

3.1b How well does a straight line fit the data?

Correlation (r): Measures direction and strength of a linear relationship.

$$-1 \leq r \leq 1$$

negative correlation means negative direction
positive r means positive direction

(Formula on p. 152 and blue packet)

Interpreting r

- $r = 0 \rightarrow$ no linear relationship
- $|r| \leq 0.5 \rightarrow$ weak correlation
- $0.5 < |r| \leq 0.7 \rightarrow$ moderate correlation
- $0.7 < |r| \leq 0.9 \rightarrow$ moderately strong
- $|r| > 0.9 \rightarrow$ strong
- $|r| = 1 \rightarrow$ perfectly linear



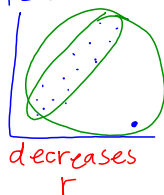
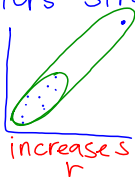
(See p. 151 for pictures)

To interpret r:

"There is a strength direction linear relationship correlation between explanatory variable and response variable."

other facts about r:

- doesn't distinguish between the x and y variables
- has no units
- only for LINEAR relationships
- both variables must be quantitative
- outliers strongly affect r.



See p. 155 for more characteristics of r