

1.12 TRY **At what age did women marry?** A historian wants to estimate the average age at marriage of women in New England in the early 19th century. Within her state archives she finds marriage records for the years 1800–1820, which she treats as a sample of all marriage records from the early 19th century. The average age of the women in the records is 24.1 years. Using the appropriate statistical method, she estimates that the average age of brides in early 19th-century New England was between 23.5 and 24.7.

Descriptive

Inference

- Which part of this example gives a descriptive summary of the data?
- Which part of this example draws an inference about a population? **The population of all brides between the years of 1800 and 1820**
- To what population does the inference in part b refer?
- The average age of the sample was 24.1 years. Is 24.1 a statistic or a parameter? **A statistic**

1.30 Multiple choice: Believe in reincarnation? In a survey of 750 Americans conducted by the Gallup organization, 24% indicated a belief in reincarnation. A method presented later in this book allows us to predict that for *all* adult Americans, the percentage believing in reincarnation falls between 21% and 27%. This prediction is an example of

- descriptive statistics
- inferential statistics
- a data file
- designing a study

1.32 True or false? In a particular study, you could use descriptive statistics, or you could use inferential statistics, but you would rarely need to use both. **False**

We want to describe the sample and use it to make inference about the population.

1.34 What is statistics? On a final exam that one of us recently gave, students were asked, “How would you define ‘statistics’ to someone who has never taken a statistics course?” One student wrote, “You want to know the answer to some question. There’s no answer in the back of a book. You collect some data. Statistics is the body of procedures that helps you analyze the data to figure out the answer and how sure you can be about it.” Pick a question that interests you, and explain how you might be able to use statistics to investigate the answer.

2.4 Categorical or quantitative? Identify each of the following variables as either categorical or quantitative.

- Choice of diet (vegetarian, nonvegetarian) **categorical**
- Time spent in previous month attending a place of religious worship **quantitative**
- Ownership of a personal computer (yes, no) **categorical**
- Number of people you have known who have been elected to a political office **quantitative**

2.8 Number of children In the 2008 General Social Survey, 2020 respondents answered the question, “How many children have you ever had?” The results were

The mode

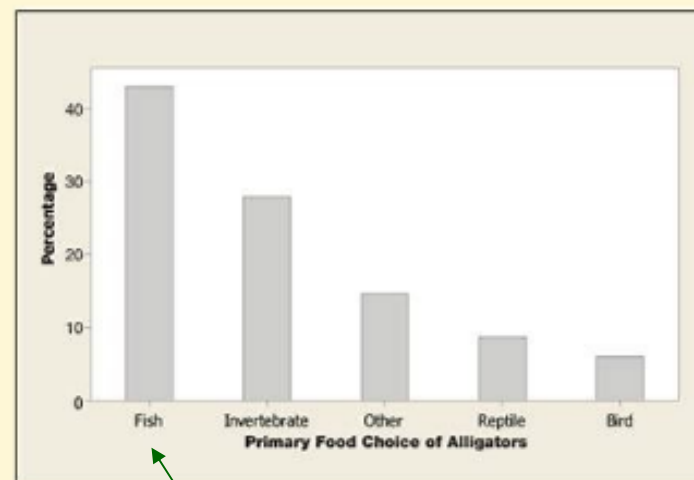
No. children	0	1	2	3	4	5	6	7	8+	Total
Count	521	323	524	344	160	77	30	19	22	2020

Proportion 0.258 0.160 0.259 0.170 0.079 0.038 0.015 0.009 0.011

- Is the variable, number of children, categorical or quantitative?
- Is the variable, number of children, discrete or continuous?
- Add proportions and percentages to this frequency table.
- Which response is the mode?

2.10 What do alligators eat? The bar chart (constructed using MINITAB) is from a study² investigating the factors that influence alligators' choice of food. For 219 alligators captured in four Florida lakes, researchers classified the primary food choice (in volume) found in the alligator's stomach in one of the categories—fish, invertebrate (snails, insects, crayfish), reptile (turtles, baby alligators), bird, or other (amphibian, mammal, plants).

- Is primary food choice categorical or quantitative?
- Which is the modal category for primary food choice?
- About what percentage of alligators had fish as the primary food choice? **around 43%**
- This type of bar chart, with categories listed in order of frequency, has a special name. What is it? **Pareto chart**



The modal category

2.12 France is most popular holiday spot Which countries are most frequently visited by tourists from other countries? The table shows results according to *Travel and Leisure* magazine (2005).

- Is country visited a categorical or a quantitative variable?
- In creating a bar graph of these data, would it be most sensible to list the countries alphabetically or in the form of a Pareto chart? Explain. **Yes, we can easily locate the countries most visited**
- Does either a dot plot or stem-and-leaf plot make sense for these data? Explain. **No, the data is categorical**

Most Visited Countries, 2005	
Country	Number of Visits (millions)
France	77.0
China	53.4
Spain	51.8
United States	41.9
Italy	39.8
United Kingdom	24.2
Canada	20.1
Mexico	19.7

Source: Data from *Travel and Leisure* magazine, 2005.

2.16 Graphing exam scores A teacher shows her class the scores on the midterm exam in the stem-and-leaf plot shown:



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6 | 588
7 | 01136779
8 | 1223334677789
9 | 011234458
  
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- Identify the number of students and their minimum and maximum scores. **33 students; min=65; max=98**
- Sketch how the data could be displayed in a dot plot
- Sketch how the data could be displayed in a histogram with four intervals.

