

LSE Works: Department of Methodology



The Brexit Debate through Social Media: deliberative discussion, or deliberate dysfunction?

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THE LONDON SCHOOL
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POLITICAL SCIENCE

The Brexit Debate Through Social Media

Deliberative Discussion, or Deliberate Dysfunction?

Kenneth Benoit
Department of Methodology, LSE



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OF ECONOMICS AND
POLITICAL SCIENCE ■



Research Team

LSE Department of Methodology

- EUENGAGE: Dr. Akitaka Matsuo, Research Officer (<http://amatsuo.net>)
- quanteda (the R package for managing and analyzing text)
 - Dr. Haiyan Wang, Research Officer
 - Kohei Watanabe, Ph.D Candidate (<http://koheiw.net>)

Imperial College London, Data Science Institute

- Dr. Julio Amador Díaz López, Research Associate
- David Birch, Research Associate
- Prof. Mark Kennedy, Professor



social media in political communications

- approximately 400-450 million Tweets per day
- 29.2% of US population are active users
- 20% of UK population (13.1 million in 2016)
- 563 UK MPs have Twitter accounts

87% of UK MPs have Twitter accounts



How Twitter is used for political communication: to send a message



Boris Johnson @BorisJohnson · Jan 13

Global health security will continue to challenge us all. I believe @davidnabarro is the right choice for the next @WHO leader



26



60



96



Donald J. Trump @realDonaldTrump · 15h

Big day planned on NATIONAL SECURITY tomorrow. Among many other things, we will build the wall!



36K



48K



157K

to call attention to an event or report



Nigel Farage Retweeted



Sky News @SkyNews · Jan 20

UK-US trade deal could be struck 'within 90 days', says Nigel Farage



UK-US trade deal 'within 90 days' of Brexit

The former UKIP leader says the Trump team are offering Britain a "great gift" and hailed their "can-do attitude".

news.sky.com

← 99

↻ 571

♥ 1.2K

@mentions



Michael Gove Retweeted



Henry Dimbleby @HenryDimbleby · Jan 18

Must read. The transcript of @michaelgove 's Trump interview is the gift that keeps giving. Worth the subscription to @thetimes on its own.

days

we'll want to have other people coming in
ing their country and you know in this case
a very strong borders from the day I get in.
orders I'm gonna sign - day one - which I
be Monday as opposed to Friday or Sat
mean my day one is gonna be Monday bec
nt to be signing and get it mixed up with b
ion, but one of the first orders we're gonna
e gonna be strong borders.

I want people coming in from Syria who w

Henry Dimbleby @HenryDimbleby

Day one is Monday, right? Not Friday or Saturday.
[thetimes.co.uk/edition/news/f...](https://www.thetimes.co.uk/edition/news/f...)



8



10



16

#hashtags



“Retweets”



President Trump Retweeted



Donald J. Trump @realDonaldTrump · 15h

If Chicago doesn't fix the horrible "carnage" going on, 228 shootings in 2017 with 42 killings (up 24% from 2016), I will send in the Feds!



35K



47K



163K

Current project: Brexit-related Tweets

- some 35 million since January
- present analysis: Through end of June (26 million)
- capture based on #hashtags, @usernames, and search terms

Search terms

Hashtags:

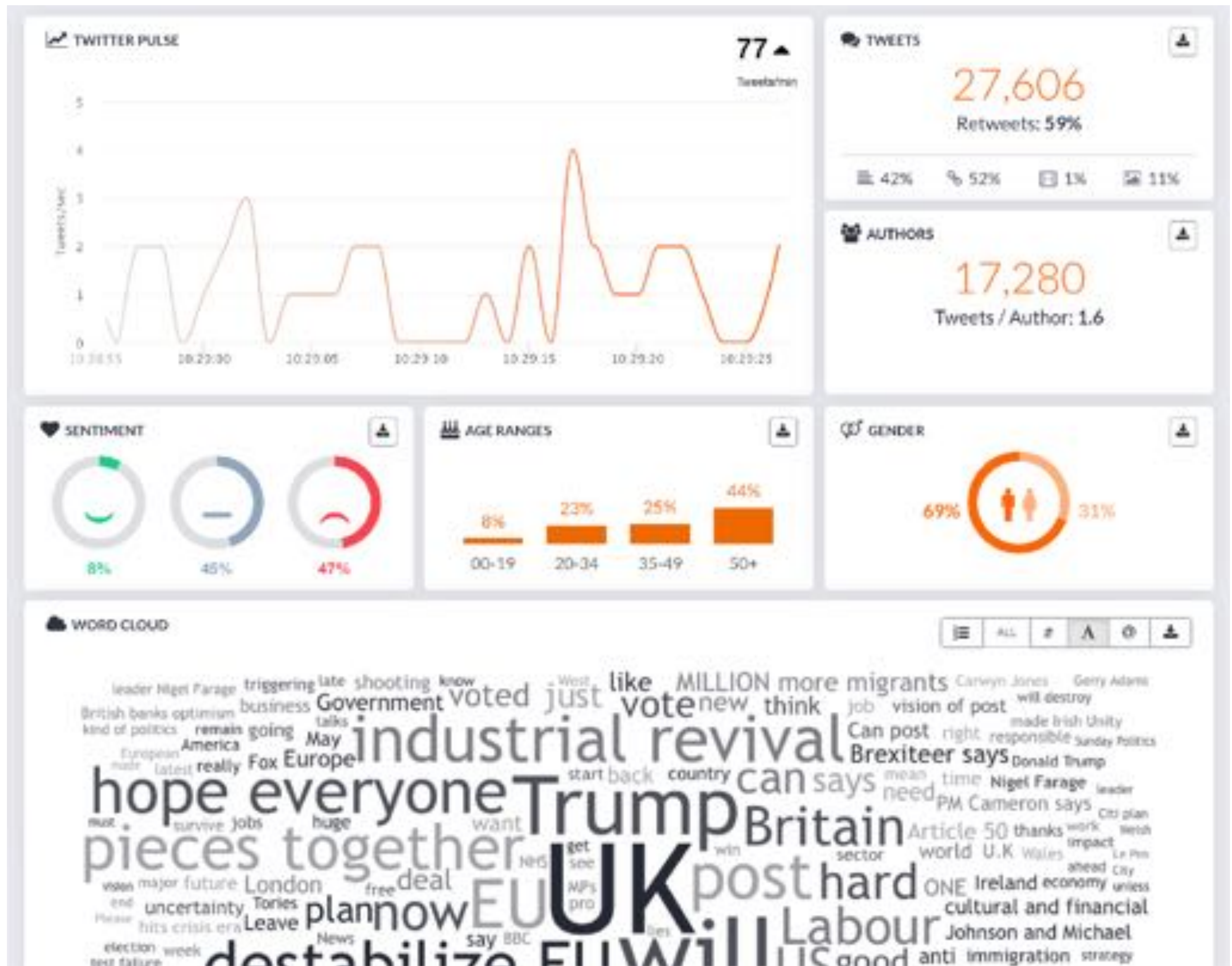
#betterdealforbritain
#betteroffout
#brexit
#euref
#eureferendum
#eusummit
#getoutnow
#leaveeu
#no2eu
#notoeu
#strongerin
#ukineu
#voteleave
#wewantout
#yes2eu
#yestoeu

brexit

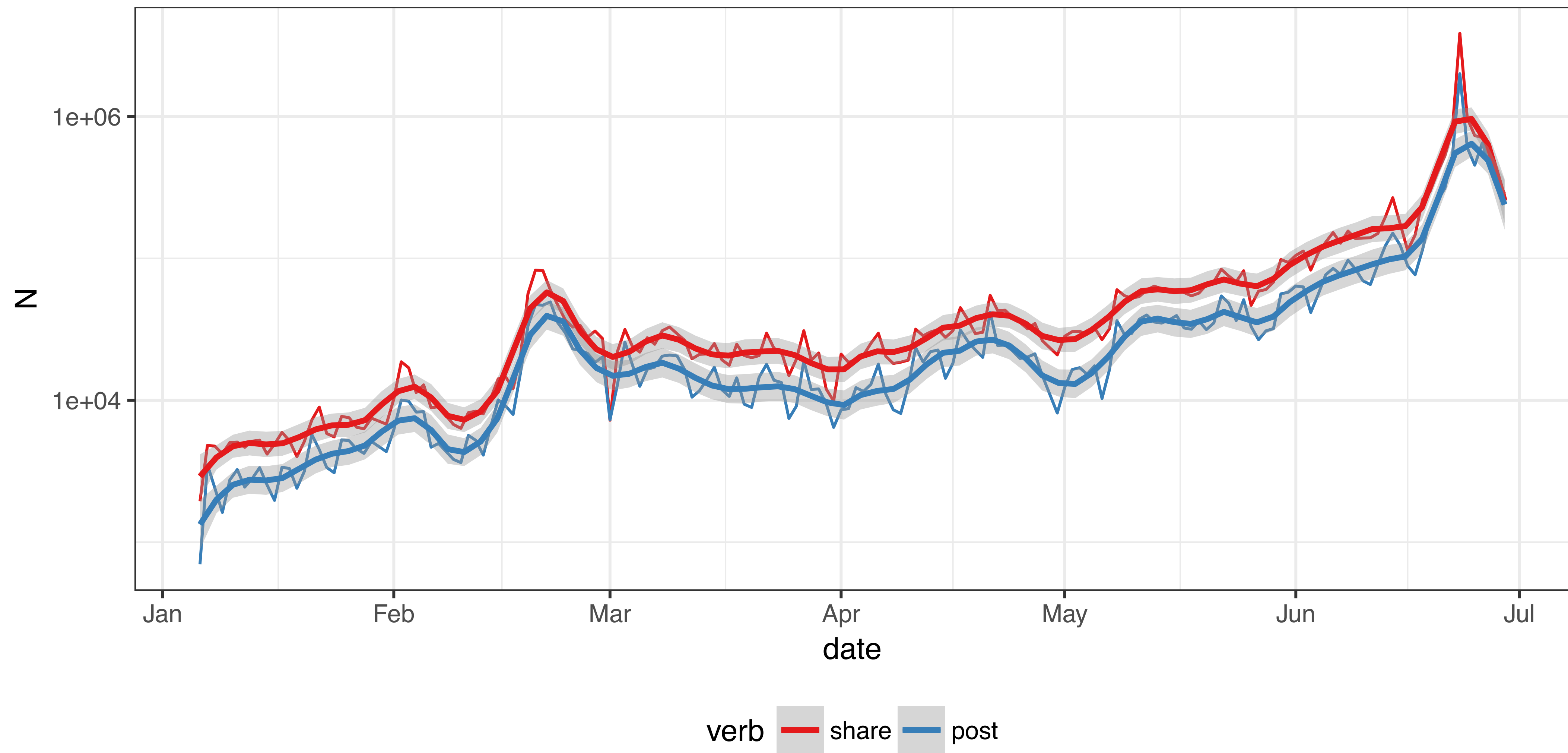
Username:

@vote_leave
@brexitwatch
@eureferendum
@ukandeu
@notoeu
@leavehq
@ukineu
@leaveeuofficial
@ukleave_eu
@strongerin
@yesforeurope
@grassroots_out
@stronger_in

Capture platform



Frequencies of Tweets



Users in data

- 3.6M unique users
- number of tweets:
 - average: 7.2
 - median: 1 (more than 50% had only one tweet)
 - max: 81.1K

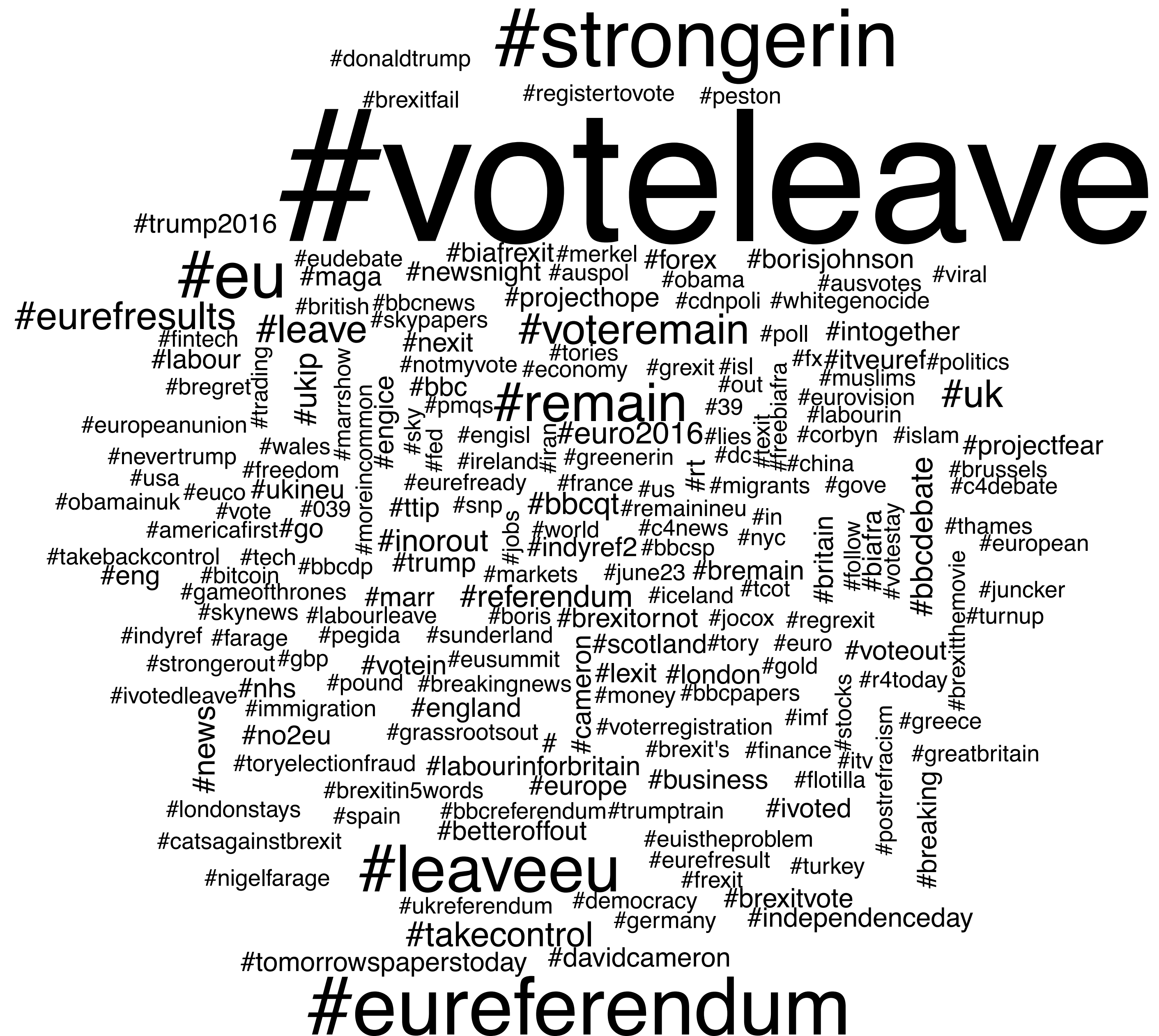
Heavy users

username	share	post	N
iVoteLeave	81101	3	81104
iVoteStay	57615	1	57616
Col_Connaughton	0	21451	21451
brexitmarch	0	20873	20873
MikkiL	18850	1407	20257
Fight4UK	13785	4777	18562
JodieActy	13837	1021	14858
SaraPadmore	14692	20	14712
Brndstr	0	13449	13449
marie52d	12884	349	13233
RoyalNavyNews	2648	10382	13030
ukleave_eu	9890	2589	12479
mwengway	10072	2183	12255

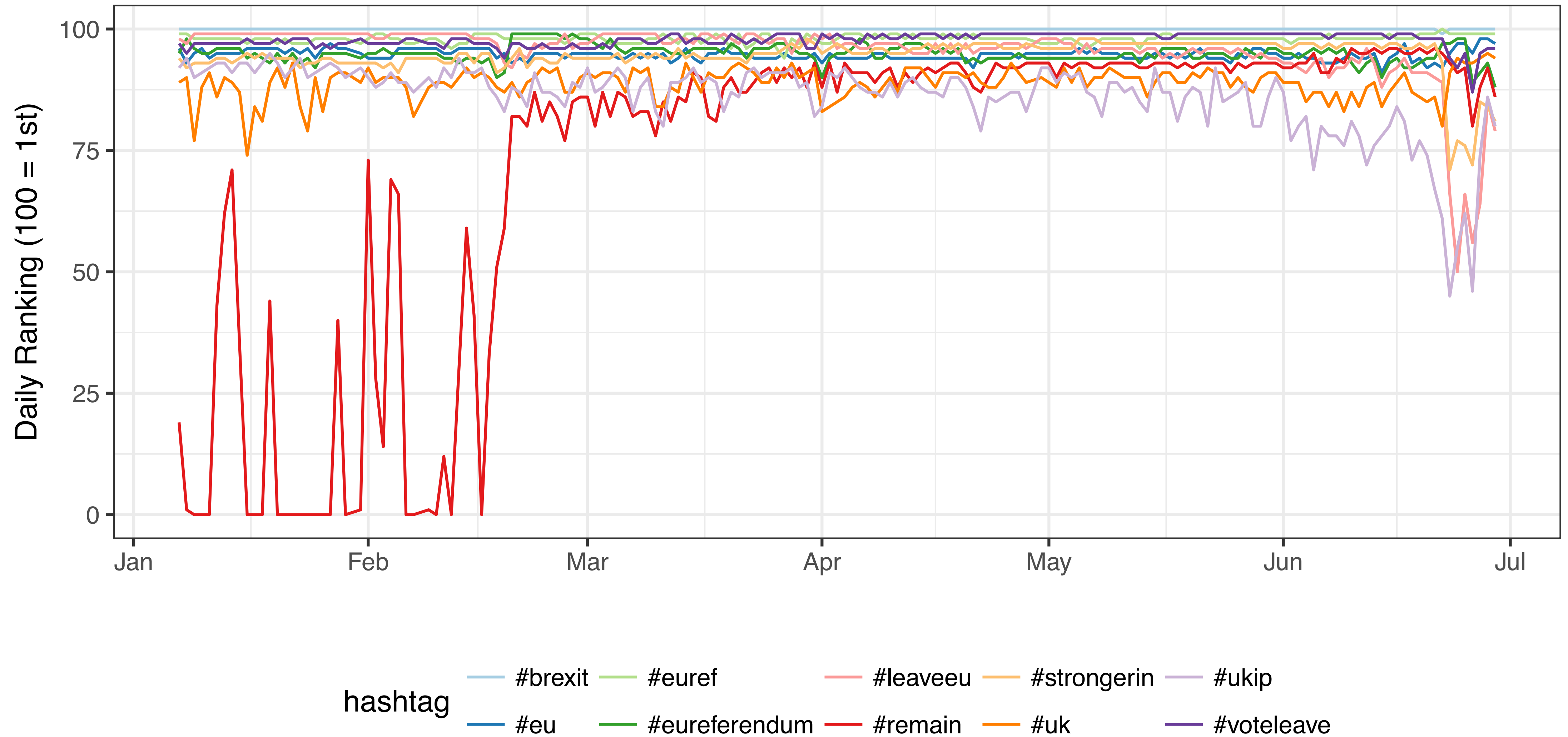
Main hashtags

- List of hashtags
http://rpubs.com/amatsuo/top_hashtags_10000
- c.f List of mentions
http://rpubs.com/amatsuo/top_mentions_10000

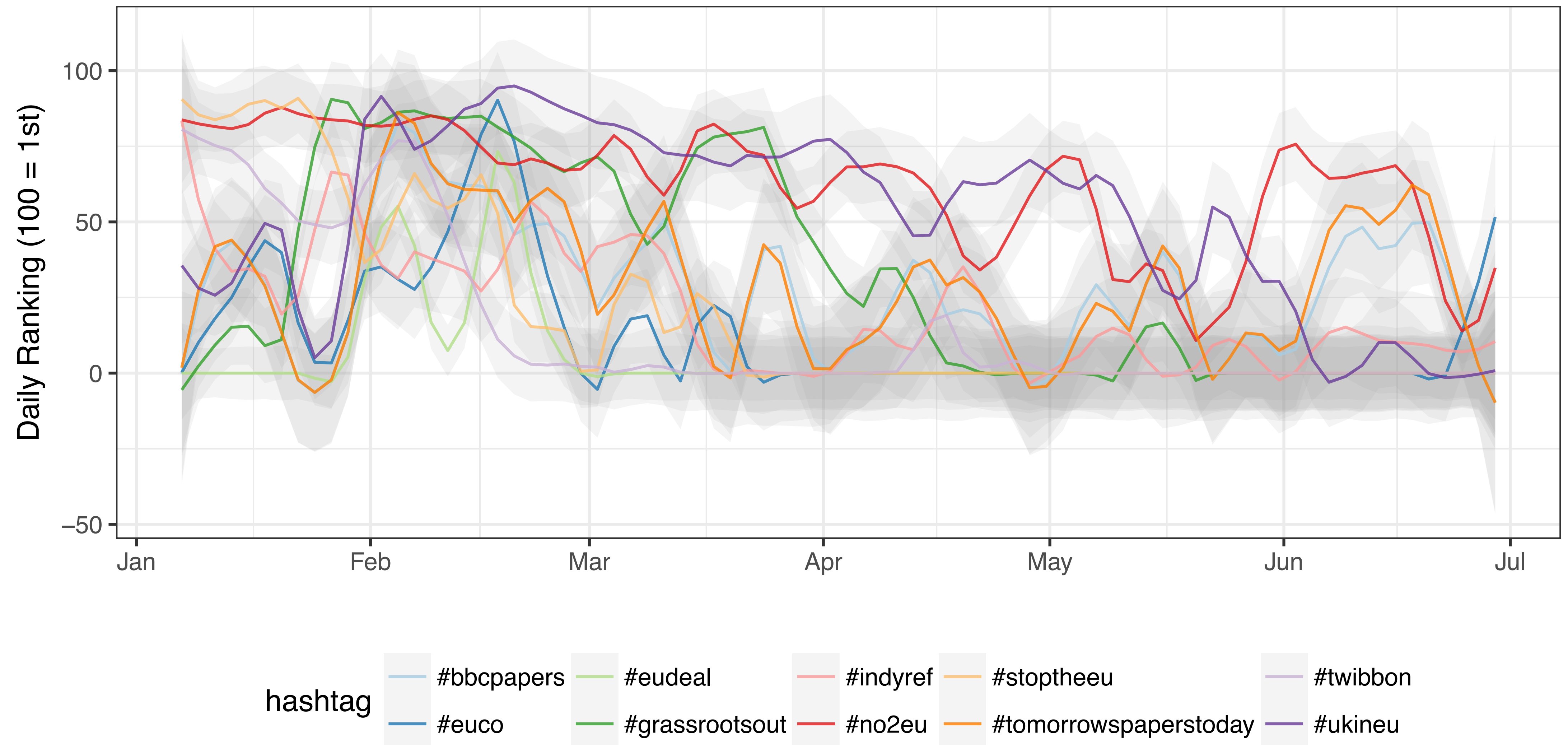
Main hashtags



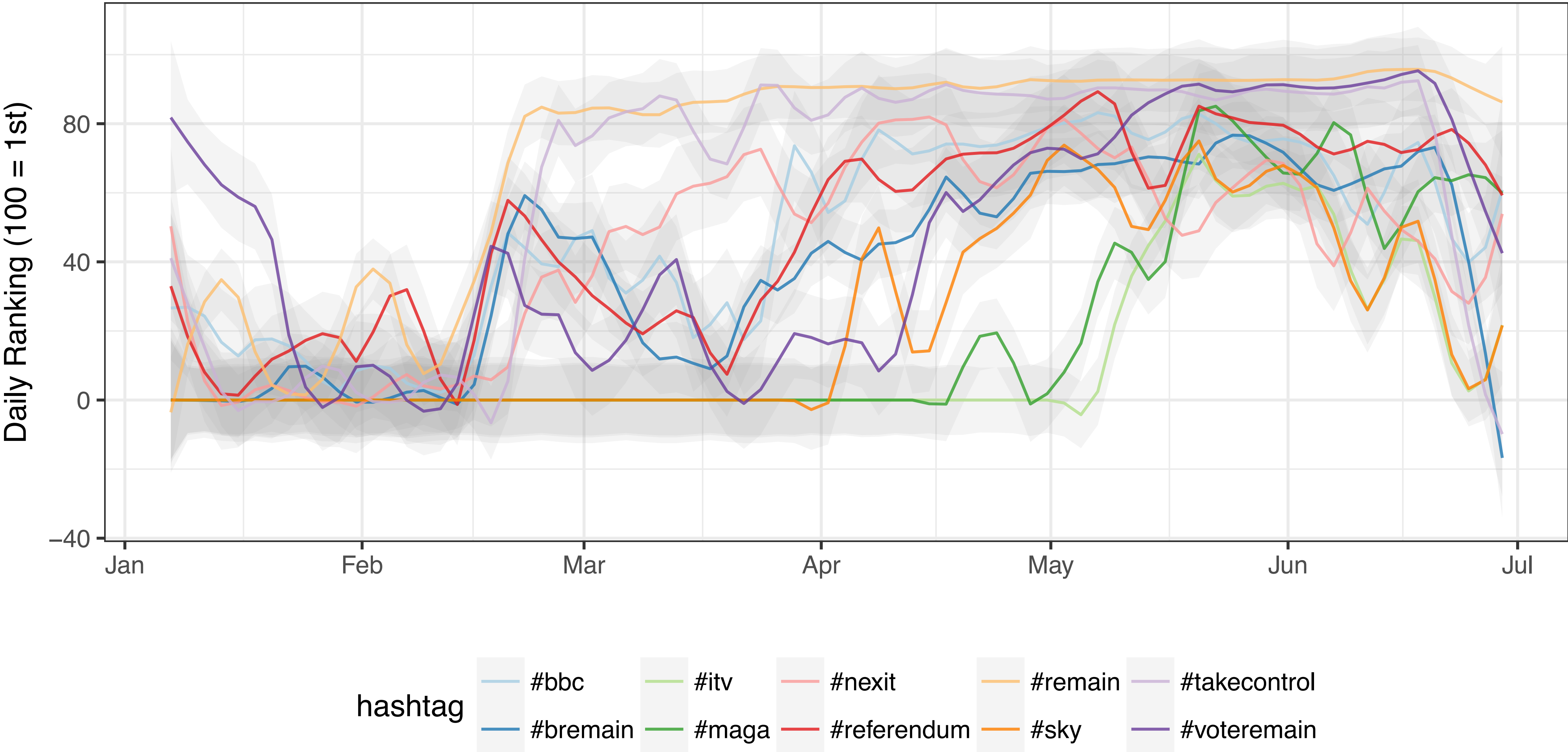
Evolution of hashtags (ranking)



Evolution of hashtags (ranking)



Hashtags surging popularity



Predicting Leave v. Remain

- Method: Naive Bayes classifier, also Support-Vector Machines (SVM)
- Data source: combined tweet corpus at user level
- Creating training data
 - Select “power-users” (more than 100 tweets in the corpus, 15K users)
 - Check the use of pre-determined set of “leave” and “remain” hashtags
 - Calculate the difference in the use of leave and remain hashtags. Construct training data from top and bottom 10% of power users
- Features
 - Use bag of words method (unigrams, remove features used less than 20 users)

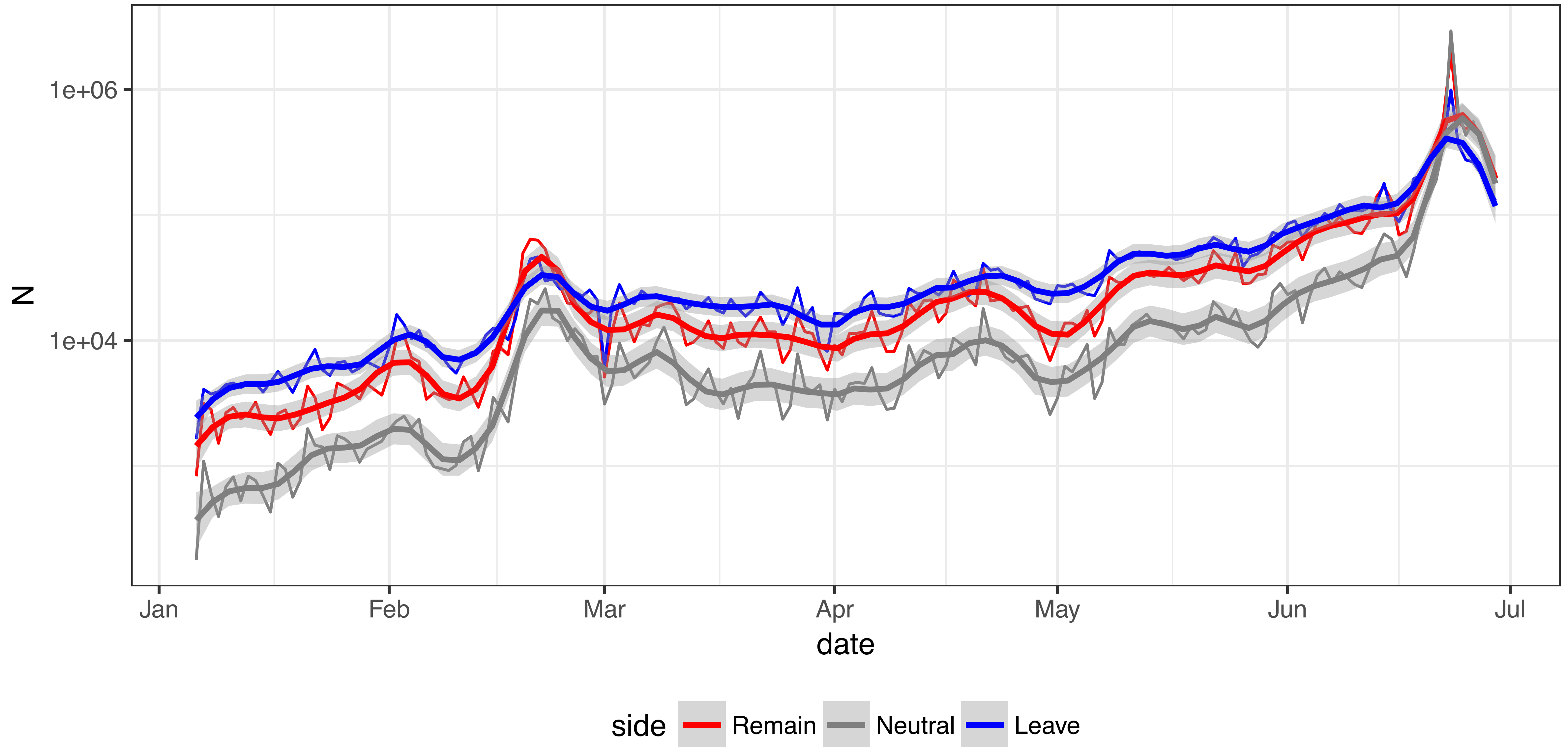
Predicting Leave v. Remain (Feature Selection)

- Models are evaluated through
 - Split training data into training and test sets
 - Check the prediction accuracy for test sets
- Three models are tested (prediction accuracy for test set in parentheses)
 - All words (49.4%)
 - Only hashtags (82.8%)
 - Hashtags and mentions (88.2%)

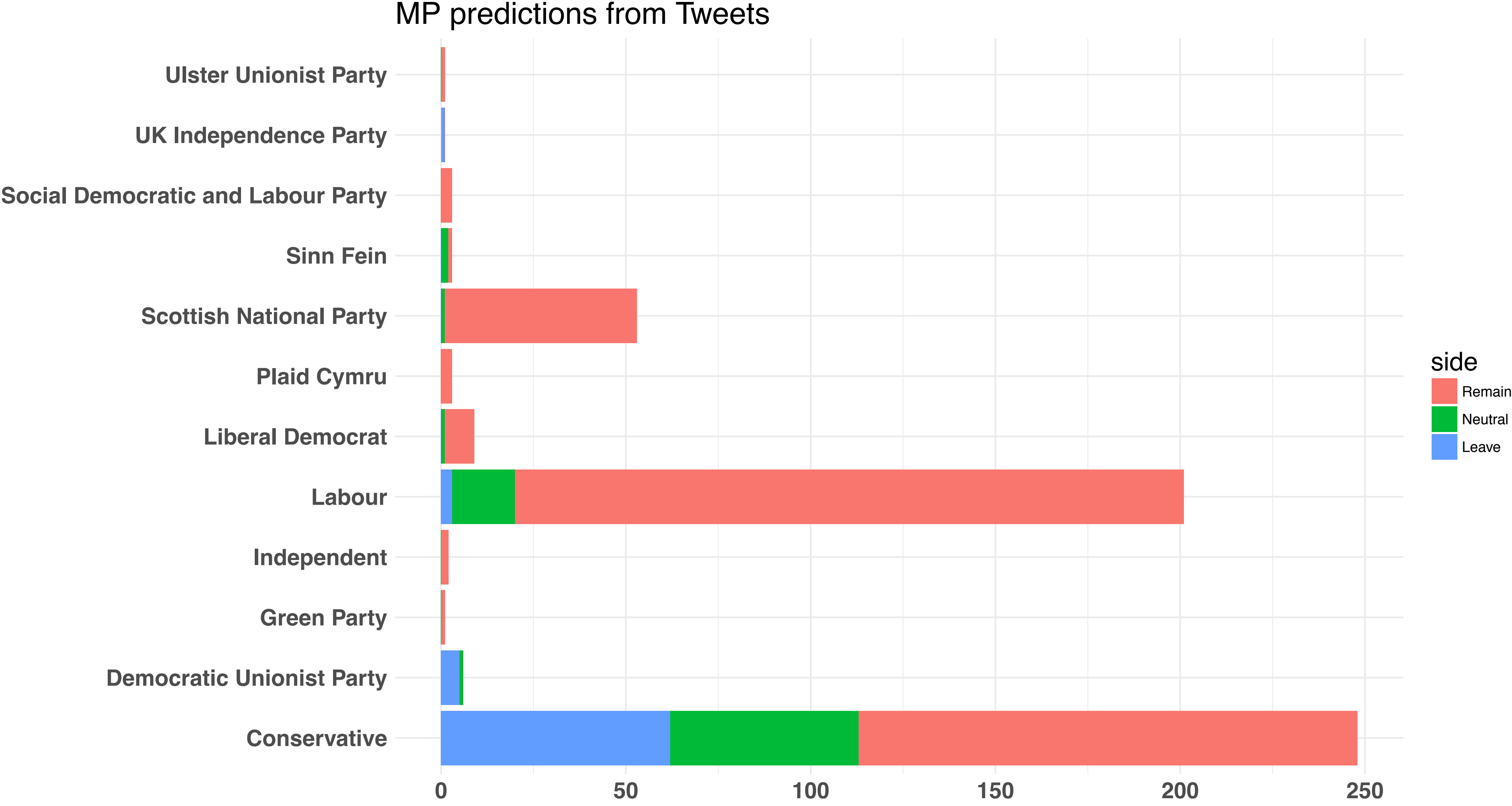
Predicting Leave v. Remain

	N	%
Remain	9,780,223	36.93%
Neutral	7,786,297	29.40%
Leave	8,914,207	33.66%

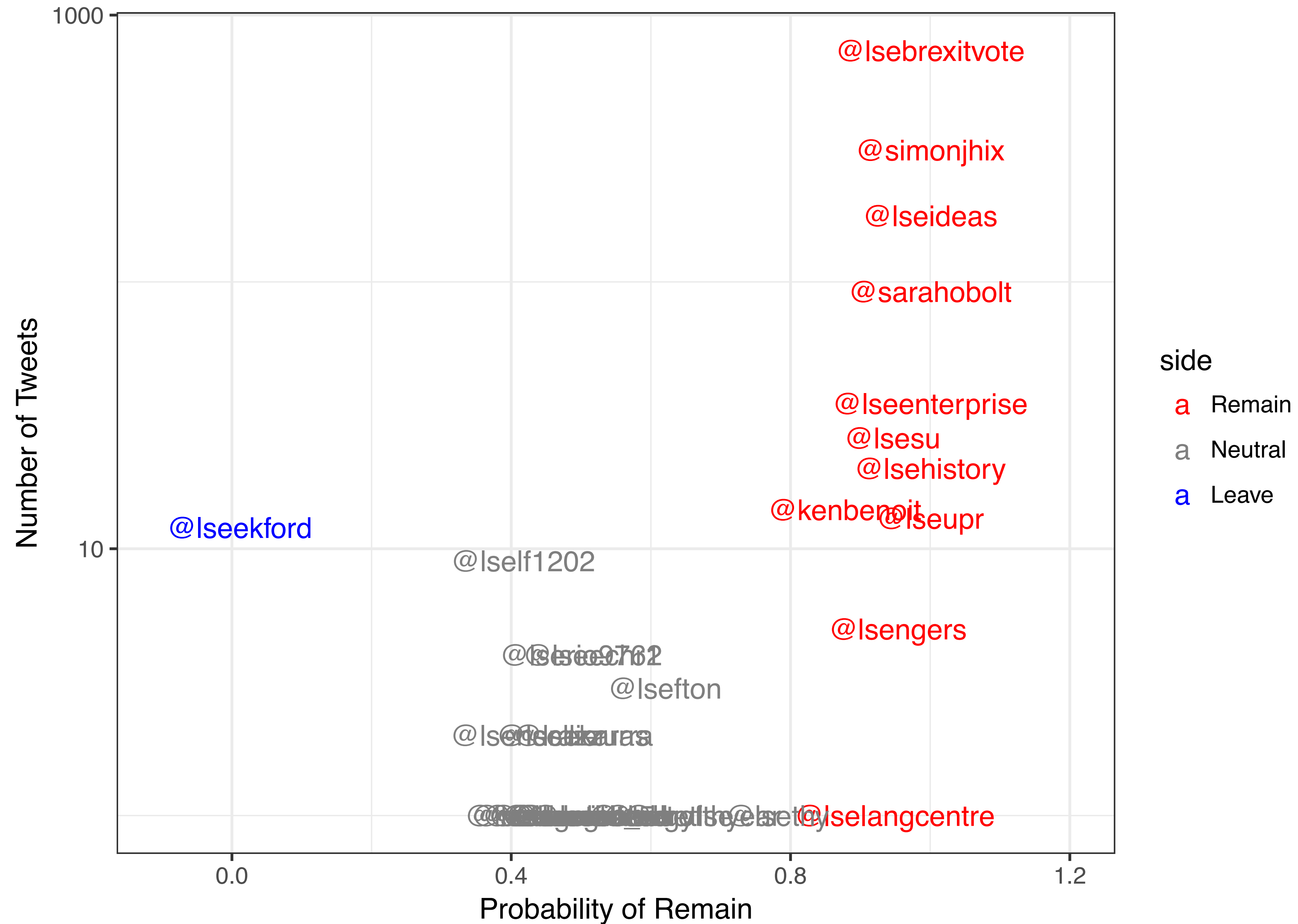
Patterns of posts, Leave v. Remain



MP side predictions by party



A few well-known
Twitter users





TWEETS
4,078

FOLLOWING
232

FOLLOWERS
123

LIKES
3,376

 [Follow](#)

linda seekford
@lseekford

Joined October 2012

 [Tweet to linda seekford](#)

 40 Photos and videos



https://ads.twimg.com/sticky/default_profile_images/default_profile_6_200x200.png in a new tab

TweetsTweets & repliesMedia

**linda seekford** @lseekford · Jan 20
Sad liberals spewing hate

AJ+ @ajplus

#inauguration2017: We're in DC showing you everything going down on this historic day. periscope.tv/w/a1DIKzQzNDk5...



**linda seekford** @lseekford · Jan 20
Thank God we survived the last 8 yrs



**linda seekford** @lseekford · Jan 17

John McCain is,a snake. Go away you old goat

 1

**linda seekford** @lseekford · Jan 20

Mass impeachment for the traitor democracts



Leave and Remain

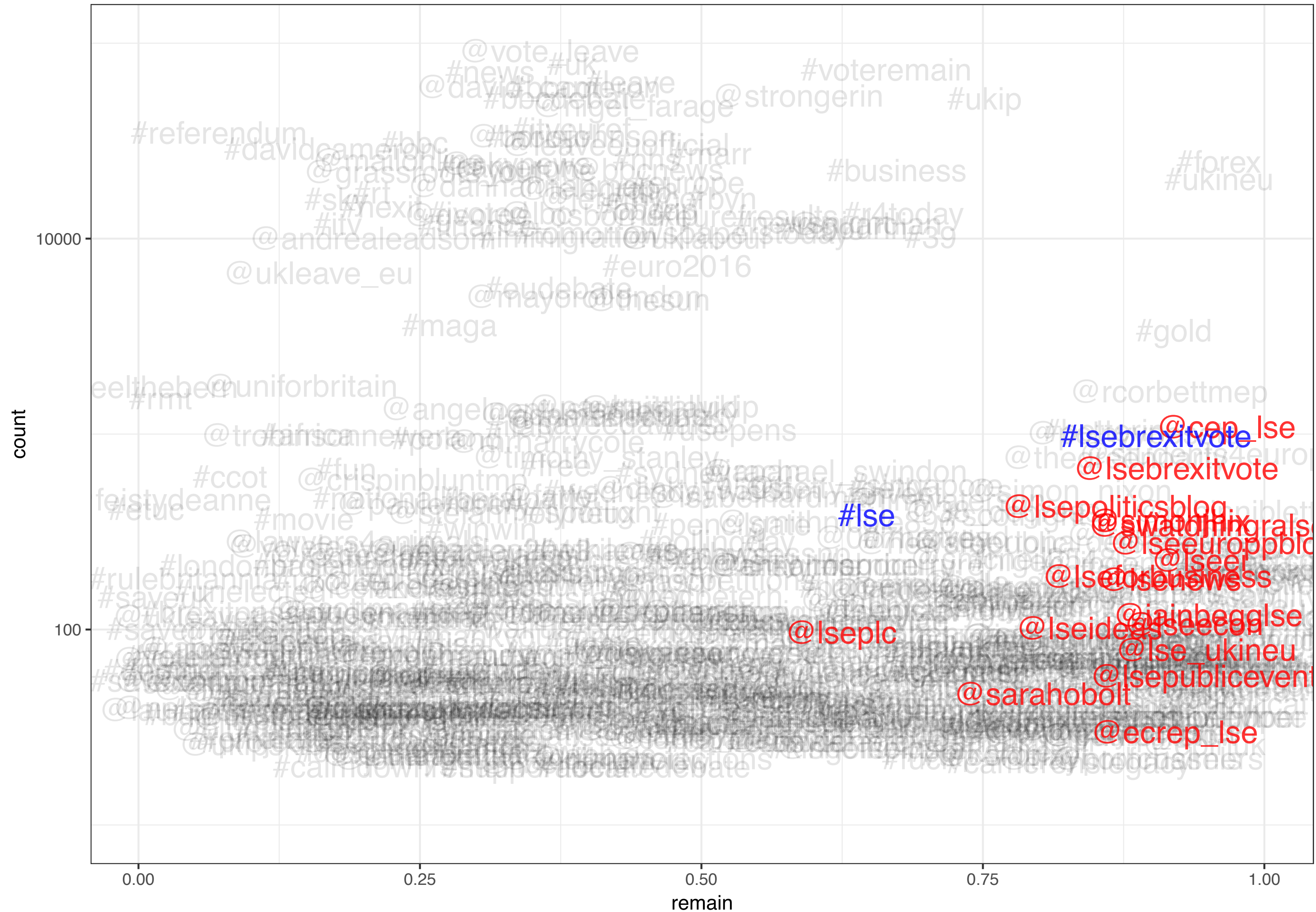
Hashtags



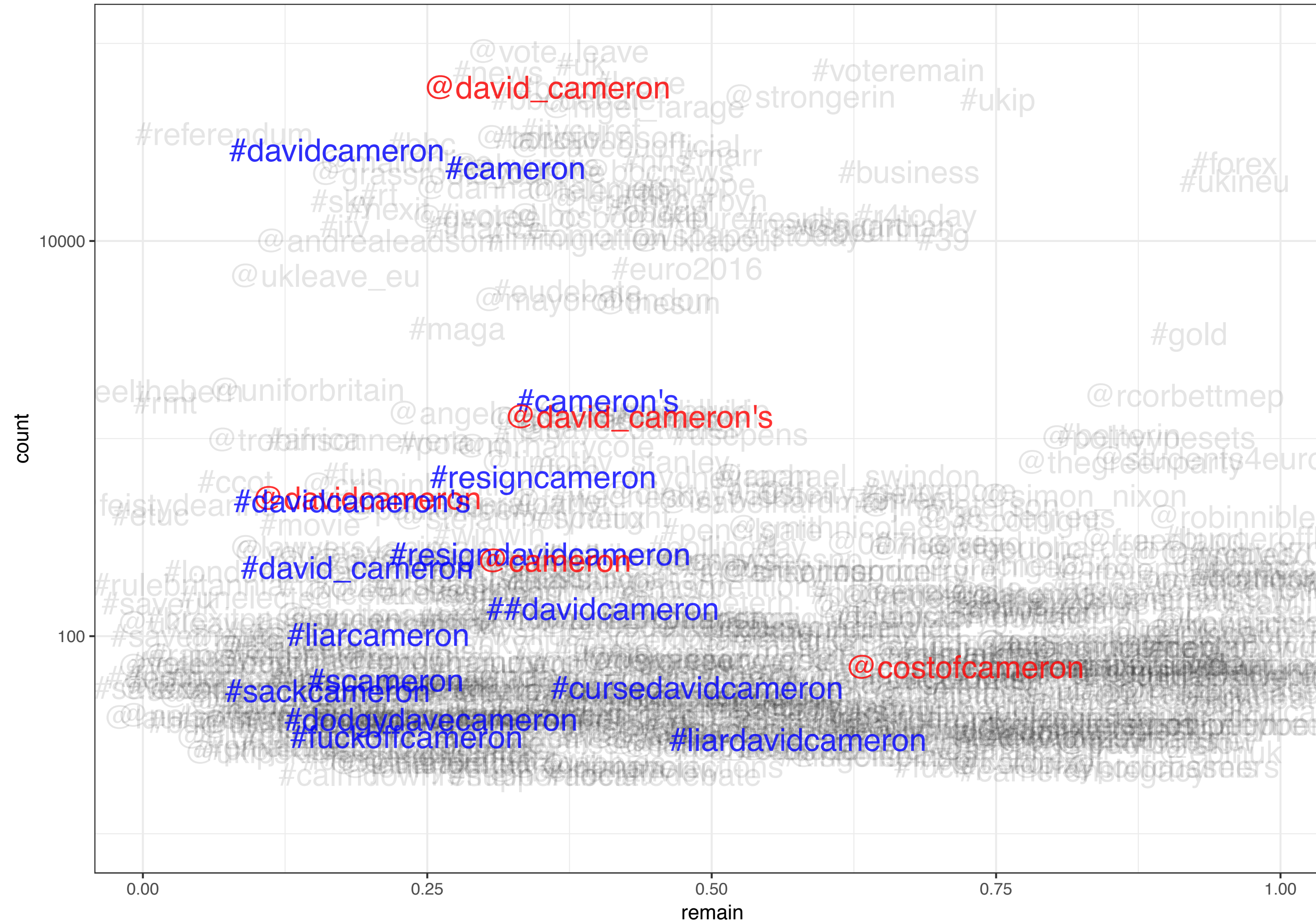
Leave and Remain Features

http://rpubs.com/amatsuo/feature_scores

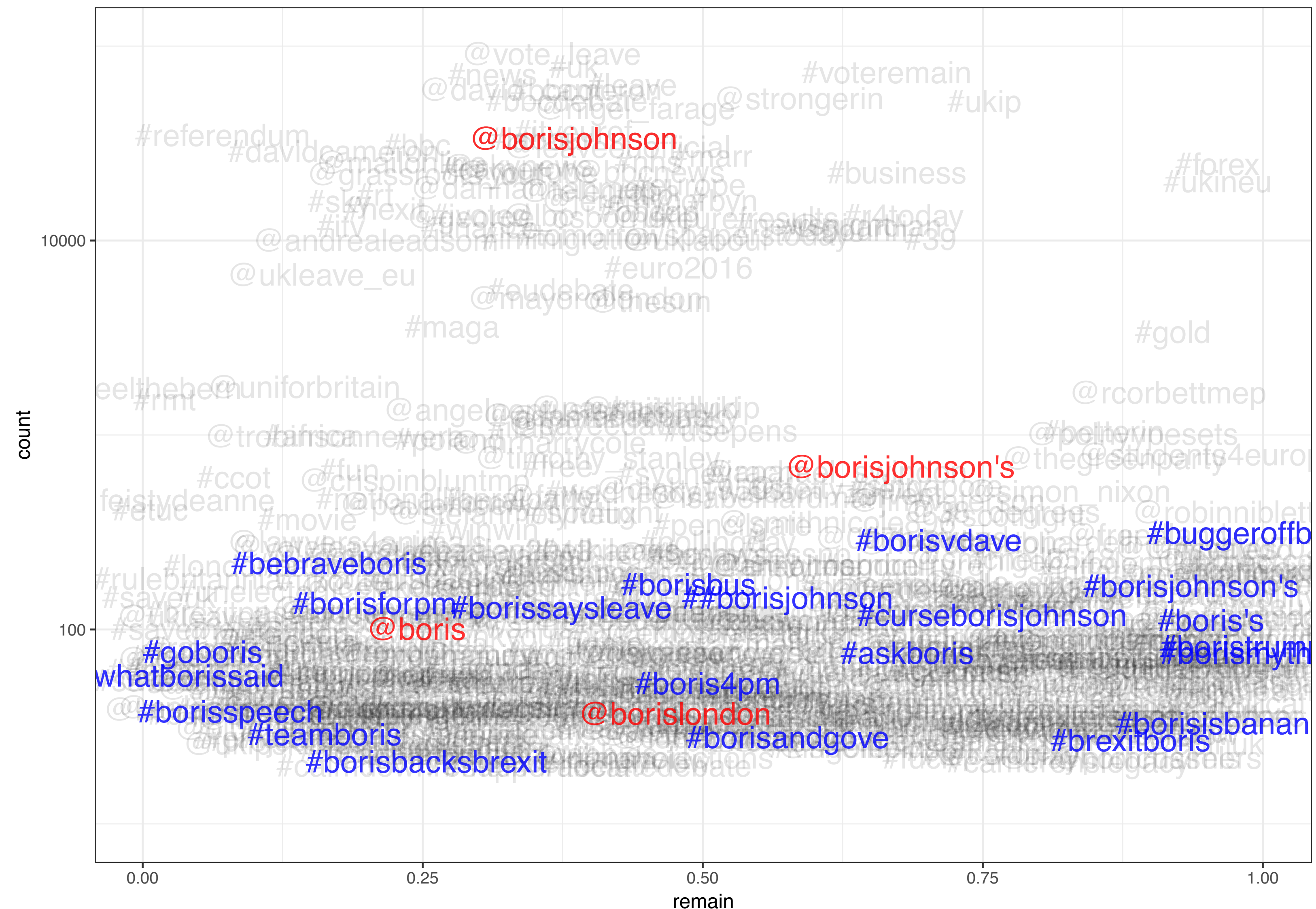
Leave and Remain Hashtags (LSE)



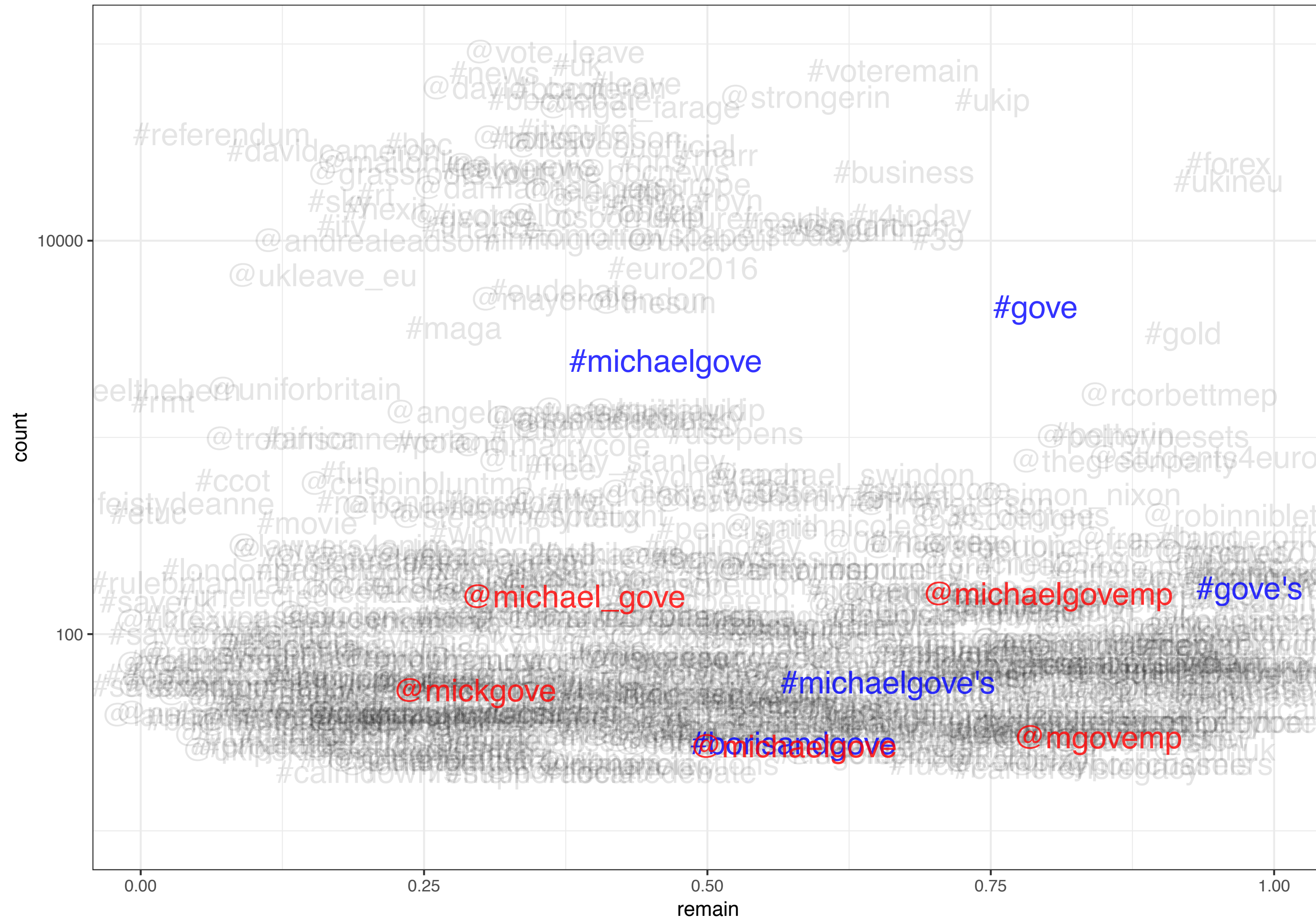
Leave and Remain Hashtags (Cameron)



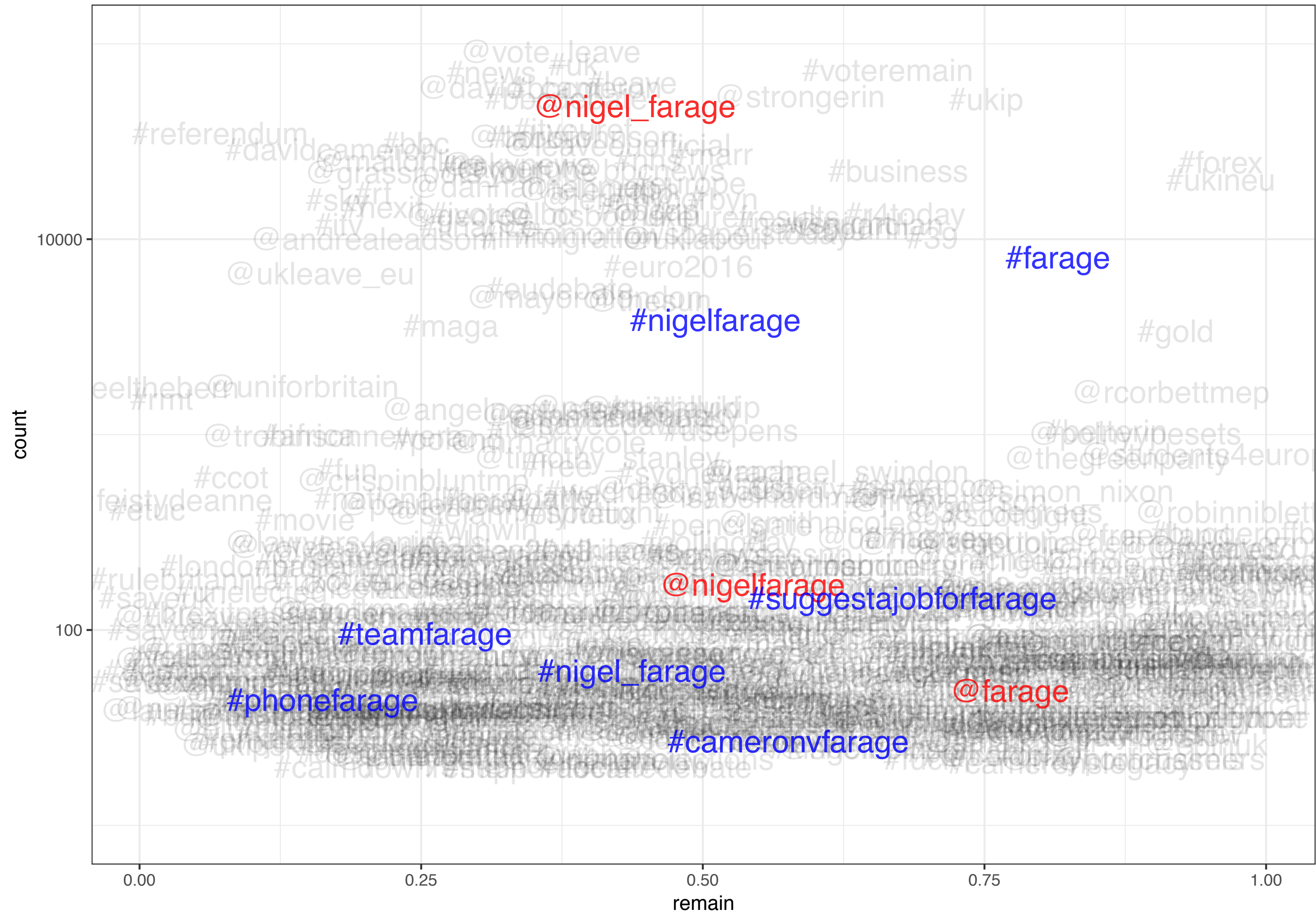
Leave and Remain Hashtags (Boris Johnson)



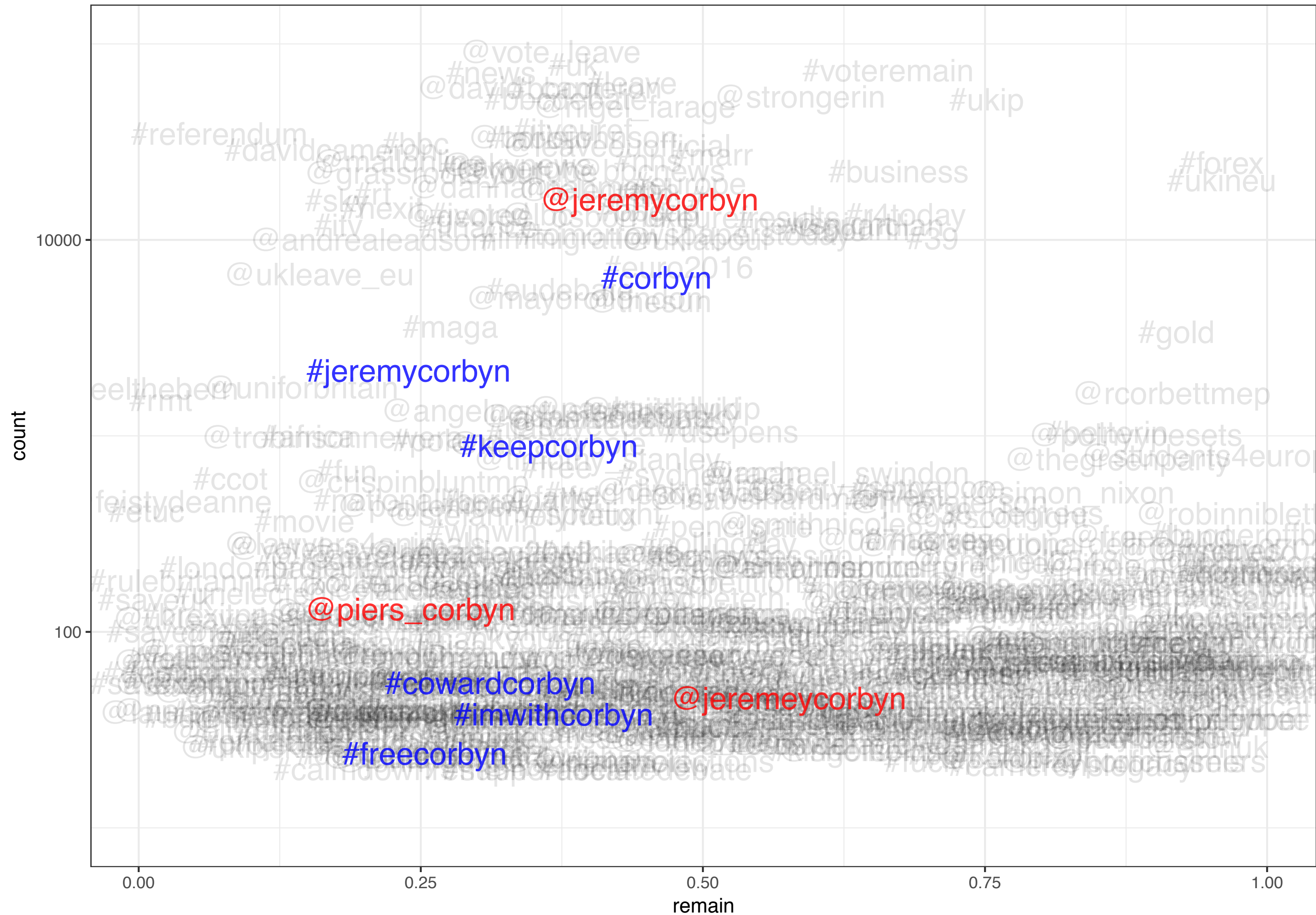
Leave and Remain Hashtags (Gove)



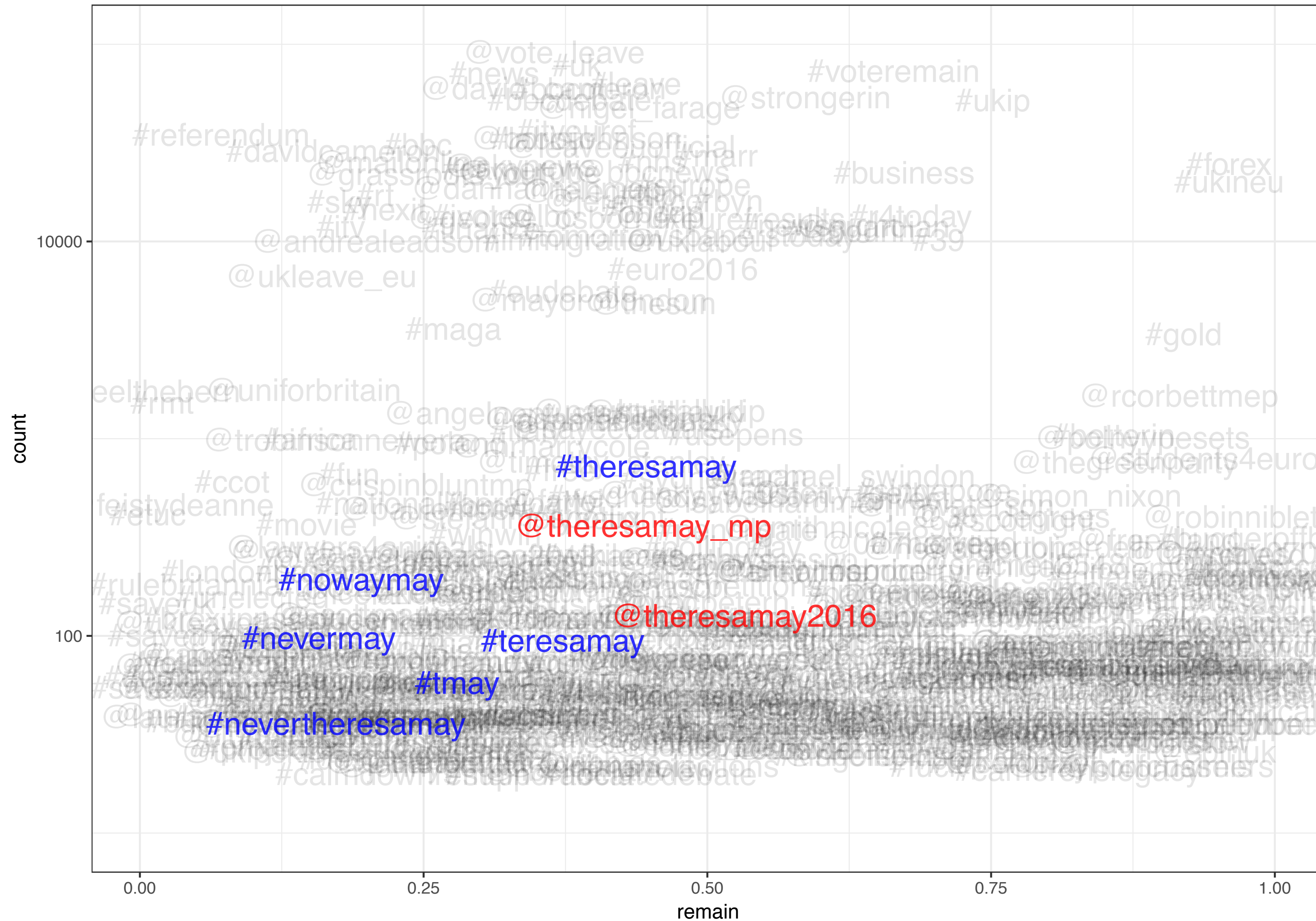
Leave and Remain Hashtags (Farage)



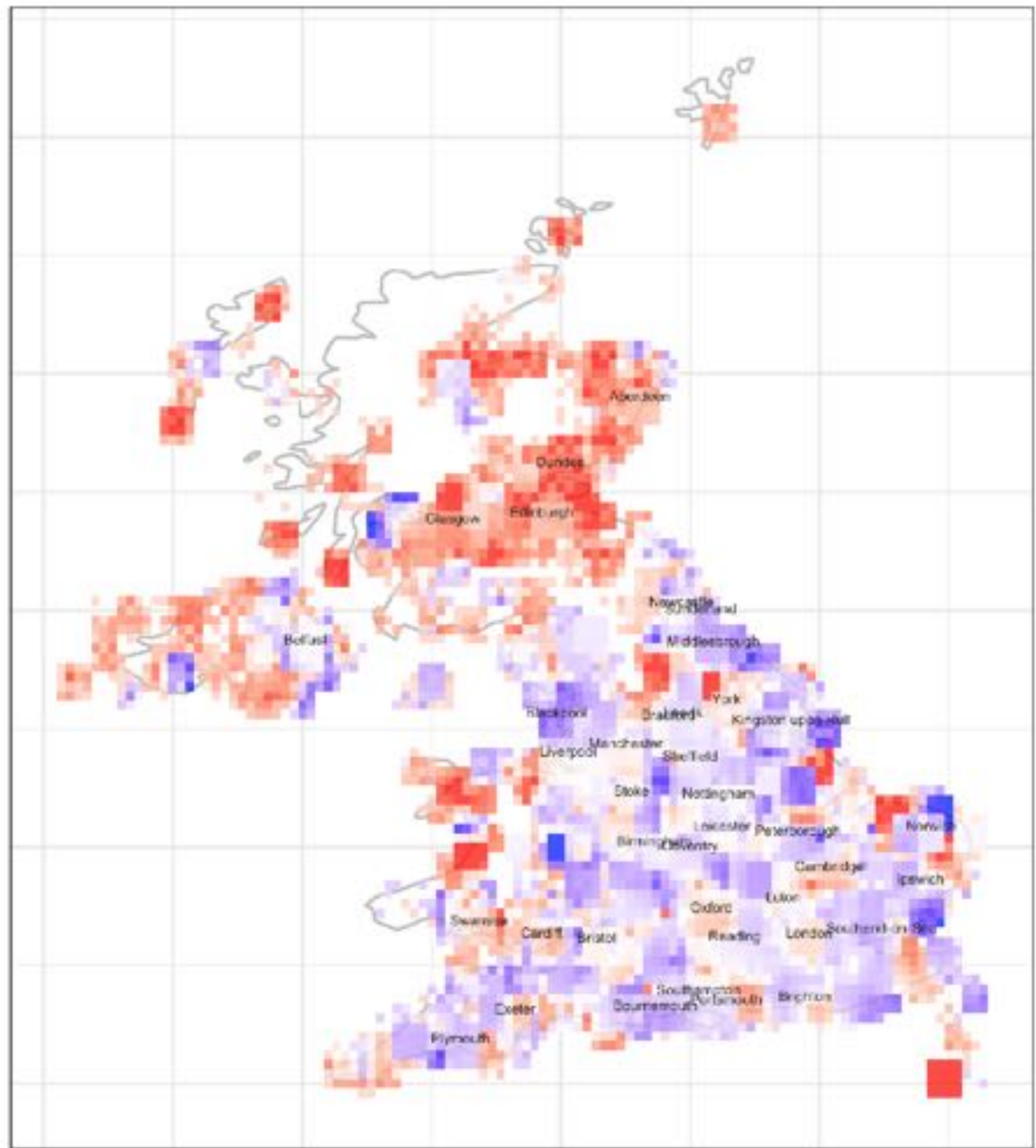
Leave and Remain Hashtags (Corbyn)



Leave and Remain Hashtags (LSE)



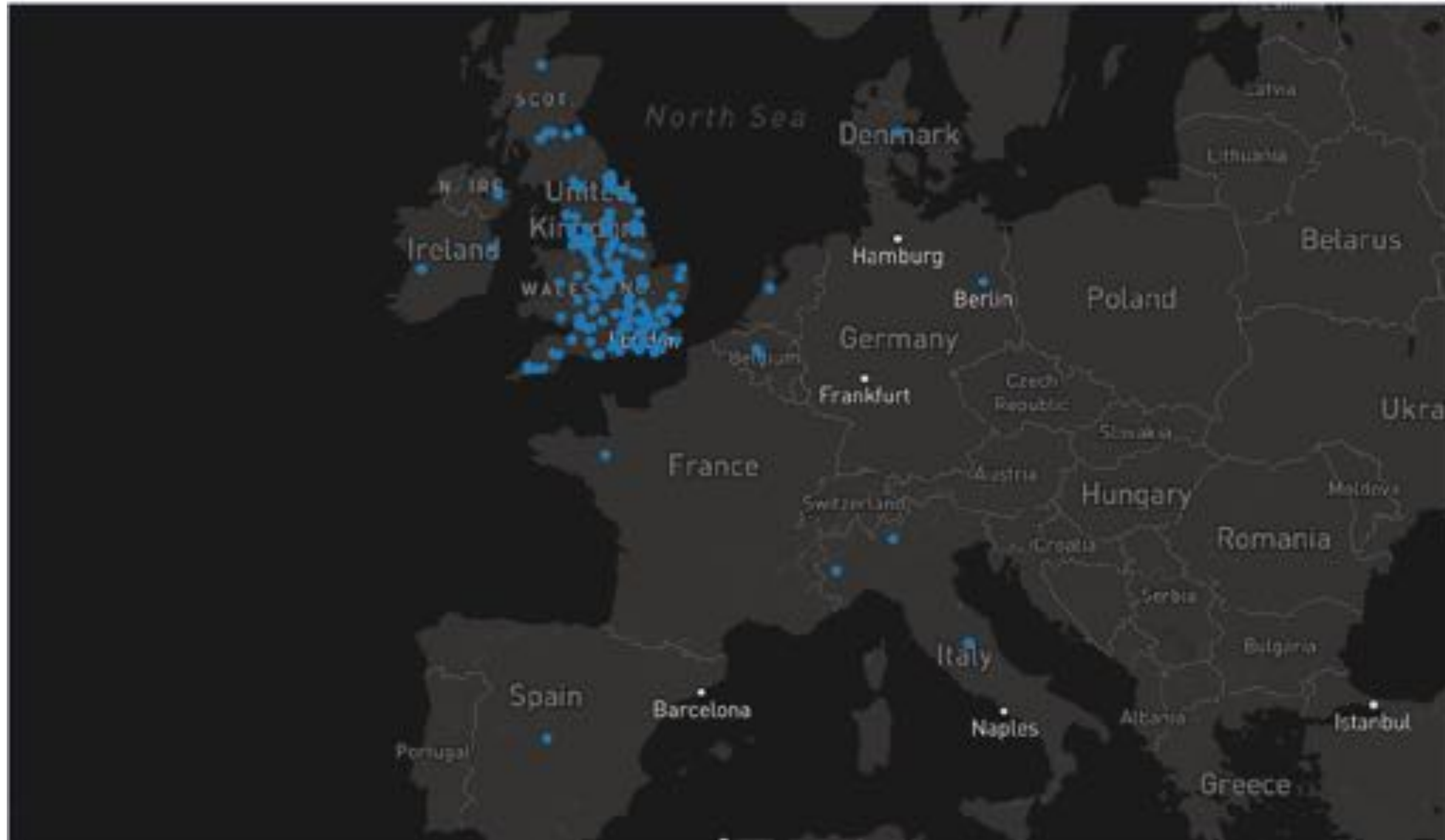
Leave v. Remain Hashtags



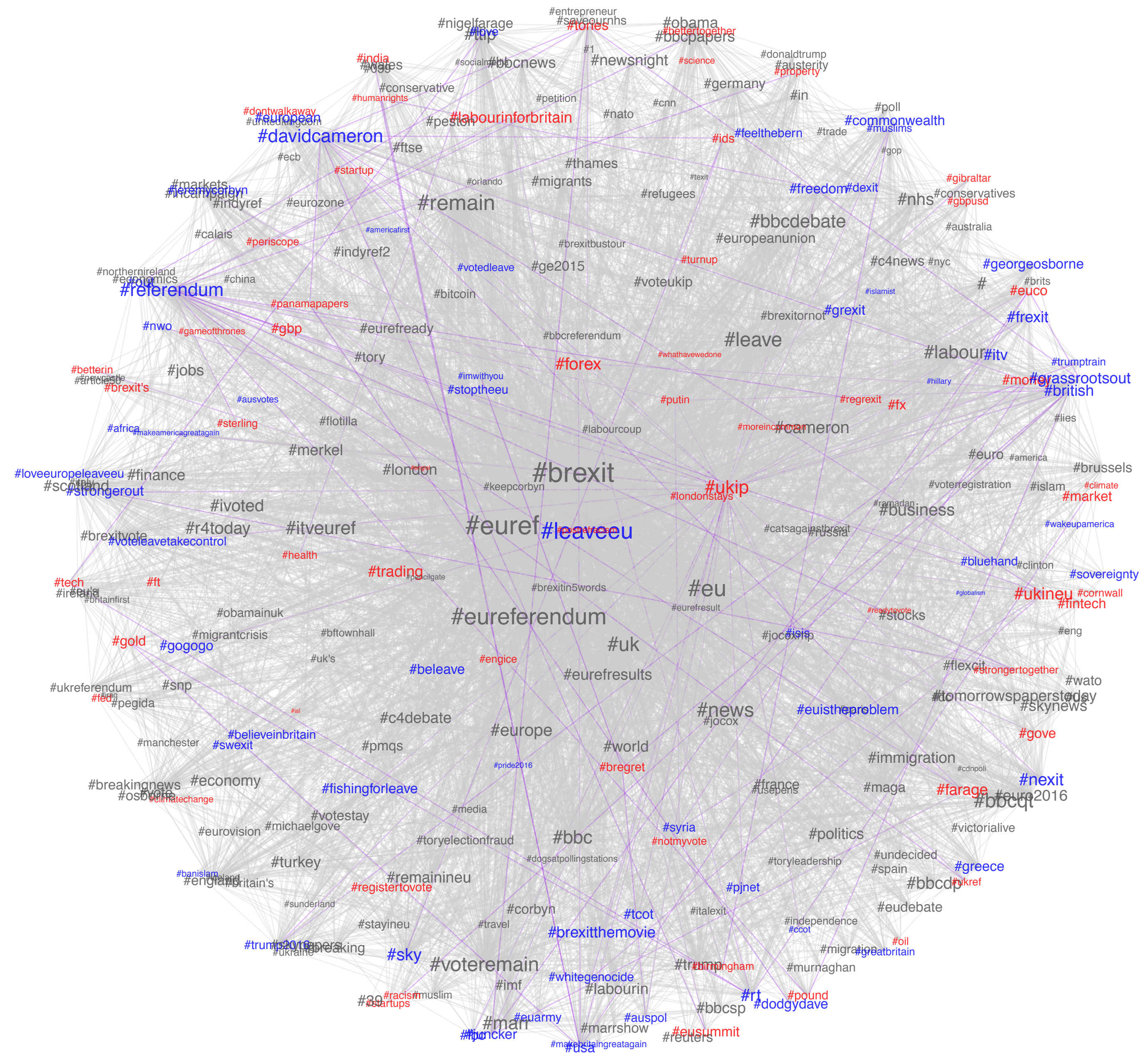
SVM classification Europe-wide: Remain



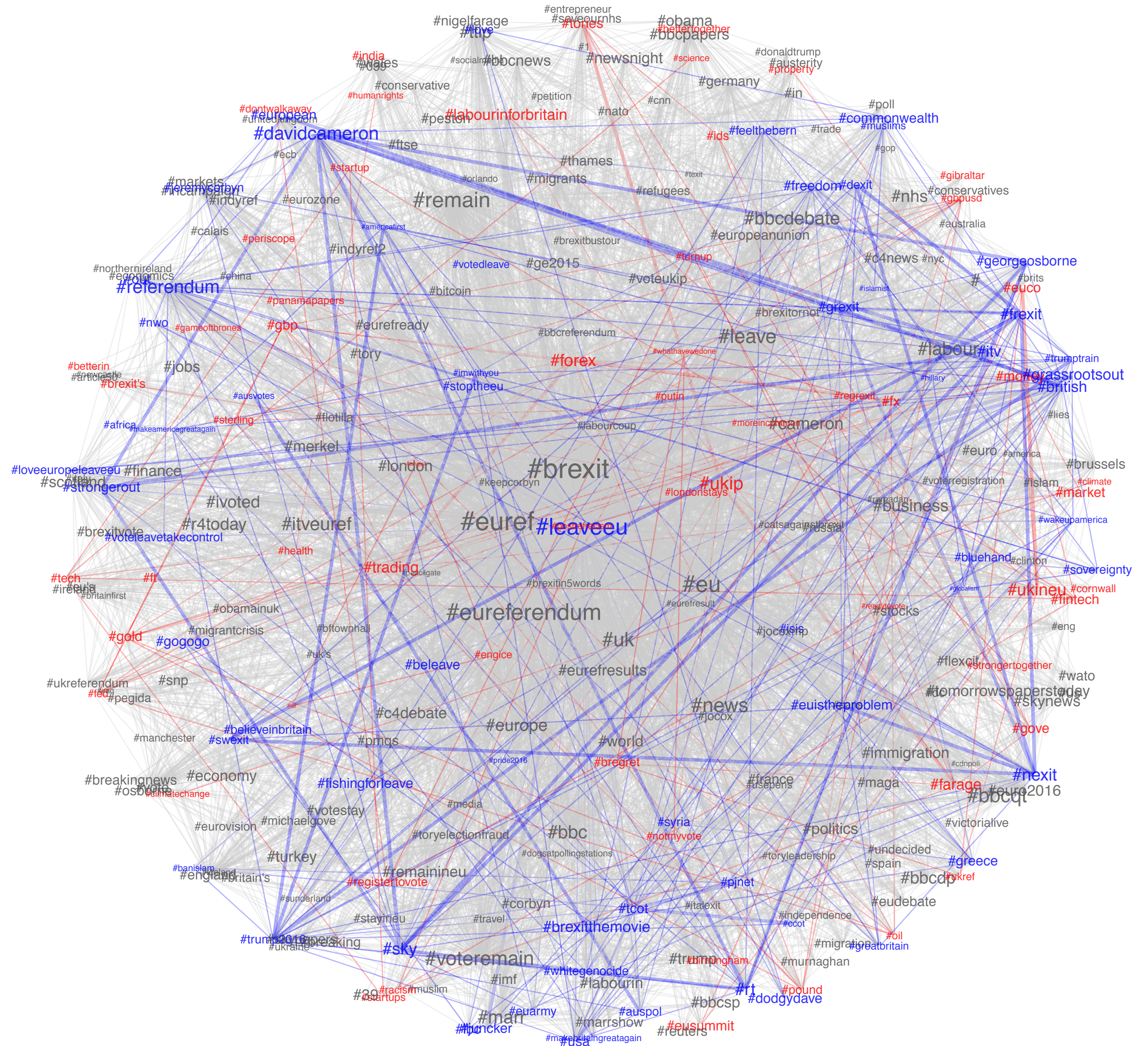
SVM classification Europe-wide: Leave



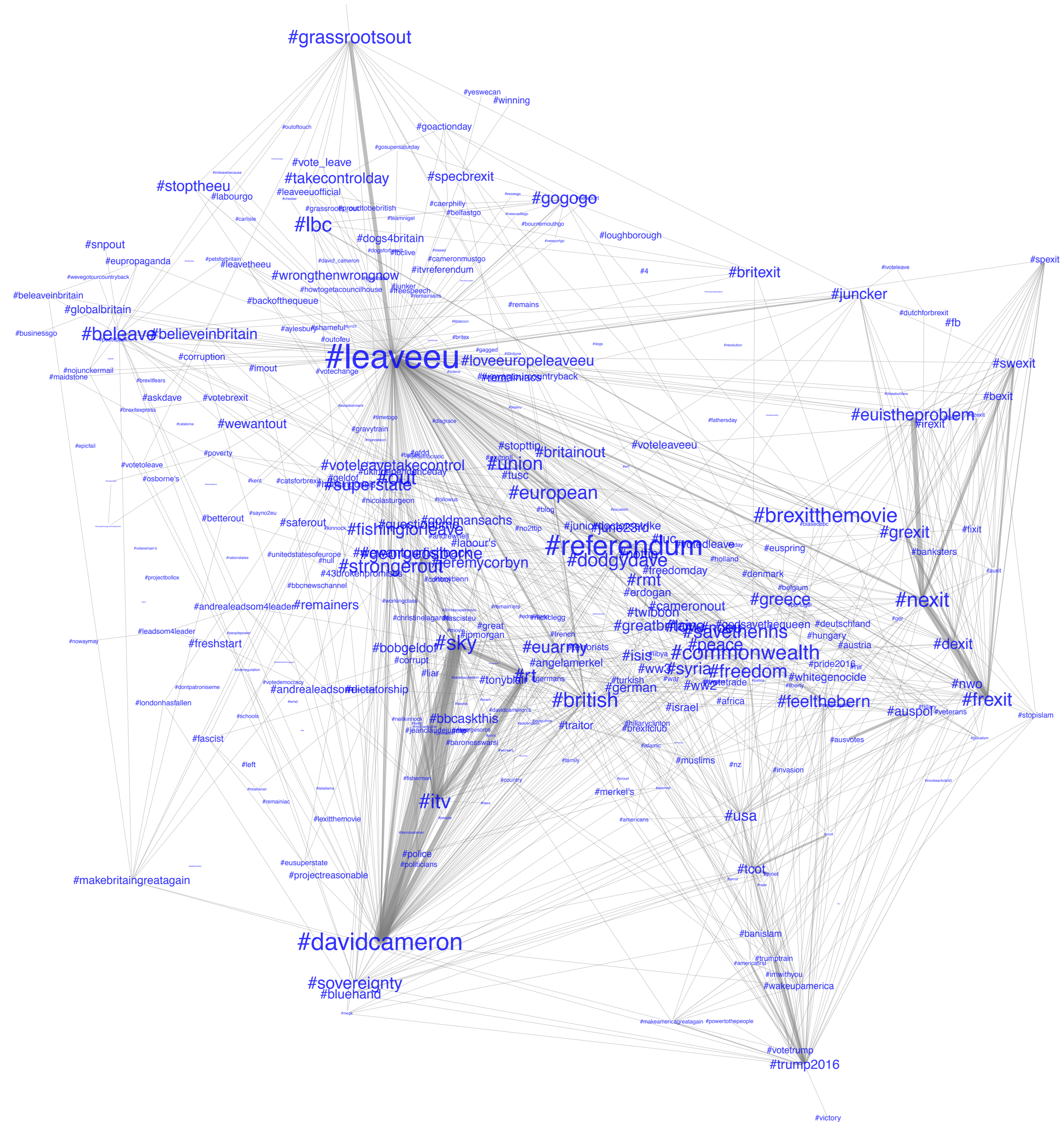
Hashtag Networks (Top 300, across sides)



Hashtag Networks (Top 300, across sides)



Hashtag Networks (Leave)





bury #shameful #jun23

#outofeu

#leaveeu

#votechange

#liblabcon

#britex

#scotlandgo

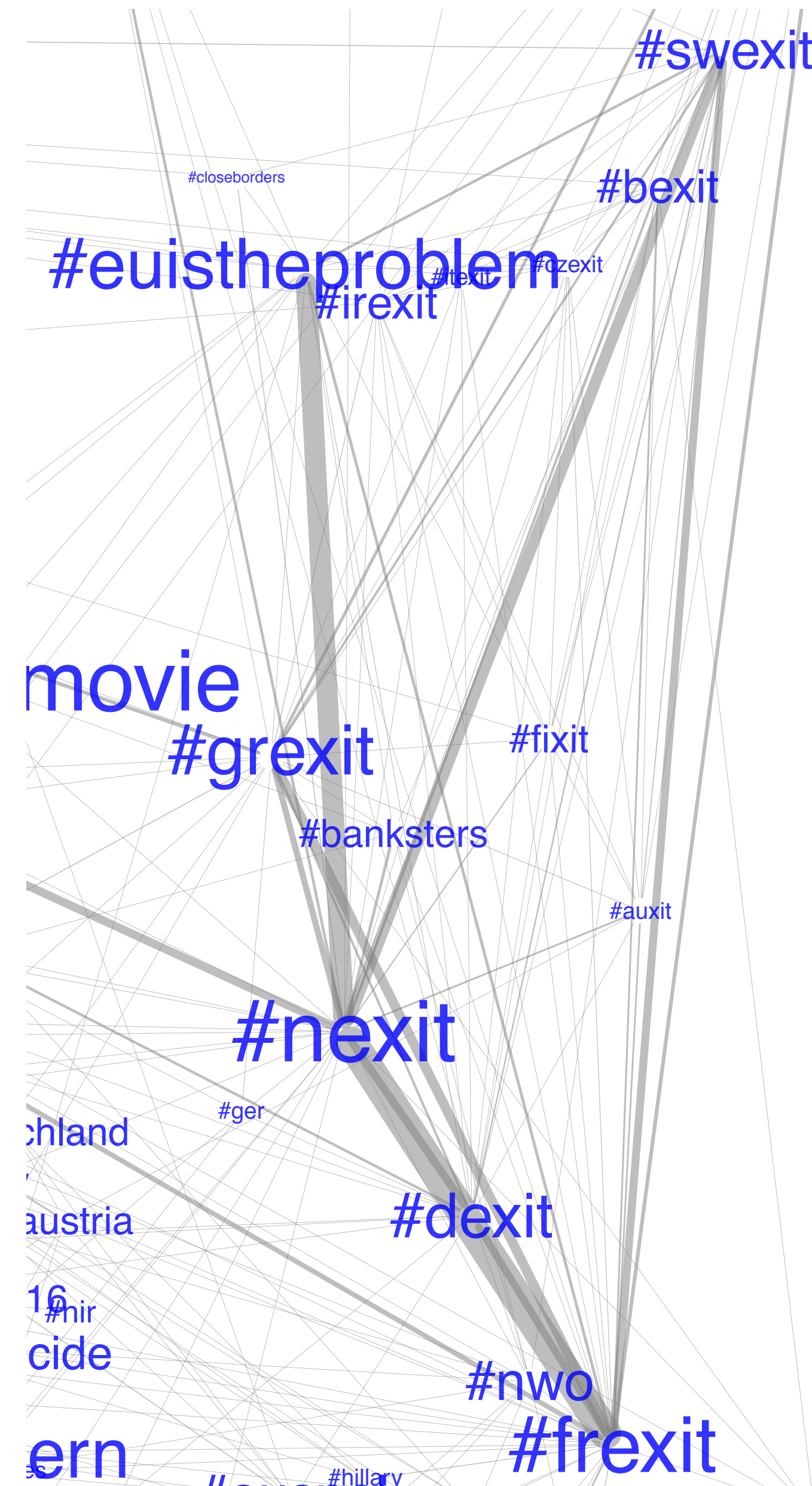
#gagged

#loveeu

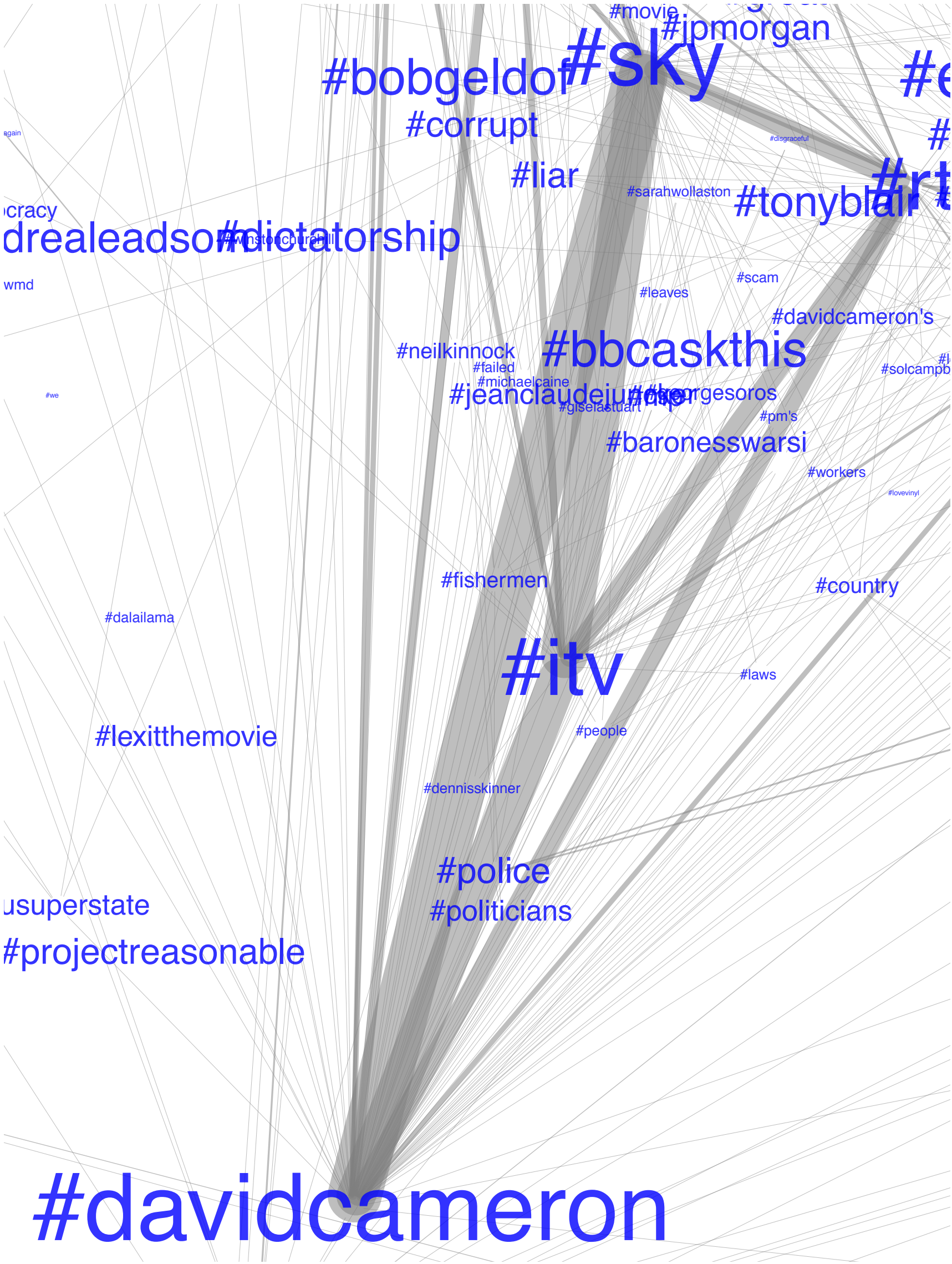
#voteno

#wey
#time

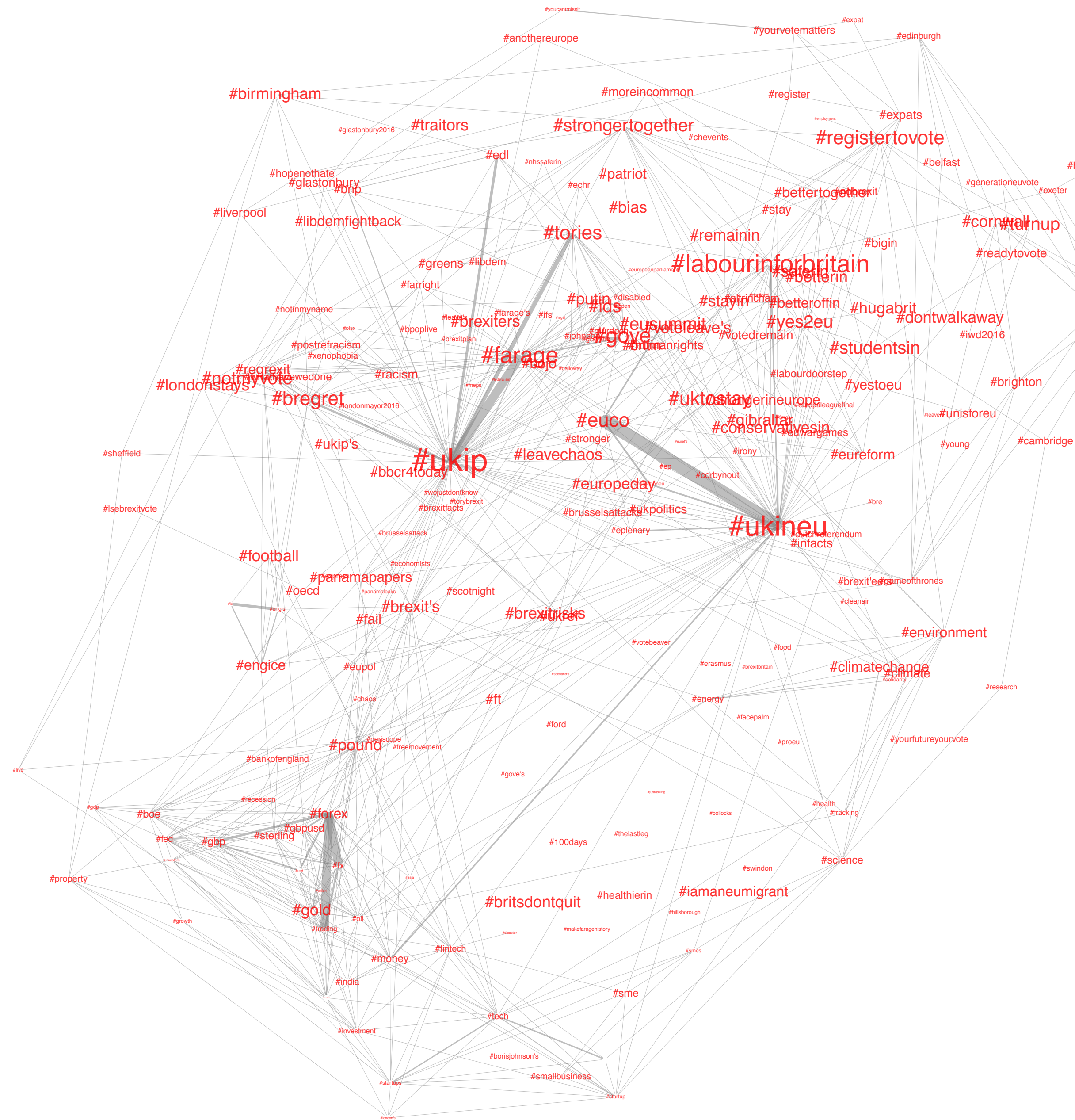
Hashtag Networks (Leave, anti-EU)



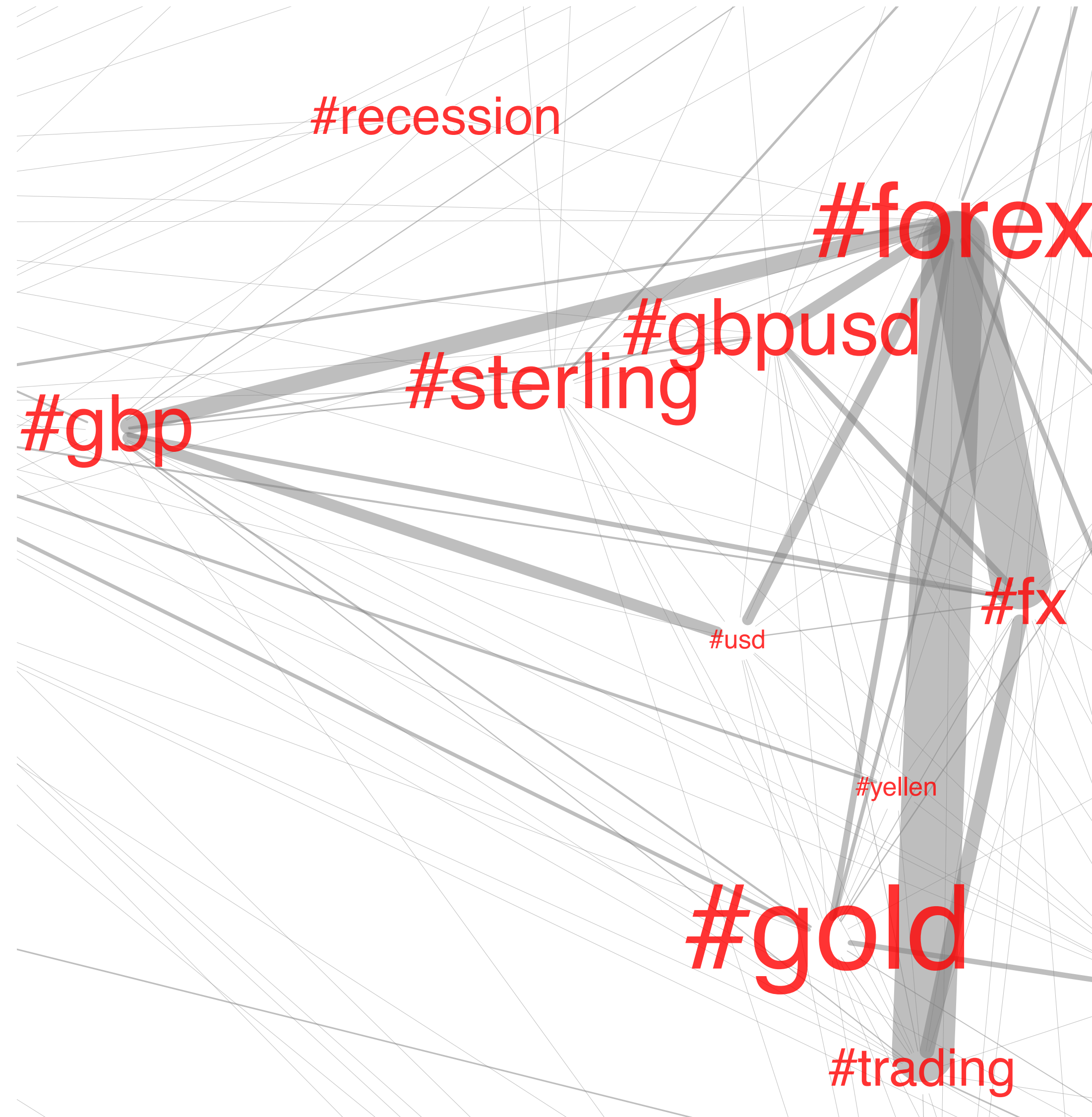
Hashtag Networks (Leave, debate)



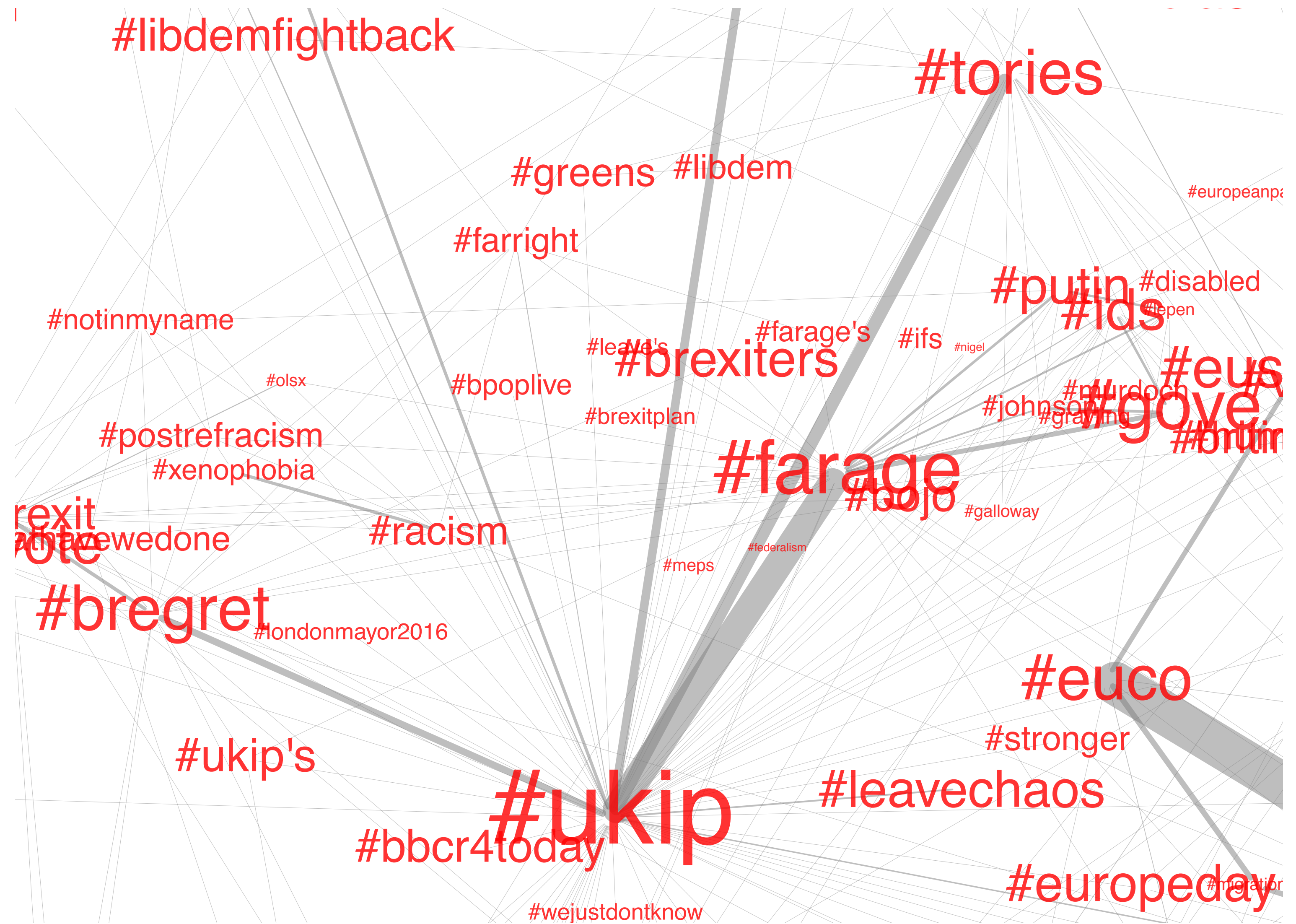
Hashtag Networks (Remain)



Hashtag Networks (Remain, economic concerns)



Hashtag Networks (Remain, parties and political figures)





Data Science Institute Twitter Observatory

A Set of Tools to Explore Twitter
C Snowden, D Birch

The Twitter Observatory

Chris Snowden, Dr David Birch

Data Science Institute
Imperial College London

Data Kindly Provided by Prof Ken Benoit

**Imperial College
London**

Visual Analytics tools for Exploring Twitter

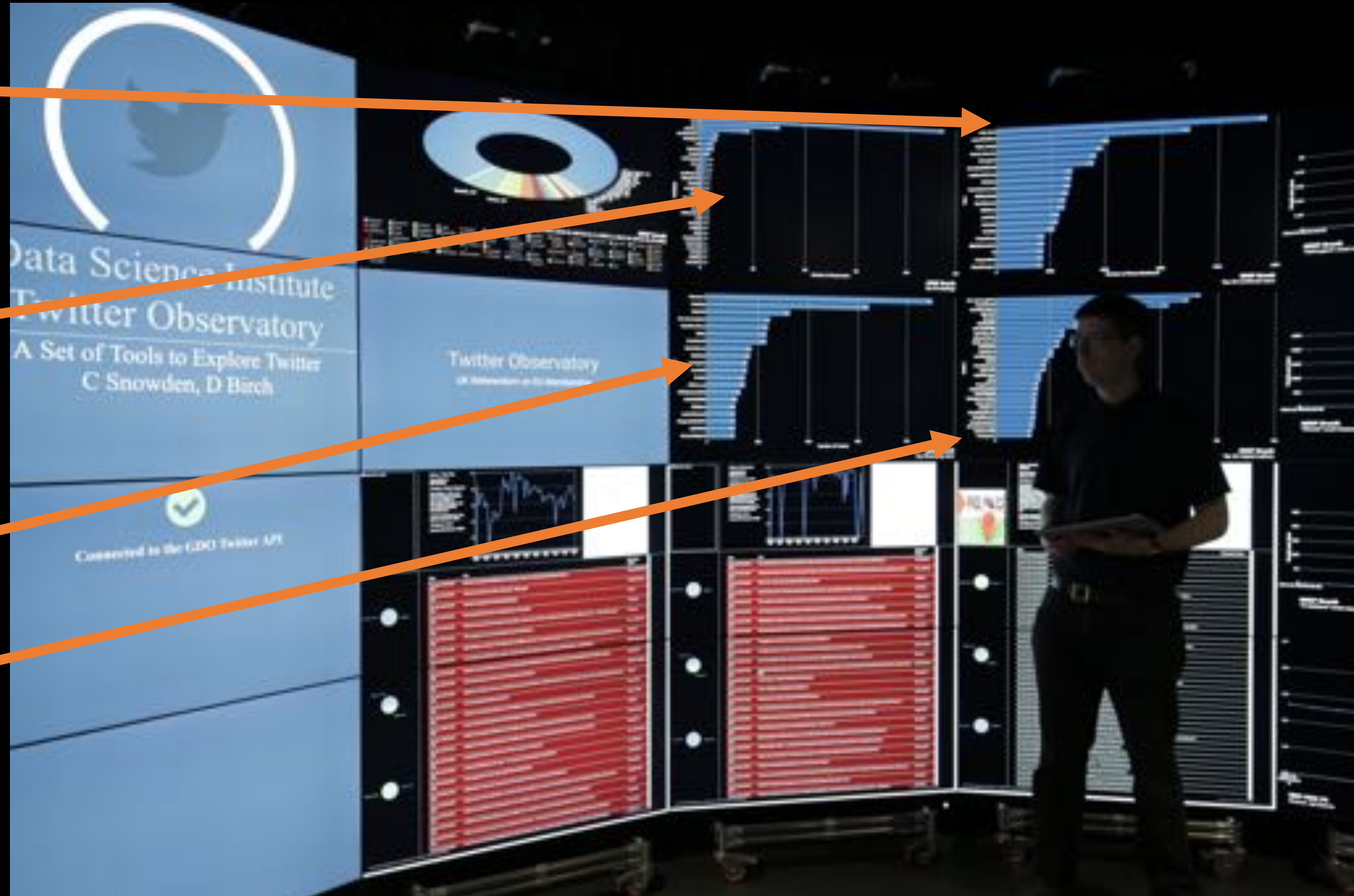
- We use the KPMG Data Observatory a 64 screen immersive visualisation environment
- To create an immersive social discussion environment driven by data.
- Interactive queries can be run on the data and displayed in real time to support multi-disciplinary discussion
- 132million pixels allows us to display huge amounts of data for detailed discussion

Most
mentioned
users

Most
popular
Hashtags

Most
popular
tweeters

Most
original
tweets



Community detection

Leave (red)
Remain (purple)

Several communities of leavers
Only one strong remain community

Clear “echo chamber” of leavers



Sentiment Analysis

- Looks up terms from the Linguistic Inquiry and Word Count, a psychological dictionary
- Contains categories about:
 - positive and negative emotion
 - politics
 - power
 - quantitative language
 - tentative language
 - sadness
 - future v. past orientation

example: "reward" language

```
> data_dictionary_liwc[["reward"]]
```

[1]	"access*"	"accrue*"	"accumul*"	"achievable"	"achieve*"	"achievi*"
[7]	"acquir*"	"add"	"added"	"adding"	"adds"	"advanc*"
[13]	"advantag*"	"adventur*"	"amass*"	"approach"	"approached"	"approaches"
[19]	"approaching"	"award*"	"benefit"	"benefits"	"best"	"bet"
[25]	"bets"	"better"	"betting"	"bold"	"bonus*"	"confidence"
[31]	"confident"	"confidently"	"crave"	"craving"	"dare"	"dared"
[37]	"dares"	"daring"	"desir*"	"eager"	"eagerly"	"eagerness"
[43]	"earn"	"earned"	"earning"	"earnings"	"earns"	"enthus*"
[49]	"excite"	"excited"	"excitedly"	"excitement"	"exciting"	"fearless*"
[55]	"fulfill*"	"gain*"	"get"	"gets"	"getting"	"goal*"
[61]	"good"	"got"	"gotten"	"great"	"greed*"	"invigor*"
[67]	"jackpot*"	"luck"	"lucky"	"obtain"	"obtainable"	"obtained"
[73]	"obtaining"	"obtains"	"opportun*"	"optimal*"	"optimism"	"optimistic"
[79]	"perfect"	"perfected"	"perfecting"	"perfection"	"perfectly"	"plus"
[85]	"positive"	"positively"	"positives"	"positivi*"	"prize*"	"profit*"
[91]	"promot*"	"reward*"	"score*"	"scoring"	"seize*"	"snag*"
[97]	"steal*"	"stole"	"succeed*"	"success"	"successes"	"successful"
[103]	"successfully"	"surpass*"	"take"	"taken"	"takes"	"taking"
[109]	"took"	"triumph*"	"victor*"	"wager"	"wagered"	"wagering"
[115]	"wagers"	"willing"	"win"	"winn*"	"wins"	"won"

Reward Language

Remain

Neutral

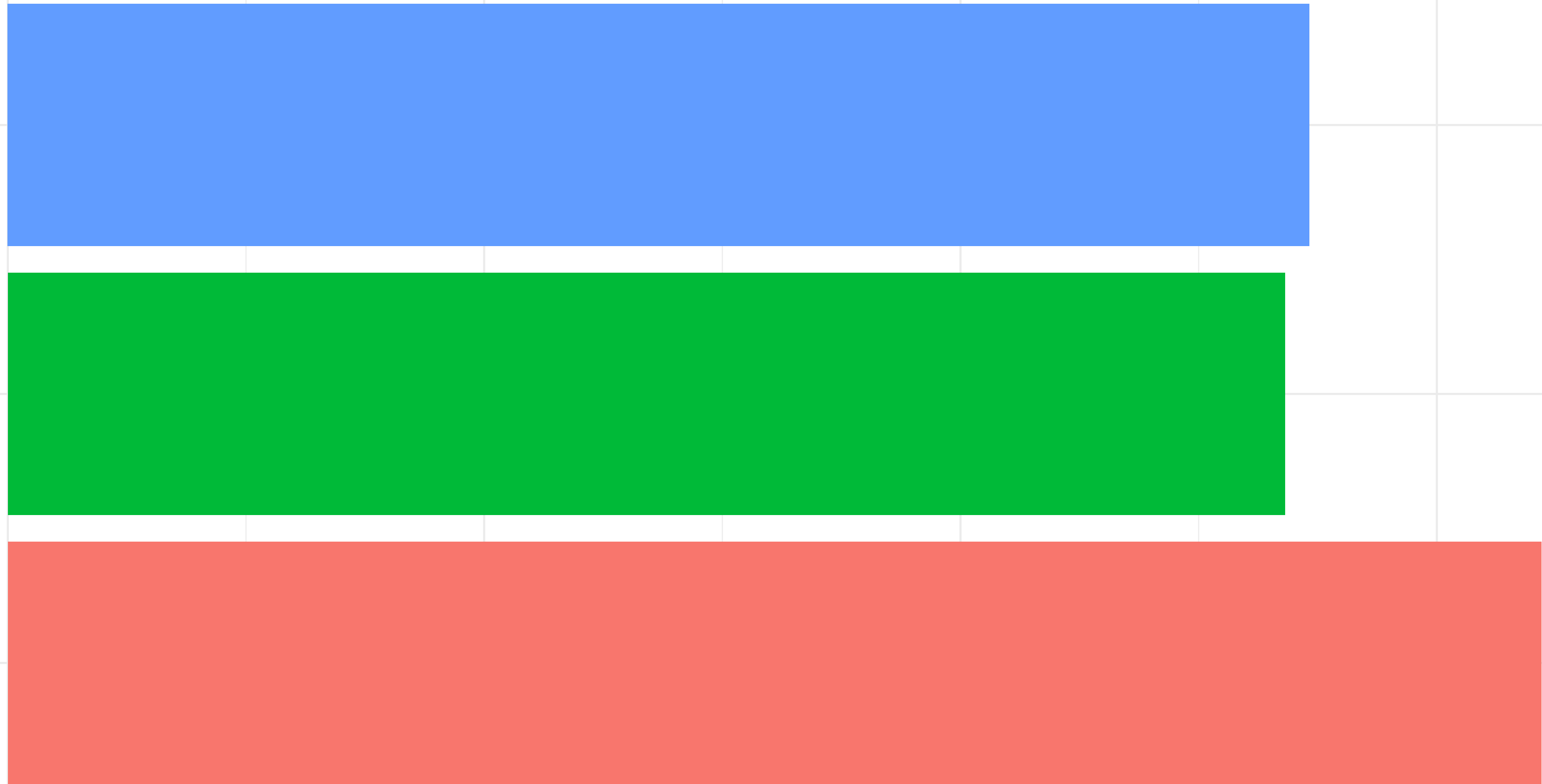
Leave

0.000

0.002

0.004

0.006



Positive v. Negative Emotion Language

Remain

0.0

0.4

0.8

1.2

Neutral

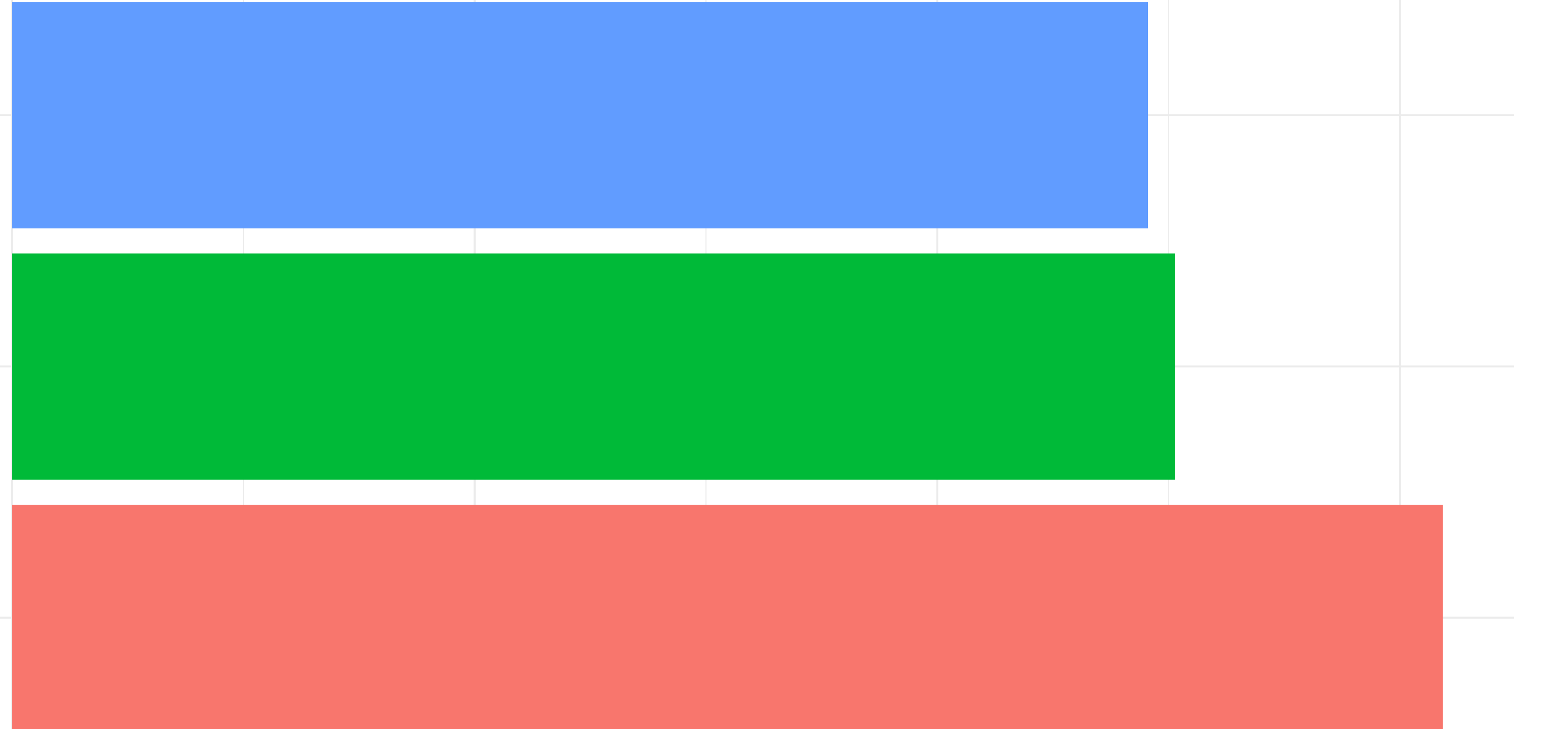
Leave

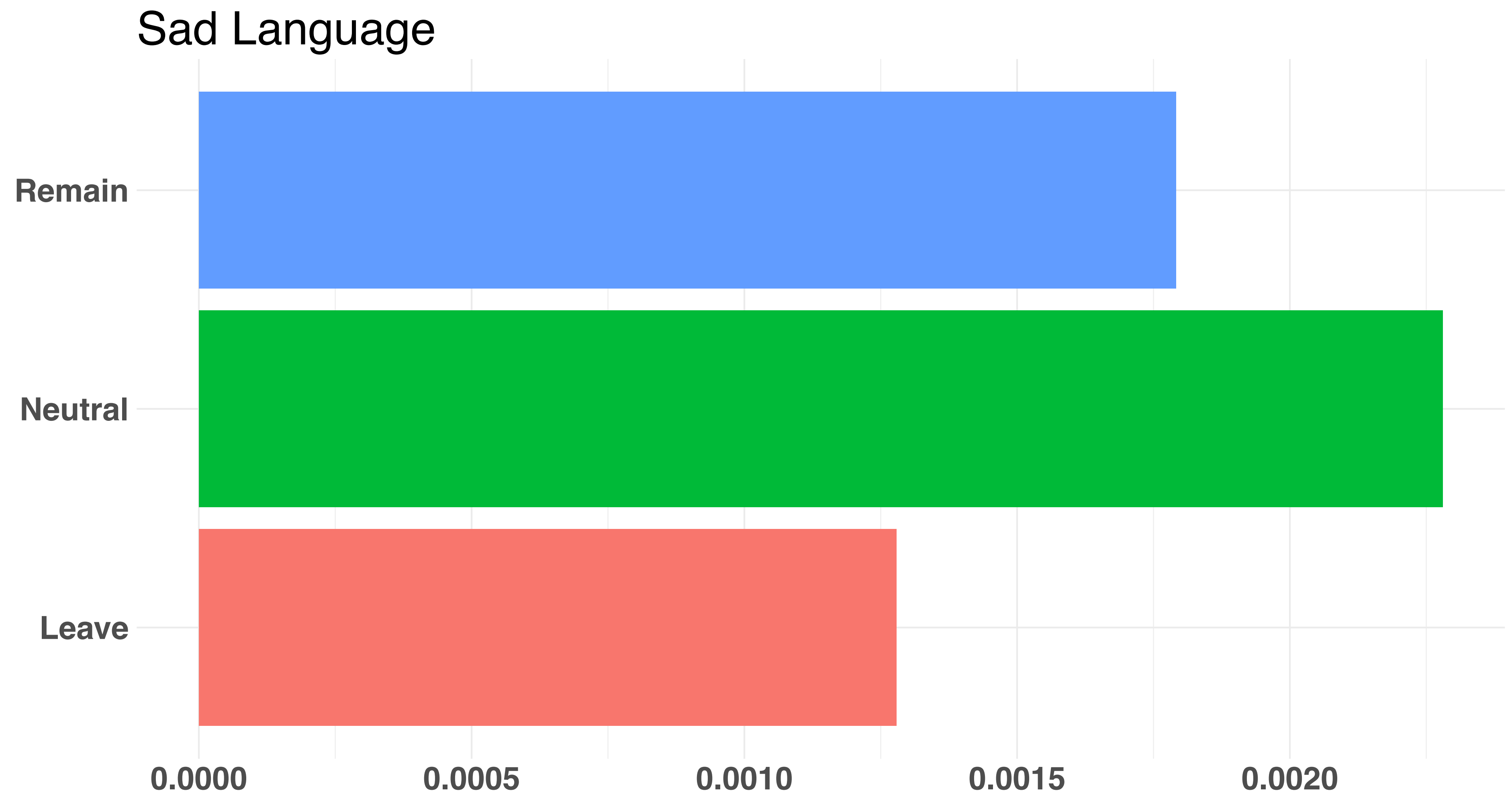
0.0

0.4

0.8

1.2





Future v. Past Language

Remain

Neutral

Leave

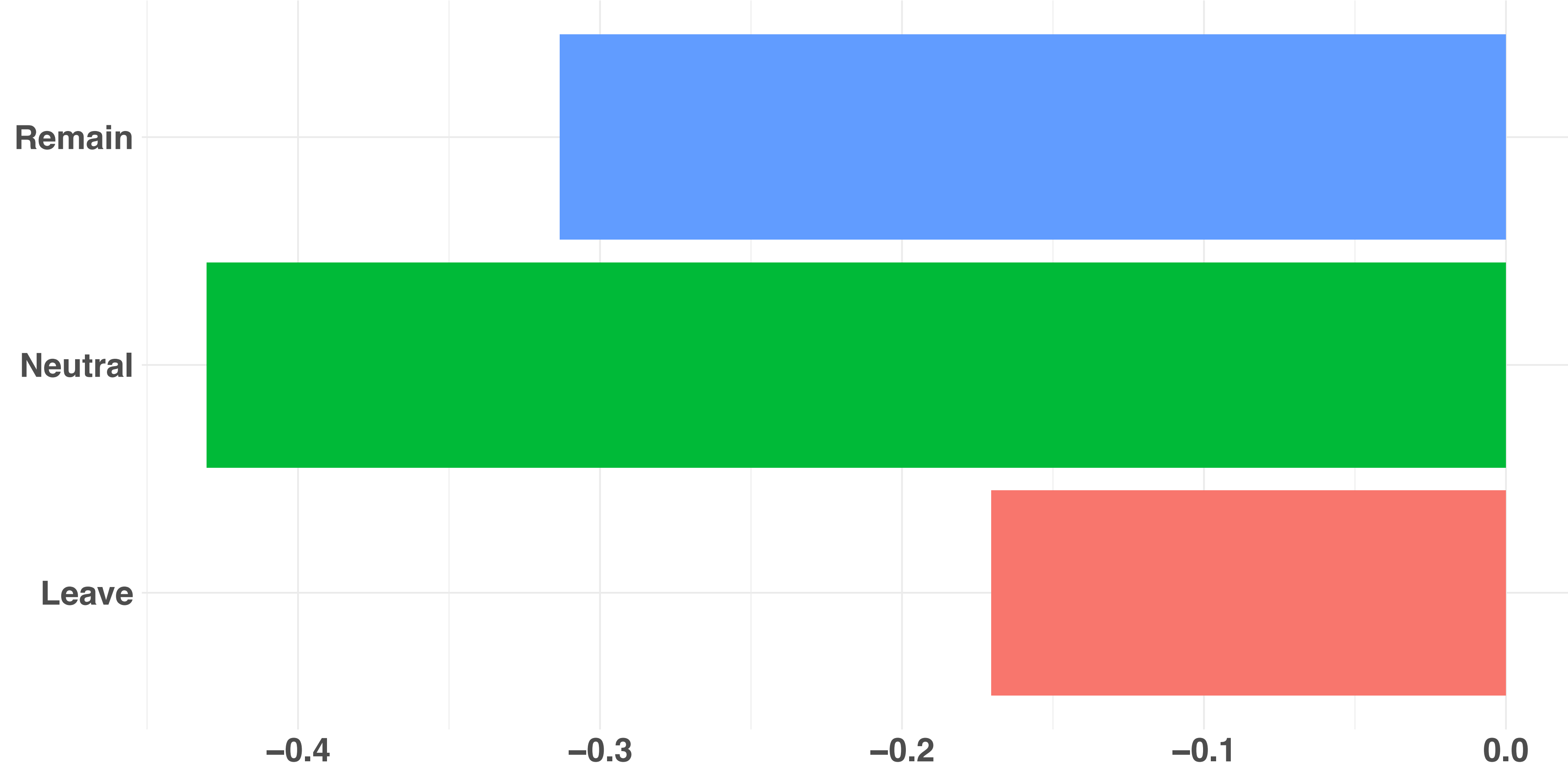
-0.4

-0.3

-0.2

-0.1

0.0



Tentative Language

Remain

Neutral

Leave

0.000

0.002

0.004

0.006



Power Language

Remain



Neutral



Leave



Quantitative Language

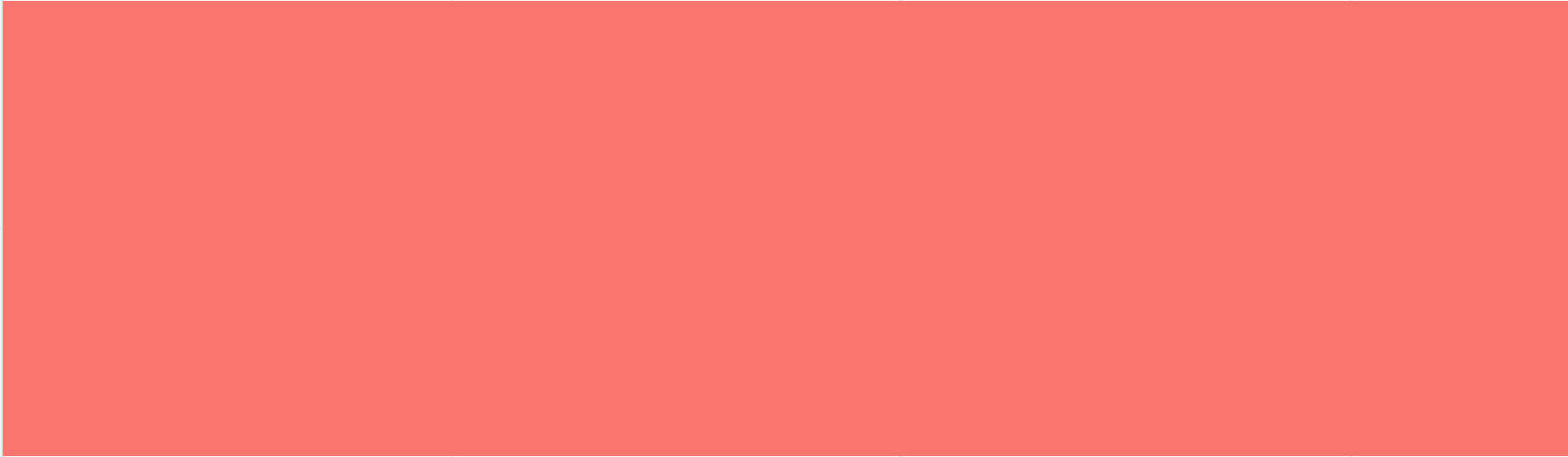
Remain



Neutral



Leave



0.000

0.002

0.004

0.006

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