

HBEH 760: Research Methods with Health Behavior Applications I

Fall 2018

Department of Health Behavior
Gillings School of Global Public Health

Tuesday and Thursday, 11-12:15, 1303 McGavran-Greenberg
Course Website: Accessible through Sakai, at <http://sakai.unc.edu/>

Teaching Team

Susan Ennett, sennett@email.unc.edu
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Office Hours: By Appointment

Course Description

Advanced Research Methods, HBEH 760, is part of the required methods training sequence for doctoral students in the Department of Health Behavior. The course is organized by modules and team-taught by department faculty. Emphasis in the first semester (HBEH 760) is on issues related to the research process, study design, and sampling while emphasis in the later semesters (HBEH 761, 762, 850) is on selected analytic topics, including generalized linear modeling, mediation and moderation analysis, modeling grouped data (hierarchical and longitudinal), and psychometric methods. Modules covered in the first semester are: Conceptualizing Research Questions and Hypotheses; Testing Hypotheses: SAS and Data Fundamentals; Intervention Study Designs; Nonintervention Study Designs; and Sampling.

Course Learning Objectives

At the completion of the course, students will be able to:

- L1. Construct research questions, hypotheses, and conceptual models that are informed by theory and empirical evidence
- L2. Identify units of analysis in different research scenarios and discuss the ecological fallacy
- L3. Explain why measurement is important in health behavior research and identify and define different types of reliability and validity
- L4. Distinguish between main effects, mediation, moderation, and confounding in conceptual hypotheses and understand basic analytic steps for testing these types of hypotheses
- L5. Use SAS to perform data management tasks including dataset and variable manipulation
- L6. Select appropriate bivariate analytic methods for testing conceptual hypotheses
- L7. Use SAS to conduct bivariate analyses and correctly interpret findings
- L8. Identify study designs appropriate to address intervention and nonintervention research questions
- L9. Explain aspects of evidence that should be considered when drawing conclusions about causal relations between variables
- L10. Explain the strengths and weaknesses of different study designs for establishing internal and external validity
- L11. Describe different methods used in survey sampling
- L12. Evaluate the merits and weaknesses of various sampling designs as applied to a specific research question
- L13. Identify the different considerations that go into determining sample size for hypothesis testing

Grading and Assignments

The quality of the course depends on your preparation for and participation in discussion and assignments. You are expected to read the assigned readings before class and come to class prepared to contribute to the discussion. In several sessions, students will lead discussion of journal articles. Other assignments include graded exercises assigned as homework, a midterm exam, and a final exam. Written assignments will be submitted to instructors using the drop box feature in Sakai and are due prior to the start of class on the day they are due. Grades will be based on: graded homework exercises (30%), midterm exam (30%), final exam (30%), and contribution to class discussion, including leading and contributing to discussion of journal articles (10%).

All grades will be determined using the following scale:

Graduate Permanent Grade	UNC Graduate School Grading Description	Points Range
H	High Pass – Clear Excellence	≥ 93
P	Pass – Entirely Satisfactory Graduate Work	≥ 80
L	Low Pass – Inadequate Graduate Work	≥ 70
F	Fail	< 70

Honor Code

Students must observe the Honor Code in all course assignments. You are expected to produce your own work, except where group work is specifically allowed. In all written assignments, you must not plagiarize the work of others. The instrument defining the Honor Code defines plagiarism as "deliberate or reckless representation of another's words, thoughts, or ideas as one's own without attribution in connection with submission of academic work, whether graded or otherwise." If you have questions about your responsibility under the Honor Code, please bring them to one of the instructors or consult with the office of the Dean of Students or the *Instrument of Student Judicial Governance*. This document, adopted by the Chancellor, the Faculty Council, and the Student Congress, contains all policies and procedures pertaining to the student honor system.

Please include the following pledge on all written assignments: "On my honor, I have neither given nor received unauthorized aid on this assignment."

Diversity and Inclusion Statement

In support of the University and the Gillings School of Global Public Health's diversity and inclusion goals, the Health Behavior department embraces diversity as an ethical and societal value. We broadly define diversity to include race, gender, national origin, ethnicity, religion, social class, age, sexual orientation, and physical and learning ability. Promoting and valuing diversity in the classroom enriches learning and broadens everyone's perspectives and are key elements for the success of any enterprise.

This class will follow principles of inclusion, respect, tolerance, and acceptance that support the values of diversity.

Some useful links:

- UNC Non-Discrimination Policies: <http://policy.sites.unc.edu/files/2013/04/nondiscrim.pdf>
- Prohibited Discrimination, Harassment, and Related Misconduct at UNC: <https://deanofstudents.unc.edu/incident-reporting/prohibited-harassmentsexual-misconduct>
- Diversity and Inclusion at the Gillings School of Global Public Health: <http://sph.unc.edu/resource-pages/diversity/>

Course Evaluations

Student evaluations are critical to course development and improvement. Students are asked to complete the official on-line departmental/school evaluation at the close of the course; time will be set aside in the last class for students to complete the evaluation. Informal feedback is welcomed at any time.

Required Readings

Delwiche, L.D., Slaughter, S.J. *The Little SAS Book: A Primer* (Fifth Edition). 2012. Cary, NC: SAS Institute Inc. (Fourth edition is available for free online via the UNC library catalog)

Shadish, W.R., Cook, T.D., and Campbell, D.T. (2002). *Experimental and Quasi-Experimental Designs for Causal Inference*. Boston: Houghton Mifflin Co. (listed below as SCC)

Other readings (see Course Schedule) are available electronically on the Sakai website. Both texts are on reserve at the Health Sciences Library and copies are available in the doctoral student library

Course Schedule

Module 1: Conceptualizing Research Questions and Hypotheses (Luz McNaughton Reyes)

Aug. 21 Units of Analysis, Variables, and Levels of Variables

Singleton, R.A., & Straits, B.C (2010). Chapter 4: Elements of Research Design. In *Approaches to Social Research*, 5th ed. (pp. 79-114). New York: Oxford University Press.

Shah, A. (2010). The relationship between obesity and elderly suicide rates: a cross-national study. *Injury & Violence*, 2(2), 105-9.

Sundquist, K. et al. (2011). Neighborhood walkability, physical activity, and walking behavior: The Swedish Neighborhood and Physical Activity (SNAP) study. *Social Science and Medicine*, 72, 1266-1273.

Aug. 23 Relationships among Variables: Mediation, Confounding, and Moderation

MacKinnon, Krull, & Lockwood (2000). Equivalence of the mediation, confounding, and suppression effect. *Prevention Science*, 1(4), 173 – 181.

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology*, 51(1), 115-134

Bauman, K (1980). Chapter 3: Causal Research. In *Research Methods for Community Health and Welfare: An Introduction*. (pp. 16-22). Oxford: Oxford University Press.

Ungraded homework exercise handed out (Finish by Aug 28, discuss answers Aug 30)

Aug. 28 Writing Research Questions and Hypotheses

Kerlinger, F. N. & Lee, H. B. (2000). Problems and hypotheses. In *Foundations of Behavioral Research*, 4th ed. (pp. 23-37). Fort Worth: Harcourt College Publishers.

McGuire, W. J. (1997). Creative hypothesis generating in psychology: Some useful heuristics. *Annual Review of Psychology*, 48: 1-30.

Aug. 30 Role of Theory and Conceptual Models in Research

Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.) (2008). Theory, research and practice in health behavior and health education. In *Health Behavior and Health Education: Theory, Research, and Practice* 4th ed. (pp. 23-40). San Francisco: Jossey-Bass Publishers.

Earp, J. & Ennett, S. (1991). Conceptual models for health education research and practice. *Health Education Research*, 6(2), 163–171.

Keine et al. (2013). Understanding HIV transmission risk among HIV-infected South Africans receiving antiretroviral therapy: An information-motivation-behavioral skills model analysis. *Health Psychology*, 32(8), 860-868.

Sept. 4 In Class Exercise on Developing Theoretically Informed Conceptual Models

Foshee, V. A., Ennett, S. E., Bauman, K. E., Granger, D. A., Benefield, T., Suchindran, C., ... DuRant, R. H. (2007). A test of biosocial models of adolescent cigarette and alcohol involvement. *Journal of Early Adolescence*, 27 (1), 4-39.

Graded Homework 1 handed out (Due September 20)

Sept. 6 Operationalizing Theoretical Constructs: Measurement (part I)

DeVellis, R. F. (2006). Classical test theory. *Medical Care*, 44(11), 50-59.

Carmines, E.G. & Woods, J.A. (2005a). Reliability Assessment. *Encyclopedia of Social Measurement*. Vol. 3 (361-365).

Carmines, E.G. & Woods, J.A. (2005b). Validity Assessment. *Encyclopedia of Social Measurement*. Vol. 3 (933-937).

Sept. 11 Operationalizing Theoretical Constructs: Measurement (part II)

Student Leader: Abler, L., Hill, L., Maman, S., DeVellis, R., Twine, R., Khan, K., MacPhail, C., Pettifor, A. (2017). Hope Matters: Developing and validating a measure of future expectations among young women in a high HIV prevalence setting in rural South Africa (HPTN 068). *AIDS Behav.* 21: 2165-2166.

Module 2: Testing Hypotheses: SAS and Data Fundamentals (Luz McNaughton Reyes)

Sept. 13 Data Management: SAS Basics

Little SAS book:

Chapter 1, Sections 1.1-1.4, 1.6-1.9

- 1.1 The SAS language
- 1.2 SAS data sets
- 1.3 DATA and PROC steps
- 1.4 The DATA step's built in loop
- 1.6 Windows and commands in the SAS windowing environment
- 1.7 Submitting a program in the SAS windowing environment
- 1.8 Reading the SAS log
- 1.9 Viewing your results

Chapter 2, Sections 2.1, 2.18, 2.19

- 2.1 Methods for getting your data into SAS
- 2.18 Temporary vs. permanent data sets
- 2.19 Using permanent SAS datasets with LIBNAME statements

Sept. 18 Data Management: Using SAS to Manipulate, Examine, and Summarize your Data

Little SAS book:

Chapter 3, Sections 3.1, 3.2, 3.4- 3.6)

- 3.1 Creating and redefining variables
- 3.2 Using SAS functions
- 3.4 Selected SAS numeric functions
- 3.5 Using IF-THEN statements
- 3.6 Grouping observations with IF-THEN/ELSE statements
- 3.11 Simplifying programs with arrays

Chapter 4, Sections 4.1-4.3, 4.5, 4.10, 4.12

- 4.1 Using SAS procedures
- 4.2 Subsetting in procedures with the WHERE statement
- 4.3 Sorting your data using PROC SORT
- 4.5 Printing your data using PROC PRINT
- 4.10 Summarizing your data using PROC MEANS
- 4.12 Counting your data using PROC FREQ

Chapter 9, Sections 9.1, 9.3, 9.6

- 9.1 Examining the distribution of data with PROC UNIVARIATE
- 9.3 Producing statistics with PROC MEANS
- 9.6 Testing categorical data with PROC FREQ
- 9.9 Examining correlations with PROC CORR

Homework 2 handed out (Due on October 4)

Sept. 20 Hypothesis Testing: Bivariate Analysis with SAS

Videos on Confidence Intervals 1-4:

- https://www.youtube.com/watch?v=LTkM_s9Xrzw
- <https://www.youtube.com/watch?v=JjoPXqXLwbc>
- <https://www.youtube.com/watch?v=SX0ntoKKJok>
- https://www.youtube.com/watch?v=wdsDz_2cEzw

Streiner, DL. 1996. Maintaining standards: The difference between the standard deviation and standard error, and when to use each. *Canadian Journal of Psychiatry*, 41, 498-502.

<https://stats.idre.ucla.edu/other/mult-pkg/whatstat/>

http://www.ats.ucla.edu/stat/mult_pkg/whatstat/choosestat.html

Homework 1 Due

Sept. 25 Hypothesis Testing: Bivariate Analysis with SAS

In Class SAS Exercise

Sept. 27 Hypothesis Testing: Bivariate Analysis with SAS

In Class SAS Exercise

Module 3: Intervention Study Designs (Susan Ennett)

Oct. 2 Fundamentals of Intervention Evaluation Research and Validity Typology

Suchman, E. A. (1967). Categories of evaluation. In *Evaluative Research*, pp. 60-68. New York: Russell Sage Foundation.

Bauman, K.E., (1980). Chapter 3: Causal Research.* In *Research Methods for Community Health and Welfare*, pp.16-22. New York: Oxford University Press

SCC, Chapter 2: Validity, pp. 34-42.

Gottfredson, D.C., Cook, T., Gardner, F.E.M., Gorman-Smith, D., Howe, G.W., Sandler, I.N., & Zafft, K.M. (2015). Standards of evidence for efficacy, effectiveness, and scale-up research in prevention science: Next generation. *Prevention Science*, 16, pp. 893-904 (through Standard 5.b.ii).

*Also assigned on 8/23; please review.

Oct. 4 Pre-Experimental Designs

Bauman, K.E., (1980). Chapter 4: Intervention designs. In *Research Methods for Community Health and Welfare*, pp. 23-49. New York: Oxford University Press.

SCC, Chapter 4: Quasi-experimental designs that lack either a control group or lack pretest observations on the outcome, pp. 103-111 and pp. 115-122.

Student Leader: Allen, M. L., Hurtado, G. A., Yon, K. J., Okuyemi, K. S., Davey, C. S., Marczak, M. S., ... & Svetaz, V. M. (2013). Feasibility of a parenting program to prevent substance use among Latino youth: a community-based participatory research study. *Health Promotion*, 27(4), 240-244.

Homework 2 Due

Oct. 9 Quasi-Experimental Designs

SCC, Chapter 5: Quasi-experimental designs that use both control groups and pretests, pp. 135-161.

Gottfredson, D.C., Cook, T., Gardner, F.E.M., Gorman-Smith, D., Howe, G.W., Sandler, I.N., & Zafft, K.M. (2015). Standards of evidence for efficacy, effectiveness, and scale-up research in prevention science: Next generation. *Prevention Science*, 16, pp. 903 and 906-907 (Standards 5.a., 5.b., and 5.b.v.).

Student Leader: Andersen, S., Rod, M. H., Ersbøll, A. K., Stock, C., Johansen, C., Holmberg, T., ... & Tolstrup, J. S. (2016). Effects of a settings-based intervention to promote student wellbeing and reduce smoking in vocational schools: A non-randomized controlled study. *Social Science & Medicine*, 161, 195-203.

TAKE-HOME MIDTERM AVAILABLE OCT 10 AT 8 AM, DUE OCTOBER 12 BY 5 PM.

Oct. 11 Randomization and Experimental Designs

SCC, Chapter 8: Randomized experiments: Rationale, designs, and conditions conducive to doing them, pp. 246-263 and pp. 266-278.

Gottfredson, D.C., Cook, T., Gardner, F.E.M., Gorman-Smith, D., Howe, G.W., Sandler, I.N., & Zafft, K.M. (2015). Standards of evidence for efficacy, effectiveness, and scale-up research in prevention science: Next generation. *Prevention Science*, 16, pp. 903-904 (Standards 5.b.i- and 5.b.ii.).

Student Leader: Williams, M., Bowen, A., Atkinson, J. S., Nilsson-Schönnesson, L., Diamond, P. M., Ross, M. W., & Pallonen, U. E. (2012). An assessment of brief group interventions to increase condom use by heterosexual crack smokers living with HIV infection. *AIDS care*, 24(2), 220-231.

Oct. 16 Factorial Designs

SCC, Chapter 8: Randomized experiments: Rationale, designs, and conditions conducive to doing them, pp. 263-266.

Singleton, R.A., & Straits, B.C (2010). Chapter 7: Experimental designs. In *Approaches to Social Research*, 4th ed. (pp. 200-206). Oxford: Oxford University Press.

Student Leader: Brooner, R. K., Kidorf, M. S., King, V. L., Stoller, K. B., Neufeld, K. J., & Kolodner, K. (2007). Comparing adaptive stepped care and monetary-based voucher interventions for opioid dependence. *Drug and alcohol dependence*, 88, S14-S23.

Oct. 18 **NO CLASS FALL BREAK**

Oct. 23 In-Class Exercise on Factorial Designs

Ungraded exercise handed out – Design Tables Part I (due on Nov 1)

Homework 3 handed out (due on Nov 8)

Oct. 25 Interrupted Time-Series, Multiple Baseline, and Stepped Wedge Designs

Craig, P., Katikireddi, S.V., Leyland, A. & Popham, F. (2017). Natural experiments: An overview of methods, approaches, and contributions to public health intervention research. *Annual Review of Public Health*, 38, 39-56.

Hawkins, N.G., Sanson-Fisher, R.W., Shakeshaft, A., D'Este, C., & Green, L.W. (2007). The multiple baseline design for evaluating population-based research. *American Journal of Preventive Medicine*, 33, 162-168.

Gottfredson, D.C., Cook, T., Gardner, F.E.M., Gorman-Smith, D., Howe, G.W., Sandler, I.N., & Zafft, K.M. (2015). Standards of evidence for efficacy, effectiveness, and scale-up research in prevention science: Next generation. *Prevention Science*, 16, pp. 905 (Standard 5.b.iv.).

Student Leader: Wagenaar, A.C., Maldonado-Molina, M. & Wagenaar, B.H. (2009). Effects of alcohol tax increases on alcohol-related disease mortality in Alaska: Time-series analyses from 1976-2004, *American Journal of Public Health*, 99, 1464-1470.

- Oct. 30 Difference-in-Differences, Regression Discontinuity, and Propensity Score Matching Designs
- Basu, S., Meghani, A., & Siddiqui, A. (2017). Evaluating the health impact of large-scale public policy changes: Classical and novel approaches. *Annual Review of Public Health, 38*, 351-370.
- Gottfredson, D.C., Cook, T., Gardner, F.E.M., Gorman-Smith, D., Howe, G.W., Sandler, I.N., & Zafft, K.M. (2015). Standards of evidence for efficacy, effectiveness, and scale-up research in prevention science: Next generation. *Prevention Science, 16*, p. 904-905 (Standard 5.b.iii.).
- Student Leader:* Adam, C. & Raschzok, A. (2017). Cannabis policy and the uptake of treatment for cannabis-related problems. *Drug and Alcohol Review, 36*, 171-177.
- Student Leader:* Thomas, J.M. (2017). Early truancy evaluation: Replication of an evaluation using a regression discontinuity design. *Children and Youth Service Review, 78*, 150-160.

Module 4: Nonintervention Study Designs (Susan Ennett & Luz Reyes)

- Nov. 1 Cross-Sectional and Repeated Cross-sectional Designs
- Bauman, K.E. (1980). Chapter 5: Nonintervention Designs. In *Research Methods for Community Health and Welfare*, pp. 50-62. New York: Oxford University Press.
- Student Leader:* Rutkowski, E.M. & Connelly, C.D. (2011). Self-efficacy and physical activity in adolescent and parent dyads. *Journal for Specialists in Pediatric Nursing, 17*, 51-60.
- Student Leader:* Wang, C., Gortmaker, S.L., & Tavernas, E.M. (2011). Trends and racial/ethnic disparities in severe obesity among US children and adolescents, 1976-2006. *International Journal of Pediatric Obesity, 6*, 12-20.
- Ungraded exercise handed out – Design Tables Part 2 (due on November 13)***
- Design Tables Part 1 Due***
- Nov. 6 Longitudinal Designs
- Huebner, D. M., Neilands, T. B., Rebchook, G. M., & Kegeles, S. M. (2011). Sorting through chickens and eggs: A longitudinal examination of the associations between attitudes, norms, and sexual risk behavior. *Health Psychology, 30*(1), 110-118.
- Miyazaki, Y., & Raudenbush, S.W. (2000). Tests for linkage of multiple cohorts in an accelerated longitudinal design. *Psychological Methods, 5*, 44-63. **Note: Only read p.44-49 [stop at the section title “Testing Convergence under ML”]**
- Muller, A., Mitchell, J. E., Crosby, R. D., Cao, L., Johnson, J., Claes, L., & de Zwaan, M. (2012). Mood states preceding and following compulsive buying episodes: an ecological momentary assessment study. *Psychiatry Research, 200*, 575-580.
- Zeiders, K. H., Umaña-Taylor, A. J., & Derlan, C. L. (2013). Trajectories of depressive symptoms and self-esteem in Latino youths: Examining the role of gender and perceived discrimination. *Developmental psychology, 49*(5), 951-963
- Student Leader:* Hill LM, Gottfredson NC, Kajula LJ, Pence BW, Go VF, Moody J, Maman S. Changes in Anxiety and Depression Symptoms Predict Sexual Risk Behaviors Among Young Men Living in Dar es Salaam, Tanzania. *AIDS and Behavior, 22*:1435-1445.

Nov. 8 Multilevel Designs

MacIntyre, S., & Ellaway, A. (2000). Ecological approaches: Rediscovering the role of the physical and social environment. In L. Berkman and I. Kawachi (Eds.), *Social Epidemiology*. Oxford, Oxford University Press.

MacIntyre, S., Ellaway, A., & Cummins, S. (2002). Place effects on health: how can we conceptualize, operationalize and measure them? *Social Science & Medicine*, 55, 125-139.

Kim, D. (2008). Blues from the neighborhood? Neighborhood characteristics and depression. *Epidemiologic Reviews*, 30, 101-117.

Student Leader: Mulawa ML, Reyes HLM, Foshee VA, Halpern CT, Martin SL, Kajula LJ, Maman S. Associations between peer network gender norms and the perpetration of intimate partner violence among urban Tanzanian men: a multilevel analysis. *Prevention Science*, 19:427-436.

Homework 3 Due

Homework 4 handed out (due on November 27)

Nov. 13 In Class Exercise on Selecting Study Designs (Intervention and Nonintervention)

Design Tables Part 2 Due

Module 5: Sampling (Derrick Matthews)

Nov. 15 Foundations of Survey Sampling:

Henry, Gary T. (2009). Chapter 4: Practical Sampling. In Leonard Bickman and Debra Rog (eds.). *Handbook of Applied Social Research Methods, 2nd Edition*. Thousand Oaks, CA: Sage Publications.

**Note: Focus on pages 1-6, and Practical Sampling Design Framework (pg 16-29).*

Meyer, I. H., & Wilson, P. A. (2009). Sampling lesbian, gay, and bisexual populations. *Journal of Counseling Psychology*, 56(1), 23-31.

Homework 5 handed out (due December 4)

Nov. 20 Simple and Stratified Random Sampling

Martin, Kathryn. *Analyzing Data from Complex Samples Using PROC SURVEYFREQ in SAS 9.2*. California Department of Public Health.

SAS Institute Inc. (2008). Chapter 14: Introduction to Survey Sampling and Analysis Procedures. SAS/STAT 9.2 User's Guide. Cary, NC: SAS Institute Inc.

Student Leader: McCabe, S. E., West, B. T., Teter, C. J., & Boyd, C. J. (2014). Trends in medical use, diversion, and nonmedical use of prescription medications among college students from 2003 to 2013: Connecting the dots. *Addictive behaviors*, 39(7), 1176-1182.

Nov. 22 **NO CLASS THANKSGIVING**

Nov. 27 Cluster Sampling, Weighting, and Poststratification

Global Adult Tobacco Survey Collaborative Group (2010). *Global Adult Tobacco Survey (GATS): Sample Weights Manual, Version 2.0*. Atlanta, GA: Centers for Disease Control and Prevention, 2010.

**Note: Focus on Chapters 1, 2, and section on MEFF (pg 4.1). Briefly review the rest of the manual*

Student Leader: Luque, J. S., Tarasenko, Y. N., Dixon, B. T., Vogel, R. L., & Tedders, S. H. (2014). Recommendations and administration of the HPV vaccine to 11-to 12-year-old girls and boys: a statewide survey of Georgia vaccines for children provider practices. Journal of lower genital tract disease, 18(4), 298-303.

Ungraded homework exercise handed out (discuss answers 12/4)

Homework 4 Due

Nov. 29 Sample Size and Power

Student Leader: Brahmam, G. N., Kodavalla, V., Rajkumar, H., Rachakulla, H. K., Kallam, S., Myakala, S. P., ... & Ramesh, B. M. (2008). Sexual practices, HIV and sexually transmitted infections among self-identified men who have sex with men in four high HIV prevalence states of India. AIDS, 22, S45-S57.

Dec. 4 In-Class Exercise on Sample Size

Spybrook, J., Raudenbush, S. W., Liu, X., Congdon, R., & Martínez, A. (2006). Optimal design for longitudinal and multilevel research: Documentation for the “Optimal Design” software. *Survey Research Center of the Institute of Social Research at University of Michigan*.

**Note: Review pages 32-49.*

Review ungraded assignment

Homework 5 Due

TAKE HOME FINAL EXAM AVAILABLE DEC. 7 AT 8 AM, DUE DECEMBER 10 BY 5 PM