5.1: Why It Matters- Relationships in Categorical Data with Intro to Probability

Before we begin *Relationships in Categorical Data with Intro to Probability*, it is helpful to consider how it relates to the work we have already done in previous modules.

At the start of *Summarizing Data Graphically and Numerically*, we stated the difference between quantitative and categorical variables:

- **Quantitative variables** have *numeric* values that can be averaged. A quantitative variable is frequently a measurement – for example, a person's height in inches.
- **Categorical variables** are variables that can have one of a limited number of values, or labels. Values that can be represented by categorical variables include, for example, a person's eye color, gender, or home state; a vehicle's body style (sedan, SUV, minivan, etc.); a dog's breed (bulldog, greyhound, beagle, etc.).

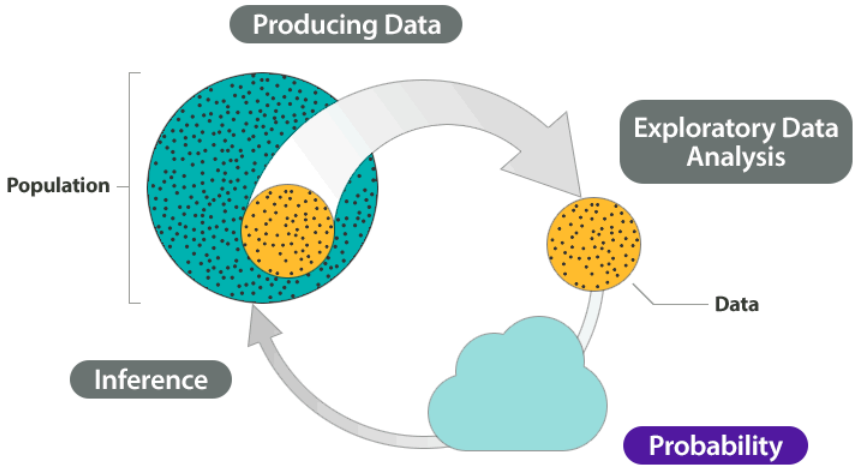
The remainder of *Summarizing Data Graphically and Numerically* focused on describing the overall pattern (shape, center, and spread) of the distribution of a quantitative variable.

In and *Examining Relationships: Quantitative Data* and *Nonlinear Models*, our goal was to identify and model the relationship between *two quantitative variables.*

Now, in this module, we turn our full attention back to categorical variables. Our objective is to study the relationship between two categorical variables. Just as in *Examining Relationships: Quantitative Data* and *Nonlinear Models*, we will be looking for patterns in the data.

As we organize and analyze data from two categorical variables, we make extensive use of **two-way tables**. Two-way tables for two categorical variables are in some ways like scatterplots for two quantitative variables: they give us a useful snapshot of all of the data organized in terms of the two variables of interest. This will be helpful in finding and comparing patterns. This part of *Relationships in Categorical Data with Intro to Probability* is exploratory data analysis in the Big Picture of Statistics.

A second important objective of this module is to introduce you to the concept of **probability**. Two-way tables give us a practical context for talking about probability. We also use two-way tables to help us visualize and solve real-world problems involving probability. This part of the module is part of probability in the Big Picture of Statistics.



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