

# Psychological Statistics

## Frequency Distributions and Graphs



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## What We Will Cover in This Section

- Introduction
- Frequency Distributions
- Graphs



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## Data For a Group of People

15	13	14	11
14	12	17	15
11	15	14	12
13	10	13	15
12	14	13	14

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### Simple frequency distribution (N=20)

Score	Frequency (f)	%	Cum % Percentile
17	1	5	100
16	0	0	95
15	4	20	95
14	5	25	75
13	4	20	50
12	3	15	30
11	2	10	15
10	1	5	5

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### Your First Equation

$$\text{Percent} = 100 \times \left( \frac{f}{N} \right)$$

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### Common Statistics

- Frequency
  - The number of people who got a certain score.
  - Symbolized with f.
- Number
  - The total count of observations in a sample.
  - Symbolized with N.
- Percentile
  - The percent of people who got a score and lower.
  - Symbolized with P<sub>n</sub>.

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**Grouped Frequency Distribution (N = 50)**

Score	Frequency (f)	Cum f	Cum % Percentile
94-96	1	50	100.00
91-93	1	49	98.00
88-90	6	48	96.00
85-87	10	42	84.00
82-84	6	32	64.00
79-81	6	26	52.00
76-78	6	20	40.00
73-75	2	14	28.00
70-72	5	12	24.00
67-69	5	7	14.00
64-66	0	2	4.00
61-63	2	2	4.00

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- ### Terms for a Cumulative Frequency Distribution
- $i$  = interval width.
  - $f$  = frequency.
  - Cum  $f$  = cumulative number of cases.
  - % = percent of cases.
  - $P_n$  = percentile.

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- ### Rules for Intervals
1. All intervals must be the same width.
  2. The intervals must be continuous.
  3. Each number should be represented only once.
  4. All numbers should be represented.

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## Width Rule

Right	Wrong
26 - 30	27 - 33
21 - 25	20 - 26
16 - 20	16 - 19
11 - 15	10 - 15

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## Numbers Rules

Right	Wrong
26 - 30	31 - 35
21 - 25	22 - 26
16 - 20	15 - 19
11 - 15	11 - 15

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## Limits: Real and Apparent Limits

Grouped frequency distribution	
Score	(f)
24-25	1
22-23	4
20-21	6
18-19	11
16-17	4
14-15	3
12-13	2
10-11	1

Real Upper Limit 21.5	
Apparent Upper Limit 21	
Apparent Lower Limit 20	
Real Lower Limit 19.5	

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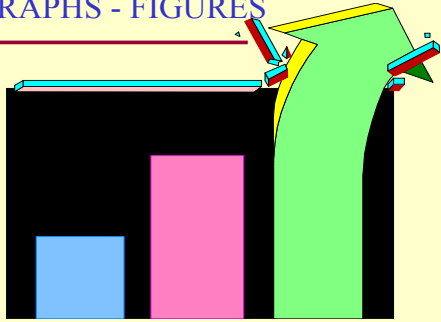
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# GRAPHS - FIGURES



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## Bar Graph

Used for nominal data.

- The bars do **not** touch each other.
- All numbers are represented.
- There is **no grouping** of numbers.

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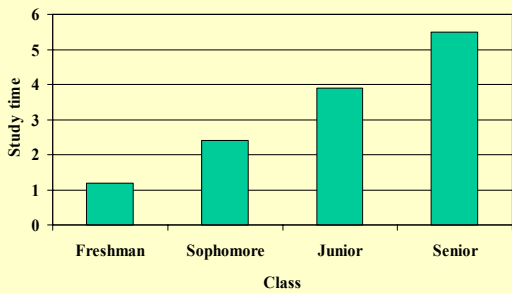
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Figure 1. Average hours spent studying per day.



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## Histogram

Used for ordinal, interval, and ratio data.

- The scores are shown on the x-axis.
- Frequency is shown on the y-axis.
- Same numbering rules as for the grouped frequency distribution.
- The bars touch each other.

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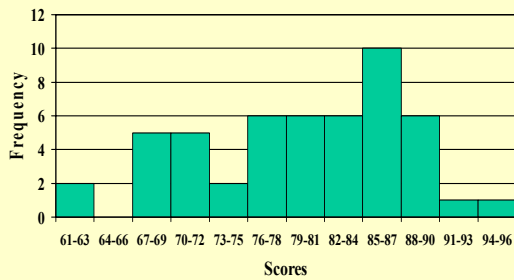
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Figure 2. Score frequency for Sweeney's Simple Test



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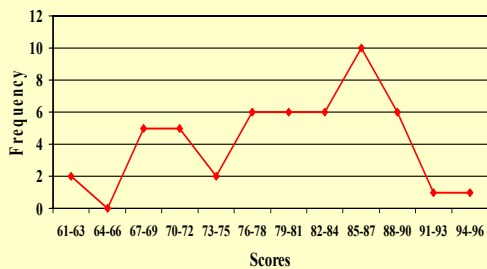
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Frequency Polygon Example



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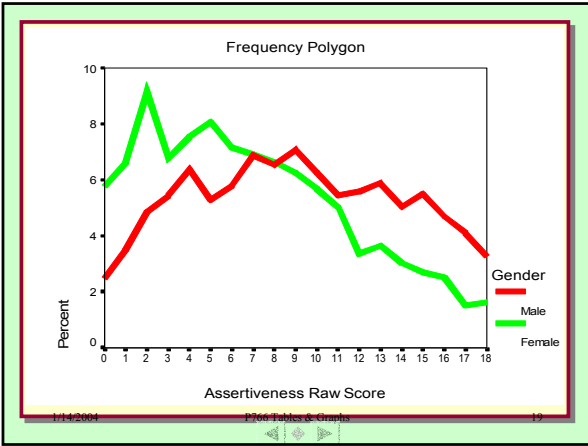
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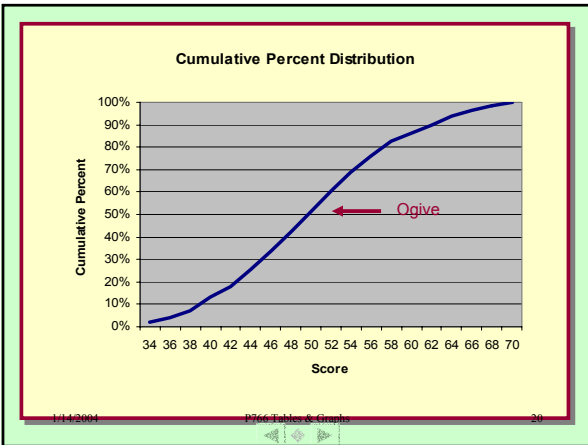
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### APA Figure Format

- Title at the top labeled as figure.
- Y-axis always starts at zero.
- 8 x 5 aspect ratio.
- All elements are labeled.

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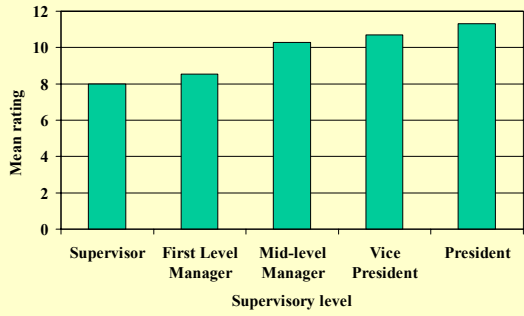
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Figure 1. Mean assertiveness rating by job level.



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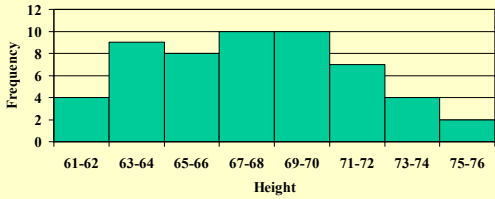
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### Error: Chart Too Flat

Figure 1. Class height frequency



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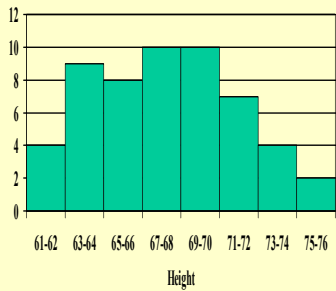
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Figure 1. Class height frequency

### Error: Chart Too Tall



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# Important Histograms

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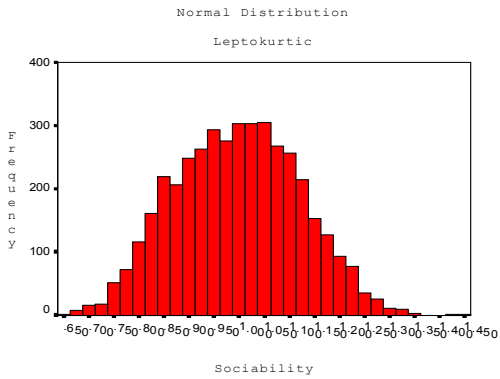
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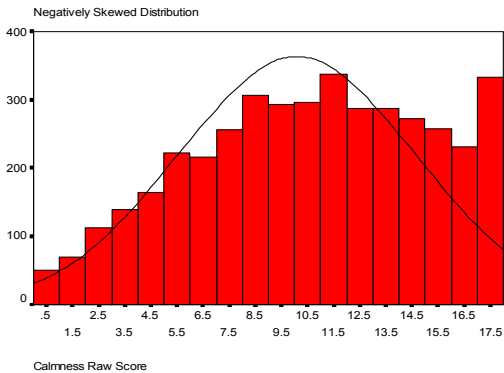
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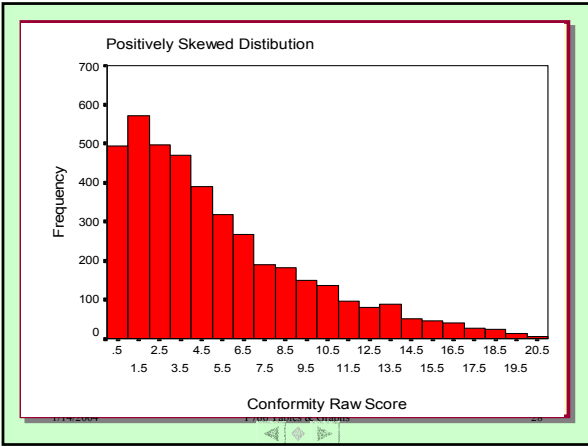
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