

Psychology 6420
Advanced Experimental Design

Spring- 08

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This course will present experimental quantitative methods using two perspectives: Analysis of Variance and Multiple Correlation. Our tactical aim is to first present these approaches intuitively, and second, formally.

Having an intuitive sense of statistical concepts helps one understand the principle/s behind their utility. Having a formal sense of statistics allows one to both execute procedures, and communicate meaning (-after all, statistics is a language you must learn to speak and write). In the end, you need both!

Strategic Aim

The course will be departure from the traditional approaches used in teaching experimental design. For example, the influence of Cronbach (1957) has perpetuated the notion that there are two 'kinds' of researchers; a) the experimentalist, who faithfully adheres to Analysis of Variance procedures for testing research hypotheses, and b) the non-experimentalist, whose analytic tools are the Correlational procedures. This dualistic perspective can **inhibit** an understanding for the common structural similarities between the two methods. As a result of this dualistic approach, students very often organize ANOVA and Correlation as independent methods of analytic assessment (both statistically and conceptually). The implication of this type of organizing process is that a student focuses on one approach at the expense of learning the other. Often times this has the effect of generating a methods driven research style- **if the problem does not fit neatly within the constraints of a particular technique, then the problem is not of interest!** In reality, both approaches are based on the same General Linear Model, and under similar applications, produce identical outcomes.

In effect, we want to do in this course is learn how these approaches converge (and diverge), and that the techniques serve to express relationships found in the data in different ways. Our goal is to help promote a **problem driven research style**, which allows us to shift between approaches, or combine approaches in order to fully elucidate data relationships.

Course Structure

- The lectures will primarily serve to present and clarify the theoretical/conceptual material presented in the required textbook. On occasion, homework may be assigned in an effort to help illuminate certain ideas. The focus of this course is on the theoretical/conceptual underpinnings of ANOVA and Correlation. As such, we will relegate class time to working actual problems when it serves to facilitate an understanding of theoretical/conceptual issues. However, we will remain flexible in what we cover and the sequence of that coverage.
- The required textbook is Data Analysis for Research Designs, by G. Kepple and S. Zedeck (Freeman Press). ISBN #0-7167-1991-6.
- There will be Two (2) exams- a midterm and final. The final will be comprehensive.
- In addition there will be a SPSS laboratory presentation segment that will be defined for you by a senior Teaching Assistant for the course.

The Following represents a tentative SEQUENCE of content coverage. Actual rate of coverage will be dependent on our progress during lectures.

	<u>DAY</u>		<u>Chapter</u>
Week 1 1/11	T	Opening Remarks/Review	
	Th	Principles of Research Design	1-4
Week 2	T	Basics: Correlation	5
	Th	Correlation continued	5 (Short Video)
Week 3	T	Laboratory Segment	Handout
	Th	ANOVA	6
Week 4	T	ANOVA	6
	Th	ANOVA/Lab Segment	6
Week 5	T	Regression/Correlation	7
	Th	Regression	7
Week 6	T	Significance and Hypothesis Testing	8
	Th	Significance Continued	8
Week 7	T	Coding for Experiments-MRC	9
	Th	EXAM1	
Week 8	T	Overall Analysis- ANOVA vs. MRC	10
	Th	MRC continued	10
Week 9	T	Detailed Analyses	11
	Th	Correction	12
Week 10	T	Factorial Design	13
	Th	Factorial - Main/Simple effects	13-14
Week 11	T	Interaction Comparisons	15
	Th	Within Subjects	16
Week 12	T	Mixed Designs	17

Week 13	Th	Mixed Designs	17-18
	T	Trend	23
	Th	Trend	23