normsSTM

Aaron Dantzler

2023-07-28

bing

```
data <- read.csv(file = "D:\\Princeton\\BSPL\\norms_sent_bing.csv")
head(data)
```

```
##                     prolific  control    treatment frq_topic_t1
## 1 546e3778fdf99b2bc7ebcff6  climate     evidence            6
## 2 55519750fdf99b7f2114cc3e   health normevidence            4
## 3 55a29659fdf99b5ff49937d3  climate         norm            4
## 4 55b9a9b0fdf99b6906d2aba4 politics         norm            1
## 5 55c43918fdf99b080551e044 politics normevidence            4
## 6 55d0945934e9060005e57258 politics     evidence            4
##
## 1
## 2
## 3
## 4
## 5 I believe access to mental health matters because a lot of people have mental issues, but they don
## 6
##   frq_t1_character_count frq_t1_word_count importance_t1_1 importance_t1_2
## 1                    329                69               3               3
## 2                    396                70               3               3
## 3                    397                65               3               2
## 4                    328                57               4               4
## 5                    694               117               3               4
## 6                    290                54               1               1
##   importance_t1_3 importance_t1_4 importance_t1_5 importance_t1_6 frq_topic_t2
## 1               5               5               4               5            6
## 2               5               5               2               5            6
## 3               3               4               2               3            3
## 4               4               3               3               3            3
## 5               3               4               3               4            6
## 6               1               4               1               1            3
##
## 1
## 2
## 3
## 4
## 5 It is important that everyone be able to get paid enough to live. It's ridiculous that people can
## 6
```

```
##   frq_t2_character_count frq_t2_word_count importance_t2_1 importance_t2_2
## 1                    395                79               3               4
## 2                    488                88               2               5
## 3                    371                65               3               3
## 4                    342                51               4               4
## 5                    761               134               4               4
## 6                    287                49               4               5
##   importance_t2_3 importance_t2_4 importance_t2_5 importance_t2_6 frq_topic_t3
## 1               5               5               4               5            3
## 2               5               5               5               5            4
## 3               4               3               3               2            4
## 4               5               4               4               3            1
## 5               3               5               3               5            6
## 6               5               5               1               1            3
##
## 1
## 2
## 3
## 4
## 5 Increasing the federal minimum wage is extremely important since it's ridiculous that people can't
## 6
##   frq_t3_character_count frq_t3_word_count importance_t3_1 importance_t3_2
## 1                    289                59               3               4
## 2                    385                71               2               3
## 3                    442                79               3               3
## 4                    330                55               4               4
## 5                    799               134               4               3
## 6                    301                51               3               3
##   importance_t3_3 importance_t3_4 importance_t3_5 importance_t3_6 negativet1
## 1               5               3               3               4          1
## 2               5               5               3               5          1
## 3               4               5               3               3          5
## 4               4               3               3               3          1
## 5               3               4               3               5         11
## 6               1               3               1               3          4
##   positivet1 neutralt1 sentimentt1 negativet2 positivet2 neutralt2 sentimentt2
## 1          0        32          -1          2          2        36           0
## 2          6        28           5          0          2        47           2
## 3          2        34          -3          8          0        24          -8
## 4          1        33           0          6          1        26          -5
## 5          2        49          -9          2          8        57           6
## 6          1        21          -3          9          0        20          -9
##   negativet3 positivet3 neutralt3 sentimentt3
## 1          5          0        24          -5
## 2          1          0        30          -1
## 3          5          2        31          -3
## 4          4          1        30          -3
## 5          2          4        71           2
## 6          6          0        23          -6
```

```r
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

new_df <- select(data, prolific, control, treatment, frq_topic_t1, frq_t1,
                 frq_topic_t2, frq_t2, frq_topic_t3, frq_t3, sentimentt1,
                 sentimentt2, sentimentt3)

new_df <- rename(new_df, sentiment_t1 = sentimentt1, sentiment_t2 = sentimentt2,
                 sentiment_t3 = sentimentt3)

frq_topic <- c(new_df$frq_topic_t1, new_df$frq_topic_t2, new_df$frq_topic_t3)

frq <- c(new_df$frq_t1, new_df$frq_t2, new_df$frq_t3)

stacked_df <- data.frame(frq_topic, frq)

time1 <- c(1)
num_repetitions <- 616
time1 <- rep(time1, times = num_repetitions)

time2 <- c(2)
time2 <- rep(time2, times = num_repetitions)

time3 <- c(3)
time3 <- rep(time3, times = num_repetitions)

time <- c(time1, time2, time3)

stacked_df$time <- time

stacked_df$prolific <- c(new_df$prolific, new_df$prolific, new_df$prolific)
stacked_df$control <- c(new_df$control, new_df$control, new_df$control)
stacked_df$treatment <- c(new_df$treatment, new_df$treatment, new_df$treatment)

stacked_df$sentiment <- c(new_df$sentiment_t1, new_df$sentiment_t2,
                          new_df$sentiment_t3)

stacked_df$treated <- ifelse((((data$control == "climate") &
                                 (data$frq_topic_t1 == 1 | data$frq_topic_t1 == 2)),
                              0,
                          ifelse((((data$control == "health") &
                                 (data$frq_topic_t1 == 4 | data$frq_topic_t1 == 5)),
                              0,
                           ifelse((((data$control == "politics") &
                                 (data$frq_topic_t1 == 5 | data$frq_topic_t1 == 6)),
                              0, 1)))
```

```r
stacked_df$evidence <- ifelse((stacked_df$treated == 1) &
                                (stacked_df$treatment == "evidence"), 1, 0)

stacked_df$normevidence <- ifelse((stacked_df$treated == 1) &
                                (stacked_df$treatment == "normevidence"), 1, 0)

stacked_df$norm <- ifelse((stacked_df$treated == 1) &
                                (stacked_df$treatment == "norm"), 1, 0)

# Create a new dataframe by dropping rows from df1 where ID is present in df2
df2 <- data.frame(frq_topic = c(3, 4, 5, 6))
climate_stacked_df <- subset(stacked_df, !(frq_topic %in% df2$frq_topic))

df2 <- data.frame(frq_topic = c(1, 2, 5, 6))
health_stacked_df <- subset(stacked_df, !(frq_topic %in% df2$frq_topic))

df2 <- data.frame(frq_topic = c(1, 2, 3, 4))
politics_stacked_df <- subset(stacked_df, !(frq_topic %in% df2$frq_topic))

set.seed(1000)
sI = sessionInfo()
sI
```

```
## R version 4.3.0 (2023-04-21 ucrt)
## Platform: x86_64-w64-mingw32/x64 (64-bit)
## Running under: Windows 10 x64 (build 19045)
##
## Matrix products: default
##
##
## locale:
## [1] LC_COLLATE=English_United States.utf8
## [2] LC_CTYPE=English_United States.utf8
## [3] LC_MONETARY=English_United States.utf8
## [4] LC_NUMERIC=C
## [5] LC_TIME=English_United States.utf8
##
## time zone: America/New_York
## tzcode source: internal
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
## [1] dplyr_1.1.2
##
## loaded via a namespace (and not attached):
##  [1] digest_0.6.31    utf8_1.2.3      R6_2.5.1          fastmap_1.1.1
##  [5] tidyselect_1.2.0 xfun_0.39       magrittr_2.0.3   glue_1.6.2
##  [9] tibble_3.2.1     knitr_1.43      pkgconfig_2.0.3  htmltools_0.5.5
## [13] rmarkdown_2.22   generics_0.1.3  lifecycle_1.0.3  cli_3.6.1
## [17] fansi_1.0.4      vctrs_0.6.2     withr_2.5.0      compiler_4.3.0
## [21] rstudioapi_0.15.0 tools_4.3.0    pillar_1.9.0     evaluate_0.21
```

```
## [25] yaml_2.3.7          rlang_1.1.1
```

All of the Data

```r
library("stm")
```

```
## stm v1.3.6 successfully loaded. See ?stm for help.
##  Papers, resources, and other materials at structuraltopicmodel.com
```

```r
data <- stacked_df
processed <- textProcessor(data$frq, metadata = data)
```

```
## Building corpus...
## Converting to Lower Case...
## Removing punctuation...
## Removing stopwords...
## Removing numbers...
## Stemming...
## Creating Output...
```
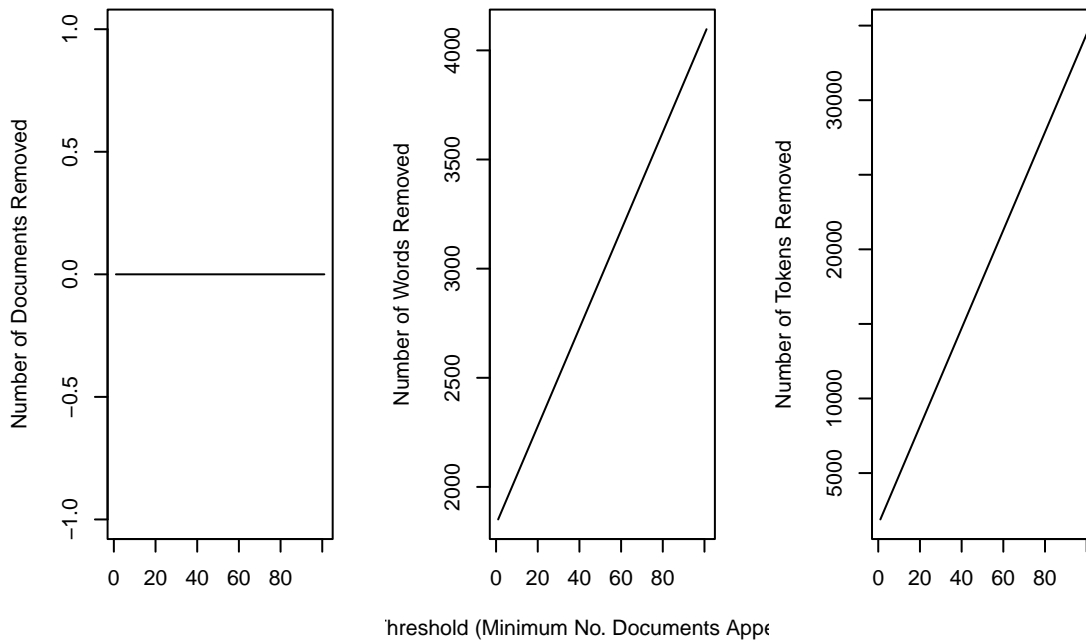
```r
out <- prepDocuments(processed$documents, processed$vocab, processed$meta)
```

```
## Removing 1851 of 4205 terms (1851 of 58416 tokens) due to frequency
## Your corpus now has 1848 documents, 2354 terms and 56565 tokens.
```

```r
docs <- out$documents
vocab <- out$vocab
meta <- out$meta
```

```r
plotRemoved(processed$documents, lower.thresh = seq(1, 200, by = 100))
```

Documents Removed by Thres   Words Removed by Thresho   Tokens Removed by Thresho

Threshold (Minimum No. Documents Appe

```r
# change lower.thresh
out <- prepDocuments(processed$documents, processed$vocab, processed$meta,
                     lower.thresh = 5)
```

```
## Removing 2966 of 4205 terms (5140 of 58416 tokens) due to frequency
## Your corpus now has 1848 documents, 1239 terms and 53276 tokens.
```

```r
# add content?
frqModel <- stm(documents = out$documents, vocab = out$vocab, K = 15,
                     prevalence =~ treated,
                     content =~ sentiment,
                     seed = 1000,
                     max.em.its = 75, data = out$meta, init.type = "Spectral")
```

```
## Beginning Spectral Initialization
##    Calculating the gram matrix...
##    Finding anchor words...
##       ...............
##    Recovering initialization...
##       ............
## Initialization complete.
## ....................................................................................................
## Completed E-Step (0 seconds).
## ....................................................................................................
## Completed M-Step (18 seconds).
```

```
## Completing Iteration 1 (approx. per word bound = -5.681)
## .............................................................................................
## Completed E-Step (0 seconds).
## .............................................................................................
## Completed M-Step (16 seconds).
## Completing Iteration 2 (approx. per word bound = -5.572, relative change = 1.921e-02)
## .............................................................................................
## Completed E-Step (0 seconds).
## .............................................................................................
## Completed M-Step (18 seconds).
## Completing Iteration 3 (approx. per word bound = -5.549, relative change = 3.980e-03)
## .............................................................................................
## Completed E-Step (0 seconds).
## .............................................................................................
## Completed M-Step (16 seconds).
## Completing Iteration 4 (approx. per word bound = -5.543, relative change = 1.148e-03)
## .............................................................................................
## Completed E-Step (0 seconds).
## .............................................................................................
## Completed M-Step (16 seconds).
## Completing Iteration 5 (approx. per word bound = -5.542, relative change = 1.440e-04)
## Topic 1: physic, access, stigma, care, untreat
##  Topic 2: driver, drunk, car, innoc, drive
##  Topic 3: ocean, anim, reusabl, ban, environ
##  Topic 4: requir, hire, greedi, profit, market
##  Topic 5: democrat, heard, ballot, democraci, vote
##  Topic 6: climat, emiss, carbon, offset, fuel
##  Topic 7: rent, earn, worker, hour, gas
##  Topic 8: topic, list, attack, select, utmost
##  Topic 9: schizophrenia, patient, donat, bipolar, anxieti
##  Topic 10: addict, violent, cope, homeless, identifi
##  Topic 11: will, workplac, respect, product, happier
##  Topic 12: histori, week, appoint, societ, anoth
##  Topic 13: spend, anyth, whatev, listen, want
##  Topic 14: airplan, ticket, tax, plane, fli
##  Topic 15: doesn't, problem
## Aspect 1: distress, numer, overwhelm, troubl, contact
##  Aspect 2: fewer, walk, unfair, crime, licens
##  Aspect 3: employe, overal, often, poverti, distress
##  Aspect 4: adequ, suffer, death, drunk
##  Aspect 5: wors, heart, anxieti, consequ, account
##  Aspect 6: sad, hand, mind, never, money
##  Aspect 7: youv, needless, mandatori, refus, across
##  Aspect 8: complic, colleg, mistak, rural, unaccept
##  Aspect 9: path, desper, relat, extend, follow
##  Aspect 10: rare, sick, contact, preval, youv
##  Aspect 11: symptom, messag, fall, under, stori
##  Aspect 12: within, unless, critic, figur, unlik
##  Aspect 13: couldnt, predict, spent, wide, ton
##  Aspect 14: nowaday, park, thrive, forc, answer
##  Aspect 15: credit, pretti, status, enjoy, proven
##  Aspect 16: set, readili, outcom, colleg, chosen
##  Aspect 17: broken, effici, somebodi, boost, cycl
##  Aspect 18: particular, pocket, hous, boost, activ
```

```
##   Aspect 19: goal, mitig, prosper, corpor, engag
##   Aspect 20: activ, gain, massiv, trust, healthi
##   Aspect 21: enjoy, influenc, advantag, overal, work
##   Aspect 22: happi, car, top, best, research
##   Aspect 23: pollut, greatest, done, popul, easier
##   Aspect 24: industri, corpor, apart, rent, afford
## ..................................................................................
## Completed E-Step (0 seconds).
## ..................................................................................
## Completed M-Step (16 seconds).
## Completing Iteration 6 (approx. per word bound = -5.541, relative change = 1.463e-04)
## ..................................................................................
## Completed E-Step (0 seconds).
## ..................................................................................
## Completed M-Step (16 seconds).
## Model Converged
```

```
labelTopics(frqModel, 1:15)
```

```
## Topic Words:
##   Topic 1: physic, access, stigma, care, health, untreat, issu
##   Topic 2: driver, drunk, car, innoc, drive, wheel, irrespons
##   Topic 3: ocean, anim, reusabl, ban, environ, trash, bag
##   Topic 4: requir, hire, greedi, profit, market, busi, freedom
##   Topic 5: democrat, heard, ballot, turnout, voter, democraci, candid
##   Topic 6: climat, emiss, carbon, offset, fuel, airlin, warm
##   Topic 7: rent, earn, worker, hour, gas, wage, minimum
##   Topic 8: topic, list, select, thus, attack, utmost, achiev
##   Topic 9: schizophrenia, patient, donat, bipolar, anxieti, doctor, silent
##   Topic 10: addict, homeless, shoot, violent, cope, identifi, commit
##   Topic 11: will, workplac, product, respect, happier, welfar, econom
##   Topic 12: histori, week, appoint, societ, contact, anoth, pain
##   Topic 13: spend, anyth, whatev, want, listen, less, place
##   Topic 14: airplan, tax, ticket, plane, pay, fli, travel
##   Topic 15: doesn't, problem
##
##   Covariate Words:
##   Group -20: distress, numer, overwhelm, troubl, contact, selfish, asham
##   Group -12: fewer, unfair, walk, crime, licens, hurt, jail
##   Group -11: employe, overal, record, often, valu, selfish, health
##   Group -10: adequ, suffer, death, drunk
##   Group -9: wors, heart, consequ, becom, anxieti, account, measur
##   Group -8: sad, hand, mind, never, attent, depress, money
##   Group -7: youv, needless, refus, across, reflect, wont, dead
##   Group -6: complic, colleg, mistak, rural, unaccept, judg, yet
##   Group -5: path, relat, extend, desper, follow, plus, leav
##   Group -4: rare, preval, youv, enjoy, crack, contact, togeth
##   Group -3: symptom, messag, fall, under, stori, natur, most
##   Group -2: within, unless, critic, figur, unlik, occur, rise
##   Group -1: couldnt, predict, spent, wide, ton, somebodi, next
##   Group 0: nowaday, thrive, park, forc, answer, found, usa
##   Group 1: credit, pretti, status, enjoy, proven, near, achiev
##   Group 2: set, outcom, chosen, upon, offer, colleg, across
##   Group 3: effici, somebodi, boost, cycl, addit, research, gain
```

```
## Group 4: particular, pocket, hous, boost, activ, tie, overal
## Group 5: goal, mitig, prosper, corpor, engag, system, secur
## Group 6: activ, gain, massiv, trust, healthi, benefit, system
## Group 7: enjoy, advantag, overal, work, pretti, influenc, product
## Group 8: happi, best, top, research, workplac, worker, better
## Group 9: greatest, pollut, done, popul, easier, free, consequ
## Group 11: industri, corpor, apart, afford, rent, minimum, wage
##
## Topic-Covariate Interactions:
## Topic 1, Group -20:
## Topic 1, Group -12:
## Topic 1, Group -11: sick, poor, impact, abus, physic
## Topic 1, Group -10:
## Topic 1, Group -9: lose, everybodi, ill, treatment, individu, access
## Topic 1, Group -8: percentag, sever, beyond, stake, difficult, popul, your
## Topic 1, Group -7: fight, still, shortag, ill, biggest, normal, stigma
## Topic 1, Group -6: constant, immedi, fear, asham, didnt, sent, popul
## Topic 1, Group -5: threaten, neglect, embarrass, shoot, declin, essenti, negat
## Topic 1, Group -4: wait, homicid, qualifi, drop, facil, essenti, els
## Topic 1, Group -3: add, apart, watch, risk, drop, person, ignor
## Topic 1, Group -2: visit, readili, acknowledg, obtain, open, particular, stigmat
## Topic 1, Group -1: symptom, underserv, particular, embarrass, shouldn't, clear, insid
## Topic 1, Group 0: practic, attach, easier, percentag, essenti, popul, healthcar
## Topic 1, Group 1: yet, crime, opportun, student, attach, declin, servic
## Topic 1, Group 2: fight, reliant, clear, violenc, financ, walk, form
## Topic 1, Group 3: happi, immedi, fund, open, awar, manag, averag
## Topic 1, Group 4: clear, healthi, med, rural, ill, hospit, overal
## Topic 1, Group 5: modern, readili, discourag, main, reason, avail, fund
## Topic 1, Group 6: happier, well, someon
## Topic 1, Group 7: visit, happi, beyond, everybodi
## Topic 1, Group 8:
## Topic 1, Group 9:
## Topic 1, Group 11:
##
## Topic 2, Group -20:
## Topic 2, Group -12: driver, drunk
## Topic 2, Group -11:
## Topic 2, Group -10: urgent, heavi, attent, els, ruin, properti, consequ
## Topic 2, Group -9: period, messag, regardless, rampant, discourag, els, yet
## Topic 2, Group -8: expens, stupid, worri, hurt, selfish, walk, punish
## Topic 2, Group -7: urgent, demand, modern, devast, threaten, discourag, bring
## Topic 2, Group -6: fight, dui, month, easier, excus, needless, mother
## Topic 2, Group -5: ban, rampant, licens, incid, anoth, dui, punish
## Topic 2, Group -4: perfect, capabl, pull, congress, legisl, apart, mandat
## Topic 2, Group -3: threat, didnt, rememb, overdu, function, safe, reduc
## Topic 2, Group -2: sell, devic, coverag, devast, mother, call, death
## Topic 2, Group -1: besid, patient, capabl, devic, dui, licens, secur
## Topic 2, Group 0: dui, happi, perfect, licens, instead, safe, rememb
## Topic 2, Group 1: inform, threat, free, set, essenti, exampl, hand
## Topic 2, Group 2: capabl, trust, heavi, activ, slow, machin, metal
## Topic 2, Group 3: car, feel, type, safe, drive
## Topic 2, Group 4: awar
## Topic 2, Group 5:
## Topic 2, Group 6: fast, heavi, anoth, direct, frequent, slow, trust
```

```
##  Topic 2, Group 7:
##  Topic 2, Group 8: car
##  Topic 2, Group 9:
##  Topic 2, Group 11:
##
##  Topic 3, Group -20:
##  Topic 3, Group -12:
##  Topic 3, Group -11:
##  Topic 3, Group -10:
##  Topic 3, Group -9:
##  Topic 3, Group -8:
##  Topic 3, Group -7: consum, hurt, damag
##  Topic 3, Group -6: pocket, behavior, impact, small, pollut, yet
##  Topic 3, Group -5: mess, perfect, read, releas, mother, reliant, rememb
##  Topic 3, Group -4: chemic, path, toward, properti, negat, month, kill
##  Topic 3, Group -3: modern, bigger, bottom, declin, sit, mention, contact
##  Topic 3, Group -2: weve, fight, consum, hang, thousand, garbag, carri
##  Topic 3, Group -1: practic, mistak, mitig, non, besid, term, mess
##  Topic 3, Group 0: highest, fli, old, practic, habit, found, protect
##  Topic 3, Group 1: caught, capabl, footprint, reliant, weve, particular, reli
##  Topic 3, Group 2: consum, readili, serious, destroy, free, see, though
##  Topic 3, Group 3: highest, besid, perfect, two, demand, research, main
##  Topic 3, Group 4: main, begin, averag, anoth, incred, easier, done
##  Topic 3, Group 5: heal, purchas, obtain, car, thrive, suppli, shop
##  Topic 3, Group 6: distress, numer, expens, pretti, averag, type, less
##  Topic 3, Group 7:
##  Topic 3, Group 8:
##  Topic 3, Group 9:
##  Topic 3, Group 11:
##
##  Topic 4, Group -20:
##  Topic 4, Group -12:
##  Topic 4, Group -11:
##  Topic 4, Group -10:
##  Topic 4, Group -9: what, selfish, corpor, open, normal, profit
##  Topic 4, Group -8:
##  Topic 4, Group -7:
##  Topic 4, Group -6: havoc, fewer, higher, locat, predict, local, opportun
##  Topic 4, Group -5: effort, averag, level, reflect
##  Topic 4, Group -4: sick, constant, contact, call, encourag, worker, abus
##  Topic 4, Group -3: path, valu, addit, rais, busi
##  Topic 4, Group -2: anoth, car, greedi
##  Topic 4, Group -1: charact, custom, free, employ, market, idea, requir
##  Topic 4, Group 0: debt, complic, offset, industri, happi, employe, poverti
##  Topic 4, Group 1: wealth, secur, corpor, present, rememb, greater, exampl
##  Topic 4, Group 2: associ, strong, purchas, base, employ, pay, job
##  Topic 4, Group 3: second, requir
##  Topic 4, Group 4: charact, base, reflect, minimum, wage, worker, paid
##  Topic 4, Group 5:
##  Topic 4, Group 6: worker
##  Topic 4, Group 7:
##  Topic 4, Group 8:
##  Topic 4, Group 9:
##  Topic 4, Group 11:
```

```
## 
##   Topic 5, Group -20:
##   Topic 5, Group -12:
##   Topic 5, Group -11:
##   Topic 5, Group -10:
##   Topic 5, Group -9:
##   Topic 5, Group -8:
##   Topic 5, Group -7:
##   Topic 5, Group -6: democrat, elect
##   Topic 5, Group -5: voter
##   Topic 5, Group -4: heavi, cheat, didnt, incred, somewhat, licens, slow
##   Topic 5, Group -3: half, mess, rampant, true, open, secur, cheat
##   Topic 5, Group -2: threat, besid, practic, didnt, serious, area, week
##   Topic 5, Group -1: didnt, wont, everybodi, went, necess, obtain, complain
##   Topic 5, Group 0: unfair, remain, embarrass, eas, drop, requir, specif
##   Topic 5, Group 1: lose, essenti, percentag, cheat, count, prohibit, citizen
##   Topic 5, Group 2: drop, charact, old, sit, transport, your, counti
##   Topic 5, Group 3: everybodi, locat, stake, ideal, reflect, threat, sent
##   Topic 5, Group 4: ideal, path, news, numer, thus, taken, anymor
##   Topic 5, Group 5: base, fail, form, protect, legisl, interest, advantag
##   Topic 5, Group 6: acknowledg, secur, reflect, choic, group, congress, inform
##   Topic 5, Group 7: learn, win, part, influenc, trust, area, elect
##   Topic 5, Group 8: candid
##   Topic 5, Group 9: voter, turnout
##   Topic 5, Group 11:
## 
##   Topic 6, Group -20:
##   Topic 6, Group -12:
##   Topic 6, Group -11:
##   Topic 6, Group -10:
##   Topic 6, Group -9:
##   Topic 6, Group -8:
##   Topic 6, Group -7:
##   Topic 6, Group -6: earth
##   Topic 6, Group -5: emiss
##   Topic 6, Group -4: threat, true, cost, reflect, usag, activ, fuel
##   Topic 6, Group -3: highest, consum, devast, compani, unnecessari, legisl, immedi
##   Topic 6, Group -2: corpor, discourag, valu, heal, tax, invest, individu
##   Topic 6, Group -1: urgent, reliant, goal, perfect, essenti, technolog, industri
##   Topic 6, Group 0: fee, togeth, footprint, flight, natur, wildlif, pollut
##   Topic 6, Group 1: flight, purchas, consequ, credit, mess, flood, averag
##   Topic 6, Group 2: path, tax, alreadi, impact, fight, global
##   Topic 6, Group 3: footprint, legisl, now, natur, next, place, fight
##   Topic 6, Group 4: impact
##   Topic 6, Group 5: ban, anim
##   Topic 6, Group 6:
##   Topic 6, Group 7:
##   Topic 6, Group 8:
##   Topic 6, Group 9:
##   Topic 6, Group 11:
## 
##   Topic 7, Group -20:
##   Topic 7, Group -12:
##   Topic 7, Group -11:
```

```
##   Topic 7, Group -10:
##   Topic 7, Group -9: secur
##   Topic 7, Group -8:
##   Topic 7, Group -7:
##   Topic 7, Group -6: refus, employ, due, employe, custom, inflat, price
##   Topic 7, Group -5: demand, consid, pandem, essenti, function, worker, job
##   Topic 7, Group -4: labor, opportun, next, tip, reli, work
##   Topic 7, Group -3: debt, percentag, unabl, half, particular, busi, apart
##   Topic 7, Group -2: debt, slow, feel, wealth, constant, yet, hardest
##   Topic 7, Group -1: consum, youv, base, wealth, harder, certain, plus
##   Topic 7, Group 0: car, risen, record, averag, expens, paycheck, covid
##   Topic 7, Group 1: ideal, quit, necess, immedi, move, cover, legisl
##   Topic 7, Group 2: shortag, constant, eas, besid, kept, shelter, second
##   Topic 7, Group 3: payer, motiv, wouldnt, purchas, program, overal, across
##   Topic 7, Group 4: constant, happi, wait, modern, sent, servic, allow
##   Topic 7, Group 5: fight, compani, richer, eat, averag, apart, profit
##   Topic 7, Group 6: besid, natur, havent, modern, somewhat, discourag, fewer
##   Topic 7, Group 7: support, decent, worker, money, wage, work
##   Topic 7, Group 8: enjoy, consum, servic, beyond, incom, tip
##   Topic 7, Group 9:
##   Topic 7, Group 11:
##
##   Topic 8, Group -20:
##   Topic 8, Group -12:
##   Topic 8, Group -11:
##   Topic 8, Group -10:
##   Topic 8, Group -9:
##   Topic 8, Group -8:
##   Topic 8, Group -7: achiev
##   Topic 8, Group -6:
##   Topic 8, Group -5:
##   Topic 8, Group -4: topic
##   Topic 8, Group -3: posit, impact, address, issu
##   Topic 8, Group -2: toward, topic, address
##   Topic 8, Group -1: democraci, matter, wide, voter, turnout, topic, address
##   Topic 8, Group 0: legisl, fight, ideal, valu, turnout, voter, democraci
##   Topic 8, Group 1: fight, forward, focus
##   Topic 8, Group 2: ideal, support, polici, great
##   Topic 8, Group 3: legisl, inflat, decis, improv
##   Topic 8, Group 4: perfect, healthcar, immedi, outcom, legisl, improv, great
##   Topic 8, Group 5: turnout, achiev, voter, improv
##   Topic 8, Group 6:
##   Topic 8, Group 7:
##   Topic 8, Group 8:
##   Topic 8, Group 9:
##   Topic 8, Group 11:
##
##   Topic 9, Group -20:
##   Topic 9, Group -12:
##   Topic 9, Group -11:
##   Topic 9, Group -10:
##   Topic 9, Group -9:
##   Topic 9, Group -8: fight, urgent, overwhelm, worst, ill
##   Topic 9, Group -7: embarrass, didnt, fear, diagnos, yet, lost, youv
```

```
##  Topic 9, Group -6: symptom, real, happen, depress, yet, kill, patient
##  Topic 9, Group -5: refus, your, top, yet, ill, went, due
##  Topic 9, Group -4: charact, rememb, somewhat, addit, colleg, happi, contact
##  Topic 9, Group -3: troubl, don't, final, resolv, heavi, clear, instead
##  Topic 9, Group -2: tremend, modern, trauma, distress, men, clear, normal
##  Topic 9, Group -1: visit, emerg, wait, metal, period, servic, ideal
##  Topic 9, Group 0: declin, demand, base, drug, find, program, yet
##  Topic 9, Group 1: wait, thousand, drop, urgent, children, abus, couldnt
##  Topic 9, Group 2: inform, shooter, readili, rememb, desper, detect, weve
##  Topic 9, Group 3: visit, win, often, best, resourc, help, avail
##  Topic 9, Group 4: went, manag, therapist, apart, plus, behavior, threaten
##  Topic 9, Group 5: citizen
##  Topic 9, Group 6: countless, place, ill, save, safe
##  Topic 9, Group 7: sick, half, symptom, undiagnos, thank, inform, first
##  Topic 9, Group 8:
##  Topic 9, Group 9:
##  Topic 9, Group 11:
##
##  Topic 10, Group -20:
##  Topic 10, Group -12:
##  Topic 10, Group -11: distress, declin, devast, valu, undiagnos, unstabl, receiv
##  Topic 10, Group -10: modern, asham, undiagnos, fear, unstabl, disord, ask
##  Topic 10, Group -9: modern, overwhelm, ruin, might, person, troubl, stress
##  Topic 10, Group -8: distress, somewhat, symptom, anxieti, place, countless, suffer
##  Topic 10, Group -7: constant, unstabl, asham, bigger, instead, open, ignor
##  Topic 10, Group -6: wait, distress, declin, abus, children, assist, mass
##  Topic 10, Group -5: hospit, clear, anoth, urgent, constant, complic, sick
##  Topic 10, Group -4: broken, fear, urgent, punish, inform, obvious, embarrass
##  Topic 10, Group -3: fight, weve, non, fear, higher, crime, countless
##  Topic 10, Group -2: untreat, abus, aspect, homicid, wait, popul, practic
##  Topic 10, Group -1: popul, percentag, payer, fight, allevi, normal, sick
##  Topic 10, Group 0: acknowledg, open, clear, modern, diagnos, led, unit
##  Topic 10, Group 1: clear, undiagnos, invest, level, practic, weve, happi
##  Topic 10, Group 2: thrive, happi, focus, sent, daili, allow, suffer
##  Topic 10, Group 3: urgent, readili, gone, numer, troubl, easier, healthi
##  Topic 10, Group 4: fewer, happier, enjoy, servic, reduc, less, access
##  Topic 10, Group 5: peac, focus, ill, improv
##  Topic 10, Group 6: happi, citizen, product, societi, crime, health, support
##  Topic 10, Group 7:
##  Topic 10, Group 8:
##  Topic 10, Group 9: clear, adequ, opinion, communiti, like
##  Topic 10, Group 11:
##
##  Topic 11, Group -20:
##  Topic 11, Group -12:
##  Topic 11, Group -11:
##  Topic 11, Group -10:
##  Topic 11, Group -9:
##  Topic 11, Group -8:
##  Topic 11, Group -7:
##  Topic 11, Group -6:
##  Topic 11, Group -5:
##  Topic 11, Group -4:
##  Topic 11, Group -3:
```

```
##  Topic 11, Group -2: employe, forward, straight, problem
##  Topic 11, Group -1: overwhelm, assist, practic, anoth, valu, solv, happier
##  Topic 11, Group 0:
##  Topic 11, Group 1: stress, less, happier, healthi
##  Topic 11, Group 2: highest, ruin, will
##  Topic 11, Group 3: economi
##  Topic 11, Group 4: custom, urgent, purchas, popul, secur, corpor, economi
##  Topic 11, Group 5: win, happier
##  Topic 11, Group 6:
##  Topic 11, Group 7:
##  Topic 11, Group 8: collect, work
##  Topic 11, Group 9:
##  Topic 11, Group 11:
##
##  Topic 12, Group -20:
##  Topic 12, Group -12:
##  Topic 12, Group -11:
##  Topic 12, Group -10: devast, abus, alcohol, drunk, citizen, drive
##  Topic 12, Group -9:
##  Topic 12, Group -8: sent, driver, trauma, went, doctor, drunk
##  Topic 12, Group -7:
##  Topic 12, Group -6: destroy, rampant, alreadi, children
##  Topic 12, Group -5: patient, doctor, call, pain, physic, there, immedi
##  Topic 12, Group -4: heavi, mess, youv, first, destroy, your, crazi
##  Topic 12, Group -3: emot, visit, trust, litter, ideal, public, men
##  Topic 12, Group -2: crazi, selfish, answer, societ, say, decid, dear
##  Topic 12, Group -1: numer, highest, healthcar, threat, add, thousand, prohibit
##  Topic 12, Group 0: anymor, mess, know, anoth, dont, dear
##  Topic 12, Group 1: moment, werent, fellow, miss, citizen, rememb, rampant
##  Topic 12, Group 2: wait, contact, week, anoth
##  Topic 12, Group 3: mass, appoint, anoth
##  Topic 12, Group 4:
##  Topic 12, Group 5:
##  Topic 12, Group 6:
##  Topic 12, Group 7:
##  Topic 12, Group 8:
##  Topic 12, Group 9:
##  Topic 12, Group 11:
##
##  Topic 13, Group -20:
##  Topic 13, Group -12:
##  Topic 13, Group -11:
##  Topic 13, Group -10:
##  Topic 13, Group -9:
##  Topic 13, Group -8:
##  Topic 13, Group -7: less
##  Topic 13, Group -6: charact
##  Topic 13, Group -5: main, weve, charact, less
##  Topic 13, Group -4:
##  Topic 13, Group -3: fewer, die, work, whatev, money, want, put
##  Topic 13, Group -2: town, inform, allow, corrupt, less, lot, place
##  Topic 13, Group -1: pass, money, debt, didnt, less
##  Topic 13, Group 0: money, sick, work, bad
##  Topic 13, Group 1: told, debt, daili, sent, feel, economi, percent
```

```
##  Topic 13, Group 2: unfair, modern, front, line, path, littl, stress
##  Topic 13, Group 3: fewer, less
##  Topic 13, Group 4:
##  Topic 13, Group 5: car
##  Topic 13, Group 6:
##  Topic 13, Group 7:
##  Topic 13, Group 8: happi
##  Topic 13, Group 9:
##  Topic 13, Group 11:
##
##  Topic 14, Group -20:
##  Topic 14, Group -12:
##  Topic 14, Group -11:
##  Topic 14, Group -10:
##  Topic 14, Group -9:
##  Topic 14, Group -8:
##  Topic 14, Group -7: footprint, tax
##  Topic 14, Group -6: clear
##  Topic 14, Group -5: prohibit, clear, mass, creat, sky, leav, plane
##  Topic 14, Group -4: price
##  Topic 14, Group -3: pollut, thousand, notic, planet, pick, destroy, sky
##  Topic 14, Group -2: fewer, plane, pay
##  Topic 14, Group -1: releas, larg, rare, increas, emiss
##  Topic 14, Group 0: wait, fewer, global, flight, altern, buy, happen
##  Topic 14, Group 1: tip, constant, honest, consum, idea, frequent, higher
##  Topic 14, Group 2: fuel, walk, car, footprint, privat, punish, global
##  Topic 14, Group 3: pass, advantag, custom, pollut, carri, flight, airlin
##  Topic 14, Group 4: consum
##  Topic 14, Group 5: highest
##  Topic 14, Group 6:
##  Topic 14, Group 7:
##  Topic 14, Group 8:
##  Topic 14, Group 9:
##  Topic 14, Group 11:
##
##  Topic 15, Group -20:
##  Topic 15, Group -12:
##  Topic 15, Group -11:
##  Topic 15, Group -10:
##  Topic 15, Group -9:
##  Topic 15, Group -8:
##  Topic 15, Group -7:
##  Topic 15, Group -6:
##  Topic 15, Group -5:
##  Topic 15, Group -4:
##  Topic 15, Group -3:
##  Topic 15, Group -2:
##  Topic 15, Group -1:
##  Topic 15, Group 0:
##  Topic 15, Group 1:
##  Topic 15, Group 2:
##  Topic 15, Group 3:
##  Topic 15, Group 4:
##  Topic 15, Group 5:
```

```
##  Topic 15, Group 6:
##  Topic 15, Group 7:
##  Topic 15, Group 8:
##  Topic 15, Group 9:
##  Topic 15, Group 11:
##
```

```
thoughts2 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 2)$docs[[1]]
thoughts3 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 3)$docs[[1]]
thoughts5 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 5)$docs[[1]]
```

```
par(mfrow = c(1, 2),mar = c(.5, .5, 1, .5))
plotQuote(thoughts2, width = 30, main = "Topic 2")
plotQuote(thoughts3, width = 30, main = "Topic 3")
```

Topic 2

Because so many people are
irresponsible and drive while
drunk, the consequences for
drunk driving should be much
stronger. Too many people
are killed or injured due
to drunk driving. There
should be stronger laws and
punishments for this behavior,
like revoking driver license
for 30 years, 30 years prison
time for killing someone, 20
years for injuring someone
permanently, 10 years for
injuring anyone or causing
substantial damage. Plus
financial contribution for the
damage caused.

Topic 3

I think banishing plastic bags
is a great idea. I Remember
when I was young and worked
at a grocery store and first
switched from paper bags
to plastic bags to save the
trees. But in reality plastic
bags were cheaper. But I hated
them because they were harder
to put groceries in. And now
we have gone 360 degrees or
full circle, and want to go
back to paper bags because
plastic bags are polluting
the oceans and killing
wildlife because they are so
indestructible. When will we
ever learn to use reusable non
tree killing paper bags or non
ocean killing plastic bags

```
plotQuote(thoughts5, width = 30, main = "Topic 5")
```

Topic 5

Unfortunately, turnout for even highly contested elections, like the 2020 presidential election, do not see a majority of eligible voters cast a ballot. Consider that in 2020, 158.4 million people voted which was a historic and significant number of voters. However, that number represents only 62.8% of voting age people. In other words, approximately 37% of the population didn't vote. What would the results of the election have been if that 37% voted? What is more troubling is that the U.S. currently ranks 31st in voter turnout when compared to other developed countries. This is

```
prep <- estimateEffect(1:15 ~ treated,
                       frqModel, meta = out$meta, uncertainty = "Global")
summary(prep, topics=1:15)
```

```
##
## Call:
## estimateEffect(formula = 1:15 ~ treated, stmobj = frqModel, metadata = out$meta,
##     uncertainty = "Global")
##
##
## Topic 1:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.157418   0.012380  12.716   <2e-16 ***
## treated     -0.009867   0.014964  -0.659     0.51
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 2:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.04909    0.01186   4.140 3.63e-05 ***
```

```
## treated       0.12548    0.01469    8.542  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 3:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.08878    0.01001   8.873   <2e-16 ***
## treated     -0.02469    0.01209  -2.043   0.0412 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 4:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.031405   0.005482   5.728 1.18e-08 ***
## treated     -0.002047   0.006622  -0.309    0.757
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 5:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.14217    0.01187  11.981  < 2e-16 ***
## treated     -0.07890    0.01316  -5.995 2.44e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 6:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.0295731  0.0058202   5.081 4.13e-07 ***
## treated     0.0003456  0.0073455   0.047    0.962
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 7:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.112297   0.011134  10.086   <2e-16 ***
## treated     0.008077   0.013413   0.602    0.547
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
##
## Topic 8:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.049597   0.007551   6.569 6.58e-11 ***
## treated     -0.010588   0.008487  -1.248    0.212
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 9:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.068449   0.009682   7.069  2.2e-12 ***
## treated     0.001491   0.011836   0.126      0.9
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 10:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.100216   0.011206   8.943   <2e-16 ***
## treated     -0.003332   0.012406  -0.269    0.788
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 11:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.037240   0.006008   6.199 7.01e-10 ***
## treated     0.002325   0.007399   0.314    0.753
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 12:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.044120   0.006246   7.063 2.29e-12 ***
## treated     -0.007313   0.007589  -0.964    0.335
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 13:
##
## Coefficients:
```

```
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0564564  0.0078623   7.181    1e-12 ***
## treated     -0.0005927  0.0100716  -0.059    0.953
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 14:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0254578  0.0048358   5.264 1.57e-07 ***
## treated     -0.0003966  0.0060894  -0.065    0.948
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 15:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 7.805e-03  8.470e-04   9.215   <2e-16 ***
## treated     4.671e-05  1.107e-03   0.042    0.966
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
par(fig = c(0, 1, 0, 1))  # Set the figure region (left, right, bottom, top)
par(plt = c(0, 1, 0, 1))  # Set the plot region (left, right, bottom, top)
plot(frqModel, type = "summary", xlim = c(0, .2))
```

Topic 2: drive

Topic 7: rent, earn, work

Topic 10: addict, homeless, shoot

Topic 5: democrat, heard, ballot

Topic 3: ocean, anim, reusabl

Topic 9: schizophrenia, patient, donat

Topic 13: spend, anyth, whatev

Topic 11: will, workplac, product

Topic 6: climat, emiss, carbon

Topic 8: topic, list, select

Topic 12: histori, week, appoint

Topic 4: requir, hire, greedi

Topic 14: airplan, tax, ticket

Topic 15: doesn't, problem

```r
plot(prep, covariate = "treated", topics = c(1:15),
model = frqModel, method = "difference",
cov.value1 = 1, cov.value2 = 0,
xlab = "Not Treated ... Treated",
main = "Effect of Treatment",
xlim = c(-.15, .15), labeltype = "custom",
custom.labels = c('Health/Stigma', 'Drunk Driver/Irresponsible', 'Reusable/Ban', 'Greedy/Profit', 'Demo
```

Effect of Treatment

Not Treated ... Treated
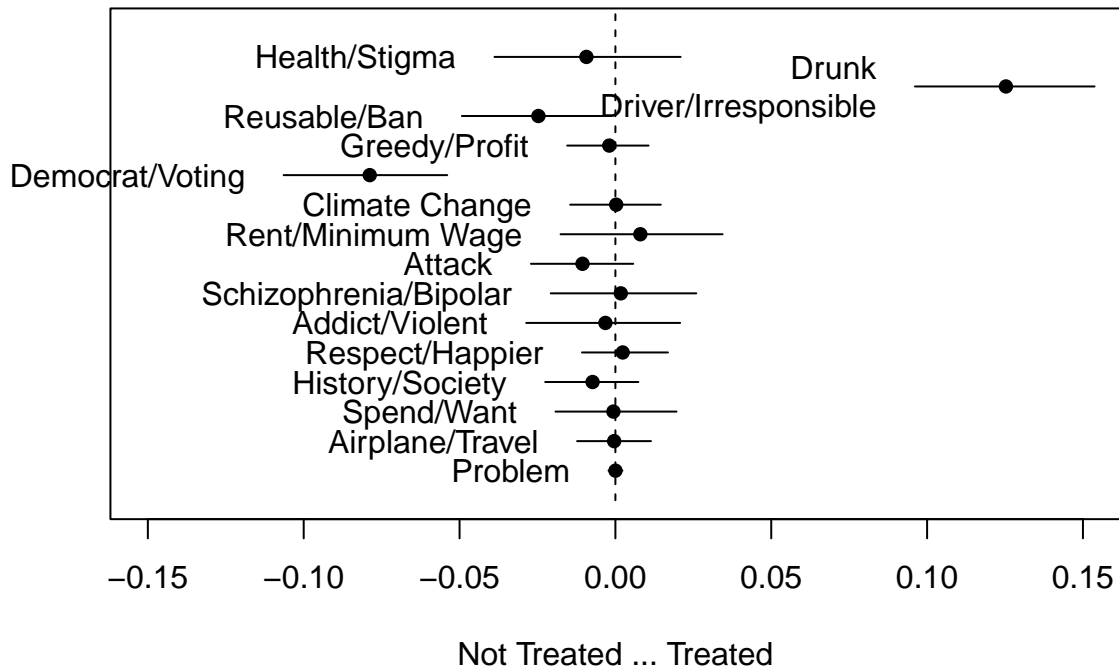
```
mod.out.corr <- topicCorr(frqModel)
plot(mod.out.corr, topics = c(1:15), vlabels = c('Health/Stigma', 'Drunk Driver/Irresponsible', 'Reusab
```
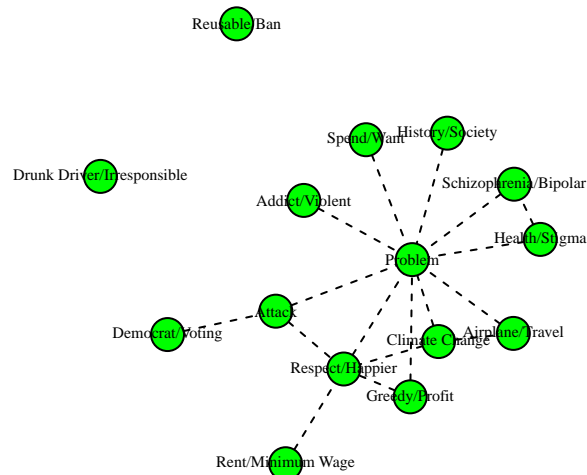
Climate Only

```r
library("stm")
data <- climate_stacked_df
processed <- textProcessor(data$frq, metadata = data)
```

```
## Building corpus...
## Converting to Lower Case...
## Removing punctuation...
## Removing stopwords...
## Removing numbers...
## Stemming...
## Creating Output...
```

```r
out <- prepDocuments(processed$documents, processed$vocab, processed$meta)
```

```
## Removing 751 of 1435 terms (751 of 6279 tokens) due to frequency
## Your corpus now has 199 documents, 684 terms and 5528 tokens.
```

```r
docs <- out$documents
vocab <- out$vocab
meta <- out$meta
```

```
plotRemoved(processed$documents, lower.thresh = seq(1, 200, by = 100))
```

Documents Removed by Thres   Words Removed by Thresho   Tokens Removed by Thresho

Threshold (Minimum No. Documents Appe
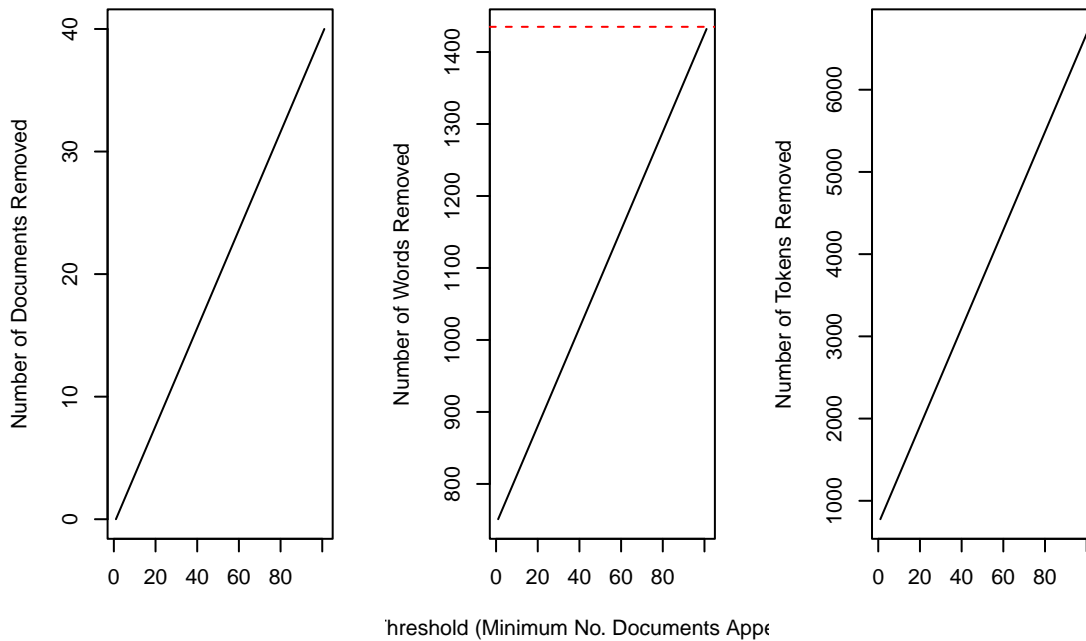
```
# change lower.thresh
out <- prepDocuments(processed$documents, processed$vocab, processed$meta,
                     lower.thresh = 0)
```

```
# add content?
frqModel <- stm(documents = out$documents, vocab = out$vocab, K = 10,
                prevalence =~ treated,
                content =~ sentiment,
                seed = 1000,
                max.em.its = 75, data = out$meta, init.type = "Spectral")
```

```
## Beginning Spectral Initialization
##    Calculating the gram matrix...
##    Finding anchor words...
##        ..........
##    Recovering initialization...
##        ..............
## Initialization complete.
## ....................................................................................................
## Completed E-Step (0 seconds).
## ....................................................................................................
## Completed M-Step (9 seconds).
```

```
## Completing Iteration 1 (approx. per word bound = -5.873)
## ...............................................................................
## Completed E-Step (0 seconds).
## ...............................................................................
## Completed M-Step (9 seconds).
## Completing Iteration 2 (approx. per word bound = -5.398, relative change = 8.073e-02)
## ...............................................................................
## Completed E-Step (0 seconds).
## ...............................................................................
## Completed M-Step (9 seconds).
## Completing Iteration 3 (approx. per word bound = -5.319, relative change = 1.469e-02)
## ...............................................................................
## Completed E-Step (0 seconds).
## ...............................................................................
## Completed M-Step (9 seconds).
## Completing Iteration 4 (approx. per word bound = -5.308, relative change = 2.142e-03)
## ...............................................................................
## Completed E-Step (0 seconds).
## ...............................................................................
## Completed M-Step (9 seconds).
## Completing Iteration 5 (approx. per word bound = -5.307, relative change = 1.769e-04)
## Topic 1: travel, pay, air, carbon, offset
##  Topic 2: reusabl, easi, store, shop, wish
##  Topic 3: nonrenew, resourc, item, materi, oil
##  Topic 4: stuff, worth, bad, terribl, two
##  Topic 5: creatur, river, lake, float, unsight
##  Topic 6: detriment, pile, medic, ingest, improv
##  Topic 7: kid, decis, forward, price, generat
##  Topic 8: deep, lifetim, trash, hurt, enough
##  Topic 9: doesn‚äôt, perfect, switch, paper, rememb
##  Topic 10: serious, imposs, got, ecosystem, mess
## Aspect 1: irrepar, law, suit, appal, choic
##  Aspect 2: disenigr, emmis, aspect, burn, yet
##  Aspect 3: suffoc, leav, mother, real, cover
##  Aspect 4: combat, system, kill, negat, die
##  Aspect 5: educ, might, ever, dirti, sit
##  Aspect 6: except, current, say, hang, implement
##  Aspect 7: matter, young, high, mistak, ive
##  Aspect 8: hey, remov, answer, alway, useless
##  Aspect 9: resid, overal, normal, effort, breath
##  Aspect 10: grow, though, wealthi, see, jet
##  Aspect 11: effici, substitut, airlin, reason, someth
##  Aspect 12: vessel, american, main, trip, simpli
##  Aspect 13: suppli, conveni, pollut, car, ocean
##  Aspect 14: citizen, deed, distress, fair, fold
## ...............................................................................
## Completed E-Step (0 seconds).
## ...............................................................................
## Completed M-Step (9 seconds).
## Completing Iteration 6 (approx. per word bound = -5.303, relative change = 7.260e-04)
## ...............................................................................
## Completed E-Step (0 seconds).
## ...............................................................................
## Completed M-Step (9 seconds).
```

```
## Completing Iteration 7 (approx. per word bound = -5.301, relative change = 4.615e-04)
## .................................................................................................
## Completed E-Step (0 seconds).
## .................................................................................................
## Completed M-Step (9 seconds).
## Completing Iteration 8 (approx. per word bound = -5.295, relative change = 1.107e-03)
## .................................................................................................
## Completed E-Step (0 seconds).
## .................................................................................................
## Completed M-Step (9 seconds).
## Completing Iteration 9 (approx. per word bound = -5.290, relative change = 8.671e-04)
## .................................................................................................
## Completed E-Step (0 seconds).
## .................................................................................................
## Completed M-Step (9 seconds).
## Model Converged
```

```
labelTopics(frqModel, 1:10)
```

```
## Topic Words:
##  Topic 1: travel, carbon, pay, air, offset, global, extrem
##  Topic 2: reusabl, easi, store, shop, nation, wish, rather
##  Topic 3: resourc, item, nonrenew, product, materi, oil, alarm
##  Topic 4: stuff, bad, worth, terribl, two, cheap, throw
##  Topic 5: creatur, river, lake, float, unsight, greenhous, biodegrad
##  Topic 6: detriment, pile, medic, ingest, bigger, improv, understand
##  Topic 7: decis, kid, entir, forward, generat, natur, price
##  Topic 8: deep, lifetim, trash, hurt, enough, caught, anim
##  Topic 9: perfect, doesn‚äôt, switch, paper, rememb, forev, proper
##  Topic 10: serious, imposs, got, mess, ecosystem, chang, protect
##
##  Covariate Words:
##  Group -7: irrepar, law, suit, appal, choic, follow, soon
##  Group -6: disenigr, emmis, burn, aspect, yet, earth, made
##  Group -5: suffoc, leav, mother, real, cover, hang, horribl
##  Group -4: combat, system, kill, negat, die, tangl, usag
##  Group -3: educ, might, ever, choke, dirti, sit, progress
##  Group -2: except, current, say, hang, implement, now, start
##  Group -1: matter, high, mistak, mitig, young, save, move
##  Group 0: hey, remov, answer, alway, allow, useless, action
##  Group 1: resid, overal, normal, effort, breath, doesnt, cleaner
##  Group 2: grow, though, wealthi, see, jet, increas, earth
##  Group 3: effici, substitut, airlin, reason, someth, better, pay
##  Group 4: vessel, american, main, trip, simpli, anoth, replac
##  Group 5: suppli, conveni, ocean, longer
##  Group 6: citizen, deed, distress, fair, fold, mesh, nomin
##
##  Topic-Covariate Interactions:
##  Topic 1, Group -7:
##  Topic 1, Group -6:
##  Topic 1, Group -5:
##  Topic 1, Group -4: extern, largest, market, ongo, reflect, threat, true
##  Topic 1, Group -3: expenditur, hurri, trend, unbalanc, deter, essenc, owe
##  Topic 1, Group -2: burdensom, complex, duti, regardless, sector, charter, ineffici
```

```
##  Topic 1, Group -1: condit, urgent, goal, machineri, short-term, technolog, zero
##  Topic 1, Group 0: choos, fare, alli, airport, frequenc, onto, trajectori
##  Topic 1, Group 1: incentiv, prove, annual, billion, dollar, frequent, popular
##  Topic 1, Group 2: apocolyps, appeal, capit, commit, cultist, everyman, exagger
##  Topic 1, Group 3: advantag, afford, disproportion, earner, incom, util, whether
##  Topic 1, Group 4:
##  Topic 1, Group 5:
##  Topic 1, Group 6:
##
##  Topic 2, Group -7:
##  Topic 2, Group -6: behavior, hardship, pocket, purs, sealif, stopp, tuck
##  Topic 2, Group -5: involv, aren't, damag, nation, wast, reusabl
##  Topic 2, Group -4: jeremi, packag, properti, chemic, join, toxic, stream
##  Topic 2, Group -3: ahead, annoy, canva, declin, digit, dissemin, fragil
##  Topic 2, Group -2: afterward, agre, secondari, size, supplement, imagin, wouldnt
##  Topic 2, Group -1: bought, bust, door, exact, handi, handl, lay
##  Topic 2, Group 0: prblem, recylcl, arm, cent, hassl, fit, larger
##  Topic 2, Group 1: tax, bat, doubt, garbageplast, neighborhood, slight, slowli
##  Topic 2, Group 2: anyon, enact, readili, inexpens, free, consum, howev
##  Topic 2, Group 3: avail, neat, anywher, besid, explain, lazi, age
##  Topic 2, Group 4:
##  Topic 2, Group 5: curtail, margin, easiest, supermarket
##  Topic 2, Group 6:
##
##  Topic 3, Group -7:
##  Topic 3, Group -6:
##  Topic 3, Group -5:
##  Topic 3, Group -4: alarm, rate
##  Topic 3, Group -3: belong, wear, whale, bird, isn't, half, don't
##  Topic 3, Group -2: materialist, overconsum, cultur, averag, oil, made, alarm
##  Topic 3, Group -1: accept, broader, discontinu, eco, repres, charact, counter
##  Topic 3, Group 0: finit, non-degrad, yet, suppli, useless, oil, made
##  Topic 3, Group 1: cup, frivol, nonsens, plenti, throwaway, incap, circul
##  Topic 3, Group 2: packaging, spread, throughout, plasic, petroleum, situat, work
##  Topic 3, Group 3:
##  Topic 3, Group 4:
##  Topic 3, Group 5:
##  Topic 3, Group 6:
##
##  Topic 4, Group -7:
##  Topic 4, Group -6: cheap, bad
##  Topic 4, Group -5: beign, enrvionr, extinct, kinder, reliant, suppos, health
##  Topic 4, Group -4:
##  Topic 4, Group -3: bomb, cigarett, enter, lead, decinigr, doesn't, environmentit
##  Topic 4, Group -2: joe, suggest, tear, entitl, fastest, homedont, invent
##  Topic 4, Group -1: search, top, anywher, near, purchas, box, free
##  Topic 4, Group 0: billi, decay, sheet, sometim, adopt, york, old
##  Topic 4, Group 1: becam, dislik, express, vendor, vocal, window, act
##  Topic 4, Group 2:
##  Topic 4, Group 3: fantast, priv, re-us, million, emiss, main, demand
##  Topic 4, Group 4:
##  Topic 4, Group 5:
##  Topic 4, Group 6:
##
```

```
##   Topic 5, Group -7:
##   Topic 5, Group -6:
##   Topic 5, Group -5: brood, empti, fate, mark, read, vantag, victim
##   Topic 5, Group -4: touch, return, path, anyth, die
##   Topic 5, Group -3: base, beach, eyesor, imag, modern, nudg, refin
##   Topic 5, Group -2: couldnt, disappear, fetus, grown, isol, macro, suffus
##   Topic 5, Group -1: past, roadsid, rot, concert, crimin, debri, island
##   Topic 5, Group 0: penalti, individu, solut, feder, life
##   Topic 5, Group 1: clean-, contamin, safe, individu
##   Topic 5, Group 2: multi-us, wild, safe, side, road, litter, unsight
##   Topic 5, Group 3: gass, research, addit, figur, final, indestruct, minim
##   Topic 5, Group 4:
##   Topic 5, Group 5:
##   Topic 5, Group 6:
##
##   Topic 6, Group -7:
##   Topic 6, Group -6:
##   Topic 6, Group -5:
##   Topic 6, Group -4: backyard, creek, disturb, drain, month, spend, known
##   Topic 6, Group -3: furthermor, ground, leech, preserv, sick, tend, dent
##   Topic 6, Group -2: attempt, bandi, calcul, contest, counterargu, diminish, group
##   Topic 6, Group -1: atroc, card, foremost, gross, heard, univers, week
##   Topic 6, Group 0: ‚äôs, ‚äôve, buddi, crazi, jersey, pantri, seep
##   Topic 6, Group 1: institut, relat, shift, stone, texa, pool, sceneri
##   Topic 6, Group 2: inhal, utmost, micro-plast, children, grandchildren, depend, isnt
##   Topic 6, Group 3: indirect, microscop, perspect, vital, carbon, conserv, almost
##   Topic 6, Group 4:
##   Topic 6, Group 5:
##   Topic 6, Group 6:
##
##   Topic 7, Group -7:
##   Topic 7, Group -6:
##   Topic 7, Group -5: clear, cross, grey, hazi, hidden, hour, modif
##   Topic 7, Group -4:
##   Topic 7, Group -3: angri, combin, debat, deeper, dysfunct, emot, equal
##   Topic 7, Group -2: allevi, critic, emmiss, empir, question, scientif, world‚äô
##   Topic 7, Group -1: casual, recogn, monetari, rare, emitt, releas, twice
##   Topic 7, Group 0: wait, abus, bow, gurt, intox, sake, hefti
##   Topic 7, Group 1: build, constant, fulli, output, presenc, run, smallest
##   Topic 7, Group 2: across, carpool, cattl, christma, cool, electr, finish
##   Topic 7, Group 3: advoc, andor, aviat, exercis, folk, futil, jane
##   Topic 7, Group 4:
##   Topic 7, Group 5:
##   Topic 7, Group 6:
##
##   Topic 8, Group -7:
##   Topic 8, Group -6:
##   Topic 8, Group -5: among, beaten, civil, domest, escap, oddest, rock
##   Topic 8, Group -4: unhealthi, america, rare, street, almost, reus, incred
##   Topic 8, Group -3: assur, certain, contact, critter, daili, legion, oryou
##   Topic 8, Group -2: habitat, wors
##   Topic 8, Group -1: infinit, irrevers, late, alreadi
##   Topic 8, Group 0: accomplish, easiest, list, safe, rest
##   Topic 8, Group 1: glass, aquat, particular, suffici, instead, bodi, caught
```

```
##   Topic 8, Group 2: communiti, decompos, now
##   Topic 8, Group 3:
##   Topic 8, Group 4:
##   Topic 8, Group 5:
##   Topic 8, Group 6:
##
##   Topic 9, Group -7:
##   Topic 9, Group -6:
##   Topic 9, Group -5: absurd, bloodstream, brain, bug, cat, decid, decor
##   Topic 9, Group -4: compost, fauna, flora, attent, realiz, accumul, move
##   Topic 9, Group -3:
##   Topic 9, Group -2: cow, erod, farm, thrown, eat, die, work
##   Topic 9, Group -1: banish, degre, gone, harder, apart, brown, discinagr
##   Topic 9, Group 0: chosen, discuss, proposit, wrote, children‚äô, drive, drunk
##   Topic 9, Group 1: disintegr, discard, respect, arent, reus, work, hazard
##   Topic 9, Group 2:
##   Topic 9, Group 3: aldi, basic, chose, overus, that, forget, easi
##   Topic 9, Group 4:
##   Topic 9, Group 5: bank, endang, obtain, thrive, sacrific, heal, somewher
##   Topic 9, Group 6:
##
##   Topic 10, Group -7:
##   Topic 10, Group -6:
##   Topic 10, Group -5:
##   Topic 10, Group -4:
##   Topic 10, Group -3:
##   Topic 10, Group -2: otherwis, surviv, experi, individu, soon, work, will
##   Topic 10, Group -1: amazon, bandwagon, changesigh, gutter, justic, oppos, social
##   Topic 10, Group 0: nowaday, plant, reckless, complain, tremend, exist, follow
##   Topic 10, Group 1: flourish, focus, glacier, hotter, melt, stronger, rise
##   Topic 10, Group 2: add, came, greatest, non-liv, object, program, satisfi
##   Topic 10, Group 3:
##   Topic 10, Group 4:
##   Topic 10, Group 5:
##   Topic 10, Group 6:
##
```

```r
thoughts3 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 3)$docs[[1]]
thoughts4 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 4)$docs[[1]]
thoughts5 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 5)$docs[[1]]
```

```r
par(mfrow = c(1, 2),mar = c(.5, .5, 1, .5))
plotQuote(thoughts3, width = 30, main = "Topic 3")
plotQuote(thoughts4, width = 30, main = "Topic 4")
```

Topic 3

Here in our materialistic
culture, we overconsume
plastic at an alarming rate.
The average person uses so
many disposable products that
are made of plastic everyday.
Oil is used to make plastic,
and oil is a nonrenewable
resource. We cannot waste our
oil on disposable items made
of plastic.

Topic 4

A federal ban on plastic
bags would be fantastic for
several reasons. One, it
would cut down on the demand
for plastic bags which will
cut down on emissions which
are bad for the environment.
Two it would force people
to re-use bags and that is a
very good habit to get in to
because our country produces,
uses and throws away millions
of re-usable things every day
and it's creating a huge issue
for us. Those two main points
are the most important to
me, although there are other
benefits as well I'm sure, but
for me personally, those two
take the highest priority.

```
plotQuote(thoughts5, width = 30, main = "Topic 5")
```

Topic 5

Hi Mark! I have been reading
about the problems that
plastic bag cause in the
ocean.!! I read that most of
the trash is emptied out into
the ocean!! What a horrible
fate for some innocent turtle
or even a large fish! These
bags float down and the brood
of fish or any other type
of sea creature are victim
to these plastic bags. They
cover their faces and they
are destined to suffocate due
to the plastic bag over their
face. People can AT LEAST
start to cut out the bottom
of any type of bag so that
it will at least give the sea
people a bit of an ad vantage.

```
prep <- estimateEffect(1:10 ~ treated,
                        frqModel, meta = out$meta, uncertainty = "Global")
summary(prep, topics=1:10)
```

```
##
## Call:
## estimateEffect(formula = 1:10 ~ treated, stmobj = frqModel, metadata = out$meta,
##     uncertainty = "Global")
##
##
## Topic 1:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.15236    0.03893   3.913 0.000125 ***
## treated      0.01840    0.05059   0.364 0.716430
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 2:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.16595    0.04068   4.079 6.55e-05 ***
```
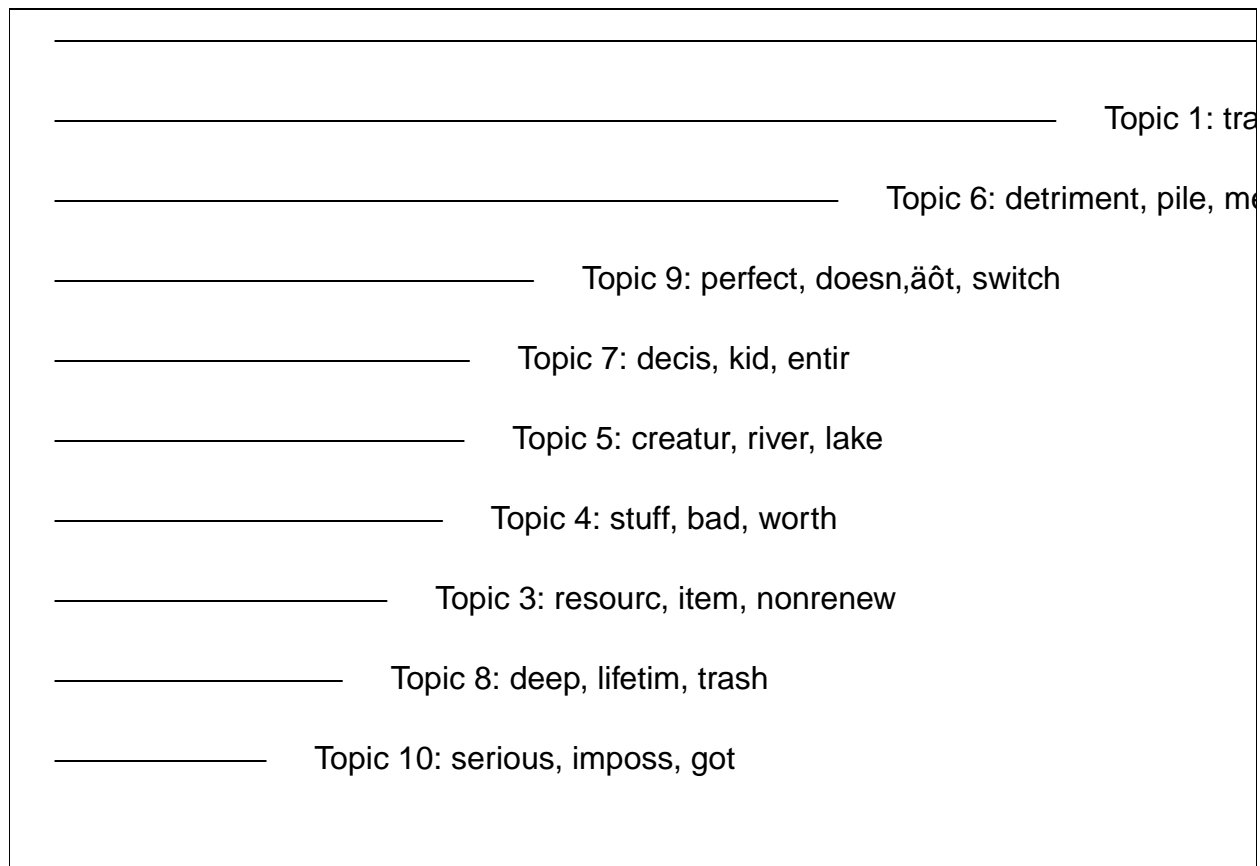
```
## treated        0.08642    0.05392   1.603     0.111
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 3:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.10100    0.02590   3.899 0.000132 ***
## treated     -0.05246    0.03163  -1.658 0.098814 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 4:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.05054    0.02589   1.952   0.0523 .
## treated      0.04044    0.03415   1.184   0.2378
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 5:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.13214    0.02976    4.44  1.5e-05 ***
## treated     -0.08315    0.03779   -2.20   0.0289 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 6:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.13983    0.03499   3.996 9.09e-05 ***
## treated     -0.01756    0.04344  -0.404    0.686
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 7:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.05929    0.02850   2.080   0.0388 *
## treated      0.03304    0.03651   0.905   0.3667
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## 
## Topic 8:
## 
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.09662    0.02282   4.234 3.51e-05 ***
## treated     -0.06499    0.02787  -2.332   0.0207 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## 
## Topic 9:
## 
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.085914   0.030406   2.826  0.00521 **
## treated     0.005065   0.037719   0.134  0.89332
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## 
## Topic 10:
## 
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.01698    0.01564   1.086    0.279
## treated      0.03467    0.02132   1.626    0.105
```

```r
par(fig = c(0, 1, 0, 1))  # Set the figure region (left, right, bottom, top)
par(plt = c(0, 1, 0, 1))  # Set the plot region (left, right, bottom, top)
plot(frqModel, type = "summary", xlim = c(0, .2))
```

Topic 1: tra

Topic 6: detriment, pile, me

Topic 9: perfect, doesn‚äôt, switch

Topic 7: decis, kid, entir

Topic 5: creatur, river, lake

Topic 4: stuff, bad, worth

Topic 3: resourc, item, nonrenew

Topic 8: deep, lifetim, trash

Topic 10: serious, imposs, got

```r
plot(prep, covariate = "treated", topics = c(1:6, 8, 10),
model = frqModel, method = "difference",
cov.value1 = 1, cov.value2 = 0,
xlab = "Not Treated ... Treated",
main = "Effect of Treatment",
xlim = c(-.15, .15), labeltype = "custom",
custom.labels = c('Travel/Carbon', 'Reusable/Easy', 'Nonrenewable/Resource', 'Bad/Terrible', 'Greenhouse
```

Effect of Treatment
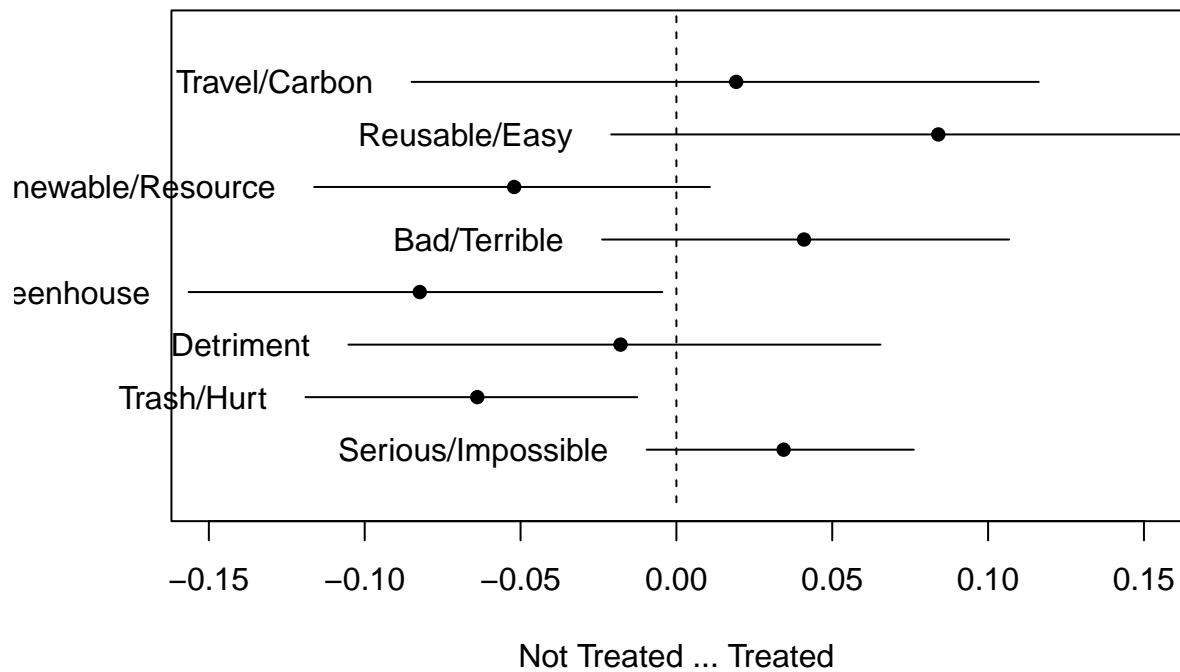

```
mod.out.corr <- topicCorr(frqModel)
plot(mod.out.corr, topics = c(1:6, 8, 10), vlabels = c('Travel/Carbon', 'Reusable/Easy', 'Nonrenewable/
```

Reusable/Easy

Trash/Hurt

Serious/Impossible

Greenhouse

Nonrenewable/Resource

Bad/Terrible

Travel/Carbon

Detriment
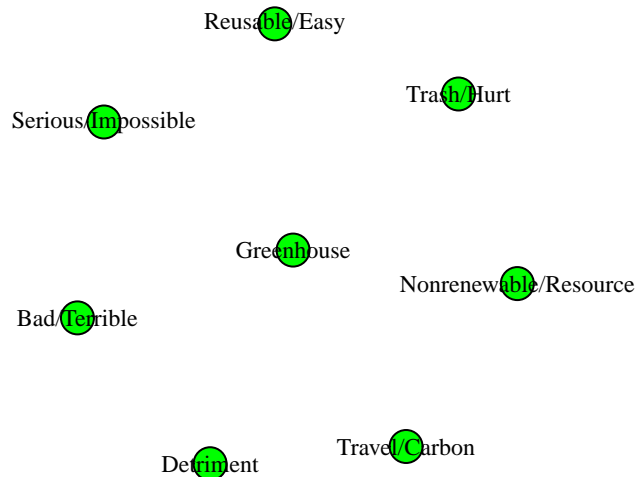
Health Only

```
library("stm")
data <- health_stacked_df
processed <- textProcessor(data$frq, metadata = data)
```

```
## Building corpus...
## Converting to Lower Case...
## Removing punctuation...
## Removing stopwords...
## Removing numbers...
## Stemming...
## Creating Output...
```
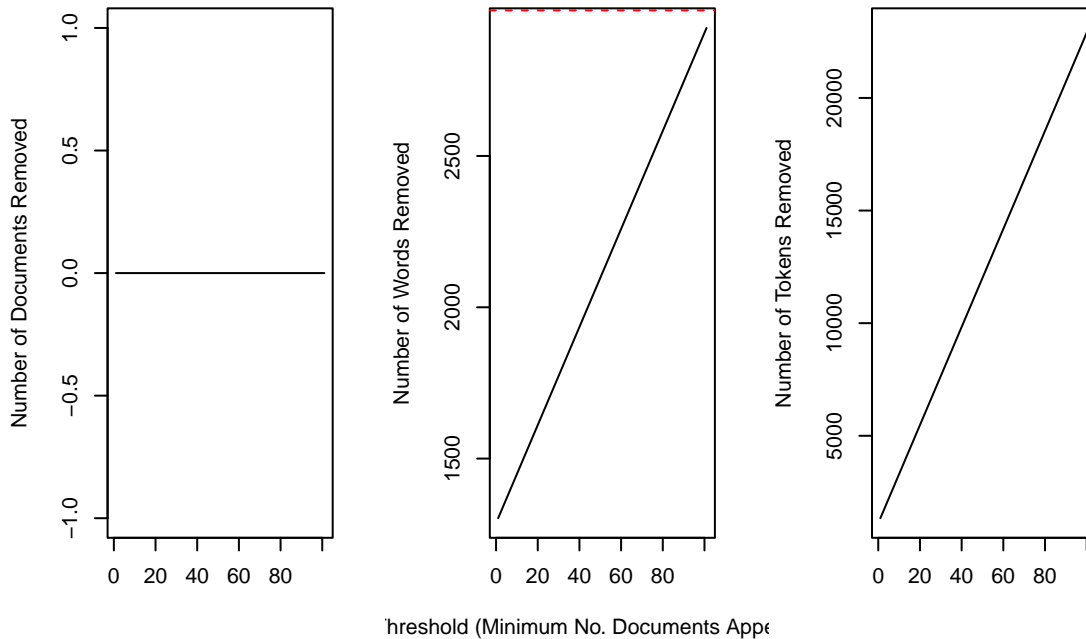
```
out <- prepDocuments(processed$documents, processed$vocab, processed$meta)
```

```
## Removing 1303 of 2981 terms (1303 of 34991 tokens) due to frequency
## Your corpus now has 1102 documents, 1678 terms and 33688 tokens.
```

```
docs <- out$documents
vocab <- out$vocab
meta <- out$meta
```

```
plotRemoved(processed$documents, lower.thresh = seq(1, 200, by = 100))
```

Documents Removed by Thres   Words Removed by Thresho   Tokens Removed by Thresho

Threshold (Minimum No. Documents Appe

```
# change lower.thresh
out <- prepDocuments(processed$documents, processed$vocab, processed$meta,
                     lower.thresh = 2)
```

```
## Removing 1682 of 2981 terms (2061 of 34991 tokens) due to frequency
## Your corpus now has 1102 documents, 1299 terms and 32930 tokens.
```

```
# add content?
frqModel <- stm(documents = out$documents, vocab = out$vocab, K = 15,
                prevalence =~ treated,
                content =~ sentiment,
                seed = 1000,
                max.em.its = 75, data = out$meta, init.type = "Spectral")
```

```
## Beginning Spectral Initialization
##    Calculating the gram matrix...
##    Finding anchor words...
##       ..............
##    Recovering initialization...
##       ............
## Initialization complete.
## .................................................................................................
```

```
## Completed E-Step (0 seconds).
## .................................................................................................
## Completed M-Step (15 seconds).
## Completing Iteration 1 (approx. per word bound = -5.668)
## .................................................................................................
## Completed E-Step (0 seconds).
## .................................................................................................
## Completed M-Step (15 seconds).
## Completing Iteration 2 (approx. per word bound = -5.546, relative change = 2.153e-02)
## .................................................................................................
## Completed E-Step (0 seconds).
## .................................................................................................
## Completed M-Step (17 seconds).
## Completing Iteration 3 (approx. per word bound = -5.502, relative change = 7.929e-03)
## .................................................................................................
## Completed E-Step (0 seconds).
## .................................................................................................
## Completed M-Step (21 seconds).
## Completing Iteration 4 (approx. per word bound = -5.484, relative change = 3.210e-03)
## .................................................................................................
## Completed E-Step (0 seconds).
## .................................................................................................
## Completed M-Step (21 seconds).
## Completing Iteration 5 (approx. per word bound = -5.476, relative change = 1.474e-03)
## Topic 1: homicid, domest, relationship, seek, troubl
##  Topic 2: wheel, tougher, innoc, forev, instal
##  Topic 3: isnt, pull, fault, key, steadi
##  Topic 4: blood, aim, implement, minut, bac
##  Topic 5: inpati, belief, oldest, outpati, economi
##  Topic 6: confront, gone, outsid, weak, stress
##  Topic 7: expand, unabl, exist, incom, barrier
##  Topic 8: perman, licens, wife, damag, what
##  Topic 9: ill, feder, vulner, urgent, diseas
##  Topic 10: save, forward, tragic, truth, straight
##  Topic 11: neglect, wellb, compar, essenti, physic
##  Topic 12: pay, ticket, bill, scare, head
##  Topic 13: advoc, schizophrenia, bipolar, passion, sister
##  Topic 14: lyft, uber, fun, arrest, design
##  Topic 15: burnout, worker, host, work, problem
## Aspect 1: materialist, complex, depend, record, distress
##  Aspect 2: five, violat, maim, crisi, hurt
##  Aspect 3: adulthood, degre, cruel, record, valu
##  Aspect 4: pursu, similar, focus, adequ, seem
##  Aspect 5: account, tie, regardless, specif, insist
##  Aspect 6: sad, stupid, grief, selfish, distress
##  Aspect 7: weapon, somehow, motiv, controversi, refus
##  Aspect 8: constant, colleg, stranger, month, singl
##  Aspect 9: priorit, bigger, mention, item, follow
##  Aspect 10: nationwid, won't, rare, cop, separ
##  Aspect 11: higher, headlin, notic, non, door
##  Aspect 12: tremend, mark, erad, establish, within
##  Aspect 13: payer, emerg, necessarili, plan, ton
##  Aspect 14: gen, war, larger, usa, program
##  Aspect 15: miss, method, pretti, status, advantag
```

```
##   Aspect 16: deterior, form, cowork, clean, mention
##   Aspect 17: unhealthi, amongst, desir, requir, previous
##   Aspect 18: inflict, hous, polici, move, urg
##   Aspect 19: happier, peac, generat, protect, success
##   Aspect 20: gain, dire, eas, happier, eat
##   Aspect 21: wrote, ward, half, attend, beyond
##   Aspect 22: opinion, safer, near, move, communiti
## ....................................................................................................
## Completed E-Step (0 seconds).
## ....................................................................................................
## Completed M-Step (21 seconds).
## Completing Iteration 6 (approx. per word bound = -5.473, relative change = 5.252e-04)
## ....................................................................................................
## Completed E-Step (0 seconds).
## ....................................................................................................
## Completed M-Step (21 seconds).
## Completing Iteration 7 (approx. per word bound = -5.471, relative change = 4.409e-04)
## ....................................................................................................
## Completed E-Step (0 seconds).
## ....................................................................................................
## Completed M-Step (21 seconds).
## Completing Iteration 8 (approx. per word bound = -5.470, relative change = 5.640e-05)
## ....................................................................................................
## Completed E-Step (0 seconds).
## ....................................................................................................
## Completed M-Step (20 seconds).
## Model Converged
```

```
labelTopics(frqModel, 1:15)
```

```
## Topic Words:
##   Topic 1: homicid, relationship, seek, domest, troubl, suffer, unstabl
##   Topic 2: wheel, tougher, innoc, instal, forev, impos, behind
##   Topic 3: pull, isnt, anymor, key, answer, dont, okay
##   Topic 4: blood, aim, minut, bac, manufactur, technolog, implement
##   Topic 5: belief, inpati, oldest, outpati, appropri, economi, heath
##   Topic 6: confront, gone, weak, outsid, problem, diagnos, desper
##   Topic 7: unabl, expand, incom, begin, obstacl, abl, cant
##   Topic 8: perman, licens, wife, jail, damag, what, period
##   Topic 9: ill, feder, vulner, diseas, institut, cancer, urgent
##   Topic 10: save, countless, forward, tragic, straight, drunk-driv, think
##   Topic 11: neglect, wellb, physic, essenti, regular, compar, trace
##   Topic 12: ticket, head, pay, bill, scare, sell, carbon
##   Topic 13: schizophrenia, advoc, bipolar, sister, debilit, passion, donat
##   Topic 14: uber, lyft, fun, drink, ride, arrest, design
##   Topic 15: burnout, host, worker, work, problem
##
##   Covariate Words:
##   Group -20: complex, materialist, record, well-, distress, overwhelm, seem
##   Group -12: maim, five, violat, hurt, receiv, crime, say
##   Group -11: pass, degre, materialist, adulthood, otherwis, record, valu
##   Group -10: pursu, pressur, adequ, seem, reason, death, wheel
##   Group -9: tie, spiral, regardless, account, specif, insist, replac
##   Group -8: sad, stupid, grief, hand, selfish, worri, slowli
```

```
##  Group -7: weapon, needless, fault, refus, motiv, controversi, truth
##  Group -6: constant, colleg, stranger, four, month, singl, judg
##  Group -5: priorit, bigger, mention, minor, item, follow, injur
##  Group -4: nationwid, rare, won't, separ, perfect, broken, averag
##  Group -3: higher, headlin, notic, non, door, stori, anyth
##  Group -2: tremend, brought, establish, mark, within, erad, societ
##  Group -1: emerg, necessarili, plan, percentag, ton, fail, undeserv
##  Group 0: gen, war, usa, program, led, larger, technolog
##  Group 1: method, pretti, advantag, status, repercuss, set, stabl
##  Group 2: form, cowork, clean, mention, readili, opportun, deterior
##  Group 3: unhealthi, amongst, desir, requir, previous, worth, alon
##  Group 4: inflict, hous, polici, spiral, move, urg, med
##  Group 5: happier, peac, extend, protect, multipl, success, spend
##  Group 6: gain, dire, eas, happier, eat, spend, economi
##  Group 7: attend, ward, wrote, half, survey, beyond, medic
##  Group 9: opinion, safer, near, like, move, quit, communiti
##
##  Topic-Covariate Interactions:
##  Topic 1, Group -20:
##  Topic 1, Group -12:
##  Topic 1, Group -11: integr, becom, degre, materialist, well-, receiv, world
##  Topic 1, Group -10:
##  Topic 1, Group -9:
##  Topic 1, Group -8:
##  Topic 1, Group -7: shortag, diabet, danger, unstabl, situat, ignor, crisi
##  Topic 1, Group -6: fill, still, ill, seek
##  Topic 1, Group -5: difficulti, comfort, less, resourc, interact, seek
##  Topic 1, Group -4: fit, drop, visibl, eye, necessari, dont, resourc
##  Topic 1, Group -3: clinic, diminish, doesn't, drop, secret, self-med, counti
##  Topic 1, Group -2: hide, readili, self-med, super, reserv, chosen, judg
##  Topic 1, Group -1: visibl, mother, ptsd, oftentim, wear, send, goal
##  Topic 1, Group 0: can‚äôt, attack, demograph, prescript, mark, lower, don‚äôt
##  Topic 1, Group 1: super, secret, briefli, wrote, eye, loss, slowli
##  Topic 1, Group 2: thrive, oneself, prescrib, briefli, daili, nation, reli
##  Topic 1, Group 3: welfar, valid, outlet, demograph, express, open, similar
##  Topic 1, Group 4: psychiatr, overal, wake, fewer, open, lot, violenc
##  Topic 1, Group 5: prosper, confid, worth, access
##  Topic 1, Group 6: environ, safer, better, product, societi, crime
##  Topic 1, Group 7: advantag, worth, pretti, safer, focus, improv
##  Topic 1, Group 9:
##
##  Topic 2, Group -20:
##  Topic 2, Group -12:
##  Topic 2, Group -11:
##  Topic 2, Group -10: oftentim, cultur, heavi, properti, consequ, danger, attent
##  Topic 2, Group -9: price, rampant, discourag, measur, citi, stricter, lot
##  Topic 2, Group -8: lifetim, mother, background, pass, safeti, begin, teach
##  Topic 2, Group -7: driven, devast, discourag, grandfath, loss, injur, barrier
##  Topic 2, Group -6: shouldn‚äôt, dozen, carol, sit, vast, pass, dui
##  Topic 2, Group -5: ban, suggest, attack, traumat, fellow, grief, inflict
##  Topic 2, Group -4: advanc, injur, drunken, replac, grandfath, background, unfair
##  Topic 2, Group -3: technolog, heard, knew, nowaday, fatal, associ, safe
##  Topic 2, Group -2: doesn't, yes, mandatori, machin, shown, entir, surviv
##  Topic 2, Group -1: empathi, ride, still, shouldnt, properti, transport, focus
```

```
##  Topic 2, Group 0: buddi, drink, smart, law, car, rais
##  Topic 2, Group 1: conveni, inform, unawar, danger, spread, level, influenc
##  Topic 2, Group 2: intox
##  Topic 2, Group 3:
##  Topic 2, Group 4:
##  Topic 2, Group 5:
##  Topic 2, Group 6:
##  Topic 2, Group 7:
##  Topic 2, Group 9:
##
##  Topic 3, Group -20:
##  Topic 3, Group -12:
##  Topic 3, Group -11:
##  Topic 3, Group -10:
##  Topic 3, Group -9:
##  Topic 3, Group -8: carol, heartbreak, cruel, hour
##  Topic 3, Group -7: your
##  Topic 3, Group -6: select, anyth, might
##  Topic 3, Group -5: pain, entir, diminish, perform, realiti, establish, wheel
##  Topic 3, Group -4: univers, ten, wonder, heavi, open, reason, mess
##  Topic 3, Group -3: collect, anybodi, tire, unsaf, stuff, pill, throw
##  Topic 3, Group -2: meet, nice, fault, still, contain, send, okay
##  Topic 3, Group -1: degre, three, sit, pass, couldnt, tri, summer
##  Topic 3, Group 0: dont, mess, anymor, know
##  Topic 3, Group 1: greatest, amaz, yes, miss, afterward, five, transport
##  Topic 3, Group 2: steadi, take
##  Topic 3, Group 3: anoth
##  Topic 3, Group 4: steadi
##  Topic 3, Group 5:
##  Topic 3, Group 6:
##  Topic 3, Group 7:
##  Topic 3, Group 9:
##
##  Topic 4, Group -20:
##  Topic 4, Group -12: drive
##  Topic 4, Group -11:
##  Topic 4, Group -10: devast, similar, histori, fulli, sensor, mari, injur
##  Topic 4, Group -9: lifetim, messag, properti, loss, punish, needless, reason
##  Topic 4, Group -8: purpos, second, extend, chanc, lower, resolv, punish
##  Topic 4, Group -7: mandatori, anybodi, advanc, heavili, repeat, hate, somehow
##  Topic 4, Group -6: excus, uber, till, perform, conscious, call, counti
##  Topic 4, Group -5: fit, host, harder, dui, travel, consum, incid
##  Topic 4, Group -4: oneself, recognit, deterr, lane, sensor, interest, mindset
##  Topic 4, Group -3: strict, perpetr, loss, frustrat, fair, wonder, financ
##  Topic 4, Group -2: instant, sincer, letter, book, urgenc, attribut, child
##  Topic 4, Group -1: patient, particip, measur, dui, relat, center, devic
##  Topic 4, Group 0: motor, unless, call, happi, still, event, alcohol
##  Topic 4, Group 1: offic, polic, reserv, eventu, detect, anyth, ride
##  Topic 4, Group 2: activ, machin, metal, heavi, swift, trust, attent
##  Topic 4, Group 3:
##  Topic 4, Group 4:
##  Topic 4, Group 5:
##  Topic 4, Group 6: fast, frequent, machin, slow, direct, trust, heavi
##  Topic 4, Group 7:
```

```
## Topic 4, Group 9:
##
## Topic 5, Group -20:
## Topic 5, Group -12:
## Topic 5, Group -11:
## Topic 5, Group -10:
## Topic 5, Group -9:
## Topic 5, Group -8:
## Topic 5, Group -7:
## Topic 5, Group -6: attack, link, headlin, crisi
## Topic 5, Group -5:
## Topic 5, Group -4: preserv, fellow, purpos, anyth, lash, complex, man
## Topic 5, Group -3: reflect, prohibit, covid-, epidem, crisi, among, lockdown
## Topic 5, Group -2: abus, difficulti, diminish, practic, utmost, evalu, situat
## Topic 5, Group -1: healthcar, payer, wake, specif, expens, metal, absolut
## Topic 5, Group 0: larger, environ, underfund, unsaf, space, heal, summer
## Topic 5, Group 1: voter, middl, perform, six, incred, chanc, dire
## Topic 5, Group 2: human, electr, collect, eventu, shooter, born, question
## Topic 5, Group 3: self-med, werent, appoint, wonder, second, staff, gain
## Topic 5, Group 4: tie, reserv, medicin, select, internet, minimum, hour
## Topic 5, Group 5: varieti, may, reason, avail, fund
## Topic 5, Group 6: particip, fulli, includ
## Topic 5, Group 7: psych
## Topic 5, Group 9:
##
## Topic 6, Group -20:
## Topic 6, Group -12:
## Topic 6, Group -11:
## Topic 6, Group -10:
## Topic 6, Group -9: ruin, might, person
## Topic 6, Group -8:
## Topic 6, Group -7: gave, destigmat, cultur, cruel, psychiatr, anxious, pass
## Topic 6, Group -6: asham, immedi, screw, patient
## Topic 6, Group -5: dedic, complic, addict, drug, week, homeless, alcohol
## Topic 6, Group -4: underfund, upset, front, assault, throw, don‚äôt, medicin
## Topic 6, Group -3: psych, psychologist, scale, research, seek, compani, week
## Topic 6, Group -2: heavili, expens, reli, togeth, well-, counselor, alter
## Topic 6, Group -1: somebodi, compound, allevi, staff, project, man, tool
## Topic 6, Group 0: physician, dozen, reserv, open, fight, prosper, accept
## Topic 6, Group 1: drop, conscious, liter, joke, undiagnos, lead, condit
## Topic 6, Group 2: fellow, shouldn‚äôt, contain, spot, littl, surviv, better
## Topic 6, Group 3: exacerb, readili, beyond, gone, crazi, like
## Topic 6, Group 4:
## Topic 6, Group 5:
## Topic 6, Group 6:
## Topic 6, Group 7:
## Topic 6, Group 9:
##
## Topic 7, Group -20:
## Topic 7, Group -12:
## Topic 7, Group -11:
## Topic 7, Group -10:
## Topic 7, Group -9: ptsd, lose, fulfil, ill, treatment, individu, lot
## Topic 7, Group -8: appar, distress, focus, never, beyond, difficult, becom
```

```
##  Topic 7, Group -7:
##  Topic 7, Group -6: anxious, slowli, ask, hopeless, sent, close, covid
##  Topic 7, Group -5: ptsd, heard, appar, eas, danger, your, yet
##  Topic 7, Group -4: onlin, compound, fill, hopeless, entir, like, improv
##  Topic 7, Group -3: valid, fall, shame, driven, total, fill, amongst
##  Topic 7, Group -2: silent, suffer, detriment, hurt, asset, previous, real
##  Topic 7, Group -1: underserv, popul, integr, particular, pocket, evalu, half
##  Topic 7, Group 0: express, practic, manifest, visibl, empathi, counti, judg
##  Topic 7, Group 1: payer, till, prescript, student, yet, born, assess
##  Topic 7, Group 2: decent, financ, practition, preserv, fight, chosen, abil
##  Topic 7, Group 3: attend, lower, somebodi, meet, sooner, base, happi
##  Topic 7, Group 4: circumst, utmost, gave, prescript, pocket, episod, usa
##  Topic 7, Group 5: discourag, previous, interact, modern, readili, detriment
##  Topic 7, Group 6: comfort, question, chanc, burden, financi, like, everyon
##  Topic 7, Group 7: upset, varieti, happi
##  Topic 7, Group 9:
##
##  Topic 8, Group -20:
##  Topic 8, Group -12:
##  Topic 8, Group -11:
##  Topic 8, Group -10:
##  Topic 8, Group -9: toll, serv, repeat, entir, injur, ten, hurt
##  Topic 8, Group -8: trauma, assess, sent, known, man, doctor, went
##  Topic 8, Group -7:
##  Topic 8, Group -6: charact, injur, miss, chanc, four, lot, surviv
##  Topic 8, Group -5: vote, father, punish, pass, consider, revok, mother
##  Topic 8, Group -4: illeg, beer, dozen, yes, surpris, restaur, crise
##  Topic 8, Group -3: kept, shot, pass, loos, initi
##  Topic 8, Group -2:
##  Topic 8, Group -1: valid, dui, mandatori, interact, room, punish, revok
##  Topic 8, Group 0: dui, harsh, noth, perfect, husband, fine, damag
##  Topic 8, Group 1: affect, skill
##  Topic 8, Group 2:
##  Topic 8, Group 3:
##  Topic 8, Group 4:
##  Topic 8, Group 5:
##  Topic 8, Group 6:
##  Topic 8, Group 7:
##  Topic 8, Group 9:
##
##  Topic 9, Group -20:
##  Topic 9, Group -12:
##  Topic 9, Group -11:
##  Topic 9, Group -10: materialist, crucial, focus, world
##  Topic 9, Group -9: blame
##  Topic 9, Group -8: lash, loos, worst, taboo, fight, child, anxieti
##  Topic 9, Group -7: bigger, constant, experi, crucial, instead, focus, crisi
##  Topic 9, Group -6: oneself, practition, knowledg, pill, distress, local, real
##  Topic 9, Group -5: approach, standard, top, hospit, entir, ward, alloc
##  Topic 9, Group -4: charact, felt, financ, equal, prosper, type, afflict
##  Topic 9, Group -3: resolv, hour, confid, realiti, unaddress, fortun, mindset
##  Topic 9, Group -2: diabet, flu, citizen, wonder, facil, better, unless
##  Topic 9, Group -1: histor, clinic, collect, kept, releas, separ, metal
##  Topic 9, Group 0: shortag, wealthi, surpris, appar, danger, healthcar, prescrib
```

```
## Topic 9, Group 1: project, link, practic, werent, urgenc, counti, dedic
## Topic 9, Group 2: focus, fit, mask, privat, cure, adequ, unless
## Topic 9, Group 3: win, manner, job
## Topic 9, Group 4: prove, initi, still
## Topic 9, Group 5: amaz, food, meet, side, connect, surviv, chanc
## Topic 9, Group 6:
## Topic 9, Group 7:
## Topic 9, Group 9:
##
## Topic 10, Group -20:
## Topic 10, Group -12:
## Topic 10, Group -11:
## Topic 10, Group -10:
## Topic 10, Group -9:
## Topic 10, Group -8:
## Topic 10, Group -7: killer
## Topic 10, Group -6: didn't
## Topic 10, Group -5: carol
## Topic 10, Group -4: impact, think, awar, rais
## Topic 10, Group -3: worst, initi, implement, immedi, drunk-driv
## Topic 10, Group -2: town, three, mistak, action, controversi, anyth, citi
## Topic 10, Group -1: werent, skill, eat, one, drunk-driv
## Topic 10, Group 0: truth, wheel, save
## Topic 10, Group 1: polit, focus
## Topic 10, Group 2: capabl, instant, unsaf, truth
## Topic 10, Group 3: save
## Topic 10, Group 4: save
## Topic 10, Group 5: mindset, spot, strict, eas
## Topic 10, Group 6: save
## Topic 10, Group 7:
## Topic 10, Group 9:
##
## Topic 11, Group -20:
## Topic 11, Group -12:
## Topic 11, Group -11: imper, poor, lower, loss, epidem, impact, physic
## Topic 11, Group -10:
## Topic 11, Group -9:
## Topic 11, Group -8: compound, percentag, exacerb, harm, creat
## Topic 11, Group -7: still, reduct, dedic, stigma, normal, issu
## Topic 11, Group -6: wear, mask, onlin, church, tie, unaddress, teen
## Topic 11, Group -5: murder, trace, insid, requir, imposs, relat, fine
## Topic 11, Group -4: shortag, doesn't, link, degre, prohibit, attribut, catch
## Topic 11, Group -3: danger, prove, outlet, manifest, room, heal, repeat
## Topic 11, Group -2: virtual, born, equal, pocket, wealthi, frustrat, urg
## Topic 11, Group -1: detriment, carri, focus, middl, manifest, suggest, numer
## Topic 11, Group 0: play, rug, nowaday, anybodi, open, recognit, major
## Topic 11, Group 1: adulthood, interact, traumat, subject, unaddress, knowledg, children
## Topic 11, Group 2: reliant, integr, sincer, bless, driven, priorit, surviv
## Topic 11, Group 3: spread, histori, lockdown, emot, interact, well-, fund
## Topic 11, Group 4: eventu, focus, aspect, prevent, young, general, improv
## Topic 11, Group 5: environ, amongst, send, focus, killer, spread, citizen
## Topic 11, Group 6: massiv, recognit, happi, prosper, citizen
## Topic 11, Group 7:
## Topic 11, Group 9:
```

```
##
##  Topic 12, Group -20:
##  Topic 12, Group -12:
##  Topic 12, Group -11:
##  Topic 12, Group -10:
##  Topic 12, Group -9:
##  Topic 12, Group -8: children
##  Topic 12, Group -7: screw, vote, wake, tax, particip, opinion, carbon
##  Topic 12, Group -6:
##  Topic 12, Group -5: wear, mask, flu, lockdown, lose, hit
##  Topic 12, Group -4:
##  Topic 12, Group -3: church, counselor, trust, coupl, line, briefli, amaz
##  Topic 12, Group -2: drunken, onlin, mess, emiss, valu, man, plastic
##  Topic 12, Group -1: conscious, stuff, cover, check, dui, car, spot
##  Topic 12, Group 0: area, dire, togeth, mention
##  Topic 12, Group 1: told, shouldnt, insid, word, question, mom, said
##  Topic 12, Group 2: tire, lane, select, initi, beer, conveni, polici
##  Topic 12, Group 3:
##  Topic 12, Group 4: front
##  Topic 12, Group 5:
##  Topic 12, Group 6:
##  Topic 12, Group 7:
##  Topic 12, Group 9:
##
##  Topic 13, Group -20:
##  Topic 13, Group -12:
##  Topic 13, Group -11:
##  Topic 13, Group -10:
##  Topic 13, Group -9:
##  Topic 13, Group -8:
##  Topic 13, Group -7:
##  Topic 13, Group -6: traumat, lifetim, entir, husband, chosen, worst, lost
##  Topic 13, Group -5: luckili, due, suffer, disabl
##  Topic 13, Group -4: power, love, togeth, difficult, lost, depress, help
##  Topic 13, Group -3: surpris, till, controversi, survey, mother, mind, heavi
##  Topic 13, Group -2: grew, realiti, trauma, surviv, mother, condit, father
##  Topic 13, Group -1: virtual, outlet, circumst, counsel, forget, hope, togeth
##  Topic 13, Group 0: mdd, disabl, nice, insur, find, suffer, help
##  Topic 13, Group 1: difficulti, catch, sincer, vote, tri, couldnt, intervent
##  Topic 13, Group 2: nowaday, inform, detect, develop, rememb, togeth, may
##  Topic 13, Group 3: select, wrote, topic, say, militari
##  Topic 13, Group 4: offic, felt, sit, stuff, apart, manag, went
##  Topic 13, Group 5:
##  Topic 13, Group 6:
##  Topic 13, Group 7: letter, chanc, thank, mdd, passion
##  Topic 13, Group 9:
##
##  Topic 14, Group -20:
##  Topic 14, Group -12: fewer, unfair, danger
##  Topic 14, Group -11:
##  Topic 14, Group -10:
##  Topic 14, Group -9: wealthi, background, fault, empathi, illeg, shown, discrimin
##  Topic 14, Group -8: heard, somehow, fine, hurt, spend, ton, expens
##  Topic 14, Group -7: achiev, demograph, purpos, across, greater, deterr, reflect
```

```
##   Topic 14, Group -6: harsh, hate, dui, swept, grandfath, lane, tire
##   Topic 14, Group -5: preserv, upset, charact, instant, desir, rampant, didn't
##   Topic 14, Group -4: congress, utmost, maim, urgenc, gave, smoke, harder
##   Topic 14, Group -3: father, mari, greatest, three, injur, book, advanc
##   Topic 14, Group -2: suggest, maim, offens, oftentim, quit, reduct, togeth
##   Topic 14, Group -1: select, letter, steadi, coupl, manner, wheel, like
##   Topic 14, Group 0: luckili, total, protect, season, safe, coupl, drunk-driv
##   Topic 14, Group 1: event, approach, ban, support, equal, set, devast
##   Topic 14, Group 2:
##   Topic 14, Group 3: car, feel
##   Topic 14, Group 4:
##   Topic 14, Group 5:
##   Topic 14, Group 6:
##   Topic 14, Group 7:
##   Topic 14, Group 9:
##
##   Topic 15, Group -20:
##   Topic 15, Group -12:
##   Topic 15, Group -11:
##   Topic 15, Group -10:
##   Topic 15, Group -9:
##   Topic 15, Group -8:
##   Topic 15, Group -7:
##   Topic 15, Group -6: complic, asset, manifest, host
##   Topic 15, Group -5:
##   Topic 15, Group -4:
##   Topic 15, Group -3:
##   Topic 15, Group -2:
##   Topic 15, Group -1: space, worker
##   Topic 15, Group 0:
##   Topic 15, Group 1: practition, rampant
##   Topic 15, Group 2: host
##   Topic 15, Group 3:
##   Topic 15, Group 4:
##   Topic 15, Group 5:
##   Topic 15, Group 6:
##   Topic 15, Group 7:
##   Topic 15, Group 9:
##
```

```r
thoughts3 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 3)$docs[[1]]
thoughts4 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 4)$docs[[1]]
thoughts5 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 5)$docs[[1]]
```

```r
par(mfrow = c(1, 2),mar = c(.5, .5, 1, .5))
plotQuote(thoughts3, width = 30, main = "Topic 3")
plotQuote(thoughts4, width = 30, main = "Topic 4")
```

Topic 3

the end, she admitted that she needed help and she wanted to get help. We made all kinds of calls. We tried everything. But getting help costs money and we don't have any and she couldn't hold down a job long enough to get insurance. We even took her to the detox center of a homeless shelter downtown but they were full. In the end, no one could help her. Demoralized and depressed, she ended up sitting in her car in shopping center parking lot and drinking until she passed out. It got up to 100 degrees that day and she died of hyperthermia. We didn't find her for three weeks. She

Topic 4

Drunk drivers kill many Americans per day. These deaths are all preventable. Citizens should encourage car manufacturers to incorporate technology to prevent intoxicated drivers from being able to operate a vehicle. Likewise, auto insurance carriers should provide their customers with lower insurance rates if the customer is willing to participate in technology aimed at preventing drunk driving. I think we can all agree that government regulation of these matters is a dumb idea, so we should encourage the free market to solve drunk driving.

```
plotQuote(thoughts5, width = 30, main = "Topic 5")
```

Topic 5

depression, addiction, and
suicide to name a few. If
people are able to seek out
trusted and qualified mental
health care professionals
before it is too late they
can learn how to rethink
and reframe their views on
themselves and the world. It
will help by teaching them
how to correctly process
and evaluate information and
situations and give them the
tools to practice to improve
their handling of stressful
or tense situations in a more
appropriate and civil manner.
These things could have an
overall positive impact on
those individuals' lives
and others around them. I

```
prep <- estimateEffect(1:15 ~ treated,
                       frqModel, meta = out$meta, uncertainty = "Global")
summary(prep, topics=1:15)
```

```
##
## Call:
## estimateEffect(formula = 1:15 ~ treated, stmobj = frqModel, metadata = out$meta,
##     uncertainty = "Global")
##
##
## Topic 1:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.14306    0.01579   9.057   <2e-16 ***
## treated     -0.02878    0.01829  -1.574    0.116
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 2:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.03933    0.01340   2.935  0.00341 **
```

```
## treated       0.06597    0.01627    4.055 5.37e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 3:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.039630   0.009338   4.244 2.38e-05 ***
## treated     0.005859   0.011330   0.517    0.605
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 4:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.03267    0.01187   2.751  0.00603 **
## treated      0.04176    0.01393   2.999  0.00277 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 5:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.09075    0.01388   6.538 9.55e-11 ***
## treated     -0.02852    0.01513  -1.885   0.0597 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 6:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.09319    0.01250   7.458 1.78e-13 ***
## treated     -0.03996    0.01459  -2.739  0.00627 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 7:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.17764    0.01663  10.682  < 2e-16 ***
## treated     -0.07574    0.01953  -3.878 0.000111 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
##
## Topic 8:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.019569   0.008234   2.377   0.0176 *
## treated     0.019553   0.009978   1.959   0.0503 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 9:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.07080    0.01228   5.764 1.06e-08 ***
## treated     -0.00272    0.01357  -0.200    0.841
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 10:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.033973   0.008311   4.088 4.68e-05 ***
## treated     0.010584   0.009440   1.121    0.262
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 11:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.14624    0.01717   8.517   <2e-16 ***
## treated     -0.04557    0.02000  -2.279   0.0229 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 12:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.024404   0.007652   3.189  0.00147 **
## treated     0.010381   0.008809   1.178  0.23887
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 13:
##
## Coefficients:
```

```
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.053344    0.011718    4.552  5.9e-06 ***
## treated     -0.007859    0.012903   -0.609     0.543
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 14:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.02780     0.01346    2.066   0.0391 *
## treated      0.07227     0.01587    4.553 5.87e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 15:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.008216    0.001576    5.214 2.21e-07 ***
## treated     0.001993    0.001882    1.059     0.29
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
par(fig = c(0, 1, 0, 1))  # Set the figure region (left, right, bottom, top)
par(plt = c(0, 1, 0, 1))  # Set the plot region (left, right, bottom, top)
plot(frqModel, type = "summary", xlim = c(0, .2))
```

Topic 1: homicid, relatio

Topic 7: unabl, expand, ind

Topic 11: neglect, wellb, phys

Topic 2: wheel, tougher, innoc

Topic 14: uber, lyft, fun

Topic 9: ill, feder, vulner

Topic 4: blood, aim, minut

Topic 5: belief, inpati, oldest

Topic 6: confront, gone, weak

Topic 13: schizophrenia, advoc, bipolar

Topic 3: pull, isnt, anymor

Topic 10: save, countless, forward

Topic 8: perman, licens, wife

Topic 12: ticket, head, pay

Topic 15: burnout, host, worker

```
plot(prep, covariate = "treated", topics = c(1:2, 4:15),
model = frqModel, method = "difference",
cov.value1 = 1, cov.value2 = 0,
xlab = "Not Treated ... Treated",
main = "Effect of Treatment",
xlim = c(-.15, .15), labeltype = "custom",
custom.labels = c('Homicide/Suffer', 'Wheel/Impossible', 'Technology', 'Belief', 'Confront/Problem', 'Un
```

Effect of Treatment

Not Treated ... Treated
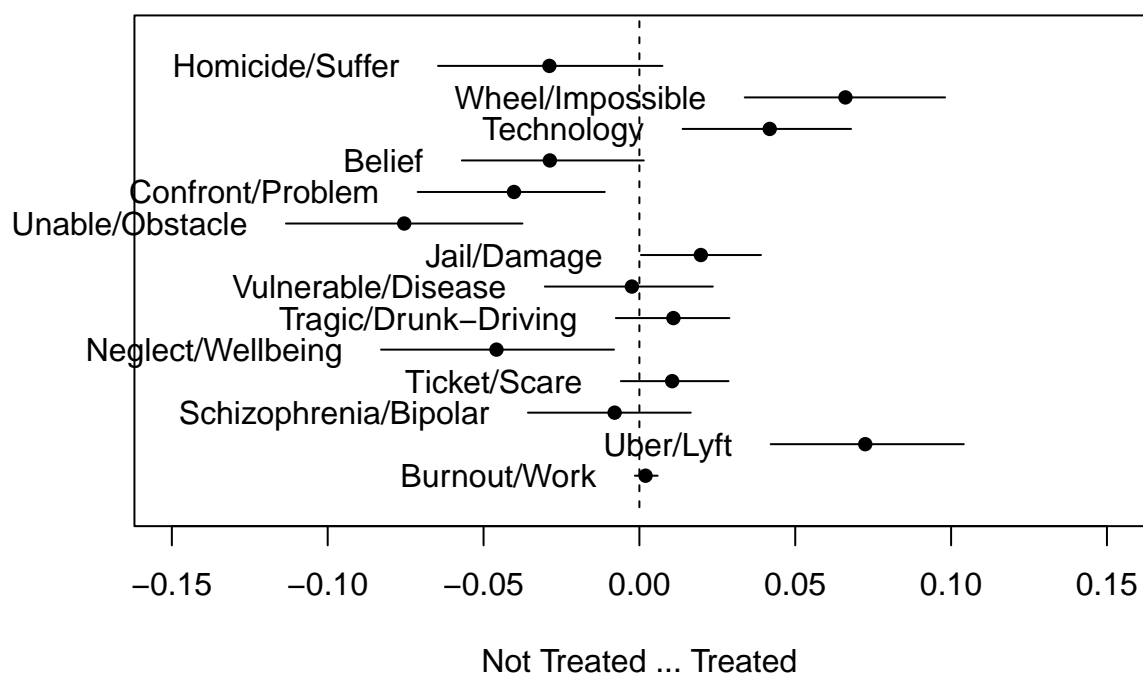
```
mod.out.corr <- topicCorr(frqModel)
plot(mod.out.corr, topics = c(1:2, 4:15), vlabels = c('Homicide/Suffer', 'Wheel/Impossible', 'Technology
```

The diagram shows nodes labeled: Belief, Schizophrenia/Bipolar, Confront/Problem, Unable/Obstacle, Uber/Lyft, Burnout/Work, Vulnerable/Disease, Technology, Tragic/Drunk-Driving, Wheel/Impossible, Neglect/Wellbeing, Ticket/Scare, Jail/Damage, Homicide/Suffer
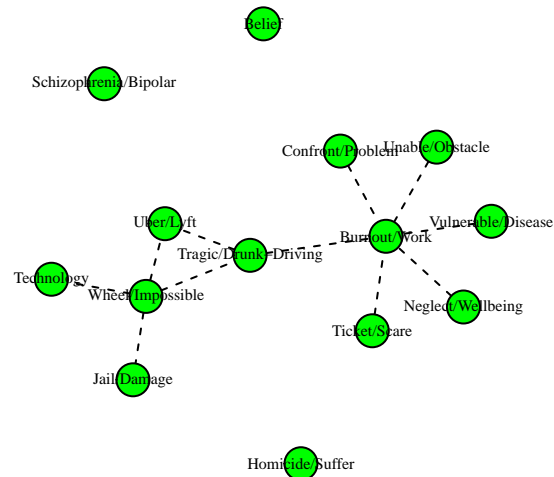
Politics Only

```
library("stm")
data <- politics_stacked_df
processed <- textProcessor(data$frq, metadata = data)
```

```
## Building corpus...
## Converting to Lower Case...
## Removing punctuation...
## Removing stopwords...
## Removing numbers...
## Stemming...
## Creating Output...
```
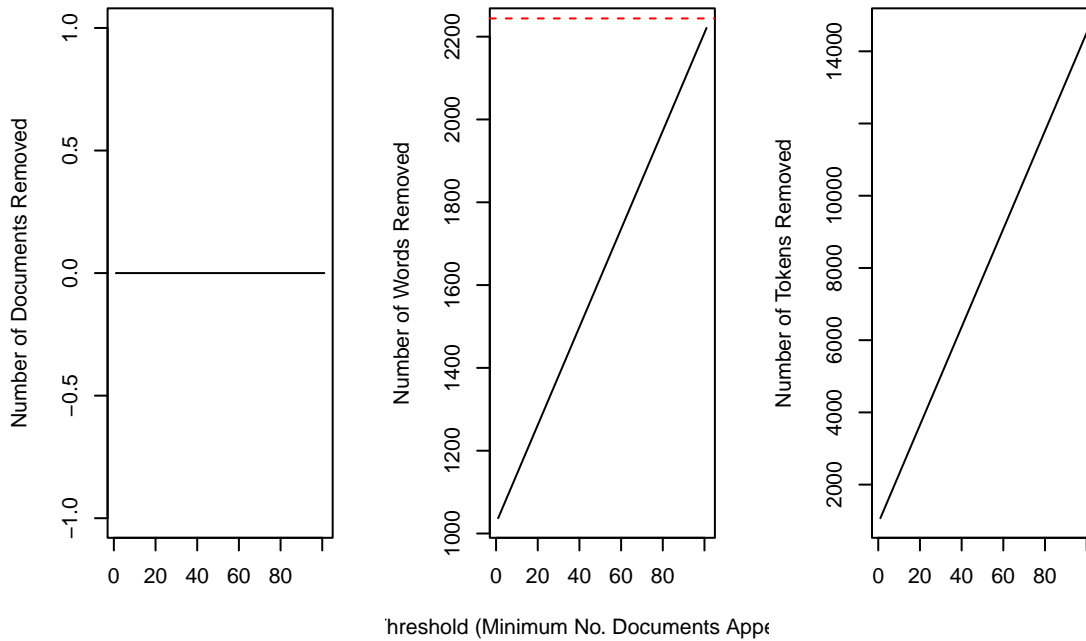
```
out <- prepDocuments(processed$documents, processed$vocab, processed$meta)
```

```
## Removing 1037 of 2244 terms (1037 of 17146 tokens) due to frequency
## Your corpus now has 547 documents, 1207 terms and 16109 tokens.
```

```
docs <- out$documents
vocab <- out$vocab
meta <- out$meta
```

```
plotRemoved(processed$documents, lower.thresh = seq(1, 200, by = 100))
```



```
# change lower.thresh
out <- prepDocuments(processed$documents, processed$vocab, processed$meta,
                     lower.thresh = 1)
```

```
## Removing 1037 of 2244 terms (1037 of 17146 tokens) due to frequency
## Your corpus now has 547 documents, 1207 terms and 16109 tokens.
```

```
# add content?
frqModel <- stm(documents = out$documents, vocab = out$vocab, K = 15,
                prevalence =~ treated,
                content =~ sentiment,
                seed = 1000,
                max.em.its = 75, data = out$meta, init.type = "Spectral")
```

```
## Beginning Spectral Initialization
##    Calculating the gram matrix...
##    Finding anchor words...
##        ..............
##    Recovering initialization...
##        ............
## Initialization complete.
## ....................................................................................................
```

```
## Completed E-Step (0 seconds).
## ................................................................................
## Completed M-Step (12 seconds).
## Completing Iteration 1 (approx. per word bound = -5.691)
## ................................................................................
## Completed E-Step (0 seconds).
## ................................................................................
## Completed M-Step (12 seconds).
## Completing Iteration 2 (approx. per word bound = -5.506, relative change = 3.256e-02)
## ................................................................................
## Completed E-Step (0 seconds).
## ................................................................................
## Completed M-Step (12 seconds).
## Completing Iteration 3 (approx. per word bound = -5.452, relative change = 9.850e-03)
## ................................................................................
## Completed E-Step (0 seconds).
## ................................................................................
## Completed M-Step (13 seconds).
## Completing Iteration 4 (approx. per word bound = -5.432, relative change = 3.602e-03)
## ................................................................................
## Completed E-Step (0 seconds).
## ................................................................................
## Completed M-Step (13 seconds).
## Completing Iteration 5 (approx. per word bound = -5.419, relative change = 2.451e-03)
## Topic 1: resembl, small, dramat, twenti, propos
##  Topic 2: mail-, except, elig, avail, court
##  Topic 3: complac, younger, lobbyist, democraci, easi
##  Topic 4: poverti, life, reduc, growth, economi
##  Topic 5: conserv, ask, democract, thank, harvest
##  Topic 6: worker, custom, demand, job, kid
##  Topic 7: holiday, day, tabul, perhap, earli
##  Topic 8: mental, drunk, attack, health, issu
##  Topic 9: system, factor, dont, legal, corrupt
##  Topic 10: media, energi, insignific, grant, represent
##  Topic 11: worst, fix, child, reli, unabl
##  Topic 12: legisl, effici, turnout, compet, issu
##  Topic 13: econom, unfair, practic, mail, abl
##  Topic 14: car, bill, buy, alot, medic
##  Topic 15:
## Aspect 1: kill, billionair, what, open, thought
##  Aspect 2: refus, failur, clear, astronom, suffici
##  Aspect 3: pandem, moot, disabl, argument, odd
##  Aspect 4: sick, arizona, driver, obvious, human
##  Aspect 5: known, half, serv, eventu, stem
##  Aspect 6: unaccept, via, accept, develop, unless
##  Aspect 7: five, oppos, contest, rid, reduct
##  Aspect 8: complic, fear, utmost, thrive, bad
##  Aspect 9: appear, immedi, quit, stagnant, resourc
##  Aspect 10: joke, hold, arbitrari, old, waitress
##  Aspect 11: prioriti, accur, payer, scheme, wast
##  Aspect 12: plan, particular, outsid, disagre, paper
##  Aspect 13: mitig, share, goal, fight, execut
##  Aspect 14: speak, choic, improv, secur, paid
##  Aspect 15: influenc, support, polit, attent, decent
```

```
##  Aspect 16: happi, top, incom, best, good
##  Aspect 17: climat, greatest, sweep, resolv, determin
##  Aspect 18: oper, retail, understand, stimul, bedroom
## .............................................................................................
## Completed E-Step (0 seconds).
## .............................................................................................
## Completed M-Step (14 seconds).
## Completing Iteration 6 (approx. per word bound = -5.410, relative change = 1.738e-03)
## .............................................................................................
## Completed E-Step (0 seconds).
## .............................................................................................
## Completed M-Step (14 seconds).
## Completing Iteration 7 (approx. per word bound = -5.406, relative change = 5.798e-04)
## .............................................................................................
## Completed E-Step (0 seconds).
## .............................................................................................
## Completed M-Step (13 seconds).
## Completing Iteration 8 (approx. per word bound = -5.404, relative change = 4.322e-04)
## .............................................................................................
## Completed E-Step (0 seconds).
## .............................................................................................
## Completed M-Step (14 seconds).
## Completing Iteration 9 (approx. per word bound = -5.401, relative change = 5.826e-04)
## .............................................................................................
## Completed E-Step (0 seconds).
## .............................................................................................
## Completed M-Step (14 seconds).
## Model Converged
```

```
labelTopics(frqModel, 1:15)
```

```
## Topic Words:
##  Topic 1: resembl, dramat, small, hour, twenti, slowli, propos
##  Topic 2: mail-, elig, except, court, notion, restrict, barrier
##  Topic 3: democraci, die, complac, lobbyist, younger, opinion, repres
##  Topic 4: poverti, life, economi, growth, liveabl, financi, reduc
##  Topic 5: conserv, ask, democract, thank, harvest, machin, republican
##  Topic 6: worker, custom, demand, employ, job, massiv, servic
##  Topic 7: holiday, day, tabul, fraud, perhap, earli, weekend
##  Topic 8: mental, drunk, health, issu, attack, margin, definit
##  Topic 9: dont, system, corrupt, legal, slaveri, although, anyway
##  Topic 10: energi, insignific, media, grant, represent, heard, shape
##  Topic 11: worst, welfar, reli, fix, unabl, paid, hard
##  Topic 12: turnout, legisl, voter, issu, effici, compet, relat
##  Topic 13: econom, practic, unfair, abl, mail, polit, vote
##  Topic 14: car, bill, groceri, buy, gas, alot, price
##  Topic 15:
##
##  Covariate Words:
##  Group -9: kill, billionair, normal, what, open, thought, greedi
##  Group -6: refus, clear, failur, astronom, suffici, virtual, gasolin
##  Group -5: moot, odd, disabl, apathi, danger, argument, job
##  Group -4: sick, arizona, driver, obvious, listen, human, big
##  Group -3: known, half, serv, eventu, unabl, busi, made
```

```
## Group -2: unaccept, unless, accept, develop, men, taxpay, among
## Group -1: five, contest, cook, rid, improp, predict, oppos
## Group 0: complic, fear, utmost, thrive, cut, bad, eas
## Group 1: appear, immedi, stagnant, quit, moment, resourc, percent
## Group 2: joke, hold, old, offer, within, regard, ignor
## Group 3: prioriti, accur, payer, stake, scheme, disenfranchis, program
## Group 4: plan, particular, outsid, paper, proper, everyday, support
## Group 5: mitig, share, goal, fight, execut, top, eat
## Group 6: choic, improv, secur, paid, enough, work, dont
## Group 7: influenc, support, attent, polit, decent, win, local
## Group 8: happi, top, incom, best, will, better, good
## Group 9: sweep, climat, greatest, fraction, resolv, moder, determin
## Group 11: oper, retail, understand, bedroom, stimul, industri, apart
##
## Topic-Covariate Interactions:
## Topic 1, Group -9:
## Topic 1, Group -6: wreak, havoc, sweep, vast, inexperienc, unskil, biggest
## Topic 1, Group -5:
## Topic 1, Group -4:
## Topic 1, Group -3: wild, pace, poorest, percentag, counti, particular, understand
## Topic 1, Group -2: stuck, fallen, greedi, union, subsidi, compani, artifici
## Topic 1, Group -1: cash, tenabl, paper, tip, cultur, hospit, away
## Topic 1, Group 0: countless, outrag, poverti, standard, wage
## Topic 1, Group 1: rememb, presid, fast, rural, scam, index, studi
## Topic 1, Group 2: call, chosen, unconscion, strong, thrive, week, involv
## Topic 1, Group 3: alloc, workforc, travesti, strength, belief, guarante, proport
## Topic 1, Group 4: upon, load, charact, requir, paid, basic, good
## Topic 1, Group 5: favor, area
## Topic 1, Group 6:
## Topic 1, Group 7:
## Topic 1, Group 8:
## Topic 1, Group 9:
## Topic 1, Group 11:
##
## Topic 2, Group -9:
## Topic 2, Group -6:
## Topic 2, Group -5:
## Topic 2, Group -4: bought, thru, question, incred, licens, night, trump
## Topic 2, Group -3: million
## Topic 2, Group -2: threat, mandatori, democraci, holiday, suppress, voic, requir
## Topic 2, Group -1: wild, prioriti, obtain, room, bother, thought, talk
## Topic 2, Group 0: embarrass, travesti, involv, drop, easiest, requir, mass
## Topic 2, Group 1: quo, status, closer, andor, remov, onlin, experienc
## Topic 2, Group 2: charact, usual, forth, elector, parti, dictat, town
## Topic 2, Group 3: registr, suprem, unnecessari, rough, bar, miss, estim
## Topic 2, Group 4: light, logic, disabl, origin, fine, race, roll
## Topic 2, Group 5: method, conveni, absente, ballot, system
## Topic 2, Group 6: leader, understand
## Topic 2, Group 7:
## Topic 2, Group 8:
## Topic 2, Group 9:
## Topic 2, Group 11:
##
## Topic 3, Group -9:
```

```
## Topic 3, Group -6:
## Topic 3, Group -5:
## Topic 3, Group -4: georgia, failur, slow, count
## Topic 3, Group -3: administr, elector, open, vote
## Topic 3, Group -2: won, crazi, besid, complain, understand, illinoi, pritzker
## Topic 3, Group -1: terribl, involv, promot, understand, illinoi, pritzker, danger
## Topic 3, Group 0: moder, instanc, foreign, politician, greater, resolv, tend
## Topic 3, Group 1: morn, select, fought, said, leader, entir, older
## Topic 3, Group 2: inherit, won't, earth, watch, what, complain, polit
## Topic 3, Group 3: greatest, forth, disagre, constitu, everybodi, excit, folk
## Topic 3, Group 4: low-incom, comparison, chunk, news, meanwhil, correct, republican
## Topic 3, Group 5: expand, climat, emiss, protect, consider, plastic, freedom
## Topic 3, Group 6: uphold, wish, progress, solut, upheld, possibl, democrat
## Topic 3, Group 7: demograph, underrepres, lead, new, establish
## Topic 3, Group 8:
## Topic 3, Group 9:
## Topic 3, Group 11:
##
## Topic 4, Group -9:
## Topic 4, Group -6: abus, inequ, poverti
## Topic 4, Group -5:
## Topic 4, Group -4:
## Topic 4, Group -3: alcohol, drug, stem, ill, embarrass, abus, sad
## Topic 4, Group -2: univers, autom, appar, slide, taxat, distribut, suprem
## Topic 4, Group -1: ball, suggest, stabil, viabl, consequ, widen, stuff
## Topic 4, Group 0: ordinari, advoc, theyr, figur, capac, dedic, absurd
## Topic 4, Group 1: meal, enjoy, relief, urban, pull, charg, send
## Topic 4, Group 2: human, much, shelter, produc, eas, sell, paycheck
## Topic 4, Group 3: board, theyll, can't, sustain, hasn‚äôt, healthcar, period
## Topic 4, Group 4: older, scheme, ahead, pocket, return, retir, train
## Topic 4, Group 5: bonus, administr, compani, countri, care, live, work
## Topic 4, Group 6: andor, hardship, capac, somewhat, modern, fulfil, normal
## Topic 4, Group 7: enjoy, world, chanc, will, better, famili
## Topic 4, Group 8: car, new, good, worker
## Topic 4, Group 9:
## Topic 4, Group 11:
##
## Topic 5, Group -9:
## Topic 5, Group -6:
## Topic 5, Group -5:
## Topic 5, Group -4: overcom, cheat
## Topic 5, Group -3:
## Topic 5, Group -2: pursu, combat
## Topic 5, Group -1:
## Topic 5, Group 0: card, understand, charg, question, center, independ, liber
## Topic 5, Group 1: avoid, oper, play, somebodi, start, ballot, harvest
## Topic 5, Group 2: wish, conserv
## Topic 5, Group 3:
## Topic 5, Group 4: paper
## Topic 5, Group 5:
## Topic 5, Group 6:
## Topic 5, Group 7:
## Topic 5, Group 8:
## Topic 5, Group 9:
```

```
##   Topic 5, Group 11:
##
##   Topic 6, Group -9:
##   Topic 6, Group -6: inflat, employ, will, increas
##   Topic 6, Group -5: argument, unknown, moot, odd, pandem, danger, consid
##   Topic 6, Group -4: boss, call, contact, moot, kill, liter, abus
##   Topic 6, Group -3: train, urban, fallen, discrimin, index, pursu, incent
##   Topic 6, Group -2: tend, via, retail, shift, insur, night, feet
##   Topic 6, Group -1: sell, supplement, low-incom, total, odd, simpl, lost
##   Topic 6, Group 0: retent, stagnat, sort, risen, morn, hand, median
##   Topic 6, Group 1: loan, manag, univers, credit, word, automat, bought
##   Topic 6, Group 2: satisfact, waitress, associ, arbitrari, shortag, ultim, store
##   Topic 6, Group 3: ownership, paycheck, consider, grown, condit, adequ, week
##   Topic 6, Group 4: whether, remov, wait, staff, went, respect, outsid
##   Topic 6, Group 5: earner, highest, exploit, insur, total, erod, accomplish
##   Topic 6, Group 6: gain
##   Topic 6, Group 7: within, earner, adequ, pay
##   Topic 6, Group 8: night, workplac, add, enjoy, guarante, fine, bonus
##   Topic 6, Group 9:
##   Topic 6, Group 11:
##
##   Topic 7, Group -9:
##   Topic 7, Group -6:
##   Topic 7, Group -5:
##   Topic 7, Group -4: apathi, suggest, incent, appli, schedul, somewhat, unabl
##   Topic 7, Group -3: manipul, count, ballot
##   Topic 7, Group -2: figur, prior, arizona, happen, week, democract, republican
##   Topic 7, Group -1: couldnt, went, absente, reduct, particip, requir, mail
##   Topic 7, Group 0: yesterday, miss, discrimin, disgust, next, self, mid
##   Topic 7, Group 1: mass, virtual, produc, scale, vast, free, excit
##   Topic 7, Group 2: drop, stick, verifi, free, transport, case, rememb
##   Topic 7, Group 3: mind, voic, vote, holiday
##   Topic 7, Group 4: send, advoc, favor, confid, paper, ideal, requir
##   Topic 7, Group 5: item, technolog, requir
##   Topic 7, Group 6: winner, night, activ, steal, count, prove, week
##   Topic 7, Group 7: convers, knowledg, learn, correct, honest, gain, system
##   Topic 7, Group 8:
##   Topic 7, Group 9:
##   Topic 7, Group 11:
##
##   Topic 8, Group -9:
##   Topic 8, Group -6: issu
##   Topic 8, Group -5:
##   Topic 8, Group -4:
##   Topic 8, Group -3: decreas, mayb, impact, posit, address, issu
##   Topic 8, Group -2: sustain
##   Topic 8, Group -1: none, democraci, margin, solv, issu
##   Topic 8, Group 0: slide, ideal, fight, attack
##   Topic 8, Group 1:
##   Topic 8, Group 2: margin
##   Topic 8, Group 3: hing, engag, societi
##   Topic 8, Group 4: environ, disagre, perfect, anybodi, creat, incom
##   Topic 8, Group 5:
##   Topic 8, Group 6:
```

```
##  Topic 8, Group 7:
##  Topic 8, Group 8:
##  Topic 8, Group 9:
##  Topic 8, Group 11:
##
##  Topic 9, Group -9:
##  Topic 9, Group -6:
##  Topic 9, Group -5:
##  Topic 9, Group -4:
##  Topic 9, Group -3: scam, dumb, none, pick, cook, race, tax
##  Topic 9, Group -2: corrupt, although
##  Topic 9, Group -1: system
##  Topic 9, Group 0: strengthen, viabl, dont
##  Topic 9, Group 1: screw, leader, mayb, societi, dont
##  Topic 9, Group 2: although, dont
##  Topic 9, Group 3: factor, ive, choos
##  Topic 9, Group 4: solut
##  Topic 9, Group 5:
##  Topic 9, Group 6: belief, manipul, suffici, insecur, etc, support, process
##  Topic 9, Group 7:
##  Topic 9, Group 8:
##  Topic 9, Group 9:
##  Topic 9, Group 11:
##
##  Topic 10, Group -9:
##  Topic 10, Group -6:
##  Topic 10, Group -5:
##  Topic 10, Group -4: appar, crazi, didn‚äôt, across, term, talk, tire
##  Topic 10, Group -3:
##  Topic 10, Group -2: watch, onlin, knowledg, talk, correct, inform, seek
##  Topic 10, Group -1: exist, somebodi, otherwis, everybodi, emphas, view, polit
##  Topic 10, Group 0: stem, strength, complain, made, promot, cancel, head
##  Topic 10, Group 1: dedic, led, foreign, complain, lose, bit, emphas
##  Topic 10, Group 2: imaginari, sit, depress, wait, liber, highest, contact
##  Topic 10, Group 3: proud, wast, georgia, align, locat, rural, thru
##  Topic 10, Group 4: abid, taken, won, path, didn‚äôt, luxuri, togeth
##  Topic 10, Group 5: fail, form, fundament, base, subject, best, world
##  Topic 10, Group 6: fought, whatev, follow, right
##  Topic 10, Group 7: appreci, level, believ, happen, life
##  Topic 10, Group 8: men, heart, free, women, put, candid, happi
##  Topic 10, Group 9:
##  Topic 10, Group 11:
##
##  Topic 11, Group -9:
##  Topic 11, Group -6:
##  Topic 11, Group -5:
##  Topic 11, Group -4: uncar, unknown, rude, disgrac, load, guarante, next
##  Topic 11, Group -3: frustrat, conveni, rude, ive, cash, cycl, check
##  Topic 11, Group -2: break, pull, suicid, play, disgust, terribl, burden
##  Topic 11, Group -1: sometim, counter, wish, act, worri, despit, harder
##  Topic 11, Group 0: fifteen, paycheck, pocket, autom, period, enough, method
##  Topic 11, Group 1: stabil, hasn‚äôt, depress, self, simpl, happier, digniti
##  Topic 11, Group 2: subsidi, hardship, famili, front, outrag, supplement, incred
##  Topic 11, Group 3: ahead, motiv, socioeconom, ethic, unconscion, appreci, ultim
```

```
## Topic 11, Group 4: upward, richest, nice, bar, modern, constant, mandatori
## Topic 11, Group 5: return, boss, respect, bit, win, step, surviv
## Topic 11, Group 6: havent, total, discourag, besid, outright, restaur, luxuri
## Topic 11, Group 7: realiti, enough, money
## Topic 11, Group 8: collect, welfar, better
## Topic 11, Group 9:
## Topic 11, Group 11:
##
## Topic 12, Group -9:
## Topic 12, Group -6:
## Topic 12, Group -5: underrepres, disabl, apathi, unabl, result, issu
## Topic 12, Group -4:
## Topic 12, Group -3: relat
## Topic 12, Group -2: word, practic, contest, number, elect
## Topic 12, Group -1: select, whenev, potenti, fraudul, decreas, commit, ballot
## Topic 12, Group 0: confid, across, solut, sad, unqualifi, face, commit
## Topic 12, Group 1: abid, poorest, soon, obvious, among, unqualifi, best
## Topic 12, Group 2: upon, uphold, represent, progress, cycl, otherwis, fraction
## Topic 12, Group 3: plan, pathet, action, candid, inform, polit, public
## Topic 12, Group 4: studi, align, intellig, prior, total, student, thus
## Topic 12, Group 5: enact, special, constitu, measur, counter, hing, interest
## Topic 12, Group 6: voter
## Topic 12, Group 7:
## Topic 12, Group 8:
## Topic 12, Group 9:
## Topic 12, Group 11:
##
## Topic 13, Group -9:
## Topic 13, Group -6:
## Topic 13, Group -5:
## Topic 13, Group -4:
## Topic 13, Group -3:
## Topic 13, Group -2:
## Topic 13, Group -1: deal
## Topic 13, Group 0: previous, regardless, requir, suppress, unfair, vote
## Topic 13, Group 1: via, whatev, polit
## Topic 13, Group 2: uncar, folk, ideal, talk
## Topic 13, Group 3:
## Topic 13, Group 4:
## Topic 13, Group 5:
## Topic 13, Group 6:
## Topic 13, Group 7:
## Topic 13, Group 8:
## Topic 13, Group 9:
## Topic 13, Group 11:
##
## Topic 14, Group -9:
## Topic 14, Group -6: price
## Topic 14, Group -5:
## Topic 14, Group -4:
## Topic 14, Group -3: common, path, fall, stick, tenabl, contribut, led
## Topic 14, Group -2: ordinari, stagnat, richest, earth, modern, consist, harder
## Topic 14, Group -1: retir, rough, estim, experienc, poorer, argument, astronom
## Topic 14, Group 0: tabl, taxat, cost, heat, covid, hit, world
```

```
##  Topic 14, Group 1: ball, understand, store, confid, face, environ, sky
##  Topic 14, Group 2: exist, unnecessari, compani, adjust, manag, bonus, reflect
##  Topic 14, Group 3: nice, independ, scale, imagin, enough, heat, compani
##  Topic 14, Group 4: alcohol, drug, whatev, special, compani, money, abl
##  Topic 14, Group 5: forget, alloc, execut, els, big, put, car
##  Topic 14, Group 6: ethic, afford, paid, cost
##  Topic 14, Group 7:
##  Topic 14, Group 8:
##  Topic 14, Group 9:
##  Topic 14, Group 11:
##
##  Topic 15, Group -9:
##  Topic 15, Group -6:
##  Topic 15, Group -5:
##  Topic 15, Group -4:
##  Topic 15, Group -3:
##  Topic 15, Group -2:
##  Topic 15, Group -1: distribut, socioeconom, unemploy, reduc
##  Topic 15, Group 0:
##  Topic 15, Group 1:
##  Topic 15, Group 2:
##  Topic 15, Group 3:
##  Topic 15, Group 4:
##  Topic 15, Group 5:
##  Topic 15, Group 6:
##  Topic 15, Group 7:
##  Topic 15, Group 8:
##  Topic 15, Group 9:
##  Topic 15, Group 11:
##
```

```r
thoughts3 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 3)$docs[[1]]
thoughts4 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 4)$docs[[1]]
thoughts5 <- findThoughts(frqModel, texts = data$frq, n = 1,
                          topics = 5)$docs[[1]]
```

```r
par(mfrow = c(1, 2),mar = c(.5, .5, 1, .5))
plotQuote(thoughts3, width = 30, main = "Topic 3")
plotQuote(thoughts4, width = 30, main = "Topic 4")
```

Topic 3

and how more people are
getting out and vote. I
believe that in the long–term,
this could end up being a
great thing for our country.
Currently, we have Republicans
who only care about themselves
and the rich people.
Democrats, meanwhile, do care
for all people, including
low–income people. In this
country, we have far more
Democrats than Republicans.
If more and more people vote
in elections, this would kick
out Republicans from Congress
and more Democrats would
be elected. It would allow
Democrats to pass legislation
that benefits people. Overall,
if more people get out

Topic 4

The minimum wage needs to
be increased. The real world
wages are not enough to
support a family in todays
world. Increasing the minimum
wage will help give families
a chance at a decent life.
Overall everyone will be
better with an increase in
the minimum wage and will help
everyone to live a better life
that more people will enjoy
and make better.

```
plotQuote(thoughts5, width = 30, main = "Topic 5")
```

Topic 5

Reasons for this decline is
several fold and education
will help. For example; some
of the population do not
have a full understanding of
Democrat verse Republican and
Independent verses not voting.
Individuals also need to
understand what Conservative
verse Liberal means. Most
importantly, individuals need
to understand that it is ok to
have these conversations with
family and friends. Likewise
the only "dumb" question is
the one that is not asked. I
believe it should be important
to show id (government issued)
or have a plastic – hard copy
of a voter card that can be
inserted into each machine

```
prep <- estimateEffect(1:15 ~ treated,
                       frqModel, meta = out$meta, uncertainty = "Global")
summary(prep, topics=1:15)
```

```
##
## Call:
## estimateEffect(formula = 1:15 ~ treated, stmobj = frqModel, metadata = out$meta,
##     uncertainty = "Global")
##
##
## Topic 1:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.06027    0.01426   4.226 2.79e-05 ***
## treated      0.02226    0.01928   1.155    0.249
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 2:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.063980   0.014340   4.462 9.89e-06 ***
```

```
## treated      -0.004464   0.018081  -0.247      0.805
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 3:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.13160    0.01810   7.271 1.25e-12 ***
## treated     -0.06989    0.02191  -3.190   0.0015 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 4:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.09732    0.01943   5.010 7.38e-07 ***
## treated      0.10836    0.02665   4.066 5.48e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 5:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.018273   0.007673   2.381   0.0176 *
## treated     0.002846   0.009847   0.289   0.7726
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 6:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.109023   0.017496   6.231 9.26e-10 ***
## treated     0.000743   0.022304   0.033    0.973
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 7:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.06895    0.01380   4.996 7.88e-07 ***
## treated     -0.01654    0.01786  -0.926    0.355
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
##
## Topic 8:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.030488   0.009064   3.363 0.000824 ***
## treated     -0.001847   0.011333  -0.163 0.870581
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 9:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.022952   0.008258   2.779  0.00564 **
## treated     0.006133   0.009930   0.618  0.53710
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 10:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.09826    0.01549   6.342 4.76e-10 ***
## treated     -0.02519    0.02021  -1.247    0.213
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 11:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.08986    0.01689   5.319 1.53e-07 ***
## treated      0.01617    0.02208   0.732    0.464
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 12:
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.11863    0.01576   7.526 2.18e-13 ***
## treated     -0.06752    0.02043  -3.305  0.00101 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 13:
##
## Coefficients:
```

```
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.019702    0.006227   3.164  0.00164 **
## treated     -0.007292    0.007752  -0.941  0.34727
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 14:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.06416     0.01514   4.237 2.65e-05 ***
## treated      0.03471     0.01994   1.741   0.0823 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## Topic 15:
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.006691    0.001408   4.753 2.57e-06 ***
## treated     0.001221    0.002025   0.603    0.547
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```
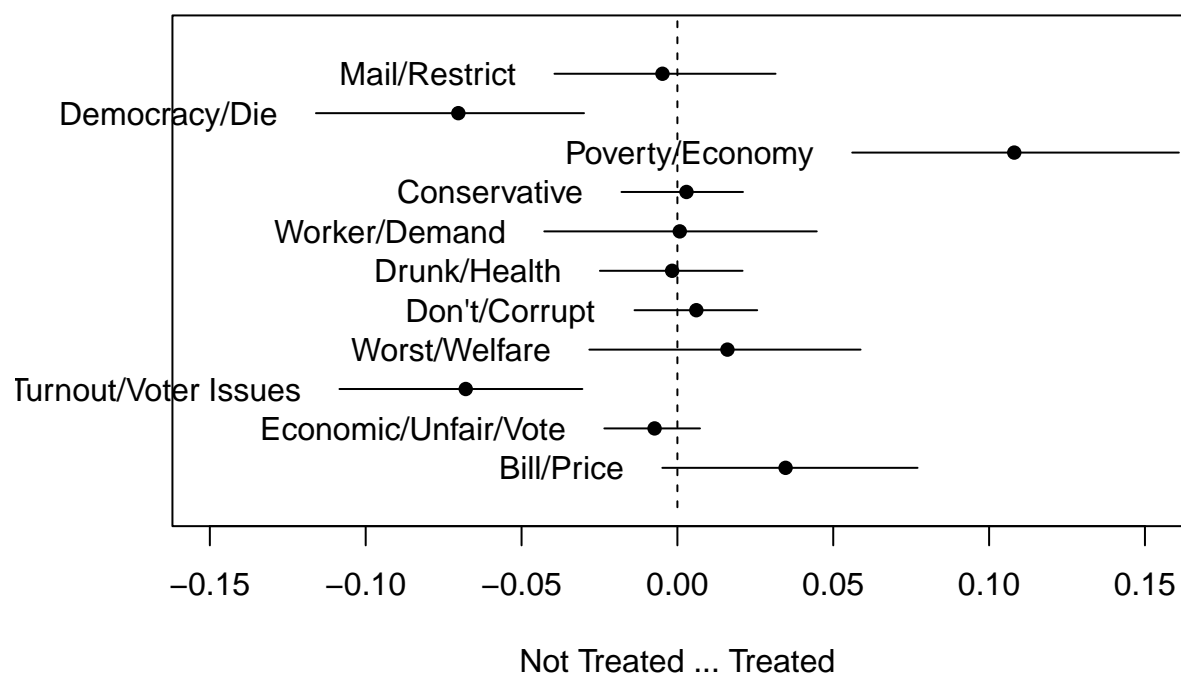
```r
par(fig = c(0, 1, 0, 1))  # Set the figure region (left, right, bottom, top)
par(plt = c(0, 1, 0, 1))  # Set the plot region (left, right, bottom, top)
plot(frqModel, type = "summary", xlim = c(0, .2))
```

Topic 6: worker, custom, demand

Topic 11: worst, welfar, reli

Topic 3: democraci, die, complac

Topic 10: energi, insignific, media

Topic 14: car, bill, groceri

Topic 12: turnout, legisl, voter

Topic 1: resembl, dramat, small

Topic 2: mail–, elig, except

Topic 7: holiday, day, tabul

Topic 9: dont, system, corrupt

Topic 8: mental, drunk, health

Topic 5: conserv, ask, democract

Topic 15:

Topic 13: econom, practic, unfair

```
plot(prep, covariate = "treated", topics = c(2:6, 8:9, 11:14),
model = frqModel, method = "difference",
cov.value1 = 1, cov.value2 = 0,
xlab = "Not Treated ... Treated",
main = "Effect of Treatment",
xlim = c(-.15, .15), labeltype = "custom",
custom.labels = c('Mail/Restrict', 'Democracy/Die', 'Poverty/Economy', 'Conservative', 'Worker/Demand',
```

Effect of Treatment


```r
mod.out.corr <- topicCorr(frqModel)
plot(mod.out.corr, topics = c(2:6, 8:9, 11:14), vlabels = c('Mail/Restrict', 'Democracy/Die', 'Poverty/
```