

## Data analysis

Making sense of numbers

Copyright A. C. Ekin 1998-2002

## Data reduction

Making mole-hills out of mountains

- A data matrix consists of all the information collected and it is raw data
- Data reduction results in a smaller set of numbers that define the characteristics of the entire data set

Copyright A. C. Ekin 1998-2002

## Data reduction

Basic functions

- Summarize
- Conceptualize
- Extrapolate
- Communicate

Copyright A. C. Ekin 1998-2002

## Data reduction

Summarize

- Data reduction yields summary measures that describe the data set

*Example:*

*Average income of the respondents is better understood than individual income figures of the participants*

Copyright A. C. Ekin 1998-2002

## Data reduction

Conceptualize

- Data reduction allows easier visualization of the information

*Example:*

*"Income is highly correlated to the respondent's age"  
makes the relation easy to understand*

- Without reduction this conceptualization may not even be possible

Copyright A. C. Ekin 1998-2002

## Data reduction

Extrapolate

- Data reduction allows for making generalizations about the population

*Example:*

*"the income of the target market is between \$45,000-75,000 with a \$7,500 margin of error"*

Copyright A. C. Ekin 1998-2002

## Data reduction

Communicate

- A data-matrix is extremely difficult to communicate
  - Raw form may be useless in making decisions
  - Large size makes it impractical to communicate and impossible to understand

Copyright A. C. Ekin 1998-2002

## Data analysis

Types of analysis

- Descriptive
- Inferential
- Comparative
- Associative
- Predictive

Copyright A. C. Ekin 1998-2002

## Descriptive analysis

Measures of central tendency

### ■ Mode

*Value that occurs most frequently*

### ■ Median

*Value of the element that divides an ordered array into two equal parts*

### ■ Mean

*Arithmetic average of all the values in an array*

Copyright A. C. Ekin 1998-2002

## Descriptive analysis

Measures of variability

### ■ Frequency distribution

*A table of the number of occurrence of each value in an array*

### ■ Range

*Difference between the highest and the lowest values in an array*

Copyright A. C. Ekin 1998-2002

## Descriptive analysis

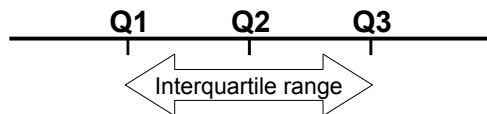
Measures of variability

### ■ Standard deviation

*Standardized unit of measure of variability*

### ■ Interquartile range

*Difference between the first and the third quartile*

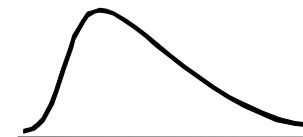


Copyright A. C. Ekin 1998-2002

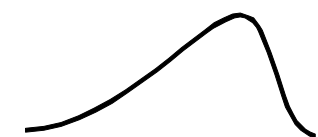
## Other descriptive measures

### ■ Skewness

*A measure of asymmetry*



**Positive skewness**



**Negative skewness**

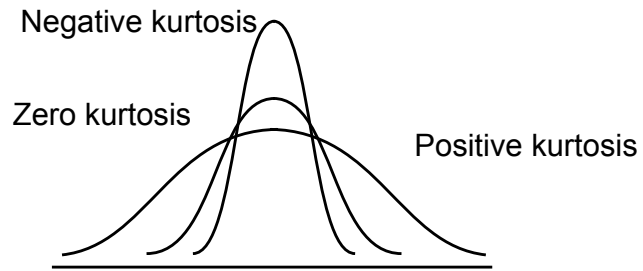
Copyright A. C. Ekin 1998-2002

# Descriptive analysis

Other descriptive measures

## ■ Kurtosis

*A measure of peakedness of the distribution*



Copyright A. C. Ekin 1998-2002

# Selection of tool

Must use the proper statistic

## ■ Match the level of measurement to the statistic

	Level of measurement		
	Nominal	Ordinal	Interval, ratio
Summary			
Center	Mode	Median	Mean
Dispersion	Frequency distribution	Cumulative percentage distribution Interquartile range	Standard deviation

Copyright A. C. Ekin 1998-2002