

Mosaic Plots

For use with the discussion of side-by-side and segmented bar graphs on page 19 (6e).

Yellowstone National Park staff surveyed a random sample of 1526 winter visitors to the park. They asked each person whether he or she belonged to an environmental club (like the Sierra Club). Respondents were also asked whether they owned, rented, or had never used a snowmobile. Here is a two-way table summarizing the results.

Snowmobile use	Environmental club		Total
	No	Yes	
Never used	445	212	657
Snowmobile renter	497	77	574
Snowmobile owner	279	16	295
Total	1221	305	1526

Figure 1.3 compares the distributions of snowmobile use for Yellowstone National Park visitors who are environmental club members and those who are not environmental club members with (a) a side-by-side bar graph, (b) a segmented bar graph, and (c) a mosaic plot. Notice that the segmented bar graph can be obtained by stacking the bars in the side-by-side bar graph for each of the two environmental club membership categories (no and yes). The bar widths in the mosaic plot are proportional to the number of survey respondents who are (305) and are not (1221) environmental club members.

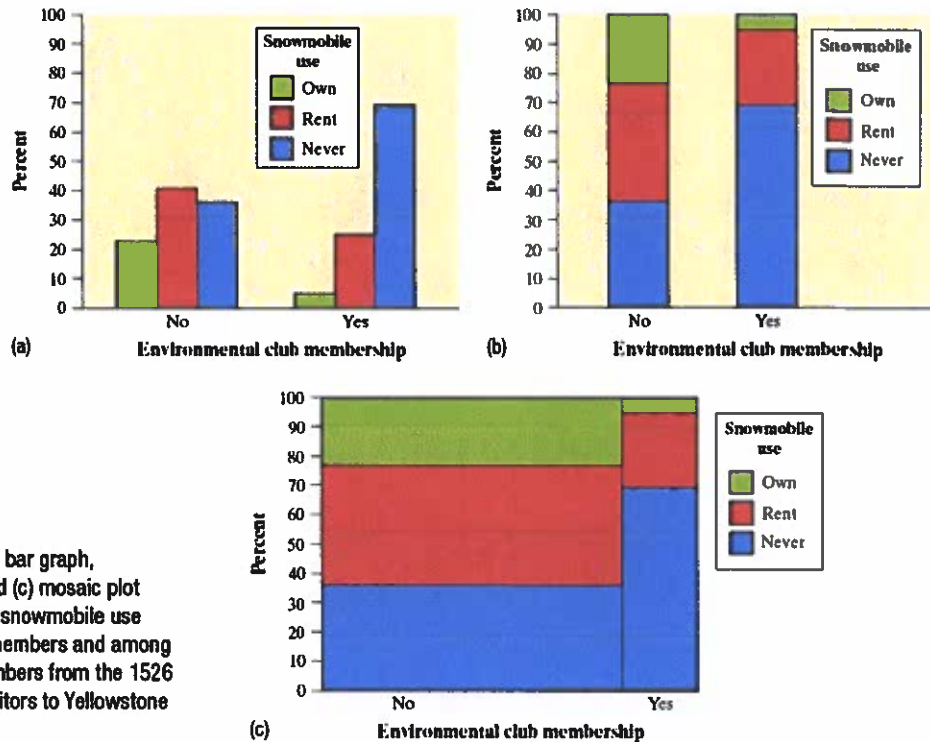


FIGURE 1.3 (a) Side-by-side bar graph, (b) segmented bar graph, and (c) mosaic plot displaying the distribution of snowmobile use among environmental club members and among non-environmental club members from the 1526 randomly selected winter visitors to Yellowstone National Park.

DEFINITION Side-by side bar graph, Segmented bar graph, Mosaic plot

A **side-by-side bar graph** displays the distribution of a categorical variable for each value of another categorical variable. The bars are grouped together based on the values of one of the categorical variables and placed side by side.

A **segmented bar graph** displays the distribution of a categorical variable as segments of a rectangle, with the area of each segment proportional to the percent of individuals in the corresponding category.

A **mosaic plot** is a modified segmented bar graph in which the width of each rectangle is proportional to the number of individuals in the corresponding category.

Exercises

1. Body image A random sample of 1200 U.S. college students was asked, “What is your perception of your own body? Do you feel that you are overweight, underweight, or about right?” The two-way table summarizes the data on perceived body image by gender.

		Gender		
		Female	Male	Total
Body image	About right	560	295	855
	Overweight	163	72	235
	Underweight	37	73	110
	Total	760	440	1200

(a) Of the respondents who felt that their body weight was about right, what proportion were female?

(b) Of the female respondents, what percent felt that their body weight was about right?

(c) The mosaic plot displays the distribution of perceived body image by gender. Describe what this graph reveals about the association between these two variables for the 1200 college students in the sample.

