

One-way ANOVA

Student's name

Institutional Affiliation

Date

## ONE-WAY ANOVA

Statistical analysis entails diverse sections, each driving towards a certain aspect in educational and psychological research (Allen, 2017). As the main topic of the write-up, the discussion will be based on one-way Analysis of Variance (ANOVA). In satisfaction of the study, the paper tries to answer some specific questions as far as one-way ANOVA is concerned. In simpler terms, it will tackle the questions answered in the Analysis of Variance, the hypothesis in the test, determination of dependent and independent variable, sample size, and the limitations and assumptions that are related to one-way ANOVA.

With the given scenario, a researcher wants to compare the efficacy of three different techniques for memorizing information. They are repetition, imagery, and mnemonics. The researcher randomly assigns participants to one of the techniques. Each group is instructed in their assigned memory technique and given a document to memorize within a set time. Later, a test about the document is given to all participants. From my point of view, the researcher wants to see if there exists a statistical significance among these variables. For better results, the groups are assigned to arbitrary participants to come up with the data set required for the analysis.

Considerably, the test in this scenario can be regarded to be non-directional because there is no much difference between the three research variables. They are two-tailed in that they don't predict the exact direction of difference or relationship. In satisfying the hypothesis, one type of variable is preferred over the others. An alternative hypothesis explains that the observed difference in the results is most probably open and not likely to have happened by accident alone. To satisfy this, at least one means should be different. In-line with the study, a one-way ANOVA is used because there is only one dependent variable to justify. Given the null hypothesis ( $H_0: \mu_1 = \mu_2 = \mu_3$ ) will be that all group means have the same value. The reason is

that the variables are non-specific are not practically equal. Having the three independent variables, repetition, imagery, and mnemonics.

Theoretically, repetition is most useful in remembering a piece of less detailed information. Mnemonics are mostly preferred in memorizing detailed information. Mnemonics is the best decision for detailed information because it has many smaller mnemonic categories to choose between. They include acronyms, abbreviations, peg words, rhymes, and keywords in information to be memorized. Imagery operates with the techniques of recalling information. It usually works with smaller pieces of information. Based on this theory, it can be concluded that a null hypothesis fits the scenario. If it is considered, it means that there might be no significant difference between the three variables (One-way ANOVA, 2013). From the data table given, the hypothesis is regarded as non-exact. This study is equally the same as compared to the money guess research.

One-way ANOVA has some assumptions that contribute to the results provided. Firstly, it is assumed that the samples are independent. The assumption means that the samples are strained individually and independently of the other samples in the study. The second assumption is normality. That each of the samples is taken from a normally distributed population. Also, the variance is assumed to be equal. The data variance in diverse groups should be regarded as the same. Lastly, the dependent variable should be continuous.

As explained by the one-way ANOVA guidelines, the number of groups in a study should be three or more. In calculating the sample size, the sum of the Between SSB and Within SSW should be determined. From the given table, the total sample size (N) is 235.9111. Based on the provided number of independent variables, there are three groups presented for the statistical analysis.

When interpreting the ANOVA results in the table, the statistical significance can be determined from the provided data. Because the F value (19.74) is less than the  $k-1$  (2) numerator and  $N-k$  (42) denominator degrees of freedom. As such, we have to reject the null hypothesis ( $H_0$ ) and give the reception of the alternative hypothesis ( $H_1$ ). Thus, concluding that one of the means is different between the three. In summary, F-test has satisfied that among the three memorizing techniques, one might be different if given the same constant time.

## References

- Allen, M. (2017). *The sage encyclopedia of communication research methods* (Vols. 1-4). Thousand Oaks, CA: SAGE Publications, Inc doi: 10.4135/9781483381411.
- One-way ANOVA: Against all odds: Inside statistics* [Video file]. (2013). Retrieved January 21, 2020, from <https://digital.films.com/PortalPlaylists.aspx?wID=100753&xtid=111550>.