

# Visualizing Evidence: Tables and Graphs

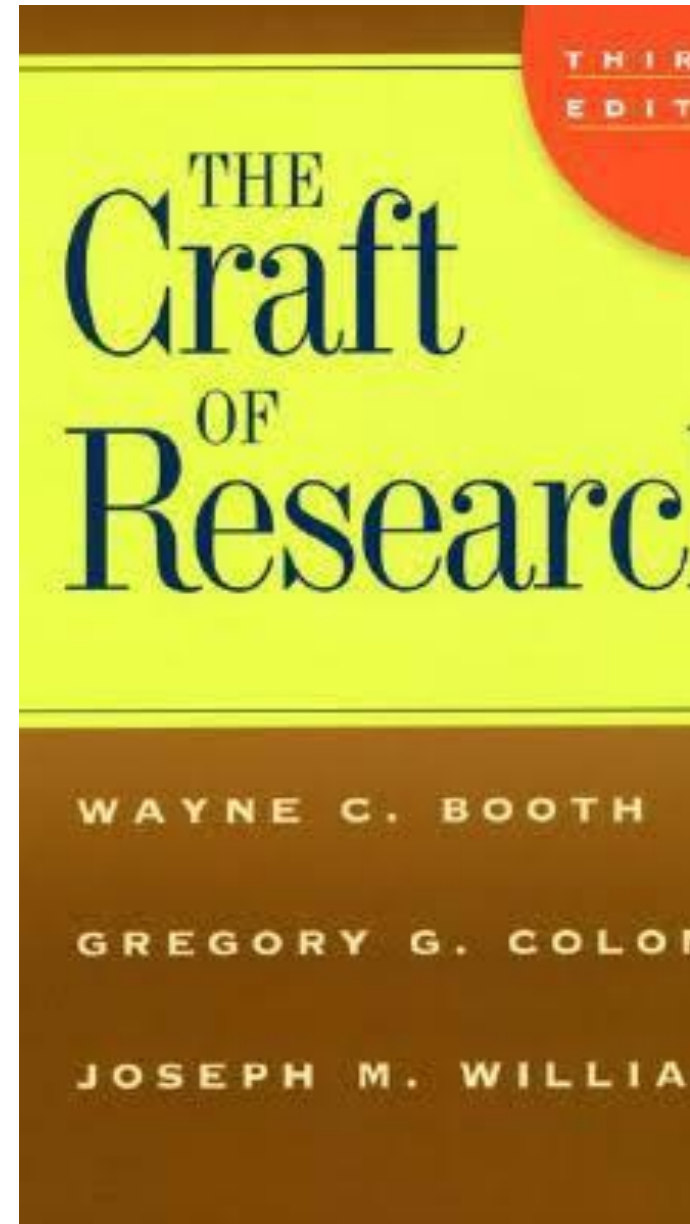
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# Acknowledgement

- Booth, W. C., Colomb, G. G., & Williams, J. M. (2008). *The craft of research (3<sup>rd</sup> ed.)*. University of Chicago press.



# Table and Graph

- Use tables when data in evidence are few and simple
- Use graphs when data in evidence are complex

# How do we present the following statement?

- An example in Booth, Colomb, and Williams, 2008
- “In 1996, on average, men earned \$32,144 a year, women \$23,710, a difference of \$8,434.”

# 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

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

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# Details matters.

- How about this one?
- "In 1996, on average, men earned \$32,144 a year, women \$23,710, a difference of \$8,434." (an example in Booth, Colomb, and Williams)

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

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|            |          |
|------------|----------|
| Men        | \$32,144 |
| Women      | \$23,710 |
| Difference | \$8,434  |

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# How do we present the following paragraph?

- See next slide.

"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."

(another example in Booth, Colomb, and Williams, 2008)



# 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

# Let's try both

- We may need to see both before we make a decision which one to use.
- Illustrate the example using a table
- Illustrate the example using a graph

# Example 2 in Table

- Are the messages you want to convey easily be seen by readers?

**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    |

# Use Graph

- But there are many types of charts or graphs, and they differ.
- Examples of different types of graph
  - 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)

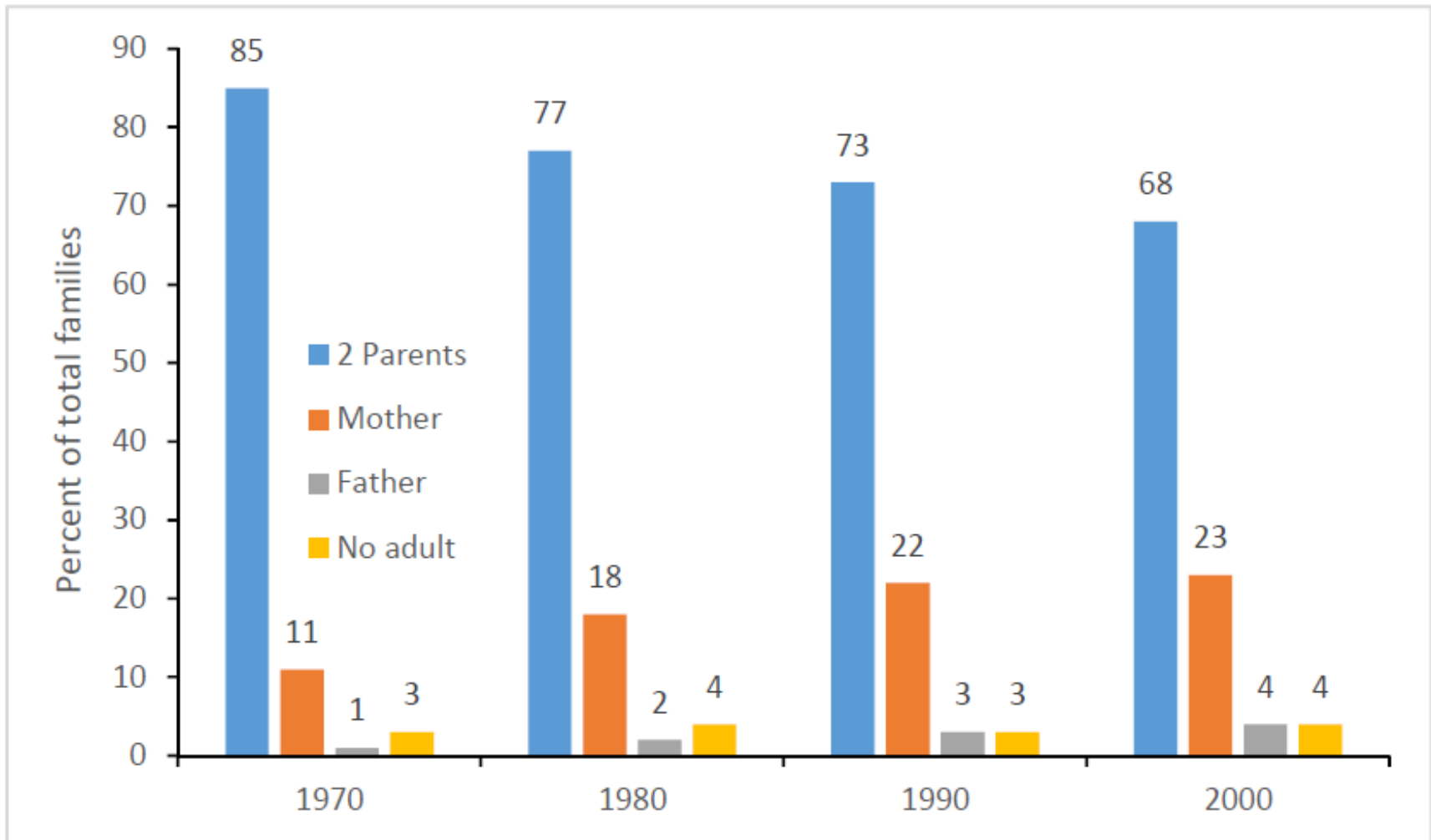


Figure 15.1. Changes in U.S. family structure, 1970 - 2000

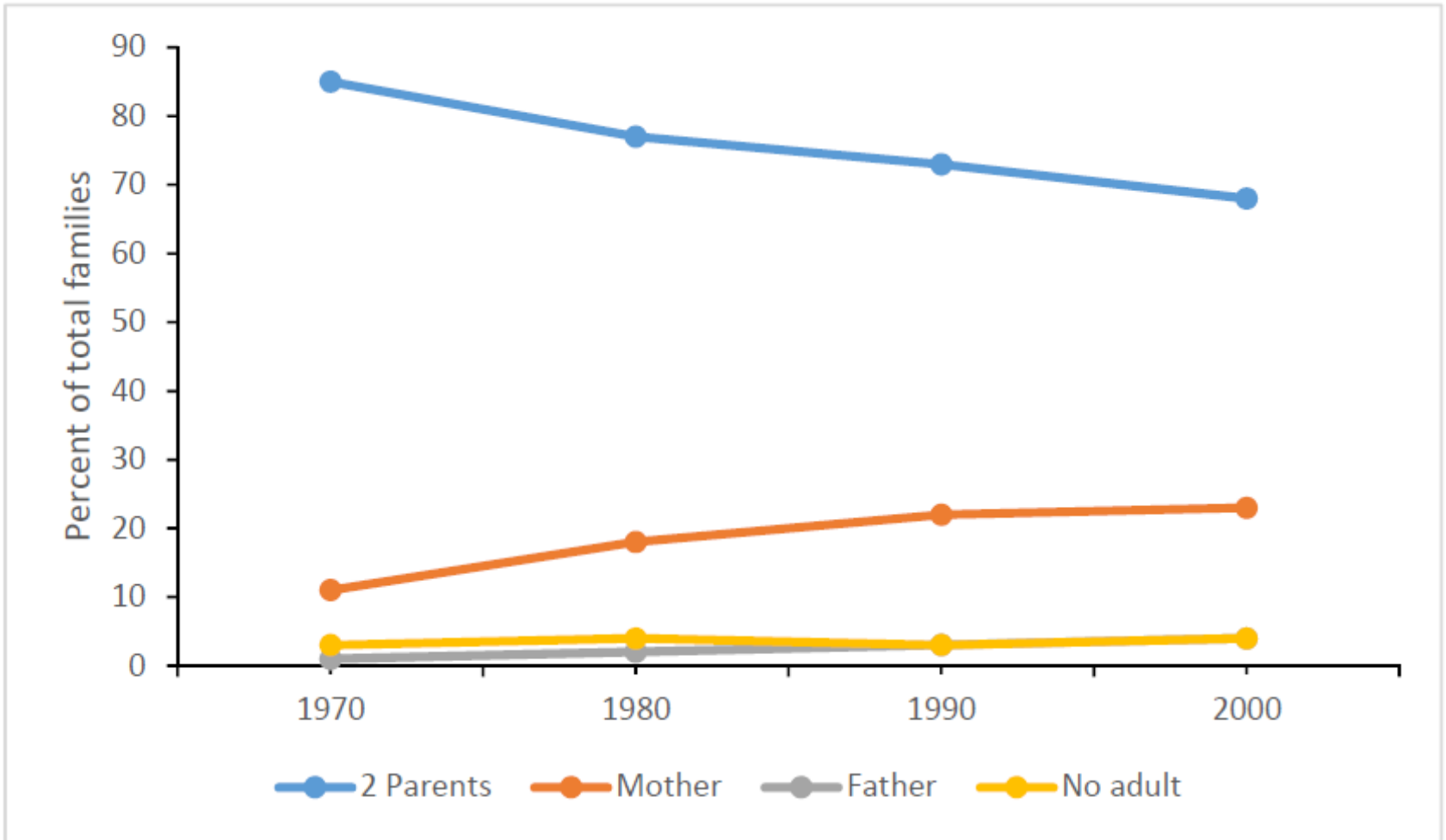
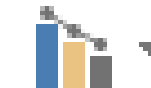


Figure 15.1. Changes in U.S. family structure, 1970 - 2000

# Common Chart and Graph Types

- When to use them?
- See chapter 15 of the textbook (Booth, Colomb, and Williams, 2008)
  - 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"

-- Booth, Colomb, and Williams, 2008

- Good visualization takes time
- Know your tools