Chapter 5 Ice cream and Crime: Computing Correlation and Coefficients

Correlations (p. 74-93)

Correlation Coefficients: Is a numerical index that reflects the linear relationship between two variables. The value of this descriptive statistic ranges from the value of -1 and +1. It demonstrates the value of variable as the other changes. It is a numerical index of the relationship between two variables.

The Pearson product-moment: Is a specific type of correlation coefficient. It is utilized when the variables are continuous in nature. The pearson product coefficient with variables that are examined along the continuum. N

|  |  |
| --- | --- |
| Size of the Correlation Coefficient | General Interpretation |
| .8 to 1.0 | Very Strong relationship |
| .6 to .8 | Strong Relationship |
| .4 to .6 | Moderate Relationship |
| .2 to .4 | Weak Relationship |
| .0 to .2 | Weak or No Relationship |

Direct/indirect correlation: Either a positive correlation where the values of both variables change in the same direction, or a negative correlation where the values of variables move in opposite directions. A direct corrletions are utilized when the value of both variables increases or decreases in value, and the indirect correlation is utilized when either the amount of either variable increases and the other decreases, or vice versa. The direct/indirect correlation is computated by listing the two values for each variable, and compute the sum of all x values, as well as the y values. Square the x values, and square the y values, and find the sum of the XY products.

Scattorplot: A plot of each set of scores on separate axes. The scattorplot allows ghe researcher to evaluate both the direction and the strength of the relationship among the x and y variables. The strength of the relationship between x an y is determined by the saer of the points. The scatterplot is useful for providing a quick indication of the nature of the relationship among the two variables.

Rule of Thumb: The easiest, albeit not the most scientific, way to interpret the value of the correlation

The Rule of Thumb approach is a convenient way to get a general idea of the value of the correlation coefficient and can subjectively approach the strength of the relationship of the two variables.

 coefficient is by “eyeballing” and utilizing a table which can be used as such:

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Determining Correlation Coefficients utilizing the information on Chapter 5 Data Set 1

 **Correlations**

|  |  |  |  |
| --- | --- | --- | --- |
|   |   | Income | Education |
| Income | Pearson Correlation | 1 | .574(\*\*) |
| Sig. (2-tailed) |   | .008 |
| N | 20 | 20 |
| Education | Pearson Correlation | .574(\*\*) | 1 |
| Sig. (2-tailed) | .008 |   |
| N | 20 | 20 |

\*\* Correlation is significant at the 0.01 level (2-tailed).

Simple scattorplot utilizing information on Chapter 5 Set 1.



Chapter 6: (it is important to note that the information on Reliability and Validity is included in chapter 16) Chapter 6 is really the hypothesis chapter that you deem as chapter 7. I hope I did not confuse you. If I have made mistakes on this, I apologize, I just could not find the information in the text, using the second edition.

Chapter 16: Just the Truth: An Introduction to Understanding Reliability and Validity.

Independent and Dependent Variable: An independent variable is a negative correlation where the values of variables move in opposite directions, and dependent variables are outcome variables or the predicted variables in a regression equation. They are utilized to determine that the test, scale, and instrument, etc., works every time, and whatever I measure, does what it supposed to measure.

Nominal, Ordinal, Interval and Ratio Measurement: Nominal Measurement: the characteristics of an outcome. It fits into one and only one class or category. (example is gender (male or female) which can be nominal as can ethnicity. Also, the nominal measurement has no order or difference in magnitude. An ordinal level of measurement has to do with an underlying continuum that is ordered. An example states individuals in ranking order or importance. Dr. Bernice is #1, …Omero is #30 etc. Interval Level of Measurement has to do with testing or assessing based upon some underlying continuum such that we can talk about how much higher a performance is than a lesser one. A distinguishing characteristic of this type of measurement is that the intervals along the scale are equal to one another. For example, ten words correct is two more than eight correct, which is three more than five correct. A ratio level is a scale of measurement characterized by zero. This can be the case in the physical and the biological sciences, where you can have the absence of a characteristic, such as absolute zero (no molecular movement). These various scales of measurements are utilized at different times, contingent upon how the outcomes are measured, and how the scales of measurements are ordered. The scales of measurement demonstrate an order form the least precise to the most precise.

Types of Reliability: Doing it again until you get it right. Reliability determines whether a test, or measurement tool, consistently over time. There are different types of reliability: a test-retest reliability when it is desirable to know whether a test is reliable over time. It is done to correlate the scores from a test fiven in tiem 1 with the same test given in time 2. An example is the Bonzo test of identity formation ofr adolescents is reliable over time; another type or reliability concerns parallel forms and it utilized to determine ho several different forms of a test are reliable or equivalent. This is done by correlating the scores from one form of the test with the scores from a second form of the same test of the same content (but not the exact same test). The two forms of the Reglar Guy test are equivalent to one another and have shown parallel forms reliability. Inernal consistency is another type of reliability which is used when you want to know if the items on a test assess one, and only on, dimension. The correlate each individual item score with the total score. An example is determining all the items on the SMART Test of Creativity assess the same construct. Last, the interater reliability: When one wants to know whether there is consistency in the rating of some outcome. It is determined by examining the percent of agreement between raters. The interrater reliability for the best-dressed Foosball player judging was .91 indicating a high degree of agreement between judges.

Validity: Whoa! What Is The Truth?

Types of Validity-validity is property of an assessment tool that indicates that the tool does what it says it does. There are three most important categories in the chapter: content Validity; is useful to determine when a sample of items truly reflects an entire universe of items in a certain topic. It is dome by asking an expert to judge the items and determine whether they reflect the universe of items or if more items need to be included. An example listed in the textbook is the weekly quiz in stats class on the chapter’s content. Another type of validity is called a criterion validity test. It is desirable if test scores are systemically related to other criteria that indicate the test taker is competent in a certain area and it can be designated by correlating the scores from the test wihtsome other measure that is already valid and assesses the same set of abilities. An example is the EATS test of Culinary Skills which has been shown to be correlated with being a fine chef 2 years after culinary school. Lastly, the construct validity test has to do with if a test measured some underlying psychological construct, and is utilized by correlating the set of test scores with some theorized outcome that reflects the construct for which the test is being designed. The example here examines and designates to be true that men who participate in body contact score higher in testosterone test of aggression.

Syllabus chapter 7: The Research Hypothesis: Hypothesis: Null Hypothesis: Research Hypothesis: Directional/Nondirectional Hypothesis: what makes a good hypothesis? (page 130). Chapter8: The Normal Distribution: the Normal Curve: the standard Deviation: Z-Scores. Assignment D Due November 24th Chapter 7: the Research Hypothesis:Dr. Bernice Chapter 7 on your syllabus is really chapter 6 on my textbook: So you want to be a scientist…….no I just want to earn an Ed.D. Ok if that’s what it takes to get my ed.d. then, yes! I want to be a scientist. Chapter Title: Hypotheticals and You: Testing Your QuestionHypothesis: an if-then statement of conjecture that relates variables to one another. It is used to reflect a general problem statement or question that was a motivation for asking the research question to begin with. The hypothesis will determine the techniques in tesing the hypothesis and answering the question originally asked. The hypothesis demonstrates whether the research question is useful, not useful or no relationship. Null Hypothesis: Is a statement of equality between a set of variables. Null hypotheses have commonalities in that they contain statements that two or more things are equal, or unrelated, to each other. The null hypothesis acts as both a starting point and a benchmark against which the actual outcomes of a study cam be measured. Research Hypothesis: a definite statement that there is a relationship between variables. The one thing in common with the research hypotheses is that all statements have inequality. They demonstrate a relationship between the variables, not an equality as in the null hypothesis. This type of hypothesis utilizes the results by comparing with what is expected by chance alone to see which of the two is the more attractive explaination for any differences between groups that are observed.Directional/Nondirectional Hypothesis: a directional hypothesis reflects a difference between groups, and the directions of the difference is specified. What makes a good hypothesis? These educated gueses are starting points for research to take place. AT the starting point it is critical to have the proper critieria to utilize to decide whether the hypothesis is acceptable. The example in the text uses the hypotheses of whether after-school child care for employees who work late on the parents’ adjustment to work. The well-written hypotheses is included herein: Parents who enroll their children in after-school programs will miss fewer days of work in one year and will have a more positive attitude toward work, as measured by the attitude toward Word survey, than will parents who do not enroll their children in such programs. The criteria included are first it is written in declarative form, it posits an expected relationship between variables, and it reflects the theory on which they are based, it is brief and to the point, and it is testable.Chapter 8or 7 The Normal Distribution Chapter Title: Are Your Curves Normal? Probability and Why it CountsNormal Curve: Otherwise called a Bell-shaped curve, is a distribution of scores that is symmetrical about the mean, median, and mode and has asymptotic tails. It demonstrates a visual representation of a distribution of values where the above-mentioned characteristics are equal to one another. It demonstrates situations wherein most respondents are moderate and there are few cases of extreme on either end of the spectrum.Standard Deviation: The average deviation from the mean.

Z-Score: A raw score that is adjusted for the mean and standard deviation of the distribution from which the raw score comes.

Spss figure 8.6 page 150

Assignment D. The Research Hypothesis: