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|  | **Syllabus**  HBEH 750: Quantitative Methods in Health Behavior  Fall 2019  2 Credits | Residential |

**Course Description**

This course reviews quantitative methods in health behavior research, focusing on validity of conclusions drawn from observational and evaluation studies. The goal is to help public health practitioners be savvy consumers of published research studies and to identify the strengths and weaknesses of planned programs. Permission of the instructor required for students outside the Health Behavior MPH concentration.

**Prerequisites:** None

**Instructor**

Noel Brewer, PhD

Professor, Department of Health Behavior, 325A Rosenau Hall

**Teaching Assistant**

Sophie To, MPH, sophiebto@unc.edu

**Office Hours**

Noel: Tuesdays, 11:15 am - 12:15 pm, 325B Rosenau Hall; see schedule for exceptions.

Sophie: Wednesdays, 1 - 2 pm, Lower Atrium, Michael Hooker Research Center.

[Signup sheet for office hours](https://docs.google.com/spreadsheets/d/1Ve0-4aCUp8HGCWiROn-NHuFVgleYZXAT8WoaoTcPqtc/edit?usp=sharing)

**Course Website:** <https://sakai.unc.edu/welcome/>. Use your ONYEN and password.

**Class Days, Times, Location**

Lecture: Tuesdays, 9:30-11:10 am, 133 Rosenau

Recitation: Thursdays, 3:30-4:30 pm, 2301 McGavran-Greenberg

**Course Overview**

This overview of health behavioral research methods is designed to make you a more thoughtful consumer of scientific research on health behavior. The course begins by building the language and tools practitioners need to think about regarding research studies and evaluation. The course then reviews methods for observational research designs and ends with methods for experiments and evaluating interventions. By the end of the course, students should be able to apply the concepts of: (1) internal validity to understand whether programs cause a change in health behavior outcomes; (2) construct validity to understand whether the measures and interventions are what they seem; and (3) external validity to understand whether findings are generalizable.

**Course Format**

Most class sessions start with a review of material from the previous class; a lecture on new material using slides that many students print out beforehand; and a small group exercise. Some classes will be journal club discussions, a debate or final presentations by the students.

**Course-at-a-Glance**

The instructor reserves the right to make changes to the syllabus, including topics, readings, assignments, and due dates. Any changes will be announced as early as possible.

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| **Date** | **Topic** | **Assignment Due/Required Reading** |
| 8/20 | **HSL training** |  |
| 8/27 | **Conceptual models** |  |
| 9/3 | **Hypotheses** | Read Lindley & Walker, 1993 |
| 9/10 | **External validity** Lecture by Sophie To |  |
| 9/17 | **Journal Club 1** | Analyze Ziller et al. (2019); Birkett et al. (2014)  **Submit Homework 1** in class |
| 9/24 | **Exam 1** (on Weeks 1-4) | No recitation this week |
| 10/1 | **Construct validity: Measured variables** |  |
| 10/8 | **Construct validity: Manipulated variables** |  |
| 10/15 | **Internal validity: Observational studies** | **Submit Homework 2** in class |
| 10/22 | **Exam 2** (primarily on Weeks 6-8) | No recitation this week |
| 10/29 | **Internal validity: Overview of experiments** |  |
| 11/5 | **Internal validity: Applied to experimental designs** |  |
| 11/12 | **Journal Club 2** | Analyze Kumar et al. (2008); Turkestani et al. (2013). Scan Hennessy, et al. (2008)  **Submit Homework 3** in class |
| 11/19 | **Debate: “Are non-RCTs the best design for evaluating health behavior interventions?”** | Read Rosen et al. (2006); West et al. (2008)  Complete course evaluation in class  No recitation this week |
| 11/26 | **Exam 3** (primarily on Weeks 10-13) | No recitation this week |
| 12/3 | **Final presentations** | Attendance will be taken and is required  No recitation this week |

**Course Texts**

The text by Singleton and Straits is an optional resource for the class: Singleton, R. A., & Straits, B. C. (2009). *Approaches to Social* *Research*, 5th edition. New York: Oxford University Press.

Students can also use the 4th edition if they want to save a few dollars.

Course Schedule lists readings in addition to the text. These readings are available on Sakai under the “Readings” folder, under the Resources tab on the left side menu. 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.

**Course Schedule**

All class sessions address Health Behavior Competency 2: Critically evaluate the strengths and weaknesses of quantitative research findings and their relevance to health behavior practice.

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| **8/27** | **1. Conceptual Models** | |
| Learning Objectives | * Identify predictor and outcome variables in research studies * Draw a conceptual model for a research study | |
| Readings | *Optional*   * SS5, Ch 5: 115-130 (SS4, Ch 4: 76-90) * SS5, Ch 13: 431-439 (SS4, Ch 12: 384-389) | |
| Assignment | Review course syllabus and Sakai site | |
| **9/3** | **2. Hypotheses** | |
| Learning Objectives | * Write a hypothesis answering a research question * Identify and explain mediators and moderators in research studies | |
| Readings | *Required*   * Lindley & Walker, 1993   *Optional*   * SS5, Ch 4: 88-114 (SS4, Ch 3: 51-72) | |
| Assignments | Homework 1 posted to Sakai by 9/6, due in class 9/17 | |
| **9/10** | **3. External validity** (lecture by Sophie To) | |
| Learning Objectives | * Describe ways to achieve generalizability to a target population * Describe probability and nonprobability sampling methods * Analyze threats to generalizability related to other people, places, times, IVs and DVs | |
| Readings | *Optional*   * SS5, Ch 6: 150-191 (SS4, Ch 5: 111-152); * SS5, Ch 14: 486-488 (SS4, Ch 13: 434-435) * Shadish et al. (2002), Ch 3, 83-95 | |
| **9/17** | **4. Journal Club 1** | |
| Learning Objectives | * Derive a conceptual model from published articles * Apply the analytic tool of external validity to published articles | |
| Readings | *Required*   * Analyze Ziller et al. (2019) and Birkett et al. (2014) | |
| Assignments | Bring your analysis of the articles to class  Submit Homework 1 in class. TA will try to return graded Homework 1 by Friday | |
| **9/24** | **5. Exam 1** (no recitation this week) | |
| **10/1** | **6. Construct validity: Measured variables** | |
| Learning Objectives | * Distinguish between measured and manipulated variables * Assess construct validity of measured variables qualitatively and quantitatively | |
| Readings | *Optional*   * SS5, Ch 5: 130-147 (SS4, Ch 4: 90-105) * Krieger. et al., 2005 | |
| Assignments | Homework 2 posted to Sakai by 10/4, due in class 10/15 | |
| **10/8** | **7. Construct validity: Manipulated variables** | |
| Learning Objectives | * Distinguish between process and outcome evaluation * Identify threats to construct validity of a manipulated variable | |
| Readings | *Optional*   * Shadish, et al. (2002), Ch 3, p. 64-82 | |
| **10/15** | **8. Internal validity: Observational studies** | |
| Learning Objectives | * Describe the 3 main criteria for inferring a causal association * Describe how to assess association and temporality | |
| Readings | *Optional*   * SS5, Ch 9: 271-276 (SS4, Ch 8: 227-232) | |
| Assignment | Submit Homework 2 in class. TA will try to return graded homework by Friday | |
| **10/22** | **9. Exam 2** (no recitation this week) | |
| **10/29** | **10. Internal validity: Overview of experiments** | |
| Learning Objectives | * Describe the essential elements of a true experiment | |
| Readings | *Optional*   * SS5, Ch 7: 195-204 (SS4, Ch 6: 155-162) * Smith & Ebrahim (2001) * SS5, Ch 8: 230-235 (SS4, Ch7: 187-192) | |
| Assignments | Homework 3 posted to Sakai by 11/1, due in class 11/12 | |
| **11/5** | **11. Internal validity: Applied to experimental designs** | |
| Learning Objectives | * Apply study design notations to a public health abstract * Identify ways to reduce threats to internal validity for a given study * Define quasi-experiments | |
| Readings | *Optional*   * SS5, Ch 8: 235-243, 250-262 (SS4, Ch 7: 192-200, 206-218) * SS5, Ch 14: 477-485 (SS4, Ch13: 425-433) | |
| **11/12** | **12. Journal Club 2** | |
| Learning Objectives | * Apply all the course’s analytic tools (especially external, construct and internal validity) to published articles | |
| Readings | *Required*   * Analyze Kumar, et al. (2008) and Turkestani, et al. (2013) * Scan Hennessy, et al. (2008). Is this observational or a quasi-experiment? | |
| Assignments | Bring your analysis of the articles to class  Submit Homework 3 in class | |
| **11/19** | **13. Debate** (no recitation this week) |
| Learning Objectives | * Analyze the benefits and limitations of randomized controlled trials * Identify public health situations where a randomized controlled trial may be beneficial |
| Readings | *Required*   * Rosen, et al. (2006), West, et al. (2008) |
| Assignments | Presentation by pro and con debate teams: “Are non-RCTs the best design for evaluating health behavior interventions?” |
| **11/26** | **14. Exam 3** (no recitation this week) | |
| **12/3** | **15. Final Presentations** (no recitation this week) |
| Learning Objective | * Analyze the external, construct, and internal validity of a quasi-experimental evaluation study * Integrate understanding of material from the course |
| Assignment | Present your team’s analysis of a quasi-experimental evaluation study |

**Course Assignments and Assessments**

This course will include the following graded assignments that contribute to your final grade in the course.

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| **Assignments** |
| 1. Homeworks (x3) |
| 2. Exams (x3) |
| 3. Final Presentations (or Debate Presentation) |

**Assignment Descriptions**

**Homework**

Students independently complete three homework assignments outside of class and turn them in for grading. The schedule on the previous pages shows due dates for homework assignments. Homework is due at the start of class.

**Exams**

Exams are cumulative. We chose this approach as research suggests that it optimizes learning. Each exam has several short-answer questions (2-4 sentence answers) and then a research study abstract followed by several more short-answer questions. We allot an hour for taking each exam. Students take exams in class without access to notes or the Internet.

Students who need special accommodations for the exams—including the practice exam—should contact UNC Student Accessibility and Resources (accessibility.unc.edu/students) and the TA. Every year several students make use of this excellent, free and confidential service. ESL students can receive extra time on exams with the Instructor’s approval.

Students grade their own exams in class immediately after taking it. Then, they turn in the exam after the grading; the TA will check and finalize exam grades. For Exam 1, students can correct their answers during grading, with the expectation that all students will receive a P. 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.

**Final presentation**

The final presentation is an analysis of a research article reporting the results of a quasi-experimental study. This is a group project conducted in groups of 4-6. We share more information on the final presentation in November. Students doing well in the course will have the option to participate in a debate about the pros and cons of non-RCT designs in evaluating health behavior interventions and programs.

Map of Competencies to Learning Objectives and Assessment Assignments

Below you will see the competency you will develop in this course, the learning objectives that comprise the competency, and the assignment in which you will practice demonstrating this competency.

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| **Competency** |
| HBEH02. Critically evaluate the strengths and weaknesses of quantitative research findings and their relevance to health behavior practice. |
| **Learning Objectives** that comprise the competency |
| * Assess research findings to determine study design, variables, and hypotheses * Create research questions, hypotheses, and conceptual models for public health problems * Determine the threats to construct, internal, external and statistical conclusion validity for a given study |
| **Assessment Assignment** for evidence of student attainment of competency |
| **Homework 1:** Review a provided research study abstract, extract the conceptual model, and analyze the external validity.  **Homework 2:** Review a provided research study abstract and analyze the construct validity.  **Homework 3:** Review a provided research study abstract and analyze the internal validity.  **Journal Clubs:** Read a provided research article and assess its strengths and weaknesses through the lens of construct, internal, external and statistical conclusion validity.    **Exam 1, 2 and 3:** Evaluate the strengths and weaknesses of a research study abstract through the lens of validity.  **Debate:** Two volunteer teams of 2-4 students argue for or against use of RCT study designs in HB research.  **Final Presentation**: Teams of 4-6 students each identify a published research article that used a quasi-experimental design. Present a 10 min talk to the class on the strengths and weakness of the study in regards to construct, internal, external and statistical conclusion validity. Debate teams do not do this final presentation. |

**Syllabus Appendix**

**Course Grading Scale(s)**

Assignment and final course grades follow the [UNC Graduate School grading scale](http://handbook.unc.edu/grading.html).

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| **H** | High Pass: Clearly excellent graduate work |
| **P** | Pass: Entirely satisfactory graduate work |
| **L** | Low Pass: Inadequate graduate work |
| **F** | Fail |

We use a holistic approach to grading. This decision reflects our humility about the assignments which are not perfectly calibrated instruments. The decision also reflects a desire to respect students—no one should feel compelled to quibble over small grading issues. Thus, we look holistically across the student’s accomplishment for the entire semester

**Course grades**

H. Students who receive an H on one exam and homework (or final presentation) are eligible for an H, an indication that they have done outstanding work that is well beyond mastering the course material. About 20% of students earn an H.

P. Most students earn a P (pass) to reflect that they have mastered the material. About 75% of students receive a P.

L. Students who receive an L on one exam and homework (or final presentation) are eligible for an L, an indication that they may not have mastery of the course material. About 5% or fewer earn an L. For students who receive an L on Exam 2, the instructor will email them, their academic advisor and the MPH concentration director to note opportunities for strengthening their mastery of the material.

F. Earning an F on any assignment makes the student eligible for an F in the course. We have never conferred a grade of F.

**Assignments, exams and presentations**

We use a standard grading rubric for assignments, exams and presentations. Please understand that many questions require subjective assessment as many different good answers are possible. Each element in the grading rubric receives an evaluation of minus (needs improvement), check (meets expectations) or plus (is exceptional). We sum these pluses and minuses to create a summary grade on assignments. Generally, +2 or higher is an H, +1 to -1 is a P, -2 to -4 is an L, and -5 or lower is an F.

**Instructor Expectations**

**Lectures**

The instructor prepares and presents lectures during most classes using PowerPoint slides. The TA posts the slides on Sakai for the coming week by Monday morning. The instructor reserves the option of revising the posted slides if he sees a clearer way to present the material.

**Recitations**

The TA leads the recitations. She brings slides with key points from the last week, may review homework assignments and may review graded homework and exams.

**Grading**

The teaching team works together to draft homework and exams. The instructor works with the TA to ensure accurate and timely grading of assignments. The teaching team tries their best to get material back to students within a week and always before the next exam.

**Syllabus Changes**

On rare occasions, the instructor may update the syllabus during the course. He will announce any changes as early as possible.

**Honor Code**

Instructors may report suspected violations of the Honor Code, including inappropriate collaborative work or problematic use of secondary materials, to the Honor Court. Honor Court sanctions vary but may include receiving a zero for the assignment, failing the course and/or suspension from the university. See Additional Resources and Policies for additional information.

**Inclusive Excellence**

In this course, we practice the Gillings School’s [commitment to inclusion, diversity, and equity](https://sph.unc.edu/resource-pages/diversity-statement/) in the following ways. See Additional Resources and Policies for additional information.

* Develop classroom participation approaches that acknowledge the diversity of ways of contributing in the classroom and foster participation and engagement of *all* students.
* Structure assessment approaches that acknowledge different methods for acquiring knowledge and demonstrating proficiency.
* Encourage and solicit feedback from students to continually improve inclusive practices.

**Student Expectations**

**Communication**

The first stop when you have questions is the TA. Bring questions to class, recitation or office hours. Avoid using e-mail if possible but, if you need to send an e-mail, contact the TA. If you cannot attend class, get notes from another student and let the TA know.

**Lectures**

Complete required readings before the class when we cover the topic. Plan to attend all lectures. Students routinely say that this is the time when they do the most learning in this course. Many students find it helpful to bring a printed copy of the slides to class. Instructions are on Sakai for printing the slides with space for notes.

“Step up and step back.” Be aware of how much you are speaking. If you feel you are speaking a lot, let others speak. If you’re not talking, try to ask questions, share ideas or offer suggestions.

**In-Class Exercises**

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 discussions during which all students should contribute.

**Homework**

Submit the homework to the TA in class on the day the assignment is due.

**Recitations**

Attendance at recitations is optional; around a third of the class attend the recitations. Students attend when they want to gain deeper understanding of the material beyond what they get in class. Students can work through applying material from the course to real-world problems, get more in-person feedback, and questions answered. As preparation for exams, we also provide sample abstracts to critique during recitation or at home. If you attend, bring a question or two.

**Course Resources**

The materials used in this course, including the slides, homework and exams, may not be shared with people other than students in the course this semester.

**Honor Code**

To ensure effective functioning of the [Honor System](https://studentconduct.unc.edu/honor-system) at UNC, students are expected to:

* 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.
* Learn the recognized techniques of proper attribution of sources used in written work; and to identify allowable resource materials or aids to be used during completion of any graded work.
* Sign a pledge on all graded academic work certifying that no unauthorized assistance has been received or given in the completion of the work.
* Report any instance in which reasonable grounds exist to believe that a fellow student has violated the Honor Code.

See Additional Resources and Policies for additional information.

**Inclusive Excellence**

In this course, we practice the Gillings School’s [commitment to inclusion, diversity, and equity](https://sph.unc.edu/resource-pages/diversity-statement/) in the following ways. See Additional Resources and Policies for additional information.

* Treat all members of the Gillings community (students, faculty, and staff) as human persons of equal worth who deserve dignity and respect, even in moments of conflict and disagreement.
* Contribute to creating a welcoming and inclusive classroom environment, where all are able to learn and grow from one another.
* Acknowledge and respect the diversity of experiences that others bring to the classroom and the ways in which this richness enhances everyone’s learning.
* Strive to maintain a spirit of curiosity and generosity, particularly in the face of new and/or seemingly contradictory information and perspectives.
* Encourage and solicit feedback from students to continually improve inclusive practices.

**Additional Resources and Policies**

**Accessibility at UNC Chapel Hill**

UNC-CH supports all reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability, or a pregnancy complication resulting in difficulties with accessing learning opportunities. All accommodations are coordinated through the UNC Office of Accessibility Resources & Services (ARS), <https://ars.unc.edu/>; phone 919-962-8300; email [ars@unc.edu](mailto:ars@unc.edu). Students must document/register their need for accommodations with ARS before accommodations can be implemented.

**Counseling and Psychological Services at UNC Chapel Hill**

CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs. Go to their website: [https://caps.unc.edu](https://caps.unc.edu/), call them at 919-966-3658, or visit their facilities on the third floor of the Campus Health Services building for a walk-in evaluation to learn more.

**Gillings School Diversity Statement**

We are committed to expanding diversity and inclusiveness across the School — among faculty, staff, students, on advisory groups, and in our curricula, leadership, policies and practices. We measure diversity and inclusion not only in numbers, but also by the extent to which students, alumni, faculty, and staff members perceive the School’s environment as welcoming, valuing all individuals, and supporting their development.

For more information about how we are practicing inclusive excellence at the Gillings School, visit our ***Diversity and Inclusion*** webpages:

* Diversity and Inclusion:

<https://sph.unc.edu/resource-pages/diversity/>

* Minority Health Conference:

<http://minorityhealth.web.unc.edu/>

* National Health Equity Research Webcast:

<https://sph.unc.edu/mhp/nat-health-equity-research-webcast/>

**Gillings School Office of Student Affairs**

<https://sph.unc.edu/students/osa/>

**Honor Code**

As a student at UNC Chapel Hill, you are bound by the university’s [Honor Code](https://studentconduct.unc.edu/sites/studentconduct.unc.edu/files/documents/Instrument.pdf), through which UNC maintains standards of academic excellence and community values. It is your responsibility to learn about and abide by the code. All written assignments or presentations (including team projects) should be completed in a manner that demonstrates academic integrity and excellence. Work should be completed in your own words, but your ideas should be supported with well-cited evidence and theory. If you have any questions about [your rights and responsibilities](https://studentconduct.unc.edu/students/rights-responsibilites), please consult the Office of Student Conduct (<https://studentconduct.unc.edu/>) or review the following resources:

* Honor System

<https://studentconduct.unc.edu/honor-system>

* Honor system module

<https://studentconduct.unc.edu/students/honor-system-module>

* UNC Library’s plagiarism tutorial

<https://guides.lib.unc.edu/plagiarism>

* UNC Writing Center’s handout on plagiarism

<https://writingcenter.unc.edu/tips-and-tools/plagiarism/>

**LGBTQ Center**

<https://lgbtq.unc.edu/>

**Non-Discrimination Policies at UNC Chapel Hill**

<https://eoc.unc.edu/our-policies/policy-statement-on-non-discrimination/>

**Ombuds**

<https://ombuds.unc.edu/>

**Prohibited Discrimination, Harassment, and Related Misconduct at UNC Chapel Hill**

<https://deanofstudents.unc.edu/incident-reporting/prohibited-harassmentsexual-misconduct>

**Title IX at UNC Chapel Hill**

Acts of discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, stalking, and related retaliation are prohibited at UNC-Chapel Hill. If you have experienced these types of conduct, you are encouraged to report the incident and seek resources on campus or in the community. Please contact the Director of Title IX Compliance / Title IX Coordinator (Adrienne Allison,[adrienne.allison@unc.edu](mailto:adrienne.allison@unc.edu)), Report and Response Coordinators (Ew Quimbaya-Winship, [eqw@unc.edu](mailto:eqw@unc.edu); Rebecca Gibson, [rmgibson@unc.edu](mailto:rmgibson@unc.edu); Kathryn Winn [kmwinn@unc.edu](mailto:kmwinn@unc.edu)), Counseling and Psychological Services (CAPs) (confidential) in Campus Health Services at 919-966-3658, or the Gender Violence Services Coordinators (confidential) Cassidy Johnson, [cassidyjohnson@unc.edu](mailto:cassidyjohnson@unc.edu); Holly Lovern, [holly.lovern@unc.edu](mailto:holly.lovern@unc.edu) to discuss your specific needs. Additional resources are available at [safe.unc.edu](http://safe.unc.edu/).

**Writing Center**

<https://writingcenter.unc.edu/>