Discussion 4.1: Inferential Statistics: Sample vs. Larger Population

Initial Post

Respond to the following prompt by Day 4 of the learning week. Cite resources and references appropriately in APA format.

* We often use inferential statistics to link or distinguish two or more treatment groups (sample populations) with a larger population mean (mu). Properly reference an article in APA 7 format that discusses using an appropriate test (i.e., *t*-test, chi-squared test, etc.) relating to a specific research problem. Discuss the basic premise of this paper and what the appropriate statistic(s) measure. Be sure to identify the sample population and larger population that the sample is drawn from.

**Inferential Statistics Discussion**

In Chapter 4 of Harris et al. (2019), the authors have presented two case studies for *inferential statistics* by comparing the statistical data from data samples.

The goal of the first case study is related to understand the correlation between exercise and heart rate. The study was conducted using two methods – (a) independent two-sample design and (b) paired two-sample design. In (a), two random selected of 11 students between the age of 18-23 is selected. Both groups were asked to rest for 15 min. Then while exercise group engaged in stair-stepping for 15 min, the other groups continued to rest. After that their heart rate were measured. In (b) the sample group of students were used to measure their heart rate before and after they engaged in stair-stepping. The data for both (a) and (b) is analyzed using *barcharts*, and estimation of *mean* and *confidence intervals*. Since, the confidence intervals of the means did not overlap in either (a) or (b), the null hypothesis of equal mean was rejected. The conclusion of the study was that exercise did make a difference in heart rate measurement.

The second study called the ‘thistle study’ was related to understanding

effect of tallgrass prairie burn on weed growth. For the study, the Biocore

Prairie was divided into areas which were burnt and into ones which were

kept as is. The thistle density of a large number of 0.5 m2 quadrants from

both areas were calculated. The question was to determine whether the

difference in thistle density observed is due to the burn treatment or simply

to random variation in the samples measured. The statistical analysis was

done using *two-independent-sample t-test*. The assumptions for

*independence*, *equal variance* and *normality* for two-independent-sample t-

tests were met based on data analysis. The *t-statistic* and the

corresponding *p-value* were calculated for the sample data, and after

comparing with the desired threshold values, the null hypothesis than the

mean thistle density from the burnt and unburnt parts are same is rejected.

In other words, it was concluded, that prairie burn did affect the thistle

growth. This result also well corresponded to *85% confidence interval tests*

conducted earlier in the study.

**Reference**

Harris, M., Nordheim, R. and Batzli, J. (2019). *Process of Science Companion: Data Analysis, Statistics and Experimental Design*. University of Wisconsin Madison.

[Process of Science Companion: Data Analysis, Statistics and Experimental Design](https://wisc.pb.unizin.org/biocorestatistics) Copyright © 2019 by University of Wisconsin-Madison Biocore Program is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/), except where otherwise noted.