**Module I: Basics of Statistics**

Statistics for the Behavioral Sciences

**Frequency Distributions**

•We need to know not only…

Is research inferential or descriptive

The characteristics of variables

•E.g., operational definitions, RION, reliability/validity

•But also…

The distribution of variables

**Frequency Distributions**

•Frequency Tables

•Frequency Graphs

•Normal Distribution

**Frequency Tables**

•Frequency tables organizes information

Provides counts of values

Provides percentages of values

Allows us to “see” the “shape” of the values

•Two types

With units or intervals

**Frequency Tables**

•Standard frequency table (units)

Fewer values (e.g., response scale)

•Grouped frequency table (intervals of values)

Wide range of values (e.g., yearly income)

Includes decimals (e.g., 13.23)

Typically want between 7 and 10 intervals

**Frequency Tables**

•Juvenile delinquents history of school discipline

**Frequency Tables**

•Steps to create a group frequency table

1. Order the values from lowest to highest

2. Find the full range of the data

Highest – Lowest + “1”

Why “+ 1”? (Use smallest unit relative to measurement)

- Ex. 4 – 2 = 2, but there are 3 numbers in the range (2, 3, 4)

- So we need to add something to account for the full range

3. Determine the number and size of intervals

4. Determine the lowest interval range

Needs to include lowest value

5. Create three columns in a table

6. List the full range of intervals

1st and last interval need to have values

7. Count the scores within each interval

8. Calculate frequency percent

**Frequency Tables**

•Steps not necessary, but helpful; tables need:

Between 7 and 10 intervals

Numerical count in the first and last interval

Equal interval widths

Correct frequencies

Correct percents

**Frequency Distributions**

•Frequency Tables

•Frequency Graphs

•Normal Distribution

**Frequency Graphs**

•A picture says a thousand words…

•Histograms and frequency polygons

•Histograms (scale variables only)

1. Draw an X and Y axis

2. Label your X/Y axes and title (include 0 if practical)

3. Draw a bar for each value or interval midpoint based on your frequency table

**Frequency Graphs**

•Frequency Polygons (scale variables)

1. Draw an X and Y axis

2. Label your X and Y axes (include 0 if practical)

3. Add a frequency dot above each midpoint based on your frequency table

4. Connect the dots!

**Frequency Graphs**

•Histograms and frequency polygons

•Used for a single variable

•Variable is continuous (score or scale)

•If discrete (group), then use a bar chart

•Decide by the type of variables

One variable (continuous, scale, or score):

• Histogram (presentation)

• Frequency polygon (comparison)

One variable (discrete or group):

• Bar graph

**Frequency Distributions**

•Why should we care about the shape of the distribution?

•Most statistics tests assume normal distribution

**Frequency Distributions**

•Frequency Tables

•Frequency Graphs

•Normal Distribution

**Normal Distribution**

Normal Distribution

**Normal Distribution**

Positive Skew Distribution

**Normal Distribution**

Negative Skew Distribution

**Correcting Skew**

•Correction for a positive skew

•Take the square root of all the values

•Correction for a negative skew

•Square all of the values