Data visualizations for 2014-2018 House, Senate and Presidential elections in the U.S for the proportion of Spanish ads Javier Torralba 2023-04-25 knitr::opts_chunk\$set(warning = FALSE, message = FALSE, echo = TRUE) Loading libraries library(haven) library(dplyr) library(ggplot2) library(tidyverse) library(rjson) library(rgdal) library(rgeos) library(maptools) Loading data

```
wmp_house_2014_v1_0 <- read_dta("wmp-house-2014-v1.0/wmp-house-2014-v1.0.dta")</pre>
wmp_senate_2014_v1_0 <- read_dta("wmp-senate-2014-v1.0/wmp-senate-2014-v1.0.dta")</pre>
```

Preparing map data neil <- readOGR("nielsen-dma-master/nielsentopo.json", "nielsen_dma", stringsAsFactors=FALSE,</pre>

neil <- SpatialPolygonsDataFrame(gBuffer(neil, byid=TRUE, width=0),</pre> data=neil@data) neil_map <- fortify(neil, region="id")</pre> neil_map <- neil_map %>% rename(dma = id)neil_map\$dma <- as.numeric(neil_map\$dma)</pre>

Removing unnecessary data rm(neil) Preparing 2014 House election data # Select only relevant columns dma_and_spanish <- wmp_house_2014_v1_0 %>% select(dma, spanish, affiliation)

Proportion per dma and party dma_and_spanish <- dma_and_spanish %>% group_by(dma, affiliation) %>% summarise(prop_spanish = mean(spanish)) Merging map data and 2014 House election data house_election_2014 <- left_join(neil_map, dma_and_spanish, by = "dma")</pre>

house_election_2014 <- house_election_2014 %>% filter(affiliation %in% c("DEMOCRAT", "REPUBLICAN")) Removing data rm(dma_and_spanish, wmp_house_2014_v1_0)

Proportion of spanish adds for House elections 2014 per

DMA

DMA"

1.0.dta")

DMA

Preparing for House data

Select only relevant columns

select(dma, spanish, party)

Proportion per dma and party

group_by(dma, party) %>%

dma_and_spanish <- wmp_house_2016_v1_0 %>%

summarise(prop_spanish = mean(spanish))

Proportion of spanish adds for House elections 2016 per DMA

DEMOCRAT

dma_and_spanish <- dma_and_spanish %>%

summarise(prop_spanish = mean(spanish))

Merging map data and 2016 house election data

senate_election_2016 <- left_join(neil_map, dma_and_spanish, by = "dma")</pre>

 $ggplot(senate_election_2016, aes(x = long, y = lat, group=group)) +$

Proportion of spanish adds for Senate elections 2016 per DMA

rm(dma_and_spanish, wmp_senate_2016_v1_0, senate_election_2016)

Loading 2016 (presidential) election results

Preparing for presidential 2016 data

dma_and_spanish <- wmp_pres_2016_v1_1 %>%

dma_and_spanish <- dma_and_spanish %>%

summarise(prop_spanish = mean(spanish))

rect = element_blank()) +

facet_wrap(~party) + coord_fixed(1.3)

DEMOCRAT

Loading 2018 election results

Remove data

DMA

Select only relevant columns

select(dma, spanish, party)

Proportion per dma and party

group_by(dma, party) %>%

DEMOCRAT

geom_polygon(aes(fill = prop_spanish), color = "black", size = 0.1) +

senate_election_2016 <- senate_election_2016 %>% filter(party %in% c("DEMOCRAT", "REPUBLICAN"))

Proportion of spanish adds for Senate elections 2016 per

group_by(dma, party) %>%

DMA

dma_and_spanish <- dma_and_spanish %>%

scale_fill_gradient(name = "Gradient value", low = "white", high = "darkblue", na.value = "grey") + theme(axis.text.x = element_blank(), axis.text.y = element_blank(), axis.ticks = element_blank(), axis.title.x = element_blank(), axis.title.y = element_blank(), rect = element_blank()) + labs(title = "Proportion of spanish adds for House elections 2014 per DMA") + facet_wrap(~affiliation) + coord_fixed(1.3)

 $ggplot(house_election_2014, aes(x = long, y = lat, group=group)) +$

geom_polygon(aes(fill = prop_spanish), color = "black", size = 0.1) +

Proportion of spanish adds for House elections 2014 per DMA **REPUBLICAN** Gradient value 0.75 0.50 0.25

0.00

Removing unnecessary data rm(house_election_2014) Preparing for Senate data # Select only relevant columns dma_and_spanish <- wmp_senate_2014_v1_0 %>% select(dma, spanish, affiliation) # Proportion per dma and party dma_and_spanish <- dma_and_spanish %>% group_by(dma, affiliation) %>% summarise(prop_spanish = mean(spanish)) Merging map data and 2014 Senate election data

senate_election_2014 <- senate_election_2014 %>% filter(affiliation %in% c("DEMOCRAT", "REPUBLICAN"))

scale_fill_gradient(name = "Gradient value", low = "white", high = "darkblue", na.value = "grey") +

"Proportion of spanish adds for Senate elections 2014 per

senate_election_2014 <- left_join(neil_map, dma_and_spanish, by = "dma")</pre>

 $ggplot(senate_election_2014, aes(x = long, y = lat, group=group)) +$

Proportion of spanish adds for Senate elections 2014 per DMA

rm(dma_and_spanish, senate_election_2014, wmp_senate_2014_v1_0)

Loading 2016 (non presidential) election results

theme(axis.text.x = element_blank(),

axis.text.y = element_blank(), axis.ticks = element_blank(),

geom_polygon(aes(fill = prop_spanish), color = "black", size = 0.1) +

axis.title.x = element_blank(), axis.title.y = element_blank(), rect = element_blank()) + labs(title = "Proportion of spanish adds for Senate elections 2014 per DMA") + facet_wrap(~affiliation) + coord_fixed(1.3)

DEMOCRAT **REPUBLICAN** Gradient value Removing data 0.75 0.50 0.25 0.00

wmp_house_2016_v1_0 <- read_dta("../2016 election data (non presidential)/wmp-house-2016-v1.0/wmp-house-2016-v1.</pre>

wmp_senate_2016_v1_0 <- read_dta("../2016 election data (non presidential)/wmp-senate-2016-v1.0/wmp-senate-2016-v</pre>

Merging map data and 2016 house election data house_election_2016 <- left_join(neil_map, dma_and_spanish, by = "dma")</pre>

Proportion of spanish adds for House elections 2016 per

house_election_2016 <- house_election_2016 %>% filter(party %in% c("DEMOCRAT", "REPUBLICAN"))

 $ggplot(house_election_2016, aes(x = long, y = lat, group=group)) +$ geom_polygon(aes(fill = prop_spanish), color = "black", size = 0.1) + scale_fill_gradient(name = "Gradient value", low = "white", high = "darkblue", na.value = "grey") + theme(axis.text.x = element_blank(), axis.text.y = element_blank(), axis.ticks = element_blank(), axis.title.x = element_blank(), axis.title.y = element_blank(), rect = element_blank()) + labs(title = "Proportion of spanish adds for House elections 2016 per DMA") + facet_wrap(~party) + coord_fixed(1.3)

REPUBLICAN

Gradient value

0.3

0.2

Removing data

0.1 0.0 rm(dma_and_spanish, house_electio_2016, house_election_2016, wmp_house_2016_v1_0) Preparing for House data # Select only relevant columns dma_and_spanish <- wmp_senate_2016_v1_0 %>% select(dma, spanish, party) # Proportion per dma and party

scale_fill_gradient(name = "Gradient value", low = "white", high = "darkblue", na.value = "grey") + theme(axis.text.x = element_blank(), axis.text.y = element_blank(), axis.ticks = element_blank(), axis.title.x = element_blank(), axis.title.y = element_blank(), rect = element_blank()) + labs(title = "Proportion of spanish adds for Senate elections 2016 per DMA") + facet_wrap(~party) + coord_fixed(1.3)

REPUBLICAN

wmp_pres_2016_v1_1 <- read_dta("../2016 election data (presidential)/wmp-pres-2016-v1.1/wmp-pres-2016-v1.1.dta")</pre>

Gradient value 1.00

0.75

0.50

0.25

0.00

Removing data

Merging map data and 2016 presidential election data presidential_election_2016 <- left_join(neil_map, dma_and_spanish, by = "dma")</pre> presidential_election_2016 <- presidential_election_2016 %>% filter(party %in% c("DEMOCRAT", "REPUBLICAN")) Proportion of spanish adds for presidential elections 2016 per DMA $ggplot(presidential_election_2016, aes(x = long, y = lat, group=group)) +$ geom_polygon(aes(fill = prop_spanish), color = "black", size = 0.1) + scale_fill_gradient(name = "Gradient value", low = "white", high = "darkblue", na.value = "grey") + theme(axis.text.x = element_blank(), axis.text.y = element_blank(), axis.ticks = element_blank(), axis.title.x = element_blank(), axis.title.y = element_blank(),

REPUBLICAN

0.75

0.50

0.25

0.00

labs(title = "Proportion of spanish adds for presidential elections 2016 per DMA") +

Proportion of spanish adds for presidential elections 2016 per DMA

rm(presidential_election_2016, wmp_pres_2016_v1_1, dma_and_spanish)

house_election_2018 <- left_join(neil_map, dma_and_spanish, by = "dma")</pre>

 $ggplot(house_election_2018, aes(x = long, y = lat, group=group)) +$

rm(wmp_house_2018_v1_0, house_election_2018, dma_and_spanish)

 $ggplot(senate_election_2018, aes(x = long, y = lat, group=group)) +$

geom_polygon(aes(fill = prop_spanish), color = "black", size = 0.1) +

Preparing for Senate 2018 data

geom_polygon(aes(fill = prop_spanish), color = "black", size = 0.1) +

labs(title = "Proportion of spanish adds for House elections 2018 per DMA") +

house_election_2018 <- house_election_2018 %>% na.omit()

theme(axis.text.x = element_blank(),

rect = element_blank()) +

facet_wrap(~party) + coord_fixed(1.3)

Removing data

DMA

axis.text.y = element_blank(), axis.ticks = element_blank(), axis.title.x = element_blank(), axis.title.y = element_blank(),

wmp_senate_2018_v1_0 <- read_dta("../2018 election data/wmp-senate-2018-v1.0/wmp-senate-2018-v1.0.dta")</pre> Preparing for House 2018 data # Select only relevant columns dma_and_spanish <- wmp_house_2018_v1_0 %>% select(dma, spanish, party) %>% filter(party %in% c("DEMOCRAT", "REPUBLICAN")) # Proportion per dma and party dma_and_spanish <- dma_and_spanish %>% group_by(dma, party) %>% summarise(prop_spanish = mean(spanish)) Merging map data and 2018 House election data

Proportion of spanish adds for House elections 2018 per

scale_fill_gradient(name = "Gradient value", low = "white", high = "darkblue", na.value = "grey") +

wmp_house_2018_v1_0 <- read_dta("../2018 election data/wmp-house-2018-v1.0/wmp-house-2018-v1.0.dta")</pre>

Proportion of spanish adds for House elections 2018 per DMA **Gradient value**

0.2

0.1

0.0

Select only relevant columns dma_and_spanish <- wmp_senate_2018_v1_0 %>% select(dma, spanish, party) %>% filter(party %in% c("DEMOCRAT", "REPUBLICAN")) # Proportion per dma and party dma_and_spanish <- dma_and_spanish %>% group_by(dma, party) %>% summarise(prop_spanish = mean(spanish)) Merging map data and 2018 Senate election data senate_election_2018 <- left_join(neil_map, dma_and_spanish, by = "dma")</pre> senate_election_2018 <- senate_election_2018 %>% na.omit() Proportion of spanish adds for Senate elections 2018 per

scale_fill_gradient(name = "Gradient value", low = "white", high = "darkblue", na.value = "grey") + theme(axis.text.x = element_blank(), axis.text.y = element_blank(), axis.ticks = element_blank(), axis.title.x = element_blank(), axis.title.y = element_blank(), rect = element_blank()) + labs(title = "Proportion of spanish adds for Senate elections 2018 per DMA") + facet_wrap(~party) + coord_fixed(1.3) Proportion of spanish adds for Senate elections 2018 per DMA

DEMOCRAT REPUBLICAN Gradient value 0.75 0.50 0.25 0.00

Removing data rm(wmp_senate_2018_v1_0, senate_election_2018, dma_and_spanish)