

AP STATS: Do Now

1.) Do male or female students spend more time on the internet? You have been asked to direct a study to investigate the issue. Would you recommend a survey, an experiment, or an observational study? Be ready to explain why you chose the design that you did and why you did not choose the other two possible designs.

2.) Does listening to music help or hinder learning? You have been asked to direct a study to investigate the issue. Would you recommend a survey, an experiment, or an observational study? Be ready to explain why you chose the design that you did and why you did not choose the other two possible designs.



In the news 2 days ago.

Study finds that fans of losing NFL teams are more likely to get fat

Bad teams = bad eating.

By NATE SCOTT – September 4, 2013 at 9:04pm EDT



SHARE (585)



TWEET (21)



EMAIL (81)



Homework Questions?



Video of the Day

- Marshmallow Study



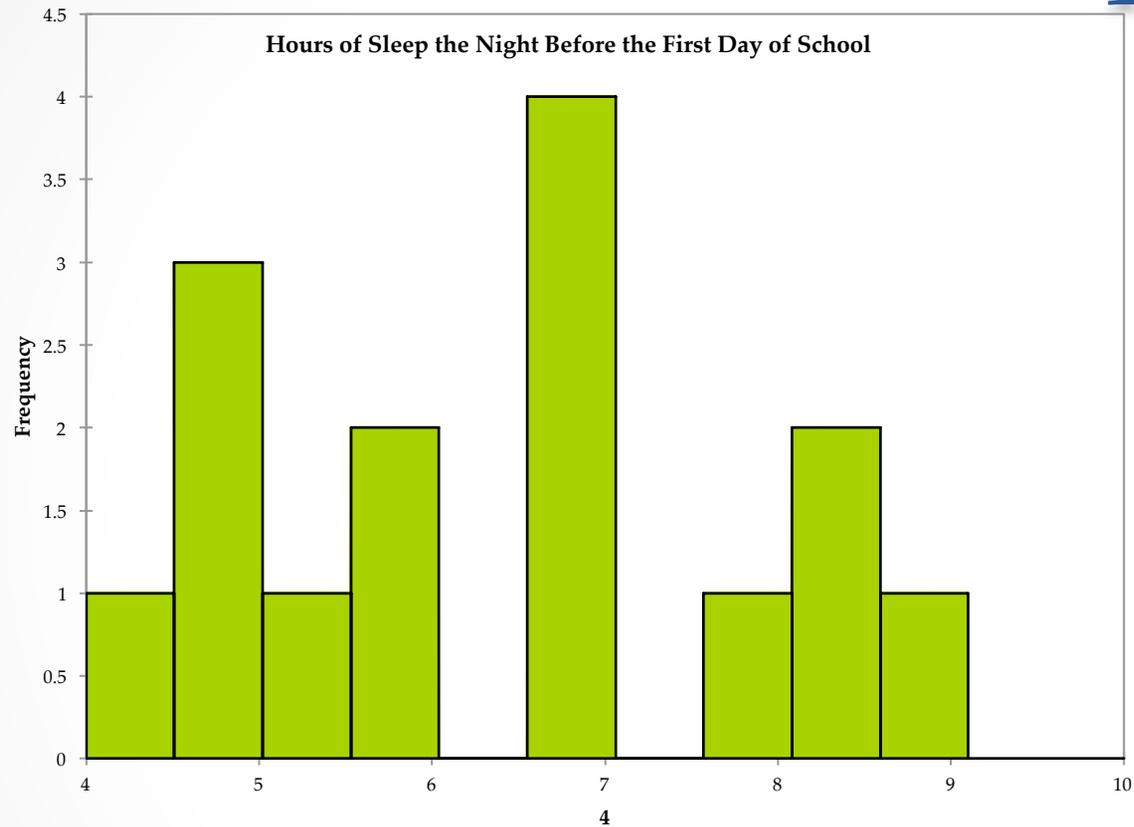
Data Analysis

- Data analysis is all about organizing, displaying, summarizing, and asking questions about the data.
- **Individuals:** are the objects described by the data set.
- **Variables:** any characteristics of an individual
- **Categorical Variables:** places individuals into one of several groups or categories
- **Quantitative Variables:** takes numerical values for which arithmetic operations such as adding makes sense.

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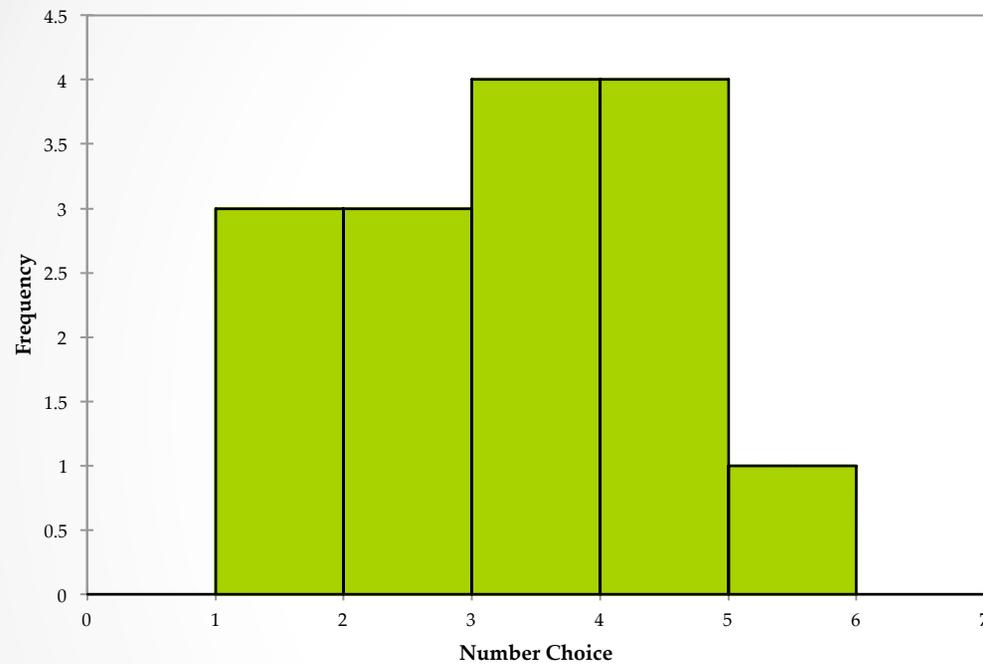
Hours of Sleep



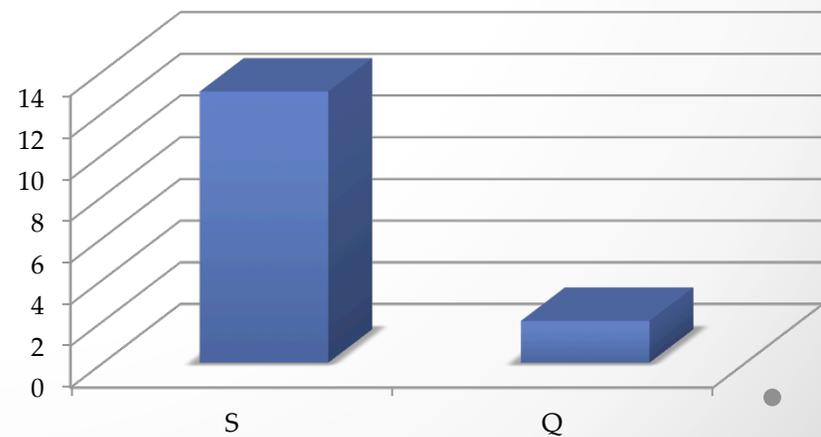
| Variable | Observations | Obs. with missing data | Obs. without missing data | Minimum | Maximum | Mean | Std. deviation |
|----------|--------------|------------------------|---------------------------|---------|---------|-------|----------------|
| 4 | 15 | 0 | 15 | 4.000 | 9.000 | 6.567 | 1.510 |

Survey Results

Pick a Number

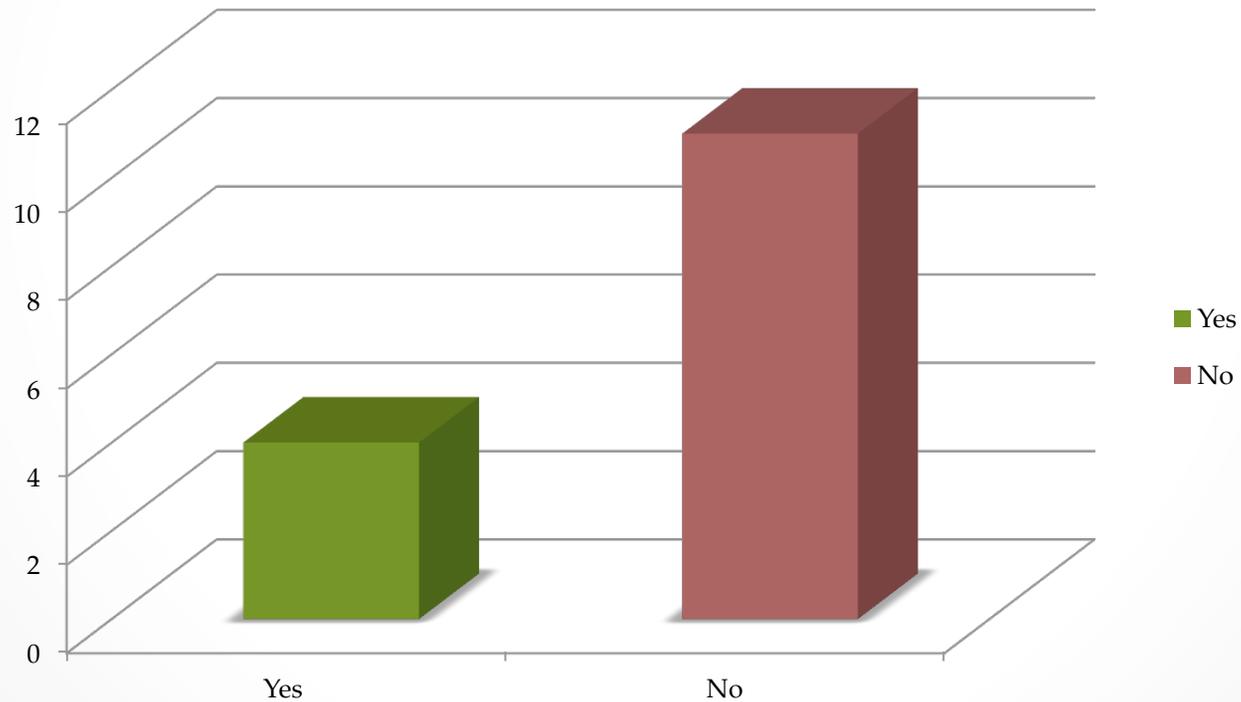


Choose a Letter: S or Q



Obesity?

Do you believe that fast food restaurants should be held accountable for obesity?



W⁵HW

- Who?
- What?
- Why?
- When?
- Where?
- How?
- by Whom?

Distribution of a Variable

- The **distribution** of a variable tells us what values the variable takes and how often it takes these values.



Do you wear your seat belt?

Describing categorical variables

Each year, the National Highway and Traffic Safety Administration (NHTSA) conducts an observational study on seat belt use. The table below shows the percent of front-seat passengers who were observed to be wearing their seat belts in each region of the United States in 1998 and 2003.⁵

| Region | Percent wearing seat belts, 2003 | Percent wearing seat belts, 1998 |
|-----------|----------------------------------|----------------------------------|
| Northeast | 74 | 66.4 |
| Midwest | 75 | 63.6 |
| South | 80 | 78.9 |
| West | 84 | 80.8 |

What do these data tell us about seat belt usage by front-seat passengers?

The *individuals* in this observational study are front-seat passengers. For each individual, the values of two *variables* are recorded: region (Northeast, Midwest, South, or West) and seat belt use (yes or no). Both of these variables are categorical.

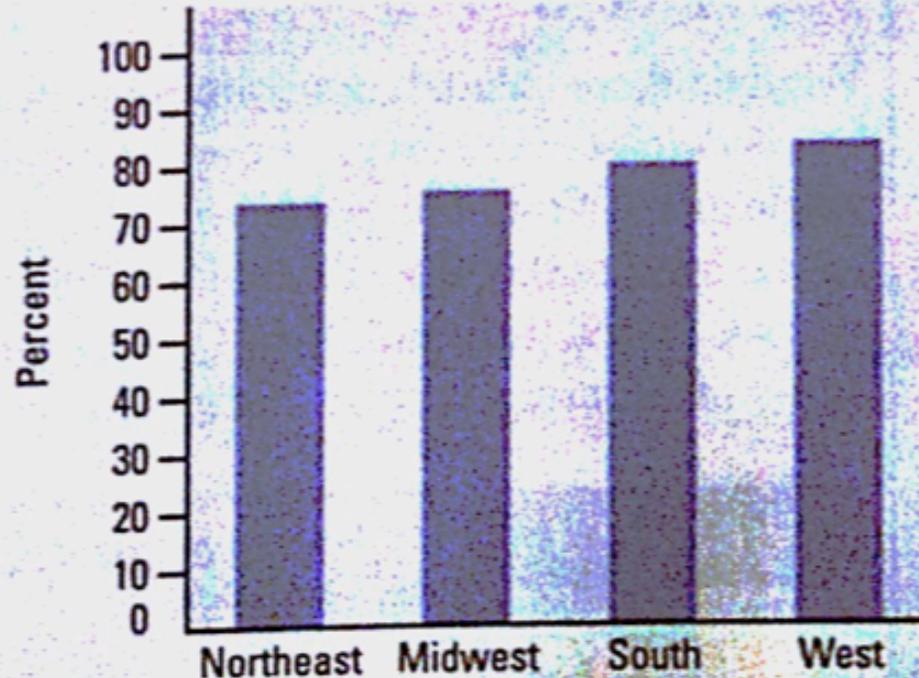
Figure P.2(a) shows a *bar graph* for the 2003 data. Notice that the vertical scale is measured in percents.

Bar Graph of the Data

Figure P.2a

(a) A bar graph showing the percent of front-seat passengers who wore their seat belts in each of four U.S. regions in 2003.

Percents of Front-Seat Passengers
Wearing Seat Belts in 2003



Example 2: Goals Scored

Example P.7

G0000AAAAALLLLLL!

Describing quantitative variables



The number of goals scored by the U.S. women's soccer team in 34 games played during the 2004 season is shown below:⁶

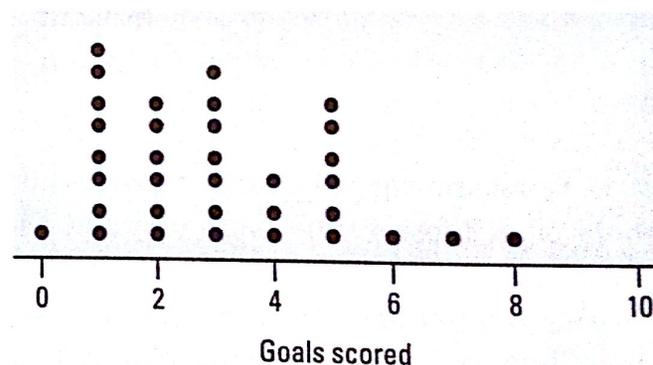
3 0 2 7 8 2 4 3 5 1 1 4 5 3 1 1 3 3 3 2 1
2 2 2 4 3 5 6 1 5 5 1 1 5

What do these data tell us about the performance of the U.S. women's team in 2004?

A *dotplot* of the data is shown in Figure P.3. Each dot represents the goals scored in a single game. From this graph, we can see that the team scored between 0 and 8 goals per game. Most of the time, they scored between 1 and 5 goals. Their most frequent number of goals scored (the *mode*) was 1. They averaged 3.059 goals per game. (Check our calculation of the *mean* on your calculator.)

Figure P.3

A dotplot of goals scored by the U.S. women's soccer team in 2004.



HW #4: Data Analysis

- Read Data Analysis (Example P.5-P.8) and complete exercises P.7-P.9 and P.12.
- In addition, look at the data set provided from our class on the first day. I only provided a few columns as I didn't want to give away who people were even though the survey was anonymous...
- Make one graph using excel and print it out from any of the columns. Be sure to label axes. Below the graph answer the questions Who, What, Why, When, Where, How, and By Whom. These answers can be very brief.
- Feel free to use excel to make the graphs in the exercises as well.

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