

1.4 Critical Thinking

- Bad Samples
 - **Self-selected survey** (or **voluntary response sample**): one in which the respondents themselves decide whether to be included (internet polls, mail-in polls, telephone call-in polls).
 - **GIGO**: garbage in, garbage out; even a huge survey can be worthless!
 - **Small Samples**
- Misleading Graphs
- Correlation and Causality - *Correlation does not imply causality!*
- Reported Results - asking people what they weigh vs weighing them on a scale.
- Percentages Misleading or unclear Percentages
 - $6\% \text{ of } 1200 \text{ responses } = \frac{6}{100} \times 1200 = 72$
 - $\frac{3}{4} = .75 \quad .75 \times 100\% = 75\%$
 - Decimal to Percent* $.250 \times 100 = 25\%$
 - Percent to Decimal* $85\% = \frac{85}{100} = .85$
- Order of Questions
- Nonresponse
- Missing Data
- Self-Interest Study
- Precise Numbers
- Deliberate Distortions