

Sunday, December 10, 2017
5:18 PM

KEY

3.1 Day 1 – Scatterplots | Chapter 3

Scatterplot: A graph that allows you to examine the relationship between 2 quantitative variables.

Individuals: The objects described by the set of data.

Variables: Any characteristic of the individual.

Quantitative Data: Data represented by numerical data.

Categorical Data: Places individuals into non-numerical categories.

*** SCATTERPLOTS MUST USE QUANTITATIVE DATA ***

Response Variable: The dependent variable. This variable goes on the Y axis.

Explanatory Variable: The independent variable. This variable goes on the X axis.

*** IF THERE IS NO CLEAR DISTINCTION, EITHER VARIABLE CAN GO ON EITHER AXIS ***

EXAMPLE:

Alcohol causes a change in body temperature. Therefore, alcohol would be the explanatory variable and temperature is the response variable. This is because the temperature is responding to the alcohol consumption.

Creating a scatterplot:

- Scale the horizontal and vertical axes uniformly; use the break indicator if you do not start at zero.
- Label both axes.
- If given graph paper, adopt scales for both axes so that nearly the entire grid is used.
- NEVER ADD BOXES! MAKE IT FIT!

Interpreting the scatterplot:

Look for the overall pattern including any deviations (determine if it is an outlier)

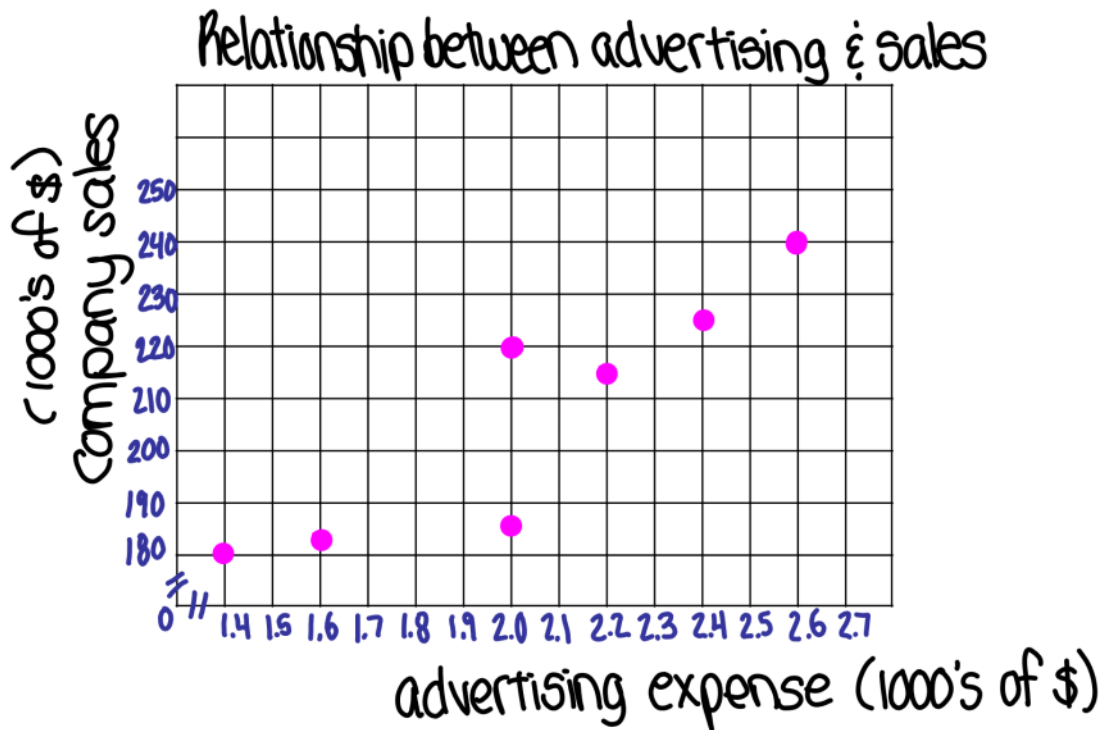
- Form
 - clustered
 - linear
- Strength – how closely the points follow a clear form
 - strong association
 - moderate association
 - weak association
 - no association - clustered
- Direction
 - positive association: upward slope; i.e., as x value increases so does the y value
 - negative association: downward slope; i.e., as x value increases y value decreases

- 1.) A marketing manager conducted a study to determine whether there is a relationship between money spent on advertising and company sales. The data are shown in the table below. Display and *interpret* the scatterplot.

Advertising expense (1000s of \$)	2.4	1.6	2.0	2.6	1.4	1.6	2.0	2.2
Company Sales (1000s of \$)	225	184	220	240	180	184	186	215

1.4 to 2.6
180 to 240

- (a) The explanatory variable is: ^(indep.) advertising expense
- (b) The response variable is: ^(dep.) company sales
- (c) Graph the scatterplot.



- (d) Interpret.

The form is linear.

The strength is moderate.

The direction is positive association.

This means... As the advertising expense increases, so do the company sales

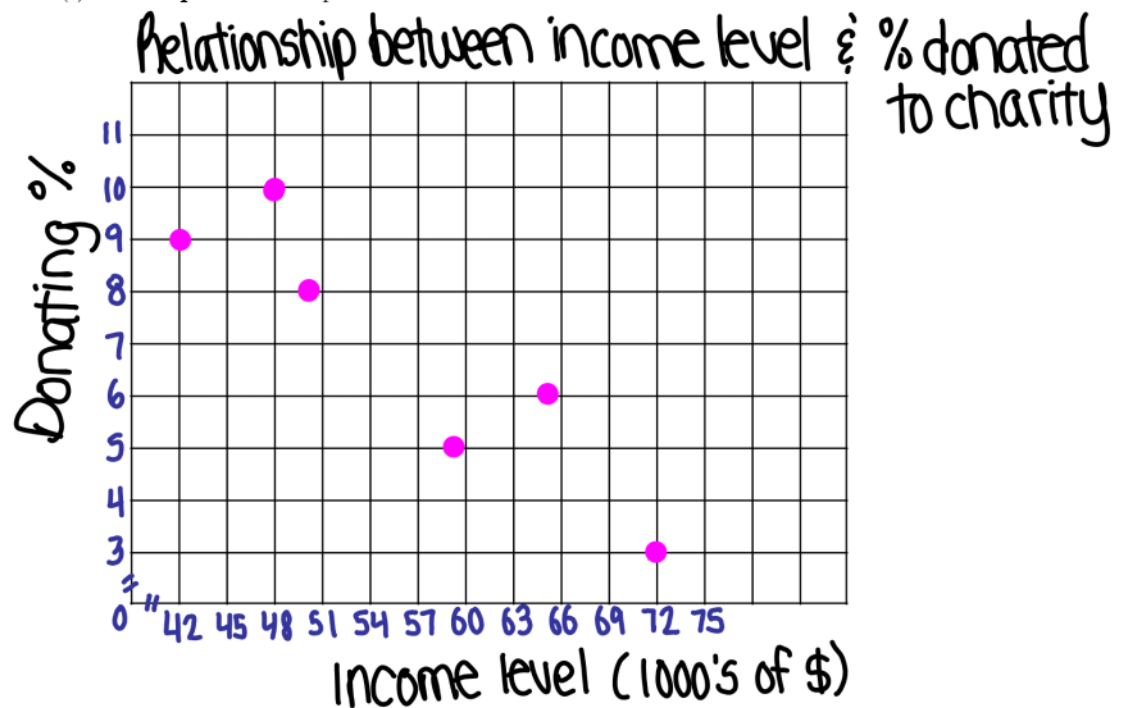
Think -
Pair -
Share

- 2.) A sociologist conducted a study to determine whether there is a relationship between family income level (in thousands of dollars) and percent of income donated to charities. That data are shown in the table below. Display and interpret the scatterplot.

Income Level (in 1000s of \$)	42	48	50	59	65	72
Donating Percent	9	10	8	5	6	3

42 to 72
3 to 10

- (a) The explanatory variable is: family income level
(indep.)
- (b) The response variable is: % income donated
(dep.)
- (c) Graph the scatterplot.

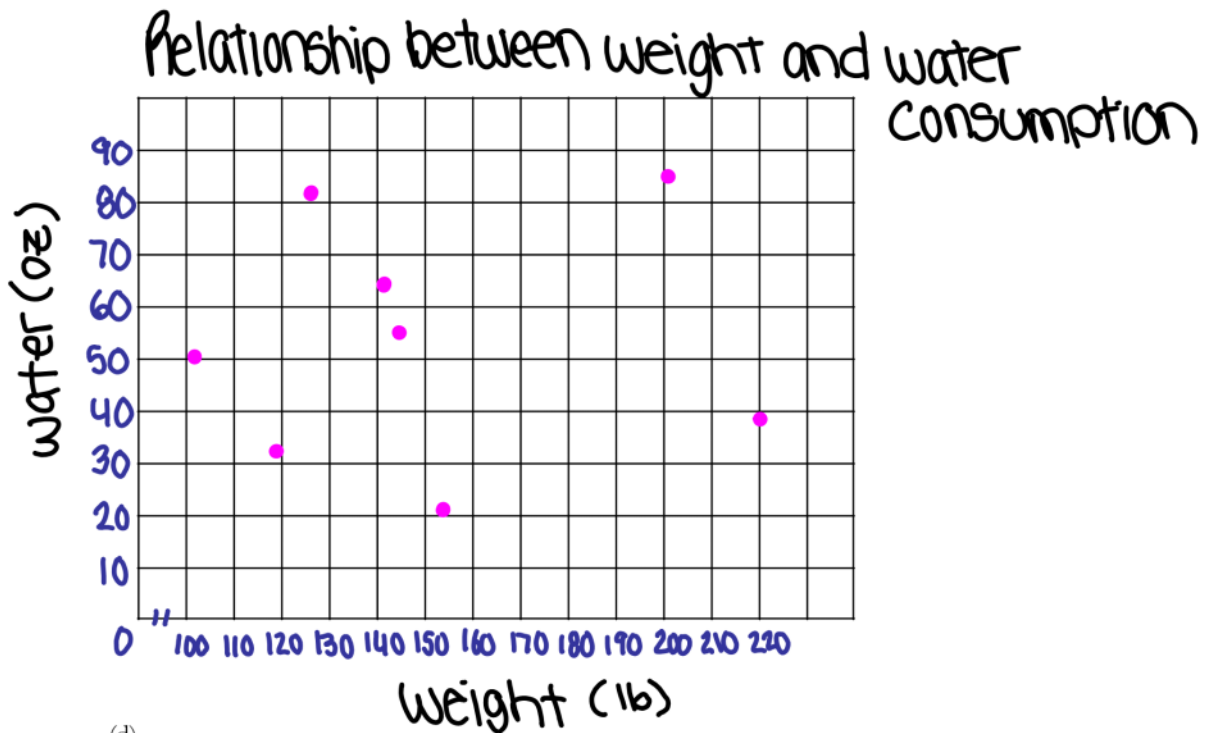


- (d) Interpret.
- The form is linear.
- The strength is moderate.
- The direction is negative association.
- This means... as the income level increases, the % donated decreases.

- 3.) A student nurse conducts a study to determine whether there is a relationship between an individual's weight (in pounds) and daily water consumption (in ounces). The data are shown in the table below. Display and interpret the data.

Weight	102	119	124	141	142	154	201	220	102-220
Water	50	32	82	64	54	21	86	39	21-86

- (a) The explanatory variable is: Weight ^(indep.)
- (b) The response variable is: Water Consumption ^(dep.)
- (c) Graph the scatterplot.



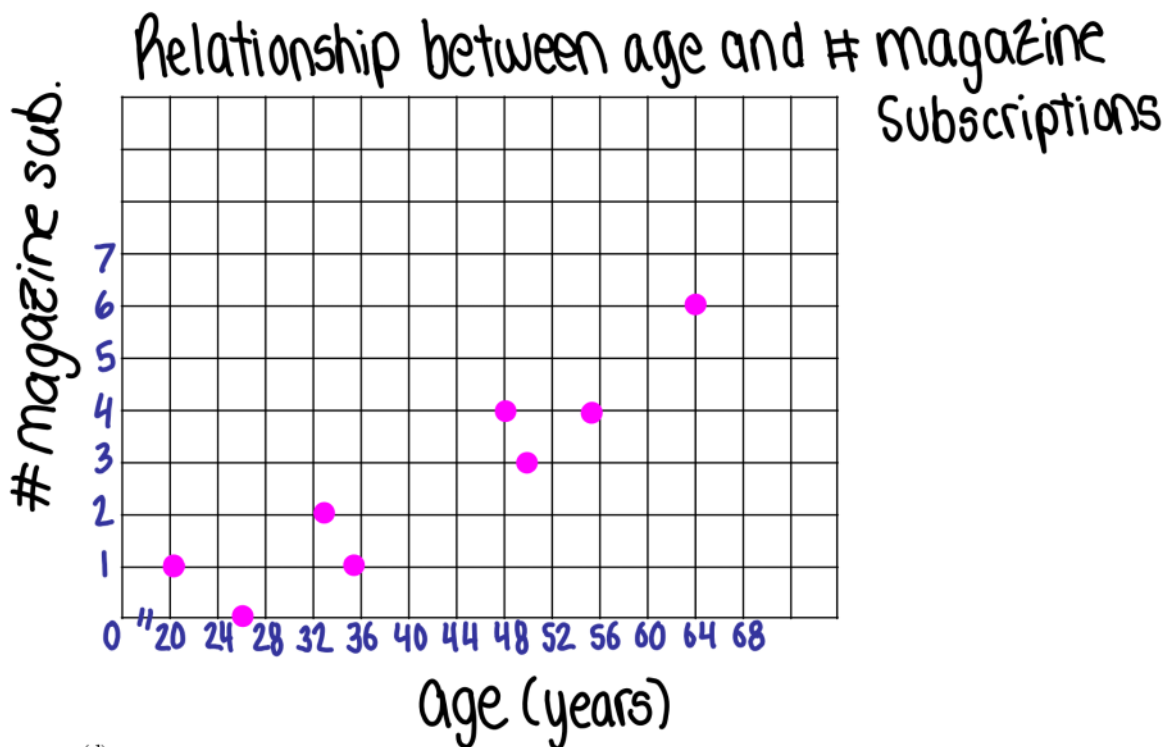
- (d) Interpret.
- The form is Clustered
- The strength is no association
- The direction is _____
- This means... there is no relationship between water consumption and weight

- 4.) A marketing manager conducts a study to determine whether there is a relationship between a person's age and the number of magazines to which that person subscribes. The data are shown in the table below. Display and interpret the data.

Age	48	21	33	50	35	55	26	64
Subscriptions	4	1	2	3	1	4	0	6

21-64
0-6

- (a) The explanatory variable is: ^(indep.) Age
- (b) The response variable is: ^(dep.) # magazine subscriptions
- (c) Graph the scatterplot.



- (d) Interpret.
- The form is linear
- The strength is strong
- The direction is positive association
- This means... As people get older, the # of magazine subscriptions increases