

UNCERTAINTY

MPA 635: Data Visualization

October 9, 2018

PLAN FOR TODAY

Uncertainty

Distributions

Visualizing uncertainty
with ggplot

UNCERTAINTY

UNCERTAINTY IS HARD

Why is uncertainty so hard to communicate?

Why is uncertainty so important to communicate?

THE BAY OF PIGS



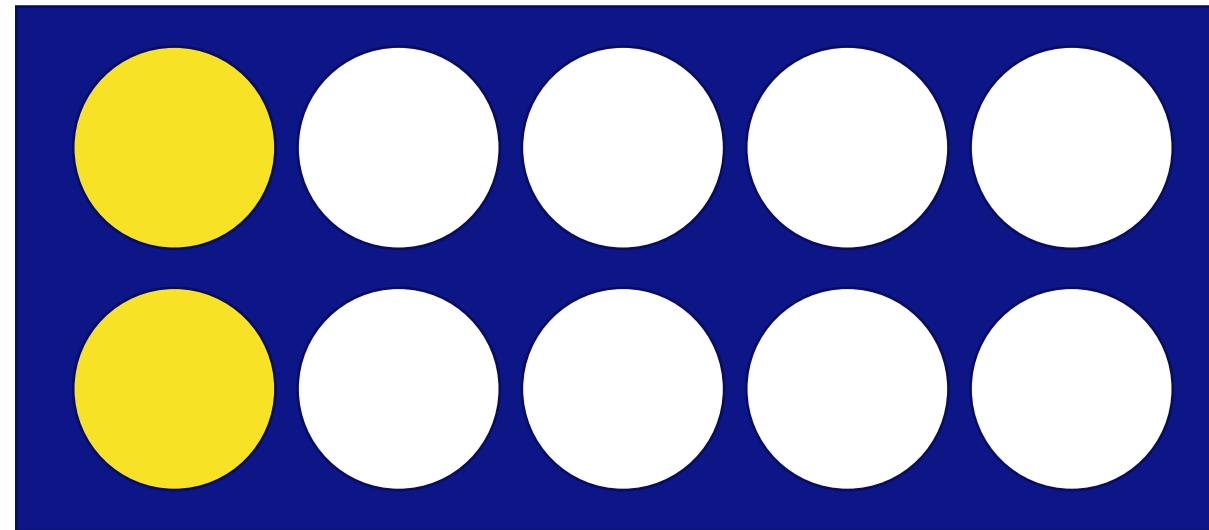
Joint Chiefs said
“fair chance of
success”

In Pentagon-speak,
that meant 3:1
odds of failure

25% chance of
success!

WEIRD PERCEPTIONS OF PROBABILITY

1 in 5 vs. 20%



WEIRD PERCEPTIONS OF PROBABILITY

Utah

SOLID R

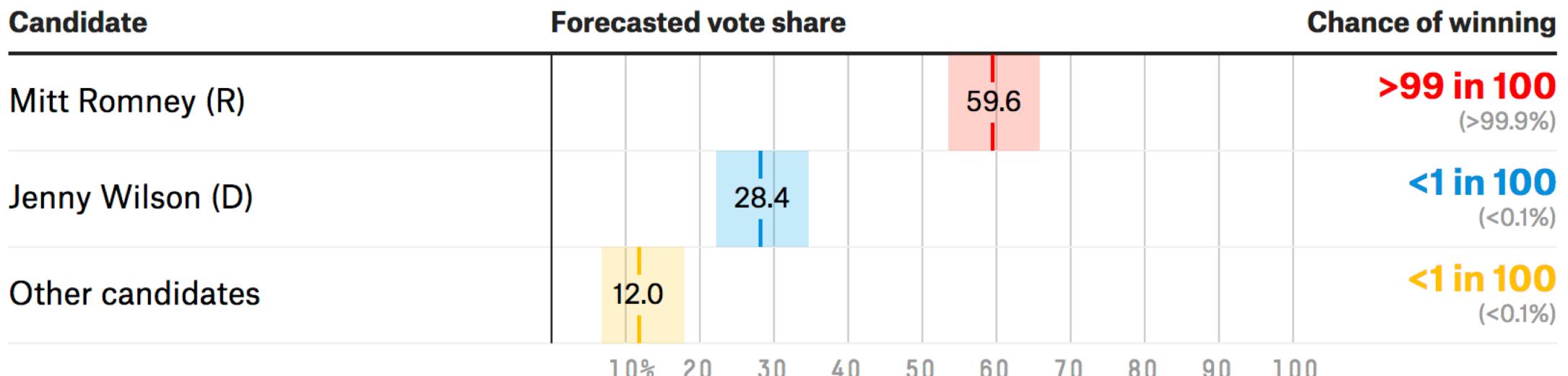


<1 in 100

Chance the Democrat wins (<0.1%)

>99 in 100

Chance the Republican wins (>99.9%)



WEIRD PERCEPTIONS OF PROBABILITY

Texas

LEAN R

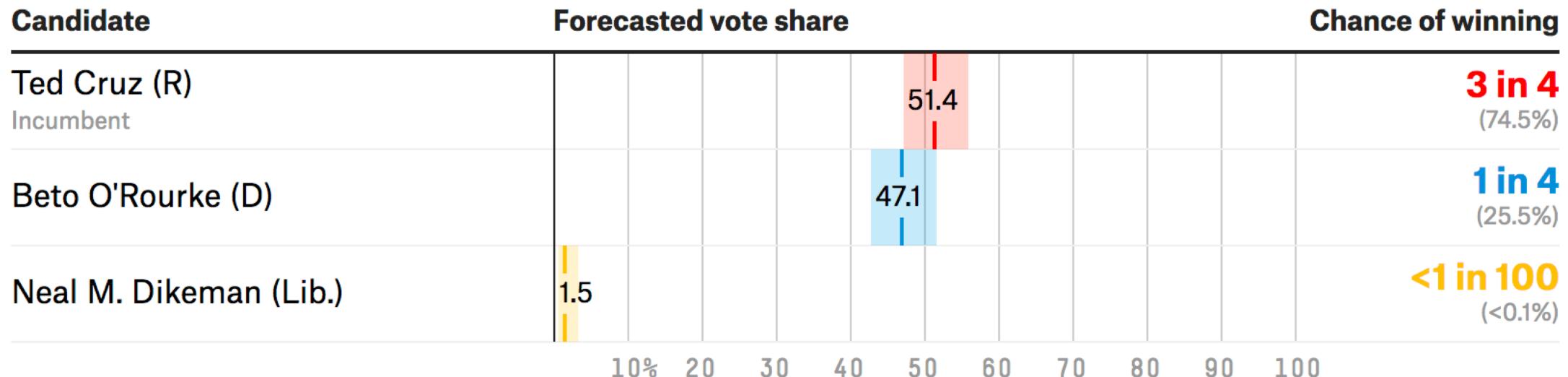


1 in 4

Chance the Democrat wins (25.5%)

3 in 4

Chance the Republican wins (74.5%)



WEIRD PERCEPTIONS OF PROBABILITY

Chance of rain =
Probability × Area



100% chance in
1/3 of the city

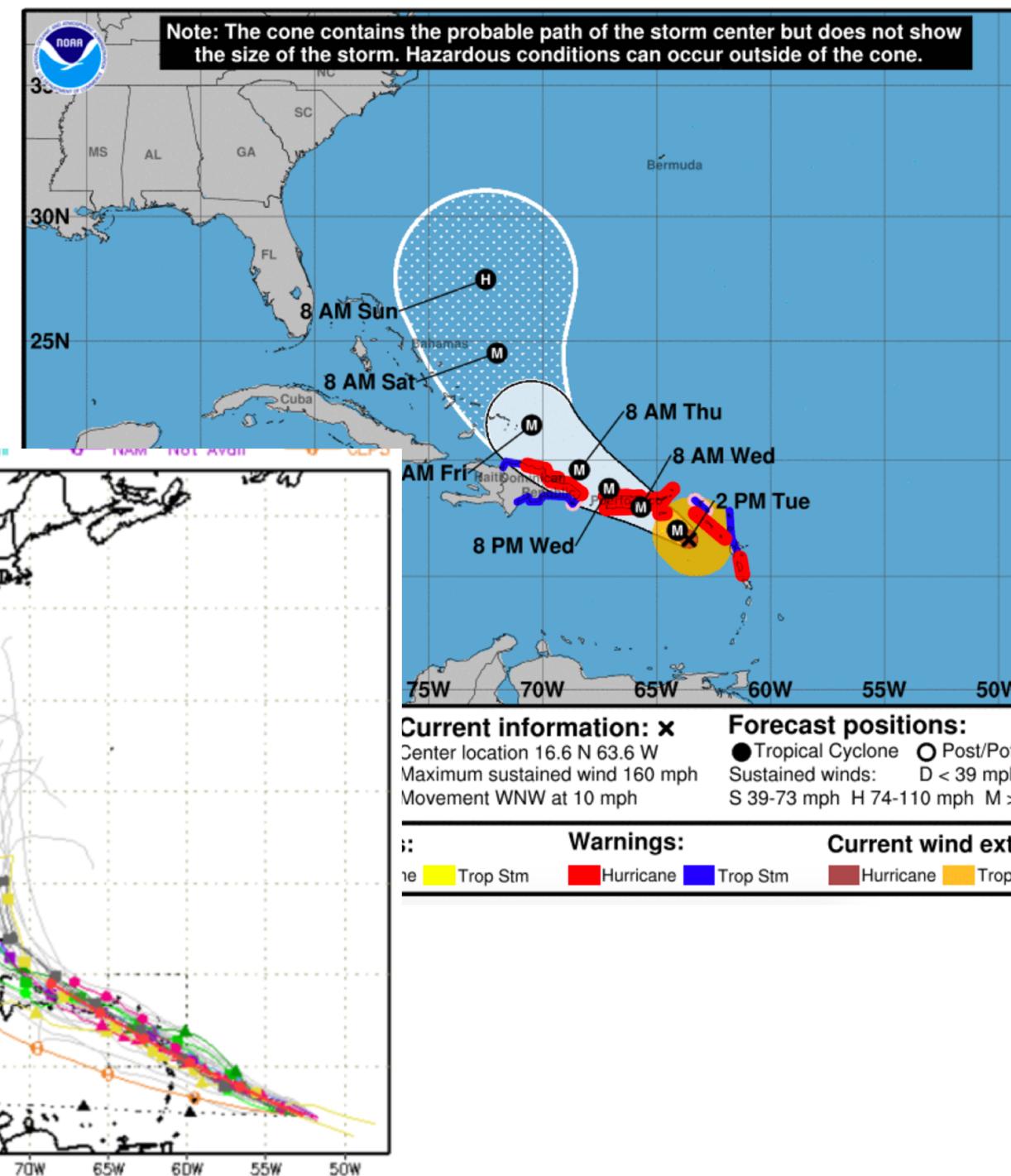
0% chance in
2/3 of the city

Chance of rain
for city = 33%

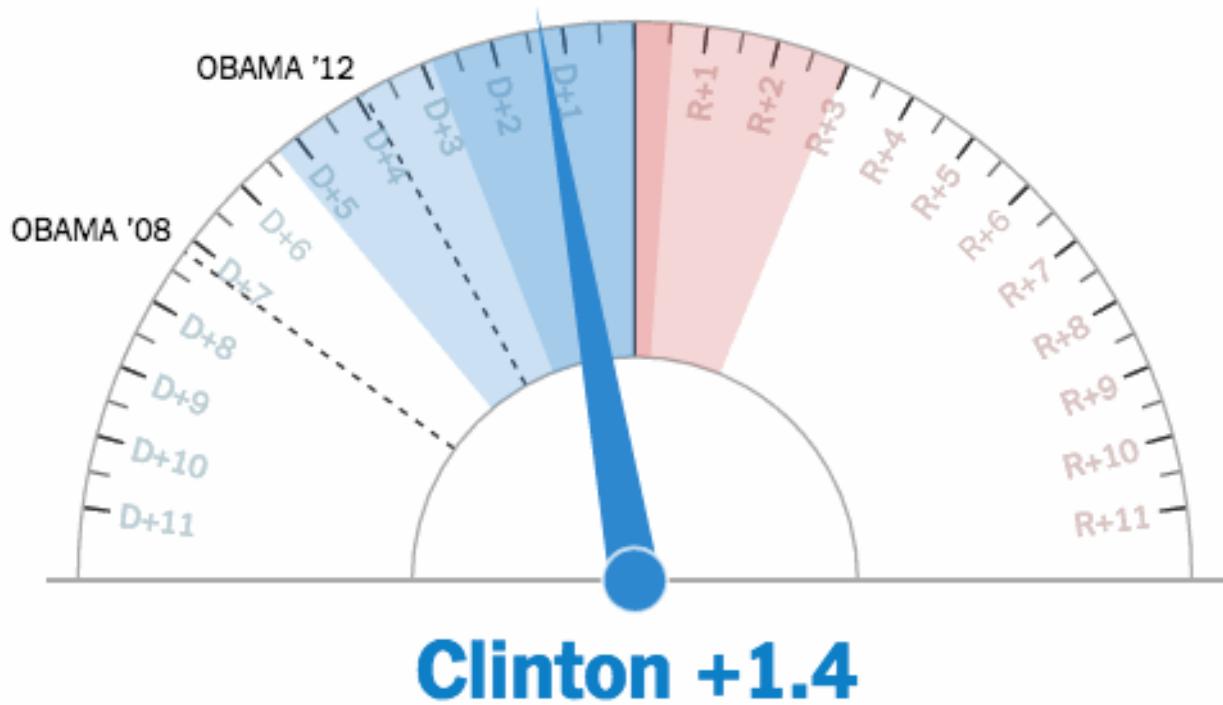
WEIRD PERCEPTIONS OF PROBABILITY

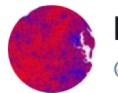


SEVERITY Category ■ 5 ■ 4 ■ 3 ■ 2 ■ 1 ■ Tropical storm



Popular vote margin



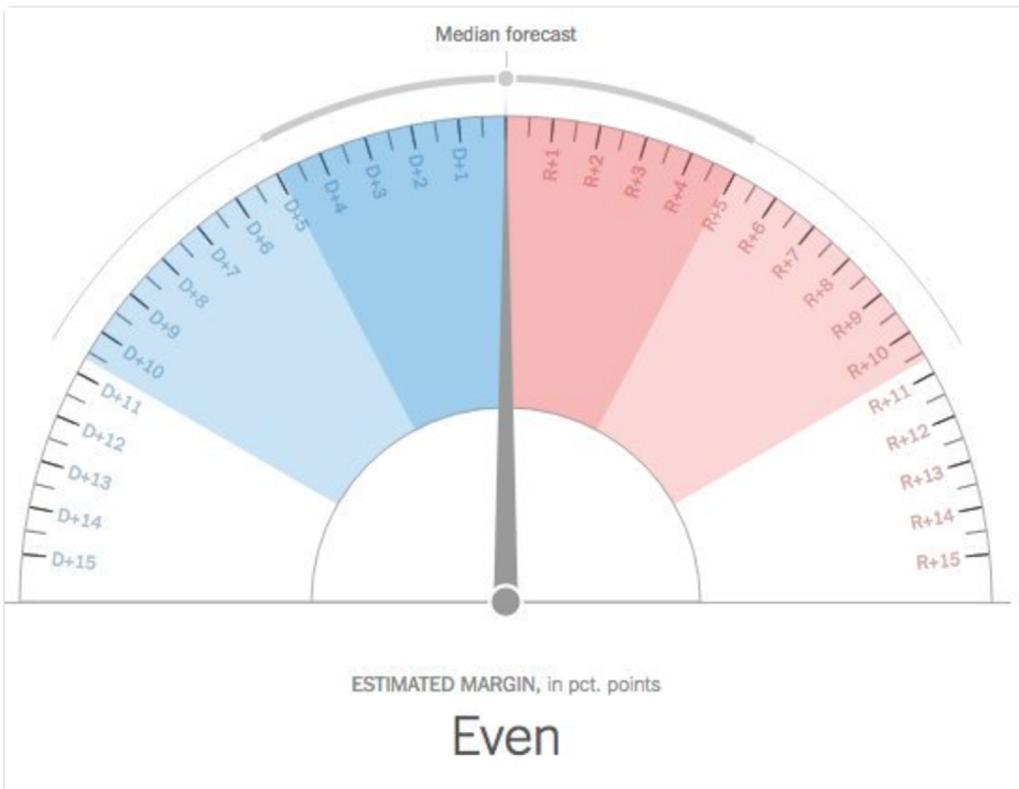


Nate Cohn ✅
@Nate_Cohn

Following



The GA-6 live model is live.
nytimes.com/elections/results ...



4:47 PM - 20 Jun 2017 from Manhattan, NY

481 Retweets 660 Likes



Virgil Texas ✅ @virgiltexas · Jun 20

Replies to @Nate_Cohn

Nate



Alp Ozcelik ✅ @alplicable · Jun 20

Replies to @Nate_Cohn

DO NOT DO THIS TO ME AGAIN



Sarcasmorator @Sarcasmorator · Jun 20

Replies to @Nate_Cohn @jacquicollins_

ah, yes, the election stress-o-meter



2

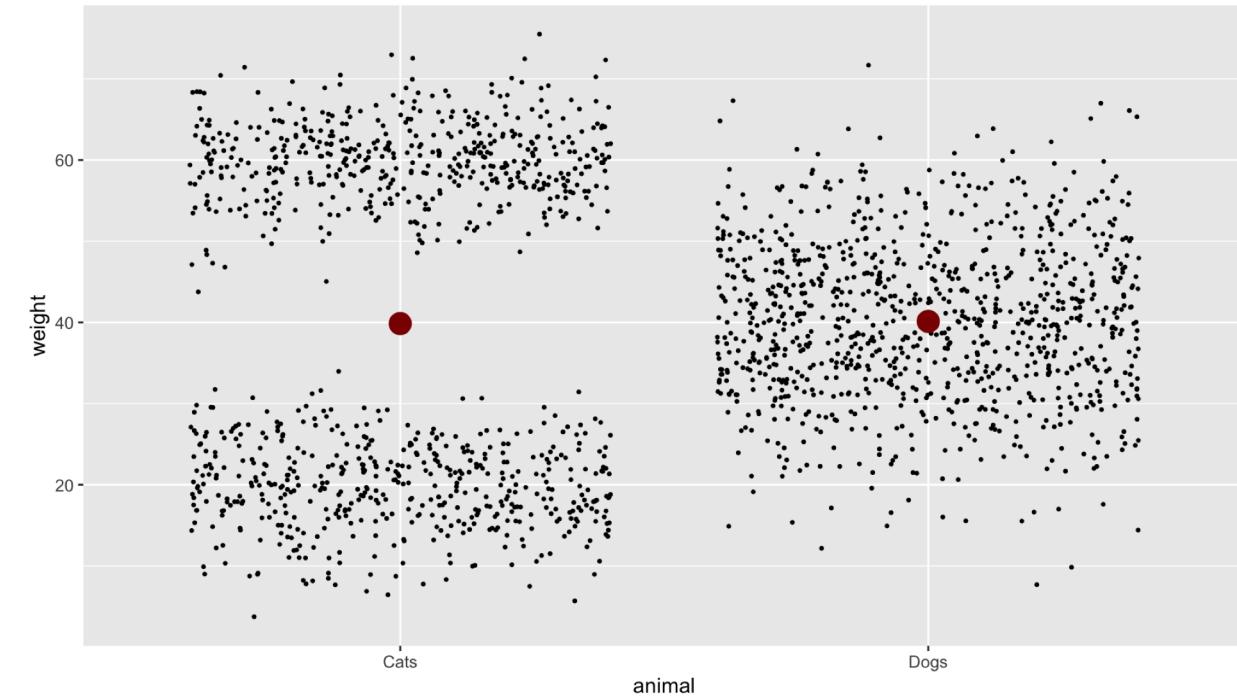
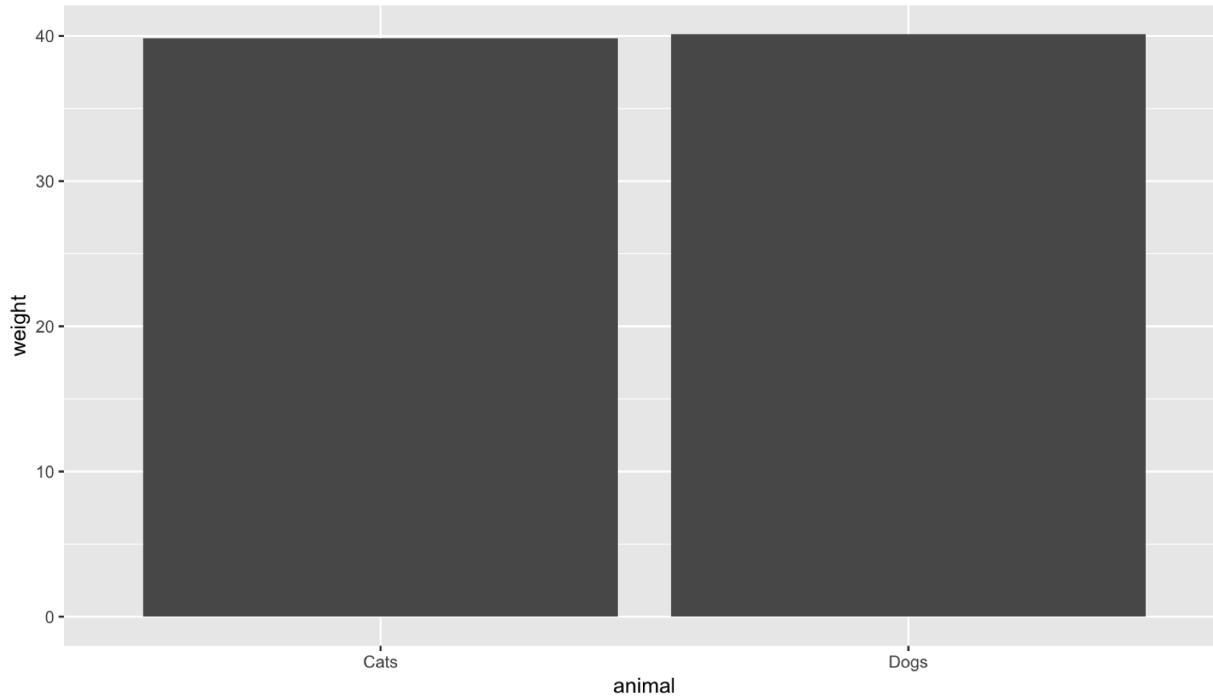
36



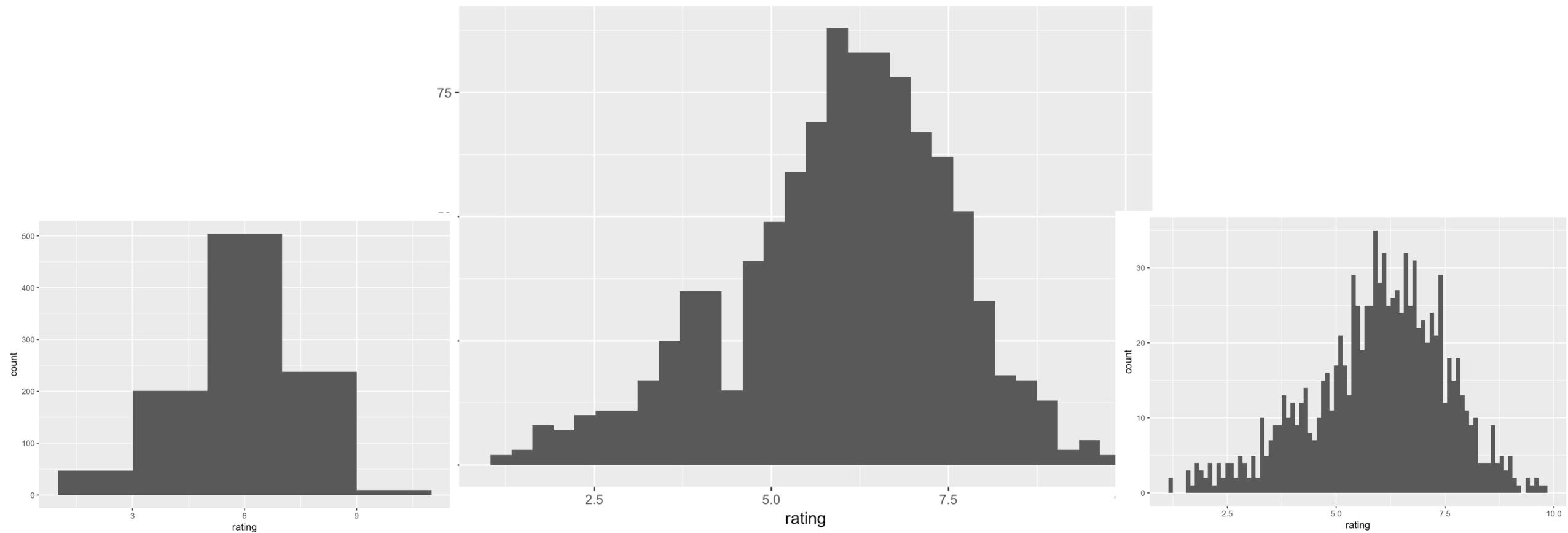
DISTRIBUTIONS

PROBLEMS WITH SINGLE NUMBERS

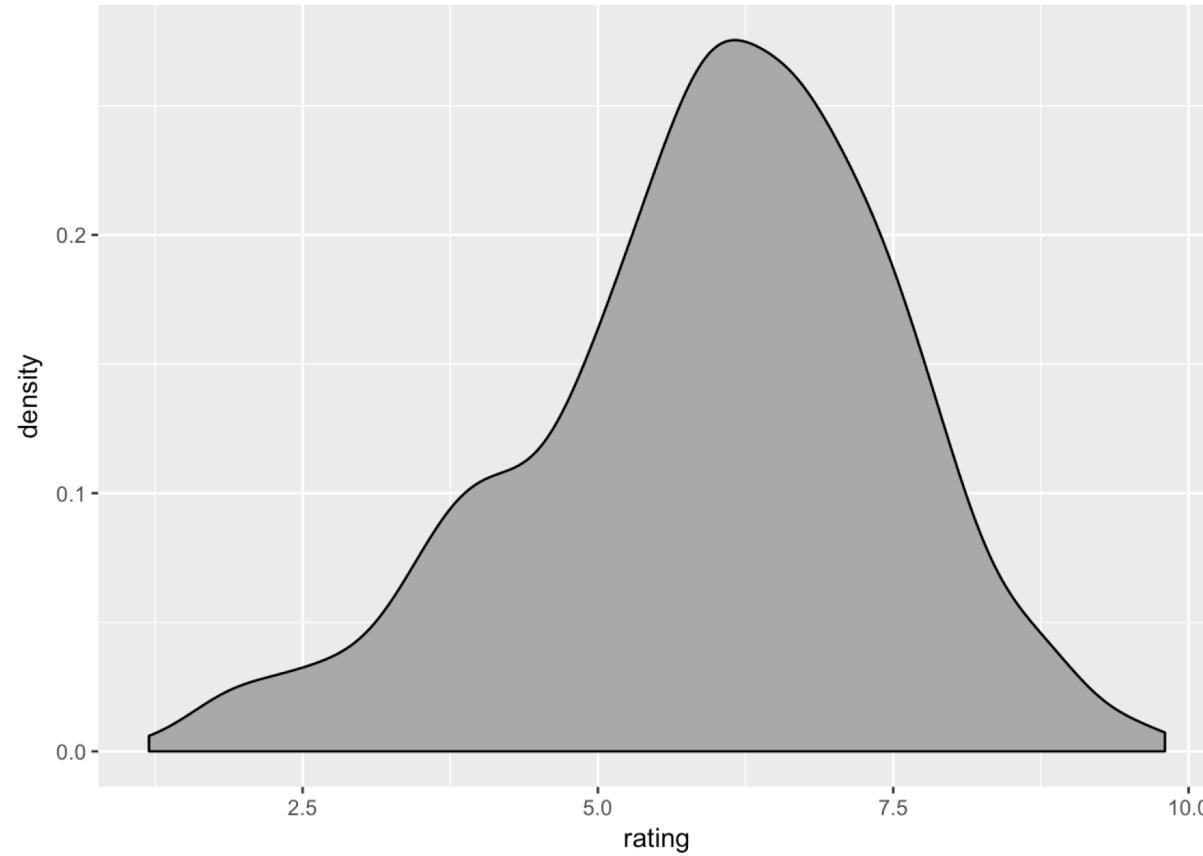
What's wrong with showing single summary statistics?



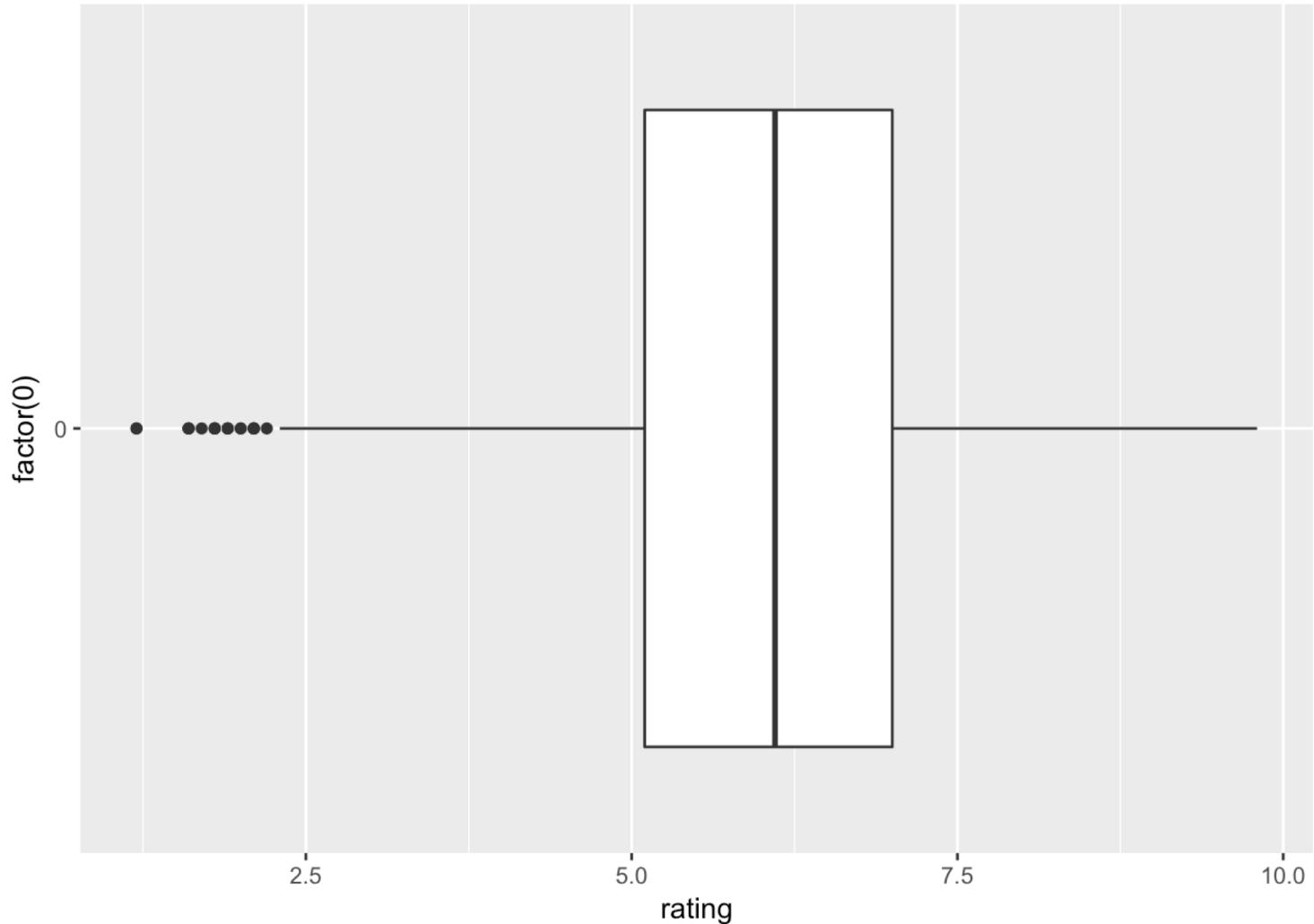
HISTOGRAMS



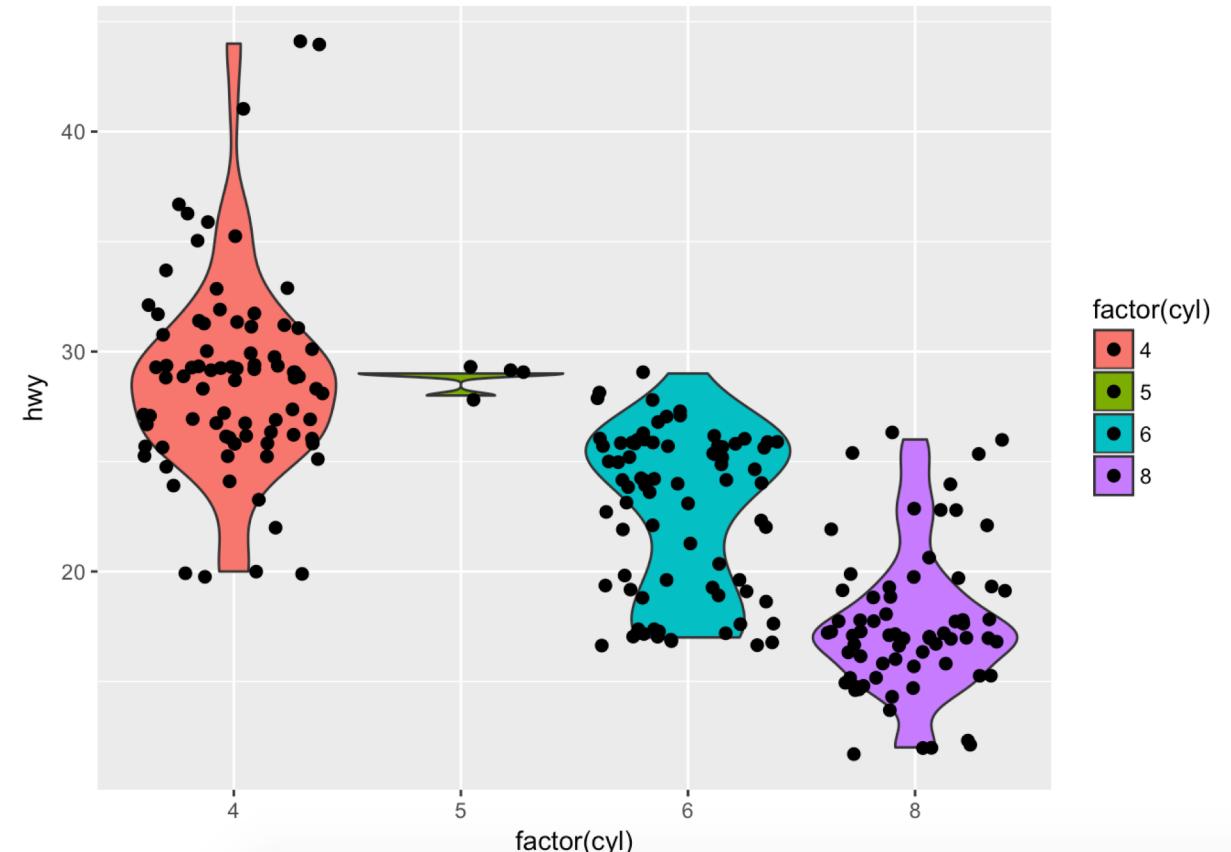
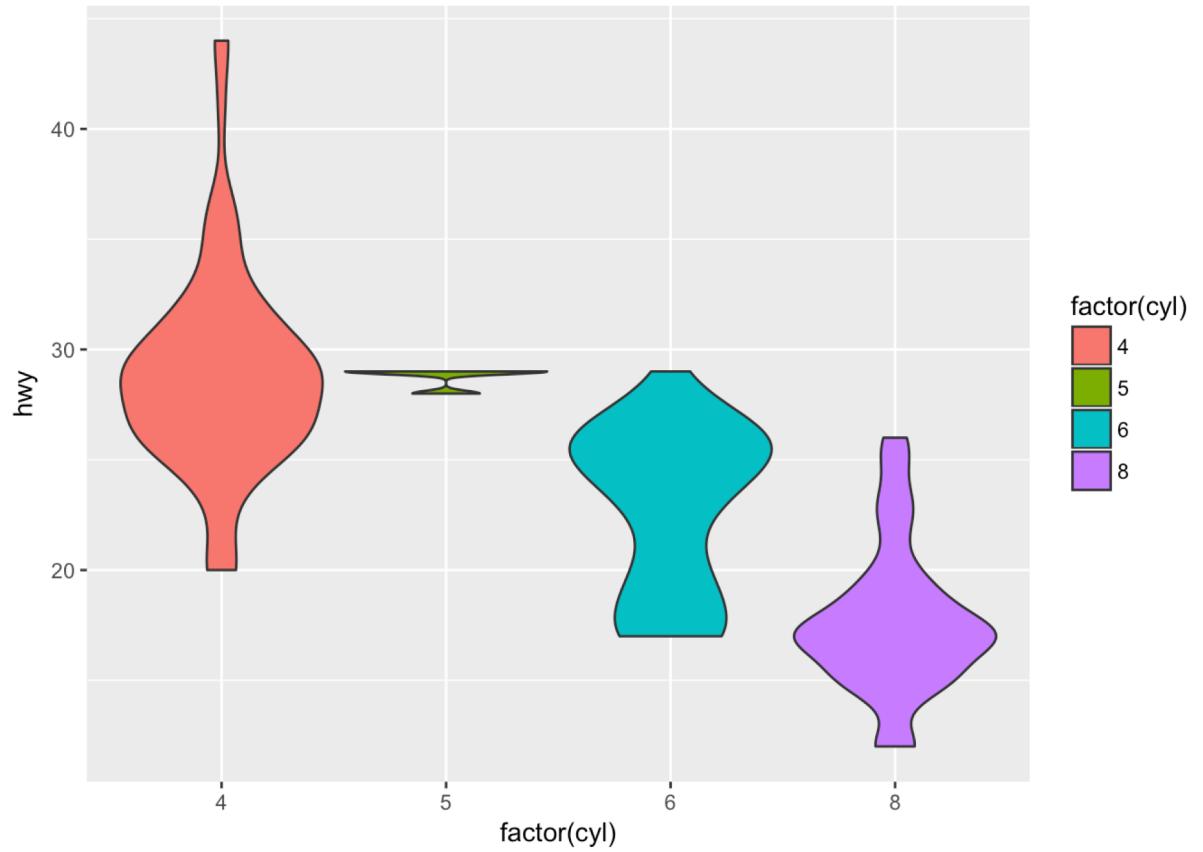
DENSITY PLOTS



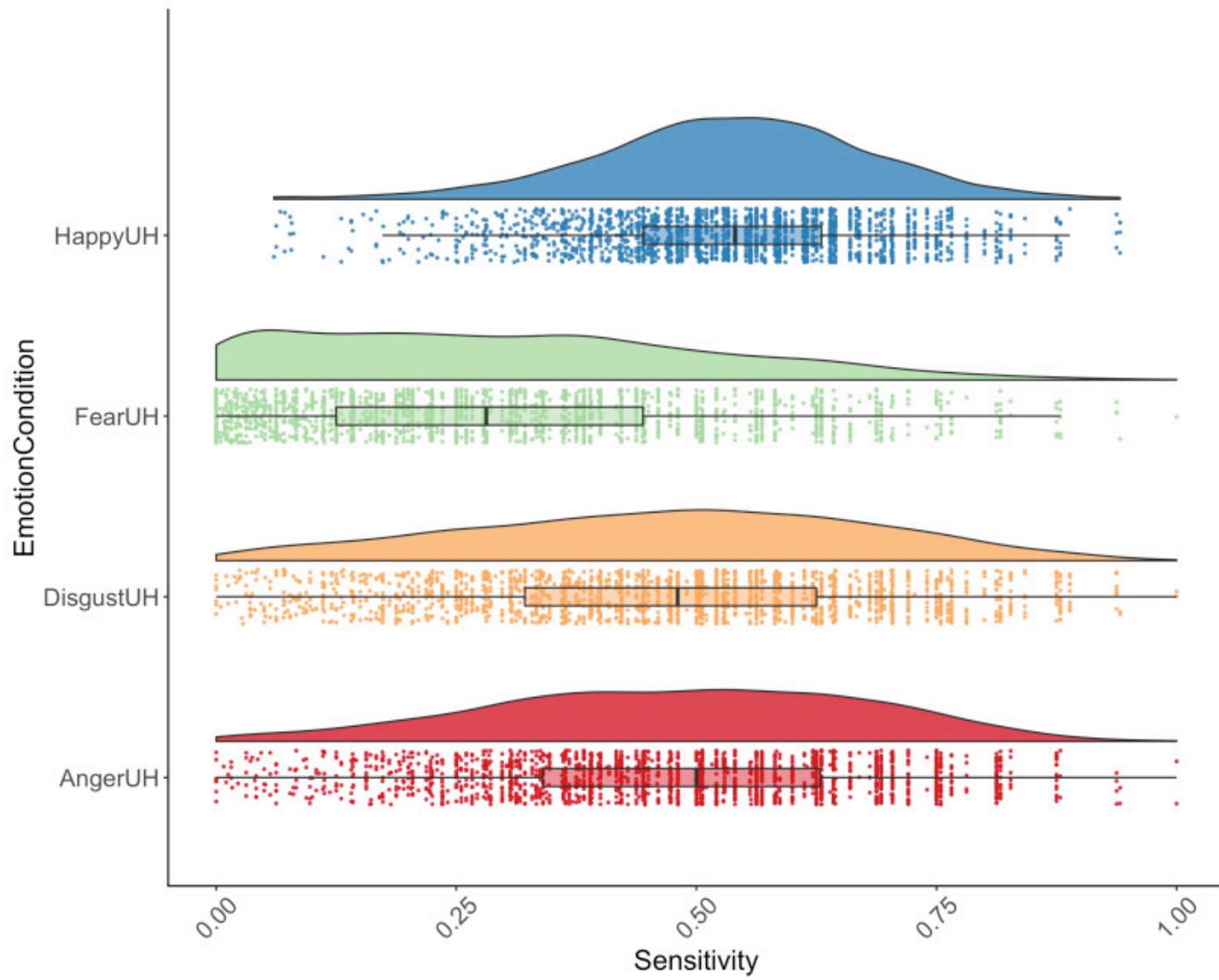
BOX PLOTS



VIOLIN CHARTS

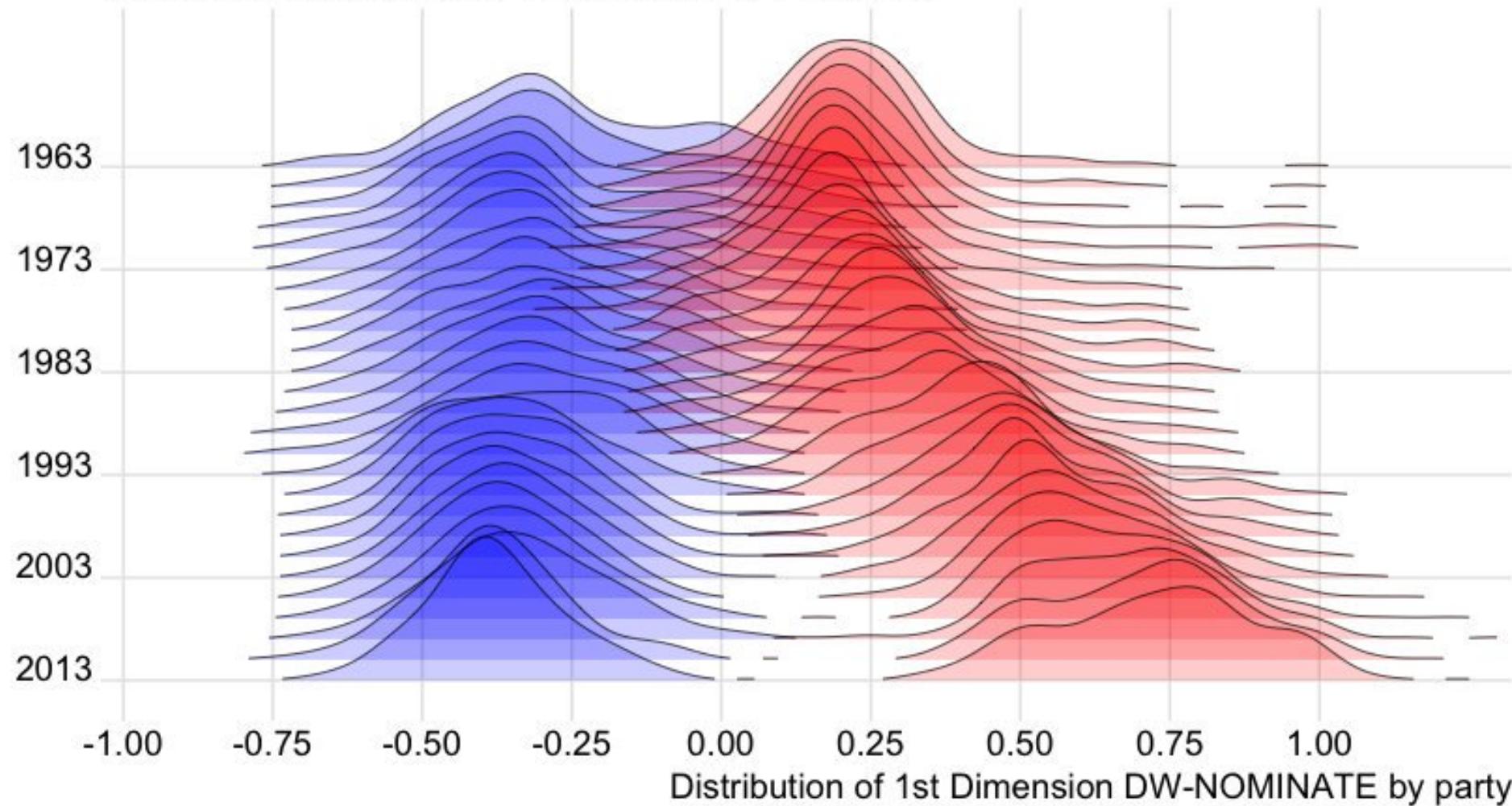


RAIN CLOUD PLOTS



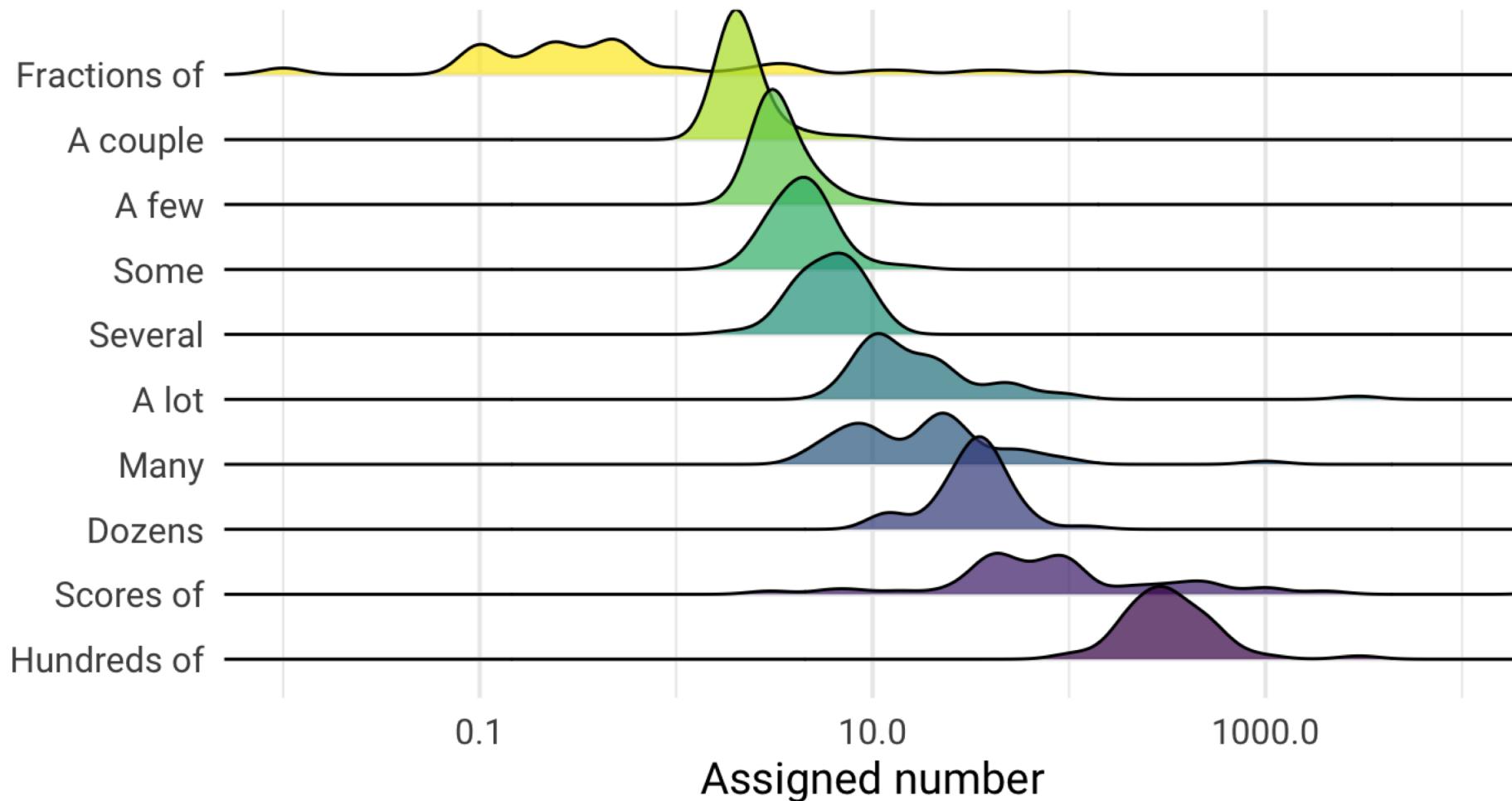
RIDGE PLOTS

DW-NOMINATE by party of U.S. House: 1963-2013

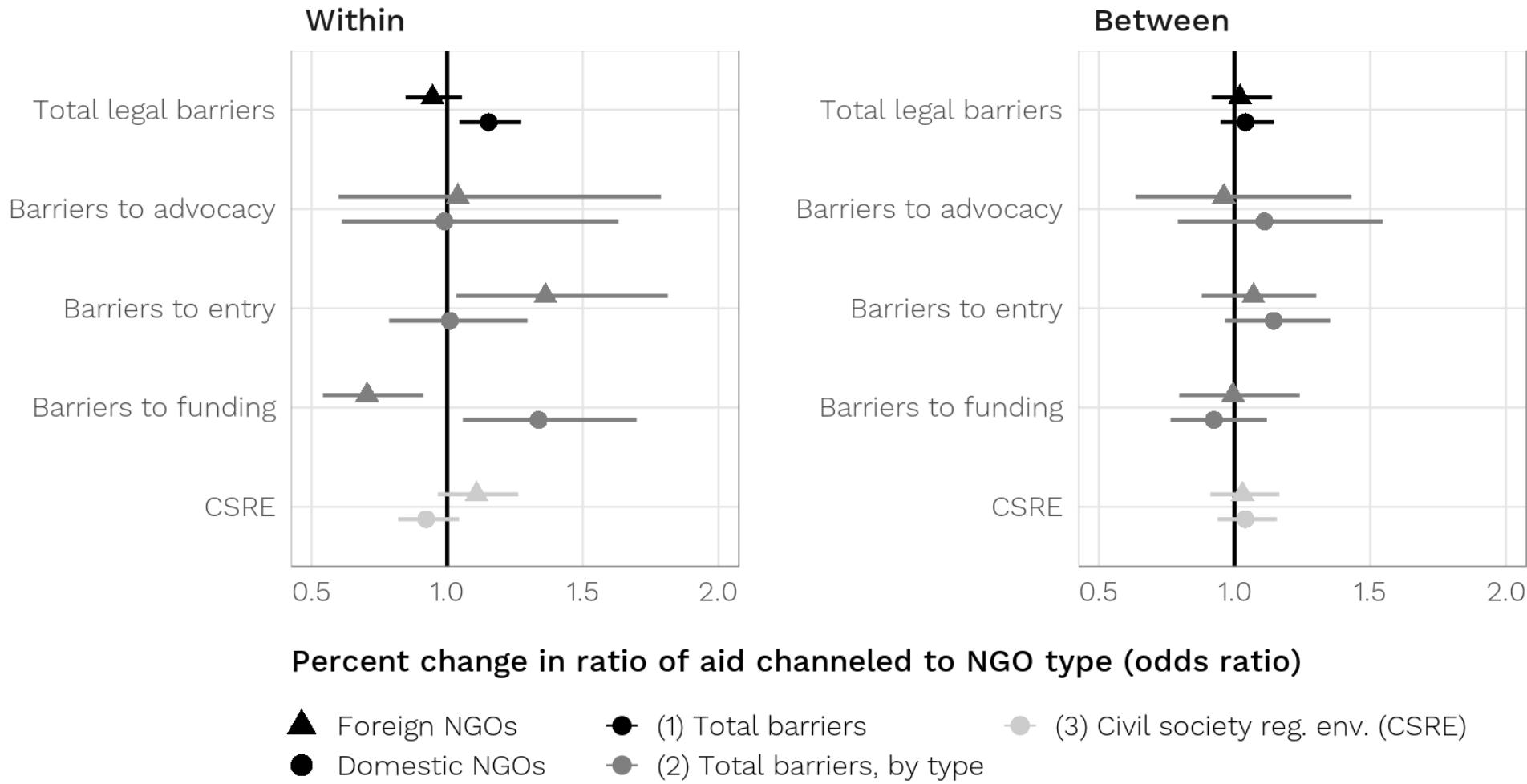


RIDGE PLOTS

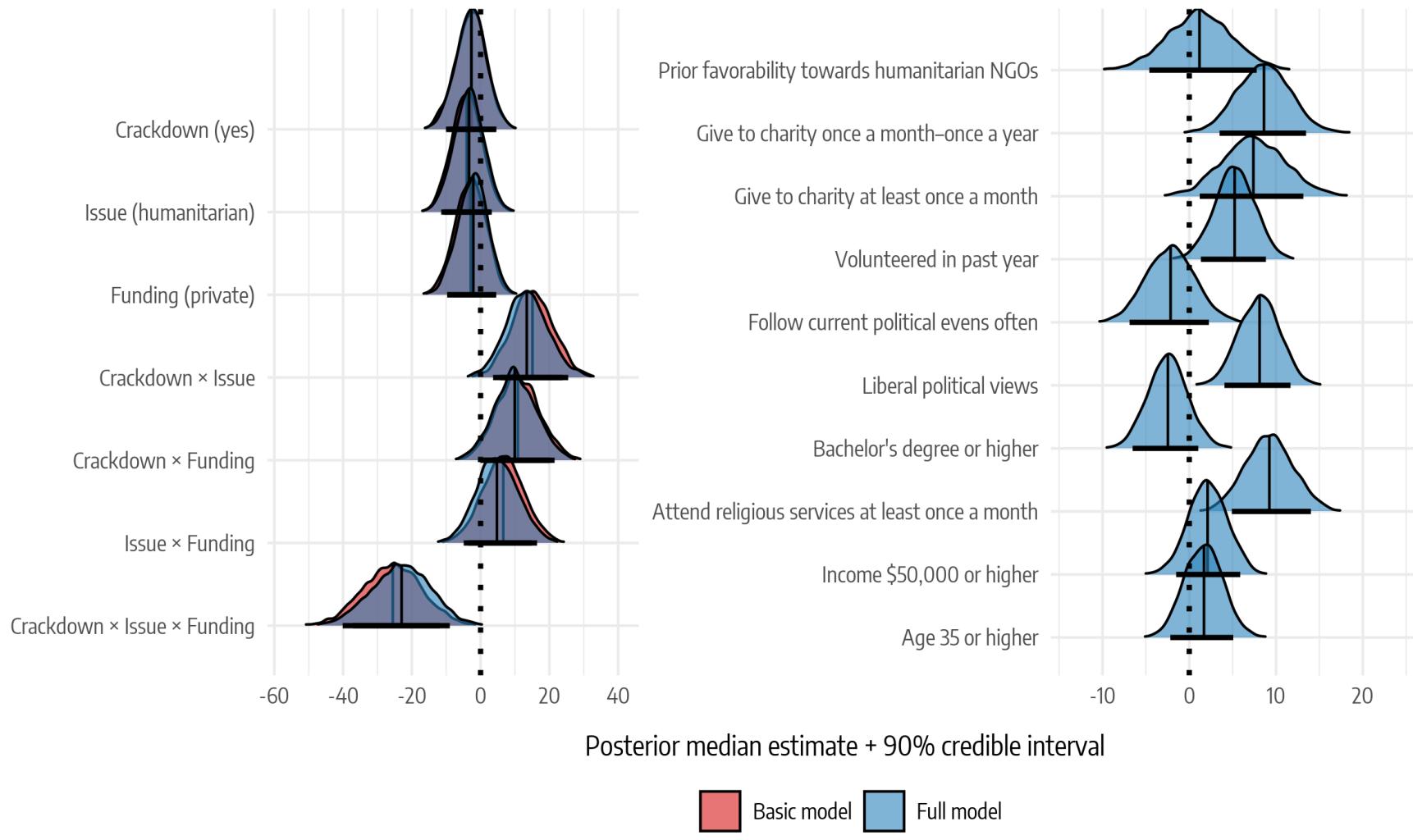
Perceptions of numbers



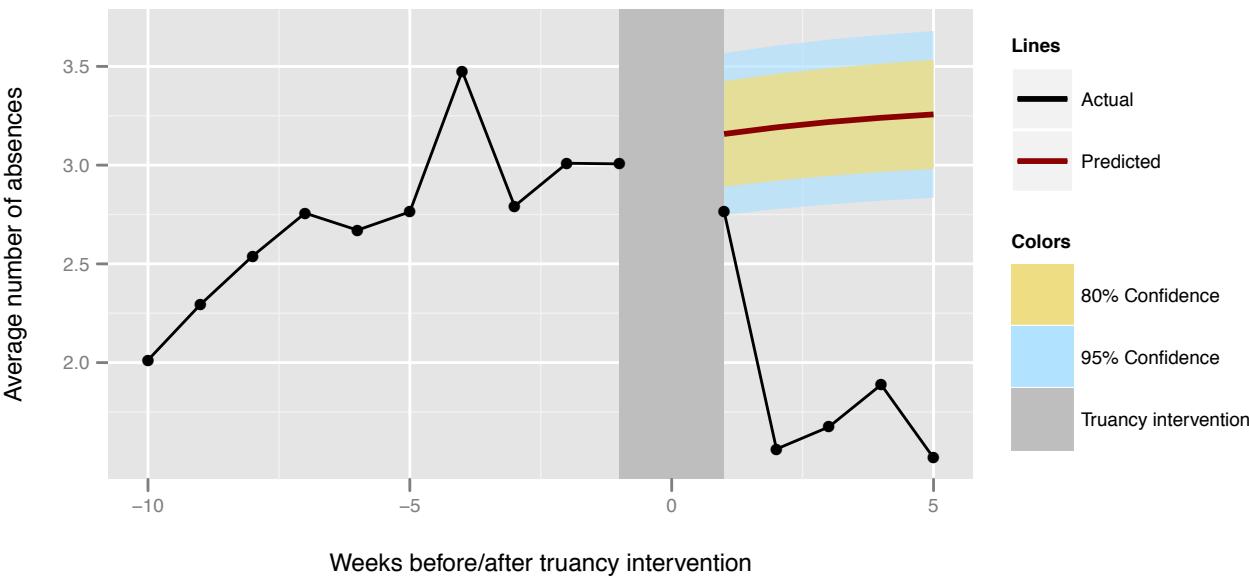
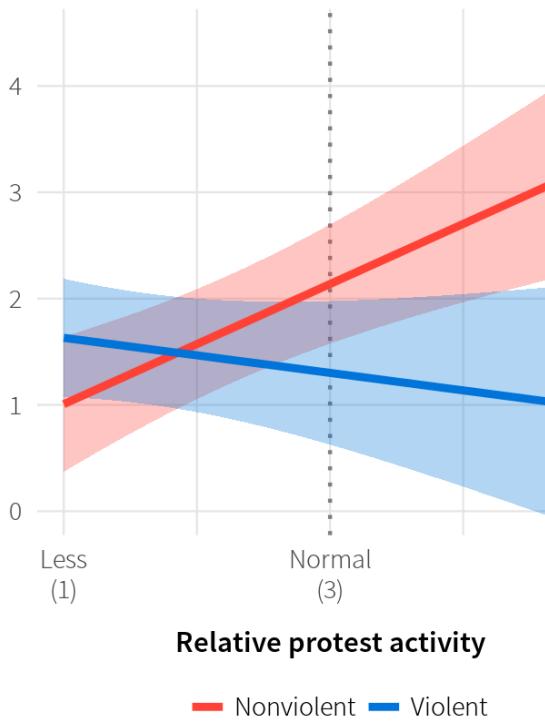
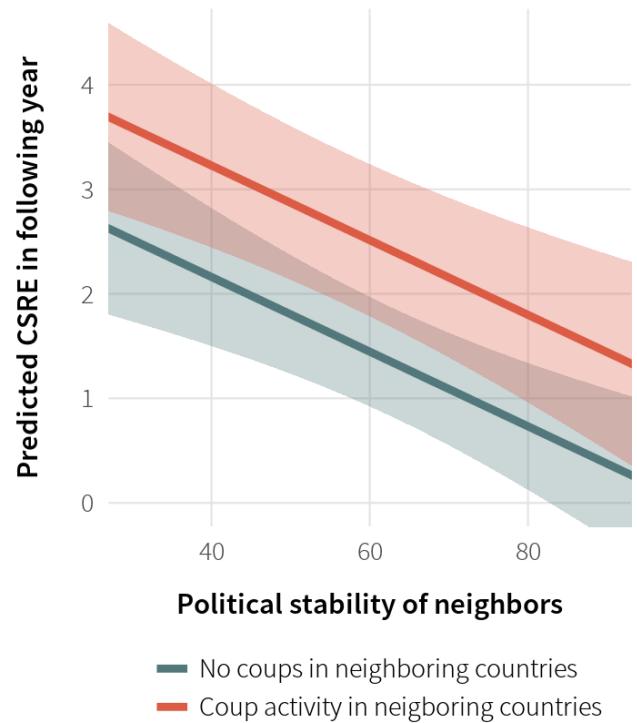
ERRORS



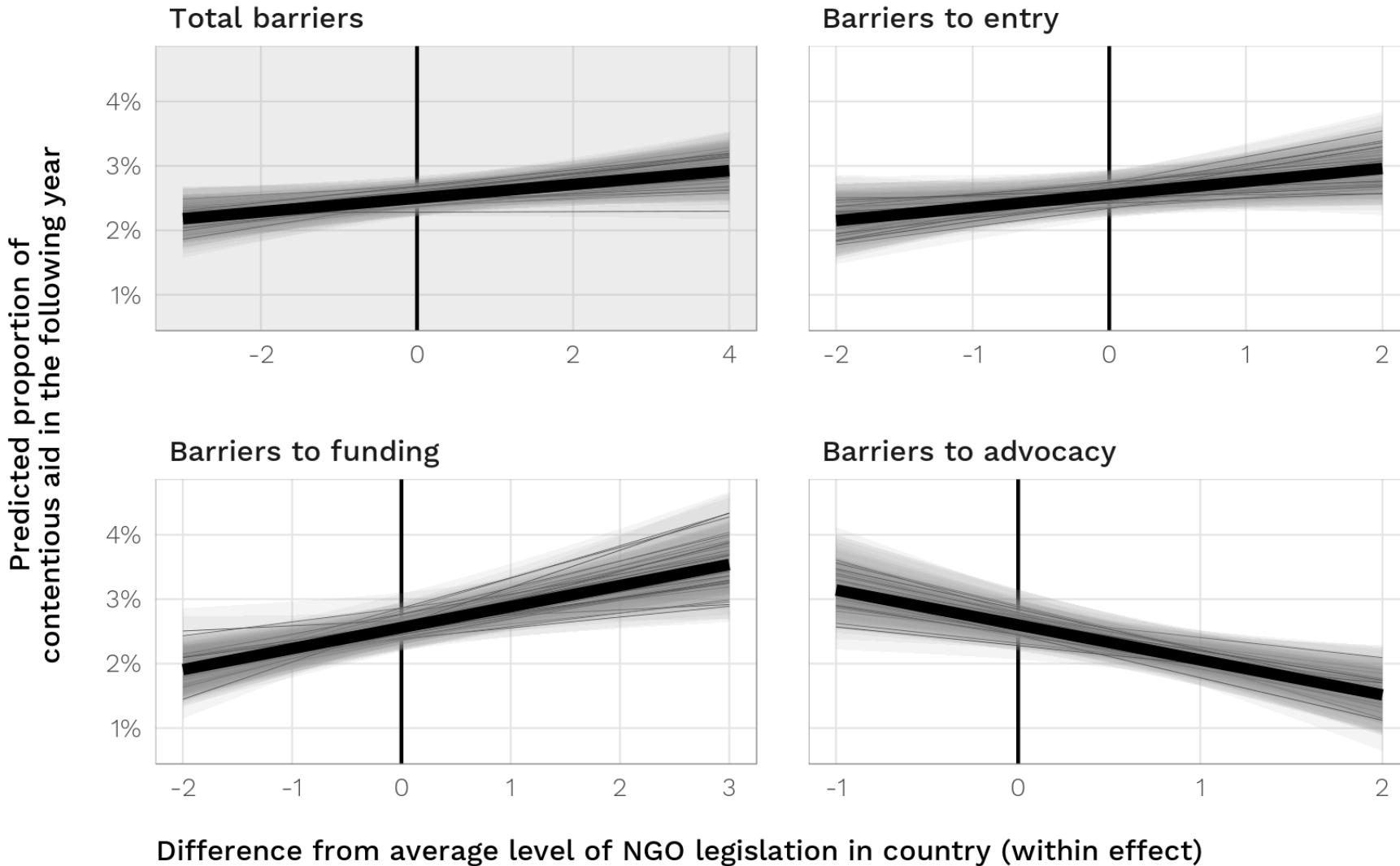
ERRORS



ERRORS



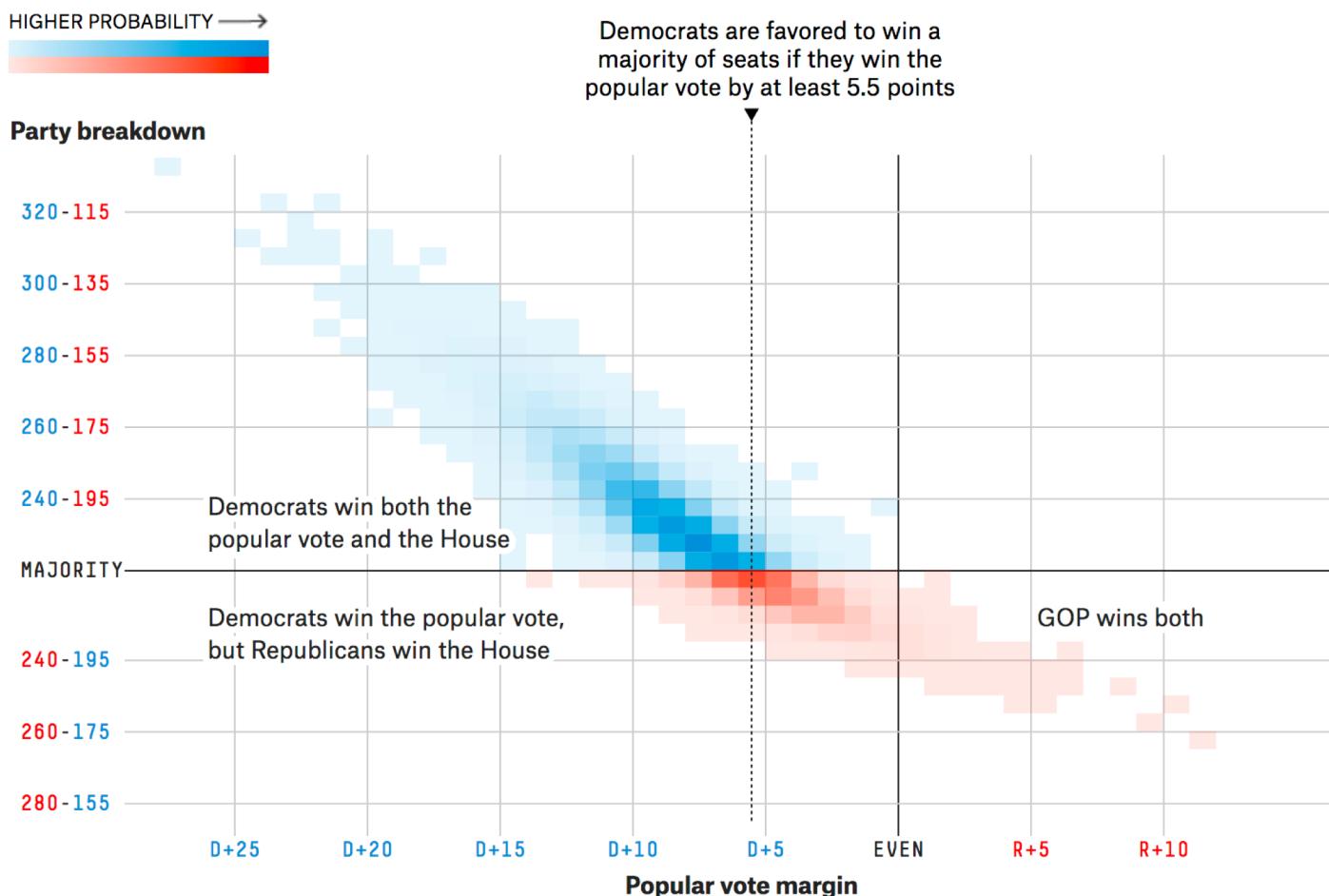
SIMULATIONS



OUTCOMES

How the popular vote for the House translates into seats

How various breakdowns in the national popular vote correspond to the most likely distributions of House seats by party, according to our forecast



VISUALIZING UNCERTAINTY WITH GGPLOT