Movie Script Keyness

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```r
library(tidyr) #text analysis in R
```

```
## Warning: package 'tidyr' was built under R version 4.1.2
```

```r
library(pdftools)
```

```
## Warning: package 'pdftools' was built under R version 4.1.2
```

```
## Using poppler version 22.02.0
```

```r
library(lubridate) #working with date data
```

```
##
## Attaching package: 'lubridate'
```

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

```r
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.6     v dplyr   1.0.9
## v tibble  3.1.7     v stringr 1.4.0
## v readr   2.1.2     v forcats 0.5.1
## v purrr   0.3.4
```

```
## Warning: package 'ggplot2' was built under R version 4.1.2
```

```
## Warning: package 'tibble' was built under R version 4.1.2
```

```
## Warning: package 'readr' was built under R version 4.1.2
```

```
## Warning: package 'dplyr' was built under R version 4.1.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x lubridate::as.difftime() masks base::as.difftime()
## x lubridate::date()        masks base::date()
## x dplyr::filter()          masks stats::filter()
## x lubridate::intersect()   masks base::intersect()
## x dplyr::lag()             masks stats::lag()
## x lubridate::setdiff()     masks base::setdiff()
## x lubridate::union()       masks base::union()
```

```
library(tidytext)
library(readr)
library(quanteda)
```

```
## Warning: package ’quanteda’ was built under R version 4.1.2
```

```
## Package version: 3.2.1
## Unicode version: 13.0
## ICU version: 69.1
```

```
## Parallel computing: 8 of 8 threads used.
```

```
## See https://quanteda.io for tutorials and examples.
```

```
library(readtext) #quanteda subpackage for reading pdf
library(quanteda.textstats)
library(quanteda.textplots)
```

```
## Warning: package ’quanteda.textplots’ was built under R version 4.1.2
```

```
library(ggplot2)
library(forcats)
library(stringr)
library(quanteda.textplots)
library(widyr)# pairwise correlations
library(igraph) #network plots
```

```
## Warning: package ’igraph’ was built under R version 4.1.2
```

```
##
## Attaching package: ’igraph’
```

```
## The following object is masked from ’package:quanteda.textplots’:
##
##     as.igraph
```

```
## The following objects are masked from ’package:dplyr’:
##
##     as_data_frame, groups, union
## The following objects are masked from 'package:purrr':
##
##     compose, simplify

## The following object is masked from 'package:tibble':
##
##     as_data_frame

## The following objects are masked from 'package:lubridate':
##
##     %--%, union

## The following object is masked from 'package:tidyr':
##
##     crossing

## The following objects are masked from 'package:stats':
##
##     decompose, spectrum

## The following object is masked from 'package:base':
##
##     union
```

```
library(ggraph)
library(here)
```

```
## here() starts at /Users/marierivers/Documents/UCSB_Environmental_Data_Science/EDS_231_Text_and_Senti
```

```
library(patchwork)
```

```
files <- list.files(path = here("data"),
                    pattern = "pdf$", full.names = TRUE)

scripts <- lapply(files, pdf_text)

scripts_pdf <- readtext(file = here("data", "*.pdf"),
                   docvarsfrom = "filenames",
                   docvarnames = c("title1", "title2", "title3"),
                   sep = NULL) # this isn't doing what I want it to do
#creating an initial corpus containing our data
scripts_corp <- corpus(x = scripts_pdf, text_field = "text" )
summary(scripts_corp) %>%
  knitr::kable(caption = "Summary of Scripts Corpus")
```

Table 1: Summary of Scripts Corpus

Text	Types	Tokens	Sentences	title1	title2	title3
an_inconvenient_truth.pdf	2245	10936	685	an	inconvenient	truth

Text	Types	Tokens	Sentences	title1	title2	title3
before_the_flood.pdf	2540	13634	863	before	the	flood
dont_look_up.pdf	4620	28016	2825	dont	look	up

```r
# Add some additional, context-specific stop words to stop word lexicon
more_stops <-c("randall", "kate", "dr", "president", "int", "oglethorpe", "jason", "brie", "orlean")
add_stops <- tibble(word = c(stop_words$word, more_stops))
stop_vec <- as_vector(add_stops)
```

xxx…look up code to remove numbers

Create different data objects that will be used for the subsequent analyses

```r
#convert to tidy format and apply my stop words
raw_text <- tidy(scripts_corp)

#Distribution of most frequent words across documents
raw_words <- raw_text %>%
  mutate(title = as.factor(title1)) %>%
  mutate(title = case_when(title == "dont" ~ "dont_look_up",
                           title == "an" ~ "an_inconvenient_truth",
                           title == "before" ~ "before_the_flood")) %>%
  unnest_tokens(word, text) %>%
  anti_join(add_stops, by = 'word') %>%
  count(title, word, sort = TRUE)
```

```r
#number of total words by document
total_words <- raw_words %>%
  group_by(title) %>%
  summarize(total = sum(n))

script_words <- left_join(raw_words, total_words)
```

```
## Joining, by = "title"
```

```r
par_tokens <- unnest_tokens(raw_text, output = paragraphs, input = text, token = "paragraphs")

par_tokens <- par_tokens %>%
 mutate(par_id = 1:n())

par_words <- unnest_tokens(par_tokens, output = word, input = paragraphs, token = "words") %>%
  mutate(title = case_when(title1 == "dont" ~ "dont_look_up",
                           title1 == "an" ~ "an_inconvenient_truth",
                           title1 == "before" ~ "before_the_flood"))
```

```r
tokens <- tokens(scripts_corp, remove_punct = TRUE)
toks1<- tokens_select(tokens, min_nchar = 3)
toks1 <- tokens_tolower(toks1)
toks1 <- tokens_remove(toks1, pattern = (stop_vec))
dfm <- dfm(toks1)

dfm$full_title <- c("an_inconvenient_truth", "before_the_flood", "dont_look_up")
docvars(dfm)
```

```
##   title1       title2 title3            full_title
## 1     an inconvenient  truth an_inconvenient_truth
## 2 before          the  flood      before_the_flood
## 3   dont         look     up          dont_look_up
```

```
par_words_inconvenient_truth <- par_words %>%
  filter(title == "an_inconvenient_truth")

par_words_before_the_flood <- par_words %>%
  filter(title == "before_the_flood")

par_words_dont_look_up <- par_words %>%
  filter(title == "dont_look_up")
```

```
word_cors_all <- par_words %>%
  add_count(par_id) %>%
  filter(n >= 50) %>%
  select(-n) %>%
  pairwise_cor(word, par_id, sort = TRUE)

word_cors_inconvenient_truth <- par_words_inconvenient_truth %>%
  add_count(par_id) %>%
  filter(n >= 50) %>%
  select(-n) %>%
  pairwise_cor(word, par_id, sort = TRUE)

word_cors_before_the_flood <- par_words_before_the_flood %>%
  add_count(par_id) %>%
  filter(n >= 50) %>%
  select(-n) %>%
  pairwise_cor(word, par_id, sort = TRUE)

word_cors_dont_look_up <- par_words_dont_look_up %>%
  add_count(par_id) %>%
  filter(n >= 50) %>%
  select(-n) %>%
  pairwise_cor(word, par_id, sort = TRUE)
```

```
dfm
```

```
## Document-feature matrix of: 3 documents, 5,042 features (56.61% sparse) and 4 docvars.
##                              features
## docs                           inconvenient truth transcript
##   an_inconvenient_truth.pdf            2     4          1
##   before_the_flood.pdf                 0     2          0
##   dont_look_up.pdf                     0     7          0
##                              features
## docs                           http://forumpolitics.com/blogs/2007/03/17/an-inconvient-truth-transcript
##   an_inconvenient_truth.pdf                                                                          1
##   before_the_flood.pdf                                                                               0
##   dont_look_up.pdf                                                                                   0
##                              features
## docs                           march 2007 introduction river gently flowing
##   an_inconvenient_truth.pdf     1    1            1     1      1       1
##   before_the_flood.pdf          1    0            0     1      0       0
##   dont_look_up.pdf              0    0            0     0      0       0
## [ reached max_nfeat ... 5,032 more features ]
```

```
#first the basic frequency stat
tstat_freq <- textstat_frequency(dfm, n = 5, groups = title1)
head(tstat_freq, 15) %>%
  knitr::kable(caption = "Subset of Top 5 Words")
```

Table 2: Subset of Top 5 Words

feature	frequency	rank	docfreq	group
ice	54	1	1	an
earth	32	2	1	an
time	32	2	1	an
warming	28	4	1	an
world	27	5	1	an
climate	69	1	1	before
page	63	2	1	before
change	52	3	1	before
people	48	4	1	before
world	38	5	1	before
comet	82	1	1	dont
time	78	2	1	dont
cont'd	76	3	1	dont
ext	70	4	1	dont
isherwell	59	5	1	dont

```
#let's zoom in on just one of our key terms
all_script_cors <- word_cors_all %>%
  filter(item1 == "climate") %>%
  mutate(n = 1:n())

all_script_cors_plot <- all_script_cors  %>%
  filter(n <= 30) %>%
  graph_from_data_frame() %>%
  ggraph(layout = "fr") +
  geom_edge_link(aes(edge_alpha = correlation, edge_width = correlation), edge_colour = "steelblue3") +
  geom_node_point(size = 4) +
  geom_node_text(aes(label = name), repel = TRUE,
                 point.padding = unit(0.2, "lines")) +
  theme_void()
```

you can compare the use of "climate" in the 2 documentations to see how this word is used differently, but don't look up never mentions the word climate or climate change

```
#let's zoom in on just one of our key terms
inconvenient_truth_cors <- word_cors_inconvenient_truth %>%
  filter(item1 == "earth") %>%
  mutate(n = 1:n())
```

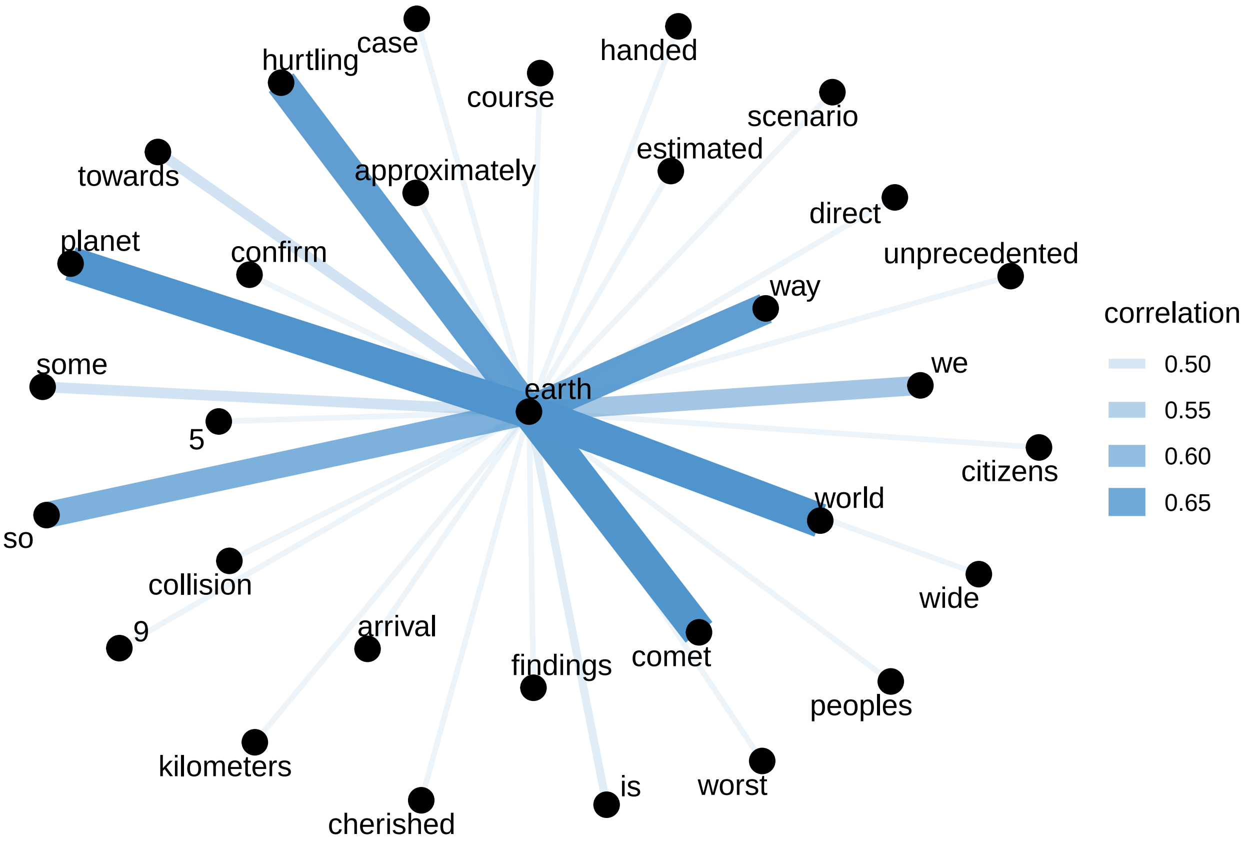
```r
inconvenient_truth_cors_plot <- inconvenient_truth_cors %>%
  filter(n <= 30) %>%
  graph_from_data_frame() %>%
  ggraph(layout = "fr") +
  geom_edge_link(aes(edge_alpha = correlation, edge_width = correlation), edge_colour = "steelblue3") +
  geom_node_point(size = 4) +
  geom_node_text(aes(label = name), repel = TRUE,
                 point.padding = unit(0.2, "lines")) +
  theme_void()
```

```r
#let's zoom in on just one of our key terms
before_the_flood_cors <- word_cors_before_the_flood %>%
  filter(item1 == "earth") %>%
  mutate(n = 1:n())

before_the_flood_cors_plot <- before_the_flood_cors %>%
  filter(n <= 30) %>%
  graph_from_data_frame() %>%
  ggraph(layout = "fr") +
  geom_edge_link(aes(edge_alpha = correlation, edge_width = correlation), edge_colour = "steelblue3") +
  geom_node_point(size = 4) +
  geom_node_text(aes(label = name), repel = TRUE,
                 point.padding = unit(0.2, "lines")) +
  theme_void()
```

```r
# don't look up never mentions climate or climate change
#let's zoom in on just one of our key terms
dont_look_up_cors <-  word_cors_dont_look_up %>%
  filter(item1 == "earth") %>%
  mutate(n = 1:n())

dont_look_up_cors  %>%
  filter(n <= 30) %>%
  graph_from_data_frame() %>%
  ggraph(layout = "fr") +
  geom_edge_link(aes(edge_alpha = correlation, edge_width = correlation), edge_colour = "steelblue3") +
  geom_node_point(size = 4) +
  geom_node_text(aes(label = name), repel = TRUE,
                 point.padding = unit(0.2, "lines")) +
  theme_void()
```



xxx…revise to have climate and earth separated

```
cors_plots <- all_script_cors_plot / (inconvenient_truth_cors_plot + before_the_flood_cors_plot)
cors_plots
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'it's' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
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```
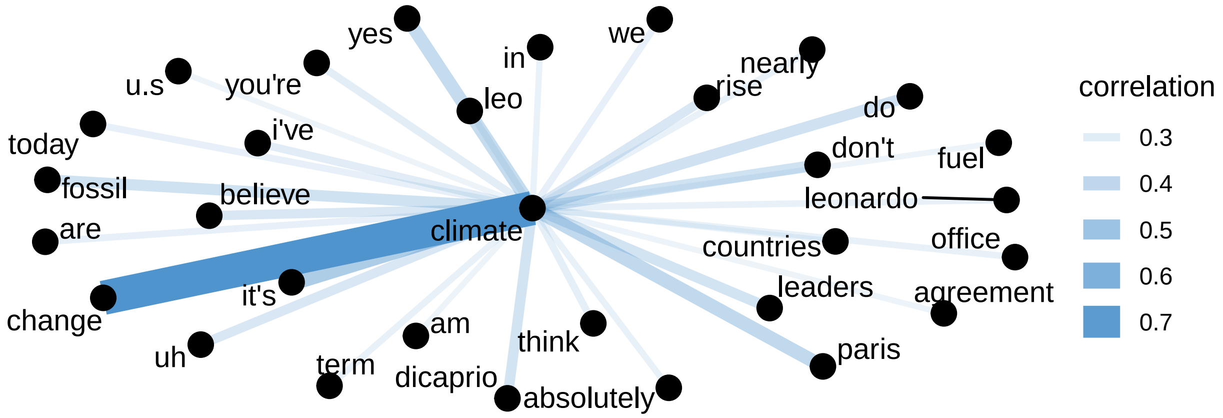
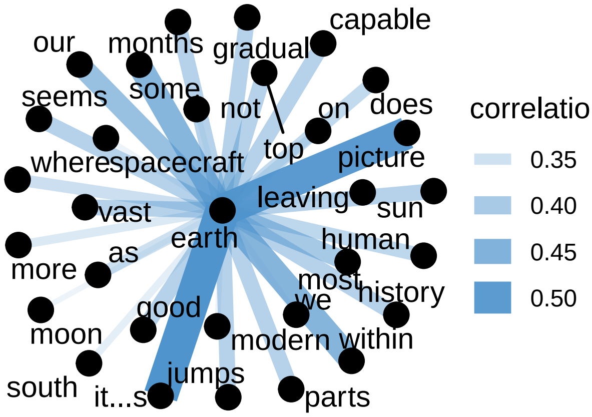
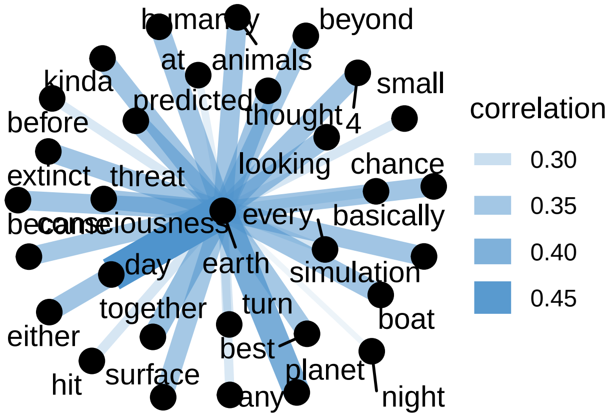
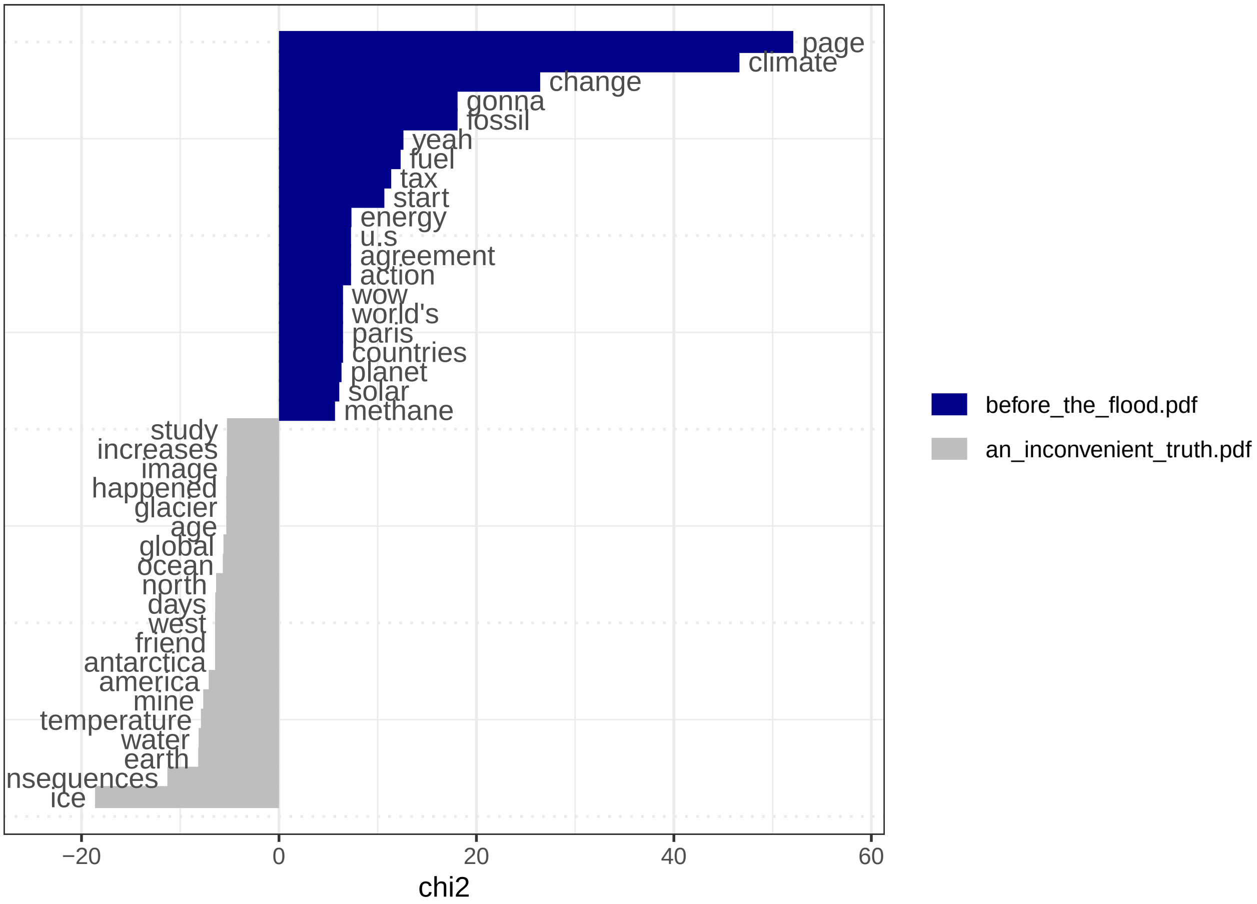





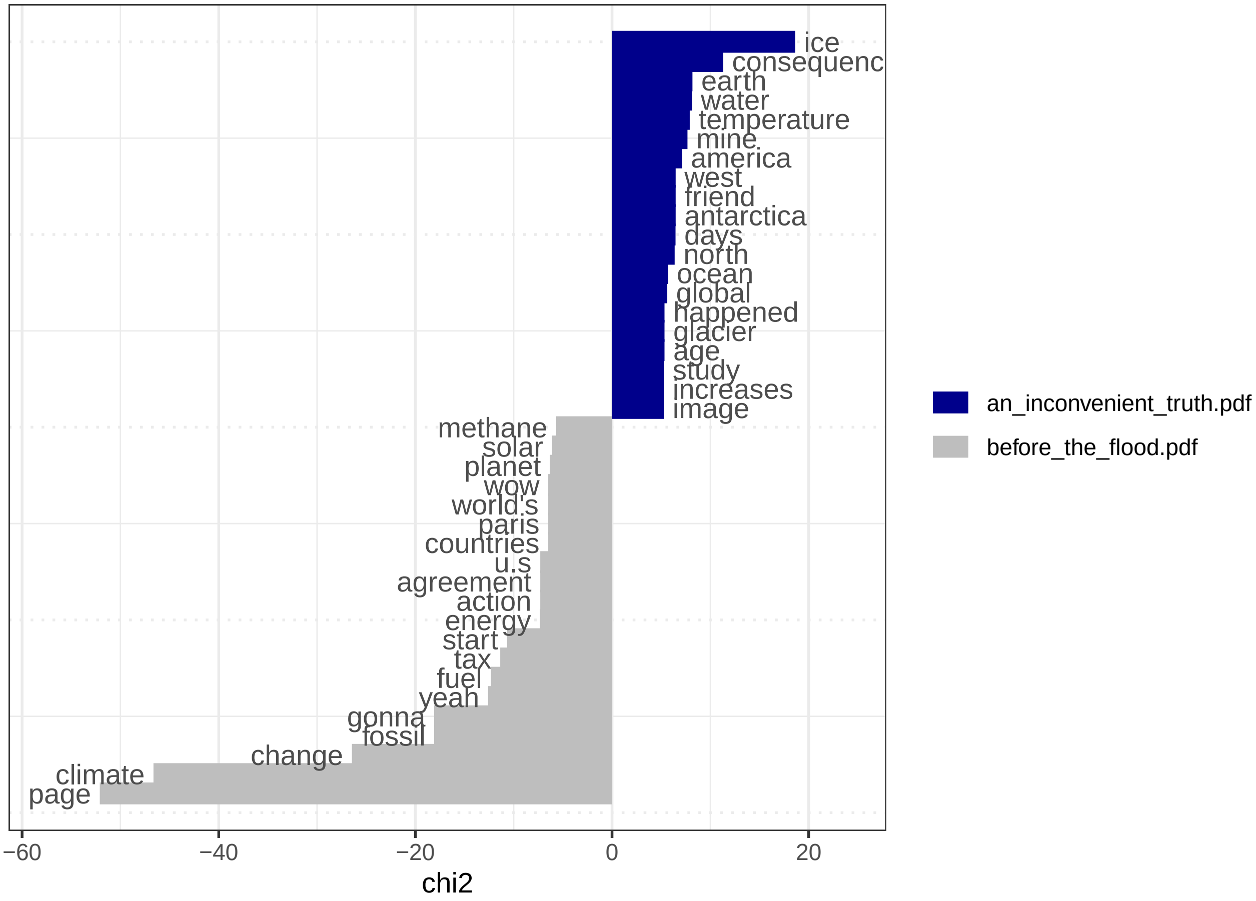


```r
keyness_function <- function(reference_report_title, target_report_title) {
  files <- list.files(path = here("data"),
                      pattern = "pdf$", full.names = TRUE)
  scripts <- lapply(files, pdf_text)
  scripts_pdf <- readtext(file = here("data", "*.pdf"),
                    docvarsfrom = "filenames",
                    docvarnames = c("title1", "title2", "title3"),
                    sep = "_")
  scripts_corp <- corpus(x = scripts_pdf, text_field = "text" )
  tokens <- tokens(scripts_corp, remove_punct = TRUE)
  toks1<- tokens_select(tokens, min_nchar = 3)
  toks1 <- tokens_tolower(toks1)
  toks1 <- tokens_remove(toks1, pattern = (stop_vec))
  dfm <- dfm(toks1)
  dfm$full_title <- c("an_inconvenient_truth", "before_the_flood", "dont_look_up")

  keyness_function_plot <- dfm %>%
    dfm_subset(full_title %in% c(reference_report_title, target_report_title)) %>%
    textstat_keyness(target = paste0(target_report_title, ".pdf")) %>%
    textplot_keyness()
  keyness_function_plot
}
```

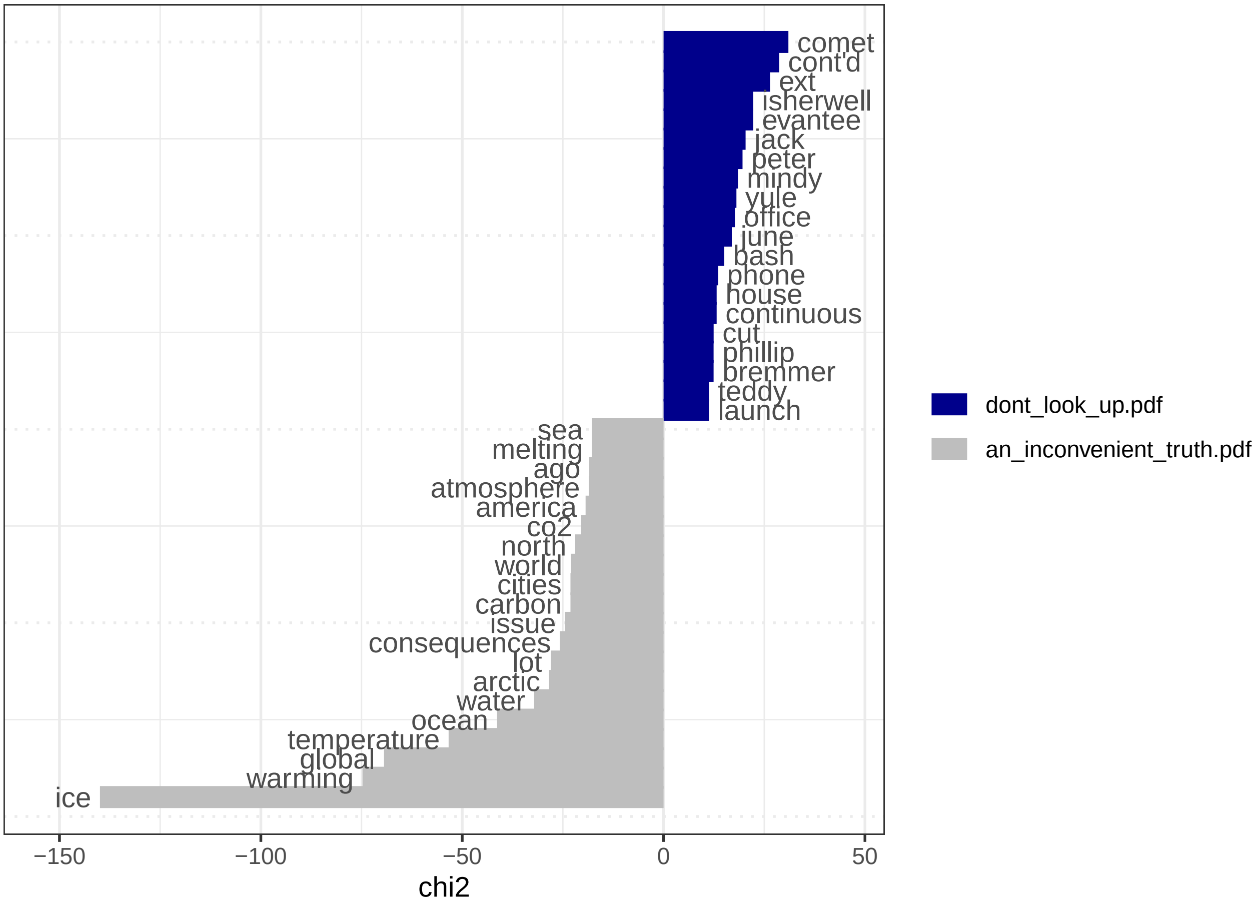
```r
# an_inconvenient_truth vs. before_the_flood
keyness_function(reference_report_title = "an_inconvenient_truth", target_report_title = "before_the_fl
```



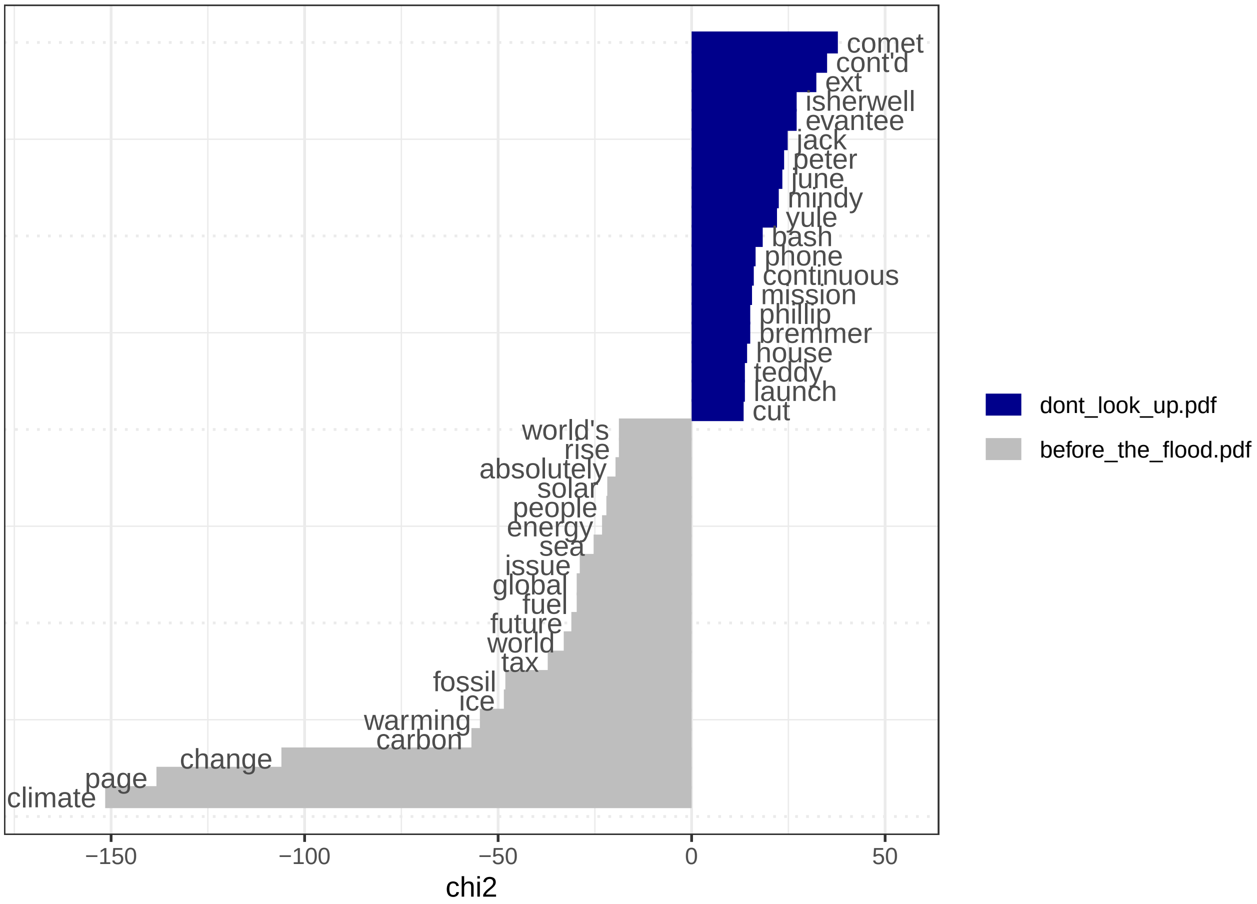
```
# before_the_flood vs. an_inconvenient_truth
keyness_function(reference_report_title = "before_the_flood", target_report_title = "an_inconvenient_tru
```



```r
# an_inconvenient_truth vs. don't look up
keyness_function(reference_report_title = "an_inconvenient_truth", target_report_title = "dont_look_up"
```



```
# an_inconvenient_truth vs. don't look up
keyness_function(reference_report_title = "before_the_flood", target_report_title = "dont_look_up")
```


comet
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peter
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mindy
yule
bash
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mission
phillip
bremmer
house
teddy
launch
cut
world's
rise
absolutely
solar
people
energy
sea
issue
global
fuel
future
world
tax
fossil
ice
warming
carbon
change
page
climate
−150
−100
−50
0
50
chi2
dont_look_up.pdf
before_the_flood.pdf