KAAP 602

Statistics

Lecture #2 Notes

1. Review SPSS homework on descriptive statistics
2. Explain Standard Error of the Mean
   1. SEM = s/sqrt(n)
3. Introduce correlation
   1. Measures relationship between 2 variables
   2. Used for paired scores (scores must come from same “subject”)
   3. Values range between -1 to +1
   4. Used to measure:
      1. Reliability
      2. Validity
      3. Relationship between measures
      4. Make predictions
   5. Scattergrams describe relationship. Draw:
      1. No relation
      2. Weak positive
      3. Weak negative
      4. Strong positive
      5. Strong negative
   6. Caution about use of word “cause”
   7. Caution about bivariate distributions
   8. Caution about non-linear distributions
   9. Correlation for ordinal data vs interval/rational data
      1. Ordinal data, most common is Rho, or Spearman’s Rho

* + 1. Interval/rational data: Pearson’s product-moment

Z-score equation:

Raw score equation:

* 1. Evaluating a correlation coefficient
     1. Statistical significance (significant if p < 0.05)
     2. Issues with test of statistical significance
        1. As N increases, the magnitude of the correlation coefficient necessary to achieve statistical significance decreases.
     3. General guidelines for evaluating the strength of a relationship\*
        1. 0.0-0.1: No Relation
        2. 0.1-0.39: Weak
        3. 0.4-0.69: Moderate
        4. 0.7-1.0: Strong

\*Dancey CP, Reidy J. *Statistics without Maths for Psychology*. Fifth. Prentice Hall, London; 2011.

1. Introduce linear regression
   1. General concept: correlation provides knowledge of one variable from another variable.
   2. Correlation coefficient is used to “temper” the estimate toward the mean
   3. Standardized simple regression equation: Z’y = r \* Zx
   4. Expand to equation for raw data
   5. Explain concept of residuals
   6. Explain standard error of estimate
   7. Use residuals to determine if relationship is linear (Plot pred vs resid).
   8. Running in SPSS
      1. Correlation
      2. Scatterplots
      3. Simple linear regression
      4. Transforming variables
      5. Polynomial regression