Statistics for Social Research III

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Assignment #1: Discussion Questions

Answer the following questions in short answer format and be prepared to discuss them with your classmates in the virtual residency or the discussion forum.

1. Why are quasi-experimental designs sometimes called “Split-Group Comparison” designs?

2. What are post-hoc procedures in statistical analysis, and why do they provide important context for hypothesis testing?

3. How does linear regression relate to correlational statistical procedures?

4. What is an ANOVA procedure, and how might it be used in quasi-experimental designs? How does it differ from an independent t-Test?

1) Why are quasi-experimental designs sometimes called “Split-Group Comparison” designs?

Experimental design research incorporates the random assignment of participants to different groups, treatment and control. Quasi-experimental designs are where there is no randomization of assigning groups. Quasi-experimental designs are sometimes called split-group comparison designs because the researcher separates the sample into groups based on what they are interested in examining (Tajika et al, 2021), such as male and female, and are interested in evaluating if there is a difference between those two groups.

2) What are post-hoc procedures in statistical analysis, and why do they provide important context for hypothesis testing?

Post-hoc procedures in statistical analysis are statistical procedures that are performed after the hypothesis testing to examine what groups may differ from each other (Hoffmann et al., 2022). The hypothesis testing will identify if a difference exists, but the post-hoc procedures will identify where the difference is. Post-hoc analysis is important to inform the researcher more about the data and could invoke further research questions.

3) How does linear regression relate to correlational statistical procedures?

Linear regression is a statistical procedure to examine the relationship between independent and dependent variables (Schober & Vetter, 2021), it utilizes the correlation coefficient (r), as in correlational statistical procedures, but also includes the coefficient of determination (r2), which measures the proportion that the independent variable explains the variation of the dependent variable. Linear regression also informs of the predictability of the dependent variable based on the value of the independent variable because of the correlation behavior of the two variables.

4) What is an ANOVA procedure, and how might it be used in quasi-experimental designs? How does it differ from an independent t-Test?

ANOVA (Analysis of Variance) procedure is used to test the difference of means between multiple groups (Hoffmann et al., 2022). The independent t-test is used to compare the mean difference between two groups. Both procedures could be used in a quasi-experimental design. The ANOVA would examine the differences between multiple groups from the same sample, such as comparing the mean difference between denominations.

WORKS CITED

Hoffmann, J. A. C., Warnecke, A., Timm, M. E., Kludt, E., Prenzler, N. K., Gärtner, L., ... & Salcher, R. B. (2022). Cochlear implantation in obliterated cochlea: a retrospective analysis and comparison between the IES stiff custom-made device and the split-array and regular electrodes. *Journal of Clinical Medicine*, 11(20), 6090.

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Tajika, M., Tanaka, T., Ishihara, M., Hirayama, Y., Onishi, S., Mizuno, N., ... & Niwa, Y. (2021). Split-dose low-volume polyethylene glycol is non-inferior but less preferred compared with same-day bowel preparation for afternoon colonoscopy*. Nagoya Journal of Medical Science*, 83(4), 787.