

Tweeting Politics

Exploring Behavioral Patterns and Partisan Stands on Social Media

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May 30, 2021

Overview

1. Introduction

2. Methods

3. Results

Project Objectives

- Social media has become an increasingly crucial platform for political discussions. Yet the opinions and information on Twitter are not always reliable.
- This study additionally focuses on the tweeting habits of the American public themselves. Previous literature suggest that exposure to opposing views on social media can increase polarization (Bail et al., 2018).
- In order to understand the activity of U.S. Twitter users, we employ the 2018 Twitter Survey data co-conducted by the Pew Research Center and the Ipsos Public Affairs to further explore the underlying patterns on social activities and political affiliation.
- Based on existing observations, our project aims to explore the relations between:
 - 1) Social trust and community attachment
 - 2) Usage frequency and tweeting habits of American Twitter users
 - 3) Partisanship and polarization.

Methods

- Exploratory Data Analysis
- Association Rules
- Dimension Reduction + Clustering (SOM, AE)

Sample Survey Questions of Our Interest

For social trust questions:

SOCTRUST2: Generally speaking, would you say that . . .

- 1 Most people can be trusted
- 2 Most people cannot be trusted

GSSTRUST2: Do you think most people...

- 1 Would try to take advantage of you if they got a chance
- 2 Would try to be fair no matter what

TRUSTCONGe: In your view, how much of the time do MEMBERS OF CONGRESS admit mistakes and take responsibility for them

- 1 Almost all the time
- 2 Some of the time
- 3 Only a little of the time
- 4 None of the time

Sample Survey Questions of Our Interest

For political activity questions:

NATPROBS: How much of a problem do you think each of the following are in the country today?

The affordability of health care:

1 A very big problem; 2 A moderately big problem; 3 A small problem

FAIRTRT: Overall, in our country today, would you say that...

- 1 Blacks are treated less fairly than whites
- 2 Whites are treated less fairly than blacks
- 3 Both are treated about equally

POL1DT: Do you approve or disapprove of the way Donald Trump is handling his job as President?

- 1 Approve
- 2 Disapprove

Sample Survey Questions of Our Interest

Measurement of polarization:

REPANTIP (for Republicans): Thinking for a moment about people who consider themselves Democrats, which of these comes closer to your views about them?

- 1 They feel differently than I do about politics, but they probably share many of my other values and goals (less polarized)
- 2 They feel differently than I do about politics, and they probably DON'T share many of my other values and goals, either (highly polarized)

DEMANTIP (for Democrats): Thinking for a moment about people who consider themselves Republicans, which of these comes closer to your views about them?

- 1 They feel differently than I do about politics, but they probably share many of my other values and goals (less polarized)
- 2 They feel differently than I do about politics, and they probably DON'T share many of my other values and goals, either (highly polarized)

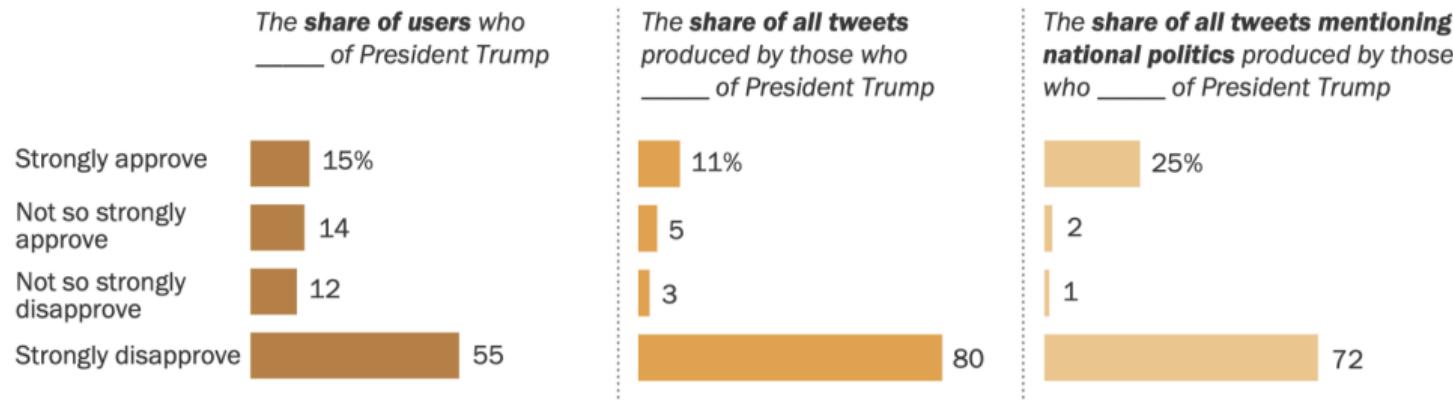
Sample Survey Questions of Our Interest

```
survey <- dataset %>%
  select(SOCTRUST2, COMATTACH, GSSTRUST2, GSSTRUST3, # social trust questions (group)
         TRUSTCONGa, TRUSTCONGb, TRUSTCONGc, TRUSTCONGd, TRUSTCONGe, # legislator responsiveness (group)
         TWITTER_USE, POLTWEET, # twitter usage
         POL1DT, FAIRTRT, WOMENOPPS, IMMCLT2, ECONFAIR2, POLCRCT,
         NATPROBSa, NATPROBSb, NATPROBSc, NATPROBSD, NATPROBSe, NATPROBSf,
         NATPROBSg, NATPROBSh, NATPROBSi, NATPROBSj, # attitudes towards various issues (group)
         THERMOa, THERMOb, THERMOC, THERMOD, THERMOe, THERMOf, THERMOg, THERMOh, # feeling thermometer (group)
         QBELIEF3, QBELIEF4, TWKNOW, # friends on twitter
         PARTY, REPANTIP, DEMANTIP, # party affiliation (layer)
         CIVIC_ENG_ACTYRa, CIVIC_ENG_ACTYRb, CIVIC_ENG_ACTYRc, # physical activities
         RELIMP, # religion identity (layer)
  ) %>%
```

Get a sense of the survey

Those who strongly approve or disapprove of Donald Trump generate majority of public tweets from U.S. adults that mention national politics

Among U.S. adults with public Twitter accounts ...



Note: Tweets about national politics include those that reference national politicians, political groups or institutions, or political behaviors such as voting.

Source: Survey of 2,427 U.S. adult Twitter users with public accounts conducted Nov. 21-Dec. 17, 2018. Tweets collected via Twitter API, June 10, 2018-June 9, 2019.

"National Politics on Twitter: Small Share of U.S. Adults Produce Majority of Tweets"

Social Trust and Polarization: Associational Rules

The image shows two tables of associational rules generated by R code. The first table is for 'trust' rules and the second for 'attachment' rules.

trust:

```
```{r}
trust <- subset(trust_rules,
 lhs %in% "high trust" &
 rhs %in% c("high polarization", "low polarization") &
 lift > 1.25); inspect(sort(trust[1:5], by = "confidence"))
```


lhs	rhs	support	confidence
[1] {high trust,never tweet,unfair society}	=> {low polarization}	0.1311358	0.6245734
[2] {high trust,mixed politics followed,never tweet}	=> {low polarization}	0.1608742	0.6201657
[3] {high trust,never tweet,social assistance}	=> {low polarization}	0.1372268	0.6177419
[4] {high trust,mixed politics followed,other affiliations}	=> {low polarization}	0.1099964	0.6055227
[5] {high attachment,high trust,never tweet}	=> {low polarization}	0.1375851	0.6018809



5 rows | 1-6 of 8 columns



attachment:



```
```{r}
attachment <- subset(trust_rules,
                      lhs %in% "high attachment" &
                        rhs %in% c("high polarization", "low polarization") &
                        lift > 1.25); inspect(sort(attachment[1:5], by = "confidence"))
```


lhs	rhs	support	confidence	coverage	lift	count
[1] {high attachment, high trust, never tweet, social assistance}	=> {low polarization}	0.1003225	0.6263982	0.1601576	1.301770	280
[2] {high attachment, high trust, mixed politics followed, never tweet}	=> {low polarization}	0.1128628	0.6262425	0.1802221	1.301447	315
[3] {high attachment, never tweet, social assistance}	=> {low polarization}	0.1103547	0.6135458	0.1798638	1.275061	308
[4] {high attachment, high trust, never tweet, no rally}	=> {low polarization}	0.1218201	0.6082290	0.2002866	1.264011	340
[5] {high attachment, high trust, never tweet}	=> {low polarization}	0.1375851	0.6018809	0.2285919	1.250819	384


```


```

Twitter Use and Polarization: Associational Rules

```
```{r}
twitter_use <- subset(social_rules,
 rhs %in% c("low polarization") &
 lhs %in% c("never tweet", "frequent tweet", "infrequent use", "frequent use") &
 lift > 1.2); inspect(sort(twitter_use[1:5], by = "confidence"))
```

```

| | lhs
<chr> | rhs
<chr> <chr> | support
<dbl> | confidence
<dbl> |
|-----|---|-----------------------|------------------|---------------------|
| [1] | {healthcare concern,never tweet,other affiliations} | => {low polarization} | 0.1092798 | 0.5980392 |
| [2] | {drug concern,never tweet,other affiliations} | => {low polarization} | 0.1049803 | 0.5967413 |
| [3] | {college cost concern,never tweet,other affiliations} | => {low polarization} | 0.1028305 | 0.5954357 |
| [4] | {never tweet,other affiliations} | => {low polarization} | 0.1142960 | 0.5863971 |
| [5] | {never tweet,not xenophobic} | => {low polarization} | 0.1644572 | 0.5802781 |

5 rows | 1-6 of 8 columns

Political Affiliation and Online Language: Associational Rules

```
```{r}
trump_1 <- subset(social_rules,
 rhs %in% c("offensive", "defensive") &
 lhs %in% "Trump adversary" &
 lift > 1.5); inspect(sort(trump_1[1:5], by = "confidence"))
```

```

| lhs
<chr> | rhs
<chr> <chr> | support
<dbl> | confidence
<dbl> |
|---|--------------------|------------------|---------------------|
| [1] {frequent tweet,not xenophobic,Trump adversary} | => {defensive} | 0.1017556 | 0.6810552 |
| [2] {frequent tweet,Trump adversary,unfair for black} | => {defensive} | 0.1006808 | 0.6787440 |
| [3] {frequent tweet,immigrants treatment concern,Trump adversary} | => {defensive} | 0.1006808 | 0.6738609 |
| [4] {frequent tweet,Trump adversary} | => {defensive} | 0.1042637 | 0.6583710 |
| [5] {Democrat,Trump adversary} | => {defensive} | 0.2311000 | 0.6096408 |

5 rows | 1-6 of 8 columns

```
```{r}
trump_2 <- subset(social_rules,
 rhs %in% c("offensive", "defensive") &
 lhs %in% "Trump supporter" &
 lift > 1.5); inspect(sort(trump_2[1:5], by = "confidence"))
```

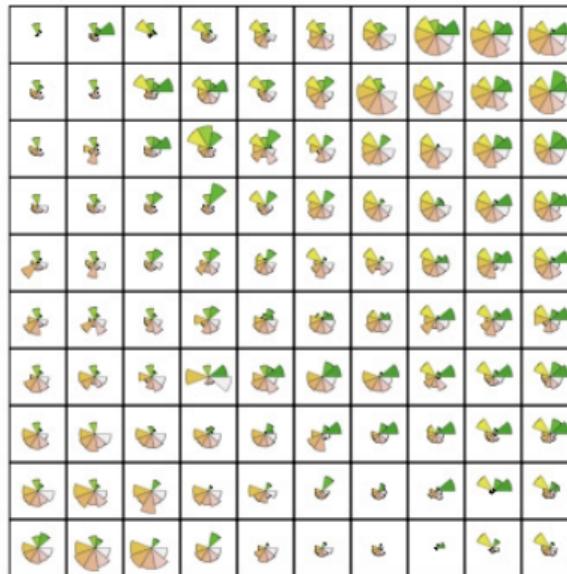
```

| lhs
<chr> | rhs
<chr> <chr> | support
<dbl> | confidence
<dbl> | coverage
<dbl> |
|---|--------------------|------------------|---------------------|-------------------|
| [1] {racism apathy,Trump supporter} | => {offensive} | 0.1343604 | 0.9101942 | 0.1476173 |
| [2] {gun apathy,Trump supporter} | => {offensive} | 0.1246865 | 0.8969072 | 0.1390183 |
| [3] {immigrants treatment apathy,Trump supporter} | => {offensive} | 0.1866714 | 0.8967298 | 0.2081691 |
| [4] {income gap apathy,Trump supporter} | => {offensive} | 0.1343604 | 0.8949881 | 0.1501254 |
| [5] {sexism apathy,Trump supporter} | => {offensive} | 0.1780724 | 0.8827709 | 0.2017198 |

5 rows | 1-7 of 8 columns

Social Trust: Self-Organizing Map

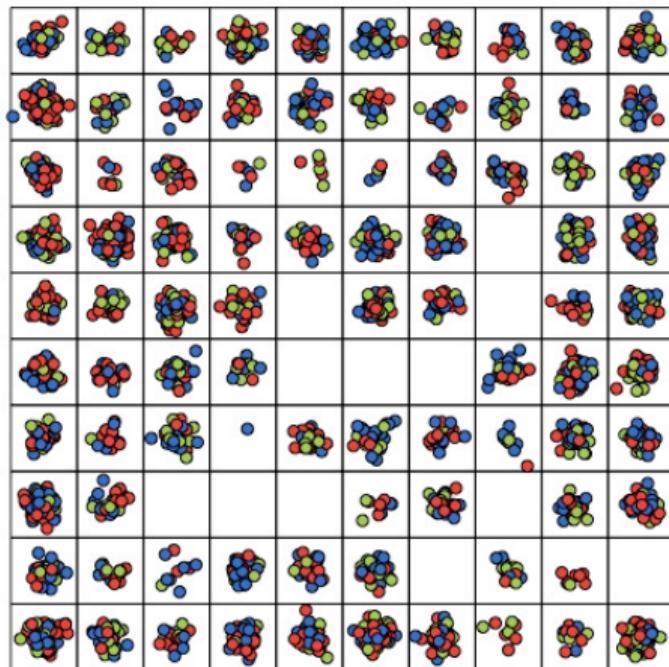
Codes plot



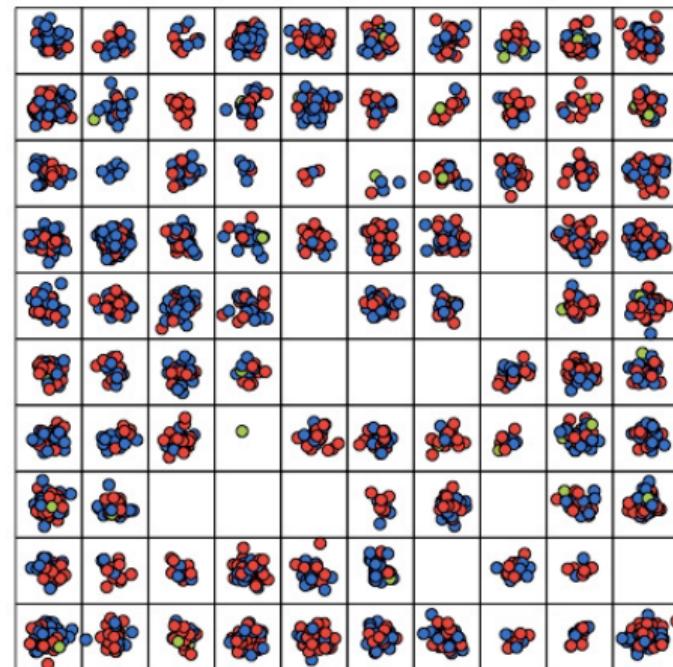
- | | | |
|-------------|--------------|--------------|
| ■ SOCTRUST2 | ■ GSSTRUST3 | ■ TRUSTCONGc |
| ■ COMATTACH | ■ TRUSTCONGa | ■ TRUSTCONGd |
| ■ GSSTRUST2 | ■ TRUSTCONGb | ■ TRUSTCONGe |

Social Trust: Self-Organizing Map

Coloring by Party

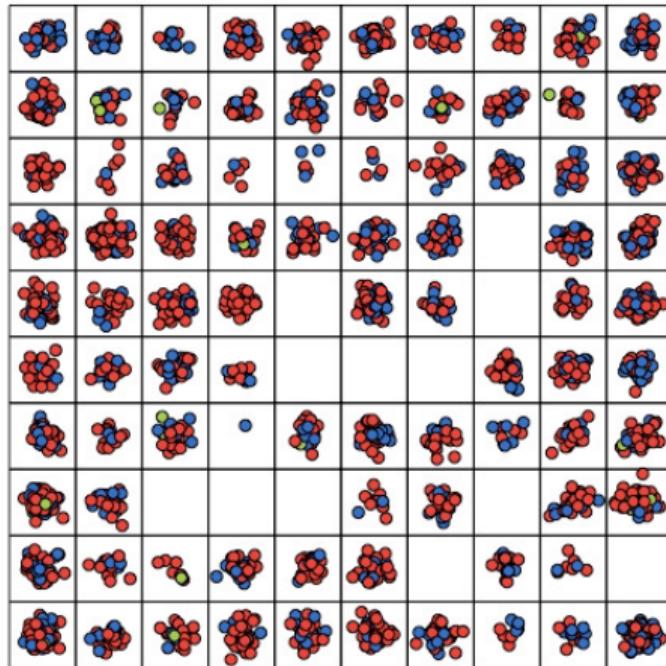


Coloring by Polarization

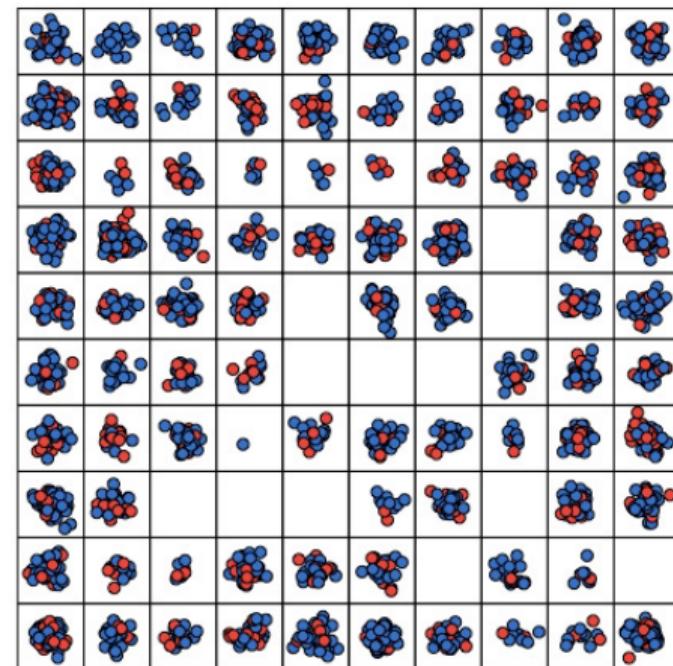


Social Trust: Self-Organizing Map

Coloring by Trump supporter or adversary



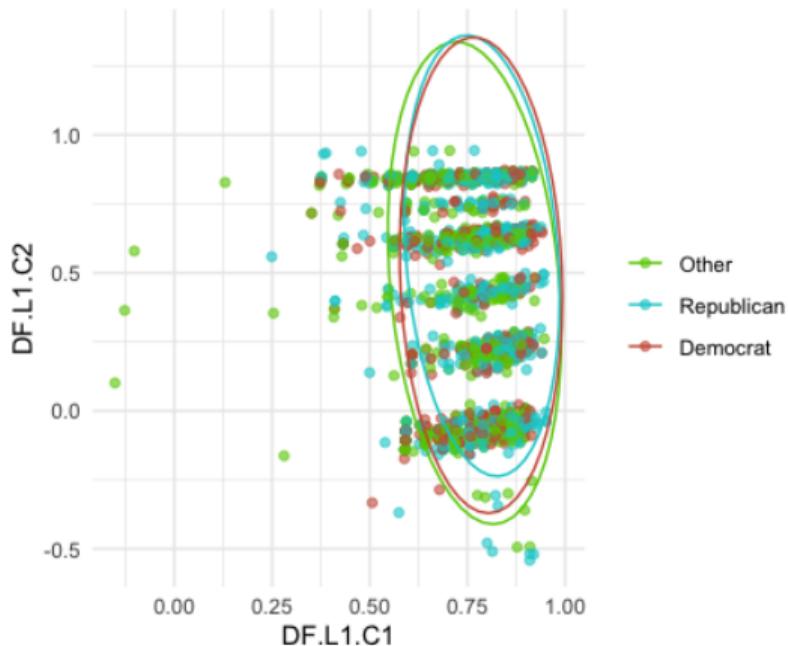
Coloring by Twitter Usage Frequency



Social Trust: Autoencoder

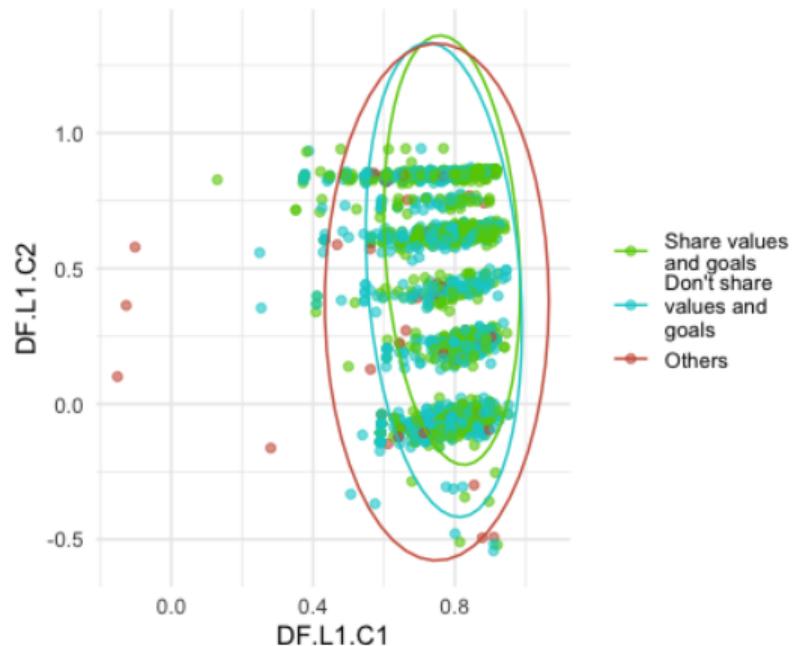
Party: Deep Features 1 & 2

hidden layers = 1, nodes = 2



Polarization: Deep Features 1 & 2

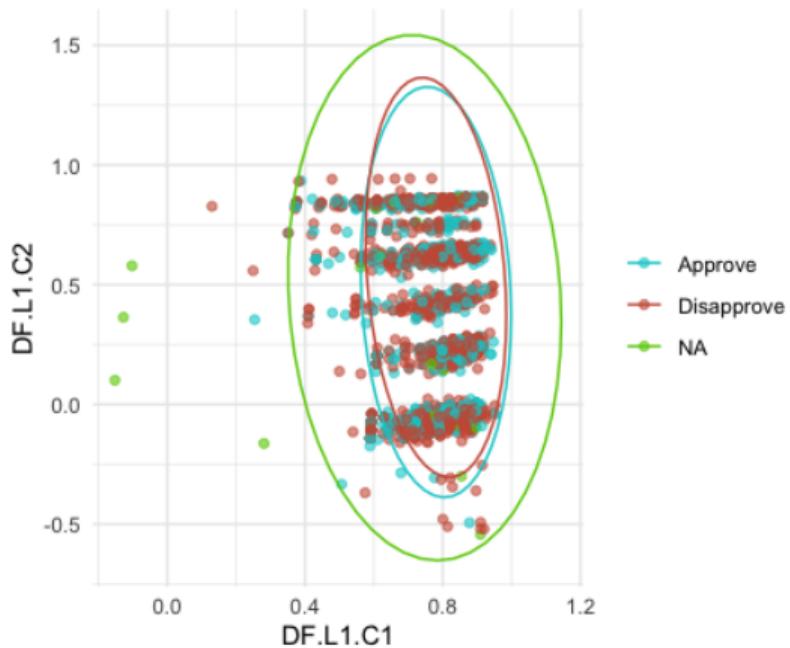
hidden layers = 1, nodes = 2



Social Trust: Autoencoder

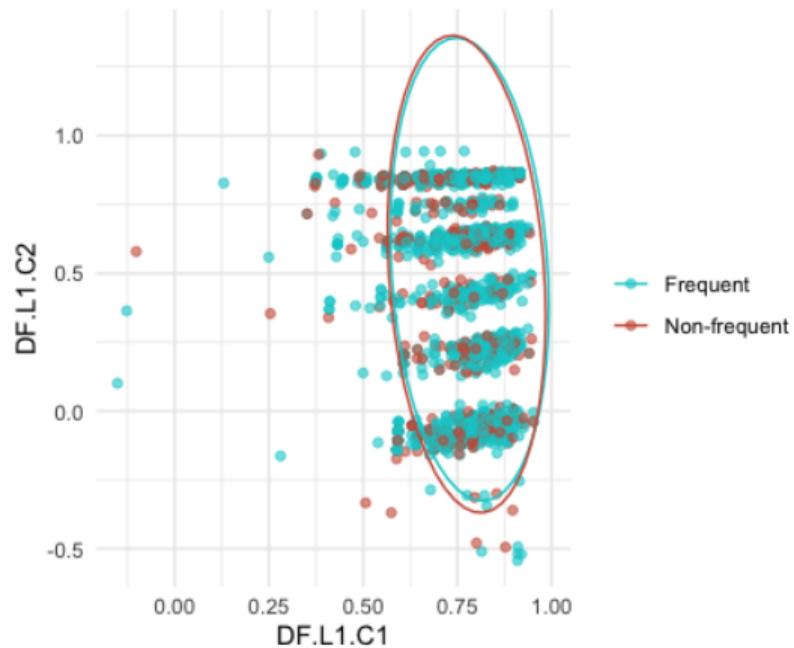
Trump: Deep Features 1 & 2

hidden layers = 1, nodes = 2



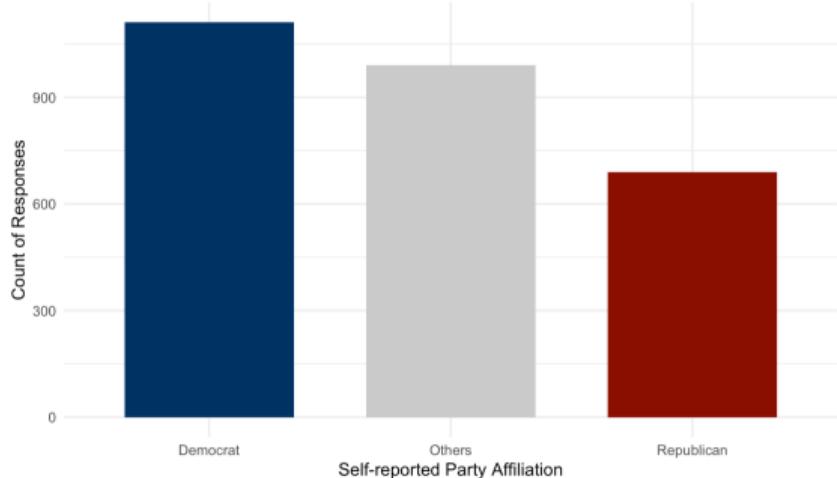
Twitter Usage Frequency: Deep Features 1 & 2

hidden layers = 1, nodes = 2



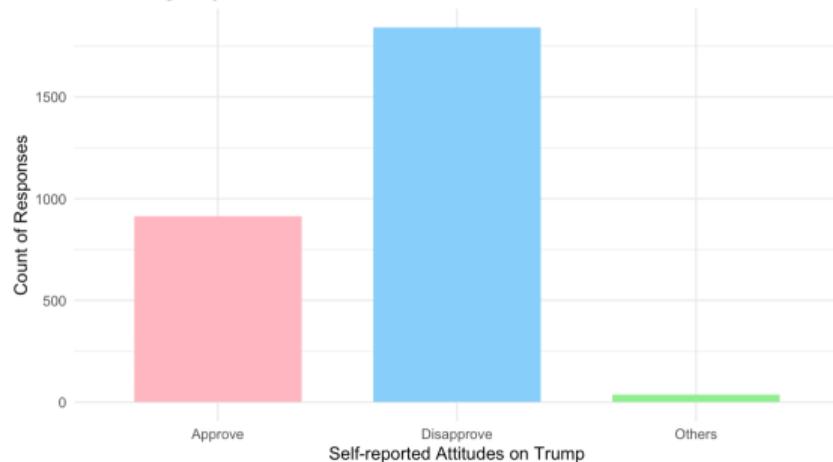
Political Views: Two Variables of Interest

Number of Responses by Self-reported Party Affiliation



Party Affiliation

Do you approve or disapprove of the way Donald Trump is handling his job as President?

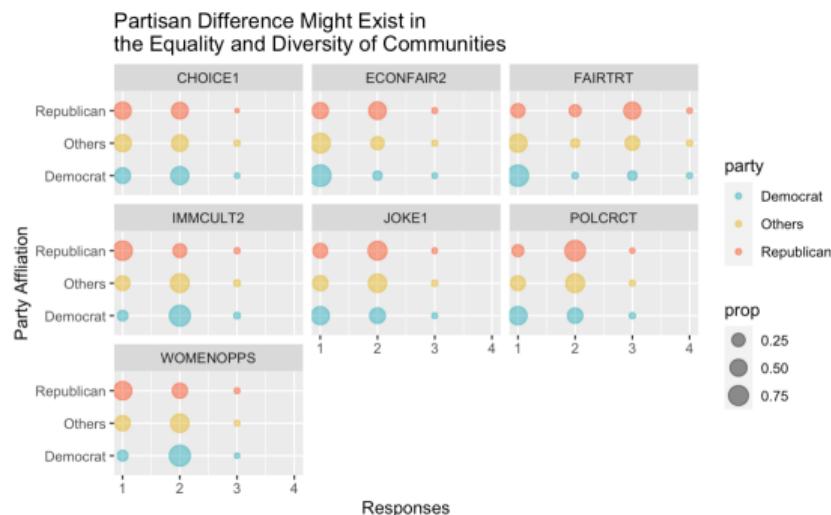


Attitudes towards Trump

Political Views on Equality and Diversity of Communities

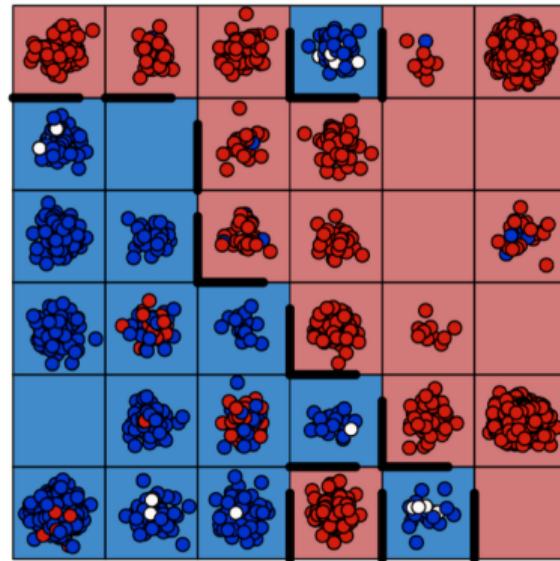
VARIABLES:

- **FAIRTRT**: whether people with different colors are treated fairly
- **WOMENOPPS**: whether women and men are treated fairly
- **IMMCULT2**: whether newcomers are treated fairly
- **ECONFAIR2**: whether the economic system is fair
- **POLCRCT**: whether people with different backgrounds are offended by language
- **JOKE1**: whether people take offensive content seriously
- **CHOICE1**: whether people can speak freely online

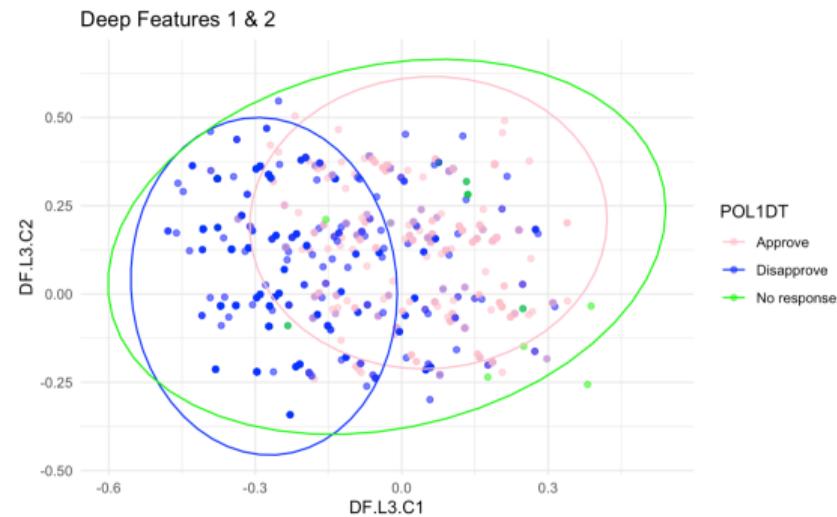


Political Views on Equality and Diversity of Communities

Coloring by Trump



SOM

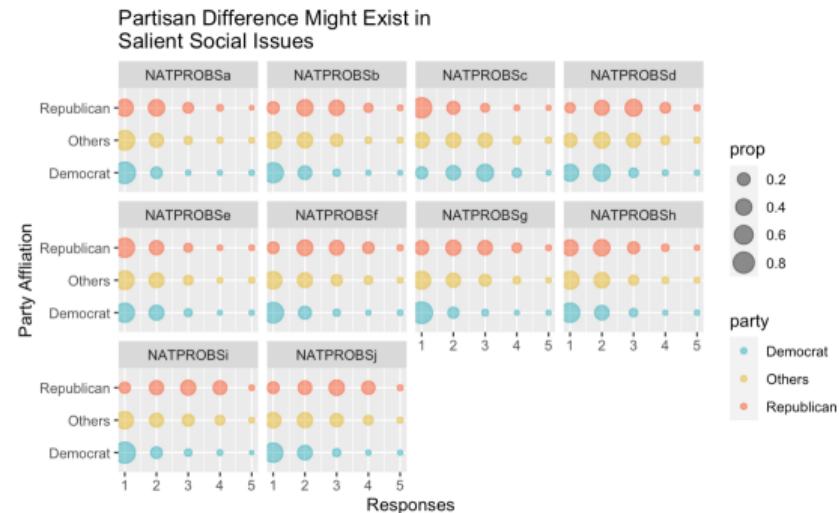


Autoencoders

Political Views on Salient Social Issues

VARIABLES:

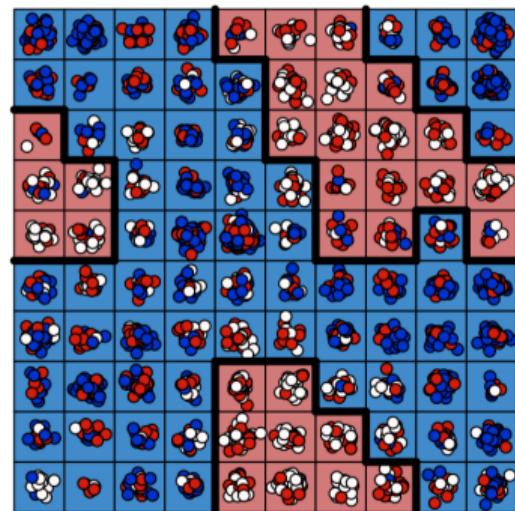
- NATPROBS_a: The affordability of health care
- NATPROBS_b: Racism
- NATPROBS_c: Illegal immigration
- NATPROBS_d: Sexism
- NATPROBS_e: Drug addiction
- NATPROBS_f: The gap between the rich and poor
- NATPROBS_g: Gun violence
- NATPROBS_h: The affordability of a college education
- NATPROBS_i: Climate change
- NATPROBS_j: Treatment of immigrants in the U.S.



Political Views on Salient Social Issues

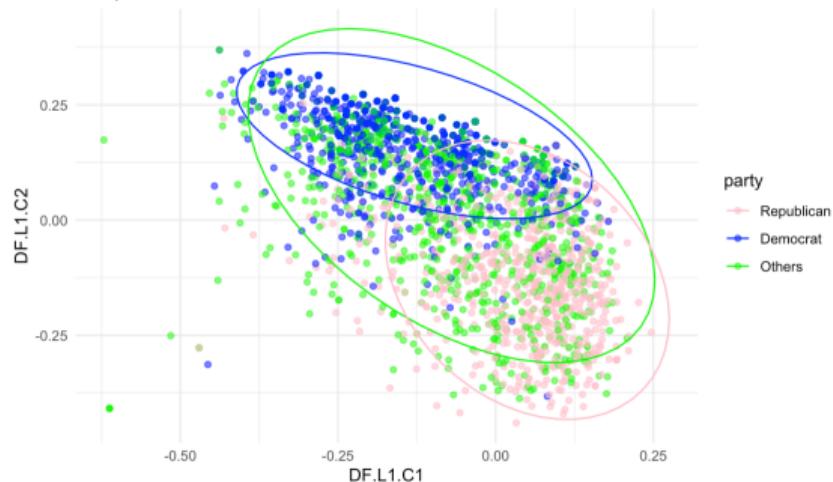
Coloring by Party Affiliation

Attitudes towards salient social issues



SOM

Deep Features 1 & 2

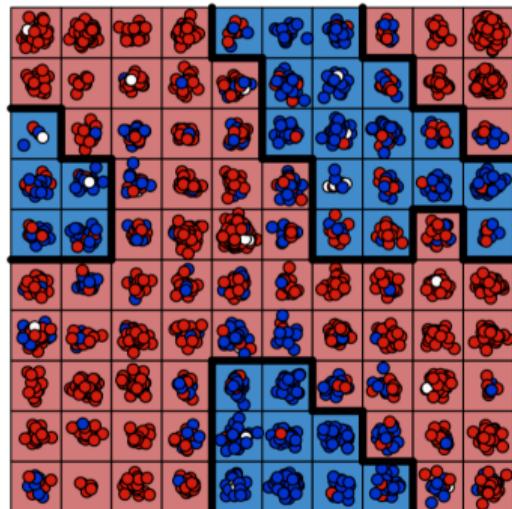


Autoencoders

Political Views on Salient Social Issues

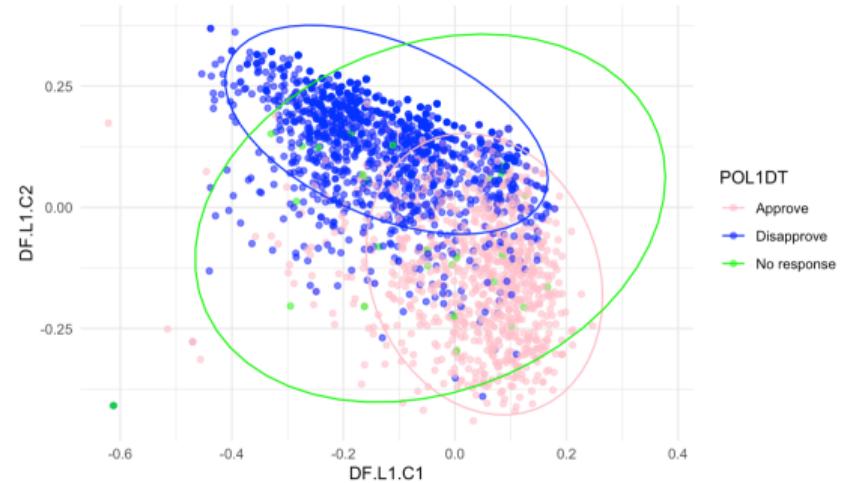
Coloring by Trump

Attitudes towards salient social issues



SOM

Deep Features 1 & 2

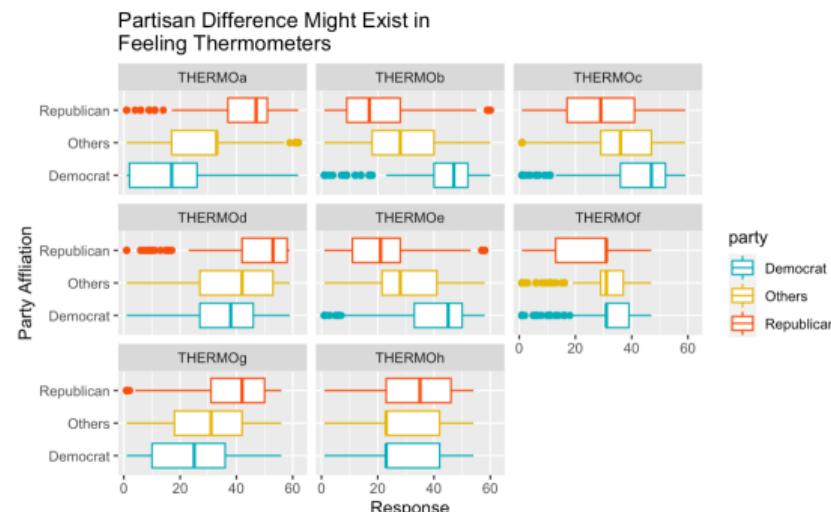


Autoencoders

Political Views on Feeling Thermometers

VARIABLES:

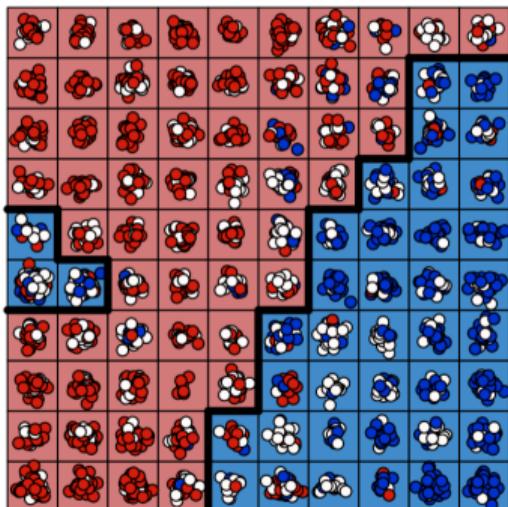
- **THERMO_a**: How do you feel toward Republicans?
- **THERMO_b**: How do you feel toward Democrats?
- **THERMO_c**: How do you feel toward college professors?
- **THERMO_d**: How do you feel toward police officers?
- **THERMO_e**: How do you feel toward journalists?
- **THERMO_f**: How do you feel toward Muslims?
- **THERMO_g**: How do you feel toward evangelical Christians?
- **THERMO_h**: How do you feel toward Catholics?



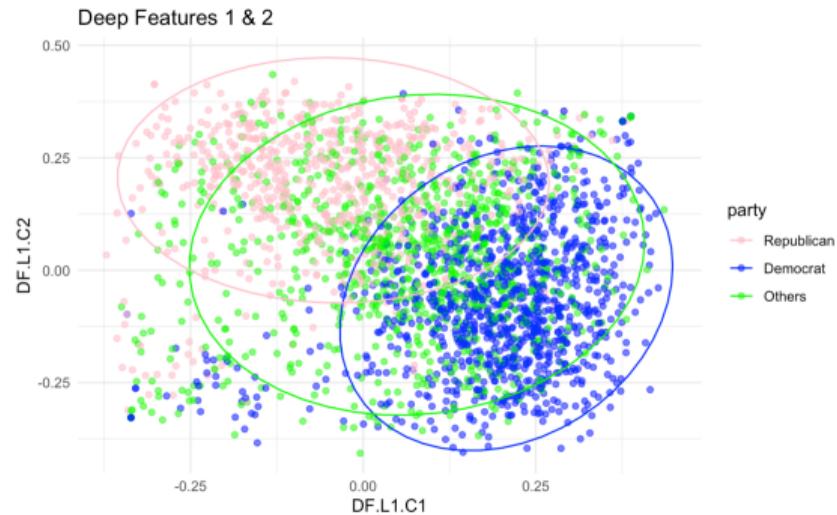
Political Views on Feeling Thermometers

Coloring by Party Affiliation

feeling thermometer by party



SOM

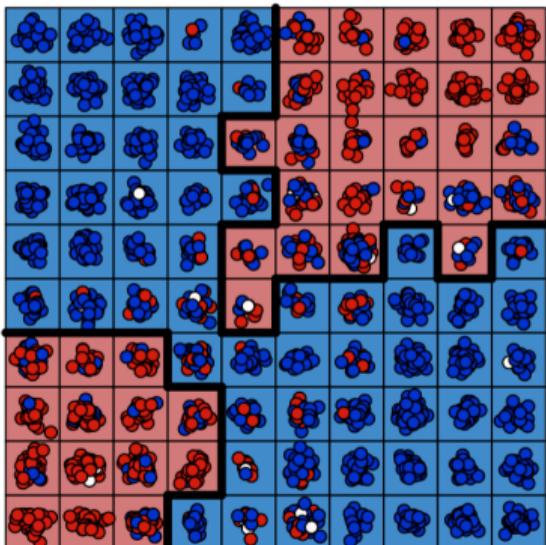


Autoencoders

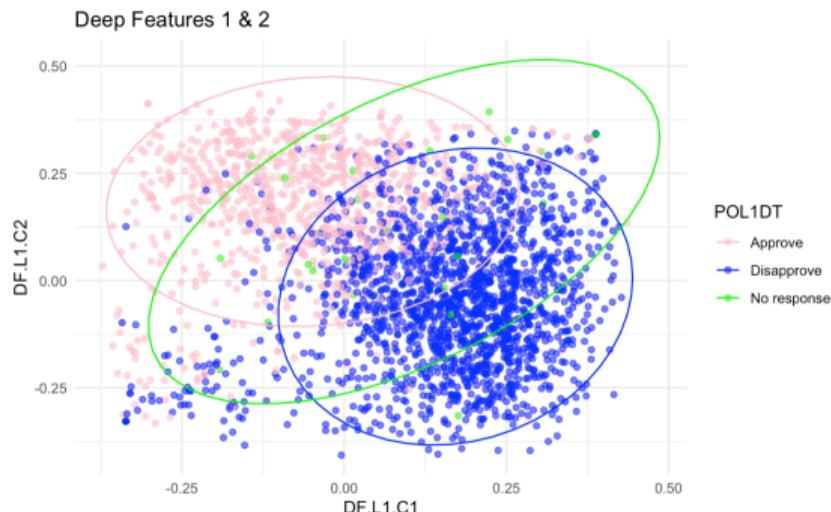
Political Views on Feeling Thermometers

Coloring by Trump

feeling thermometer by Trump



SOM



Autoencoders

The End

Thanks for Watching!