Content Analysis of Scaling Up Nutrition (SUN) Movement Progress Reports from 2011-2017

Ernest Guevarra

17/05/2018

Re-structure dataset into a one-token-per-row format

```
tidy_reports <- progress_reports() %>%
  unnest_tokens(word, text)

tidy_reports
```

```
## # A tibble: 354,209 x 5
##     page linenumber chapter  year word
##    <int>      <int>   <int> <int> <chr>
##  1     3          1       0  2011 preface
##  2     3          2       0  2011 one
##  3     3          2       0  2011 year
##  4     3          2       0  2011 ago
##  5     3          2       0  2011 i
##  6     3          2       0  2011 joined
##  7     3          2       0  2011 a
##  8     3          2       0  2011 group
##  9     3          2       0  2011 of
## 10     3          2       0  2011 leaders
## # ... with 354,199 more rows
```

Remove stop words - words not useful in analysis

```
data(stop_words)

tidy_reports <- tidy_reports %>%
  anti_join(stop_words)
```

Find the most common words in all the reports as a whole

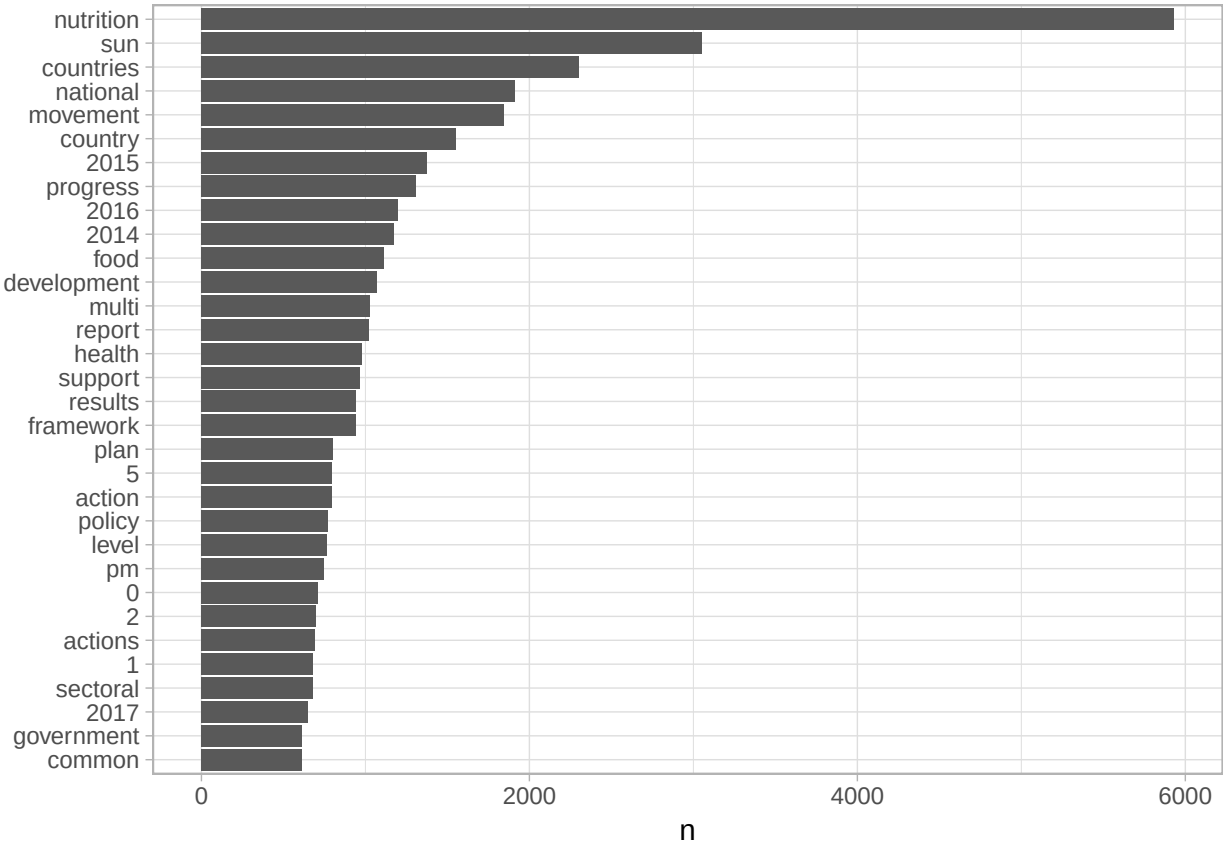
```
tidy_reports %>%
  count(word, sort = TRUE)
```

```
## # A tibble: 12,659 x 2
##    word          n
##    <chr>     <int>
##  1 nutrition  5932
```

```
##  2 sun         3050
##  3 countries   2302
##  4 national    1914
##  5 movement    1843
##  6 country     1552
##  7 2015        1377
##  8 progress    1308
##  9 2016        1199
## 10 2014        1174
## # ... with 12,649 more rows
```

Visualise the most common words

```
tidy_reports %>%
  count(word, sort = TRUE) %>%
  filter(n > 600) %>%
  mutate(word = reorder(word, n)) %>%
  ggplot(aes(word, n)) +
  geom_col() +
  xlab(NULL) +
  coord_flip()
```



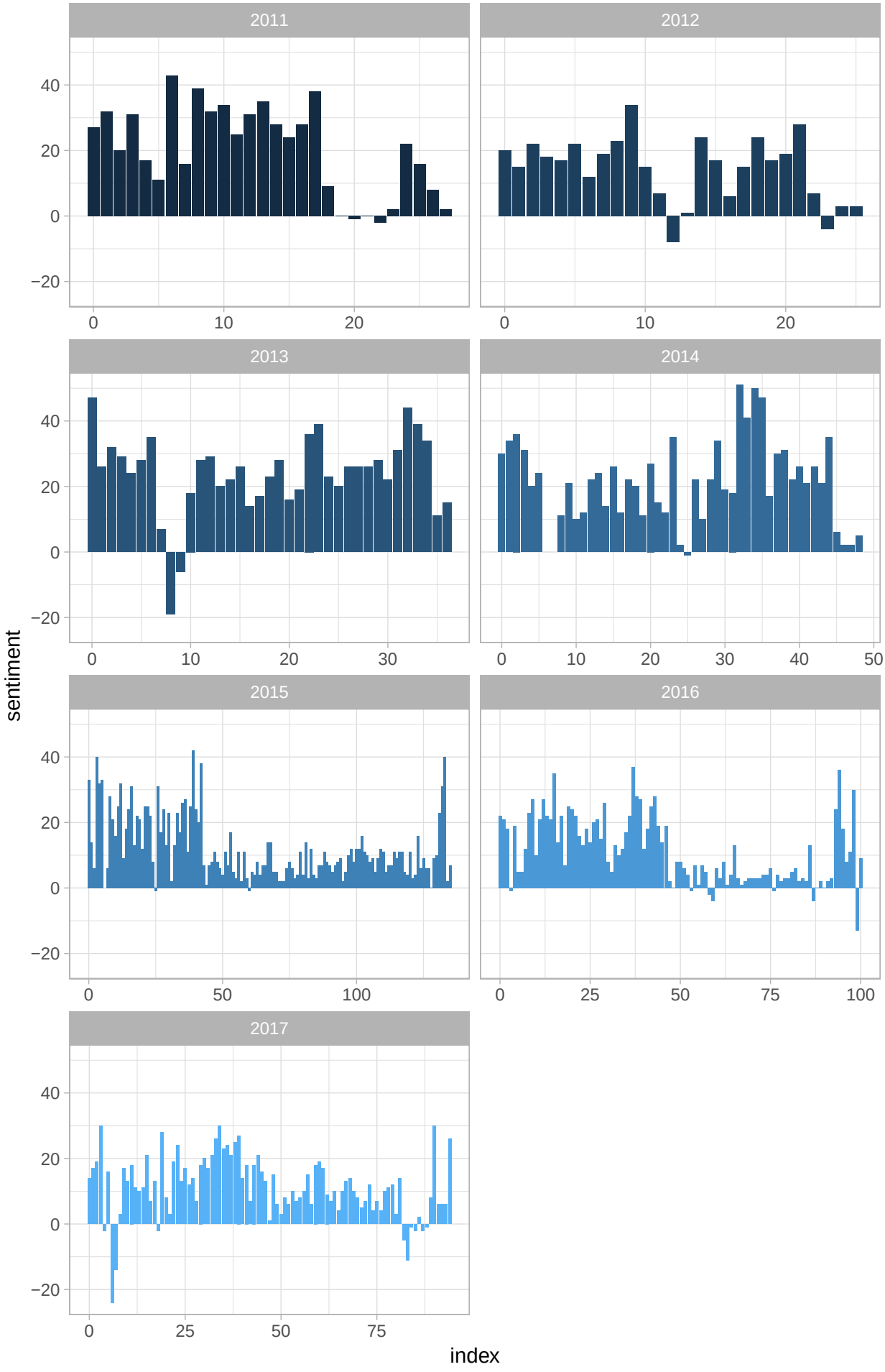

```
nrc_joy <- get_sentiments("nrc") %>%
  filter(sentiment == "joy")

tidy_reports %>%
  filter(year == 2011) %>%
```

```
  inner_join(nrc_joy) %>%
  count(word, sort = TRUE)
```

```
## # A tibble: 62 x 2
##    word            n
##    <chr>       <int>
##  1 sun           236
##  2 food          105
##  3 progress       72
##  4 child          35
##  5 resources      30
##  6 weight         19
##  7 birth          18
##  8 improve        17
##  9 established    15
## 10 engaged        13
## # ... with 52 more rows
```

```
progress_sentiment <- tidy_reports %>%
  inner_join(get_sentiments("bing")) %>%
  #count(year, index = linenumber %/% 80, sentiment) %>%
  count(year, index = page, sentiment) %>%
  spread(sentiment, n, fill = 0) %>%
  mutate(sentiment = positive - negative)
```

```
ggplot(progress_sentiment, aes(index, sentiment, fill = year)) +
  geom_col(show.legend = FALSE) +
  facet_wrap(~year, ncol = 2, scales = "free_x")
```

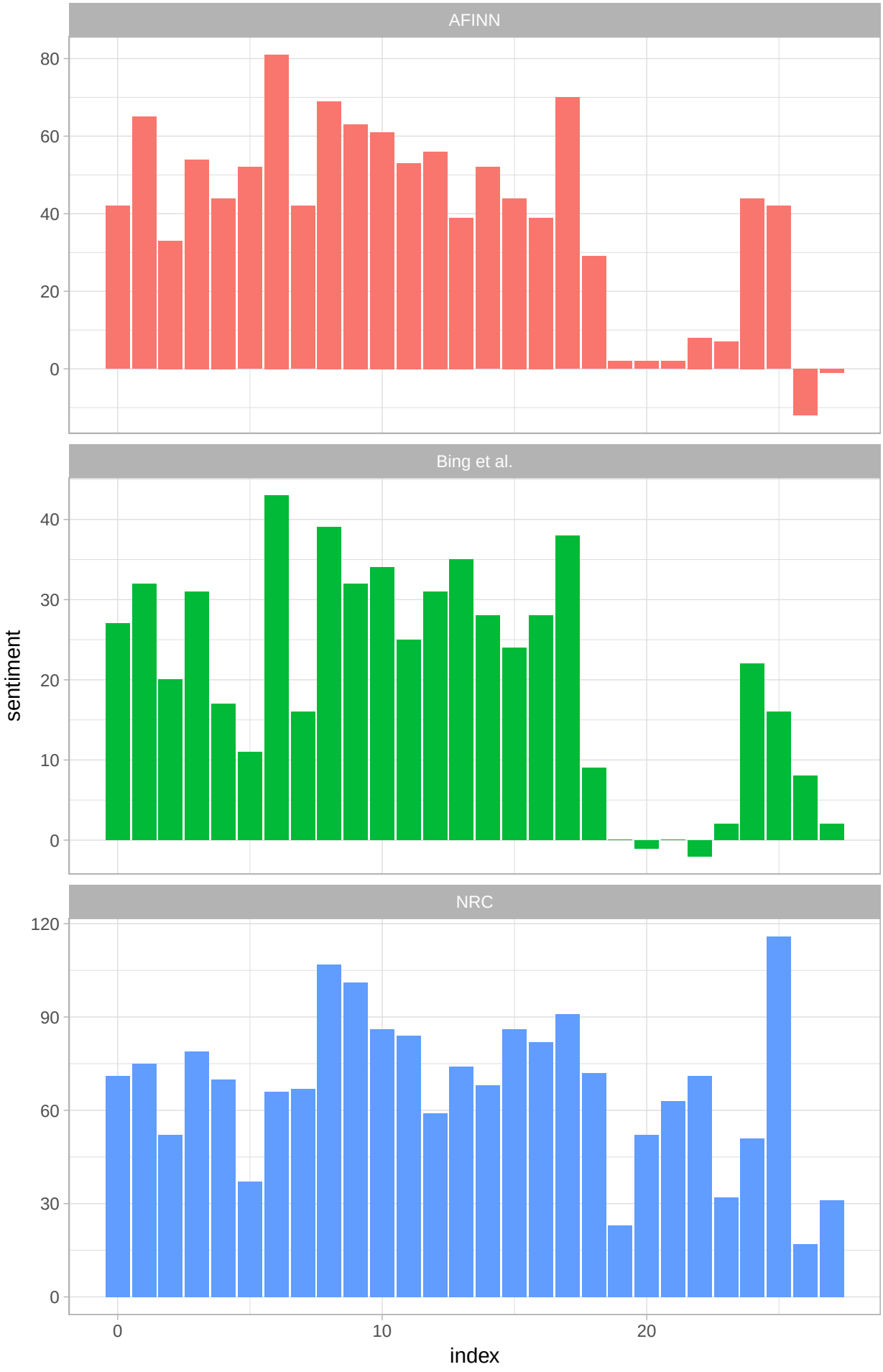

2011
2012
2013
2014
2015
2016
2017
sentiment
index
40
20
0
−20
0
10
20
30
40
50
0
25
50
75
100

```
report_2011 <- tidy_reports %>%
  filter(year == 2011)

report_2011
```

```
## # A tibble: 14,590 x 5
##     page linenumber chapter  year word
##    <int>      <int>   <int> <int> <chr>
##  1     3          1       0  2011 preface
##  2     3          2       0  2011 ago
##  3     3          2       0  2011 joined
##  4     3          2       0  2011 leaders
##  5     3          2       0  2011 pledging
##  6     3          2       0  2011 address
##  7     3          2       0  2011 global
##  8     3          2       0  2011 burden
##  9     3          2       0  2011 nutrition
## 10     3          3       0  2011 set
## # ... with 14,580 more rows
```

```
afinn <- report_2011 %>%
  inner_join(get_sentiments("afinn")) %>%
  #group_by(index = linenumber %/% 80) %>%
  group_by(index = page) %>%
  summarise(sentiment = sum(score)) %>%
  mutate(method = "AFINN")

bing_and_nrc <- bind_rows(report_2011 %>%
                            inner_join(get_sentiments("bing")) %>%
                            mutate(method = "Bing et al."),
                          report_2011 %>%
                            inner_join(get_sentiments("nrc") %>%
                                         filter(sentiment %in% c("positive",
                                                                 "negative"))) %>%
                            mutate(method = "NRC")) %>%
  #count(method, index = linenumber %/% 80, sentiment) %>%
  count(method, index = page, sentiment) %>%
  spread(sentiment, n, fill = 0) %>%
  mutate(sentiment = positive - negative)
```

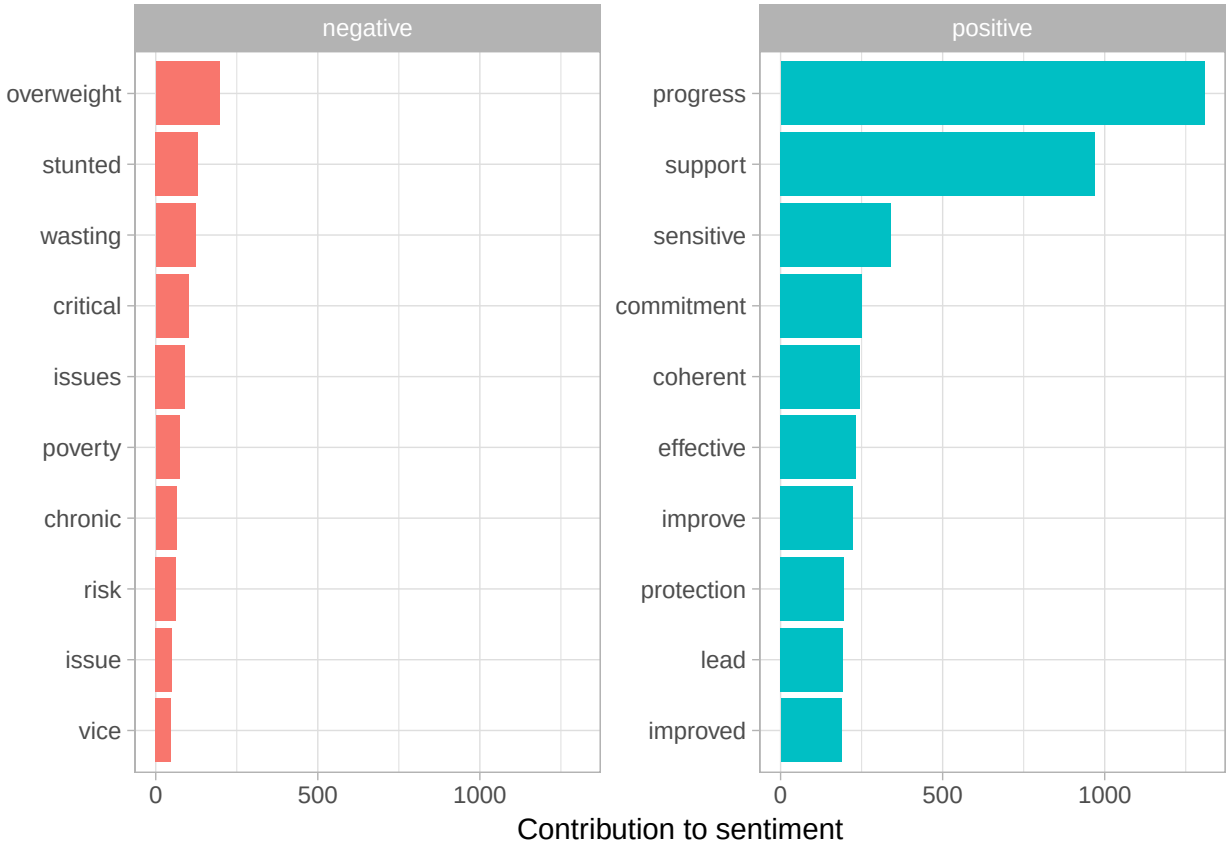
```
bind_rows(afinn,
          bing_and_nrc) %>%
  ggplot(aes(index, sentiment, fill = method)) +
  geom_col(show.legend = FALSE) +
  facet_wrap(~method, ncol = 1, scales = "free_y")
```


AFINN
Bing et al.
NRC
sentiment
index
0
10
20
30
40
60
80
90
120

```
bing_word_counts <- tidy_reports %>%
  inner_join(get_sentiments("bing")) %>%
  count(word, sentiment, sort = TRUE) %>%
  ungroup()

bing_word_counts
```

```
## # A tibble: 743 x 3
##    word       sentiment     n
##    <chr>      <chr>     <int>
##  1 progress   positive   1308
##  2 support    positive    969
##  3 sensitive  positive    340
##  4 commitment positive    250
##  5 coherent   positive    244
##  6 effective  positive    233
##  7 improve    positive    224
##  8 overweight negative    196
##  9 protection positive    195
## 10 lead       positive    192
## # ... with 733 more rows
```

```
bing_word_counts %>%
  group_by(sentiment) %>%
  top_n(10) %>%
  ungroup() %>%
  mutate(word = reorder(word, n)) %>%
  ggplot(aes(word, n, fill = sentiment)) +
  geom_col(show.legend = FALSE) +
  facet_wrap(~sentiment, scales = "free_y") +
  labs(y = "Contribution to sentiment",
       x = NULL) +
  coord_flip()
```




```
library(wordcloud)

tidy_reports %>%
  anti_join(stop_words) %>%
  count(word) %>%
  with(wordcloud(word, n, max.words = 100))
```


```
library(reshape2)
```

```
tidy_reports %>%
  inner_join(get_sentiments("bing")) %>%
  count(word, sentiment, sort = TRUE) %>%
  acast(word ~ sentiment, value.var = "n", fill = 0) %>%
  comparison.cloud(colors = c("gray20", "gray80"),
                   max.words = 100)
```


```
report1_sentences <- progress_report_2011 %>% unnest_tokens(sentence, text, token = "se
```