

# Obama 2016

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*3/12/2017*

## Libraries

```
library(broom)
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

library(tidytext)
library(ggplot2)
library(stringr)
library(knitr)
library(rmarkdown)
library(devtools)
library(tidyr)
data("stop_words")
```

## Speech Text

```
text <- c(

"Thank you. Mr. Speaker, Mr. Vice President, Members of Congress, my fellow Americans: Tonight marks the

"Now, I understand that because it's an election season, expectations for what we will achieve this year.

"But tonight I want to go easy on the traditional list of proposals for the year ahead. Don't worry, I'

"But for my final address to this Chamber, I don't want to just talk about next year. I want to focus on

"We live in a time of extraordinary change, change that's reshaping the way we live, the way we work, on

"America has been through big changes before: wars and depression, the influx of new immigrants, workers

"What was true then can be true now. Our unique strengths as a nation-our optimism and work ethic, our s

"In fact, it's in that spirit that we have made progress these past 7 years. That's how we recovered from

"But such progress is not inevitable. It's the result of choices we make together. And we face such cho
```

"So let's talk about the future and four big questions that I believe we as a country have to answer, re

"Let me start with the economy and a basic fact: The United States of America right now has the strongest

"Anyone claiming that America's economy is in decline is peddling fiction. Now, what is true-and the re

"Today, technology doesn't just replace jobs on the assembly line, but any job where work can be automa

"All these trends have squeezed workers, even when they have jobs, even when the economy is growing. It

"For the past 7 years, our goal has been a growing economy that also works better for everybody. We've m

"We agree that real opportunity requires every American to get the education and training they need to

"And we have to make college affordable for every American. No hard-working student should be stuck in

"But a great education isn't all we need in this new economy. We also need benefits and protections tha

"That's why Social Security and Medicare are more important than ever. We shouldn't weaken them, we sho

"Now, I'm guessing we won't agree on health care anytime soon, but-a little applause back there. Just a

"I also know Speaker Ryan has talked about his interest in tackling poverty. America is about giving ev

"But there are some areas where-we just have to be honest-it has been difficult to find agreement over

"I believe a thriving private sector is the lifeblood of our economy. I think there are outdated regula

"The point is, I believe that in this new economy, workers and startups and small businesses need more

"In fact, it turns, out many of our best corporate citizens are also our most creative. And this brings

"Sixty years ago, when the Russians beat us into space, we didn't deny Sputnik was up there. We didn't a

"Now, that spirit of discovery is in our DNA. America is Thomas Edison and the Wright Brothers and Georg

"And over the past 7 years, we've nurtured that spirit. We've protected an open Internet and taken bold

"Last year, Vice President Biden said that with a new moonshot, America can cure cancer. Last month, he

"Now, medical research is critical. We need the same level of commitment when it comes to developing cl

"Now we've got to accelerate the transition away from old, dirtier energy sources. Rather than subsidiz

"Now, none of this is going to happen overnight. And yes, there are plenty of entrenched interests who v

"Now, climate change is just one of many issues where our security is linked to the rest of the world. A

"Now, I told you earlier all the talk of America's economic decline is political hot air. Well, so is a

"Now, as someone who begins every day with an intelligence briefing, I know this is a dangerous time. B

"The Middle East is going through a transformation that will play out for a generation, rooted in confl

"But as we focus on destroying ISIL, over-the-top claims that this is world war III just play into their hands."

"And that's exactly what we're doing. For more than a year, America has led a coalition of more than 60 nations."

"If this Congress is serious about winning this war and wants to send a message to our troops and the world."

"Our foreign policy has to be focused on the threat from ISIL and Al Qaida, but it can't stop there. For example."

"We also can't try to take over and rebuild every country that falls into crisis, even if it's done with good intentions."

"Now, fortunately there is a smarter approach: a patient and disciplined strategy that uses every element of our power."

"That's how we stopped the spread of Ebola in West Africa. Our military, our doctors, our development workers."

"That's how we forged a Trans-Pacific Partnership to open markets and protect workers and the environment."

"Let me give you another example. Fifty years of isolating Cuba had failed to promote democracy. It set a bad example."

"The point is, American leadership in the 21st century is not a choice between ignoring the rest of the world."

"When we lead nearly 200 nations to the most ambitious agreement in history to fight climate change, yes, we're making progress."

"That's American strength. That's American leadership. And that kind of leadership depends on the power of our values."

"And that's why we need to reject any politics-any politics-that targets people because of race or religion."

"His Holiness Pope Francis told this body from the very spot that I'm standing on tonight that 'to imitate Christ is to serve the poor.'"

"The future we want-all of us want-opportunity and security for our families, a rising standard of living for all."

"A better politics doesn't mean we have to agree on everything. This is a big country: different regions, different needs."

"But democracy does require basic bonds of trust between its citizens. It doesn't work if we think the government is the enemy."

"Too many Americans feel that way right now. It's one of the few regrets of my Presidency: that the ranks of cynicism have grown."

"But, my fellow Americans, this cannot be my task-or any President's-alone. There are a whole lot of folks out there who want to make things better."

"But that means if we want a better politics-and I'm addressing the American people now-if we want a better future."

"I think we've got to end the practice of drawing our congressional districts so that politicians can protect their seats."

"I believe we've got to reduce the influence of money in our politics so that a handful of families or lobbies don't control it."

"We've got to make it easier to vote, not harder. We need to modernize it for the way we live now. This is a big country."

"What I'm suggesting is hard. It's a lot easier to be cynical; to accept that change is not possible and that we're stuck with what we have."

"We can't afford to go down that path. It won't deliver the economy we want. It will not produce the security we need."

"So, my fellow Americans, whatever you may believe, whether you prefer one party or no party, whether you're a Democrat or a Republican."

"It is not easy. Our brand of democracy is hard. But I can promise that a little over a year from now, we will be a stronger, more united nation."

"And they're out there, those voices. They don't get a lot of attention; they don't seek a lot of fanfare."

"I see it in the worker on the assembly line who clocked extra shifts to keep his company open and the line moving."

"I see it in the American who served his time, made bad mistakes as a child, but now is dreaming of starting a business."

"I see it in the soldier who gives almost everything to save his brothers, the nurse who tends to him through the pain."

"I see it in the elderly woman who will wait in line to cast her vote as long as she has to, the new citizen who works hard to become a part of the country."

"That's the America I know. That's the country we love: clear eyed, big hearted, undaunted by challenges."

"Thank you. God bless you. God bless the United States of America. Thank you.")

text

```
## [1] "Thank you. Mr. Speaker, Mr. Vice President, Members of Congress, my fellow Americans: Tonight I want to talk about the future of our country."
## [2] "Now, I understand that because it's an election season, expectations for what we will achieve in the next year are high."
## [3] "But tonight I want to go easy on the traditional list of proposals for the year ahead. Don't worry, I'll get to them."
## [4] "But for my final address to this Chamber, I don't want to just talk about next year. I want to talk about the future of our country."
## [5] "We live in a time of extraordinary change, change that's reshaping the way we live, the way we work, the way we think."
## [6] "America has been through big changes before: wars and depression, the influx of new immigrants, the rise of new technologies."
## [7] "What was true then can be true now. Our unique strengths as a nation—our optimism and work ethic, our ability to adapt—have helped us overcome these challenges."
## [8] "In fact, it's in that spirit that we have made progress these past 7 years. That's how we recovered from the recession, how we got the economy back on track."
## [9] "But such progress is not inevitable. It's the result of choices we make together. And we face a new set of challenges ahead."
## [10] "So let's talk about the future and four big questions that I believe we as a country have to answer: How do we create jobs? How do we ensure that everyone has a fair shot at success? How do we protect our freedoms? How do we lead the world?"
## [11] "Let me start with the economy and a basic fact: The United States of America right now has the highest unemployment rate in over 40 years."
## [12] "Anyone claiming that America's economy is in decline is peddling fiction. Now, what is true—and what's not—is that we have a long way to go."
## [13] "Today, technology doesn't just replace jobs on the assembly line, but any job where work can be done by a machine."
## [14] "All these trends have squeezed workers, even when they have jobs, even when the economy is growing."
## [15] "For the past 7 years, our goal has been a growing economy that also works better for everybody."
## [16] "We agree that real opportunity requires every American to get the education and training they need to succeed in the 21st century."
## [17] "And we have to make college affordable for every American. No hard-working student should be saddled with crushing debt."
## [18] "But a great education isn't all we need in this new economy. We also need benefits and protections that have been eroded over the years."
## [19] "That's why Social Security and Medicare are more important than ever. We shouldn't weaken them, we should strengthen them."
## [20] "Now, I'm guessing we won't agree on health care anytime soon, but—a little applause back there?"
## [21] "I also know Speaker Ryan has talked about his interest in tackling poverty. America is about 40 million people living in poverty."
## [22] "But there are some areas where—we just have to be honest—it has been difficult to find agreement."
## [23] "I believe a thriving private sector is the lifeblood of our economy. I think there are outdated regulations that are stifling innovation."
## [24] "The point is, I believe that in this new economy, workers and startups and small businesses need to be able to compete on a level playing field."
## [25] "In fact, it turns out many of our best corporate citizens are also our most creative. And this is true across all industries."
## [26] "Sixty years ago, when the Russians beat us into space, we didn't deny Sputnik was up there. We embraced it as a challenge."
## [27] "Now, that spirit of discovery is in our DNA. America is Thomas Edison and the Wright Brothers and the Apollo program."
## [28] "And over the past 7 years, we've nurtured that spirit. We've protected an open Internet and taken steps to ensure that our scientific research is not stifled by bureaucracy."
## [29] "Last year, Vice President Biden said that with a new moonshot, America can cure cancer. Last month, he announced a new initiative to accelerate the development of new drugs."
## [30] "Now, medical research is critical. We need the same level of commitment when it comes to developing new technologies."
## [31] "Now we've got to accelerate the transition away from old, dirtier energy sources. Rather than just talking about it, we need to get it done."
## [32] "Now, none of this is going to happen overnight. And yes, there are plenty of entrenched interests that will resist change."
## [33] "Now, climate change is just one of many issues where our security is linked to the rest of the world."
## [34] "Now, I told you earlier all the talk of America's economic decline is political hot air. Well, it's not all hot air."
## [35] "Now, as someone who begins every day with an intelligence briefing, I know this is a dangerous world."
## [36] "The Middle East is going through a transformation that will play out for a generation, rooted in centuries of conflict."
## [37] "But as we focus on destroying ISIL, over-the-top claims that this is world war III just play into the hands of those who want to see us divided."
```

```
## [38] "And that's exactly what we're doing. For more than a year, America has led a coalition of more
## [39] "If this Congress is serious about winning this war and wants to send a message to our troops a
## [40] "Our foreign policy has to be focused on the threat from ISIL and Al Qaida, but it can't stop th
## [41] "We also can't try to take over and rebuild every country that falls into crisis, even if it's c
## [42] "Now, fortunately there is a smarter approach: a patient and disciplined strategy that uses eve
## [43] "That's how we stopped the spread of Ebola in West Africa. Our military, our doctors, our devel
## [44] "That's how we forged a Trans-Pacific Partnership to open markets and protect workers and the e
## [45] "Let me give you another example. Fifty years of isolating Cuba had failed to promote democracy
## [46] "The point is, American leadership in the 21st century is not a choice between ignoring the res
## [47] "When we lead nearly 200 nations to the most ambitious agreement in history to fight climate cha
## [48] "That's American strength. That's American leadership. And that kind of leadership depends on th
## [49] "And that's why we need to reject any politics-any politics-that targets people because of race
## [50] "His Holiness Pope Francis told this body from the very spot that I'm standing on tonight that
## [51] "The future we want-all of us want-opportunity and security for our families, a rising standard
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## [53] "But democracy does require basic bonds of trust between its citizens. It doesn't work if we th
## [54] "Too many Americans feel that way right now. It's one of the few regrets of my Presidency: that
## [55] "But, my fellow Americans, this cannot be my task-or any President's-alone. There are a whole l
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## [57] "I think we've got to end the practice of drawing our congressional districts so that politician
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## [59] "We've got to make it easier to vote, not harder. We need to modernize it for the way we live n
## [60] "What I'm suggesting is hard. It's a lot easier to be cynical; to accept that change is not pos
## [61] "We can't afford to go down that path. It won't deliver the economy we want. It will not produ
## [62] "So, my fellow Americans, whatever you may believe, whether you prefer one party or no party, w
## [63] "It is not easy. Our brand of democracy is hard. But I can promise that a little over a year fr
## [64] "And they're out there, those voices. They don't get a lot of attention; they don't seek a lot
## [65] "I see it in the worker on the assembly line who clocked extra shifts to keep his company open
## [66] "I see it in the American who served his time, made bad mistakes as a child, but now is dreamin
## [67] "I see it in the soldier who gives almost everything to save his brothers, the nurse who tends
## [68] "I see it in the elderly woman who will wait in line to cast her vote as long as she has to, the
## [69] "That's the America I know. That's the country we love: clear eyed, big hearted, undaunted by c
## [70] "Thank you. God bless you. God bless the United States of America. Thank you."
```

```
library(dplyr)
Obama_16 <- data_frame(line = 1:70, text = text) %>%
  unnest_tokens(word, text)
```

```
Obama_16
```

```
## # A tibble: 6,067 × 2
##   line      word
##   <int>    <chr>
## 1     1    thank
## 2     1     you
## 3     1      mr
## 4     1  speaker
## 5     1      mr
## 6     1    vice
## 7     1 president
## 8     1  members
## 9     1      of
## 10    1 congress
## # ... with 6,057 more rows
```

```
data(stop_words)
```

```
Obama_16 <- Obama_16 %>%  
  anti_join(stop_words)
```

```
## Joining, by = "word"
```

## Tidy Text Analysis

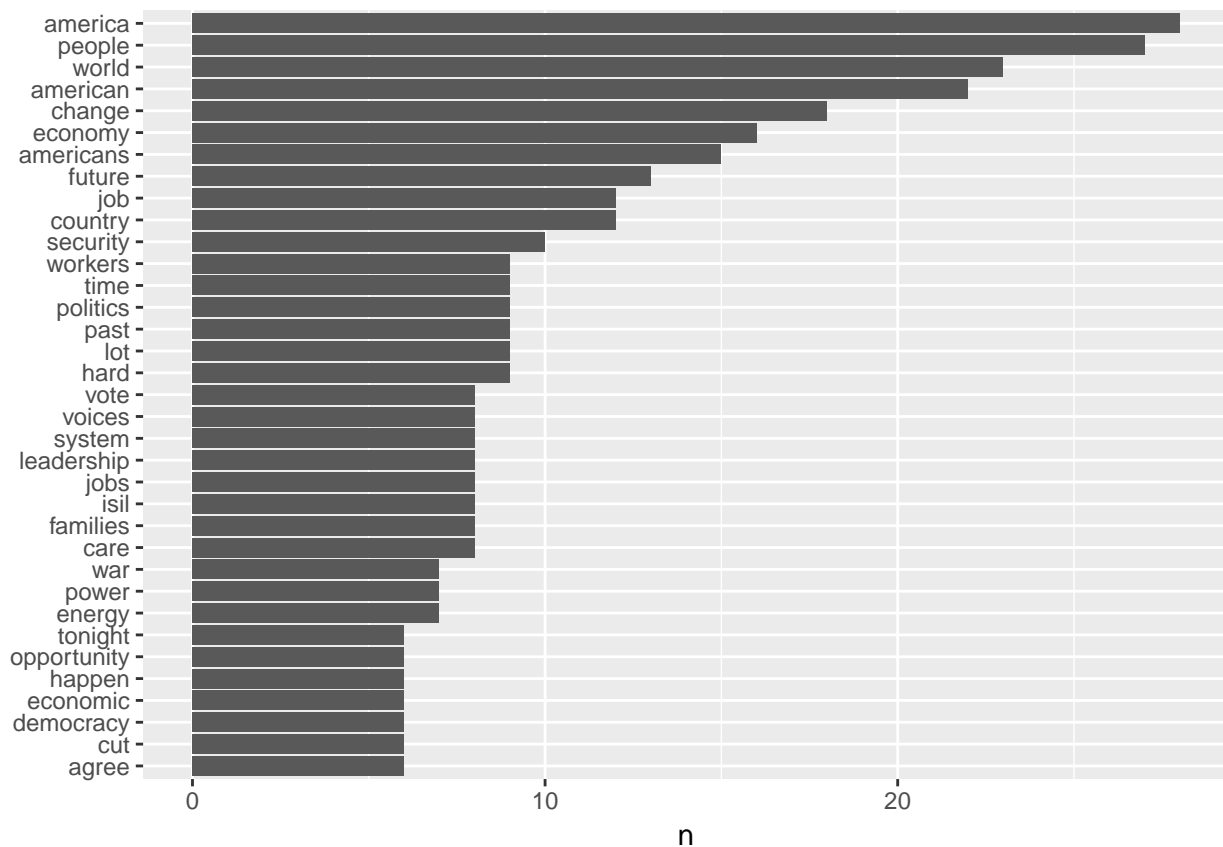
### Most Common Words

```
Obama_16 %>%  
  count(word, sort = TRUE)
```

```
## # A tibble: 1,237 × 2  
##       word      n  
##   <chr> <int>  
## 1  america    28  
## 2   people    27  
## 3   world    23  
## 4  american    22  
## 5   change    18  
## 6  economy    16  
## 7  americans    15  
## 8   future    13  
## 9  country    12  
## 10    job      12  
## # ... with 1,227 more rows
```

### Common Word Count

```
Obama_16 %>%  
  count(word, sort = TRUE) %>%  
  filter(n > 5) %>%  
  mutate(word = reorder(word, n)) %>%  
  ggplot(aes(word, n)) +  
  geom_bar(stat = "identity") +  
  xlab(NULL) +  
  coord_flip()
```



## Sentiment Testing

### Bing Sentiment Package

```
get_sentiments("afinn")
```

```
## # A tibble: 2,476 × 2
##       word score
##   <chr> <int>
## 1  abandon    -2
## 2  abandoned  -2
## 3  abandons   -2
## 4  abducted   -2
## 5  abduction  -2
## 6  abductions -2
## 7   abhor     -3
## 8  abhorred   -3
## 9  abhorrent  -3
## 10 abhors    -3
## # ... with 2,466 more rows
```

```
get_sentiments("bing")
```

```
## # A tibble: 6,788 × 2
##       word sentiment
##   <chr>      <chr>
```

```
## 1      2-faced  negative
## 2      2-faces  negative
## 3          a+   positive
## 4     abnormal  negative
## 5     abolish  negative
## 6   abominable  negative
## 7   abominably  negative
## 8     abominate  negative
## 9   abomination  negative
## 10      abort   negative
## # ... with 6,778 more rows
```

```
get_sentiments("nrc")
```

```
## # A tibble: 13,901 × 2
##       word sentiment
##       <chr>      <chr>
## 1     abacus    trust
## 2   abandon    fear
## 3   abandon  negative
## 4   abandon  sadness
## 5  abandoned   anger
## 6  abandoned   fear
## 7  abandoned  negative
## 8  abandoned  sadness
## 9  abandonment  anger
## 10 abandonment  fear
## # ... with 13,891 more rows
```

## Sentiment Analysis

```
afinn <- Obama_16 %>%
  inner_join(get_sentiments("afinn")) %>%
  group_by(index = line %/% 70) %>%
  summarise(sentiment_df = sum(score)) %>%
  mutate(method_df = "AFINN")
```

```
## Joining, by = "word"
```

```
bing_and_nrc <- bind_rows(Obama_16 %>%
  inner_join(get_sentiments("bing")) %>%
  mutate(method = "Bing et al."),
  Obama_16 %>%
  inner_join(get_sentiments("nrc") %>%
    filter(sentiment %in% c("positive",
                          "negative"))) %>%
  mutate(method = "NRC"))
```

```
## Joining, by = "word"
```

```
## Joining, by = "word"
```

```
sentiment_line <- bing_and_nrc %>%
  select(line, sentiment) %>%
  group_by(line, sentiment) %>%
  summarise(n=n()) %>%
```



```
ungroup() %>%
spread(sentiment, n, fill=0) %>%
mutate(net_sentiment = positive - negative)
```

```
sentiment_line
```

```
## # A tibble: 70 × 4
##   line negative positive net_sentiment
##   <int>    <dbl>    <dbl>         <dbl>
## 1     1         3         2          -1
## 2     2         8         8           0
## 3     3         9        10           1
## 4     4         0         3           3
## 5     5         3         8           5
## 6     6        12        14           2
## 7     7         0        10          10
## 8     8         3        10           7
## 9     9         3         5           2
## 10    10         4        12           8
## # ... with 60 more rows
```

```
sum(sentiment_line$net_sentiment)
```

```
## [1] 207
```