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Pictograms

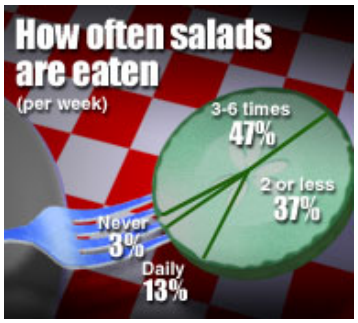
Learning Objective: Summarize and describe the distribution of a categorical variable in context.

Pictograms

1. While both the pie chart and the bar chart help us visualize the distribution of a categorical variable, the pie chart emphasizes how the different categories relate to the whole, and the bar chart emphasizes how the different categories compare with each other.

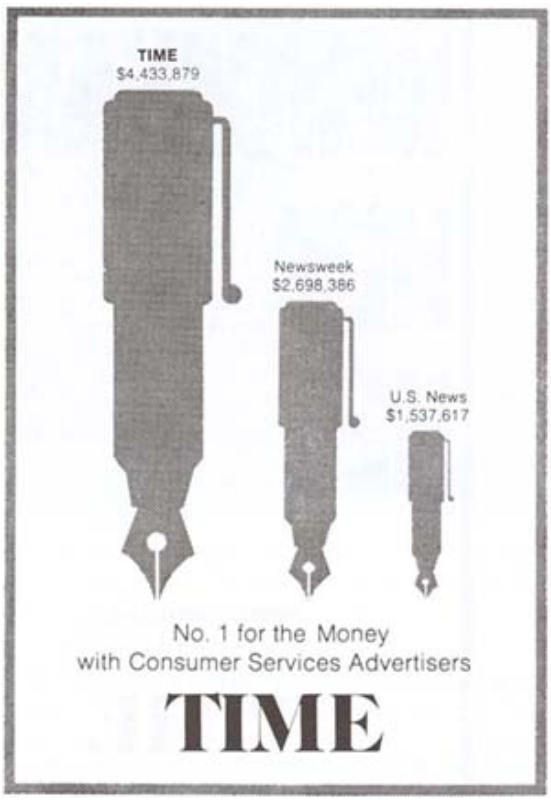
2. A variation on the pie chart and bar chart that is very commonly used in the media is the **pictogram**. Here are two examples:

Source: USA Today Snapshots and the Impulse Research for Northern Confidential Bathroom survey



Source: Market Facts for the Association of Dressings and Sauces

3. **Beware:** Pictograms can be misleading. Consider the following pictogram:



This graph is aimed at advertisers deciding where to spend their budgets, and clearly suggests that *Time* magazine attracts by far the largest amount of advertising spending. Are the differences really as dramatic as the graph suggests? If we look carefully at the numbers above the pens, we find that advertisers spend in *Time* only $4,433,879 / $2,698,386 = 1.64 times more than in *Newsweek*, and only $4,433,879 / $1,537,617 = 2.88 times more than in *U.S. News*. By looking at the pictogram, however, we get the impression that *Time* is much further ahead. Why? In order to magnify the picture without distorting it, we must increase *both* its height and width. As a result, the **area** of *Time's* pen is 1.64 * 1.64 = 2.7 times larger than the *Newsweek* pen, and 2.88 * 2.88 = 8.3 times larger than the *U.S. News* pen. Our eyes capture the area of the pens rather than only the height, and so we are misled to think that *Time* is a bigger winner than it really is.

Scenario: Making Friends

The same survey that asked 1,200 U.S. college students about their body perception also asked the following question:

"With whom do you find it easiest to make friends?" (opposite sex, same sex or no difference).

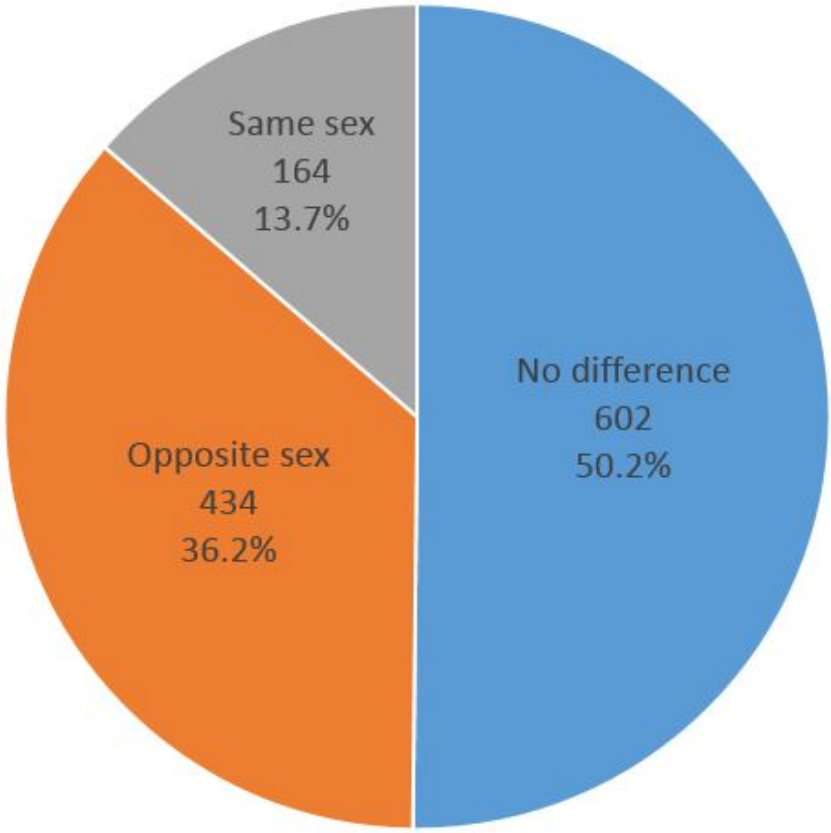
Below is a snapshot of how the first 25 men and women answered the question: "With whom do you find it easiest to make friends?"

	Friends
1	No difference
2	No difference
3	No difference
4	No difference
5	No difference
6	No difference
7	No difference
8	No difference
9	No difference
10	No difference
11	No difference
12	No difference
13	No difference
14	No difference
15	No difference
16	No difference
17	No difference
18	No difference
19	No difference
20	No difference
21	No difference
22	No difference
23	No difference
24	No difference
25	No difference

Here is a summary table of the data:

No Difference	Opposite Sex	Same Sex
602	434	164
50.2%	36.2%	13.7%

Finally, here is a pie chart of the data:



Comment

Note that the pie chart visually provides all the information that is in the table.

Learn By Doing

1/1 point (graded)

If you were to pick one of the 1,200 surveyed students at random, he/she would most likely find it easier to make friends with which of the following?

- People of the same sex.
- People of the opposite sex.
- People of the same or opposite sex equally. ✔

Answer

Correct:

No difference, or people of the same or opposite sex, was the response that was given most often (50.2%).

Submit

Let's Summarize

- The distribution of a categorical variable is summarized using:
  - **Graphical display:** pie chart or bar chart, supplemented by
  - **Numerical summaries:** category counts and percentages.
- A variation on pie charts and bar charts is the pictogram.
- Pictograms can be misleading, so make sure to use a critical approach when interpreting the information the pictogram is trying to convey.