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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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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

The screenshot shows the homepage of mpsontwitter.co.uk. At the top, there's a navigation bar with links for Home, MP List, Tweets, Party, and Search. Below the navigation is a header with the site's logo and a Twitter icon.

MPs on Twitter.co.uk

mpsontwitter.co.uk provides an interactive way to explore the way in which Members of the UK parliament use the social media website Twitter.

Archive

- Chronological list of all archived tweets
- Top tweets by UK MPs this year
- Top tweets by MPs in the past 30 days
- Top tweets by UK MPs from this day last year
- Tweets by UK MPs about Brexit

Number of Tweets Today by Party

Party	Tweets
All	860 tweets posted by UK MPs in the last 24 hours
Conservative	189 tweets posted by Conservative MPs today (20.75%)
Democratic Unionist Party	4 tweets posted by Democratic Unionist Party MPs today (0.4%)

Top Tweets Today

Boris Johnson (@BorisJohnson) Spoke to new #Gambia President Adama Barrow to congratulate him. We're both looking forward to working together to strengthen UK-Gambia ties.
10:10 PM - 22 Jan 2017
4, 13 retweets, 411 likes
Community @BorisJohnson | Uxbridge and South Ruislip
18 285,179 | ▲ 480

Angela Rayner MP (@AngelaRayner) After year upon year of Tory cuts and austerity to public services hospitals, schools, councils, emergency services are all at breaking point.
6:23 AM - 22 Jan 2017 · Ashton-under-Lyne, England
4, 123 retweets, 113 likes
Labour @AngelaRayner | Ashton-under-Lyne
18 24,309 | ▲ 382

Basic Information

Party	Percentage	Count
All	87%	860/982
Conservative	100%	189/189
Labour	90%	171/190
Conservative	92%	171/189
Labour	90%	171/190
Scottish National Party	100%	10/10
Liberal Democrat	92%	17/18
Democratic Unionist Party	88%	17/19
Sinn Féin	100%	14/14
Independent	73%	14/19
Social Democratic and Labour Party	100%	3/3
Plaid Cymru	100%	3/3
Ulster Unionist Party	100%	2/2
UK Independence Party	100%	1/1
Green Party	100%	1/1

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

@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

...I want to have other people running in i
ng their country and you know in this case
i very strong borders from the day I get in.
orders I'm gonna sign - day one - which is
to be Monday as opposed to Friday or Sat.
mean my day one is gonna be Monday bec
ause I'm signing and get it signed up with h
im, but one of the first orders we're gonna
be 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...

8

10

16

#hashtags

European Institute and 8 others follow

Richard Corbett  @RCorbettMEP · 2h
Hammond admits '#Brexit fog' impact on investment in #Britain. No hiding the negative impact of #brexitshambles



Brexit: Philip Hammond warns deal 'will take years' - BBC News
The chancellor warns the process of exiting the EU is likely to last much longer than two years.
bbc.com

6 108 86

“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
#votleave
#wewantout
#yes2eu
#yestoeu

brexit

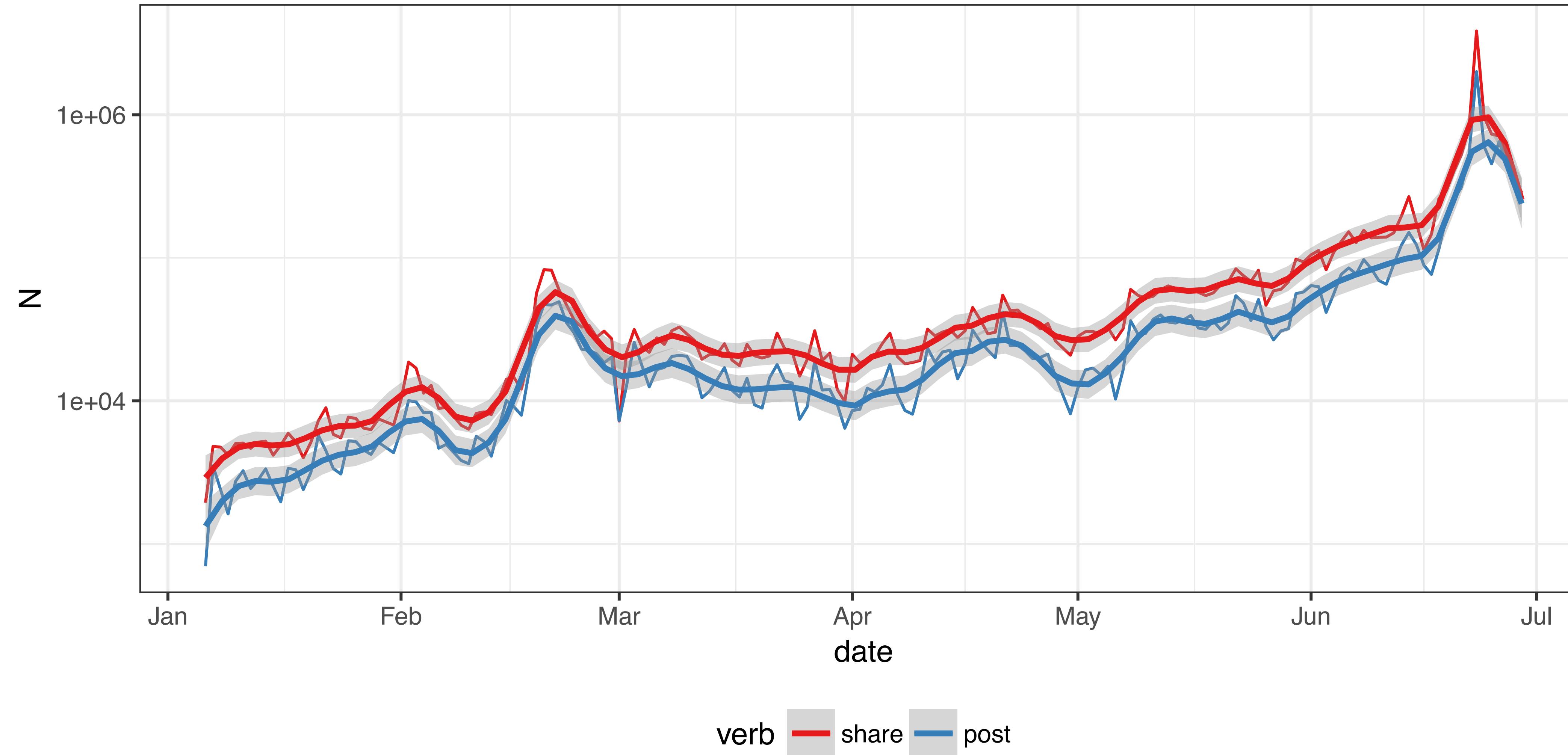
Usernames:

@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

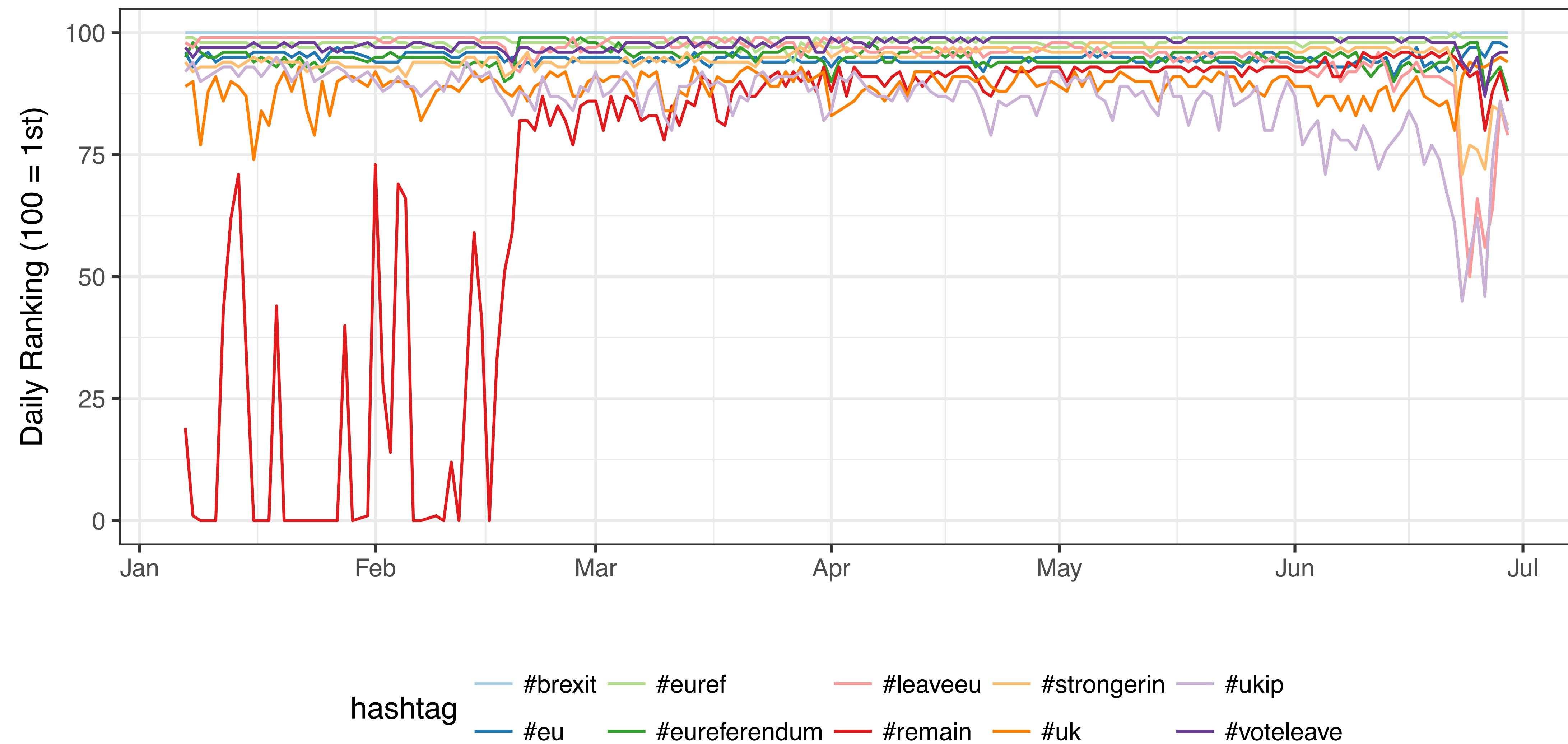
Main hashtags

The word cloud illustrates the most active hashtags during the Brexit referendum period. The size of each word represents its frequency or influence. The main themes include #voteleave, #remain, and #eureferendum, with many sub-topics like #strongerin, #borisjohnson, and #tories.

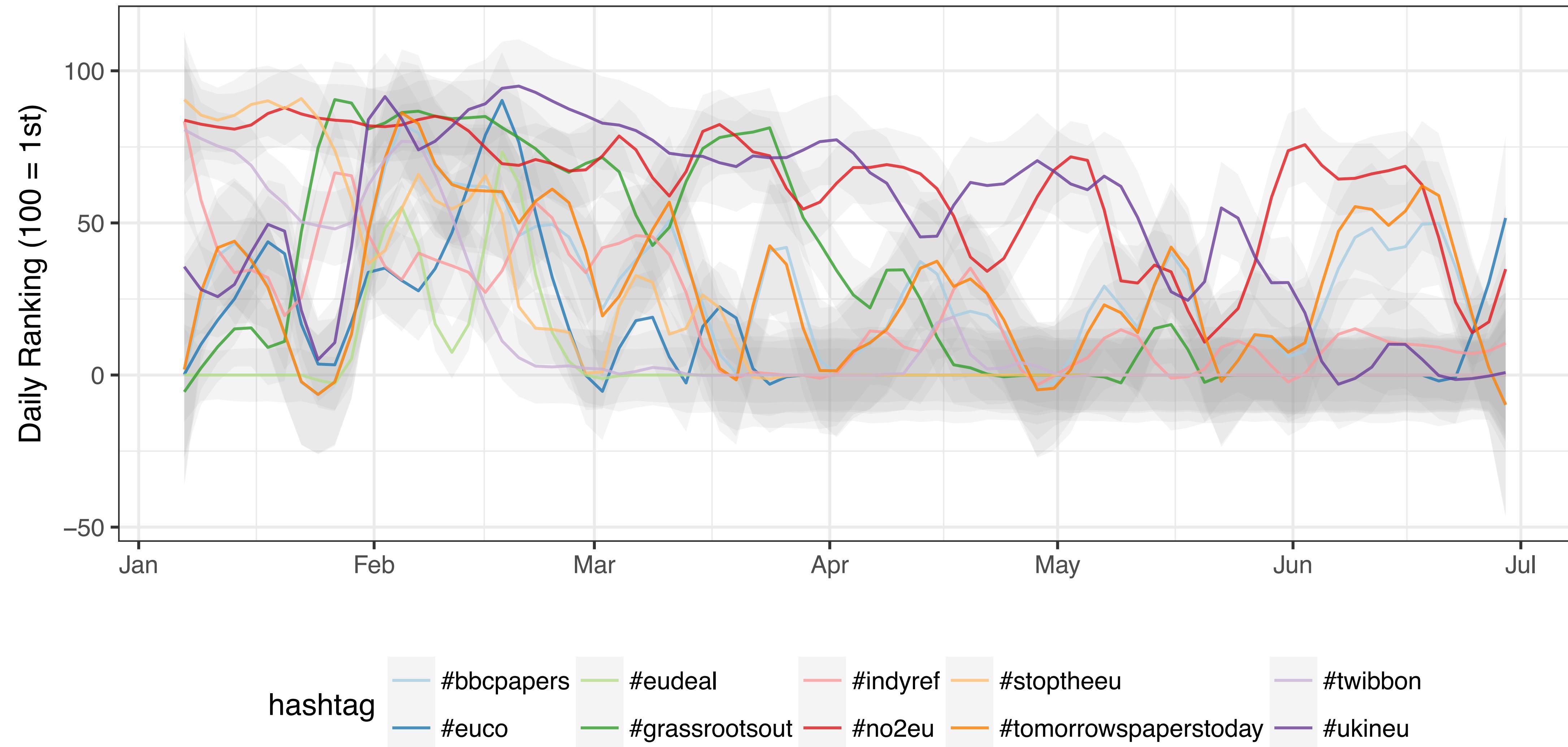
Key hashtags include:

- #strongerin**
- #voteteave**
- #remain**
- #leave**
- #eureferendum**
- #strongerout**
- #brexit**
- #trump2016**
- #eu**
- #ukip**
- #leaveeu**
- #voteremain**
- #register**
- #poll**
- #in**
- #out**
- #tories**
- #grexit**
- #isl**
- #fx**
- #itveuref**
- #politics**
- #borisjohnson**
- #merkel**
- #forex**
- #borisjohnson**
- #ausvotes**
- #viral**
- #auspol**
- #obama**
- #whitegenocide**
- #projecthope**
- #cdnpoli**
- #migrants**
- #gove**
- #labourin**
- #eurovision**
- #uk**
- #labour**
- #bregret**
- #trading**
- #fintech**
- #europeunion**
- #nevertrump**
- #wales**
- #freedom**
- #usa**
- #euco**
- #ukineu**
- #vote**
- #039**
- #americafirst#go**
- #takebackcontrol**
- #tech**
- #bbcdp**
- #eng**
- #bitcoin**
- #gameofthrones**
- #marr**
- #skynews**
- #indyref**
- #farage**
- #gbp**
- #nhs**
- #immigration**
- #news**
- #no2eu**
- #londonstays**
- #catsagainstbrexit**
- #nigelfarage**
- #marrshow**
- #bbcnews**
- #bbc**
- #pmqs**
- #marrshow**
- #moreincommon**
- #engice**
- #sky**
- #fed**
- #ireland**
- #eurefready**
- #ttip**
- #snp**
- #bbcqt**
- #remainineu**
- #inorout**
- #jobs**
- #world**
- #c4news**
- #nyc**
- #indref2**
- #bbcsp**
- #trump**
- #markets**
- #june23**
- #bremain**
- #iceland**
- #tcot**
- #boris**
- #brexitnot**
- #jocox**
- #regexit**
- #pegida**
- #sunderland**
- #strongerout#gbp**
- #votein#eusummit**
- #pound**
- #breakingnews**
- #labourleave**
- #euro**
- #scotland**
- #tory**
- #lexit**
- #london**
- #gold**
- #immigration**
- #england**
- #no2eu**
- #grassrootsout**
- #toryelectionfraud**
- #brexitin5words**
- #londonforbritain**
- #europe**
- #business**
- #flotilla**
- #bbcreferendum**
- #trumptrain**
- #ivoted**
- #spain**
- #betteroffout**
- #euisetheproblem**
- #eurefresult**
- #turkey**
- #frexit**
- #democracy**
- #brexitvote**
- #germany**
- #independenceday**
- #tomorrowspaperstoday**
- #davidcameron**
- #register**
- #poll**
- #in**
- #out**
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- #grexit**
- #isl**
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- #davidcameron**

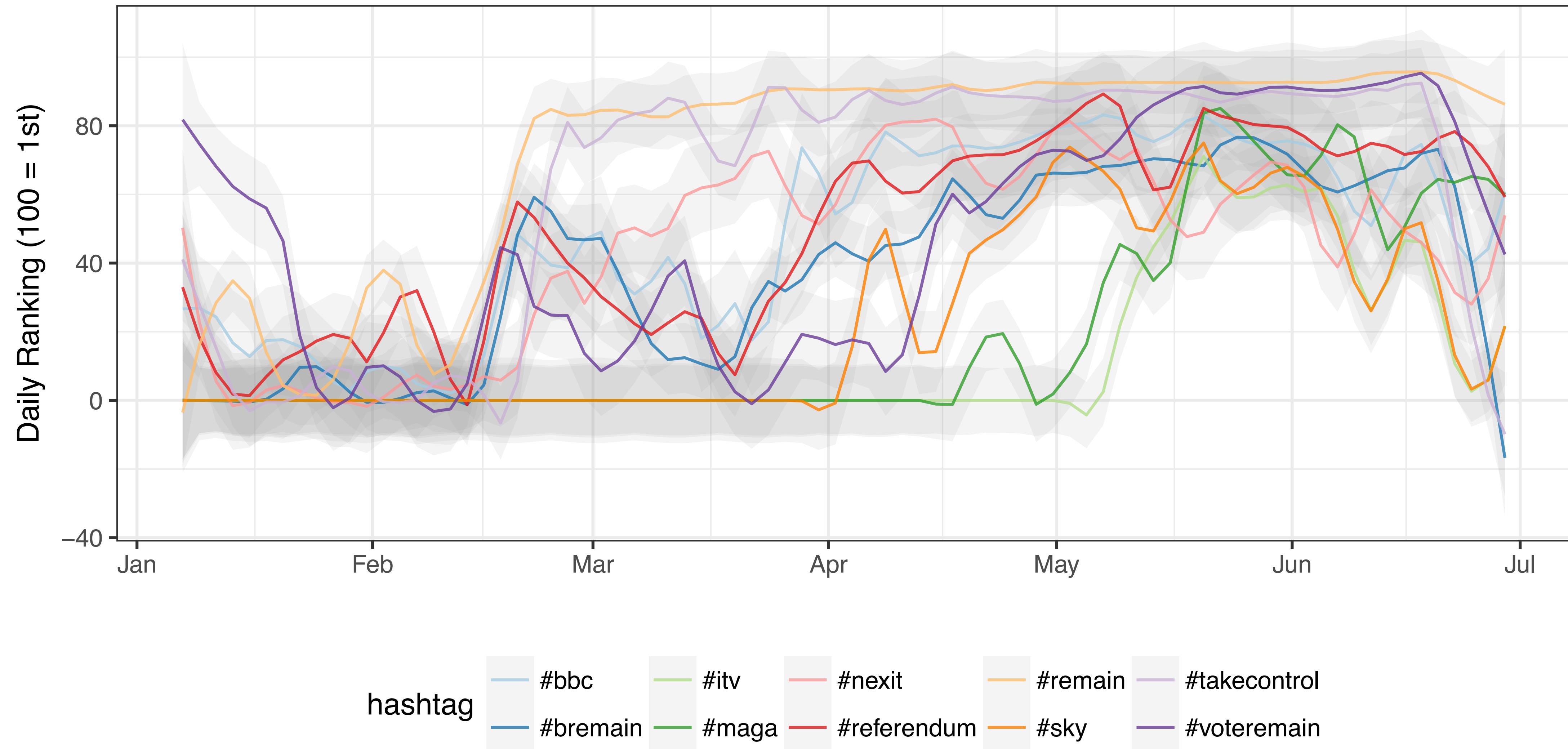
Evolution of hashtags (ranking)



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)

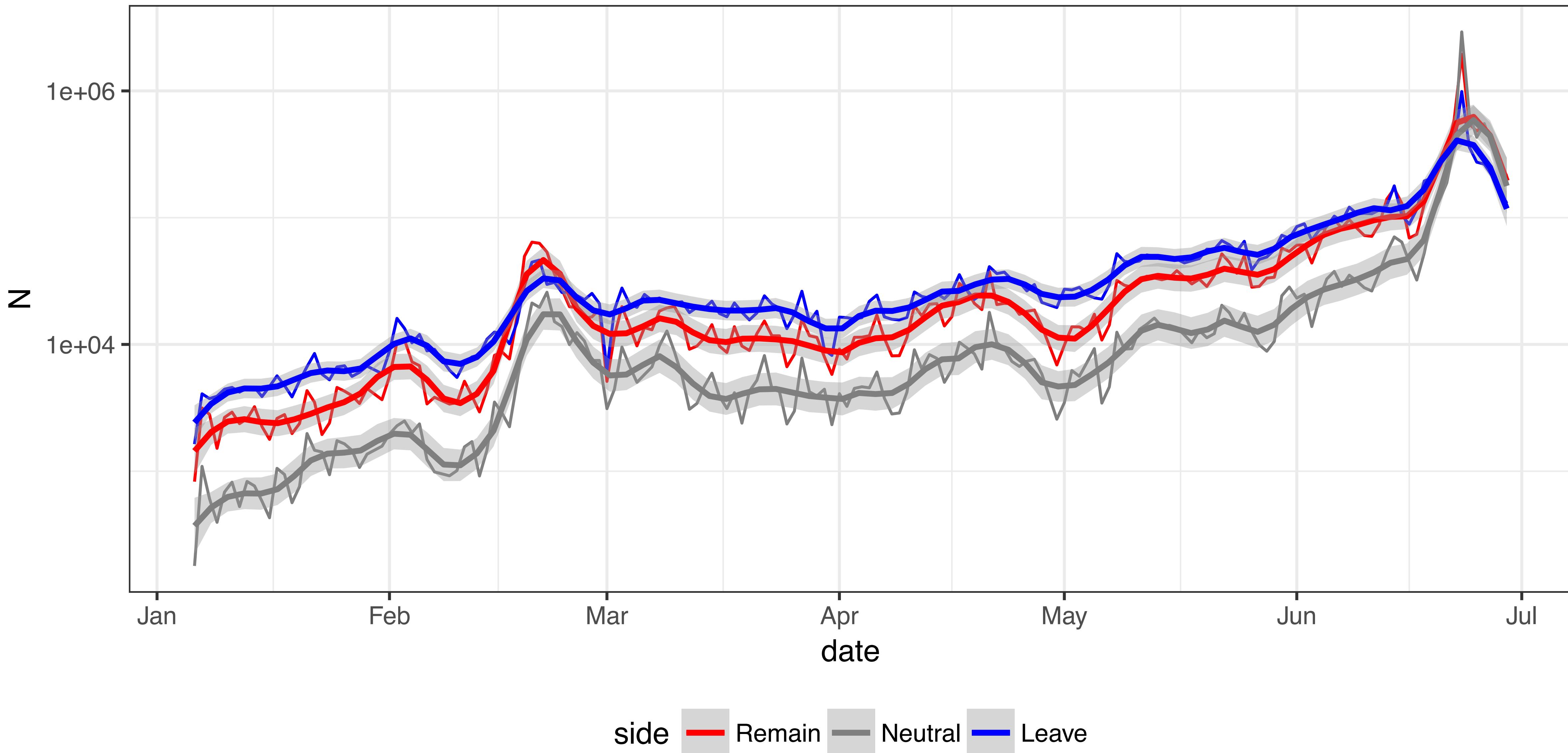
Predicting Leave v. Remain (Feature Selection)

- 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%)

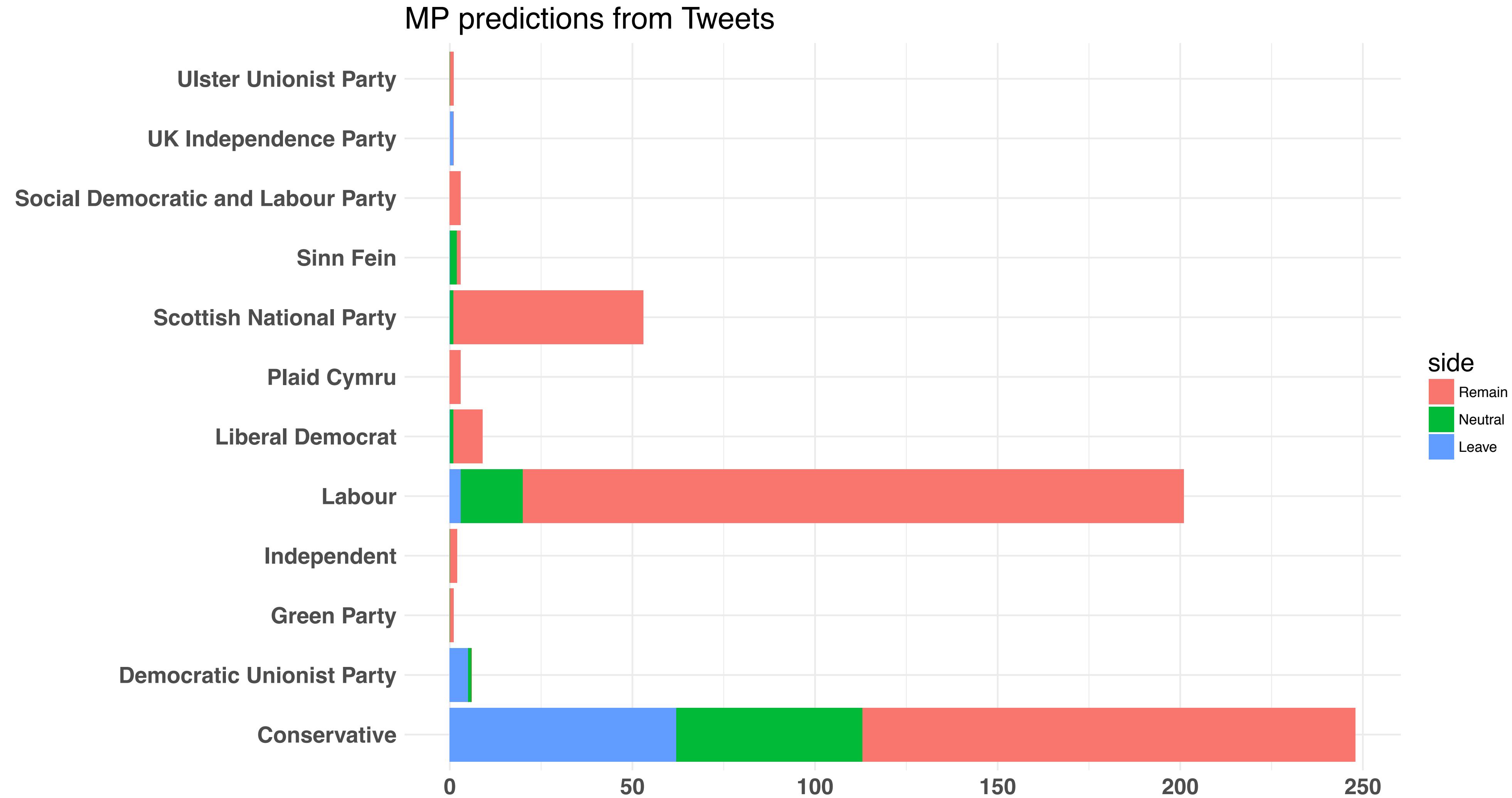
Predicting Leave v. Remain

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

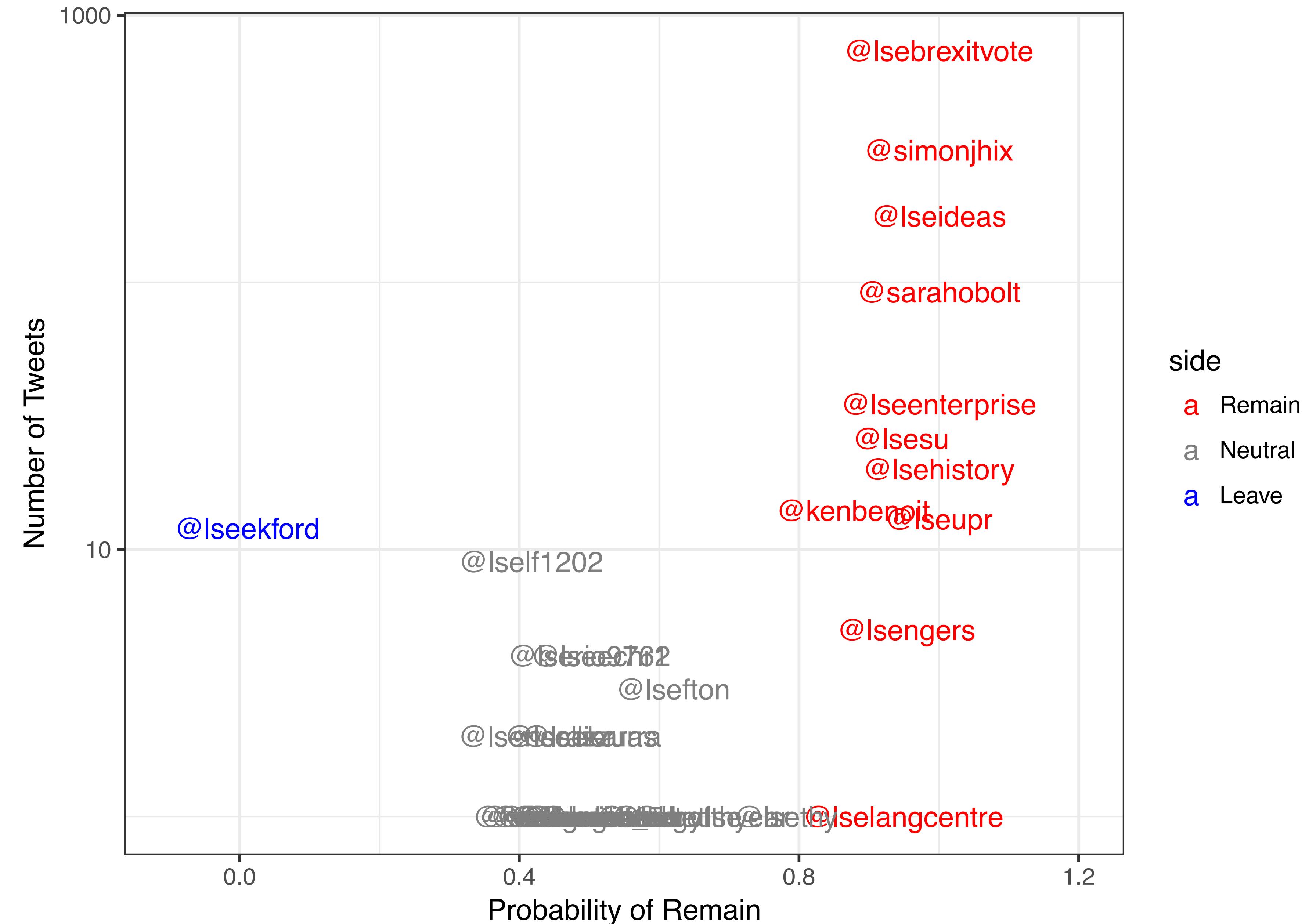
Patterns of posts, Leave v. Remain



MP side predictions by party



A few well-known Twitter users



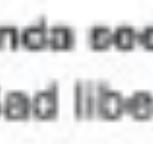


TWEETS FOLLOWING FOLLOWERS LIKES
4,078 232 123 3,376

[Follow](#)

[Tweets](#) [Tweets & replies](#) [Media](#)

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

 **AJ+ @aplus**
#inauguration2017: We're in DC showing you everything going down on this historic day. [periscope.tv/w/a1DlKzQzNDk5...](#)

 **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

 **linda seekford** @lseekford · Jan 20
Mass impeachment for the traitor democrats

Leave and Remain Hashtags

main

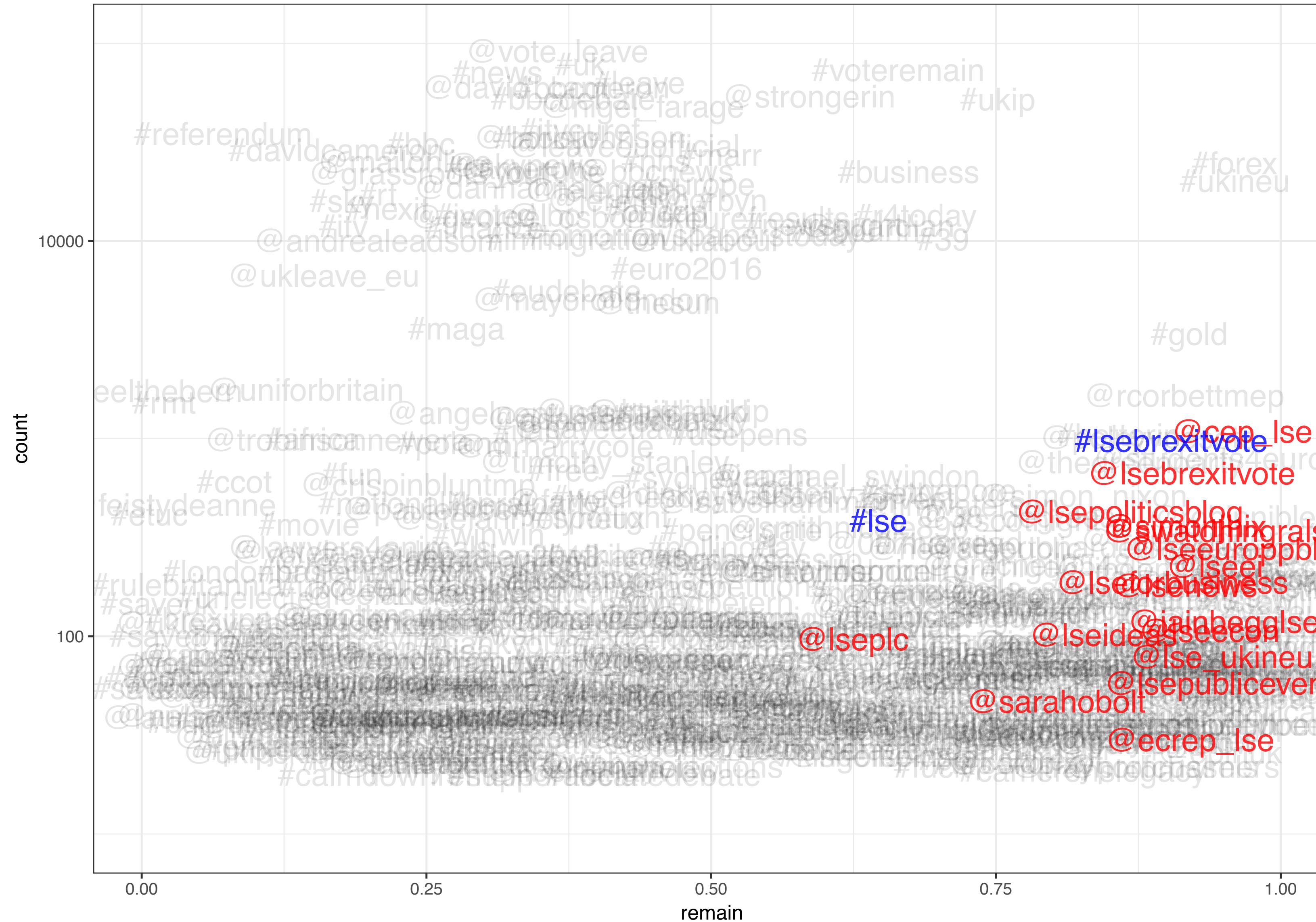
Leave

Neutral

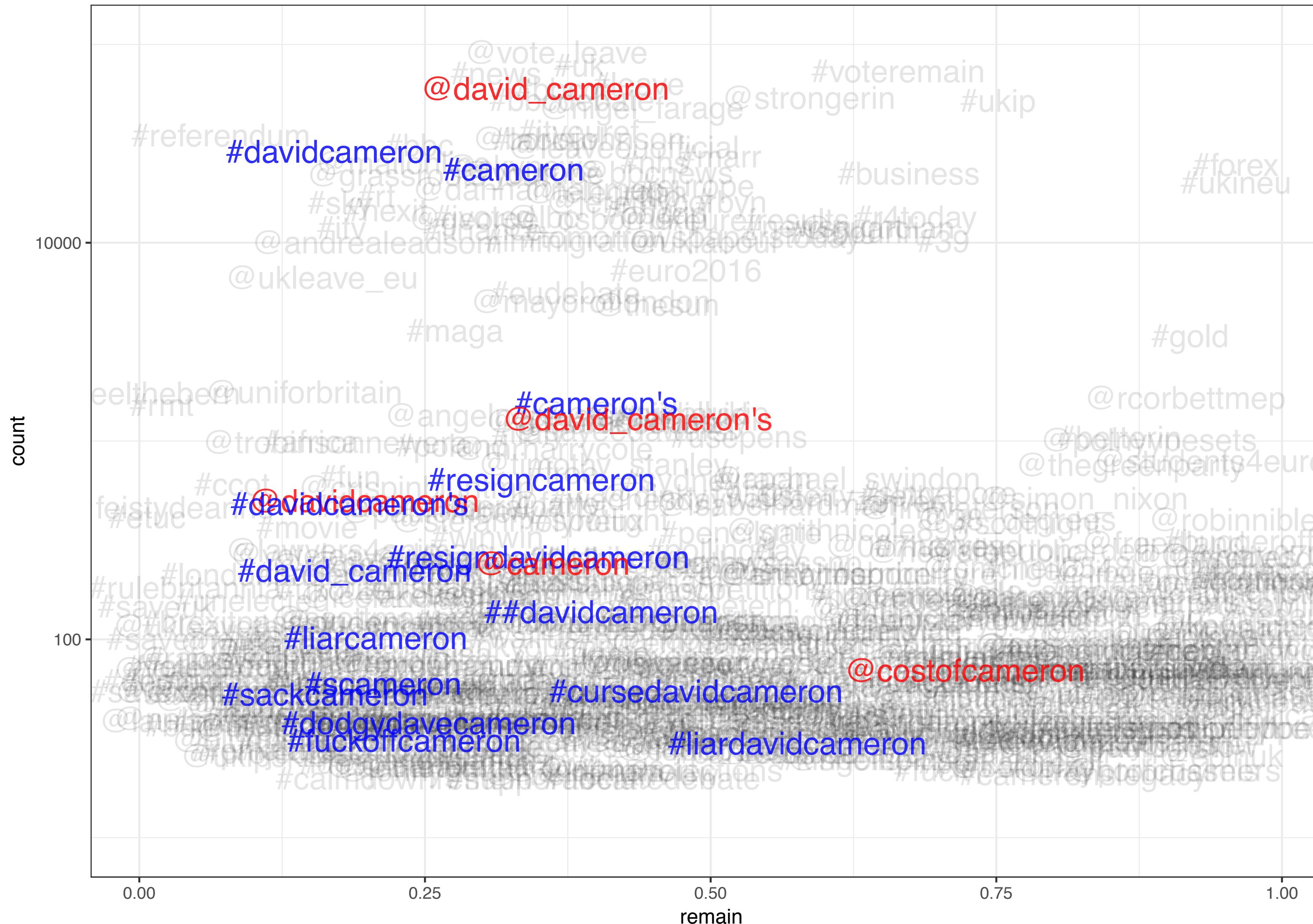
Leave and Remain Features

http://rpubs.com/amatsuo/feature_scores

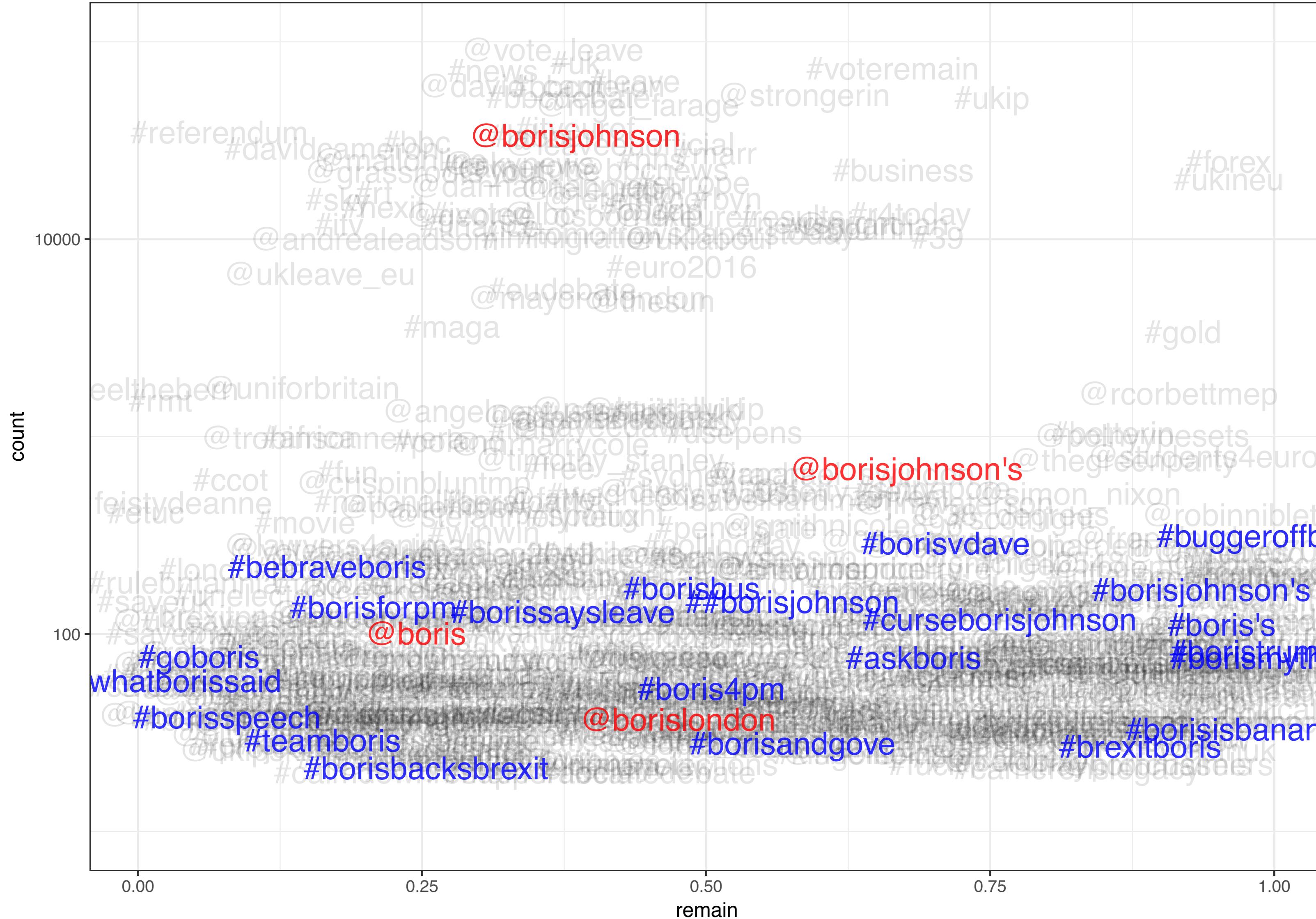
Leave and Remain Hashtags (LSE)



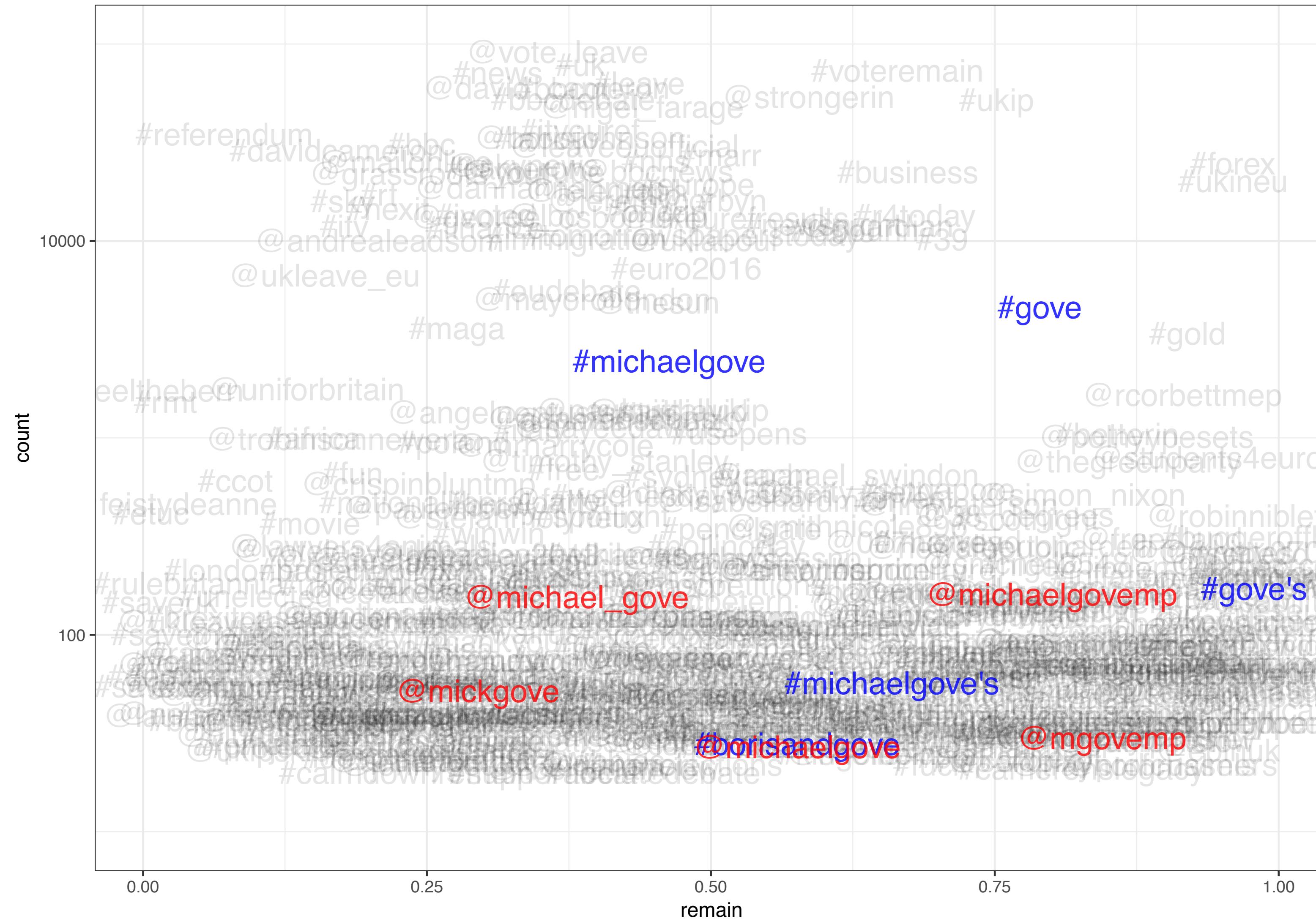
Leave and Remain Hashtags (Cameron)



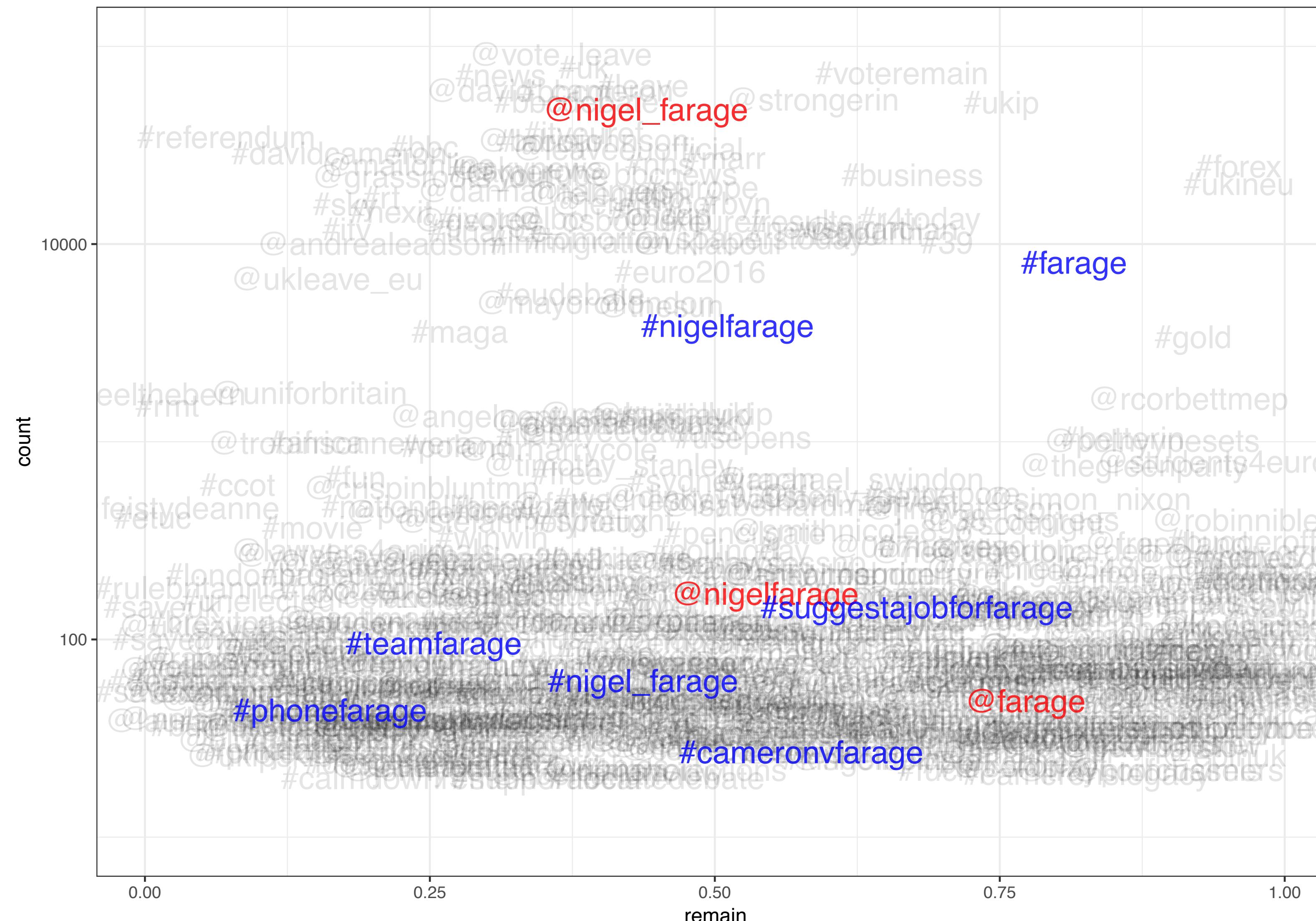
Leave and Remain Hashtags (Boris Johnson)



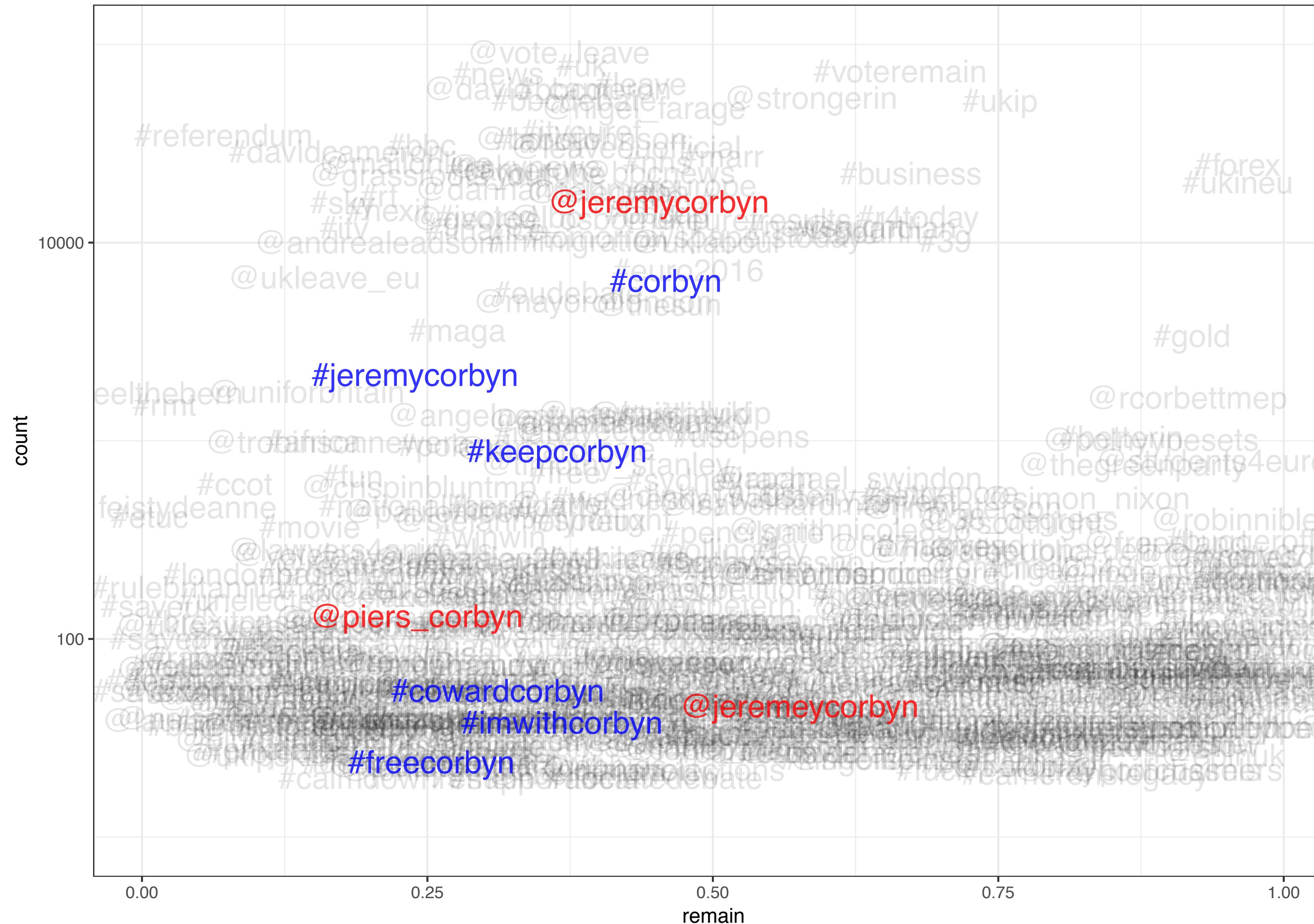
Leave and Remain Hashtags (Gove)



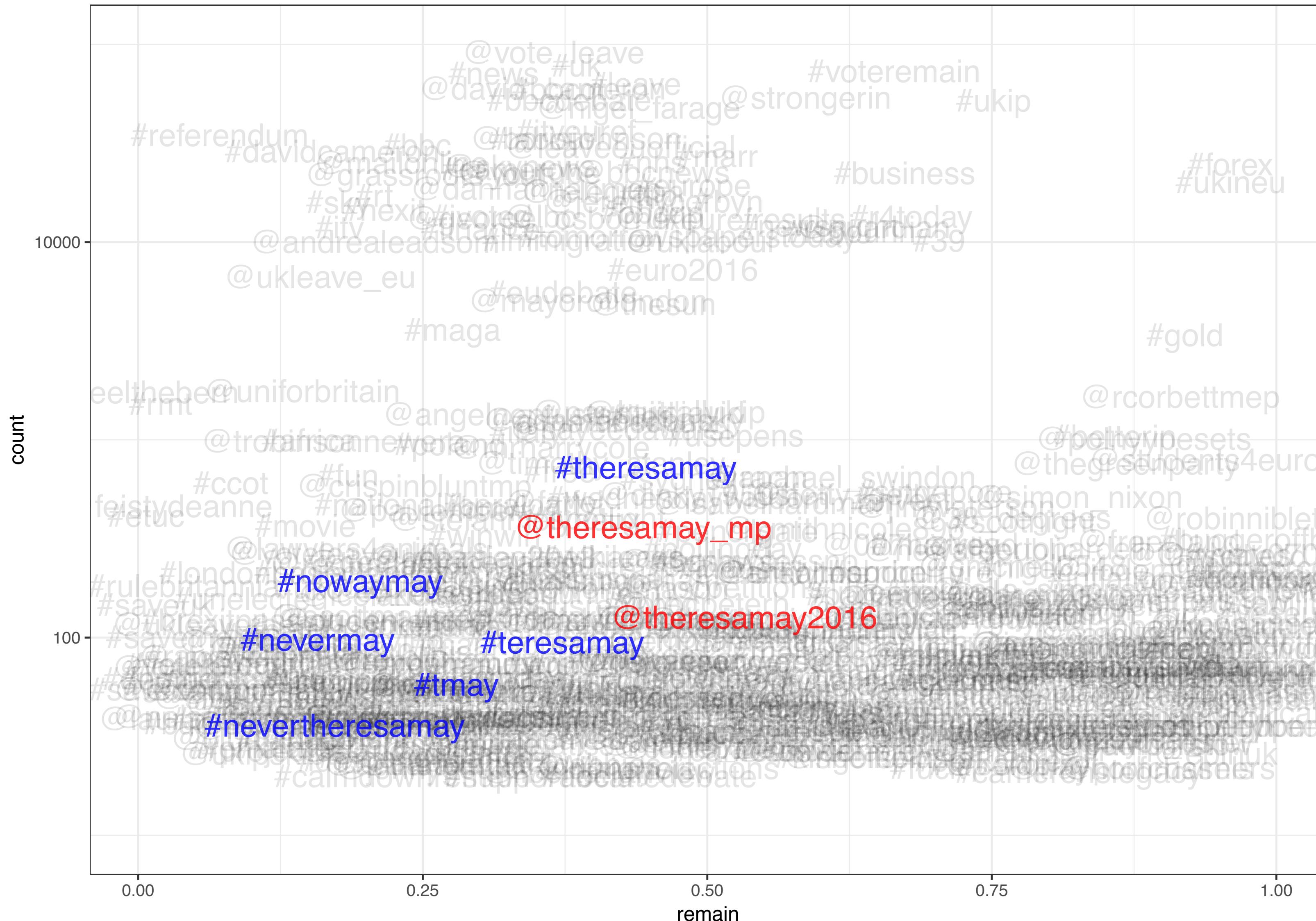
Leave and Remain Hashtags (Farage)



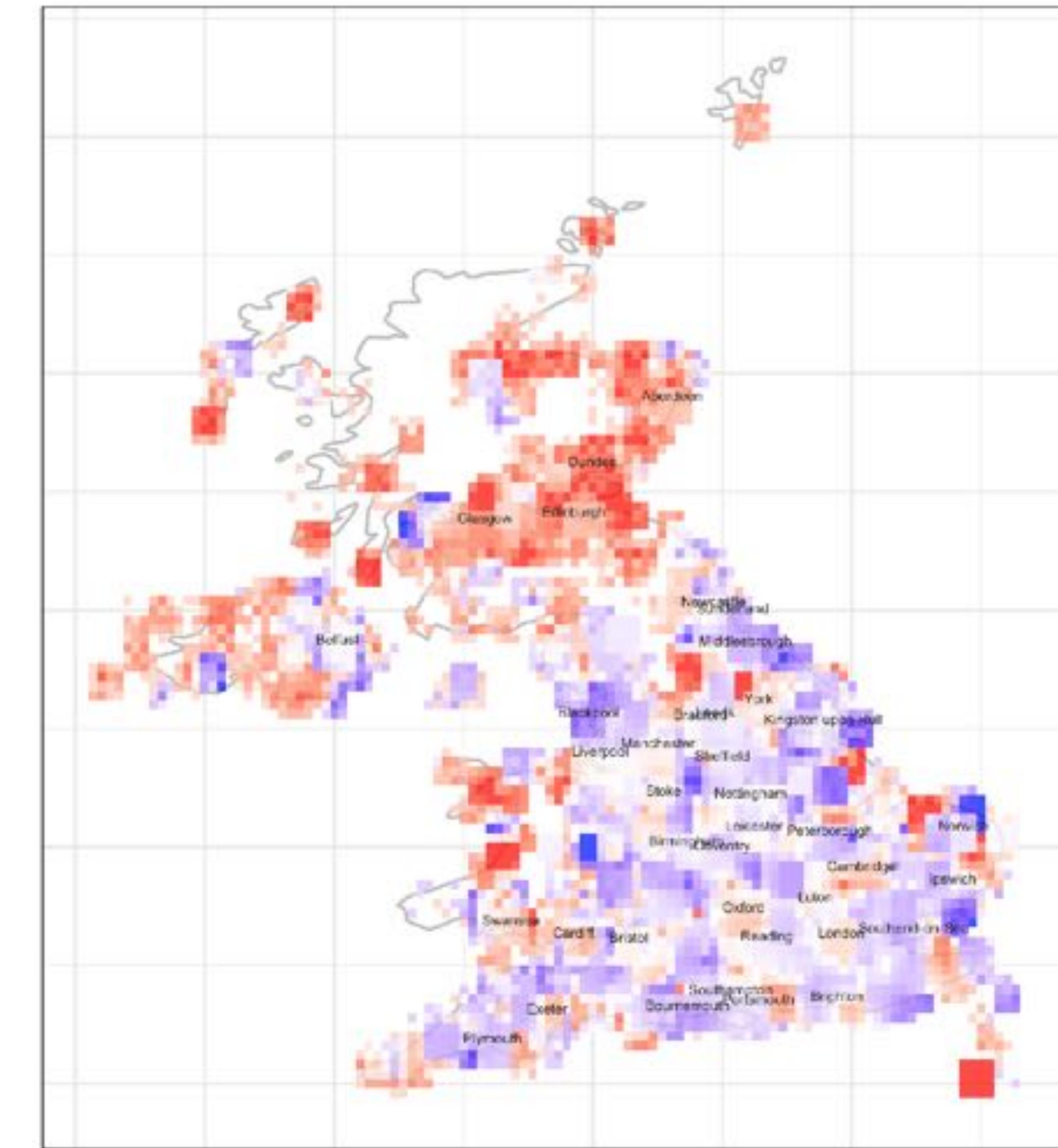
Leave and Remain Hashtags (Corbyn)



Leave and Remain Hashtags (LSE)



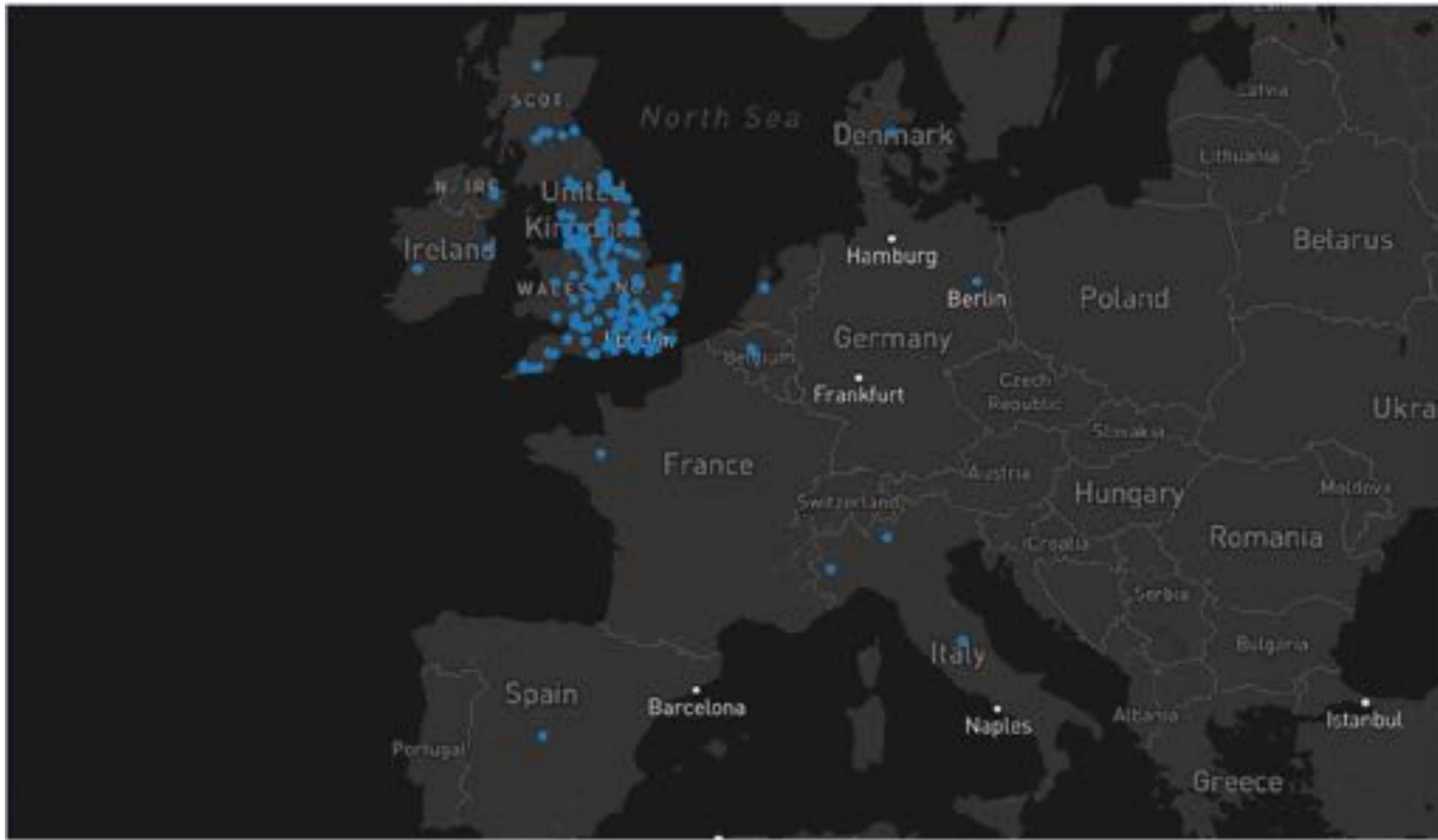
Leave v. Remain Hashtags



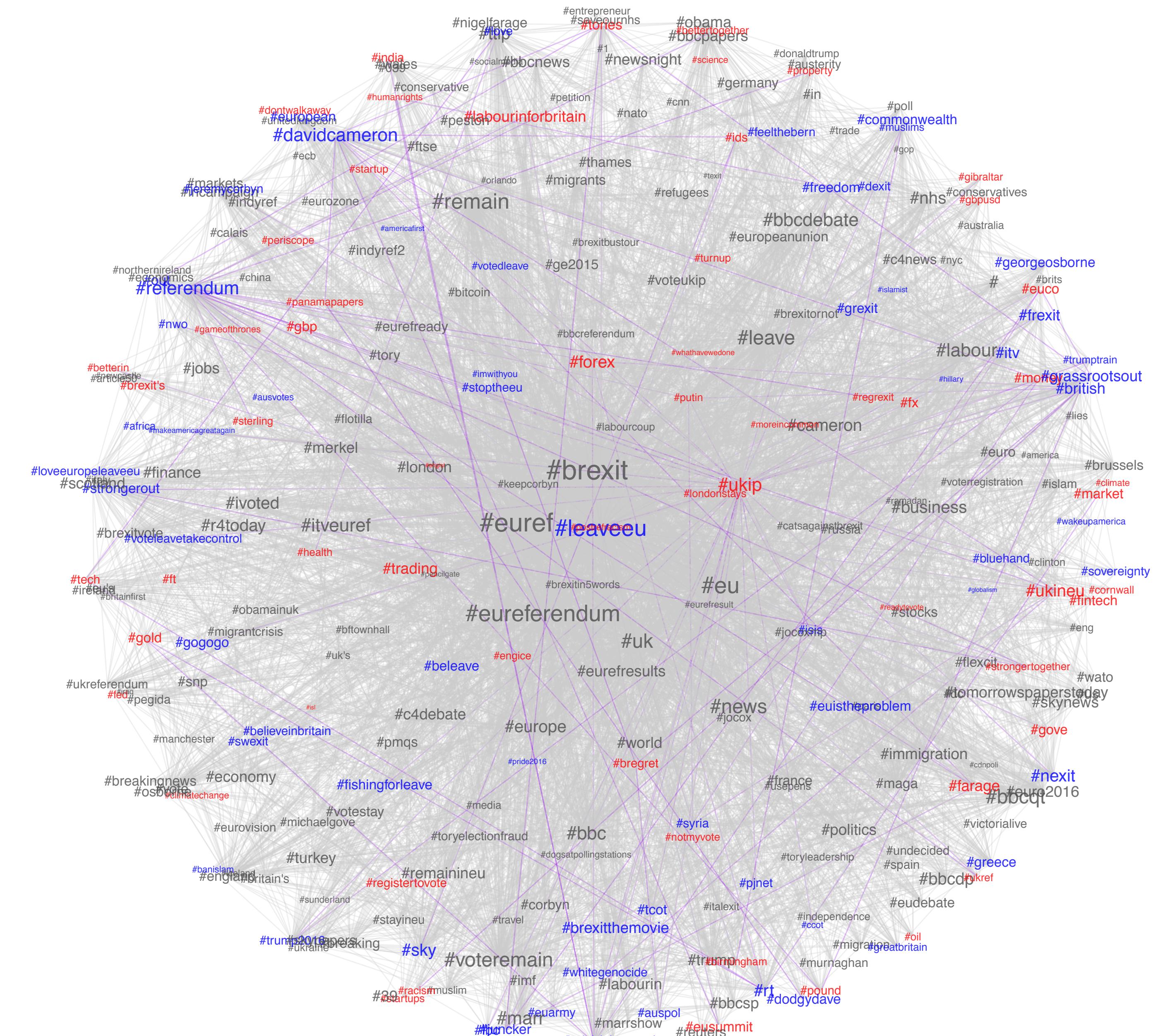
SVM classification Europe-wide: Remain



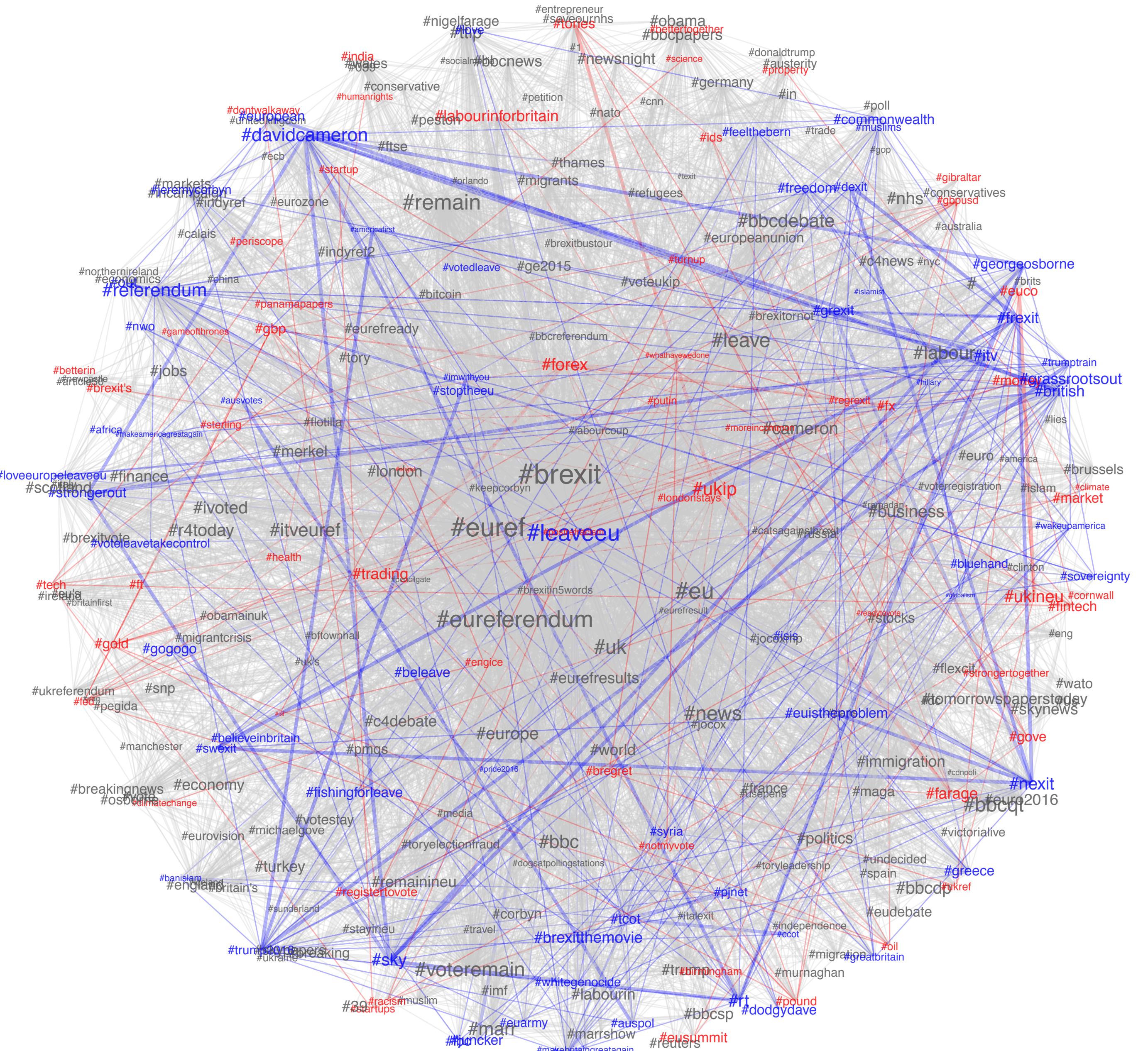
SVM classification Europe-wide: Leave



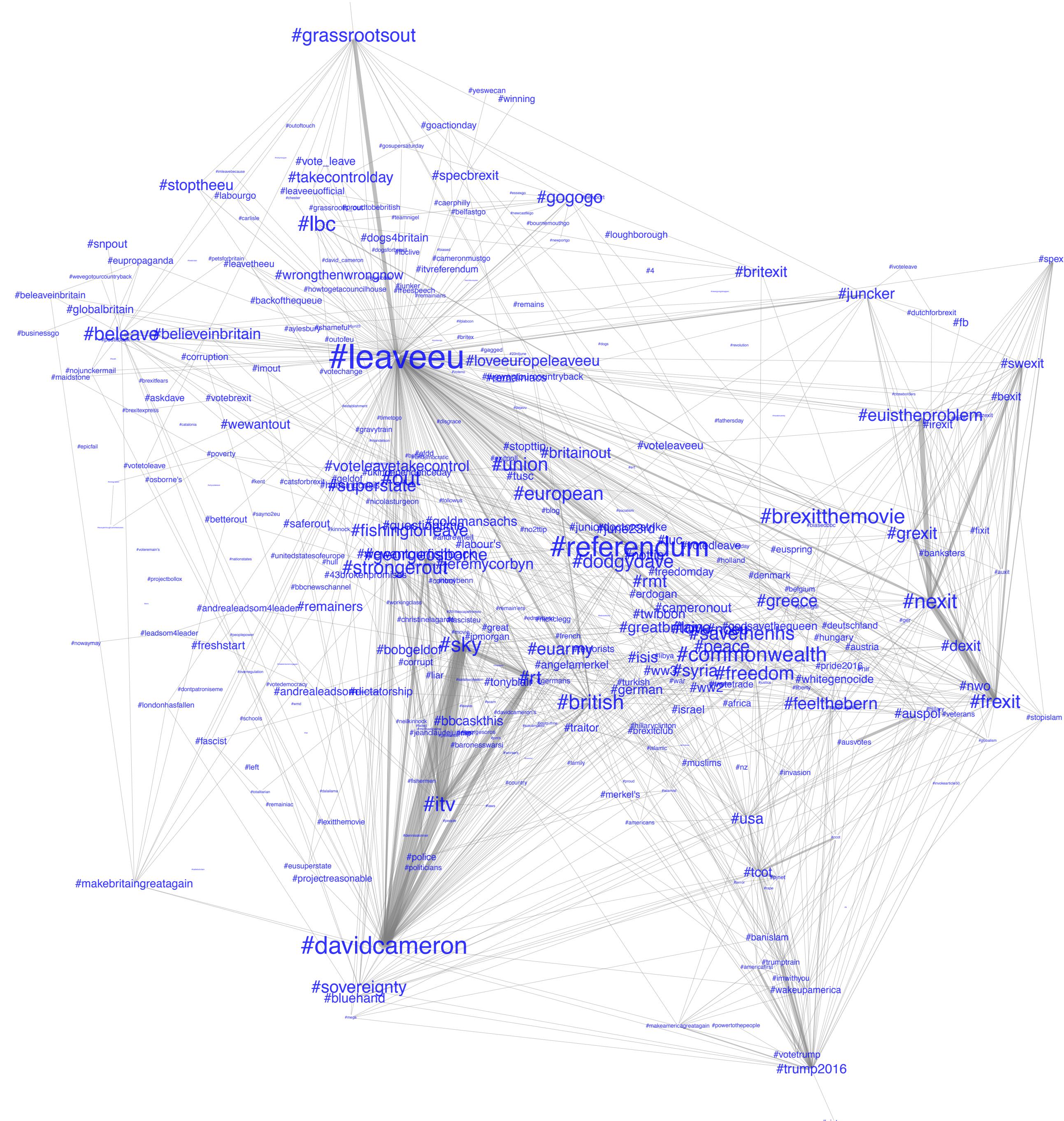
Hashtag Networks (Top 300, across sides)



Hashtag Networks (Top 300, across sides)

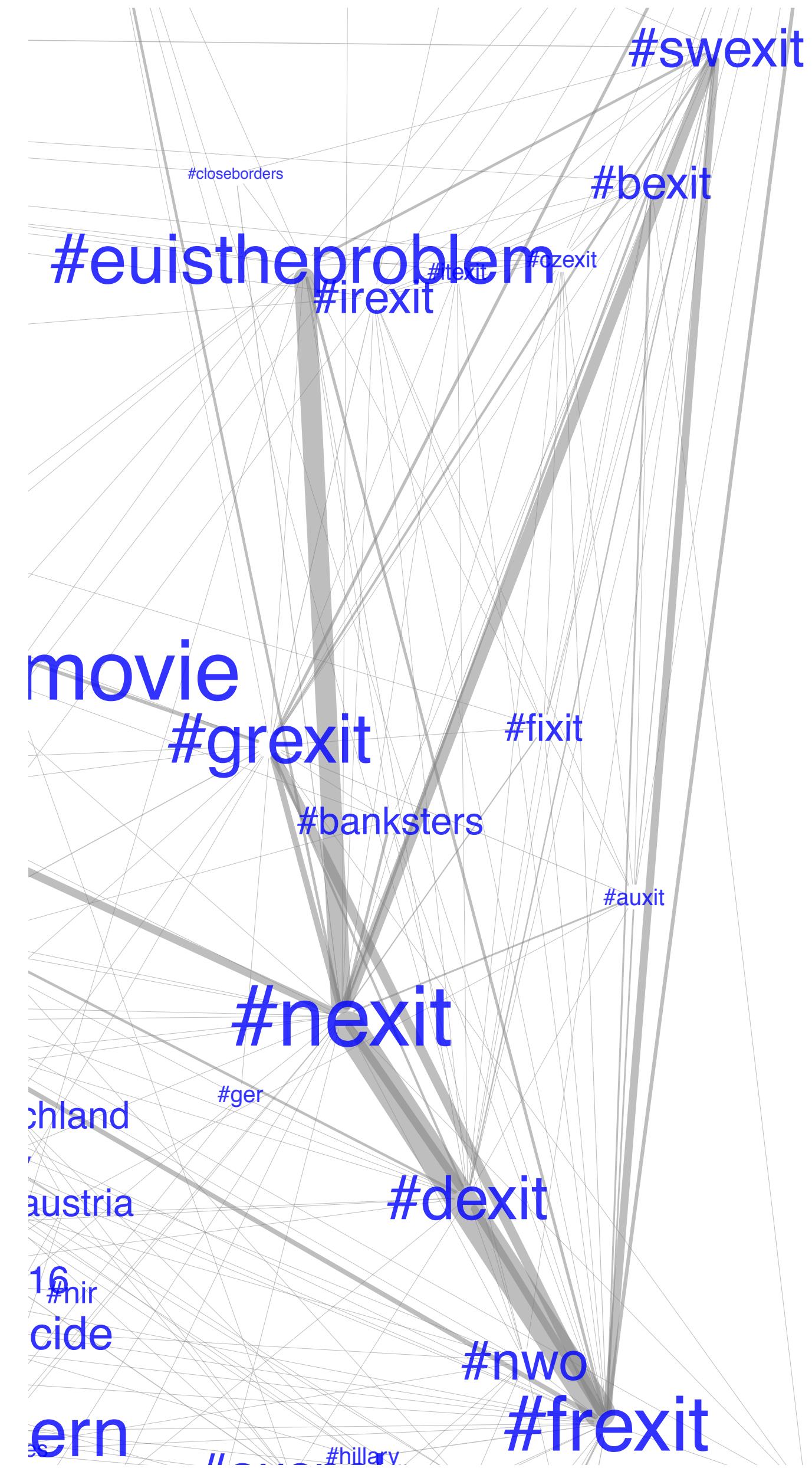


Hashtag Networks (Leave)

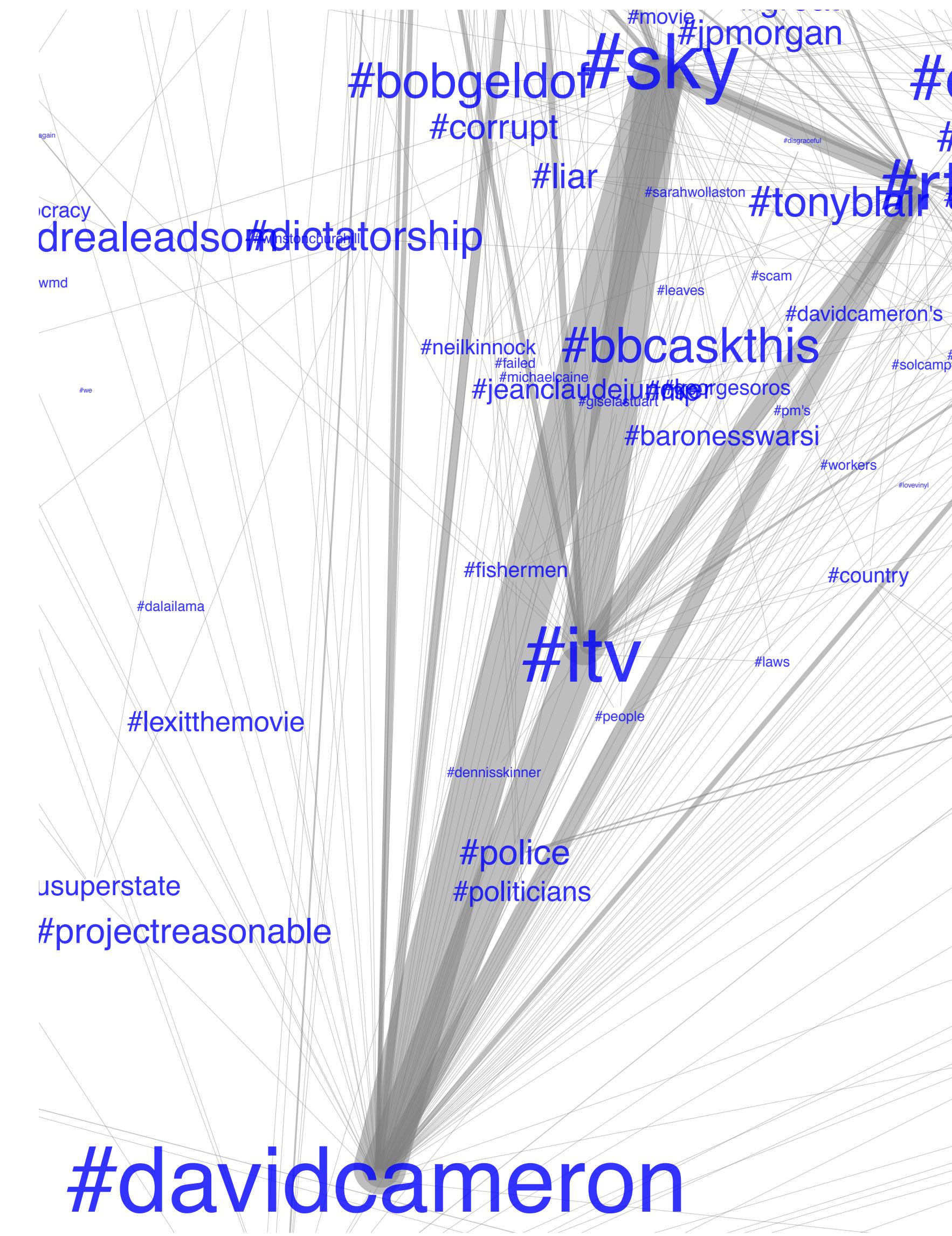




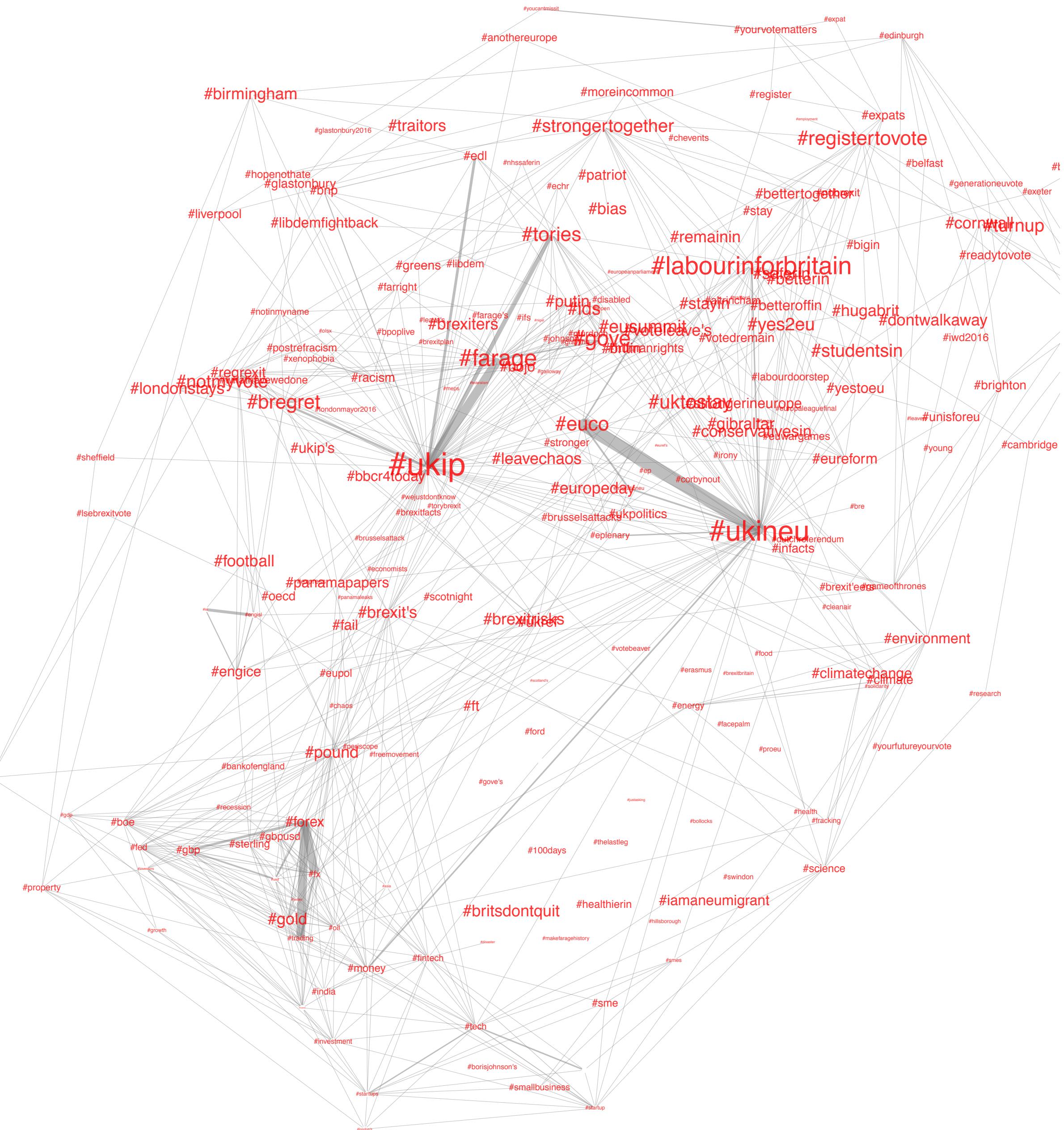
Hashtag Networks (Leave, anti-EU)



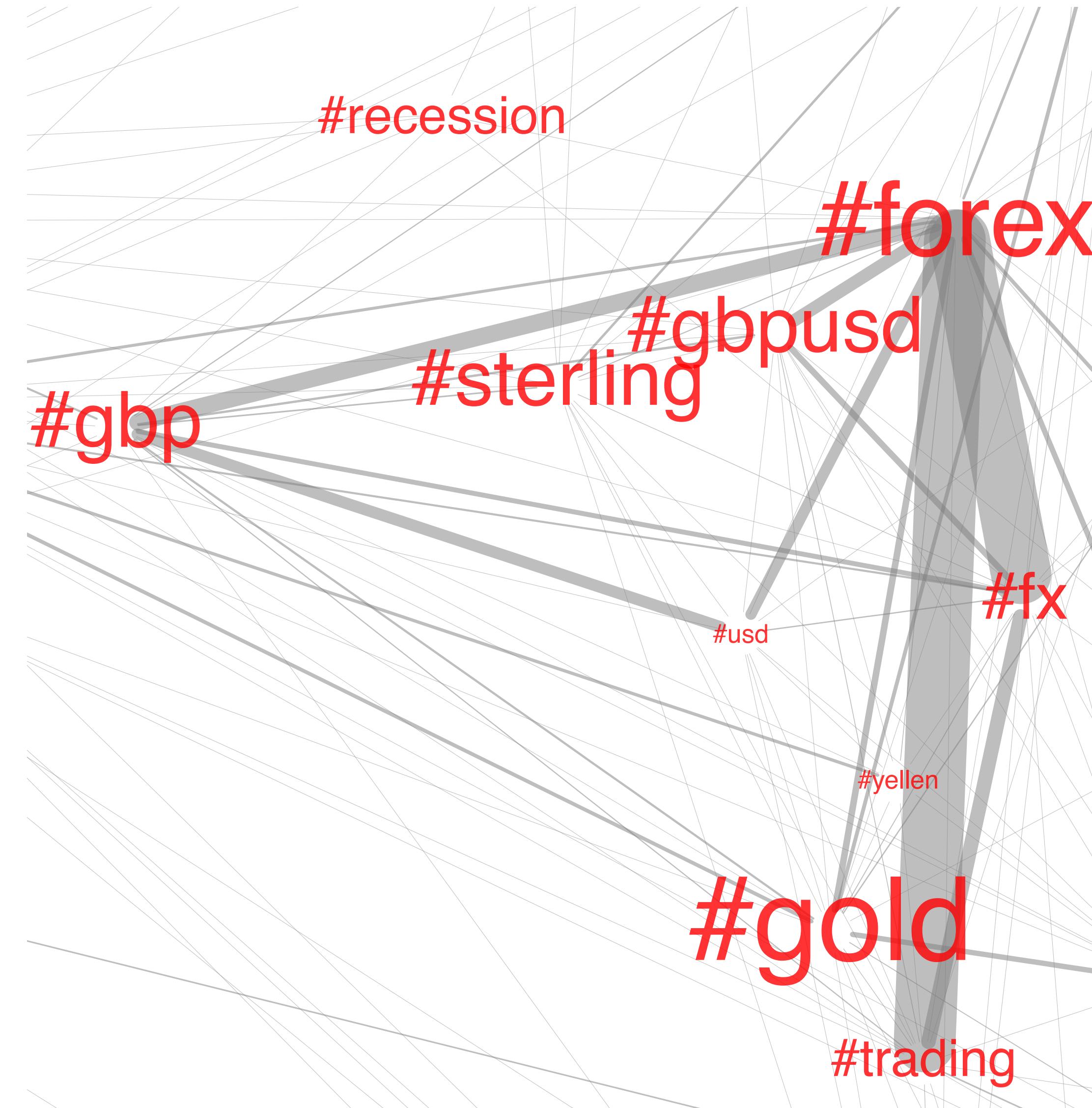
Hashtag Networks (Leave, debate)



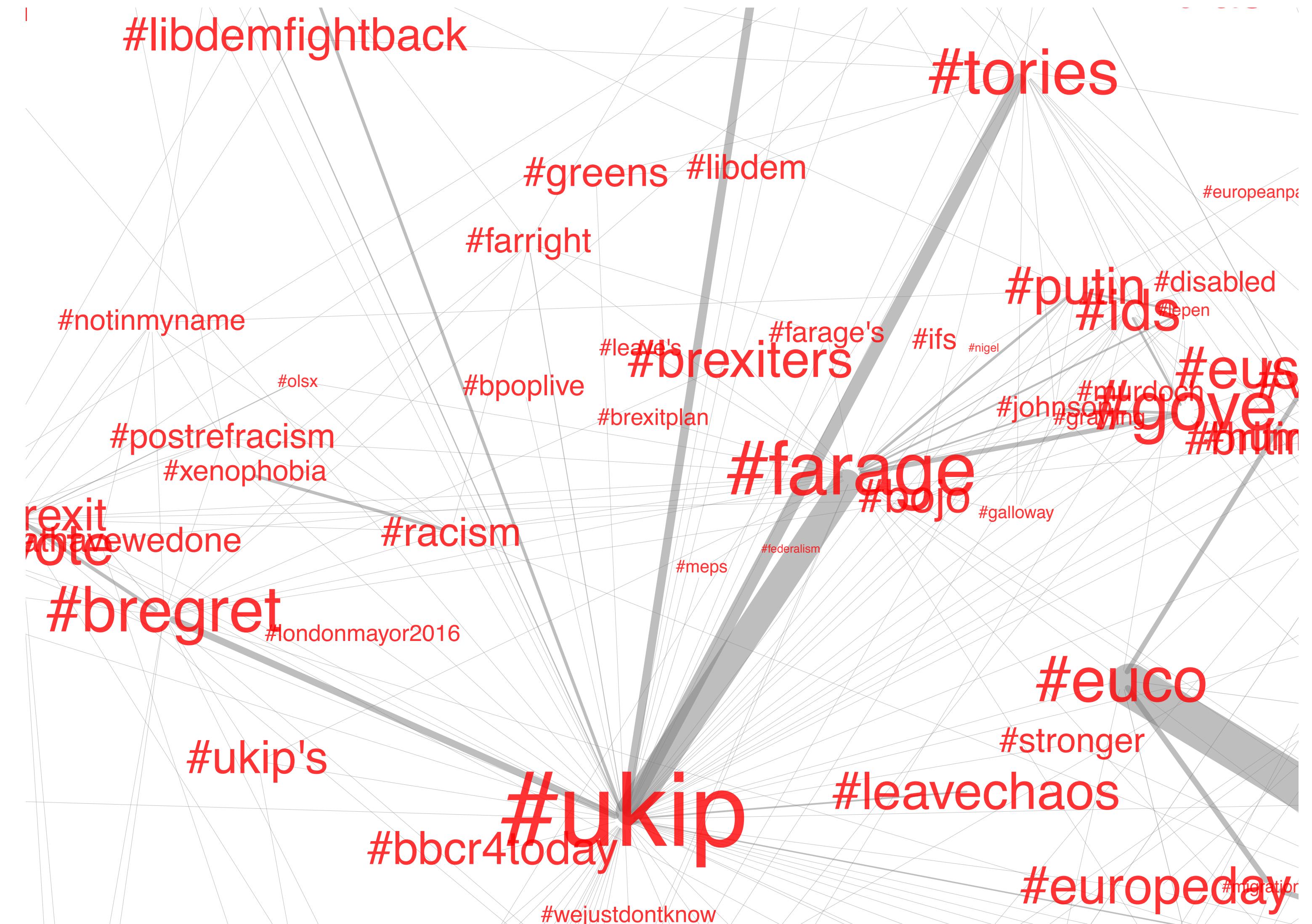
Hashtag Networks (Remain)

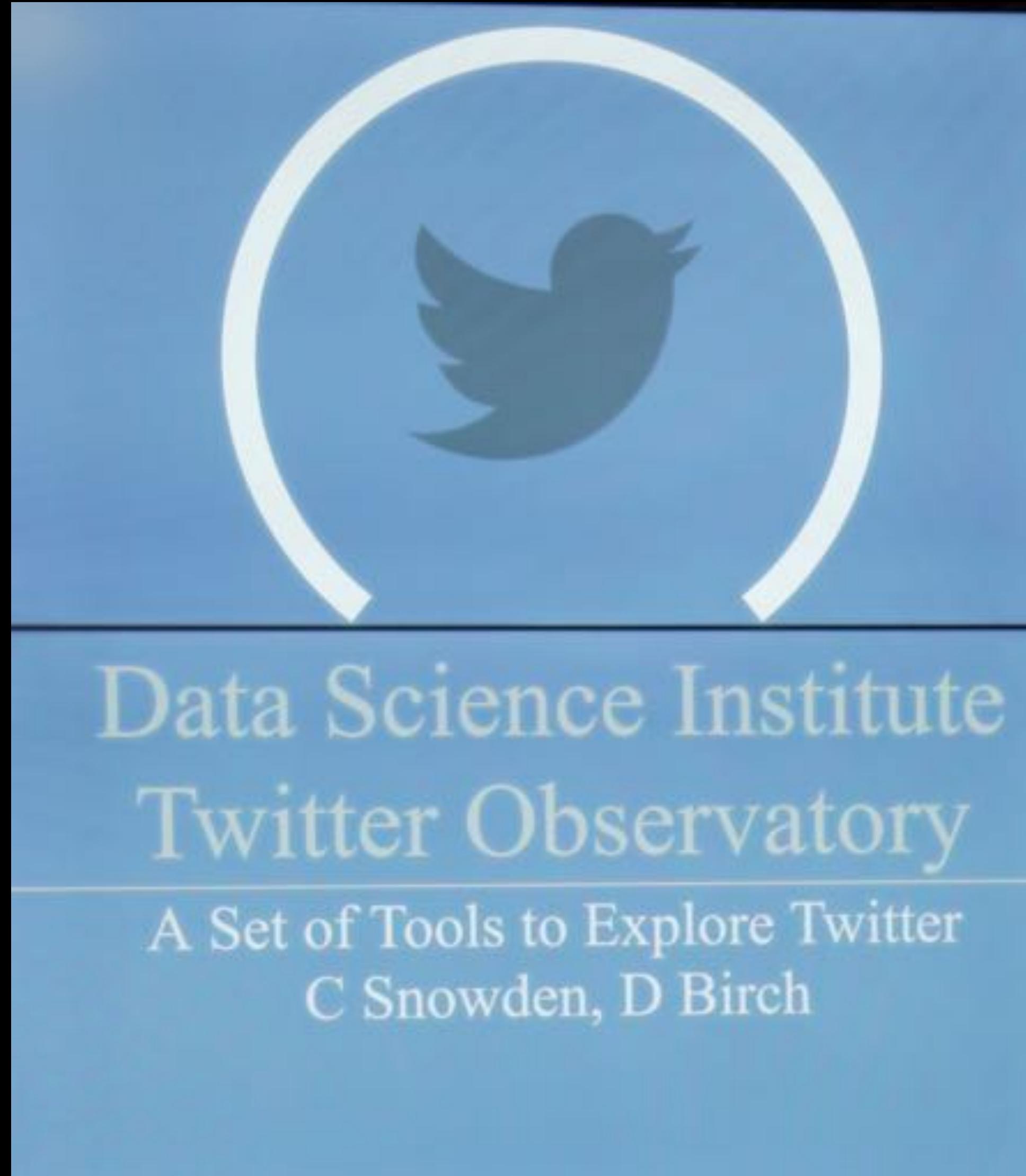


Hashtag Networks (Remain, economic concerns)



Hashtag Networks (Remain, parties and political figures)





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

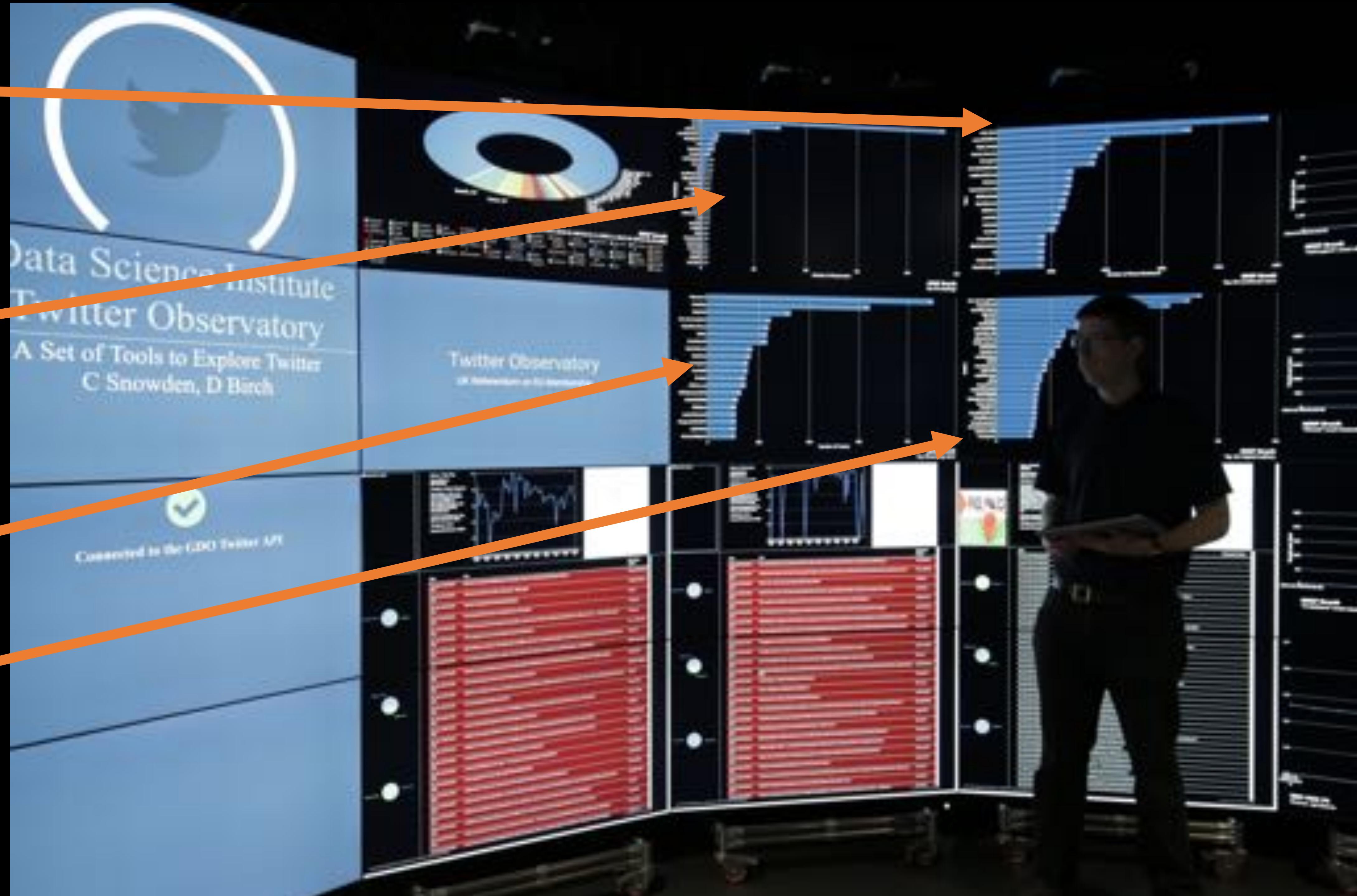
- We use the KPMG Data Observatory a 64 screen immersive visualisation environment
- To create an immersive social discussion environment driven by data.
- Interactive queries can be run on the data and displayed in real time to support multi-disciplinary discussion
- 132million pixels allows us to display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

Most mentioned users

Most popular Hashtags

Most popular tweeters

Most original tweets



Community detection

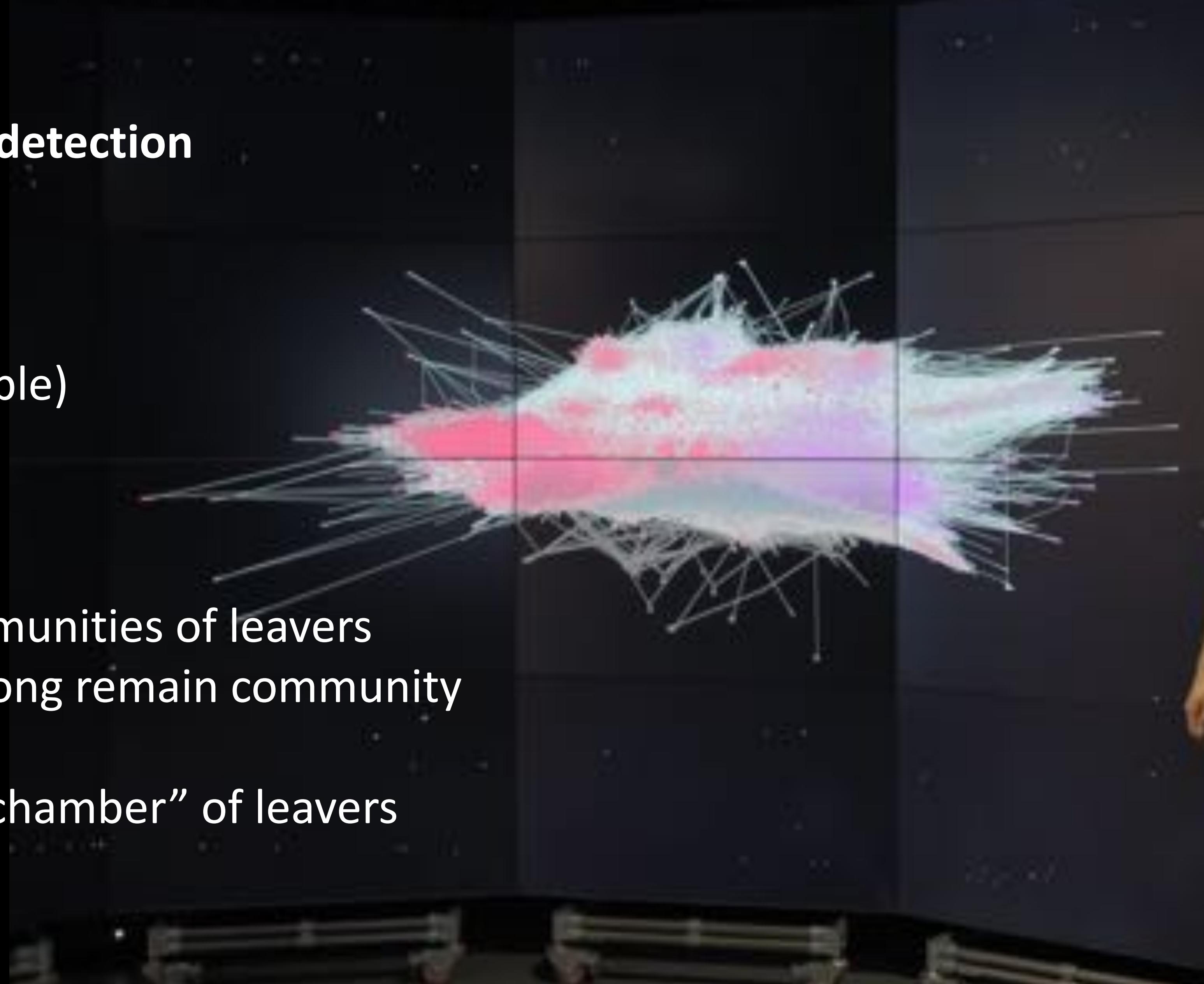
Leave (red)

Remain (purple)

Several communities of leavers

Only one strong remain community

Clear “echo chamber” of leavers



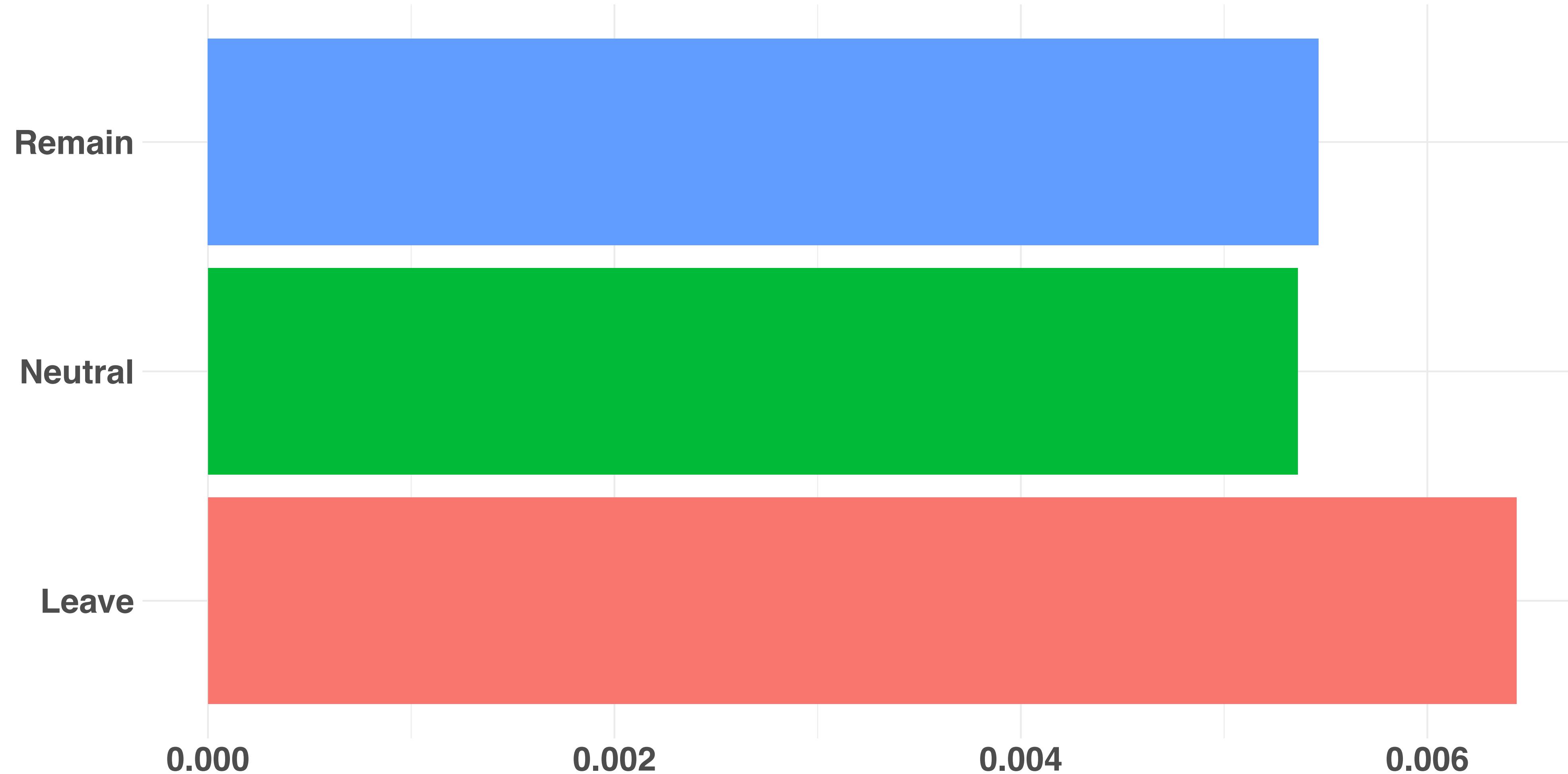
Sentiment Analysis

- 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

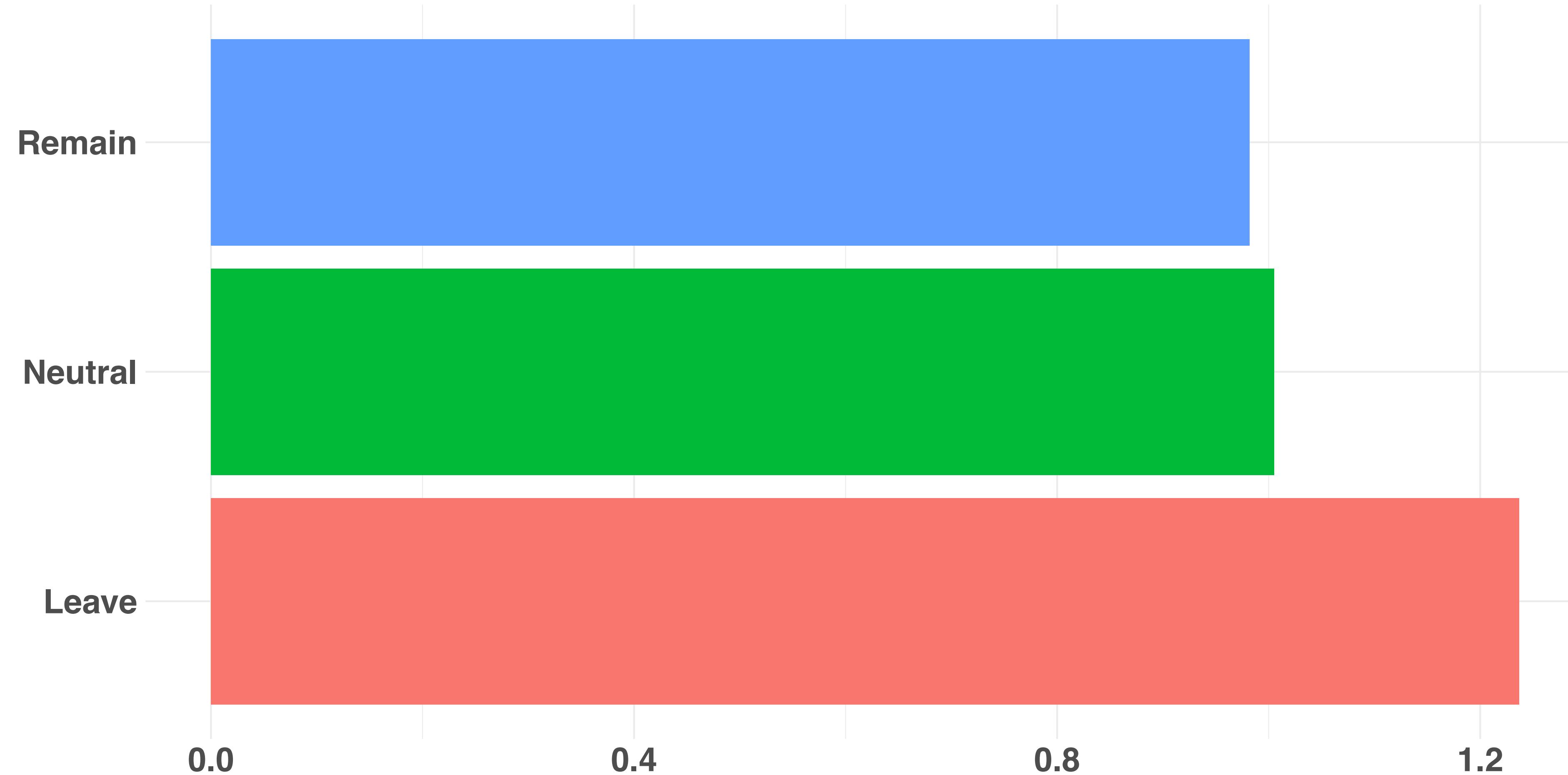
example: “reward” language

```
> 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*"     "gaine"       "get"          "gets"         "getting"      "goal"
 [61] "good"          "got"          "gotten"       "great"        "greed*"      "invigor"
 [67] "jackpot*"     "luck"         "lucky"        "obtain"       "obtainable"   "obtained"
 [73] "obtaining"    "obtains"      "opportun*"   "optimals*"    "optimism"     "optimistic"
 [79] "perfect"       "perfected"    "perfecting"   "perfection"   "perfectly"    "plus"
 [85] "positive"      "positively"   "positives"    "positivis"    "prizes"       "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"
```

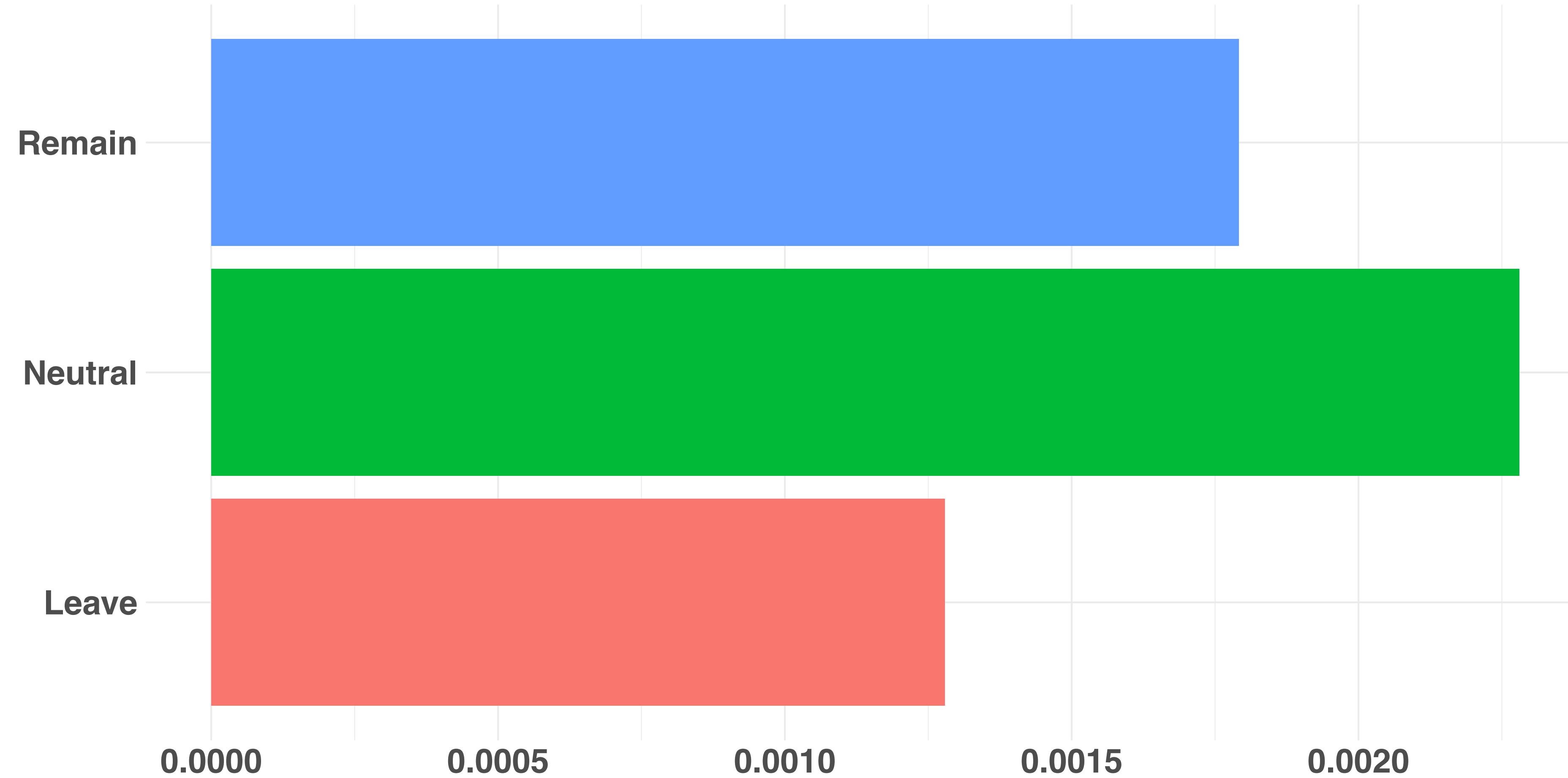
Reward Language



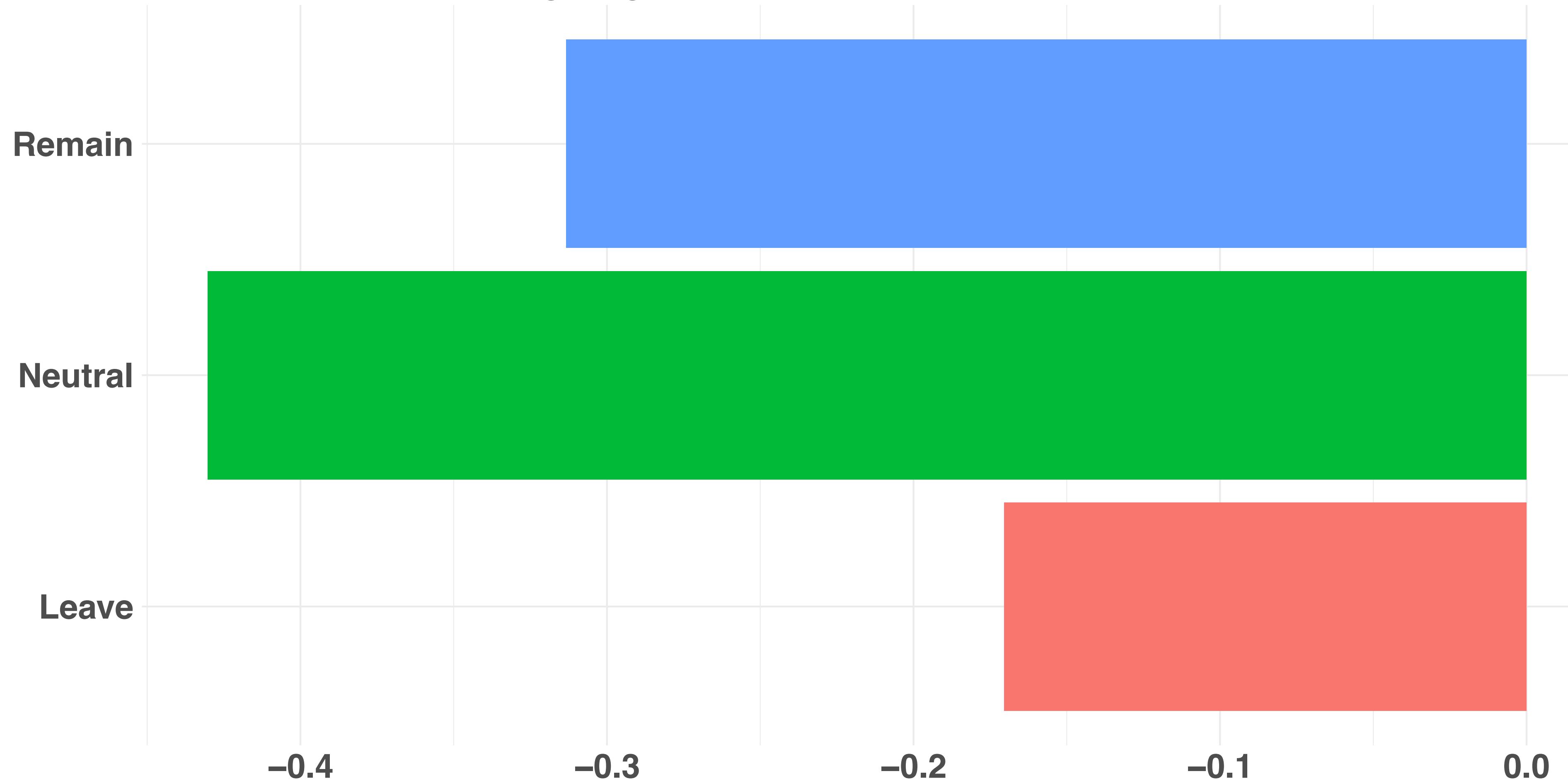
Positive v. Negative Emotion Language



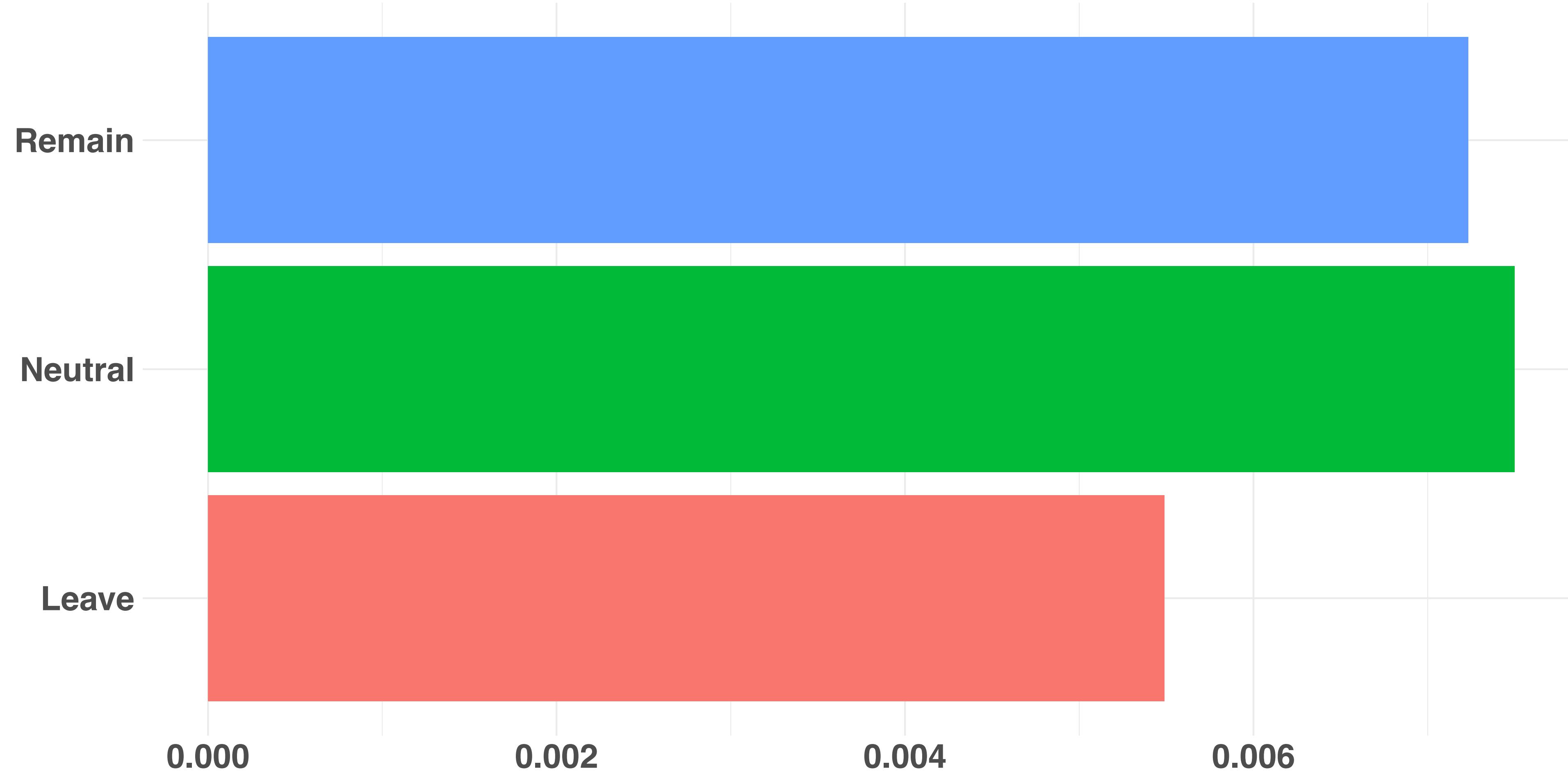
Sad Language



Future v. Past Language



Tentative Language



Power Language

Remain



Neutral



Leave

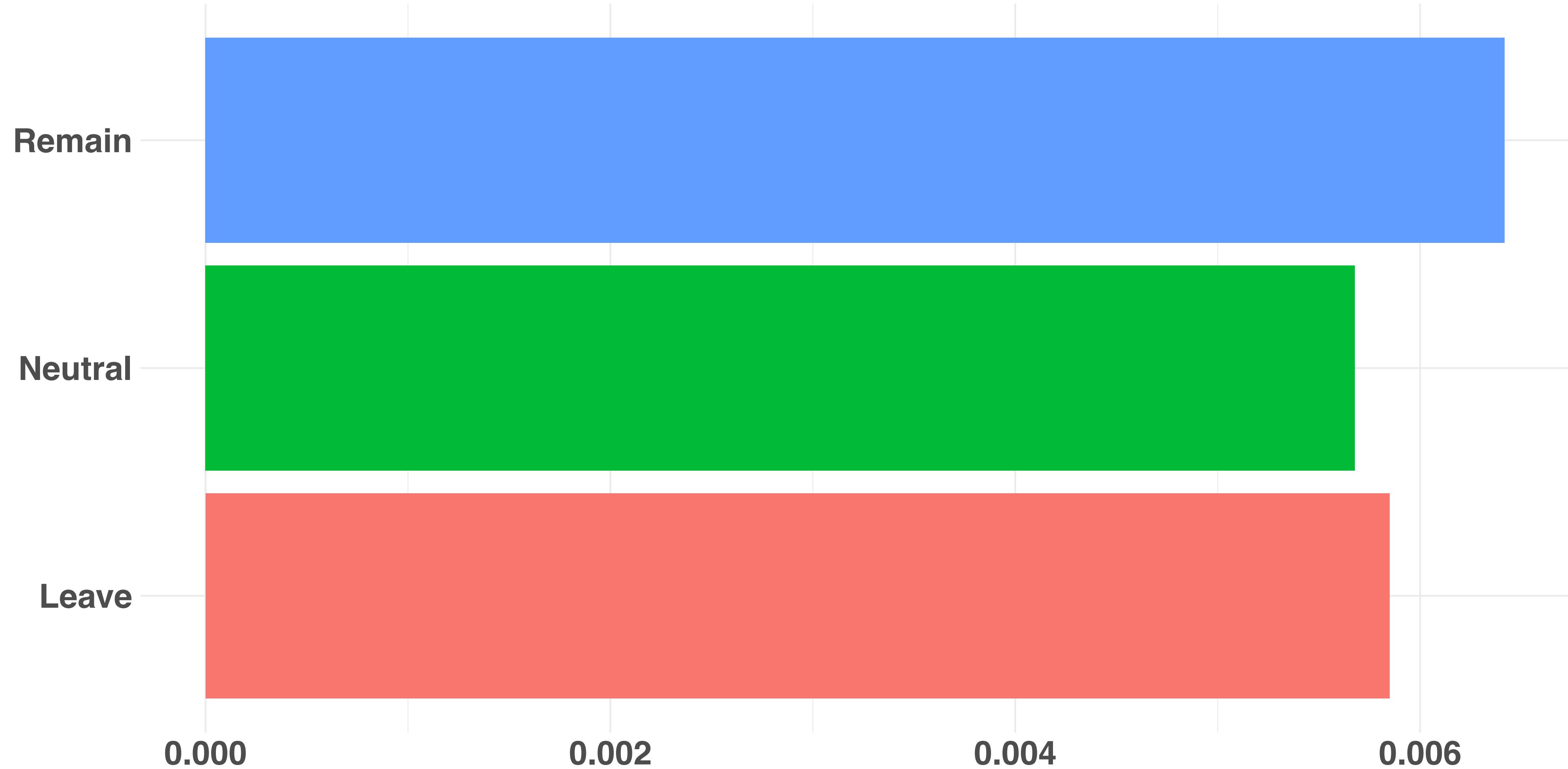


0.000

0.005

0.010

Quantitative Language



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