

ADVANCED RESEARCH METHODS IN HEALTH EDUCATION

HLTH 711 Spring 2004
SECTION 0101

DAYS AND TIMES **Wednesdays** 4:00-6:45pm (HHP 0303)

INSTRUCTOR: Bradley O. Boekeloo, Ph.D., M.S.
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PREREQUISITES: HLTH 710, Methods and Techniques of Research
Intermediate Statistics including regression

SUGGESTED TEXTS:

As this is an advanced course that assimilates and builds on prior course work, I have been unable to find one comprehensive text for this course. You should review all the texts below and decide for yourself which one(s) should be part of your own library. In my review, the Trochim text provides the most comprehensive basis for this course and it is the text that you will find in the bookstore.

The Research Methods Knowledge Base, Trochim W.M.K., Atomic Dog Publishing: Cincinnati, Ohio, 2001. www.atomicdogpublishing.com

Multivariate Data Analysis, Fifth Edition, Hair JF, Anderson RE, Tatham RL, Black WC. Prentice Hall: Upper Saddle River, New Jersey, 1998.

Psychometric Theory. Third Edition, Nunnally JC, Bernstein IH. McGraw-Hill:New York, 1994.

Meta-Analysis, Decision Analysis, and Cost-Effectiveness Analysis, Petitti DB. Oxford University Press:New York, 2000.

Design and Analysis of Group-Randomized Trials, Murray DM. Oxford University Press:New York, 1998.

The Practice of Social Research. 9th Edition. Babbie E. Wadsworth Thomson Learning:Belmont CA, 2001.

Methods in Behavioral Research. 7th Edition. Cozby PC. Mayfield Publishing Company: Mountain View, CA, 2001.

Copies of other readings will be made available through a check-out system with the instructor.

COURSE DESCRIPTION:

This course is designed to build on the research skills obtained in 710, Methods and Techniques in Research, and other fundamental research methods and statistics courses. Health education research is defined in this course as research on educational and related processes to improve health of individuals and communities. We will discuss methods and problems that are commonly encountered in health education research, and examine actual research studies. Students will be made aware of complex behavioral research issues and where to go for further information. Students will also examine an existing research data set, develop an analytic plan, and conduct data analysis. It will be assumed that students already have basic computer and statistical skills. Students are encouraged to consult with statistical experts during some phases of the data analysis as the instructor is not a statistician. The purpose of the data analysis is to hone skills. The course assignments are aimed at helping students gain confidence in their skills regarding written and oral presentation of research design and critique, and data analysis.

COURSE OBJECTIVES:

Upon completion of this course, students will be able to:

1. Review the literature to identify and articulate a health education question that warrants an investment in research.
2. Critique health education study designs and propose improvements in study designs.
3. Critique health education study measurements and analyses, and propose improvements in study measurements and analyses.
4. Analyze data and provide accurate tabular results, given a research question and an existing data set from a health education study.
5. Provide an appropriate interpretation of data analysis.
6. Provide an appropriate description of the implications of a given set of research findings.

COURSE REQUIREMENTS:

All assignments are due at the beginning of class on the due date unless otherwise prearranged with the instructor.

- A. Provide a written critique of an NIH grant proposal. (20 points) This critique of an actual NIH grant proposal will follow actual NIH review guidelines. After completing their own review, students will receive the actual NIH review summary and discuss the proposal in class.
- B. Provide a written critique of four research articles (chosen from those designated below with a **) *Two critiques must be completed before Spring Break. Reviews must be completed before they are discussed in class.* (5 points each, 20 points total)

In three pages, critique the:

1. Objective of the research
2. Application of methods and procedures
3. Application of statistical methods
4. Logic and soundness of conclusions
5. Significance to public health and health education

C. Present a lecture on a topic from a research article and lead a discussion to critique a health education research article (20 points)

Your lecture will address a designated research article below. You may not lecture on an article for which you are providing a written critique (See B above). This article and lecture date will be assigned during the first two week of class.

In fifteen minutes, address the following:

1. Summarize the research question and analysis in the article.
2. Based on your research, what is new and interesting about the topic of this article?
3. What do other articles have to say about this topic?
4. What are the most important things you learned from your research on this topic?

Lead a discussion for about 30 minutes on the scientific methods in the article.

D. Create a scale and analyze its reliability and validity (20 points)

In about ten double-spaced pages (not including tables and print-outs of your computer syntax), introduce the purpose of your scale and describe your methods, results, and conclusions regarding the reliability and validity of your scale. This must be a referenced paper which defines and describes terms and methods used.

1. Items and their level of measurement (nominal, ordinal, continuous)
2. Coding of items
3. Missing data
4. Mathematical equations for your multi-item scale score
5. Item to total correlations
6. Inter-item correlation matrix
7. Cronbach alpha
8. Split-half or Test-Retest analysis
9. Factor analysis
10. Convergent and discriminant validity analysis
11. Univariate statistics of your final multi-item scale score
12. Final conceptual description of your scale score

E. Analyze a data set to answer a research question regarding your scale, present the data in tables and figures, and interpret the results (20 points)

This must be a referenced paper which defines and describes terms and methods used.

In about ten double-spaced pages (not including tables and print-outs of your computer syntax), describe:

1. A research question
2. A theoretical model that includes two independent variables and one dependent variable (One of these variables should be your scale)
3. Your independent and dependent variables
4. A hypothesis regarding a multivariate model

5. Selection of statistics
6. How you handled missing data
7. Univariate analysis results
8. Bivariate analysis results
9. Multivariate analysis results
10. Interpretation of results

COURSE SCHEDULE:

<u>DATE</u>	<u>TIME</u>	<u>LEARNING ACTIVITIES</u>
1/28	4:00	<p>A. <u>Readings for Discussion</u> Trochim1-2, Philosophy 1-5, Evaluation Research</p> <p>B. <u>Article Critique</u> Boekeloo BO, Bobbin MP, Lee WI, Worrell KD, Hamburger EK, Russek-Cohen E. Effect of patient priming and primary care provider prompting on adolescent-provider communication about alcohol. Arch Pediatr Adolesc Med. 2003 May; 157(5): 433-9.</p> <p>C. <u>Data Analysis</u> Introduction to the study questionnaire Introduction to the data set Description of the data analysis project</p>
2/4	4:00	<p>A. <u>Readings for Discussion</u> Trochim1-4, Conceptualizing 1-1, Language of Research 6-1, Internal Validity 6-2, Intro to Design 6-3, Types of Design</p> <p>B. <u>Article Critique</u> ** Rhodes SD, Hergenrather KC. Using an integrated approach to understand vaccination behavior among young men who have sex with men: stages of change, the health belief model, and self-efficacy. J Community Health. 2003 Oct; 28(5): 347-62.</p> <p>C. <u>Data Analysis</u> NIH Request for Applications NIH Application Review Federal Register CRISP</p> <p><u>Supplemental Reading:</u></p> <ul style="list-style-type: none"> • Murray D, Chapter 2. Planning the Trial, <u>Design and Analysis of Group-Randomized Trials</u>, 1998, pp. 48-64. • Petitti D, Chapter 4. Information Retrieval. <u>Meta-Analysis, Decision Analysis, and Cost-Effectiveness Analysis</u>, 2000. • Cozby PC. <u>Methods in Behavioral Research</u>. Chapter 2. Where to Start. Mayfield Publishing, California, 2001.

- Health Education and Behavior: Special Issue. Collaborative community research: Partnerships between research and practice. April 1999.

2/11 4:00

A. Readings for Discussion
Trochim2-1, External Validity
2-2, Sampling Terminology
2-3, Statistical Terms
2-4, Probability Sampling
2-5, Non-Probability Sampling

B. Article Critique

**Weinhardt et al. Effects of HIV counseling and testing on sexual risk behavior: A meta-analytic review of published research, 1985-1997. American Journal of Public Health. 1999;89:1397-1405.

C. Data Analysis

Review NIH Grant Application

NIH GRANT PROPOSAL CRITIQUE DUE

Supplemental Reading:

- Atkins et al. Broadening the evidence base for evidence-based guidelines. A Research agenda based on the work of the U.S. Preventive Services Task Force. American Journal of Preventive Medicine 1998;14:335-344.
- US Preventive Services Task Force. Guide to clinical preventive services, 2nd edition, i. Overview, ii. Methods. Baltimore: Williams & Wilkins, 1996.

2/18 4:00

A. Readings for Discussion
Trochim4-1, Constructing the Survey
10-2, Data Preparation

B. Article Critique

**Rosenberg E, Clarfield AM, Caine Y, Patterson CJ. SCOPE: Scripture Oriented Preventive Education. Am J Prev Med. 2003 Nov; 25(4): 333-8.

C. Data Analysis:

--A research question

--A theoretical model that includes two independent variables and one dependent variable (One of these variables should be your scale)

--A hypothesis regarding a multivariate model

Supplemental Reading:

- Hair Text, Chapter 1, Introduction.
- Baranowski et al. Theory as mediating variables: Why aren't community interventions working as desired? Annals of Epidemiology 1997, 7(7 Suppl):S89-S95.
- Babbie E. The Practice of Social Research. Theory and Research. The Elaboration Model.
- Cozby PC. Methods in Behavioral Research. Chapter 1. Scientific Understanding of Behavior. Mayfield Publishing, California, 2001.

2/25 4:00

A. Readings for Discussion
Trochim3-3, Levels of Measurement
10-3a to 10-3c, Descriptive Statistics

B. Article Critique

**Vale MJ, Jelinek MV, Best JD, Dart AM, Grigg LE, Hare DL, Ho BP, Newman RW, McNeil JJ; COACH Study Group. Coaching patients On Achieving Cardiovascular Health (COACH): a multicenter randomized trial in patients with

coronary heart disease. Arch Intern Med. 2003 Dec 8-22; 163(22): 2775-83.

C. Data Analysis:

- Review of work
- Data preparation
- How to handle missing data
- Coding

Supplemental Reading:

- Hair Text, Chapter 2, Examining Your Data

3/3 Conflict with American Academy of Health Behavior Meeting—Must Change Class Time

4:00

A. Readings for Discussion

- Trochim4-2, Scaling
 - 4-3, Scaling Issues
 - 4-4, Thurstone
 - 4-5, Likert
 - 4-6, Guttman

B. Article Critique

** Raat H, Bonsel GJ, Essink-Bot ML, Landgraf JM, Gemke RJ. Reliability and validity of comprehensive health status measures in children: The Child Health Questionnaire in relation to the Health Utilities Index. Clin Epidemiol. 2002 Jan; 55(1): 67-76.

C. Data Analysis

Variables and their level (nominal, ordinal, continuous)

Supplemental Reading

- Nunnally J. Psychometric Theory, Chapter 1, Introduction, Chapter 2, Traditional Approaches to Scaling, Chapter 3, Validity
- Babbie E. The Practice of Social Research. Conceptualization and Measurement. Indexes, Scales, and Typologies.

3/10 4:00

A. Reading for Discussion

- Trochim3-2, Reliability
 - 10-3d, Correlation

B. Article Critique

**Pinkerton et al. Cost-effectiveness of a community-level HIV risk reduction intervention. American Journal of Public Health. 1998;88:1239-1242.

C. Data Analysis

- Review of work
- Scale construction
- Face validity
- Item to total correlations
- Correlation matrix

Supplemental Reading:

- Nunnally J. Psychometric Theory, Chapter 6, The Theory of Measurement Error, Chapter 7, The Assessment of Reliability
- Bartholomew et al. Intervention mapping: A process for developing theory- and evidence-based health education programs. Health Education and Behavior 1998;25(5):545-563.
- Murray D, Chapter1-Introduction, Chapter 2-Planning the Trial, Design and Analysis of Group-Randomized Trials, 1998
- Murray D. Design and analysis of group-randomized trials: A review of

recent developments. *Annals of Epidemiology* 1997;S7:S69-S77

- 3/17 4:00
- A. Reading for Discussion
Trochim3-1, Construct Validity
- B. Article Critique
**Caughy MO, O'Campo PJ, Muntaner C. When being alone might be better: neighborhood poverty, social capital, and child mental health. *Soc Sci Med.* 2003 Jul; 57(2): 227-37.
- C. Data Analysis
--Review of work
--Cronbach alpha
--Split-half
--Test-retest analysis
- Supplemental Reading:
- Babbie E. *The Practice of Social Research.* The Structuring of Inquiry.
 - Schumacker R, *A Beginner's Guide to Structural Equation Modeling*, 1996
- 3/24 Spring Break **(You should have completed an article critique prior to break)**
- 3/31 4:00
- A. Reading for Discussion
Trochim10-1, Conclusion Validity
Feldman H. Selecting end point variables for a community intervention trial. *Annals of Epidemiology* 1997;S7:S78-S88.
- B. Article Critique
**Sussman S. Project towards no tobacco use: 1-year behavior outcomes. *American Journal of Public Health.* 1993;83:1245-1250.
- C. Data Analysis
--Review of work
--Factor analysis
- Supplemental Reading
- Hair Text, Chapter 3, Factor Analysis
 - Murray D, Chapter 3-Research Designs, Chapter 4-Planning the Analysis, Design and Analysis of Group-Randomized Trials, 1998
- 4/7 4:00
- A. Reading for Discussion
Trochim11-1, Inferential Statistics
11-2, General Linear Model
- B. Article Critique
**Luepker R. Outcomes of a field trial to improve children's dietary patterns and physical activity. *Journal of the American Medical Association.* 1996;275:768-776.
- C. Data Analysis
--Review of work
--Convergent validity analysis
--Discriminant validity analysis
- Supplemental Reading:
- Nunnally J. Psychometric Theory, Chapter 3, Validity, Chapter 8, Construction of Conventional Tests

4/14 4:00

SCALE RELIABILITY AND VALIDITY PAPER DUEA. Readings for Discussion

Trochim5-1, Qualitative Measures
5-2, Unobtrusive Measures

B. Article Critique

**Singer M et al. The social geography of AIDS and hepatitis risk: Qualitative approaches for assessing local differences in sterile-syringe access among injection drug users. Am J Public Health. 2000;90:1049-1056.

C. Data Analysis

--Review of work
--A hypothesis regarding a multivariate model
--Selection of statistics

Supplemental Reading

- Hair Text, Chapter 1, Introduction
- Krueger R, Focus Groups, 1994
- Patton MQ. Enhancing the quality and credibility of qualitative analysis. Health Serv Res 1999 Dec;34(5 pt 2):1189-208.
- Academy for Educational Development, A Handbook for Excellence in Focus Group Research, 1995.

4/21 4:00

A. Reading for Discussion

Trochim11-4, Quasi-Experimental Analysis

B. Article Critique

**Kraft JM, Beeker C, Stokes JP, Peterson JL. Finding the "community" in community-level HIV/AIDS interventions: formative research with young African American men who have sex with men. Health Educ Behav. 2000 Aug;27(4):430-41.

C. Data Analysis

--Review of work
--Univariate analysis

Supplemental Reading

- Hair Text, Chapter 2, Examining Your Data

4/28 4:00

A. Reading for Discussion

- Pett M. Nonparametric Statistics for Health Care Research. Sage Publications, 1997.

B. Article Critique

** Lothen-Kline C, Howard DE, Hamburger EK, Worrell KD, Boekeloo BO. Truth and consequences: Ethics, confidentiality, and disclosure in adolescent longitudinal prevention research. Journal of Adolescent Health, Under Review, 2003.

C. Data Analysis

--Review of work
--Bivariate analysis results

Supplemental Reading:

- Nunnally, Chapter 4, Elements of Statistical Description and Estimation
- **Bridge PD and Sawilowsky SS. Increasing physicians' awareness of the impact of statistics on research outcomes: comparative power of the t-test

and Wilcoxon Rank-Sum test in small samples applied research. J Clin Epidemiol 1999 Mar;52(3):229-35.

5/5 4:00

A. Readings for Discussion
Trochim11-3, Experimental Analysis

B. Article Critique

**King et al. Moderate-intensity exercise and self-rated quality of sleep in older adults. A randomized Controlled Trial. JAMA. 1997;277:32-37.

C. Data Analysis

--Review of work

--Multivariate analysis results

Reading:

- Hair Text

5/12 4:00

A. Readings for Discussion
Trochim1-3, Ethics

B. Article Critique

** Perry CL, Williams CL, Komro KA, Veblen-Mortenson S, Stigler MH, Munson KA, Farbaksh K, Jones RM, Forster JL. Project Northland: long-term outcomes of community action to reduce adolescent alcohol use. Health Educ Res. 2002 Feb; 17(1): 117-32.

C. Data Analysis

--Review of work

--Interpretation of results

Supplemental Reading:

- Cozby PC. Methods in Behavioral Research. Chapter 3. Ethical Research. Mayfield Publishing, California, 1997.
- Babbie E. The Practice of Social Research. The Ethics and Politics of Social Research.
- Santelli J. Human subjects protection and parental permission in adolescent health research. J Adolesc Health. 1997 Dec;21(6):384-7.

5/19 **DATA ANALYSIS PAPER DUE BY CLOSE OF BUSINESS**