

Throughout this course, Statistics for Social Science, it was required that I learn the computer application for entering sociological data into statistical software and the proper techniques for doing so. In addition to being able to enter data into either Statistical Package for the Social Sciences 25.0 (SPSS 25.0) and RStudio, learning the procedure by hand was required, as well as beneficial when applying interpretations to the findings.

The first lesson was on understanding why social researchers use statistics. The purpose being that it allows researchers to describe and draw inferences about numerical properties and populations. For instance, throughout this course we studied families with children that attend Head Start (HS), so the population that we are trying to draw inferences for and from are families with children attending HS. The second lesson was organizing the data, which was done in three steps: organizing, summarizing, and graphing. The data is organized into a frequency table, take that and turn it into a graph (box and whiskers plot, circle/pie graph, histograms, etc.), and lastly, which was the third lesson of the class, gathering the measures of central tendency. Measures of central tendency are mean, median, and mode, this allows the data to be condensed and set to one representative value, which is extremely important when working with a lot of material.

After learning how to apply the measures of central tendency to understanding the data, the next session focused on expanding our descriptive statistics from mean, median, and mode, to also knowing the measures of variability. Measures of variability, which are: range, interquartile range (IQR), variance, and standard deviation (SD), represents the dispersion in a dataset and the scores within a distribution. Next, probabilities, which is the likelihood that an event will occur. Again, to relate this back to my current study, I was trying to measure the likelihood that a child would be able to complete the activities given to them. After determining

the likelihood that an event will occur, confidence intervals was the next expansion of the data. Confidence intervals take into account the sample size and the potential variation within the population and gives an estimate of the range in which the answer lies. Then, confidence intervals are divided into two intervals, 95% and 99%. Once the confidence level has been calculated, we further expand the understanding by making a *t*-test sample. The purpose of a *t*-test is to find (or not find) a significant difference between population means or in my case, not finding a significant difference between the population mean and the hypothesized mean.

Analysis of variance (ANOVA) is used to determine if there are any statistically significant differences between means of three or more independent groups. There are three sources of variation: within, between, and total. Next, Chi-Squared, was utilized to test measures and how expectations compare to actual or observed data. This test is used to test relationships between categorical variables. There is a null hypothesis that there is no relationship between a population; therefore, it is used to evaluate independence. Pearson's Correlation is any number between -1 and 1, indicating the extent to which two variables are linearly related. The correlation could be a strong or weak positive or negative correlation, or no correlation at all. Lastly, regression utilizes the previous findings to determine the strength and character of the relationship between one independent and dependent variable.

It is important to note that for each various inferential statistic: Measures of Central Tendency, Measures of Variability, Probabilities, Confidence Intervals, *t*-Tests, ANOVA, Chi-Squared, Pearson's Correlation, and Regression was able to be completed using both hand and computer calculation methods such as SPSS 25.0 and RStudio.

Statistics for Social Science is extremely important, especially as it ties in with sociology. Since sociology is the development, framework, functioning, and understanding of the interplay between variables and the population, it is only appropriate that statistics be used to analyze and corroborate findings. Often, sociologists are working with a large population and it is hard to be able to reach everyone in the sample population, but what statistics allows is making general observations and then condensing the data to one numerical value to represent the whole. This allows conclusions to be drawn and establish a true link between the groups.

From the data that is drawn, not only does it help sociologists understand the relationships between groups and how the groups interact, but it allows for sociologists to build off their findings and make improvements. In my case, the original hypothesis was that parent's who worked longer hours would have a negative effect on their child's ability to complete the activities, the numbers reveal that there was no significant difference and a weak negative correlation. If the data revealed a significant difference and a positive correlation, researchers would have been able to find ways to implement policies or guidelines to help the relationship between parents and children while improving their academic abilities. Thus, statistics can help lead to navigation for controlling problems in society. Additionally, once the problems are found in society, and the proper implementation is put into place, more studies can be conducted in order to evaluate the change and see its impact.

Statistics helps with the direction of relationships between variables. For instance, the data revealed that there was a weak negative correlation, meaning that the hours worked did not factor in on the completion of the activity. Statistics ($r = -.180$) shows that the participants' responses were not as compact. How this relates to the big picture, is that the data reveals flaws

within society, that allows others to understand how to communicate and coexist with one another. Therefore, had the data revealed that there was a correlation, teachers and others who have access to the information can determine how to interact and help.

Statistics and social science has given me lessons and ammunition that I will be able to use in the future. I will be able to construct a scientific and ethical framework that can be used not only in sociology but a plethora of other domains. Data analysis is something that can be used in everyday life as well as in a professional setting because it allows you to avoid common errors in reasoning. Analyzing and interpreting data from empirical research findings can lead to further exploration of content which leads to an understanding of how things operate.

Personally, I will be earning my Master's Degree in Cyber Security at Marymount University next Fall. While attending this course, I learned how to code data, interpret data, and apply it, which is exactly what I will be doing in the future. The skills that I have learned has allowed me to have a strong foundation and understanding of how things work in the world, and I can only hope to further strengthen my understanding.