



# Statistical Consulting Center

Department of Statistics – Franklin College of Arts and Sciences

UNIVERSITY OF GEORGIA

## *SCC Seminar on Data Analysis*

### Power Analysis & Sample Size Determination

Ideas, Tools, and Examples

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A fundamental question to be addressed when planning a research study is, “What sample size do I need?” A study should be large enough to have high probability of detecting the effect(s) hypothesized by the investigator; that is, the study should have adequate *power*. A study that is too small (i.e., *underpowered*) runs the risk of being inconclusive and may not be worth doing at all. A study that is too large wastes resources---time, money, opportunity to conduct different research, etc. Statistical methods exist for determining the sample size needed in a particular study design to achieve a power target; these approaches are also applicable to the inverse problem of determining the power that a given sample size will yield. However, such methods require assumptions about the phenomenon under investigation, which is frustrating because, if we understood that phenomenon well, then the research would not be needed in the first place! While power analysis is straight-forward in simple textbook examples, the methodology can be challenging in practice because (i) the study might involve several responses and/or hypotheses, each having different sample size requirements; (ii) the planned analysis may involve sophisticated statistical methods for which power/sample size calculations are difficult and/or not readily available; (iii) numerous assumptions may be required for which little data or intuition is available; (iv) a priori, there may be uncertainty about what statistical methodology will be used in the analysis that won’t be resolved until the data are available; etc.

In this talk, I will review the basics of power analysis and sample size determination and provide some practical advice for both applied investigators and statisticians. I will present several examples of substantially greater complexity than the simple cases typically covered in textbooks. Multiple software tools for power analysis/sample size determinations will be featured.

**Tuesday, December 6, 2022, 4:00pm-5:00pm**

**ROOM 109, Sanford Hall**

*About the SCC Seminar Series:* This series of non-technical talks, sponsored by the UGA Statistical Consulting Center, aims to present topics of interest to statisticians and users of statistics related to the practical use of statistics for data analysis.

Please share this announcement with colleagues who may be interested. To get announcements for future talks in this series, join the SCC listserv [here](#).