Examining Relationships

We distinguish two types of variables:

- **response variable:**
  - result or outcome of interest
  - often also called dependent variable
  - denoted using the letter `y`

- **explanatory variable:**
  - explains changes in the response variable
  - often also called independent variable
  - denoted using the letter `x`

**Examples:**

- explanatory variable `(x)`
- response variable `(y)`
Chapter 2.1 – Scatterplots

**EXPLORING RELATIONSHIPS GRAPHICALLY**

We can display the explanatory and the response variable in a so-called *scatterplot* showing their relationship.

explanatory variable ⇒ x-axis
response variable ⇒ y-axis

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**Example:** 

<table>
<thead>
<tr>
<th>No. of ads</th>
<th>Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>12</td>
<td>10</td>
</tr>
</tbody>
</table>

# number of radio ads aired/week and amount of sales (in $1,000)

No. ads helps explain/predict sales

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**FOUR FEATURES TO LOOK FOR IN A SCATTERPLOT**

- **Direction:** positive or negative
  - positive association:
  - negative association:
Chapter 2.1 – Scatterplots

**Form:**
- linear (straight line)
- curved
- scattered

**Strength:** strong vs. weak and moderate

**Outliers:**