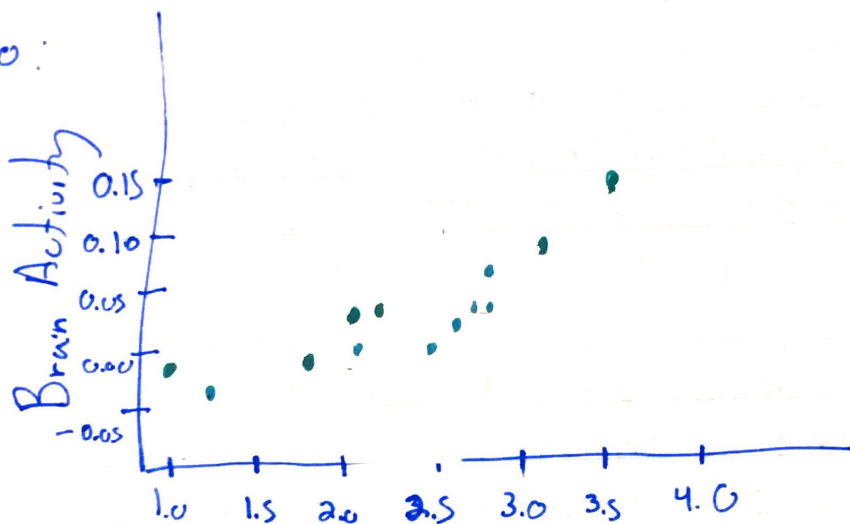


Lev 3.1 Part B problems 14-18, 21, 26 pages 160-162

(14) State: Does social rejection cause activity in areas of the brain that are known to be activated by physical pain?

Plan: Make scatterplot, compute correlation if appropriate.

Do:



Social Distress

Scatterplot shows a fairly strong positive association. There are no particular outliers. The relationship seems to be reasonably linear, so we compute $r = 0.8782$.

Conclude: Social exclusion does appear to trigger a pain response: higher social distress measurements are associated with increased activity in the pain sensing areas of the brain.

- 15)
- a) $r = 0.9$
 - b) $r = 0$
 - c) $r = 0.7$
 - d) $r = -0.3$
 - e) $r = -0.9$

16) Highest correlation: heights of women at ages 4 and 18; I expect a strong ^{pos} linear relationship, for those who were the tallest at 4 are most likely to be tallest at 18 (and vice versa is true too)

next highest would be heights of fathers and heights of adult sons; I expect a moderate strong ^{pos} relationship, since son's height might be similar to father's height (shorter fathers have shorter sons and taller fathers have taller sons)

least highest correlation heights of husbands and heights of wives; there is no relationship (genetics) to connect the two heights. correlation will be weak.

- 17)
- a) Can't find correlation; gender is a categorical variable
 - b) correlation can't be greater than 1
 - c) correlation has no units

19) The newspaper interpreted the correlation being close to zero incorrectly ($r = 0.0$).

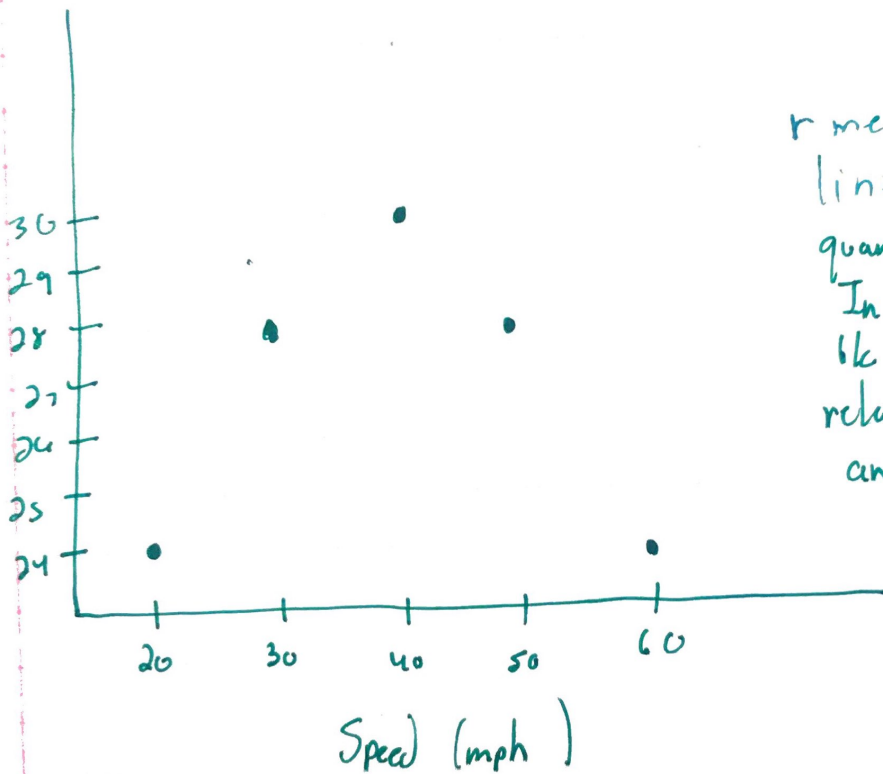
What the psychologist meant is that there is no linear association between research productivity and teaching ratings.

HW 3.1 Part B 21, 24

(21) a) There is a strong, positive linear association between the salt content and calories of hot dogs.

b) It would tend to decrease the strength of the linear relationship, and thus the correlation.

(26) Mileage (mpg)



r measures the strength of linear association between two quantitative variables.

In this case $r \approx 0$ because there is a non-linear relationship between speed and mileage.