

KEY CONCEPTS FOR REVIEW

Look for these key concepts as you read the Appendix. Be sure to understand each concept before going on to other material.

1. **The Function of Statistics.** Social scientists rely on statistics to organize, describe, and assess data. Their proper use increases precision, clarity, and objectivity and promotes reliable explanation.
2. **Data Organization.** Data can be condensed and represented by different statistical devices. The more common devices include frequency distributions, histograms (bar graphs), and frequency polygons (line graphs).
3. **Summarizing Data.** Descriptive statistics are employed to summarize data. Summaries may rely upon measures of central tendency, measures of variability, or curvilinear patterns. Sometimes the data are transformed into standardized formats (e.g., percentiles or z-scores).
4. **Describing Central Tendency.** Central tendency involves the description of data in terms of a single representative number. Measures of central tendency include the mean (arithmetic average), the median (the middle score of a ranked distribution), and the mode (the most frequent score).
5. **Describing Variability.** Variability refers to the spread of scores within a distribution. The simplest measure of variability is the range, i.e., the distance between the lowest score and the highest score. However, the standard deviation provides more complete information and allows fuller analysis. The standard deviation reflects average differences between scores and their mean.
6. **Describing Data in Standard Formats.** Raw scores are often converted into standardized formats to facilitate comparison across people and situations. Percentile scores relate raw scores to the percentage of people obtaining the scores (percentile ranking). Z-scores indicate distance from the mean based on standard deviation units.
7. **Describing Data Patterns.** A set of data may involve scores that are heavily clustered and set off toward one end. In the normal distribution, scores spread symmetrically from the central value, forming the bell-shaped normal curve. On this curve, the measures of central tendency are equal and percentile rankings are predictable.
8. **Inferential Statistics.** These statistics are important after the data have been organized and summarized. They compare experimental results to chance and provide the background for research conclusions.
9. **Testing Research Hypotheses.** Experiments are designed to directly test the null hypothesis—the possibility that the independent variable has no effect on the subjects' behavior. Statistically, this is done by assessing the likelihood that obtained scores were due to chance. When chance is highly improbable,