Learning Outcomes

• By the end of section today, you should be able to:
• Draw and interpret
  • Stem and leaf plots
  • Histograms
  • Bar plots
  • Pie charts
• Explain the fundamental problem of causal inference
• Identify examples that challenge causal claims
Announcements

• Keep posting questions on the discussion board!
• Homework 1 will be returned to you in section next week; grades on TritonEd before that
• Homework 2 is posted on TritonEd: Content (scroll down) → Homework Assignments
  • **DUE: February 13th 12pm (NOON) in class, hard copy, printed, stapled**
  • Start early and come get help if you need it
• Office Hours:
  • Monday 1:15-2:30pm SSB 368 (Prof. Desposato)
  • Tuesday 12pm-2pm (Garrett)
  • Wednesday 1pm-3pm SSB 446 (Skyler)
  • Thursday 9am-11am SSB 341 (Taylor)
  • Friday 9am-11am SSB 326 (Liesel)
What questions do you have?
Quick Recap on Plots

Pie Chart

Things That Blew Your Mind When You Were A Kid

- Airplanes
- Dinosaurs
- The Universe

Seeing your teacher anywhere but school.

Bar Chart

Dog Name Percentages in 1960

- Fido
- Spot
- Rover
- Elvis
- Other

Percent
Quick Recap on Plots

Stem and Leaf Plot

A zookeeper published the following stem-and-leaf plot showing the number of lizards at each major zoo in the country:

<table>
<thead>
<tr>
<th>Stem</th>
<th>Leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>0 6 8 8 8</td>
</tr>
<tr>
<td>3</td>
<td>0 2 6 6 7 8</td>
</tr>
<tr>
<td>4</td>
<td>1 2 6 6</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Histogram

Distribution of Number of Lizards at Major Zoos

Number of Lizards at Major Zoos

Number of Zoos

0 1 2 3 4 5 6
Check In

• Name
• What is one thing that you think you did well on Homework 1?
• What is one thing that you think you could improve for Homework 2?
• What type of graph would you use if you had a nominal independent variable and a ratio dependent variable?
  • Pie Chart
  • Bar Chart
  • Histogram
  • Stem and Leaf Plot
For more practice with graphing...


- Created with Lauren Ferry Winter 2018
Causality!

I used to think correlation implied causation.

Then I took a statistics class. Now I don't.

Sounds like the class helped.

Well, maybe.
The Fundamental Problem of Causal Inference

• We can’t prove causality without a time machine, a parallel universe, etc.
• We can assess the criteria for causality: (more in class on Monday)
  • Temporal Ordering / Directionality
    • Cause has to come before the effect
  • Correlation
    • IV and DV have to be related in some way:
      • IV goes up, DV goes up; IV goes down, DV goes down (positive correlation)
      • IV goes up, DV goes down; IV goes down, DV goes up (negative correlation)
  • Causal Mechanism
    • Tell a plausible story that connects the IV and DV
  • Rule out confounds
    • Confounding variable can make the correlation between your IV and DV spurious
    • Recall: confounds cause changes in the DV, are correlated with the IV, and are causally prior to the IV
“Teens who spend less time in front of screens are happier” Washington Post, Jan 22, 2018
“ Teens who spend less time in front of screens are happier” Washington Post, Jan 22, 2018

• Temporal ordering?
  • Does amount of screen time come before happiness?

• Correlation?
  • Is there a relationship between amount of screen time and happiness?
  • As screen time goes down, what happens to happiness?

• Causal Mechanism?
  • Is there a logical story you can tell that explains how changes in screen time cause changes in happiness?

• Rule out confounds?
  • Is there anything else that could be driving this relationship?
    • Comes before amount of screen time
    • Is correlated with screen time
    • Causes changes in happiness
Note:

• Lots of other examples in the readings for this week
  • On course reserves
  • Some posted in comment thread on TritonEd