

# Political Polarization and Public Opinion in 2016 US Presidential Election

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# Outline

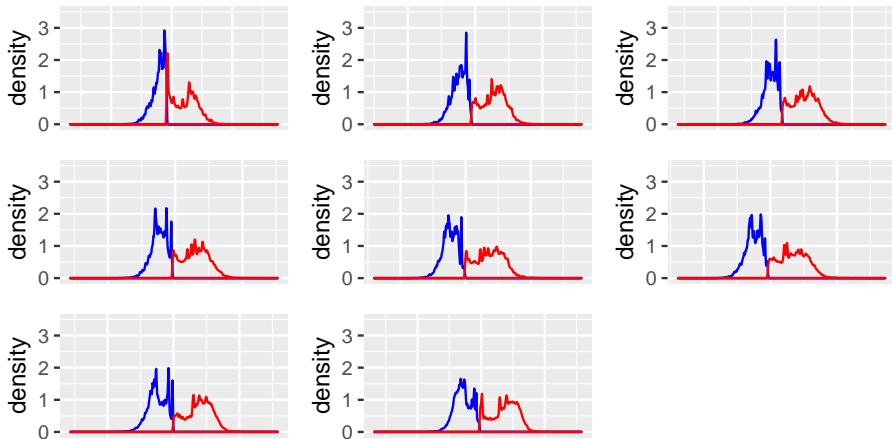
- 1 Ideology Segregation
- 2 Hate Crime
- 3 Trump and Clinton's Followers
- 4 Public Opinion

# Ideology Segregation

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

# Ideology Segregation

Figure 1: Ideology Distribution



# Ideology Segregation

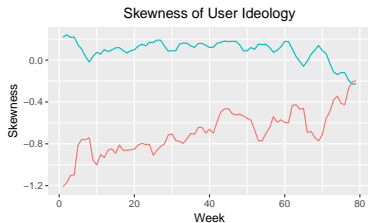


Figure 2: Skewness of Trump and Clinton's Supporters

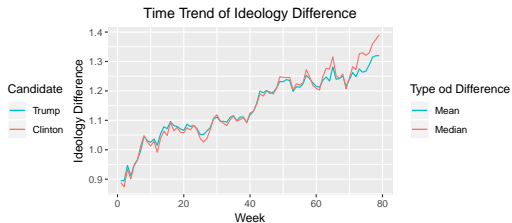


Figure 3: Ideology Segregation

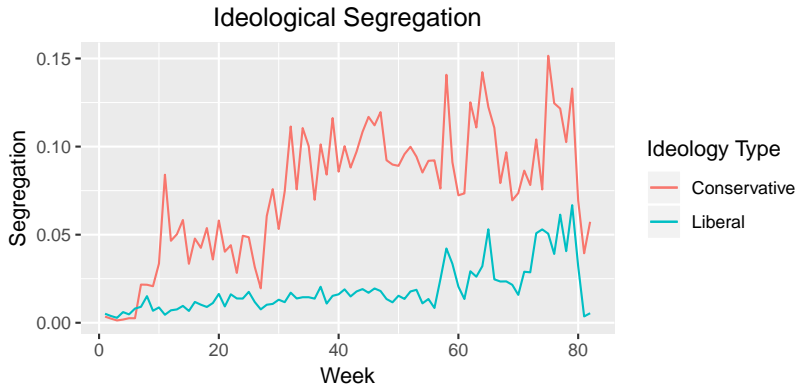
# Ideology Segregation

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

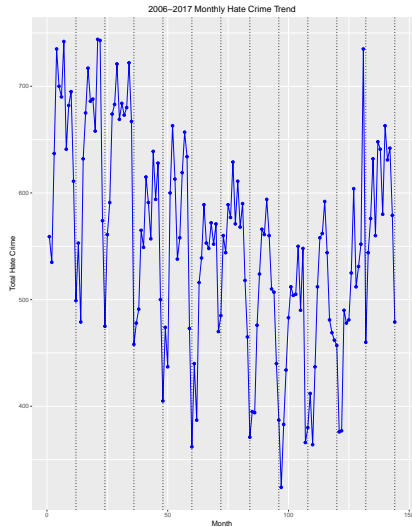
$$S_{Trump} = \frac{cons_{trump}}{cons_{all}} \cdot \frac{cons_{all}}{visit_{all}} - \frac{lib_{trump}}{lib_{all}} \cdot \frac{cons_{all}}{visit_{all}} \quad (1)$$

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

# Ideology Segregation

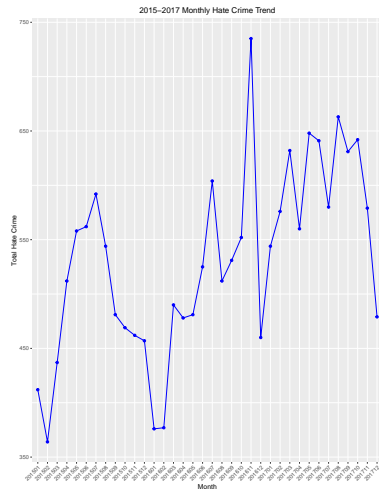
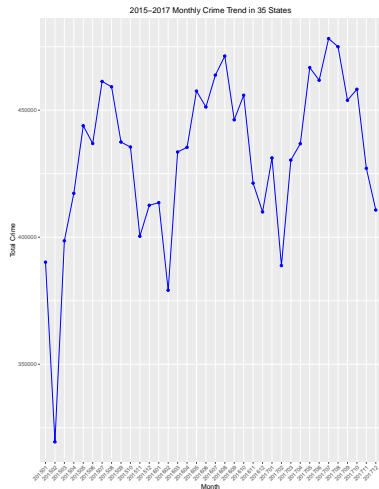


# Hate Crime

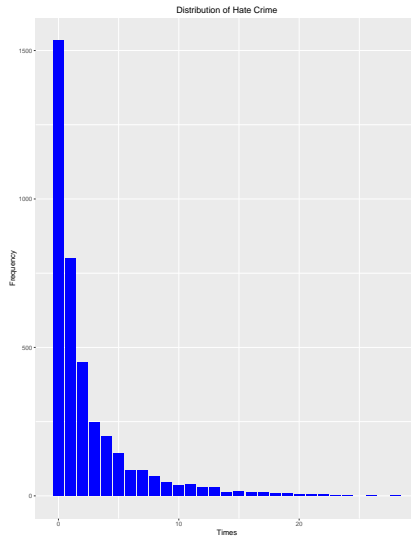




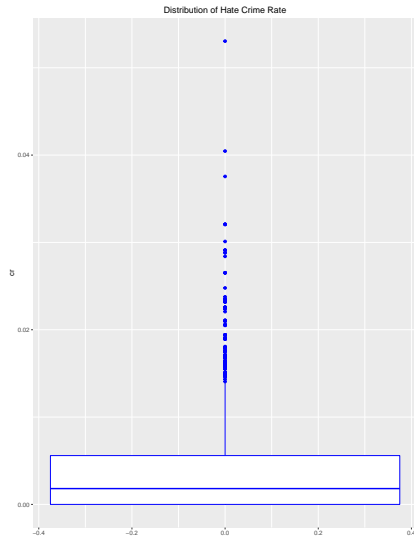
# Crime Data



# 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

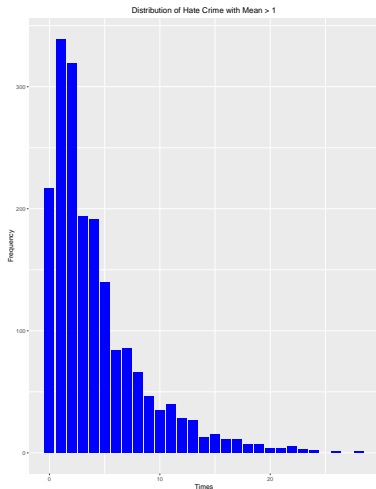
Table 1: Regression

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

# Sample Selection

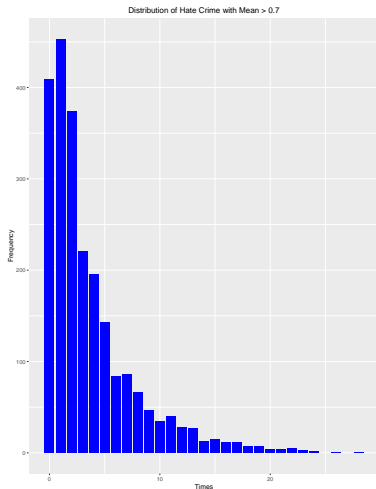
- There exists some states that hate crime rarely happens.
- Drop those states with low variation while maintaining the representative of our data.

# 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	

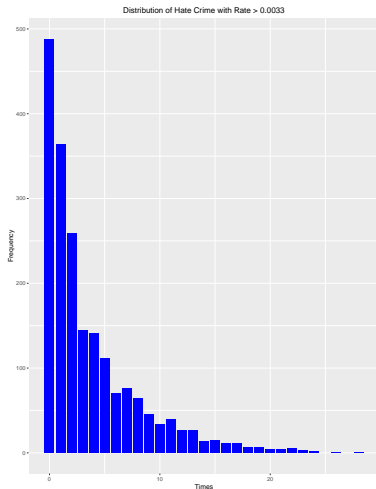
# Sample Selection (mean > 0.7)



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	

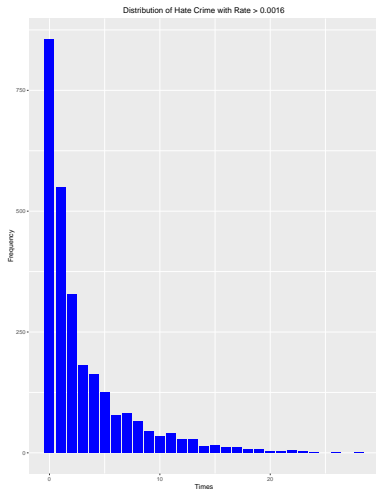


# Sample Selection (rate $> 0.0033$ )



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 (1.21)	1.43 (1.16)	1.52 (1.12)	0.84 (0.95)
Poisson	0.34 (0.21)	0.36* (0.20)	0.45** (0.21)	0.34 (0.22)
Weighted OLS	2.40** (1.13)	2.35** (1.07)	2.56** (1.20)	1.86 (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 (0.002)	0.0005 (0.002)	0.004 (0.004)	0.002 (0.004)
Weighted OLS	0.0015 (0.001)	0.0015 (0.001)	0.0028** (0.001)	0.0019 (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

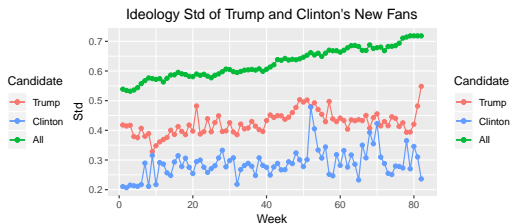
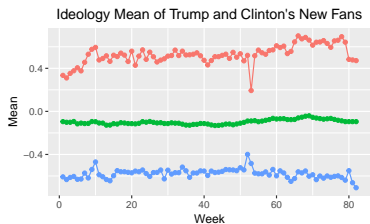
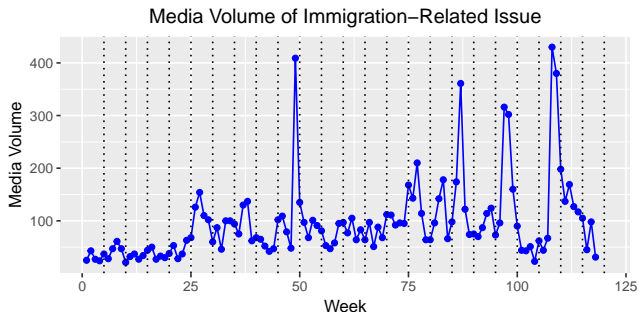


Figure 4: Time Trend of Ideology Mean      Figure 5: Time Trend of Ideology Std

# 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"
  - Validation accuracy: 80 90%
  - Validation accuracy for sentiment: 60 70%



# Post Selection

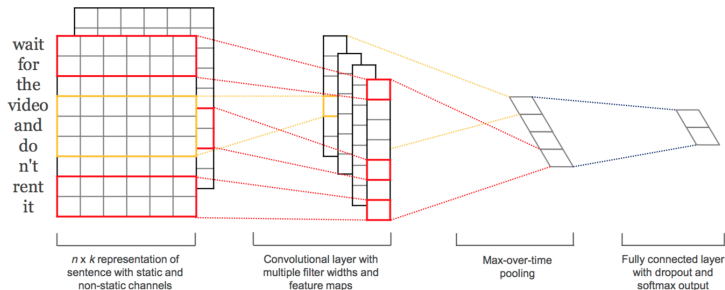


Figure 6: CNN Model Structure

# Media Volume

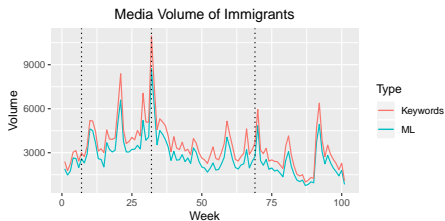


Figure 7: Immigration

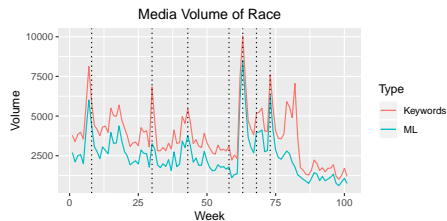


Figure 8: Race

# Media Volume

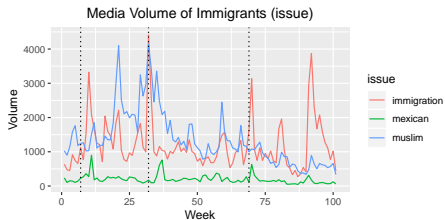


Figure 9: Immigration

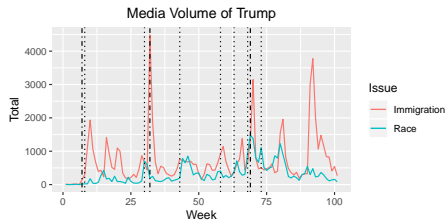


Figure 10: Trump

# Media Volume

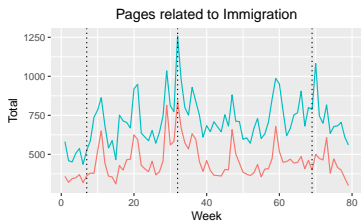


Figure 11: Immigration

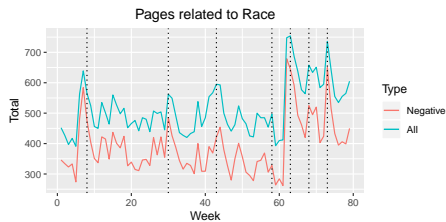


Figure 12: Race

## Users

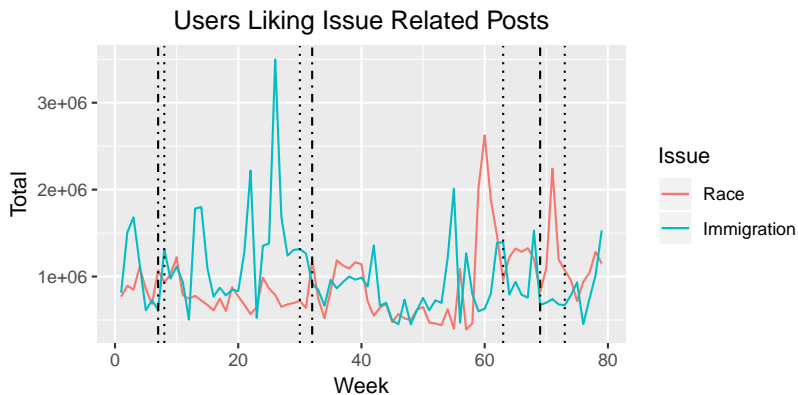


Figure 13: Users Liking Related Posts

# Ideological Difference

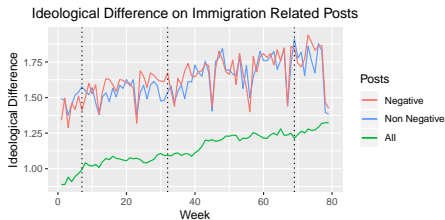


Figure 14: Immigration

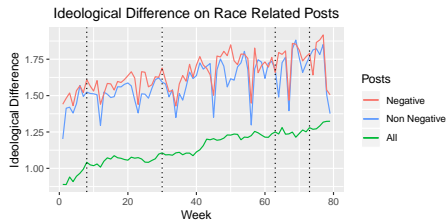


Figure 15: Race

# Users Composition (Immigration)

Conservative and Liberal Users on Non Negative Immigration Posts

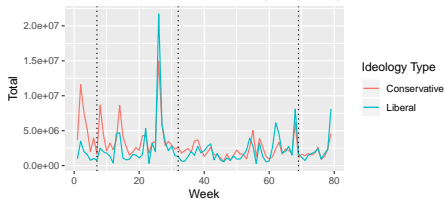


Figure 16: Non Negative

Conservative and Liberal Users on Negative Immigration Posts

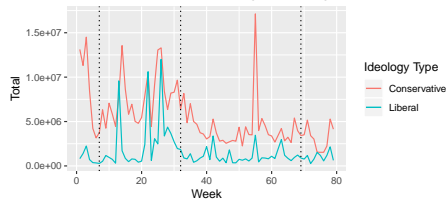


Figure 17: Negative

# Users Composition (Race)

Conservative and Liberal Users on Non Negative Race Posts

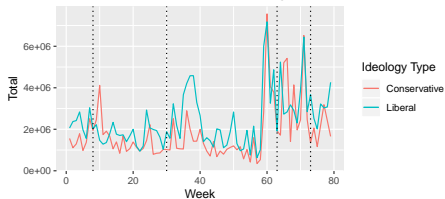


Figure 18: Non Negative

Conservative and Liberal Users on Negative Race Posts

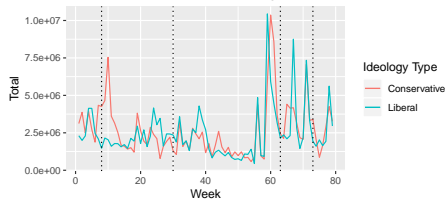


Figure 19: Negative



# Page Composition (Immigration)

Conservative and Liberal Pages on Non Negative Immigration Posts

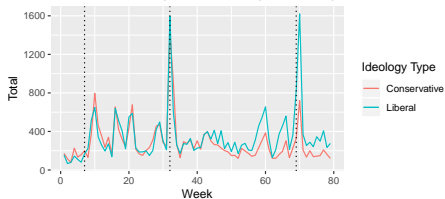


Figure 20: Non Negative

Conservative and Liberal Pages on Negative Immigration Posts

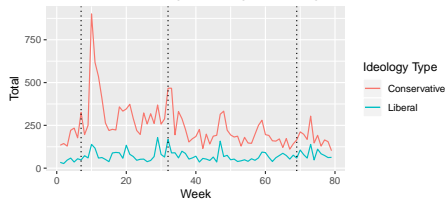


Figure 21: Negative

# Page Composition (Race)

Conservative and Liberal Pages on Non Negative Race Posts

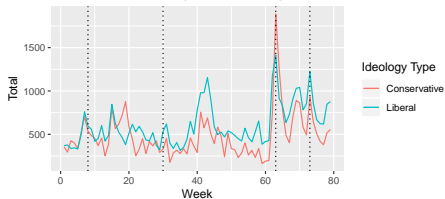


Figure 22: Non Negative

Conservative and Liberal Pages on Negative Race Posts

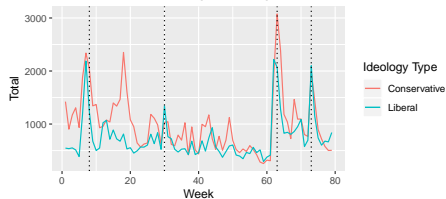


Figure 23: Negative

# Hate crime

- It seems like there is no positive relationship between online posts and hate crime/ideological difference
  - The correlation between number of crime related posts and ideological difference is -0.13
  - The correlation between number of immigration/race related posts and hate crime is 0.09
  - The correlation between number of immigration/race related posts and ideological difference is -0.23
  - The correlation between number of negative immigration/race related posts and hate crime is -0.08
  - The correlation between number of negative immigration/race related posts and ideological difference is -0.39