

# HBHE 750: Applied Research Methods – Fall 2016

Department of Health Behavior, Gillings School of Global Public Health  
University of North Carolina at Chapel Hill

Class: Tuesdays & Thursdays, 2:00pm – 3:15pm, 2306 McGavran-Greenberg Hall

*Optional* Recitation: Thursdays, 3:30pm – 4:30 pm, 2301 McGavran-Greenberg Hall

Office hours (Noel): Tuesdays, 1:00pm – 1:55pm, 325 Rosenau Hall; see schedule for exceptions

Office hours (Ashley): Mondays, 10:20am – 11:15am, Lower Atrium, Michael Hooker Research Center

Health Science Library training: September 1, 3:15 – 4:45 pm, 2301 McGavran-Greenberg Hall

## Teaching Team

Noel Brewer, PhD, Instructor, [ntb---unc.edu](mailto:ntb---unc.edu)

Ashley Phillips, Teaching assistant, [ashleyph---live.unc.edu](mailto:ashleyph---live.unc.edu)

Kaitlyn Brodar, Teaching assistant, [kbrodar---email.unc.edu](mailto:kbrodar---email.unc.edu)

Mary White, MS, MSHI, AHIP, Global Public Health Liaison Librarian (conducts HSL training),  
[mwwwhite---email.unc.edu](mailto:mwwwhite---email.unc.edu).

## Communication

TAs are your first stop when you have questions. Bring questions to class, recitation or office hours. Please avoid using e-mail if possible. If you need to send an e-mail, contact TA Ashley Phillips.

## Course Description

Whether you see yourself as a practitioner or as a researcher, this course offers a foundation for the work required in your professional career. This overview of behavioral research methods is designed to make you a more intelligent consumer of scientific research on health behavior. Whether you need to intervene on a public health problem or want to make new scientific contributions to the field, you will benefit from being able to identify the strengths and weaknesses of work you plan. The course focuses on *quantitative* research methods and covers observational and experimental research designs. A separate course covers *qualitative* research methods that are another important part of research and evaluation.

## Course Objectives

At the completion of the course, students are able to:

1. be informed consumers of the research literature;
2. formulate research questions for behavior change interventions and program evaluation; and
3. select appropriate methods for examining a specific research question or program goal.

## Website

The course website is available through [sakai.unc.edu](http://sakai.unc.edu) under HBHE750.001.FA16.

## Lectures

Plan to attend all lectures. Students routinely say that this is the time when they do the most learning for the class. If you cannot attend class, you are responsible for getting notes from another student.

## Recitations

Attendance is required on August 25 (for lecture), September 1 (for Pubmed training), and September 22 (for a practice exam), but otherwise optional. Typically, around one in five students attend. TAs lead recitations for students who wish to gain deeper understanding of the material beyond what they get in class.

## **Lecture Notes**

Many students find it helpful to bring a printed copy of the slides to class. We usually post slides for each lecture by Monday morning for the coming week. However, note that we reserve the option of revising the slides if we see a clearer way to present the material. Instructions for printing the slides with space for notes are on Sakai.

## **Readings**

All readings are available on Sakai under the “Readings” folder (accessible by clicking Resources on the left hand column). Most of these are labeled optional in the class schedule, indicating that you should read them only if the topic interests you. Journal Club articles are required reading and posted as the semester progresses in the “Journal Club” folder.

The text by Singleton and Straits is an optional resource for the class. Singleton, R. A., & Straits, B. C. (2009). *Approaches to Social Research, 5<sup>th</sup> edition*. New York: Oxford University Press. You can also use the 4<sup>th</sup> edition if you want to save a few dollars.

## **Journal Club**

Students apply course concepts as they critically assess research articles. Students read a research article, focusing on specific components of the article’s methods and results (e.g., threats to causal inference, generalizability, construct validity) that they describe and critique during group discussion. We announce journal club readings as the semester progresses.

## **In-class Exercises**

Regular in-class exercises are an integral part of the course because they provide students the opportunity to discuss and apply concepts covered in the course readings and lectures. Most are group exercises that are discussed during class. As preparation for exams, we also provide sample abstracts to critique during class or at home.

## **Assignments**

Students independently complete three homework assignments outside of class and turn them in for grading. The schedule that begins on the next page shows due dates for homework assignments. For the first homework assignment, students get feedback from one peer after they complete an initial draft: they first turn in a draft to the TA, have a student give feedback, and then turn in the final version to the TAs for official grading. For the second and third homework assignments, students do the work entirely on their own without peer grading. All assignments are due at the start of lecture.

The final presentation – designed to help you prepare for the master’s comprehensive exam – is an analysis of a research article reporting the results of a quasi-experimental study. This is a group project conducted in groups of 5-8. We share more information on the final presentation in late November.

## **Exams**

Students take exams 1 and 2 in class without access to notes or the Internet. The TAs grade exams with the expectation that perhaps a quarter of students will get an H and very few will get an L. Students who need special accommodations for the exams – including the practice exam – should contact UNC Student Accessibility and Resources (<https://accessibility.unc.edu/students>) and the TA. ESL students can receive extra time on exams with the Instructor’s approval. Noel will hold exam review sessions on October 13 and November 17. Exams are cumulative. We chose this approach as research suggests that it optimizes

learning and should best prepare you for the master's comprehensive exam.

Students take a practice exam during recitation and grade it themselves immediately thereafter, with the expectation that all students will receive a P. Note that the practice exam is a real time-limited exam, without access to notes or the Internet.

### **Grading**

We see learning as the primary goal for the course, with grading being a secondary activity. Thus, we use broad grading categories. Elements of an assignment or exam may receive an evaluation of plus (is exceptional) or minus (needs improvement), but elements that meet expectations will receive neither a plus or minus. While our grading is guided by an answer key, please understand that many questions require subjective assessment as many different answers may be acceptable. We then integrate these pluses and minuses to create a summary grade on assignments: P, H, or L. Where possible for each assignment and exam, we report the way we combined the pluses and minuses.

In response to student questions, this year the recitations will provide anonymized examples of answers that students gave on homework and exams that earned grades of L, P and H. Students who prefer not to have their answers used for this purpose can let the TAs know when they turn in an assignment, or they can opt out for the entire semester.

Students can review their graded exams during recitation, but they may not keep them. This allows us to periodically recycle some exam questions – after all, only so many ways exist for assessing understanding of research methods. Students can also review their exams in August of the following year in preparation for comprehensive exams.

Most students in the course earn a final course grade of P (pass) to reflect that they have mastered the material. About 15% or more of students earn a course grade of H, and 5% or fewer earn an L. We consider students who receive an H (high pass) on one exam and homework (or final presentation) for a final course grade of H, an indication that they have gone well beyond simple mastery. We consider students who have an L (low pass) on one exam and homework (or final presentation) for a final course grade of L, an indication that the student may not be adequately prepared for the comprehensive exam.

### **Honor Code**

The UNC Honor Code governs homework assignments and exams ([honor.unc.edu](http://honor.unc.edu)). While the rules are long, complicated and boring, the essence is this, *“Conduct all academic work within the letter and spirit of the Honor Code, which prohibits the giving or receiving of unauthorized aid in all academic processes.”* In other words, the work should be your own.

### **Diversity and Inclusion**

We want to create a welcoming and inclusive learning environment for students from diverse backgrounds. Diversity encompasses a wide variety of characteristics and life experiences including age, access to economic and educational opportunities, ethnic identification, disability, gender expression, geographic origin, political views, race, and sexual orientation. Let us know of any ways the teaching team and students can be more inclusive as we learn from one another.

## Course Evaluation

Taking the course evaluation survey at the end of the semester is the most important thing that you can do to thank the teaching team or voice your concerns about the course. I read the reviews every spring, summarize them and then review them in the fall with the new teaching team. We make changes to the course every year based on these evaluations, so your feedback is extremely useful to us! When the time comes, please consider taking a few moments to review the course, even if it is just to answer a few of the closed ended questions.

### KEY for Schedule

**February 14**

**1.1 Lecture topic**

*Readings (SS5=5<sup>th</sup> edition, SS4=4<sup>th</sup> edition)*

**Homework & exams**

*In-class activities*

*Recitation and office hours*

<p><b>SECTION 1. CONCEPTUAL MODELS</b></p> <p><b>August</b></p> <p><b>23</b></p> <p><b>No Class</b> No office hours with Noel</p>	<p><b>25</b></p> <p><b>1.1 Evaluating research evidence</b> In class exercise (designing an HIV prevention intervention) <i>Recitation: 1.2 Variables</i> <i>Review syllabus</i> <i>In-class exercise (units of analysis and variables)</i> See optional lecture notes: Social science research (literature searches &amp; reading journal articles). If this material interests you, you also can read more in: SS5, Ch.1 &amp; 2:1-46 (SS4, Ch. 1 &amp; 2: 1-40), SS5, Ch 4: 79-88 (SS4, Ch.3: 43-51) and Brownson et al. (2002), Ch. 6, all of which are optional. <b>Attendance required.</b></p>
<p><b>30</b></p> <p><b>1.3 Relationships among variables</b> <i>Required reading: Lindley &amp; Walker (1993)</i> <i>Optional: SS5, Ch 4: 88-103 (SS4, Ch.3: 51-64)</i></p> <p><b>Homework 1 available online</b></p> <p>In-class exercise (relationships among variables) Guest lecturer: William Calo, PhD No office hours with Noel</p>	<p><b>September</b></p> <p><b>1</b></p> <p><b>1.4 Research questions and hypotheses</b> <i>Optional: SS5, Ch 4: 104-114 (SS4, Ch.3: 64-72)</i> In-class exercise (practice writing hypotheses) 3:15-4:45 pm: Health Science Library training in McGavran-Greenberg 2301 - briefly review the links posted on Sakai ("HSL training" folder in Resources) and bring your laptop. <b>Attendance required.</b></p>
<p><b>6</b></p> <p><b>1.5 Conceptual models</b> <i>Required reading: Earp &amp; Ennett (1991)</i> In-class exercise (variables, hypotheses and conceptual models)</p>	<p><b>8</b></p> <p><b>1.6 Measurement-operational definitions</b> <i>Optional: SS5, Ch 5: 115-130 (SS4, Ch.4: 76-90); SS5, Ch 13: 431-439 (SS4, Ch.12: 384-389)</i> In-class exercise (measurement process) <b>Homework 1 due to TA and peer grader</b> <i>Recitation: Discuss student questions</i></p>
<p><b>SECTION 2. OBSERVATIONAL RESEARCH</b></p> <p><b>13</b></p> <p><b>2.1 Construct validity of measured variables</b> <i>Optional: SS5, Ch 5: 130-147 (SS4, Ch.4: 90-105); Krieger et al., 2005</i> In-class exercise (reliability and validity) <b>Homework 1 comments from peer grader</b> Guest lecturer: Kaitlyn Brodar No office hours with Noel</p>	<p><b>15</b></p> <p><b>2.2 Survey design</b> <i>Optional: Dillman (2000), Ch.2 &amp; 3</i> In-class exercise (questionnaire practice) <b>Revised homework 1 due to TA</b> <i>Recitation: Discuss student questions</i></p>
<p><b>20</b></p> <p><b>2.3 Interview mode</b> <i>Required reading: Edwards, et al. (2002)</i> <i>Optional: SS5, Ch.9: 276-305 (SS4, Ch.8: 232-262); Dillman (2000), Ch.11</i></p>	<p><b>22</b></p> <p><b>2.4 Observational research designs</b> <i>Optional: SS5, Ch 9: 271-276 (SS4, Ch. 8: 227-232); Schulz &amp; Grimes (2002); Grimes &amp; Schulz (2002)</i> Guest lecturer: TBA In-class exercise (observational research designs) <b>Homework 1 returned</b> <i>Recitation: Practice Exam (attendance required)</i></p>

<p>27  <b>Journal Club #1</b>  <i>Required reading: Leventhal, et al. (2015)</i></p>	<p><b>SECTION 3. STATISTICAL CONCLUSION VALIDITY</b>  29  <b>3.1 Statistical conclusion validity</b>  <b>Homework 2 available online</b>  <i>Recitation: Review practice exam</i></p>
<p><b>SECTION 4. EXTERNAL VALIDITY</b>  <u>October</u>  4  <b>4.1 Representativeness</b>  <i>Optional: SS5, Ch 6: 150-191 (SS4, Ch.5: 111-152)</i>  In-class exercise (sampling)</p>	<p>6  <b>4.2 Sampling designs</b>  <i>Optional: Coday et al., (2005); if it interests you, spend 5 mins. glancing at this reading: AAPOR (2000)</i>  <i>Recitation: Discuss Homework 2</i></p>
<p>11  <b>4.3 Generalizability</b>  <i>Optional: SS5, Ch 14: 486-488 (SS4, Ch 13: 434-435); Shadish et al. (2002), Ch. 3, 83-95</i>  In class exercise (threats to external validity)  <b>Homework 2 due</b></p>	<p><b>SECTION 5. EXPERIMENTAL RESEARCH</b>  13  <b>5.1 Outcome and process evaluation</b>  <i>Optional: SS5, Ch 15: 497-535 (SS4, Ch.14: 445-482); World Health Organization (2000)</i>  In-class exercise (process evaluation)  <b>Homework 2 returned</b>  <i>Exam 1 and Homework 2 general review in place of recitation</i></p>
<p>18  <b>Exam 1 (on Sections 1-4)</b>  <i>No office hours with Noel</i></p>	<p>20  <b>No Class (Fall Break)</b></p>
<p>25  <b>5.2 Construct validity of manipulated variables</b>  <i>Optional: Shadish et al. (2002), Ch. 3, p. 64-82.</i>  In-class exercise (manipulated vs. measured variables; construct validity)</p>	<p>27  <b>5.3 Outcome evaluation using experiments</b>  <i>Optional: SS5, Ch 7: 195-204 (SS4, Ch. 6: 155-162); Smith &amp; Ebrahim (2001)</i>  In-class exercise (outcome evaluation using experiments)  <i>Recitation: Return and Discuss Exam 1</i></p>
<p><u>November</u>  1  <b>5.4 Threats to internal validity</b>  <i>Optional: SS5, Ch 8: 230-235 (SS4, Ch.7: 187-192)</i>  In-class exercise (threats to validity and designs)  <i>Guest lecturer: Parth Shah, PharmD</i>  <i>No office hours with Noel</i></p>	<p>3  <b>Journal Club #2</b>  <i>Required reading: Kumar, et al. (2008)</i>  <i>Recitation: Discuss student questions</i>  <b>Homework 3 available online</b></p>
<p>8  <b>5.5 Outcome evaluation using pre-experiments &amp; experiments</b>  <i>Optional: SS5, Ch 8: 235-243 (SS4, Ch. 7: 192-200)</i>  In-class exercise (threats to internal validity)  <i>No office hours with Noel</i></p>	<p>10  <b>5.6 Outcome evaluation using quasi-experiments</b>  <i>Optional: SS5, Ch 8: 250-262 (SS4, Ch.7: 206-218); SS5, Ch 14: 477-485 (SS4, Ch.13: 425-433)</i>  In-class exercise (quasi-experimental designs)  <i>Recitation: Discuss student questions</i></p>

<p><b>15</b>  <b>Journal Club #3</b>  <i>Required reading: Turkestani, et al. (2013); Hennessy, et al. (2008)</i>  <b>Final presentation template available online</b>  <b>Homework 3 due</b></p>	<p><b>17</b>  <b>5.7 Outcome evaluation using factorial experiments</b>  <i>Optional: SS5, Ch 8: 243-250 (SS4, Ch. 7: 200-206)</i>  In-class exercise (factorial experiments)  <i>Guest lecturer: Ashley Phillips</i>  <b>Homework 3 returned</b>  <i>Exam 2 review (11:00am - 12:00pm)</i>  <i>Recitation: Homework 3 review</i></p>
<p><b>22</b>  <b>Exam 2 (primarily on section 5)</b>  <i>No office hours with Noel</i></p>	<p><b>24</b>  <b>No class (Thanksgiving)</b></p>
<b>SECTION 6. STANDARDS OF EVIDENCE</b>	
<p><b>29</b>  <b>6.1 Systematic reviews</b>  <b>Evaluating scientific evidence</b>  <i>Optional: Moher, et al. (1998); Brownson, et al. (2004), Ch. 3.</i></p>	<p><b>December</b>  <b>1</b>  <b>Debate: Are non-RCTs the best design for evaluating health behavior interventions?</b>  <i>Required reading: Rosen et al. (2006); West et al. (2008)</i>  <i>Recitation: Discuss student questions.</i></p>
<p><b>6 (last day of class)</b>  <b>Final Presentations</b>  Please be prepared to stay until 5:00 so that all groups can present.  Return Exam 2 in class and discuss briefly  <b>Attendance will be taken and is mandatory.</b>  <i>No office hours with Noel</i></p>	