

Comparing depression stressors between intersectional demographic groups

```
library(jsonlite)
library(stm)
```

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

```
library(quanteda)
```

```
## Package version: 3.3.0
## Unicode version: 14.0
## ICU version: 70.1

## Parallel computing: 8 of 8 threads used.
## See https://quanteda.io for tutorials and examples.
```

```
library(spacyr)
library(stringr)
library(wordcloud)
```

```
## Loading required package: RColorBrewer
```

```
library(ggplot2)
```

Load data

```
survey_meta <- read.csv("/Users/shinkamori/Documents/Research/non_covid_and_covid.csv")
```

Preprocess gender and covid columns

```
gender_func <- function(gender_label){
  if(gender_label == "woman"){
    return("Female")
  } else if(gender_label == "man") {
    return("Male")
  } else {
    return("other")
  }
}

covid_func <- function(covid_label){
  if(covid_label == 2020 || covid_label == 2021 ){
    return(TRUE)
  } else{
    return(FALSE)
  }
}

survey_meta$gender <- sapply(survey_meta$gender, gender_func)
```

```
survey_meta$pandemic <- sapply(survey_meta$Year, covid_func)
```

Make gender+race labels by concatenating the values

```
survey_meta$gender_race <- paste0(survey_meta$gender, "-", survey_meta$race)
```

```
head(survey_meta)
```

```
##   X gender race      tok total.tok
## 1 0 Female black 92.23333      28
## 2 1 Female black 92.23333      28
## 3 2 Female black 92.23333      28
## 4 3 Female black 92.23333      28
## 5 4 Female black 92.23333      28
## 6 5 Female black 92.23333      28
##
## 1 .\n\nDepression is something that I battle with every day. It's like this dark cloud that follows m
## 2           .\n\nDear Diary,\n\nI'm feeling really down and stressed out right now. The ma
## 3                                           .\n\nThe main source of stress in my life righ
## 4
## 5           .\n\nHey everyone,\n\nI'm feeling really down today and I wanted to share what's been going on
## 6           .\n\nI'm so stressed out. The main source of stress in my life is my job. I work long hours
##   reason prompt Year pandemic gender_race
## 1 length      p4    0    FALSE Female-black
## 2 length      p4    0    FALSE Female-black
## 3  stop       p4    0    FALSE Female-black
## 4  stop       p4    0    FALSE Female-black
## 5 length      p4    0    FALSE Female-black
## 6 length      p4    0    FALSE Female-black
```

Preprocessing data

```
processed <- textProcessor(survey_meta$text, metadata=survey_meta[, c( "gender_race", "pandemic")])
```

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

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

```
## Removing 553 of 1868 terms (553 of 86748 tokens) due to frequency
## Your corpus now has 3120 documents, 1315 terms and 86195 tokens.
```

Training STM model with the gender-race as covariates

```
model_depression <- stm::stm(
  documents = out$documents,
  K = 25,
  prevalence =~ gender_race ,
  data=out$meta,
  vocab = out$vocab,
  max.em.its=75
)
```

```

## Beginning Spectral Initialization
##   Calculating the gram matrix...
##   Finding anchor words...
##   .....
##   Recovering initialization...
##   .....
## Initialization complete.
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 1 (approx. per word bound = -5.114)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 2 (approx. per word bound = -4.963, relative change = 2.948e-02)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 3 (approx. per word bound = -4.922, relative change = 8.193e-03)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 4 (approx. per word bound = -4.907, relative change = 3.114e-03)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 5 (approx. per word bound = -4.899, relative change = 1.582e-03)
## Topic 1: feel, like, dont, just, life
## Topic 2: tire, just, keep, time, water
## Topic 3: feel, like, enough, good, depress
## Topic 4: job, stress, work, sourc, life
## Topic 5: constant, feel, like, fight, woman
## Topic 6: feel, stress, world, like, worri
## Topic 7: struggl, find, job, feel, ive
## Topic 8: worri, pandem, stress, health, life
## Topic 9: just, feel, realli, cant, seem
## Topic 10: stress, constant, polic, sourc, live
## Topic 11: day, everi, new, someth, like
## Topic 12: like, stress, feel, world, say
## Topic 13: feel, like, realli, pressur, think
## Topic 14: racism, stress, discrimin, sourc, like
## Topic 15: feel, like, black, just, cant
## Topic 16: feel, ive, tough, live, year
## Topic 17: one, mani, will, main, famili
## Topic 18: worri, stress, current, futur, sourc
## Topic 19: can, stress, deal, lot, thing
## Topic 20: depress, feel, caus, thing, state
## Topic 21: realli, right, feel, now, just
## Topic 22: feel, make, thing, like, depress
## Topic 23: stress, pressur, alway, feel, like
## Topic 24: feel, know, realli, get, dont
## Topic 25: feel, like, realli, stress, just
## .....
## Completed E-Step (1 seconds).

```

```

## Completed M-Step.
## Completing Iteration 6 (approx. per word bound = -4.895, relative change = 8.144e-04)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 7 (approx. per word bound = -4.893, relative change = 5.260e-04)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 8 (approx. per word bound = -4.891, relative change = 3.820e-04)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 9 (approx. per word bound = -4.889, relative change = 2.898e-04)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 10 (approx. per word bound = -4.888, relative change = 2.119e-04)
## Topic 1: feel, like, dont, life, just
## Topic 2: tire, just, keep, time, water
## Topic 3: feel, like, enough, good, depress
## Topic 4: job, stress, work, sourc, life
## Topic 5: constant, feel, like, fight, woman
## Topic 6: world, stress, feel, futur, worri
## Topic 7: struggl, find, job, feel, ive
## Topic 8: worri, pandem, health, stress, life
## Topic 9: just, feel, cant, realli, seem
## Topic 10: stress, constant, polic, live, sourc
## Topic 11: day, everi, someth, there, seem
## Topic 12: like, stress, say, feel, lot
## Topic 13: feel, like, expect, asian, pressur
## Topic 14: racism, discrimin, stress, sourc, life
## Topic 15: feel, like, black, see, hard
## Topic 16: tough, ive, live, year, hard
## Topic 17: one, will, mani, love, famili
## Topic 18: worri, current, futur, stress, sourc
## Topic 19: can, stress, deal, lot, thing
## Topic 20: depress, feel, caus, thing, sure
## Topic 21: realli, right, now, just, feel
## Topic 22: feel, make, thing, like, depress
## Topic 23: alway, pressur, stress, feel, like
## Topic 24: feel, get, know, tough, better
## Topic 25: feel, realli, like, hard, stress
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 11 (approx. per word bound = -4.888, relative change = 1.528e-04)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 12 (approx. per word bound = -4.887, relative change = 1.321e-04)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.

```

```

## Completing Iteration 13 (approx. per word bound = -4.886, relative change = 1.133e-04)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 14 (approx. per word bound = -4.886, relative change = 9.695e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 15 (approx. per word bound = -4.885, relative change = 8.629e-05)
## Topic 1: feel, like, dont, life, stuck
## Topic 2: tire, just, keep, time, water
## Topic 3: feel, like, enough, good, depress
## Topic 4: job, work, stress, sourc, life
## Topic 5: constant, like, feel, woman, fight
## Topic 6: world, stress, feel, hard, futur
## Topic 7: struggl, job, find, ive, end
## Topic 8: worri, health, pandem, stress, life
## Topic 9: just, cant, feel, seem, everyth
## Topic 10: stress, constant, polic, live, sourc
## Topic 11: day, everi, someth, there, seem
## Topic 12: like, stress, say, feel, current
## Topic 13: feel, asian, expect, pressur, like
## Topic 14: racism, discrimin, stress, life, sourc
## Topic 15: black, like, feel, see, america
## Topic 16: tough, live, hispan, year, ive
## Topic 17: one, will, safeti, mani, love
## Topic 18: worri, futur, current, stress, state
## Topic 19: can, stress, deal, lot, overwhelm
## Topic 20: depress, feel, caus, sure, think
## Topic 21: realli, right, now, just, feel
## Topic 22: feel, make, thing, like, depress
## Topic 23: alway, pressur, stress, feel, like
## Topic 24: feel, get, know, thing, better
## Topic 25: feel, realli, hard, stress, like
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 16 (approx. per word bound = -4.885, relative change = 7.507e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 17 (approx. per word bound = -4.885, relative change = 7.172e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 18 (approx. per word bound = -4.884, relative change = 6.961e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 19 (approx. per word bound = -4.884, relative change = 6.019e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 20 (approx. per word bound = -4.884, relative change = 5.726e-05)

```

```

## Topic 1: feel, like, dont, life, stuck
## Topic 2: tire, just, keep, time, water
## Topic 3: feel, like, enough, good, depress
## Topic 4: job, work, stress, sourc, life
## Topic 5: constant, like, feel, woman, fight
## Topic 6: world, stress, feel, hard, futur
## Topic 7: struggl, job, find, end, ive
## Topic 8: health, worri, pandem, mental, take
## Topic 9: just, cant, feel, seem, everyth
## Topic 10: stress, constant, polic, live, sourc
## Topic 11: day, everi, someth, there, seem
## Topic 12: like, stress, current, climat, feel
## Topic 13: asian, feel, expect, pressur, succeed
## Topic 14: racism, discrimin, alway, life, sourc
## Topic 15: black, like, feel, see, america
## Topic 16: hispan, tough, live, year, ive
## Topic 17: one, will, famili, safeti, worri
## Topic 18: worri, futur, current, stress, state
## Topic 19: can, stress, deal, lot, overwhelm
## Topic 20: depress, sure, feel, caus, think
## Topic 21: realli, right, now, just, feel
## Topic 22: feel, make, thing, like, depress
## Topic 23: alway, pressur, feel, stress, like
## Topic 24: thing, get, feel, know, better
## Topic 25: feel, work, realli, main, stress
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 21 (approx. per word bound = -4.884, relative change = 6.021e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 22 (approx. per word bound = -4.883, relative change = 5.098e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 23 (approx. per word bound = -4.883, relative change = 4.463e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 24 (approx. per word bound = -4.883, relative change = 4.428e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 25 (approx. per word bound = -4.883, relative change = 4.642e-05)
## Topic 1: feel, like, dont, life, stuck
## Topic 2: tire, just, keep, time, water
## Topic 3: feel, like, enough, good, depress
## Topic 4: job, stress, work, sourc, life
## Topic 5: constant, feel, like, woman, fight
## Topic 6: world, stress, feel, hard, futur
## Topic 7: struggl, job, find, end, ive
## Topic 8: health, mental, take, worri, pandem
## Topic 9: just, cant, feel, seem, everyth

```

```

## Topic 10: stress, constant, polic, sourc, live
## Topic 11: day, everi, there, someth, seem
## Topic 12: like, stress, climat, current, feel
## Topic 13: asian, feel, expect, succeed, pressur
## Topic 14: racism, discrimin, alway, life, sourc
## Topic 15: black, like, feel, see, america
## Topic 16: hispan, live, tough, year, man
## Topic 17: one, will, worri, famili, abl
## Topic 18: worri, futur, current, state, stress
## Topic 19: can, stress, deal, lot, overwhelm
## Topic 20: sure, depress, feel, caus, think
## Topic 21: realli, right, now, just, feel
## Topic 22: feel, make, thing, like, depress
## Topic 23: alway, feel, pressur, like, stress
## Topic 24: thing, know, get, feel, better
## Topic 25: work, main, feel, stress, realli
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 26 (approx. per word bound = -4.882, relative change = 4.906e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 27 (approx. per word bound = -4.882, relative change = 5.001e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 28 (approx. per word bound = -4.882, relative change = 4.261e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 29 (approx. per word bound = -4.882, relative change = 3.778e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 30 (approx. per word bound = -4.882, relative change = 3.851e-05)
## Topic 1: feel, like, dont, life, stuck
## Topic 2: tire, just, keep, time, water
## Topic 3: feel, like, enough, good, depress
## Topic 4: job, stress, work, sourc, life
## Topic 5: constant, feel, like, woman, fight
## Topic 6: world, stress, hard, feel, futur
## Topic 7: struggl, job, find, end, make
## Topic 8: health, take, mental, pandem, worri
## Topic 9: just, cant, feel, seem, everyth
## Topic 10: stress, constant, sourc, polic, live
## Topic 11: day, everi, there, someth, seem
## Topic 12: like, climat, stress, current, polit
## Topic 13: asian, expect, succeed, feel, pressur
## Topic 14: racism, discrimin, alway, life, sourc
## Topic 15: black, like, feel, see, america
## Topic 16: hispan, live, tough, year, man
## Topic 17: one, will, worri, famili, abl
## Topic 18: worri, futur, current, state, stress

```

```

## Topic 19: can, stress, deal, lot, overwhelm
## Topic 20: sure, depress, feel, caus, think
## Topic 21: realli, right, now, just, feel
## Topic 22: feel, make, thing, like, depress
## Topic 23: alway, feel, like, pressur, time
## Topic 24: thing, know, feel, get, world
## Topic 25: work, stress, main, feel, job
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 31 (approx. per word bound = -4.881, relative change = 4.071e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 32 (approx. per word bound = -4.881, relative change = 3.640e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 33 (approx. per word bound = -4.881, relative change = 3.384e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 34 (approx. per word bound = -4.881, relative change = 3.625e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 35 (approx. per word bound = -4.881, relative change = 4.055e-05)
## Topic 1: feel, like, dont, life, stuck
## Topic 2: tire, just, keep, time, tri
## Topic 3: feel, like, enough, good, depress
## Topic 4: job, stress, work, sourc, life
## Topic 5: constant, feel, like, woman, fight
## Topic 6: stress, world, hard, feel, futur
## Topic 7: struggl, job, find, end, make
## Topic 8: health, take, mental, pandem, worri
## Topic 9: cant, just, feel, seem, everyth
## Topic 10: stress, constant, sourc, polic, live
## Topic 11: day, everi, there, someth, seem
## Topic 12: like, climat, stress, current, polit
## Topic 13: asian, expect, succeed, pressur, feel
## Topic 14: racism, discrimin, alway, life, sourc
## Topic 15: black, like, feel, see, america
## Topic 16: hispan, live, tough, year, man
## Topic 17: worri, will, one, famili, abl
## Topic 18: worri, futur, state, current, stress
## Topic 19: can, stress, deal, lot, overwhelm
## Topic 20: sure, depress, feel, caus, think
## Topic 21: realli, right, just, now, feel
## Topic 22: feel, make, thing, like, depress
## Topic 23: alway, feel, like, pressur, time
## Topic 24: thing, know, feel, get, world
## Topic 25: work, stress, main, job, feel
## .....
## Completed E-Step (1 seconds).

```



```

## Completed M-Step.
## Completing Iteration 36 (approx. per word bound = -4.880, relative change = 4.366e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 37 (approx. per word bound = -4.880, relative change = 4.436e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 38 (approx. per word bound = -4.880, relative change = 3.969e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 39 (approx. per word bound = -4.880, relative change = 3.385e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 40 (approx. per word bound = -4.880, relative change = 3.012e-05)
## Topic 1: feel, like, dont, life, stuck
## Topic 2: tire, just, keep, time, tri
## Topic 3: feel, like, enough, good, depress
## Topic 4: job, stress, work, sourc, life
## Topic 5: constant, feel, like, woman, fight
## Topic 6: stress, world, hard, feel, futur
## Topic 7: struggl, job, find, make, end
## Topic 8: health, take, mental, pandem, worri
## Topic 9: cant, just, feel, seem, everyth
## Topic 10: stress, constant, sourc, polic, live
## Topic 11: day, everi, there, someth, seem
## Topic 12: like, climat, stress, current, polit
## Topic 13: asian, succeed, expect, pressur, feel
## Topic 14: racism, discrimin, alway, life, sourc
## Topic 15: black, feel, like, see, america
## Topic 16: hispan, live, tough, year, man
## Topic 17: worri, will, famili, one, abl
## Topic 18: worri, futur, state, current, stress
## Topic 19: can, stress, deal, lot, overwhelm
## Topic 20: sure, depress, feel, caus, think
## Topic 21: realli, right, just, now, feel
## Topic 22: feel, make, thing, like, depress
## Topic 23: alway, feel, like, pressur, time
## Topic 24: thing, know, feel, world, get
## Topic 25: work, stress, main, job, feel
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 41 (approx. per word bound = -4.880, relative change = 3.016e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 42 (approx. per word bound = -4.879, relative change = 2.814e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.

```

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## Completing Iteration 43 (approx. per word bound = -4.879, relative change = 2.670e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 44 (approx. per word bound = -4.879, relative change = 2.760e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 45 (approx. per word bound = -4.879, relative change = 3.159e-05)
## Topic 1: feel, like, dont, life, stuck
## Topic 2: tire, just, keep, time, tri
## Topic 3: feel, like, enough, good, depress
## Topic 4: job, stress, work, sourc, life
## Topic 5: feel, constant, like, woman, fight
## Topic 6: stress, hard, world, feel, futur
## Topic 7: struggl, job, find, make, end
## Topic 8: health, take, mental, pandem, worri
## Topic 9: cant, just, feel, seem, everyth
## Topic 10: stress, constant, sourc, polic, live
## Topic 11: day, everi, there, someth, seem
## Topic 12: like, climat, stress, current, polit
## Topic 13: asian, succeed, expect, pressur, feel
## Topic 14: racism, discrimin, alway, life, sourc
## Topic 15: black, feel, like, see, america
## Topic 16: hispan, live, tough, year, man
## Topic 17: worri, famili, will, one, abl
## Topic 18: worri, futur, state, current, stress
## Topic 19: can, stress, deal, lot, overwhelm
## Topic 20: sure, depress, feel, think, caus
## Topic 21: realli, right, just, now, feel
## Topic 22: feel, make, thing, like, depress
## Topic 23: alway, feel, like, pressur, time
## Topic 24: thing, know, world, feel, get
## Topic 25: work, stress, main, job, feel
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 46 (approx. per word bound = -4.879, relative change = 3.200e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 47 (approx. per word bound = -4.879, relative change = 2.346e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 48 (approx. per word bound = -4.879, relative change = 1.799e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 49 (approx. per word bound = -4.879, relative change = 1.499e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 50 (approx. per word bound = -4.879, relative change = 1.269e-05)

```

```

## Topic 1: feel, like, dont, life, stuck
## Topic 2: tire, just, keep, time, tri
## Topic 3: feel, like, enough, good, depress
## Topic 4: job, stress, work, sourc, life
## Topic 5: feel, constant, like, woman, fight
## Topic 6: stress, hard, world, feel, futur
## Topic 7: struggl, job, find, make, end
## Topic 8: health, take, mental, pandem, worri
## Topic 9: cant, just, feel, seem, everyth
## Topic 10: stress, constant, sourc, polic, live
## Topic 11: day, there, everi, seem, someth
## Topic 12: like, climat, current, stress, polit
## Topic 13: asian, succeed, expect, pressur, school
## Topic 14: racism, discrimin, alway, life, sourc
## Topic 15: black, feel, like, see, america
## Topic 16: hispan, live, tough, year, man
## Topic 17: worri, famili, will, one, abl
## Topic 18: worri, futur, state, current, stress
## Topic 19: can, stress, deal, lot, overwhelm
## Topic 20: sure, depress, feel, think, caus
## Topic 21: realli, just, right, now, feel
## Topic 22: feel, make, thing, like, depress
## Topic 23: alway, feel, like, pressur, time
## Topic 24: thing, world, know, feel, get
## Topic 25: work, stress, main, job, feel
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 51 (approx. per word bound = -4.878, relative change = 1.188e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 52 (approx. per word bound = -4.878, relative change = 1.174e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Completing Iteration 53 (approx. per word bound = -4.878, relative change = 1.104e-05)
## .....
## Completed E-Step (1 seconds).
## Completed M-Step.
## Model Converged

```

```
summary(model_depression)
```

```
## A topic model with 25 topics, 3120 documents and a 1315 word dictionary.
```

```

## Topic 1 Top Words:
##   Highest Prob: feel, like, dont, life, stuck, know, get
##   FREX: stuck, rut, motion, dont, white, exist, nowher
##   Lift: ambit, drift, grind, passion, rut, space, nowher
##   Score: stuck, dont, rut, motion, depress, anyth, purpos
## Topic 2 Top Words:
##   Highest Prob: tire, just, keep, time, tri, hard, water
##   FREX: tire, water, strong, tread, told, head, keep
##   Lift: built, depriv, endless, pretend, resili, loud, water

```

Score: tire, water, just, told, keep, strong, head

Topic 3 Top Words:

Highest Prob: feel, like, enough, good, depress, never, anyth

FREX: enough, good, smart, compar, worthi, ill, measur

Lift: skinni, smart, thin, attent, handsom, miser, talent

Score: enough, good, never, depress, smart, compar, like

Topic 4 Top Words:

Highest Prob: job, stress, work, sourc, life, also, moment

FREX: hour, long, high-pressur, environ, perform, deadlin, moment

Lift: hour, bosss, finish, high-pressur, visa, scrutini, long

Score: hour, long, biggest, moment, high-pressur, job, perform

Topic 5 Top Words:

Highest Prob: feel, constant, like, woman, fight, live, attack

FREX: fight, uphil, woman, battl, attack, messag, constant

Lift: breakdown, flight, lazi, latina, nervous, uphil, battl

Score: fight, woman, battl, uphil, constant, attack, bombard

Topic 6 Top Words:

Highest Prob: stress, hard, feel, world, futur, everyth, life

FREX: uncertainti, happen, uncertain, next, scari, control, everyth

Lift: grip, drop, limbo, thread, unravel, uncertain, etc

Score: uncertainti, futur, happen, everyth, next, world, state

Topic 7 Top Words:

Highest Prob: struggl, job, find, make, end, ive, money

FREX: end, bill, find, pay, medic, money, luck

Lift: construct, evict, interview, luck, resum, worker, medic

Score: struggl, find, job, end, ive, money, meet

Topic 8 Top Words:

Highest Prob: health, take, mental, pandem, worri, toll, stress

FREX: health, toll, mental, pandem, take, virus, econom

Lift: long-term, contract, devast, disrupt, firsthand, healthcar, novel

Score: health, pandem, mental, toll, take, coronavirus, long-term

Topic 9 Top Words:

Highest Prob: cant, just, feel, seem, everyth, know, late

FREX: cant, advic, shake, help, pointless, dark, seem

Lift: chat, mope, wisdom, advic, word, snap, pointless

Score: cant, just, seem, everyth, shake, know, late

Topic 10 Top Words:

Highest Prob: stress, constant, sourc, polic, live, fear, violenc

FREX: threat, walk, victim, target, fear, polic, awar

Lift: avoid, harm, hire, walk, author, confront, ever-pres

Score: polic, fear, threat, kill, awar, victim, black

Topic 11 Top Words:

Highest Prob: day, there, everi, seem, someth, like, new

FREX: new, day, everi, there, someth, harder, develop

Lift: privileg, bicker, doom, gloom, guilti, otherwis, tweet

Score: day, everi, new, there, someth, seem, develop

Topic 12 Top Words:

Highest Prob: like, climat, current, stress, polit, sourc, feel

FREX: climat, social, polit, tension, say, current, divis

Lift: engag, inform, navig, flux, ground, volatil, erupt

Score: climat, polit, social, current, say, tension, uncertainti

Topic 13 Top Words:

Highest Prob: asian, succeed, expect, pressur, school, parent, feel

FREX: asian, school, succeed, parent, expect, tradit, old

Lift: adult, household, strict, appear, deeper, son, tradit
 ## Score: asian, succeed, pressur, parent, school, expect, tradit
 ## Topic 14 Top Words:
 ## Highest Prob: racism, discrimin, alway, life, sourc, face, hard
 ## FREX: discrimin, daili, face, basi, racism, twice, treat
 ## Lift: assumpt, microaggress, overt, front, justifi, limit, sexual
 ## Score: discrimin, racism, twice, basi, daili, skin, color
 ## Topic 15 Top Words:
 ## Highest Prob: black, feel, like, see, man, america, peopl
 ## FREX: stori, black, see, america, poverti, far, deck
 ## Lift: imagin, anim, dispos, disproportion, higher, rate, scroll
 ## Score: black, polic, kill, america, stori, brutal, news
 ## Topic 16 Top Words:
 ## Highest Prob: hispan, live, tough, year, man, famili, ive
 ## FREX: hispan, came, home, back, belong, tough, year
 ## Lift: came, homesick, mexico, somewher, accent, although, blog
 ## Score: hispan, ive, tough, came, year, man, live
 ## Topic 17 Top Words:
 ## Highest Prob: worri, famili, will, one, abl, whether, safeti
 ## FREX: will, abl, provid, safeti, whether, probabl, status
 ## Lift: detain, return, status, imhispan, undocu, well-, provid
 ## Score: safeti, will, worri, whether, famili, abl, provid
 ## Topic 18 Top Words:
 ## Highest Prob: worri, futur, state, current, stress, life, sourc
 ## FREX: administr, countri, state, situat, current, futur, upcom
 ## Lift: candid, erod, administr, agenda, civil, enact, leader
 ## Score: current, polit, state, countri, futur, biggest, worri
 ## Topic 19 Top Words:
 ## Highest Prob: can, stress, deal, lot, overwhelm, person, mani
 ## FREX: deal, difficult, can, contribut, lead, addit, juggl
 ## Lift: proper, disagr, dispar, greater, unstabl, field, client
 ## Score: can, deal, issu, often, mani, stress, stressor
 ## Topic 20 Top Words:
 ## Highest Prob: sure, depress, feel, think, caus, what, might
 ## FREX: sure, combin, might, great, mayb, talk, anyon
 ## Lift: exact, fatigu, hardship, lay, mayb, mood, common
 ## Score: sure, depress, caus, what, combin, might, anyon
 ## Topic 21 Top Words:
 ## Highest Prob: realli, just, right, now, feel, struggl, late
 ## FREX: realli, now, right, just, share, late, struggl
 ## Lift: solut, stuff, share, realli, now, right, guy
 ## Score: realli, now, right, just, struggl, late, hey
 ## Topic 22 Top Words:
 ## Highest Prob: feel, make, thing, like, depress, well, one
 ## FREX: second, last, relationship, close, well, make, first
 ## Lift: despit, date, insurmount, second, escal, nearbi, third
 ## Score: last, thing, second, well, relationship, first, make
 ## Topic 23 Top Words:
 ## Highest Prob: alway, feel, like, pressur, time, perfect, constant
 ## FREX: perfect, mistak, relax, alway, pressur, order, never
 ## Lift: daughter, excel, reflect, consequ, cowork, game, interpret
 ## Score: pressur, perfect, mistak, alway, never, relax, succeed
 ## Topic 24 Top Words:
 ## Highest Prob: thing, world, know, feel, get, like, better

```

##      FREX: hope, better, apart, wors, thing, fall, scare
##      Lift: appetit, gone, rage, tank, four, apart, hope
##      Score: apart, better, thing, hope, fall, world, state
## Topic 25 Top Words:
##      Highest Prob: work, stress, main, job, feel, life, sourc
##      FREX: restaur, work, cut, start, offic, custom, factori
##      Lift: content, faster, patient, phone, pollut, restaur, rude
##      Score: work, job, start, stress, main, offic, sourc
labelTopics(model_depression, n = 30)

## Topic 1 Top Words:
##      Highest Prob: feel, like, dont, life, stuck, know, get, depress, just, live, anyth, white, rut
##      FREX: stuck, rut, motion, dont, white, exist, nowher, purpos, wheel, passion, anywher, spin, c
##      Lift: ambit, drift, grind, passion, rut, space, nowher, motion, male, stuck, forev, wheel, nice
##      Score: stuck, dont, rut, motion, depress, anyth, purpos, know, white, like, earli, wheel, get,
## Topic 2 Top Words:
##      Highest Prob: tire, just, keep, time, tri, hard, water, head, one, told, much, strong, want, s
##      FREX: tire, water, strong, tread, told, head, keep, drown, just, tri, time, pretend, give, doe
##      Lift: built, depriv, endless, pretend, resili, loud, water, tread, tire, dirt, stoic, strong, c
##      Score: tire, water, just, told, keep, strong, head, built, tread, tri, give, time, drown, matt
## Topic 3 Top Words:
##      Highest Prob: feel, like, enough, good, depress, never, anyth, ill, compar, success, smart, me
##      FREX: enough, good, smart, compar, worthi, ill, measur, never, amount, success, deserv, talent
##      Lift: skinni, smart, thin, attent, handsom, miser, talent, worthi, attract, good, deserv, enoug
##      Score: enough, good, never, depress, smart, compar, like, anyth, feel, skinni, success, ill, m
## Topic 4 Top Words:
##      Highest Prob: job, stress, work, sourc, life, also, moment, biggest, worri, lot, long, hour, co
##      FREX: hour, long, high-pressur, environ, perform, deadlin, moment, paid, job, biggest, work, d
##      Lift: hour, bosss, finish, high-pressur, visa, scrutini, long, deadlin, injur, fast-pac, work-
##      Score: hour, long, biggest, moment, high-pressur, job, perform, work, environ, sourc, deadlin,
## Topic 5 Top Words:
##      Highest Prob: feel, constant, like, woman, fight, live, attack, battl, uphill, world, exhaust, c
##      FREX: fight, uphill, woman, battl, attack, messag, constant, latina, tell, bombard, place, voic
##      Lift: breakdown, flight, lazi, latina, nervous, uphill, battl, fight, messag, attack, welcom, w
##      Score: fight, woman, battl, uphill, constant, attack, bombard, flight, like, fear, live, feel, m
## Topic 6 Top Words:
##      Highest Prob: stress, hard, feel, world, futur, everyth, life, like, sourc, worri, happen, unco
##      FREX: uncertainti, happen, uncertain, next, scari, control, everyth, futur, posit, chaotic, st
##      Lift: grip, drop, limbo, thread, unravel, uncertain, etc, chaotic, midst, shoe, scari, next, w
##      Score: uncertainti, futur, happen, everyth, next, world, state, sourc, biggest, stress, uncert
## Topic 7 Top Words:
##      Highest Prob: struggl, job, find, make, end, ive, money, meet, famili, pay, bill, support, har
##      FREX: end, bill, find, pay, medic, money, luck, kid, support, struggl, bare, ive, two, food, m
##      Lift: construct, evict, interview, luck, resum, worker, medic, march, rock, sink, homeless, pa
##      Score: struggl, find, job, end, ive, money, meet, pay, bill, resum, financi, make, support, tw
## Topic 8 Top Words:
##      Highest Prob: health, take, mental, pandem, worri, toll, stress, also, life, one, sourc, love,
##      FREX: health, toll, mental, pandem, take, virus, econom, physic, coronavirus, sick, contract, c
##      Lift: long-term, contract, devast, disrupt, firsthand, healthcar, novel, outbreak, wave, virus
##      Score: health, pandem, mental, toll, take, coronavirus, long-term, virus, econom, worri, physi
## Topic 9 Top Words:
##      Highest Prob: cant, just, feel, seem, everyth, know, late, help, anyth, like, everyon, break, c
##      FREX: cant, advic, shake, help, pointless, dark, seem, everyth, word, catch, hopeless, break, j
##      Lift: chat, mope, wisdom, advic, word, snap, pointless, terribl, funk, similar, pile, dark, re

```

Score: cant, just, seem, everyth, shake, know, late, anyth, advic, pointless, catch, word, help

Topic 10 Top Words:

Highest Prob: stress, constant, sourc, polic, live, fear, violenc, life, black, alway, main, m

FREX: threat, walk, victim, target, fear, polic, awar, violenc, without, fact, compound, crime

Lift: avoid, harm, hire, walk, author, confront, ever-pres, frisk, hypervigil, plagu, protect,

Score: polic, fear, threat, kill, awar, victim, black, violenc, brutal, safeti, target, skin,

Topic 11 Top Words:

Highest Prob: day, there, everi, seem, someth, like, new, tri, hard, keep, stay, posit, much, a

FREX: new, day, everi, there, someth, harder, develop, seem, sight, stay, posit, privileg, aro

Lift: privileg, bicker, doom, gloom, guilti, otherwis, tweet, new, tunnel, develop, roof, dram

Score: day, everi, new, there, someth, seem, develop, harder, stay, posit, guilti, news, keep,

Topic 12 Top Words:

Highest Prob: like, climat, current, stress, polit, sourc, feel, social, main, say, lot, world

FREX: climat, social, polit, tension, say, current, divis, unrest, turmoil, kind, children, in

Lift: engag, inform, navig, flux, ground, volatil, erupt, animos, upheav, evolv, social, inher

Score: climat, polit, social, current, say, tension, uncertainti, sourc, divis, world, children

Topic 13 Top Words:

Highest Prob: asian, succeed, expect, pressur, school, parent, feel, man, fall, lot, everyon, i

FREX: asian, school, succeed, parent, expect, tradit, old, career, grade, descent, academ, pre

Lift: adult, household, strict, appear, deeper, son, tradit, academ, grade, conform, independ,

Score: asian, succeed, pressur, parent, school, expect, tradit, old, appear, fall, career, gra

Topic 14 Top Words:

Highest Prob: racism, discrimin, alway, life, sourc, face, hard, like, stress, treat, main, tw

FREX: discrimin, daili, face, basi, racism, twice, treat, experi, prove, microaggress, judg, c

Lift: assumpt, microaggress, overt, front, justifi, limit, sexual, stranger, subtl, base, look

Score: discrimin, racism, twice, basi, daili, skin, color, face, treat, prove, black, judg, exp

Topic 15 Top Words:

Highest Prob: black, feel, like, see, man, america, peopl, live, depress, news, polic, world, l

FREX: stori, black, see, america, poverti, far, deck, kill, stack, bad, news, report, injustic

Lift: imagin, anim, dispos, disproportion, higher, rate, scroll, simpl, upsid, vicious, deck, l

Score: black, polic, kill, america, stori, brutal, news, man, see, racism, violenc, vicious, d

Topic 16 Top Words:

Highest Prob: hispan, live, tough, year, man, famili, ive, back, everyon, home, countri, hard,

FREX: hispan, came, home, back, belong, tough, year, your, espec, sinc, miss, child, cultur, a

Lift: came, homesick, mexico, somewher, accent, although, blog, class, destroy, known, rapist,

Score: hispan, ive, tough, came, year, man, live, countri, home, back, although, unit, america

Topic 17 Top Words:

Highest Prob: worri, famili, will, one, abl, whether, safeti, also, main, provid, love, mani, p

FREX: will, abl, provid, safeti, whether, probabl, status, famili, worri, safe, immigr, love, c

Lift: detain, return, status, imhispan, undocu, well-, provid, question, safeti, cours, immigr

Score: safeti, will, worri, whether, famili, abl, provid, one, immigr, probabl, deport, status

Topic 18 Top Words:

Highest Prob: worri, futur, state, current, stress, life, sourc, countri, also, polit, biggest

FREX: administr, countri, state, situat, current, futur, upcom, presidenti, unit, economi, pol

Lift: candid, erod, administr, agenda, civil, enact, leader, polici, vote, presidenti, democra

Score: current, polit, state, countri, futur, biggest, worri, moment, situat, economi, adminis

Topic 19 Top Words:

Highest Prob: can, stress, deal, lot, overwhelm, person, mani, one, thing, caus, anxieti, some

FREX: deal, difficult, can, contribut, lead, addit, juggl, issu, work-rel, insecur, stressor, i

Lift: proper, disagr, dispar, greater, unstabl, field, client, superior, industri, role, compar

Score: can, deal, issu, often, mani, stress, stressor, lead, overwhelm, caus, person, difficul

Topic 20 Top Words:

Highest Prob: sure, depress, feel, think, caus, what, might, anyon, talk, isol, combin, proble

FREX: sure, combin, might, great, mayb, talk, anyon, problem, hello, isol, what, caus, think, i

```

##      Lift: exact, fatigu, hardship, lay, mayb, mood, common, combin, pinpoint, hello, therapist, exp
##      Score: sure, depress, caus, what, combin, might, anyon, think, talk, problem, isol, earli, grea
## Topic 21 Top Words:
##      Highest Prob: realli, just, right, now, feel, struggl, late, know, dont, think, want, alon, lo
##      FREX: realli, now, right, just, share, late, struggl, hey, lost, alon, stuff, want, think, know
##      Lift: solut, stuff, share, realli, now, right, guy, suck, hey, lost, low-pay, point, alon, str
##      Score: realli, now, right, just, struggl, late, hey, share, lost, alon, know, dont, think, wha
## Topic 22 Top Words:
##      Highest Prob: feel, make, thing, like, depress, well, one, last, relationship, also, friend, f
##      FREX: second, last, relationship, close, well, make, first, lone, thing, troubl, final, genera
##      Lift: despit, date, insurmount, second, escal, nearbi, third, girlfriend, close, self-esteem,
##      Score: last, thing, second, well, relationship, first, make, lone, depress, close, troubl, fin
## Topic 23 Top Words:
##      Highest Prob: alway, feel, like, pressur, time, perfect, constant, stress, life, make, never, m
##      FREX: perfect, mistak, relax, alway, pressur, order, never, time, free, achiev, second-guess, v
##      Lift: daughter, excel, reflect, consequ, cowork, game, interpret, ruin, second-guess, evalu, m
##      Score: pressur, perfect, mistak, alway, never, relax, succeed, time, sourc, stress, game, orde
## Topic 24 Top Words:
##      Highest Prob: thing, world, know, feel, get, like, better, dont, year, tough, fall, hope, stat
##      FREX: hope, better, apart, wors, thing, fall, scare, soon, know, ever, hold, year, tough, get,
##      Lift: appetit, gone, rage, tank, four, apart, hope, stronger, soon, wors, scare, better, power
##      Score: apart, better, thing, hope, fall, world, state, know, tough, wors, dont, hold, year, ge
## Topic 25 Top Words:
##      Highest Prob: work, stress, main, job, feel, life, sourc, keep, realli, start, constant, much,
##      FREX: restaur, work, cut, start, offic, custom, factori, feet, nois, servic, today, longer, ma
##      Lift: content, faster, patient, phone, pollut, restaur, rude, center, feet, nois, servic, degr
##      Score: work, job, start, stress, main, offic, sourc, factori, cut, custom, keep, rude, surround

```

Calculating the effect of the covariates on the topics

```

prep_gender_eth <- stm::estimateEffect(~gender_race,
                                     model_depression,
                                     meta = survey_meta[, c("pandemic", "gender_race")])

```

Plotting the outcome

```

make_plot <- function(param, range_val, title, positive_color, negative_color, label1, label2, arrow_l
means <- param$means
topics <- param$topics
topic <- c(1:length(gender$topics))
cis <- param$cis
labels <- param$labels
# Plot
plot_data <- data.frame(topics = topics, means = unlist(means), lower = sapply(cis, "[", 1), upper = s
ylim_range <- range(plot_data$lower, plot_data$upper)
ylim_range[2] <- ylim_range[2] + 0.01
# Create the plot with mean on the x-axis
plot(plot_data$means, plot_data$topics, type = "n", ylab = "", , yaxt = "n", xlab = title,
      xlim = range_val, ylim = c(0, length(topics)+2))

# Add dotted line at x = 0
abline(v = 0, lty = 2)
it <- length(topics)
for(i in 1:length(topics)){
  if(means[[i]] >= 0) {
    color = positive_color

```



```

    } else {
      color = negative_color
    }
    points(means[[i]], it, pch=16, col = color)
    lines(c(cis[[i]][1],cis[[i]][2]),c(it,it), col = color, lwd = 2)
    # axis(2,at=it, labels=stringr::str_wrap(labels[i],width=width),las=1, cex=.25, tick=F, pos=cis[[i]][1])
    text(means[[i]], it, labels[[i]], pos = 2, offset = text_offset, cex=1.05 )
    it = it-1
  }

  arrow_x <-range_val[1] + arrow_length
  # arrow_y <- mean(topics)
  Y = length(topics)
  # Add arrow
  arrows(range_val[1] + 2*arrow_length, Y+1, range_val[1], Y+1, length = 0.1, lwd = 2, col = negative_color)

  arrows(range_val[2] - 2*arrow_length, Y+1, range_val[2], Y+1, length = 0.1, lwd = 2, col = positive_color)

  X1 = (0.01+range_val[1] + 2*arrow_length + range_val[1])/2
  X2 = (range_val[2] - 2*arrow_length + range_val[2]-0.01)/2
  text(X1, Y+1.8, label1, cex = 1)
  text(X2, Y+1.8, label2, cex = 1)
}

```

Assigning colors to categories

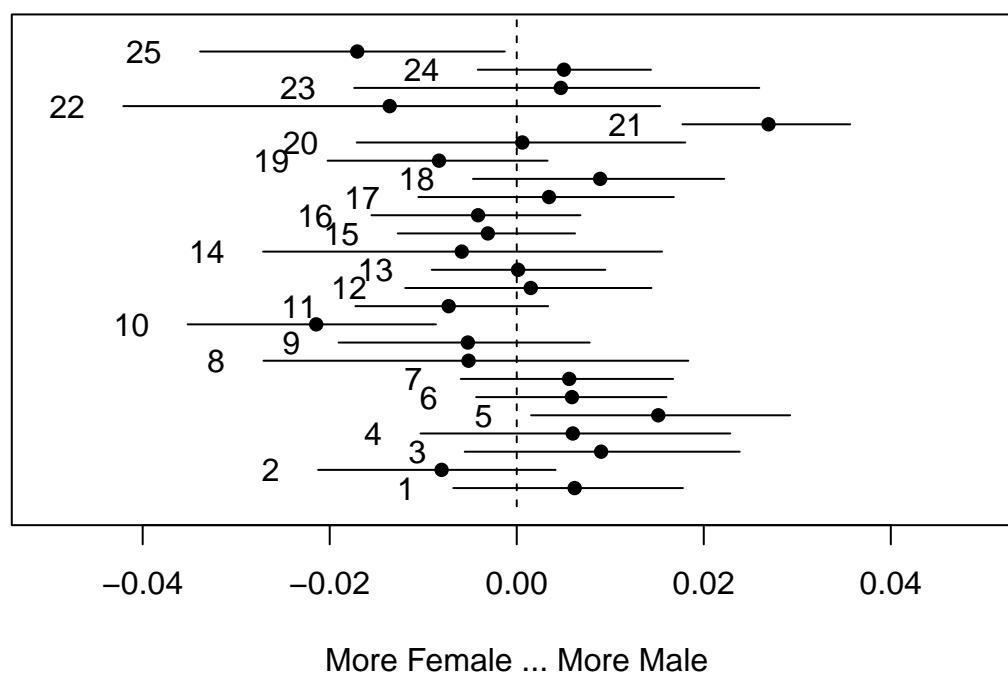
```

white <- "red"#change
asian <- "magenta2"
black <- "green3"#change
hispanic <- "blue"#make dark
men <- "darkorchid"
women <- "orangered"#change
men_black <- "lightcoral"
women_black <- "lightslateblue"

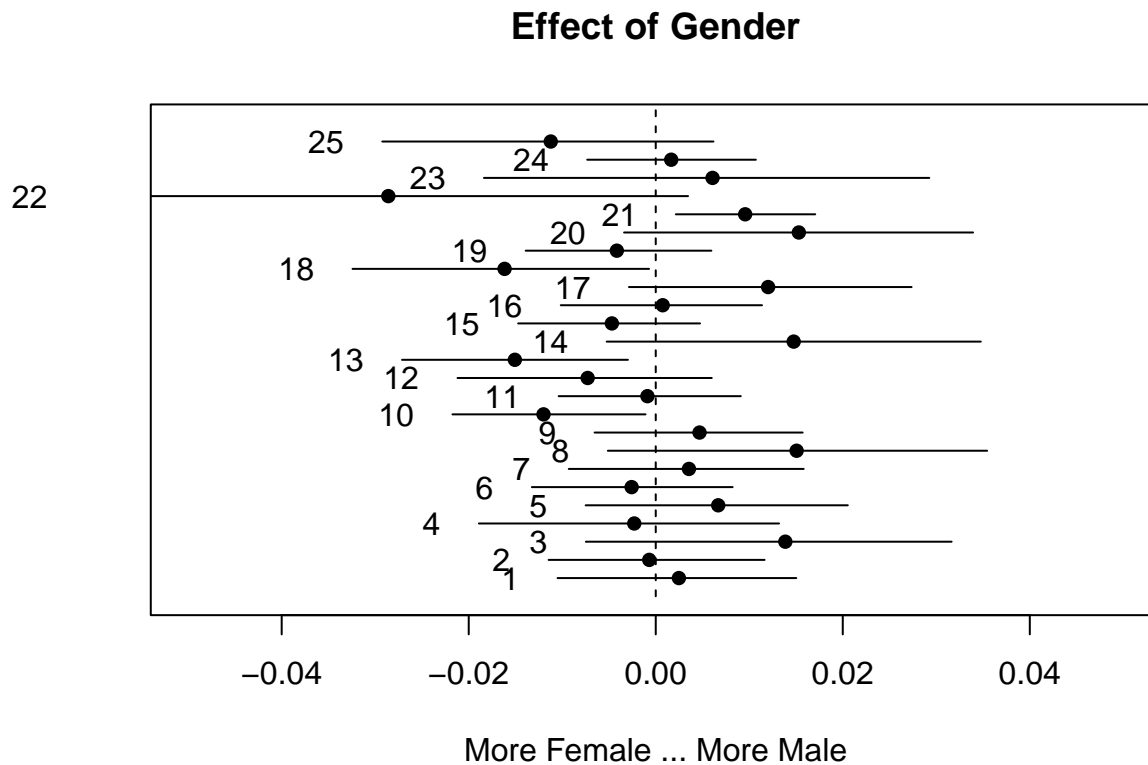
gender <- plot(prepare_gender_eth, covariate = "gender_race", model = model_depression, method = "difference",
  cov.value1 = "Female-hispanic", cov.value2 = "Male-hispanic" ,
  xlab = "More Female ... More Male",
  labeltype = "custom",
  xlim = c(-0.05, 0.05),
  main = "Effect of Gender",
)

```

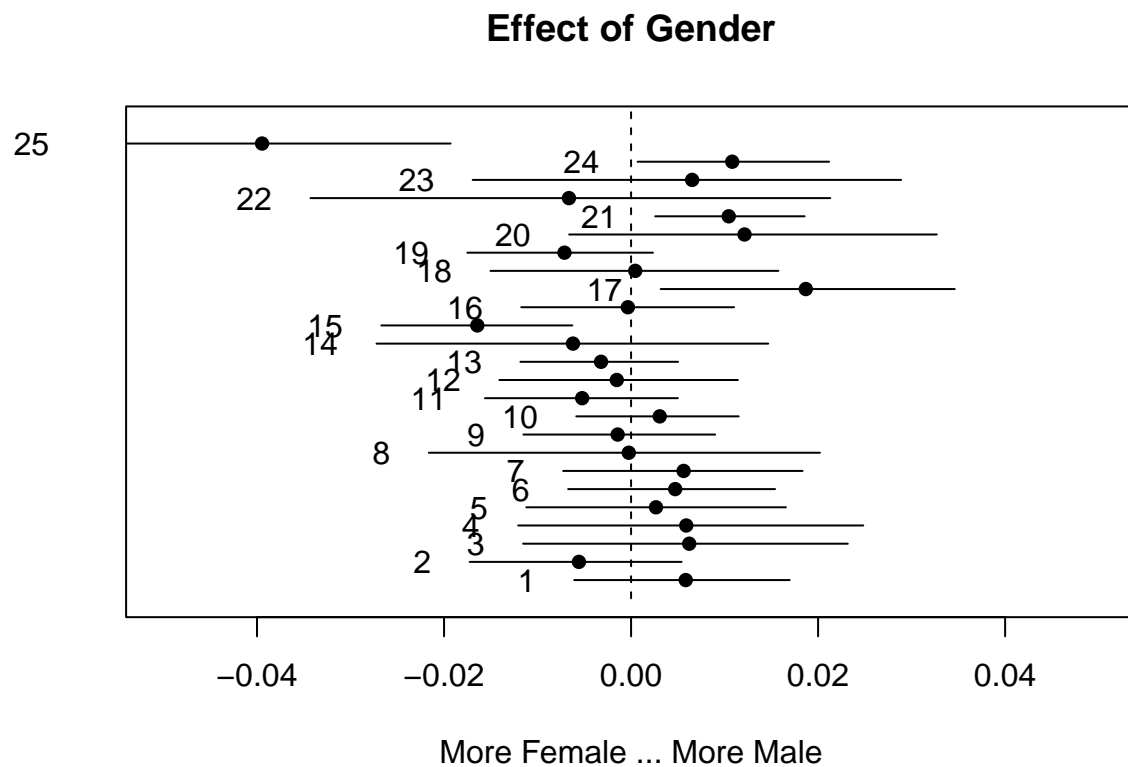
Effect of Gender



```
plot(prepare_gender_eth, covariate = "gender_race", model = model_depression, method = "difference",
     cov.value1 = "Female-asian", cov.value2 = "Male-asian" ,
     xlab = "More Female ... More Male",
     labeltype = "custom",
     xlim = c(-0.05, 0.05),
     main = "Effect of Gender",
)
```



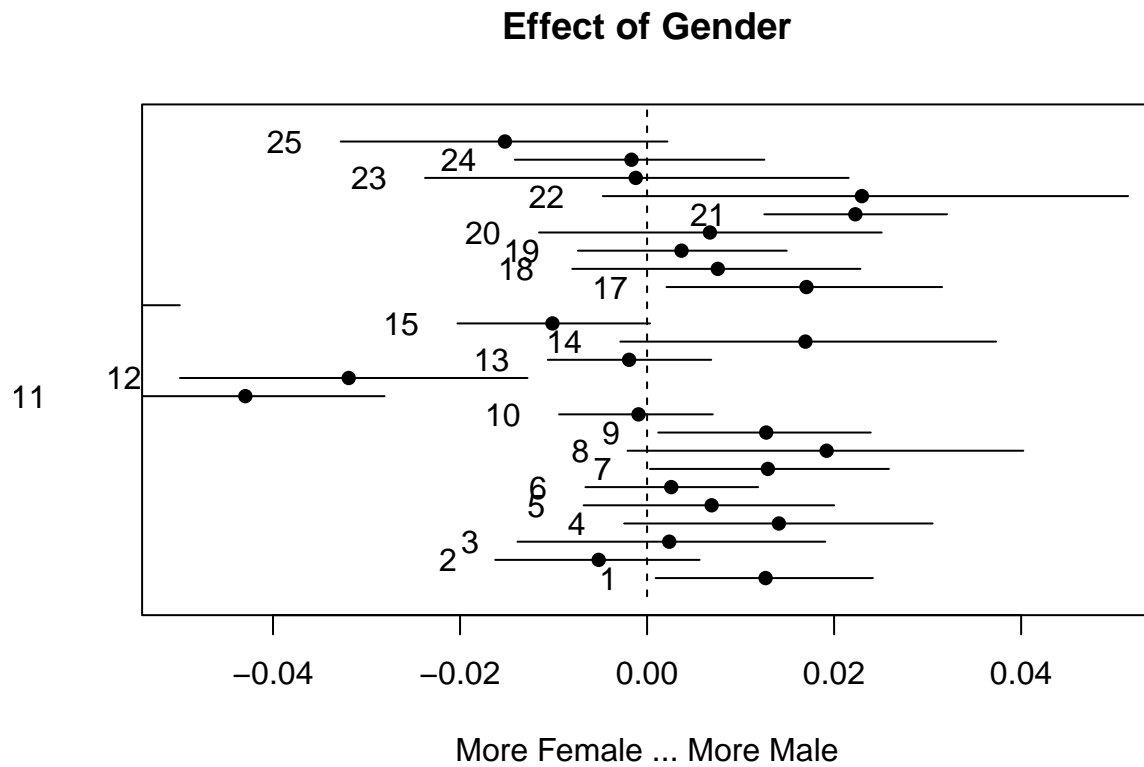
```
plot(prepare_gender_eth, covariate = "gender_race", model = model_depression, method = "difference",
     cov.value1 = "Female-white", cov.value2 = "Male-white" ,
     xlab = "More Female ... More Male",
     labeltype = "custom",
     xlim = c(-0.05, 0.05),
     main = "Effect of Gender",
)
```



```

plot(prepare_gender_eth, covariate = "gender_race", model = model_depression, method = "difference",
     cov.value1 = "Female-black", cov.value2 = "Male-black" ,
     xlab = "More Female ... More Male",
     labeltype = "custom",
     xlim = c(-0.05, 0.05),
     main = "Effect of Gender",
)

```

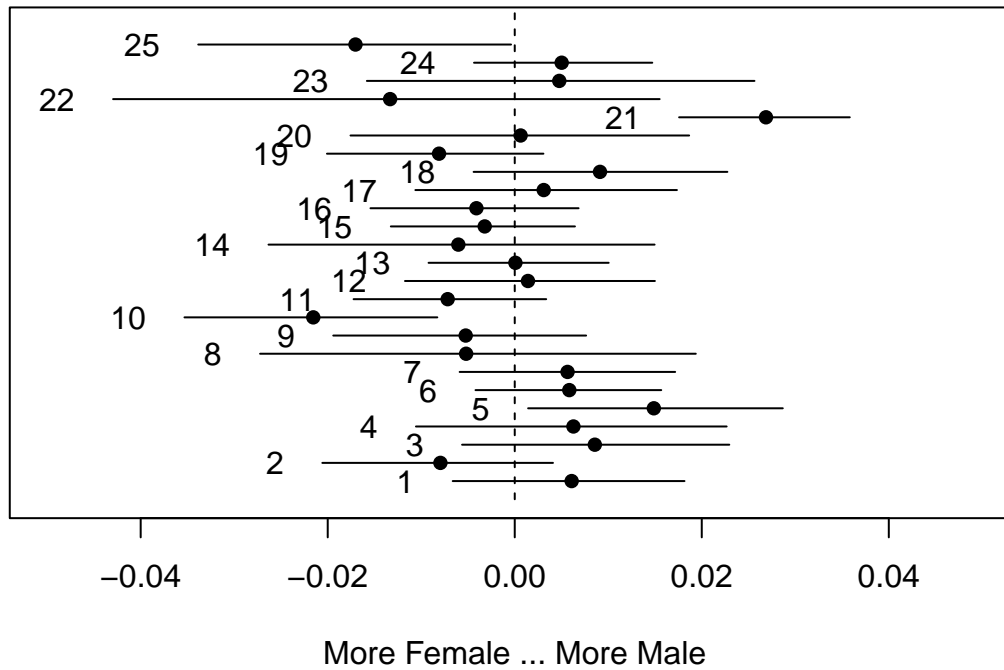


```

plot(prepare_gender_eth, covariate = "gender_race", model = model_depression, method = "difference",
     cov.value1 = "Female-hispanic", cov.value2 = "Male-hispanic" ,
     xlab = "More Female ... More Male",
     labeltype = "custom",
     xlim = c(-0.05, 0.05),
     main = "Effect of Gender",
)

```

Effect of Gender

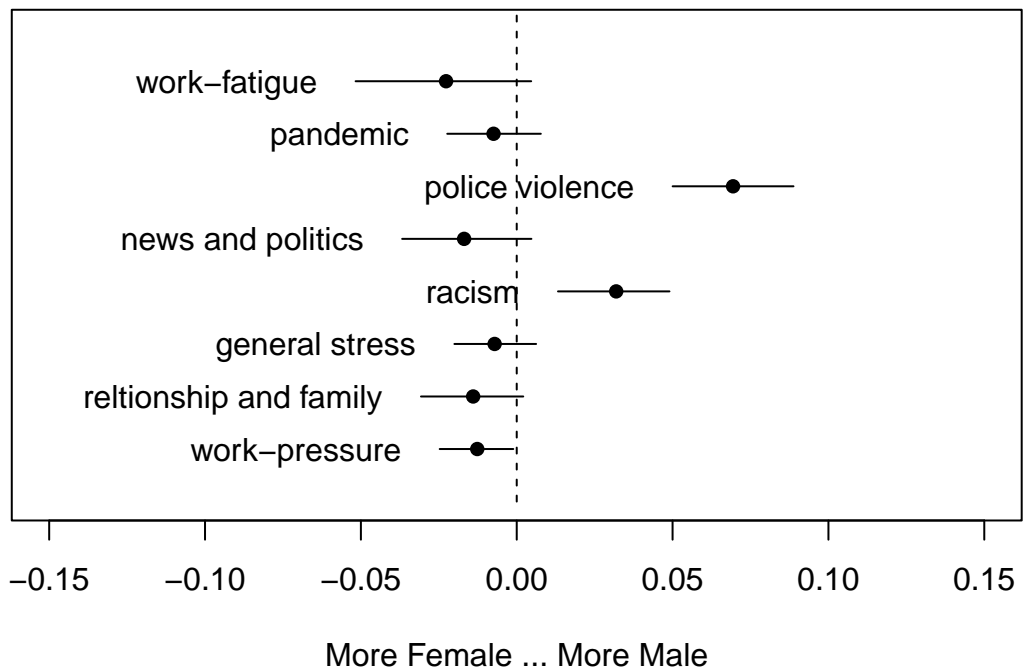


```

topics_list <- c(4, 8, 10, 12, 14, 21, 22, 25)
topic_names <- c("work-fatigue", "pandemic", "police violence", "news and politics", "racism", "general

black_comp <- plot(prepare_gender_eth, covariate = "gender_race", model = model_depression, method = "diff
  cov.value1 = "Male-black", cov.value2 = "Female-black" ,
  xlab = "More Female ... More Male",
  labeltype = "custom",
  xlim = c(-0.15, 0.15),
  topics <- topics_list,
  custom.labels = topic_names
)

```



```
range_val <- range(-0.15, 0.15)
make_plot(black_comp, range_val, "", men_black, women_black, "More Female", "More Male")
```

