Interpreting Graphical Displays

Below are links to graphical displays in published research or published data analyses. Normally graphical displays can be found in the Results sections of published studies, but they also appear in common new articles, blogs, and similar informational pieces.

(a) Find and review Figure 1 in Smith, Smith, Gilmore, and Jameson (2012).

Smith, J. K., Smith, L. F., Gilmore, A., & Jameson, M. (2012). Students' self-perception of reading ability, enjoyment of reading and reading achievement. *Learning and individual differences*, *22*(2), 202-206.

http://www.bwgriffin.com/gsu/courses/edur7130/readingstudies/2012-Smith-Reading-Ability.pdf

1. Which has the higher Reading Achievement score, the 75th percentile for year 4 students, or the median for year 8 students?

2. What do the dots below the box plot for Year 8 represent?

3. The middle 50% of Year 4 scores lie between the 25th and 75th percentiles. What are the Reading Achievement scores that correspond to the 25th and 75th percentiles for Year 4 students?

4. What is the range of Reading Achievement scores for Year 4 students?

(b) Locate Figure 1 in Blascovich, Spencer, Quinn, and Steele (2001).

Blascovich, J., Spencer, S. J., Quinn, D., & Steele, C. (2001). African Americans and high blood pressure: The role of stereotype threat. *Psychological science*, *12*(3), 225-229.

http://www.bwgriffin.com/gsu/courses/edur7130/readingstudies/2001-Blascovich-Blood-Pressure.pdf

5. Which and how many variables are presented in Figure 1?

6. Under what conditions do clear differences in blood pressure emerge for these data?

(c) Study Figure 1 in Mattox,Hancock, and Queen (2005).

Mattox, K., Hancock, D. R., & Queen, J. A. (2005). The effect of block scheduling on middle school students' mathematics achievement. *NASSP Bulletin*, *89*(642), 3-13.

http://www.bwgriffin.com/gsu/courses/edur7130/readingstudies/2005-Mattox-Block-Scheduling-a.pdf

7. Which and how many variables are presented in Figure 1?

8. Examine the achievement scores as plotted. What pattern emerges for the achievement data over time?

9. Examine the achievement scores as plotted. What appears to be the cause for the pattern of achievement observed?

(d) Review the graphic "My eyes are up here" (see next page below).

10. Which and how many variables are presented in figure "My eyes are up here"?

11. For which countries does a man asking a woman to go have a drink appear to more likely be interpreted as sexual harassment?

12. For which age group in the two countries identified above does a man asking a woman to go have a drink appear to be interpreted more strongly as sexual harassment?

13. Across all five countries, which activity are females consistently more likely to rate as sexual harassment when compared to men?

14. Which activity is mostly likely to be considered sexual harassment by both females and males and across all countries?

15. Carefully review each activity type and levels of agreement across all countries. Which country seems to be the most tolerant of these activities (i.e., least likely to rate activities as sexual harassment)? For this item, omit the activity "Requesting a sexual favour" since it has high agreement for all countries.
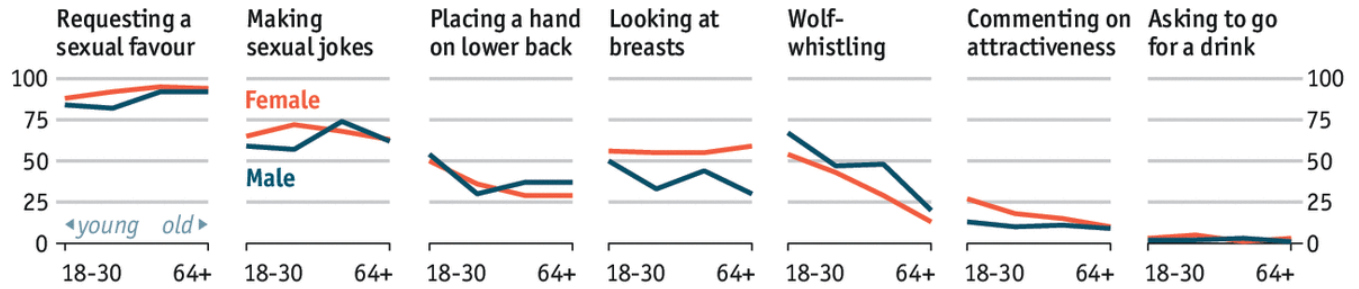
16. What is the only activity in which males may have higher agreement than females that it is a form of sexual harassment?
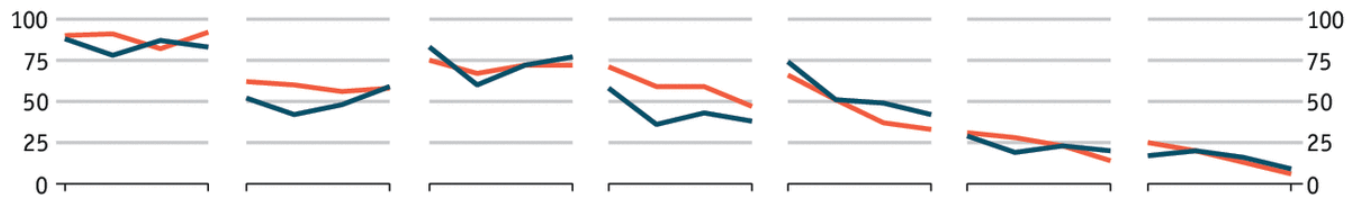
My eyes are up here

"Would you consider it sexual harassment if a man, who was not a romantic partner, did the following to a woman?"
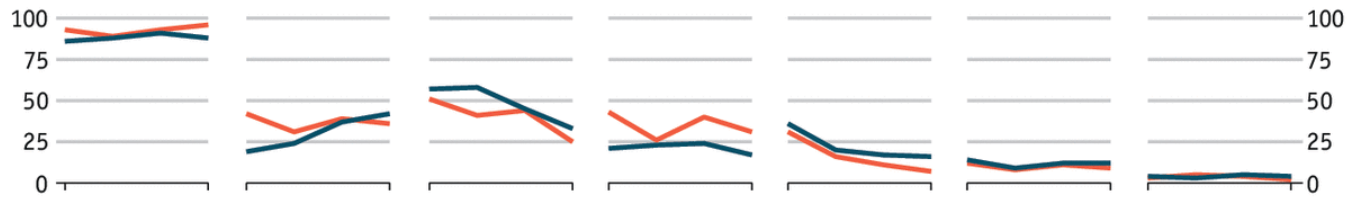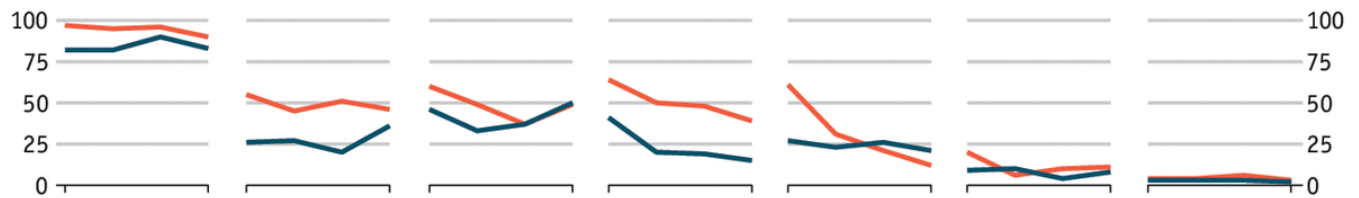Respondents stating "always" or "usually"*, %
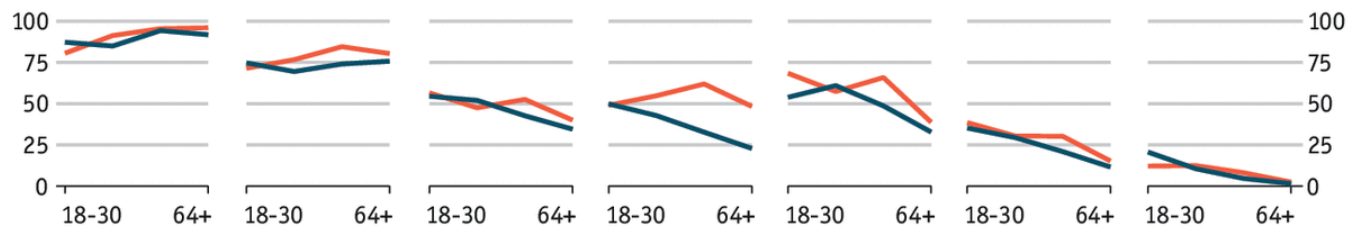
Britain

Requesting a sexual favour | Making sexual jokes | Placing a hand on lower back | Looking at breasts | Wolf-whistling | Commenting on attractiveness | Asking to go for a drink

France

Germany

Sweden

United States
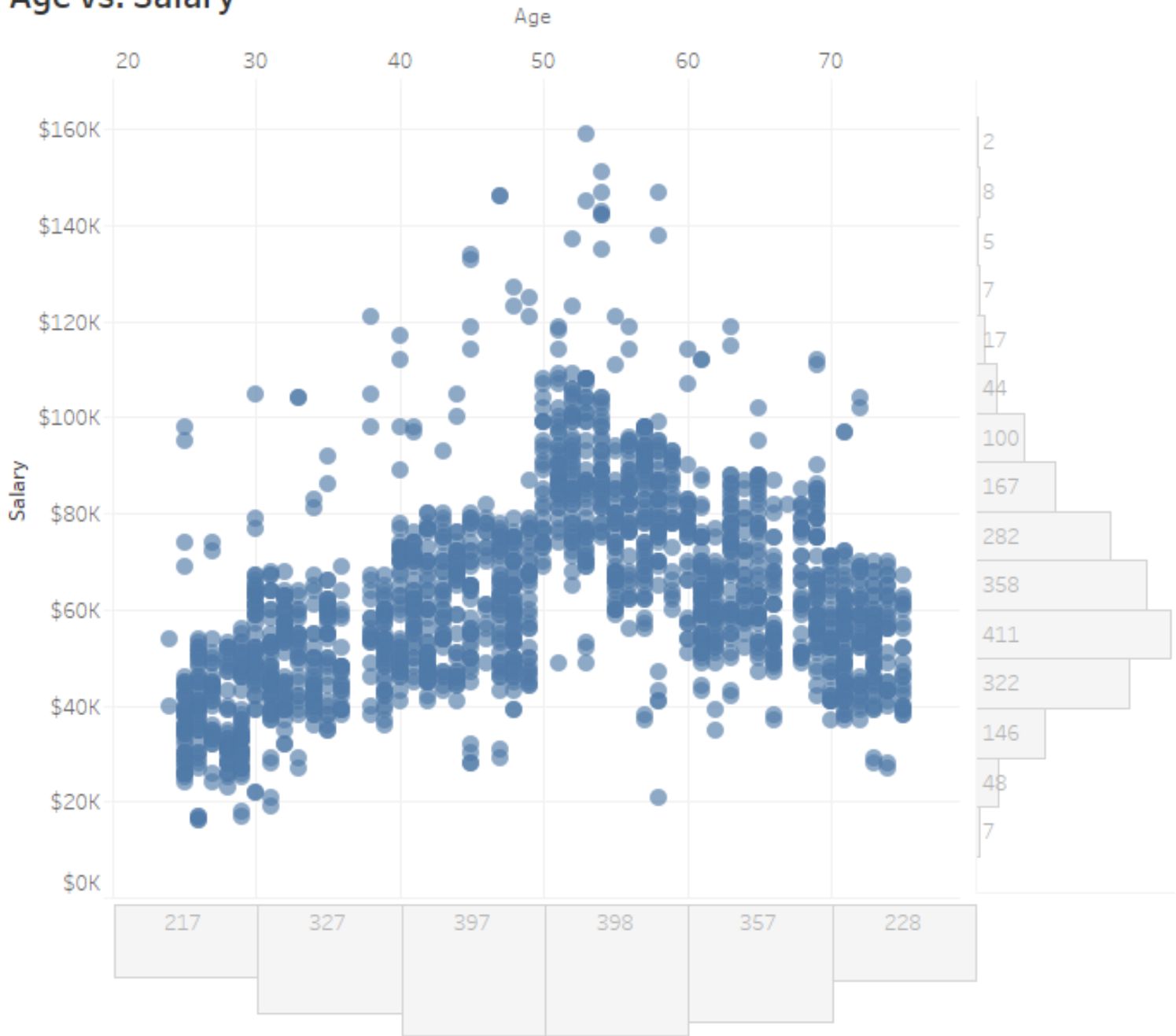
*Surveyed Oct-Nov 2017

Source: https://www.economist.com/graphic-detail/2017/11/17/over-friendly-or-sexual-harassment-it-depends-partly-on-whom-you-ask

(f) Review the "Age vs. Salary" scatterplot below.

Age vs. Salary

Source: https://www.datarevelations.com/marginal-histograms.html

17. How would you describe the relationship depicted in the "Age vs. Salary" scatterplot?

18. What is the modal age?

19. What is the modal salary?

(e) Find Figure 4 in Jahromi et al. (2016).

Jahromi, S. A. F., Forouzan, A., & Gholaminejad, R. (2016). Computer anxiety and computer self-efficacy as predictors of Iranian EFL learners' performance on the reading section of the TOEFL iBT. *Higher Education of Social Science*, *11*(6), 55-65.

http://www.bwgriffin.com/gsu/courses/edur7130/readingstudies/2016-Jahromi-Computer-Anxiety.pdf

20. What level of correlation, Pearson r, from the list below do you think best describes the scatterplot in Figure 4? Explain why.

r = -0.80
r = -0.40
r = 0.00
r = 0.40
r = 0.80

If you don't recall reviewing correlation coefficients with scatterplots, read this:

http://www.bwgriffin.com/gsu/courses/edur7130/content/correlation_coefficients.htm

(f) Find and review Table III in Steinkamp and Maehr (1983).

Steinkamp, M. W., & Maehr, M. L. (1983). Affect, ability, and science achievement: A quantitative synthesis of correlational research. *Review of Educational Research*, *53*(3), 369-396.

http://www.bwgriffin.com/gsu/courses/edur7130/readingstudies/1983-Steinkamp-Achievement.pdf

Steinkamp and Maehr (1983) conducted a meta-analysis of science achievement. A meta-analysis is the synthesis of results from many studies to show, overall, the strength of relationships found across studies. Steinkamp and Maehr wanted to learn whether **science achievement** (i.e., measured comprehension of science, physics, chemistry, biology, etc.) correlated with **cognitive ability** (i.e., brain-based skills or ability of process thoughts to learn and problem solve) and **science affect** (i.e., one's emotions, values, or feelings toward science; attitude toward science, physics, chemistry, etc.).

Steinkamp and Maehr's (1983) Table III shows stem-and-leaf displays of the Pearson correlation between

- science achievement and cognitive ability,
- science achievement and science affect, and
- cognitive ability and science affect.

Recall the Pearson correlation is a statistical measure to determine who strongly two quantitative variables relate. The maximum value is 1.00 (a perfect positive correlation) or -1.00 (a perfect negative correlation) and the minimum value is 0.00 (no evidence of a linear relation).

If you don't recall reviewing correlation coefficients with scatterplots, read this:

21. Examine, in Table III, the correlations between science achievement and cognitive ability. Note that Table III reports the correlations Steinkamp and Maehr (1983) found in studies they reviewed.

21a. What is the strongest correlation presented for achievement and cognitive ability?
21b. What is the weakest correlation presented for achievement and cognitive ability?
21c. What are the modal correlations (i.e., the most frequent) reported for achievement and cognitive ability?
21d. What is the average (mean) correlation between achievement and cognitive ability for girls?
21e. What is the average (mean) correlation between achievement and cognitive ability for boys?
21f. How many negative correlations were reported for achievement and cognitive ability?

22. Examine, in Table III, the correlations between cognitive ability and science affect.

22a. How many correlations are reported in the stem-and-leaf for cognitive ability and affect?
22b. What is the weakest correlation reported for cognitive ability and affect?
22c. What is the strongest correlation reported for cognitive ability and affect?

23. Compare the three stem-and-leaf displays in Table III for achievement/cognitive, achievement/affect, and cognitive/affect.

23a. Which tends to show the strongest correlations - achievement/cognitive, achievement/affect, or cognitive/affect?
23b. Which tends to show the weakest correlations - achievement/cognitive, achievement/affect, or cognitive/affect?

(g) Find Figure 1 in Braun et al. (2006).

Braun, H. I., Wang, A., Jenkins, F., & Weinbaum, E. (2006). The Black-White achievement gap: Do state policies matter? Education Policy Analysis Archives, 14(8).

Braun et al. (2006) studied 8th grade student achievement, for the years 1992 and 2000, in 10 states. Achievement was measured by the National Assessment of Educational Progress (NAEP), a standardized test that allows for comparisons of student performance across states. Using demographic information in the NAEP data file, Braun et al. separated school performance within each state into two strata – lower poverty (S1) and higher poverty (S2). This was an attempt to help isolate and show poverty effects on student achievement.

Figure 1 shows mean NAEP achievement scores by year (1992/2000) and poverty stratum (S1/S2).

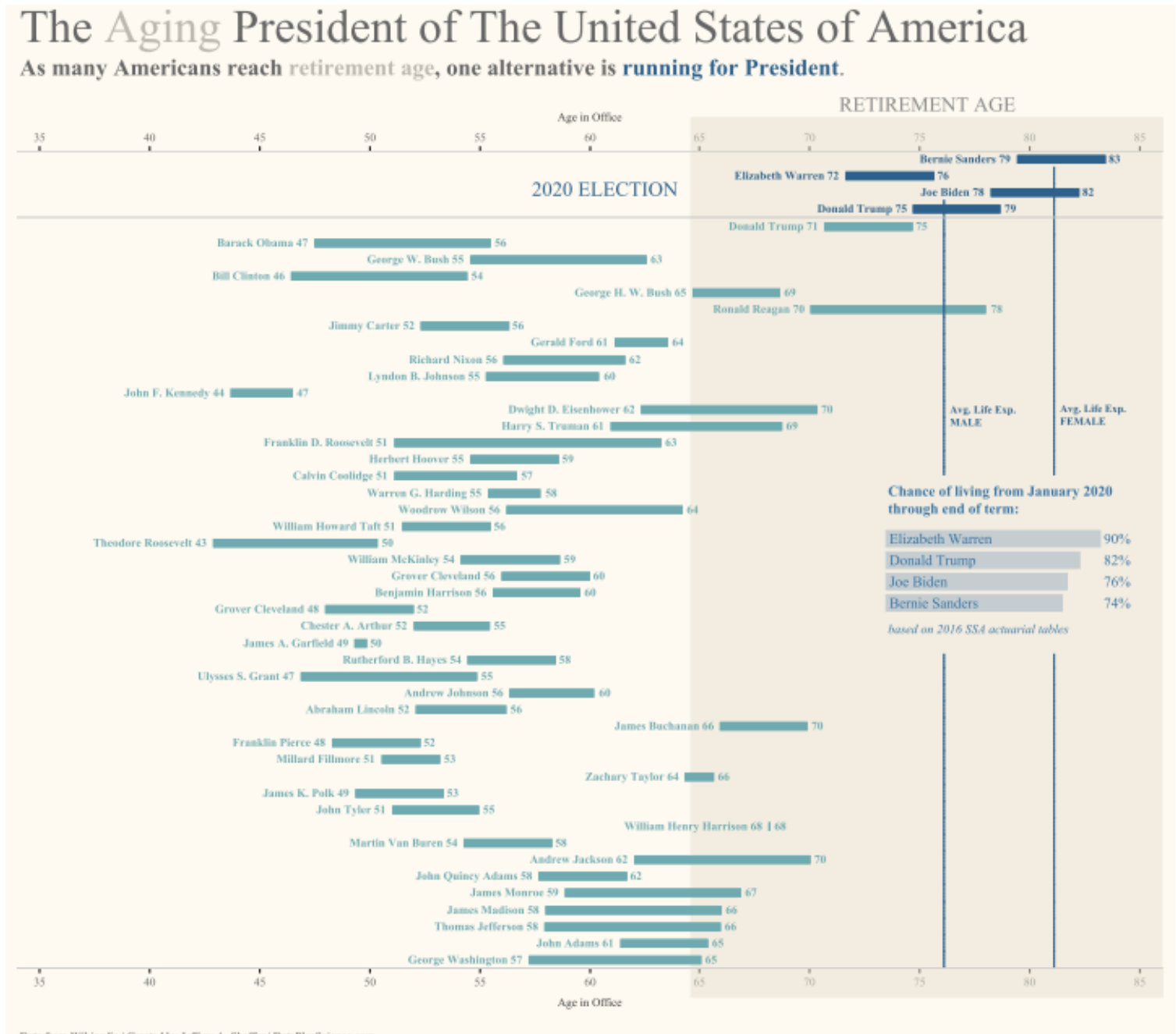24. What was the highest NAEP mean score reported in Figure 1 in 1992?

25. What was the lowest NAEP mean score reported in Figure 1 in 1992?

26. What was the highest NAEP mean score reported in Figure 1 in 2000?

27. What was the lowest NAEP mean score reported in Figure 1 in 2000?

28. For the lower poverty stratum, did the means tend to decline, stay about the same, or increase from 1992 to 2000?

29. For the higher poverty stratum, did the means tend to decline, stay about the same, or increase from 1992 to 2000?

30. Which, on average, performed better on NAEP, lower or higher poverty students?

31. Using all the means presented, what are the modes for these mean scores?

Additional graphs, no questions yet developed.

A. Source: https://public.tableau.com/en-us/gallery/aging-president-united-states

The Aging President of The United States of America
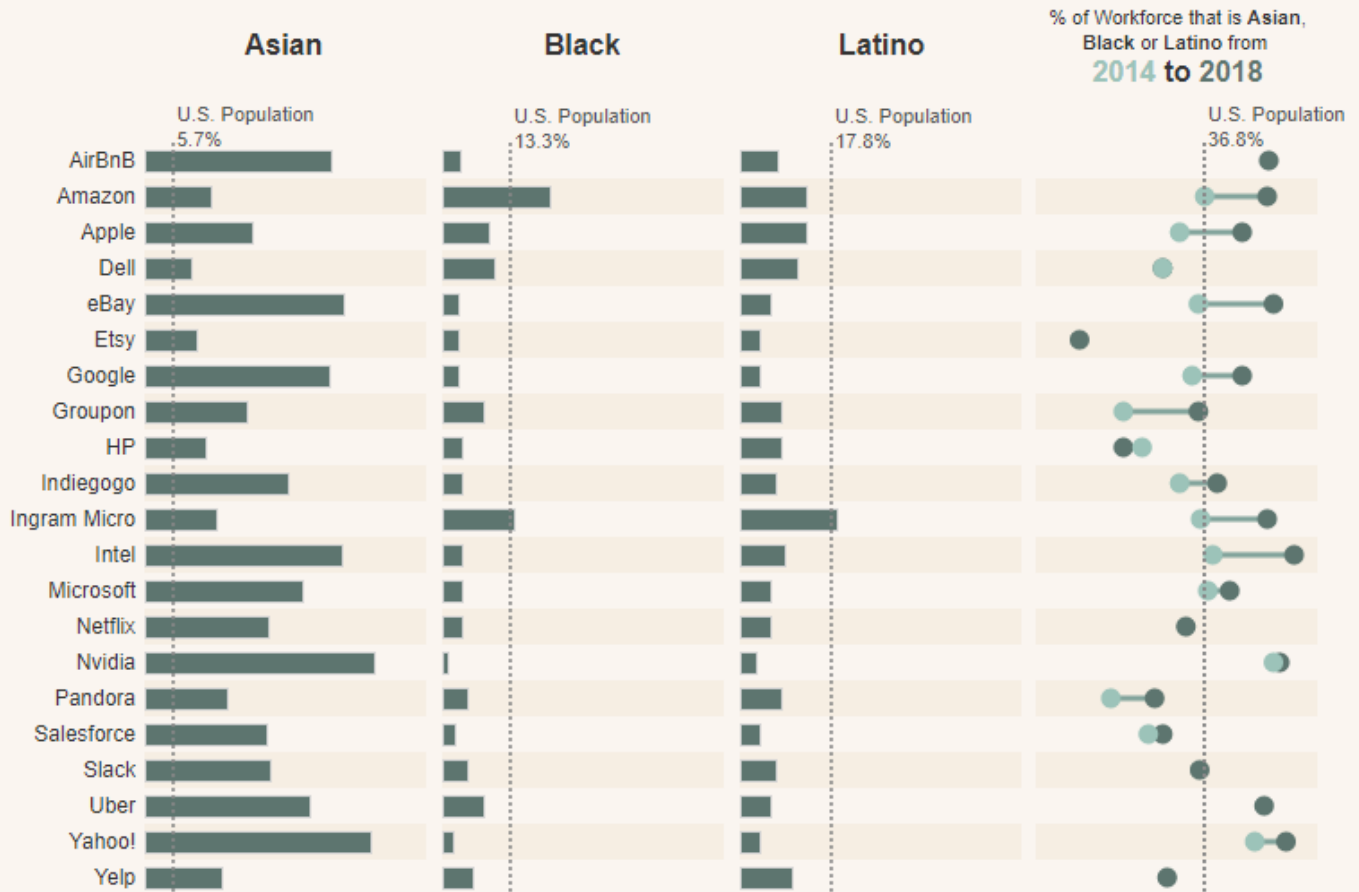**As many Americans reach** retirement age, **one alternative is running for President**.

Salary Comparison Unit Histogram Dashboard
Comparing respondent 81 with all others (bin size of $2,500)

C. Source:

Racial Minorities in U.S. **Technology** Companies

In **2018**, what percentage of each company's workforce was...

	Asian	Black	Latino	% of Workforce that is Asian, Black or Latino from **2014** to **2018**
	U.S. Population 5.7%	U.S. Population 13.3%	U.S. Population 17.8%	U.S. Population 36.8%

AirBnB, Amazon, Apple, Dell, eBay, Etsy, Google, Groupon, HP, Indiegogo, Ingram Micro, Intel, Microsoft, Netflix, Nvidia, Pandora, Salesforce, Slack, Uber, Yahoo!, Yelp

Source: Information Is Beautiful
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+tableau