Examining Relationships

- So far we have primarily focused on a single variable.
- It is often more interesting to examine the relationship between variables.
- For now, we will focus on relationships between two quantitative variables.

Roles for Variables

- Response Variable
  - Often the variable we are most interested in

- Explanatory Variable (Predictor)
  - Used to explain the variation in the response variable

Scatterplots

- Scatterplots are a common and effective way to visualize the relationship between two quantitative variables

- When describing the association, or relationship, between two variables, always look at the overall pattern and deviations from the pattern.
Teenage Drug Use

- Is there a relationship between the use of marijuana and the use of other drugs?

- A survey was conducted in the U.S. and in 10 countries of Western Europe to determine the percentage of teenagers who had used marijuana and other drugs.

- A scatterplot of the data follows.

Positive Association

- Above average values of marijuana usage are associated with above average values of the usage of other illegal drugs.

- Below average values of marijuana usage are associated with below average values of the usage of other illegal drugs.
Price of Used Cars

• Is there a relationship between the age of a car and its price?

• A scatterplot of the ages and prices of 17 used Toyota Corollas follows.

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Price of Used Cars

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Negative Association

• Above average values of car age are associated with below average values of car price.

• Below average values of car age are associated with above average values of car price.