Visualizing Evidence: Tables and Graphs

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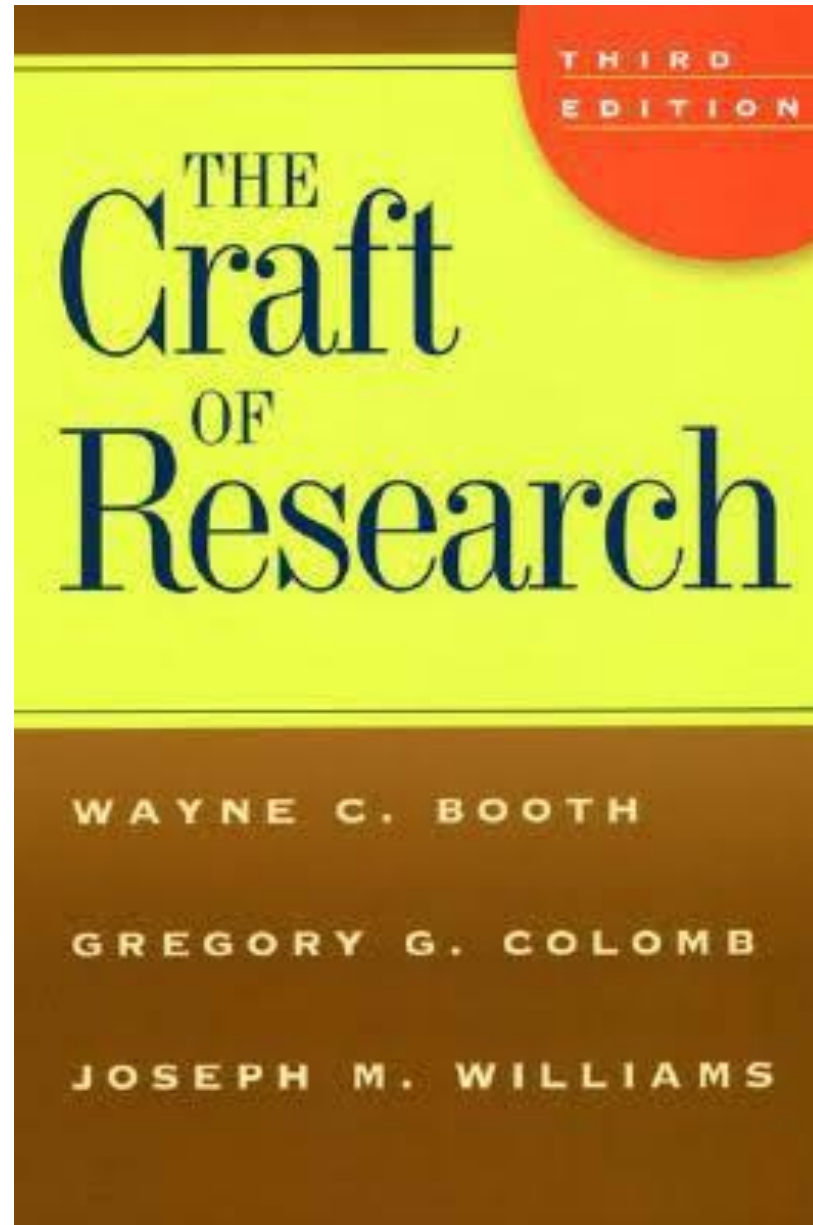
THIRD
EDITION

THE
Craft
OF
Research

WAYNE C. BOOTH

GREGORY G. COLOMB

JOSEPH M. WILLIAMS

Table and Graph

- Use tables when data in evidence are few and simple

- Use graphs when data in evidence are complex

Table Example

"In 1996, on average, men earned $32,144 a year, women $23,710, a difference of $8,434." (example in Booth, Colomb, and Williams)

TABLE 15.1. Male-female salaries ($), 1996

Men	32,144
Women	23,710
Difference	8,434

How about this one?

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TABLE 15.1. Male-female salaries ($), 1996

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Women	$23,710
Difference	$8,434

"Between 1970 and 2000, the structure of families changed in two ways. In 1970, 85 percent of families had two parents, but in 1980 that number declined to 77 percent, then to 73 percent in 1990, and to 68 percent in 2000. The number of one-parent families rose, particularly families headed by a mother. In 1970, 11 percent of families were headed by a single mother. In 1980 that number rose to 18 percent, in 1990 to 22 percent, and to 23 percent in 2000. There were some marginal changes among single fathers (headed 1 percent of the families in 1970, 2 percent in 1980, 3 percent in 1990, and 4 percent in 2000). Families headed by remained stable at 3-4 percent."

(example in Booth, Colomb, and Williams)

Visualizing Complex Data

- ## Table

  - emphasizes discrete numbers

  - requires readers to infer relationships or trends on their own

- ## Chart or graph

  - presents data less precisely than table

  - communicates more with impacts on relationships and trends

Example 2 in Table

TABLE 15.2 Changes in U.S. family structure, 1970 - 2000

Percentage of total families

Family type	1970	1980	1990	2000
2 Parents	85	77	73	68
Mother	11	18	22	23
Father	1	2	3	4
No adult	3	4	3	4

Example 2 in Graph

- But there are many types of charts or graphs, and they differ.
- Examples
  - Bar chart
    - emphasizes contrast among discrete items (in example 2, if we want to emphasize the contrast among years 1970, 1980, 1990, and 2000, respectively, we'd better to choose a bar chart)
  - Line graph
    - emphasizes significance and contrast of trends (in example 2, if we want to emphasize the significance and contrast of trends of 2-parent families, father-led families, mother-led families, families without adults from year 1970 to year 2000, we'd better to choose a line graph)
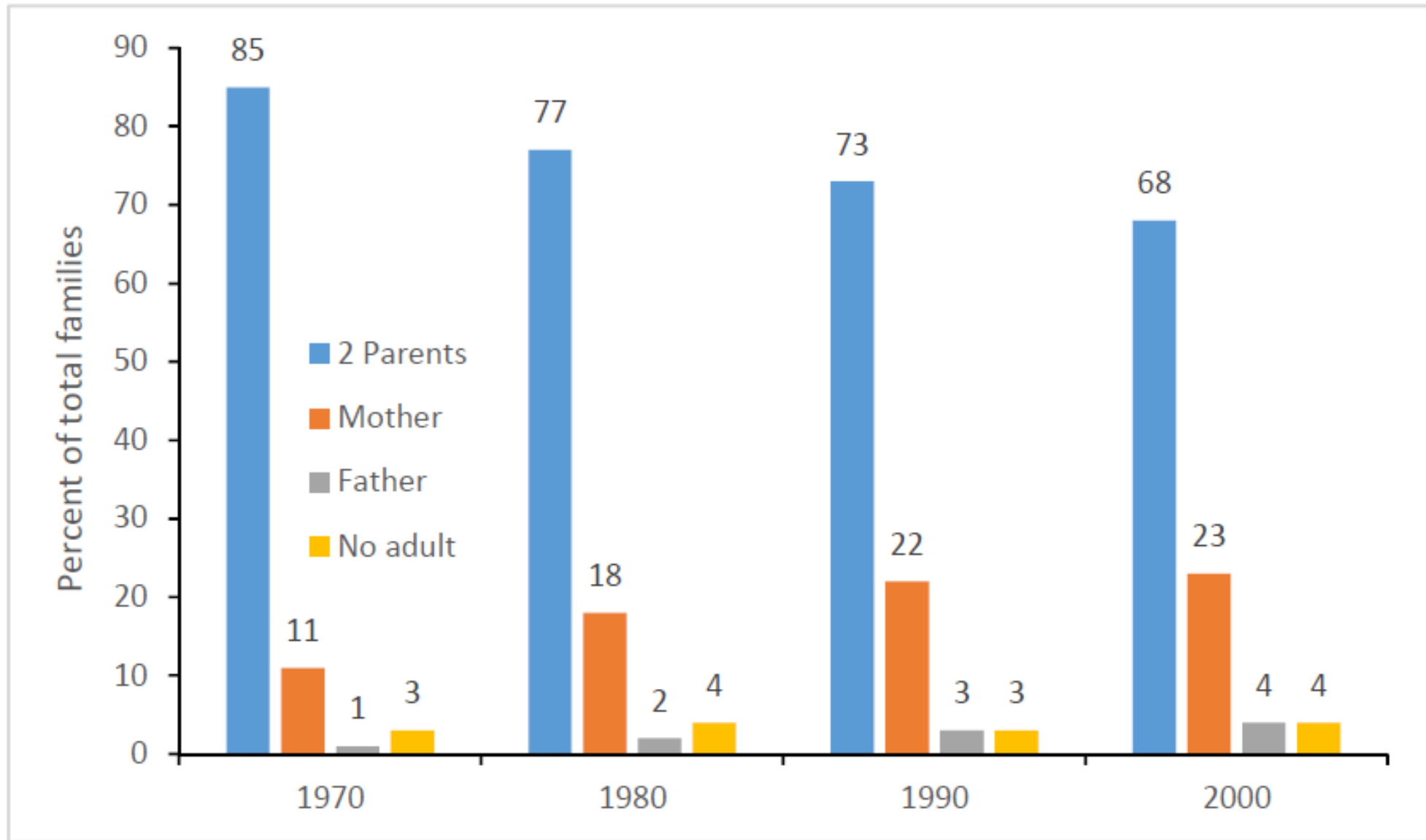
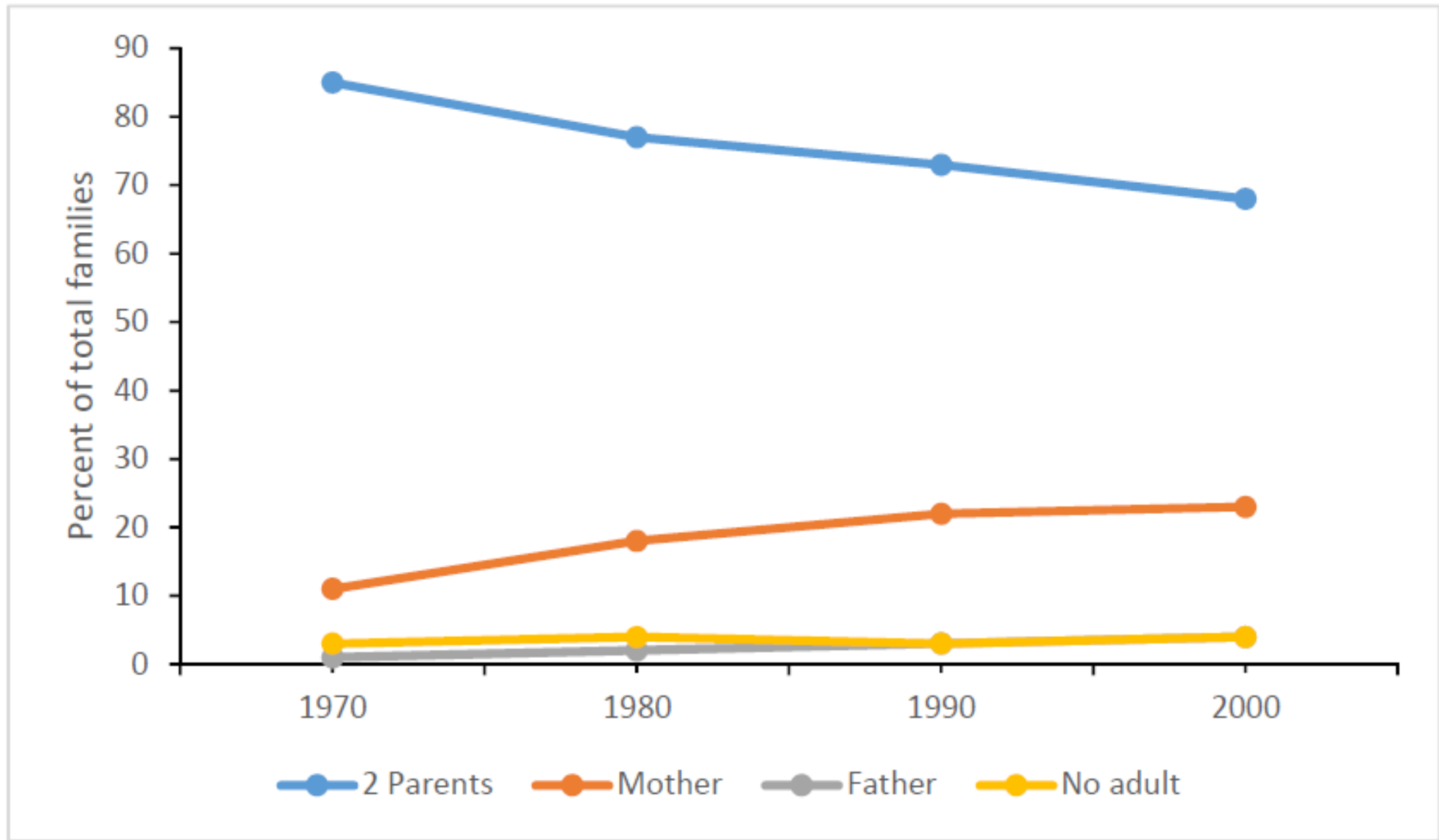Figure 15.1. Changes in U.S. family structure, 1970 - 2000

Figure 15.1. Changes in U.S. family structure, 1970 - 2000

Common Chart and Graph Types

- When to use them? (see chapter 15 of the textbook)
  - Bar chart
  - Bar chart, grouped or split
  - Bar chart, stacked
  - Histogram
  - Image chart
  - Pie chart
  - Line graph
  - Area chart
  - Scatter plot
  - Bubble chart
  - ……

- "Choose the format that achieves the effect you want, not the one that comes to your mind first"

<div align="right">-- Booth, Colomb, and Williams</div>

- Good visualization takes time

- Know your tools