Scatterplots
    – looking for an association between
      two quantitative variables

Association
    ← strong Assoc.
       but weak (no) correlation
    – can be linear or non-linear
                                 not linear

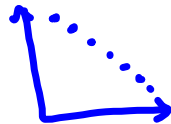## Correlation
    – must be linear

Describe Scatterplots
    1. shape (linear, etc.)
    2. strength
    3. direction (+, -)
    4. unusual (outliers)

(Linear) Correlation coefficient (r)   r has no units
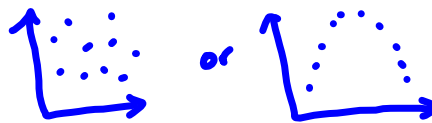
$$-1 \le r \le 1$$

perfect (-) corr. ↗   ← perfect (+) corr.

perfect (-) corr.

$r = 0$
no linear corr.

or

Conditions for using correlation
1. Quantitative data
2. Straight enough (generally linear)
3. No outliers

$x =$ explanatory variable

$y =$ response variable

Height vs. weight
$\quad\quad x \quad\quad\quad\quad\quad y$

Lurking Variable - a factor happening in
the background that affects
both variables.
Ex: ice cream sales vs. A/c sales
lurking variable = temperature

HWR: Pg. 155-157

#8 b,d , 15, 19, 22, 23

#8a: As prices ↑, # sold will ↓. ← dir (−)

Explanatory variable. = price
Response variable = # sold
Shade - linear
Strength - pretty strong

8. **Association** Suppose you were to collect data for each
   pair of variables. You want to make a scatterplot. Which
   variable would you use as the explanatory variable and
   which as the response variable? Why? What would you
   expect to see in the scatterplot? Discuss the likely direc-
   tion, form, and strength.

   a) When climbing mountains: altitude, temperature
   b) For each week: ice cream cone sales, air-conditioner
      sales
   c) People: age, grip strength
   d) Drivers: blood alcohol level, reaction time