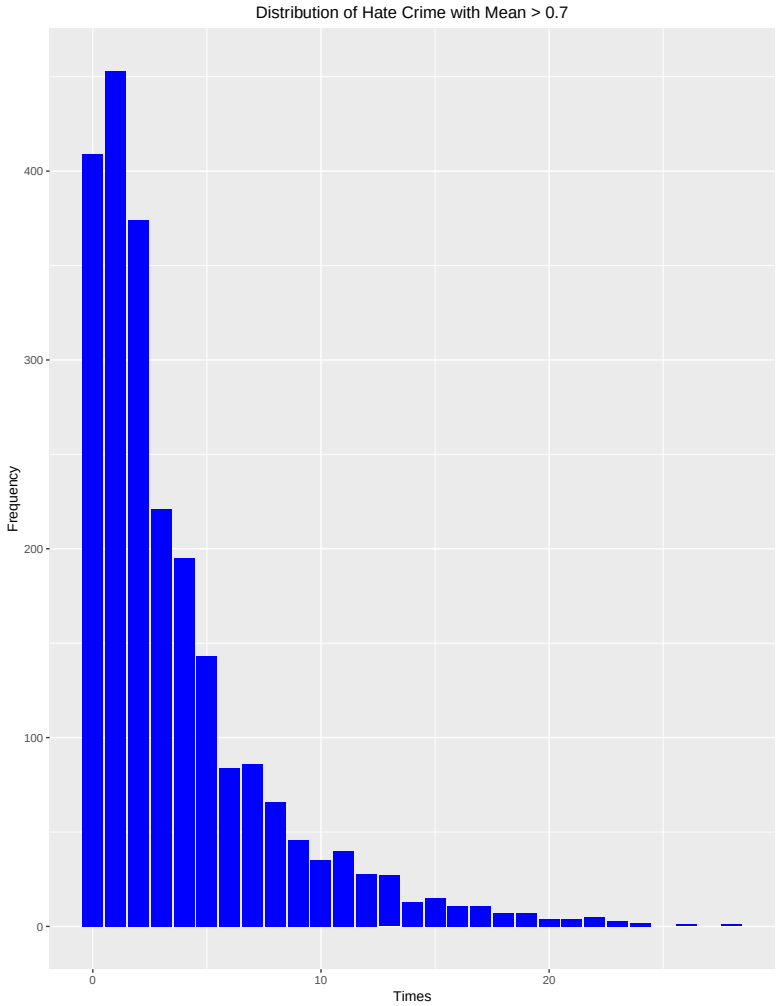
- There exists some states that hate crime rarely happens.
- Drop those states with low variation while maintaining the representative of our data.

Sample Selection (mean > 1)



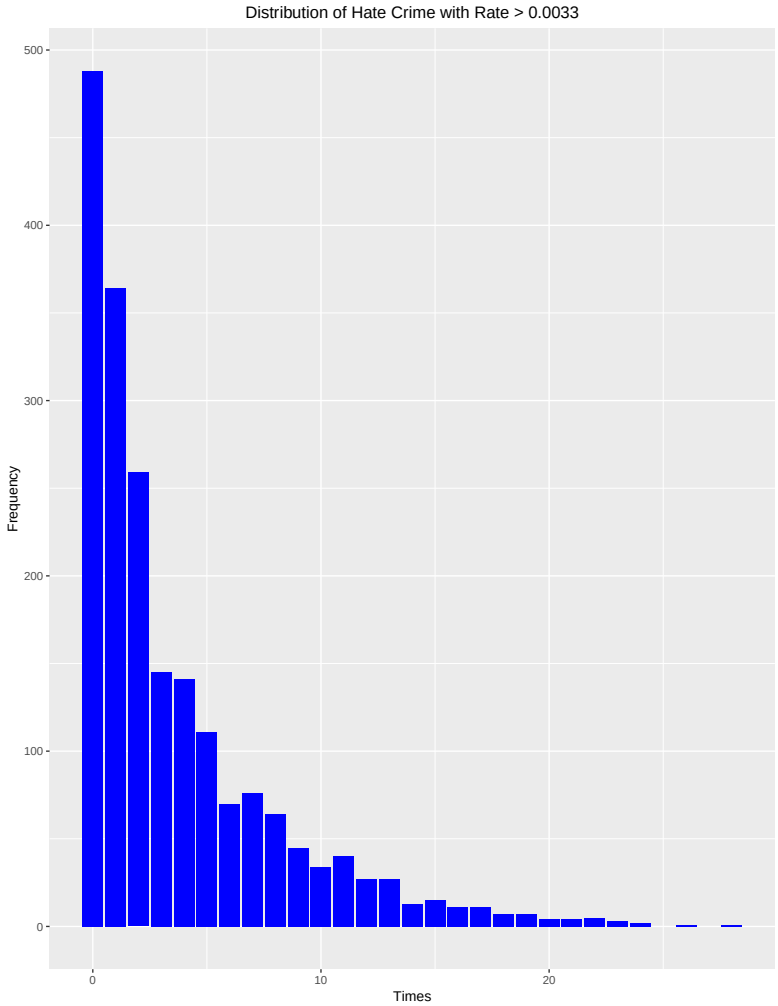
state_name	Freq.	Percent	Cum.
Alabama	79	4.17	4.17
Alaska	79	4.17	8.33
Arkansas	79	4.17	12.50
Delaware	79	4.17	16.67
Georgia	79	4.17	20.83
Idaho	79	4.17	25.00
Iowa	79	4.17	29.17
Louisiana	79	4.17	33.33
Maine	79	4.17	37.50
Maryland	79	4.17	41.67
Mississippi	79	4.17	45.83
Montana	79	4.17	50.00
Nebraska	79	4.17	54.17
New Hampshire	79	4.17	58.33
New Mexico	79	4.17	62.50
North Dakota	79	4.17	66.67
Oklahoma	79	4.17	70.83
Rhode Island	79	4.17	75.00
South Carolina	79	4.17	79.17
South Dakota	79	4.17	83.33
Vermont	79	4.17	87.50
West Virginia	79	4.17	91.67
Wisconsin	79	4.17	95.83
Wyoming	79	4.17	100.00
Total	1,896	100.00	

Sample Selection (mean > 0.7)



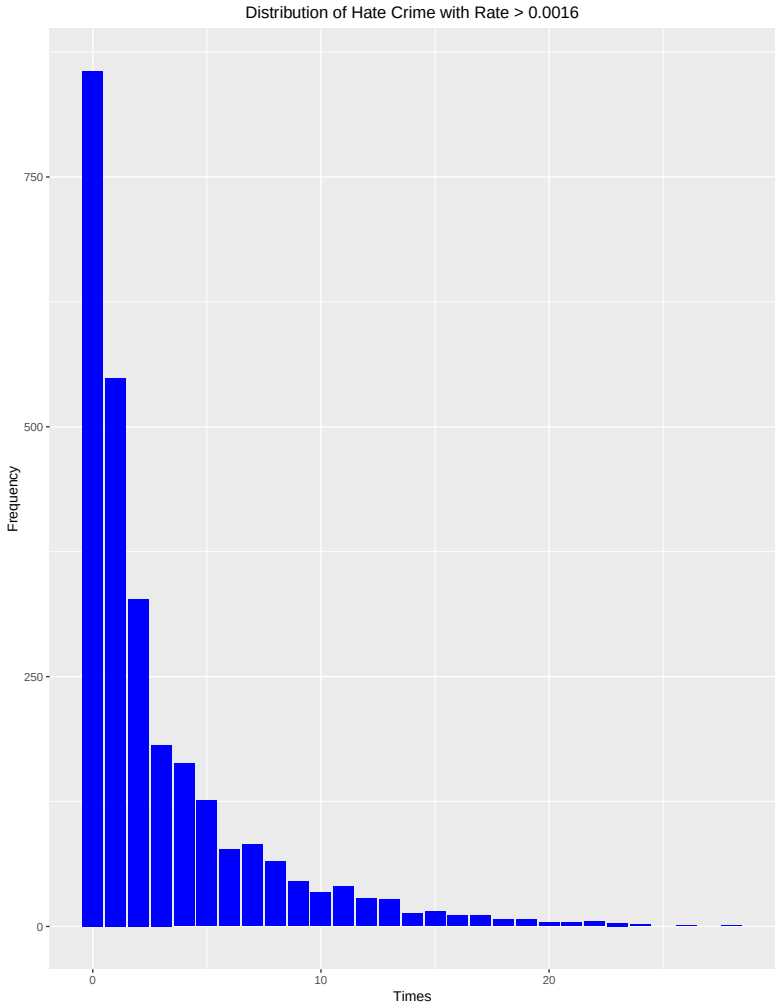
state_name	Freq.	Percent	Cum.
Alabama	79	5.00	5.00
Alaska	79	5.00	10.00
Arkansas	79	5.00	15.00
Delaware	79	5.00	20.00
Idaho	79	5.00	25.00
Iowa	79	5.00	30.00
Louisiana	79	5.00	35.00
Maryland	79	5.00	40.00
Mississippi	79	5.00	45.00
Montana	79	5.00	50.00
Nebraska	79	5.00	55.00
New Hampshire	79	5.00	60.00
New Mexico	79	5.00	65.00
North Dakota	79	5.00	70.00
Oklahoma	79	5.00	75.00
Rhode Island	79	5.00	80.00
South Dakota	79	5.00	85.00
Vermont	79	5.00	90.00
Wisconsin	79	5.00	95.00
Wyoming	79	5.00	100.00
Total	1,580	100.00	

Sample Selection (rate $>$ 0.0033)



state_name	Freq.	Percent	Cum.
Alabama	1	3.57	3.57
Alaska	1	3.57	7.14
Arkansas	1	3.57	10.71
Connecticut	1	3.57	14.29
Florida	1	3.57	17.86
Georgia	1	3.57	21.43
Illinois	1	3.57	25.00
Indiana	1	3.57	28.57
Iowa	1	3.57	32.14
Louisiana	1	3.57	35.71
Maryland	1	3.57	39.29
Minnesota	1	3.57	42.86
Mississippi	1	3.57	46.43
Missouri	1	3.57	50.00
Montana	1	3.57	53.57
Nebraska	1	3.57	57.14
Nevada	1	3.57	60.71
New Hampshire	1	3.57	64.29
New Mexico	1	3.57	67.86
Oregon	1	3.57	71.43
Pennsylvania	1	3.57	75.00
South Carolina	1	3.57	78.57
Texas	1	3.57	82.14
Utah	1	3.57	85.71
Virginia	1	3.57	89.29
West Virginia	1	3.57	92.86
Wisconsin	1	3.57	96.43
Wyoming	1	3.57	100.00
Total	28	100.00	

Sample Selection (rate $>$ 0.0016)



state_name	Freq.	Percent	Cum.
Alabama	1	4.76	4.76
Alaska	1	4.76	9.52
Arkansas	1	4.76	14.29
Georgia	1	4.76	19.05
Illinois	1	4.76	23.81
Indiana	1	4.76	28.57
Iowa	1	4.76	33.33
Minnesota	1	4.76	38.10
Mississippi	1	4.76	42.86
Missouri	1	4.76	47.62
Montana	1	4.76	52.38
Nebraska	1	4.76	57.14
Nevada	1	4.76	61.90
New Hampshire	1	4.76	66.67
New Mexico	1	4.76	71.43
Pennsylvania	1	4.76	76.19
South Carolina	1	4.76	80.95
Utah	1	4.76	85.71
West Virginia	1	4.76	90.48
Wisconsin	1	4.76	95.24
Wyoming	1	4.76	100.00
Total	21	100.00	

Regression

Table 2: Regression on Crimes

	Mean > 1	Mean > 0.7	Rate > 0.0033	Rate > 0.0016
OLS	1.31	1.43	1.52	0.84
	(1.21)	(1.16)	(1.12)	(0.95)
Poisson	0.34	0.36*	0.45**	0.34
	(0.21)	(0.20)	(0.21)	(0.22)
Weighted OLS	2.40**	2.35**	2.56**	1.86
	(1.13)	(1.07)	(1.20)	(1.10)
States	24	29	25	34

Regression

Table 3: Regression on Crime Rate

	Mean > 1	Mean > 0.7	Rate > 0.0033	Rate > 0.0016
OLS	0.0001	0.0005	0.004	0.002
	(0.002)	(0.002)	(0.004)	(0.004)
Weighted OLS	0.0015	0.0015	0.0028**	0.0019
	(0.001)	(0.001)	(0.001)	(0.0012)
States	24	29	25	34

Discussion

- Hate crime is associated with high level of polarization
- Reverse Causality: Only Correlation
- Dark figure of crime:
  - Incident Reporting Data: Those not reported
  - The ratio of participating agency is 71%: Those location not included

Trump and Clinton's Followers

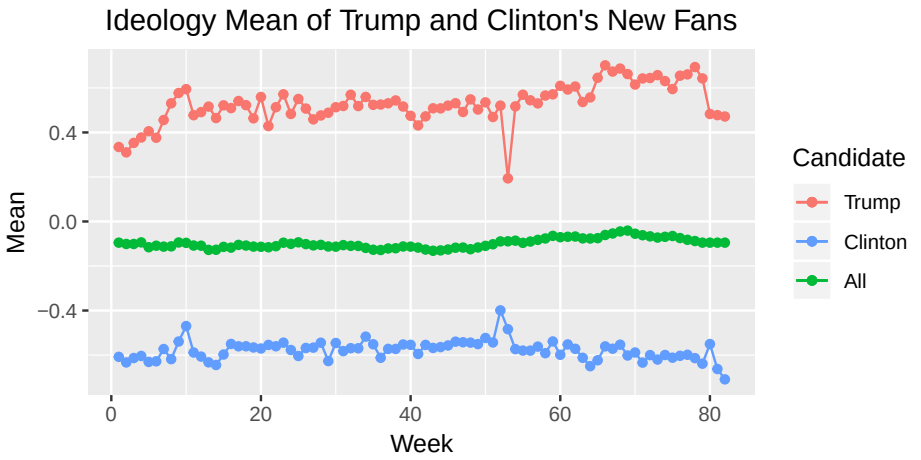


Figure 4: Time Trend of Ideology Mean

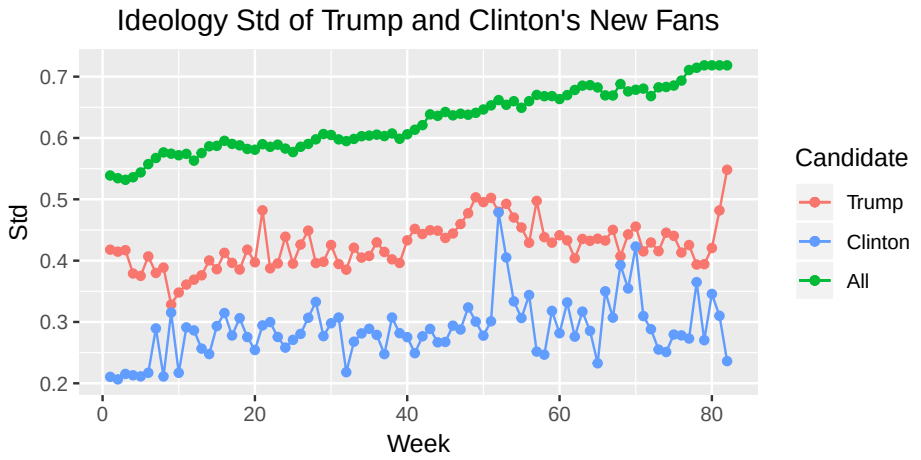
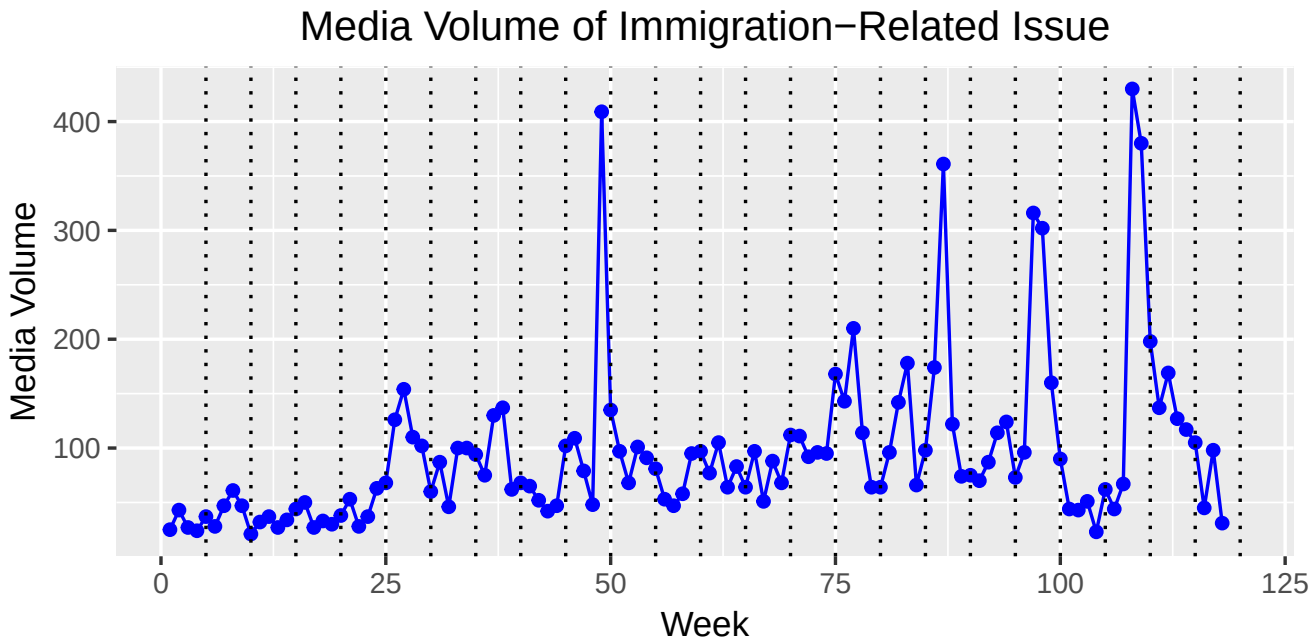


Figure 5: Time Trend of Ideology Std

Event Selection

- Select top 10 media in each category (TV, radio, newspaper, magazine)
- Using keyword combination to extract related posts.
- Define media volume as the amount of related posts posted by selected media pages.
- Select three events of each issue with the largest media volume.



Post Selection

- Goal: Select posts related to our main issues and events, and also identify whether they are related to Donald Trump.
- Method: Convolutional Neural Network Classifier (Yoon Kim, 2014)
  - Labeling: Label 500 posts each month for each issue.
  - Why CNN: Extracting implicit pattern.
  - Feature: Pre-trained word2vec on all posts containing "immigrant", "immigration" ,"Mexican", "Muslim"

Post Selection

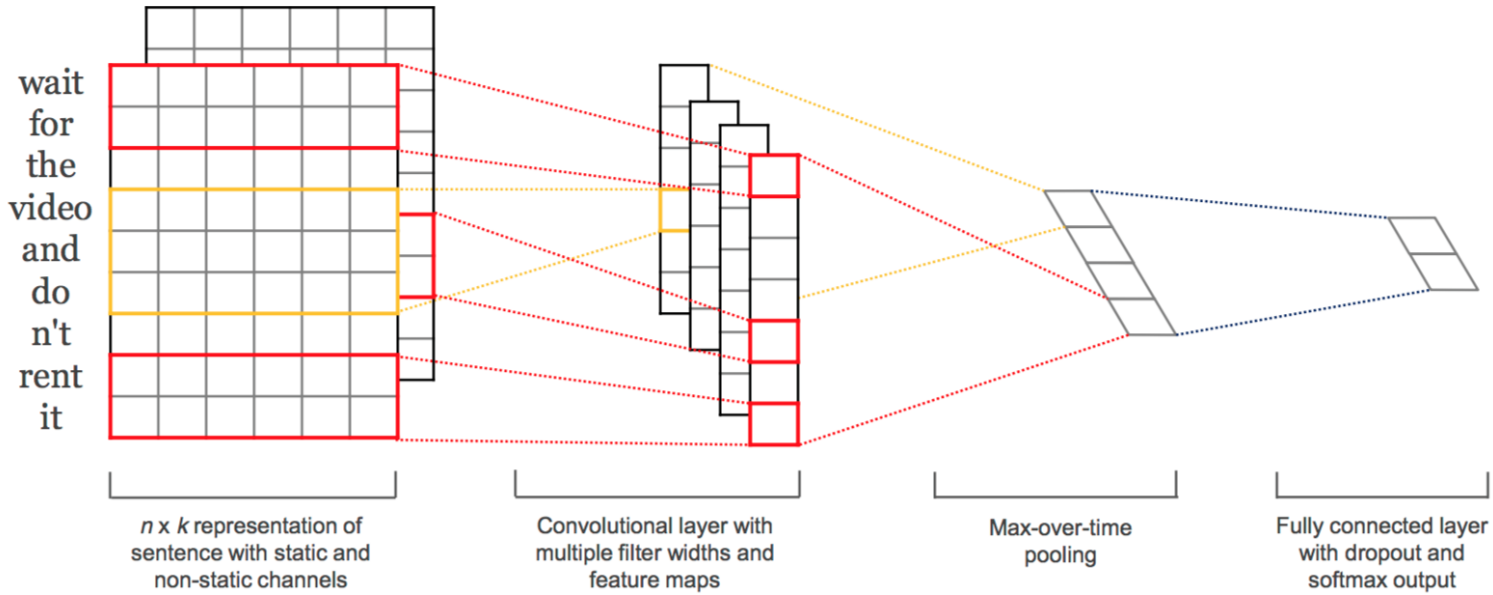


Figure 6: CNN Model Structure

Sentiment Analysis

- Goal: Identify the posts' sentiment toward targeted group/ Donald Trump.
- Method: LSTM Classifier
  - Labeling: Label 500 posts each month for each issue.
  - Why LSTM: Finding the pattern within the corpus.
  - Feature: Pre-trained word2vec on all selected posts in the previous section.

Sentiment Analysis

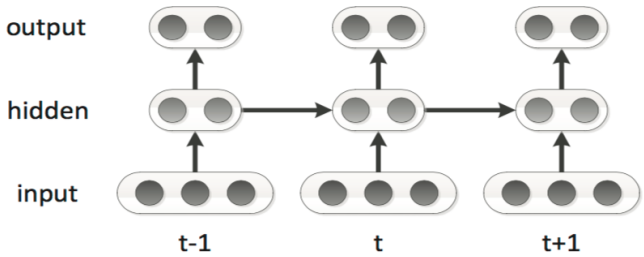


Figure 7: RNN Model Structure

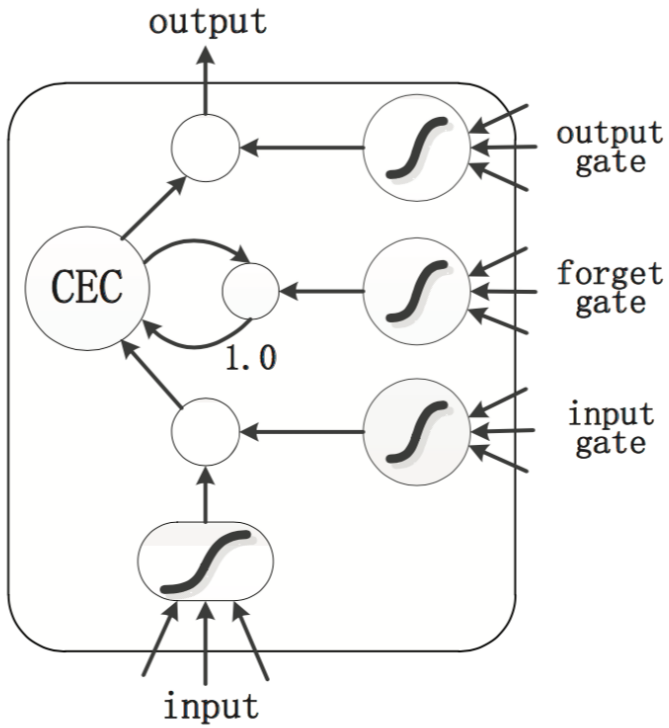


Figure 8: LSTM Model Structure

Further Analysis

- Page Analysis: Whose posts are more extreme?
- User Analysis: Who liked those extreme posts?
- Comment Analysis: What kind of posts receive more responses?
- Event Study: Compare the difference before/after our selected events.
- Hate crime: Causal inference between public opinion and hate crime.