Statistics for Social Research III

Carrington P. Morgan

Omega Graduate School

March 16, 2025

Professor

Sean Taladay Ed.D.

## Assignment #3 – Essay

1. Navigate to OGS’s [Practical Statistics for Social Research (PSSR)](https://stats.ogs.edu/) tool. Click on “Example Datasets” and load the “Example: Split Group Data” dataset.
2. Click on “Tools and Options” and then “Split By Groups”
3. Briefly describe what the software did with the original data and how it split it into two groups. Answer the following questions:
   1. Why was it necessary to conduct a meaningful quasi-experimental test on the data?
   2. Why would an ANOVA procedure not be appropriate for this dataset?
4. Navigate to OGS’s [Practical Statistics for Social Research (PSSR)](https://stats.ogs.edu/) tool. Click on “Example Datasets” and load the “ANOVA: Social Trust Scale” dataset.
5. Copy and paste the output's contents into your assignment document. Read it carefully and expand on it based on your understanding. Answer the following questions:
   1. What might be good problem and purpose statements for this dataset?
   2. What might be good research questions related to the hypotheses generated by the PSSR software?
   3. What does the output tell you about the comparison of the various groups?
   4. What is the difference between the F-Statistic and p-value used to test the hypotheses with the ANOVA procedure?
   5. How is the Omega-Squared used for post-hoc testing of an ANOVA procedure?
6. Write a thorough interpretation of the results of the ANOVA procedure. What do the results tell you about social trust between participants from various denominational backgrounds?
7. What are the limitations of the analysis? What caution should social research offer about over-generalizing results like these?
8. Summarize what you learned from conducting these statistical tests.
9. The original data presented Gender in one column and the Associated scores in the other column. The “Split By Groups” option re-arranged the data into the two desired independent variables by separating the scores of one gender in one column from the scores of the other gender in the other column. This was done in order to run a t-test.
   1. A quasi-experimental test was conducted because the groups were not arranged based on randomized selection but purposefully split into desired categories.
   2. An ANOVA procedure would not be appropriate because it there were only two independent variables and ANOVA is best for multiple categories.

# ---------------------------------------------------------------------------

# Results of Statistical Procedure

An ANOVA (Analysis of Variance) procedure was applied to the sample to examine whether a statistically significant difference exists between the means of 9 unrelated groups.

## Groups Examined (Independent Variable)

## Table 8

*Dependent Variable Summary by Independent Variable Groups*

|  |  |  |
| --- | --- | --- |
| Group | n | Mean(x̄) |
| #1 - Methodist | 5 | 13.3080 |
| #2 - COGIC | 6 | 7.2367 |
| #3 - Catholic | 2 | 9.2050 |
| #4 - Baptist | 5 | 12.5460 |
| #5 - Pentecostal | 5 | 6.1780 |
| #6 - Presbyterian | 4 | 7.9225 |
| #7 - Church of Christ | 4 | 9.7850 |
| #8 - Lutheran | 5 | 0.9920 |
| #9 - Non-Denominational | 1 | 9.9500 |

## ANOVA Statistics

## Table 9

*ANOVA Results Statistics*

|  |  |
| --- | --- |
| Statistic | Value |
| F-Statistic | 1.970567 |
| p-Value | 0.08825746 |
| Omega Squared (ω²) | 0.173453 |
| LSD (post hoc) | 0.08825746 |

## Pairwise Comparisons for Significant Differences

## Table 10

*Pairwise Comparisons for Significant Differences*

|  |  |
| --- | --- |
| Group A | Group B |
| Methodist | Lutheran |
| Catholic | Lutheran |
| Baptist | Lutheran |
| Church of Christ | Lutheran |
| Lutheran | Non-Denominational |

## Between Groups Effects

## Table 11

*ANOVA Between Groups Effects*

|  |  |
| --- | --- |
| Measure | Value |
| Sum of Squares | 525.616455 |
| Mean Square | 65.702057 |
| Degrees of Freedom | 8.000000 |

## Within Group Effects

## Table 12

*ANOVA Within Groups Effects*

|  |  |
| --- | --- |
| Measure | Value |
| Sum of Squares | 933.567718 |
| Mean Square | 33.341704 |
| Degrees of Freedom | 28.000000 |

## Hypotheses

H0: No statistically significant difference in the group means of the Social Trust Scale (STS) score among Denomination groups.

Ha: A statistically significant difference in the group means of the Social Trust Scale (STS) score among Denomination groups.

## Findings

A p-Value greater than the alpha level (0.05) indicates insufficient evidence to reject the null hypothesis and suggests no statistically significant difference between the group means.

A moderate (1-3) F-Statistic suggests some differences between group means, but these may not be strong.

A large (> 0.14) Omega-Squared (ω²) statistic indicates a large effect size and suggests the independent variable has a strong effect on the dependent variable.

# Attribution

Statistical procedures were conducted using [PSSR (Practical Statistics for Social Research)](https://stats.ogs.edu/), statistical analysis software developed by Joshua D. Reichard for [Omega Graduate School](https://ogs.edu/) based on the [jStat](https://jstat.github.io/) library.

# Reference

Reichard, J. (2025). Practical statistics for social research (PSSR). Omega Graduate School, American Centre for Research in the Social Sciences (ACRSS). <https://stats.ogs.edu/>

-------------------------------------------------

5.

1. **Problem Statement:** Persons with various denominational backgrounds have shown varied levels of trust as it relates to church leadership and other church members. **Purpose Statement:** The purpose of this quantitative study is to examine the difference in trust levels amongst major denomination groups.
2. **Research Question**: Is there a statistically significant difference in the group means of the Social Trust Scale (STS) score among denomination groups?
3. The output of comparison of the various groups shows that there is a noticeable difference between most denominations as related to the Lutheran denomination when it comes to trust levels.
4. The F-Statistic is used with the ANOVA procedure because it tests if means in a group of variables are jointly significant. The p-value is determined by the F-statistic, and shows the probability that the results could have happened by chance.
5. The Omega-Squared is the measure of effect size for ANOVA procedures. The large (>0.14) Omega-Squared (ω²) statistic indicates a large effect size and suggests the independent variable has a strong effect on the dependent variable.
6. Interpretation of Results

The results show a participants from two denominations, Methodists and Baptists, standing out as it relates to having a high degree of trust, as demonstrated by the calculation of their means.

The study also shows that there are differences between trust levels of groups but these differences are not considered significant.

Participants from the Lutheran group, however, present with a low trust mean, and show a clear paired-difference when compared to most of the other groups.

1. Limitations and cautions for generalization

The analysis has some limitations on specificity on which groups differ from each other. The sample size was also relatively small and so caution should be given to generalization of the results.

1. Summary

Conducting these statistical tests firstly showed the usefulness and agility of the PSSR software. It allows the researcher to try different procedures and scenarios in a manner that will accelerate the learning and decision making process. The process also demonstrated appropriate use for simple and more complex statistical procedures. The outputs, were also impressive in providing all of the major descriptive and statistical results.