BEHV 6140
ADVANCED STRATEGIES AND TACTICS IN BEHAVIOR ANALYTIC RESEARCH
Spring 2024

Instructor:
Dr. April Becker
Office Hours: Wednesday 4:30 – 5:30
AND by appointment Chilton 360G or zoom
(see canvas)
April.Becker@unt.edu

Course Meeting Information:
Wednesdays 6:00PM - 8:50PM
Chilton 363

OBLIGATORY SYLLABUS INSPIRATIONAL QUOTES
(BELIEVE IT OR NOT, THESE ARE HIGHLY RELEVANT TO THIS TOPIC)

“That which we persist in doing becomes easier, not that the task itself has become easier, but that our ability to perform it has improved.”
Ralph Waldo Emerson

“The fact that we live at the bottom of a deep gravity well, on the surface of a gas covered planet going around a nuclear fireball 90 million miles away and think this to be normal is obviously some indication of how skewed our perspective tends to be.”
Douglas Adams

REFLECTIONS ON THE DESIGN OF THIS COURSE

Empirical research methods are not the same from field to field or from subject matter to subject matter, much as we tout our common “scientific method”. This can be positive since not all phenomena are ideally studied in the exact same way, however it can also restrict a field whose research may be enhanced by a larger set of methods. The aim of this course is to provide for a current behavioral expert an even more evolved, deep expertise of behavior analytic methods, some expertise in methods frequently used in adjacent fields or that may be useful (if nontraditional) in behavior analysis, and a global awareness of the variety of methods in science. You will be able to evaluate the quality of any such methods given questions and subject matter at hand, and you will understand and be able to work with the occasional tension (sometimes outright contradiction) between such considerations and the professional/financial contingencies of research. This class focuses not only on methodology in behavior, health, and psychology but also biology. These may be the most foreign sections to you; you should attend to them in terms of how biological subject matter may be critically similar to (and related to) behavioral subject matter and where the rationale behind the methods could bridge.
**COURSE OBJECTIVES**

**Level 1:**
- Students will be able to identify and define common single-case experimental designs
- Students will be able to determine the conditions under which different single-case experimental designs are applicable
- Students will be familiar with common strategies and tactics of measurement in behavior analysis, including direct observation and conventional measurement assessment (interobserver agreement)
- Students will be able to identify common threats to internal validity
- Students will be able to describe general issues in single case research, including generality of results, direct and systematic replication, steady states and transition states, choosing an appropriate baseline, designing appropriate control conditions, and tracking down sources of variability
- Students will become familiar with statistical analysis in single-subject designs
- Students will be able to critically evaluate research methodology in both behavior analysis and related fields

**Level 2:**
- Students will understand the overlap and non-overlap between methodology optimized for scientific investigation vs. methodology called for by the environment of the sciences (publishing, grants, etc.)
- Students will be familiar with common concepts related to the scientific method (including their application or nonapplication to the behavior of scientists) and will be able to apply them to experimental design processes
- Students will be able to formulate clear experimental questions amenable to simple testing
- Students will be familiar with the variety of styles of hypotheses, including both inductive and deductive hypotheses, will be able to formulate appropriate hypotheses (or identify implicit hypotheses) involved with their research, and will be informed of the potential pitfalls of hypothesis-driven myopia
- Students will be familiar with experimental designs commonly used outside of behavior analysis including observational, experimental (necessity and sufficiency), and quasi-experimental designs
- Students will have a bird’s-eye understanding of qualitative, quantitative, and mixed-methods approaches to research
- Students will be able to evaluate and optimize the quality and veracity of their experimental designs through appropriate validations, controls, etc.
- Students will be able to appropriately utilize the concepts of statistical significance, effect sizes, biological significance/relevance, p values, and Prep values
- Students will have a bird’s-eye understanding of Bayesian methodology
- Students will understand theory development, its relationship to hypotheses, inductive investigation, deductive investigation, and abductive investigation
- Students will write a predoctoral fellowship or other funding application appropriate for NIH, NSF, or a different entity appropriate to career trajectory and will defend their proposal orally

**COURSE STYLE**

Typical:
- Hour 1 – 1.5  Student-led readings seminar
- Hour 1.5 – 3  Experimental Design or Grant

Substitute styles on particular weeks are indicated on the schedule

Since my courses are always in constant development, changes will most certainly occur. You must keep track of all changes announced in class, online, or via email. Please be active partners in my attempts to revise throughout the semester by communicating feedback, impressions, ideas, and suggestions

**POINT ALLOCATIONS**

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**COURSE SCHEDULE SPRING 2024**
ACCOMMODATIONS

The Department of Behavior Analysis, in cooperation with The Office of Disability Accommodation, complies with the Americans with Disabilities Act. Additionally, I consider all students to need an accommodation of some kind since you are all unique and diverse individuals with complex histories and current situations – particularly in the middle of a global pandemic. I request that you all submit a description of your accommodations to the accommodations discussion section of Canvas. If in addition you have accommodations that need to go through ODA as well, please include ODA paperwork and make sure to get it to me by the 3rd week (see ADA statement below).

ADA statement: The University of North Texas is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 92-112 – The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens. As a faculty member, I am required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty of their need for accommodation and in providing authorized documentation through designated administrative channels. Information regarding specific diagnostic criteria and policies for obtaining academic accommodations can be found at http://www.unt.edu/oda/apply/index.html. Also, you may visit the Office of Disability Accommodation in the Sage Hall (room 167) or call them at (940) 565-4323.

POLICY ON CHILDREN, CAREGIVING, AND DOMESTIC LIFE

Respecting parenting and caregiver status is part of my overall commitment to respecting the rich and invaluable diversity of our UNT classrooms. All exclusively breastfeeding babies or other children or individuals who need care are welcome in class as often as necessary. Please use good judgement about when to step outside (or mute) to tend to their needs and how to arrange their attendance in a manner compatible with the learning environment.

BASIC NEEDS

Your safety and wellbeing is more important than anything going on in class. Please feel free to reach out to me if you need to talk. Any student who faces challenges securing food, housing, or personal safety is urged to contact the Dean of Students for support, and I encourage you also to notify me if you are comfortable doing so. This will enable me to provide any resources that I can. https://deanofstudents.unt.edu/

STUDENT SUPPORT SERVICES

Particularly during this stressful time, I want to remind everyone that UNT provides mental health resources to students. UNT wants to ensure that students can turn to numerous outlets to find wholehearted care in moments of need, regardless of the nature of an issue or its severity. Listed below are several resources on campus that can support your academic success and mental well-being:

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• Student Health and Wellness Center (https://studentaffairs.unt.edu/student-health-and-wellness-center)
• Counseling and Testing Services (https://studentaffairs.unt.edu/counseling-and-testing-services)
• UNT Care Team (https://studentaffairs.unt.edu/care)
• UNT Psychiatric Services (https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry)
• Individual Counseling (https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling)
• Student Legal Services (https://studentaffairs.unt.edu/student-legal-services)
• Career Center (https://studentaffairs.unt.edu/career-center)
• Multicultural Center (https://edo.unt.edu/multicultural-center)
• Counseling and Testing Services (https://studentaffairs.unt.edu/counseling-and-testing-services)
• Pride Alliance (https://edo.unt.edu/pridealliance)
• UNT Food Pantry (https://deanofstudents.unt.edu/resources/food-pantry)

STUDENT ACADEMIC SUPPORT SERVICES

• Code of Student Conduct: provides Code of Student Conduct along with other useful links
• Office of Disability Access: exists to prevent discrimination based on disability and to help students reach a higher level of independence
• UNT Libraries
• UNT Learning Center: provides a variety of services, including tutoring, to enhance the student academic experience
• UNT Writing Center: offers free writing tutoring to all UNT students, undergraduate and graduate, including online tutoring
• Succeed at UNT: information regarding how to be a successful student at UNT
• Registrar (https://registrar.unt.edu/registration)
• Financial Aid (https://financialaid.unt.edu/)
• Academic Resource Center (https://clear.unt.edu/canvas/student-resources)
• Academic Success Center (https://success.unt.edu/asc)
• UNT Libraries (https://library.unt.edu/)
• Writing Lab (http://writingcenter.unt.edu/)

CHOOSE NAMES

A chosen name is a name that a person goes by that may or may not match their legal name. If you have a chosen name that is different from your legal name and would like that to be used in class, please let me know. Below is a list of resources for updating your chosen name at UNT.

• UNT Records
• UNT ID Card
• UNT Email Address
• Legal Name
UNT euIDs cannot be changed at this time. The collaborating offices are working on a process to make this option accessible to UNT community members.

**Pronouns**

Pronouns (she/her, they/them, he/him, etc.) are a public way for people to address you, much like your name, and can be shared with a name when making an introduction, both virtually and in-person. Just as we ask and don’t assume someone’s name, we should also ask and not assume someone’s pronouns.

You can add your pronouns to your Canvas account so that they follow your name when posting to discussion boards, submitting assignments, etc. I will also ask your pronouns on the first day of class during introductions so that you can tell the class what pronouns you wish to be used in the group. If you also wish for me to use different pronouns when addressing you via email or other nonpublic communication, you may let me know via canvas or email.

Below is a list of additional resources regarding pronouns and their usage:

- What are pronouns and why are they important?
- How do I use pronouns?
- How do I share my pronouns?
- How do I ask for another person’s pronouns?
- How do I correct myself or others when the wrong pronoun is used?

**Technical Requirements/Assistance**

UIT Help Desk: [http://www.unt.edu/helpdesk/index.htm](http://www.unt.edu/helpdesk/index.htm) The University of North Texas provides student technical support in the use of Canvas and supported resources. The student help desk may be reached at:

Email: helpdesk@unt.edu
Phone: 940.565-2324
In Person: Sage Hall, Room 130
Hours are:
- Monday-Thursday 8am-midnight
- Friday 8am-8pm
- Saturday 9am-5p
- Sunday 8am-midnight

- Canvas technical requirements: [https://clear.unt.edu/supported-technologies/canvas/requirements](https://clear.unt.edu/supported-technologies/canvas/requirements)
- It is recommended that you use Microsoft Word to prepare your written documents. As a student at UNT, you may download Microsoft Office for free. Please visit [https://it.unt.edu/installoffice365](https://it.unt.edu/installoffice365) for more information.

**Minimum Technical Skills Needed**

To be successful in the course, you must be able to use email with attachments, Zoom, Canvas, download and upload documents to Canvas (note: .doc, .docx, .pdf file formats will be used, I cannot open .pages files), create files in Microsoft word, analyze data and create figures in Microsoft Excel, and perform literature searches using the university’s library website.
STUDENT PERCEPTIONS OF TEACHING (SPOT)

Student feedback is important and an essential part of participation in this course. There will be a mid-term informal evaluation of the course for the purposes of implementing mid-semester improvements. Formal SPOT evaluations will be available at the end of the semester. This student evaluation of instruction is a requirement for all organized classes at UNT. The short SPOT survey will be made available to you with an opportunity to evaluate how this course is taught. You will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Please look for the email in your UNT email inbox.

ABSENCES

With the exception of COVID-related absences (which are always excused) only unavoidable or high-importance absences will be accommodated. If you must be absent for any reason, you must consult with me at least two weeks before the date of the missed class. Together, we will determine how to proceed with the absence and makeup. The only allowable exceptions to this procedure are scenarios involving biohazard-level sicknesses or emergencies of the defcon-1 type. Please note that scenarios avoidable via forethought or planning do not constitute emergencies – at least not mine 😊.

STUDENT CONDUCT

Each student automatically certifies that any material submitted for grading is his/her own independent work. UNT policies require reporting of plagiarism or any suspected violations that constitute possible academic misconduct. Students are responsible for being familiar with the Code of Student Conduct.

Writing: Students are expected to use correct spelling, grammar and clarity in any written material submitted for class credit. If you need assistance in fulfilling this expectation, please refer to the writing lab (listed above), where you will find teachers ready to help you acquire these skills.
GUIDELINES FOR ACTIVATES AND ASSIGNMENTS (EXCEPT FUNDING PROPOSAL)

MS-Level Final Exam
On the first week, you will be given a review reading list. You have either had most of these readings before (UNT folks) or you’ve hopefully had a similar list for your MS Research Methods Course. In the first two weeks of class, you will review all of this material, skimming and/or focusing as individually necessary to bring yourself back up to speed on all covered concepts. If you are unfamiliar with any of the concepts, this is your chance to get up to speed. You are encouraged to review in groups as this will speed your process.
Once you have finished reviewing, you will design a final exam to probe for mastery on this material. Do not make an open-ended exam; ask specific questions relevant to all important points. Because there are many points to test for, you are encouraged to make questions somewhat short. A student should be able to take this exam in about an hour or less.
On the third week of class, we will randomly re-distribute your tests so that you will take one of your classmate’s tests and one of your classmates will take yours. Come prepared to both distribute and take such a test.
After distributing and taking exams, you will write a critique (note: a critique can consist of positive as well as negative responses) of the exam that you just took. Your grade will be an evaluation of the quality of your written exam, the quality of your critique, and your performance on the test you took.

Reading Documents
Each week, we will have a set of readings. Each student will produce a document about the readings, including:
1. A bulleted outline covering the main and important topics from each reading
2. A section about how the readings together form a big picture and what that picture is
3. A section explaining in specific terms how these concepts could inform your current experimental work outside of class and/or your funding proposal.

I am looking for completeness here in the sense that I don’t want you to leave out big concepts, but I am even more interested in parsimony. It is easy to make an outline complete and easy to make it parsimonious, but to balance both will contribute to your clear thinking. Your goal is to produce the simplest document that still accounts for all vital concepts in the readings. Tools to achieve brevity include bulleting and visual rather than verbal conveyance (feel free to make a drawing or figure!).

Seminar Leadership
Each week, one student will utilize their readings document to lead a seminar on the readings. Other students may also use the concepts in their document to participate in the discussions. The role of the leader will be to:
1. Make sure the conversation is complete (covers all aspects of the week’s material). This means you may need to redirect or keep us on topic. Use your best judgement when redirecting interesting diversions.
2. Prompt participation in quiet people, guide participation with talkative people.
3. Play devil’s advocate if ideas are going unchallenged.
Experiment Critiques and Reviews
Critiques: In dyads, you will read and critique the experimental design and methodology of experiments from the published literature. Later in the semester, you will also choose papers for critiques that are relevant to your research area.
Reviews: To introduce you to best practices in conducting peer reviews and couching critiques in good, constructive communication techniques, you will read experimental papers and review them as though peer reviewing them for publication.

Experimental Design Challenges
In dyads, you will solve experimental design challenges. Your job is to take the information provided in a hypothetical research scenario and design an experiment to address the research question. Keep in mind that you may need more than one experiment to thoroughly address the issue, and if you don’t have enough information to design a good experiment you may need to start with proposed methods to gather that information. One group will be randomly chosen to present their solution to the class for discussion, critique, and brainstorming. Later in the semester, you will generate experimental design challenges from your own research area.

Experimental Design Challenges
On the last day of class, you will come to class with a prepared opinion on the materials covered in class. If you were taking over this course from someone who had taught it previously, what would you change or keep the same and why? This will be a relatively informal assignment – bulleted notes are fine. It is in your interest to simply keep an ongoing list of your opinions throughout the semester that you can bring assembled on the last day.

Review Readings (all from your previous class except *)

Baer, D. (1975). In the beginning there was the response.


Sidman, M. (1960). Parts I and II (pp. 1-91) Tactics of scientific research: Evaluating experimental data in psychology. Boston: Authors Cooperative. NOT ON CANVAS


**WEEKLY READINGS**

This class will involve a lot of reading. You will have to learn to be a strategic reader in order to avoid getting lost, panicking, or creating disruptive holes in your learning process. We will discuss strategies to this end on the first day, which include: 1. knowing when to skim, when to hyper-skim, and when to focus, 2. Scheduling lay reads for bedtime or times when you’re not fresh/need to relax, difficult reads for your best, most focused “on” times, and multiple reading windows (subdivided by sections/headers) for long/complex reads. 3. Explore potentials for group-reads (we can talk about this in class).

Reading guidance: Page numbers for each reading precede the reference, and approximate weekly totals antecede the header to help you with your study/time management. “Close reading” means read thoroughly – this is probably what you attempt for most of your readings in grad school. “Refs/definitions read” means that this reading provides a reference to convention, technical definitions, or classic paradigm – read with an eye to simply extracting those. “Quick read” means skim all material that is not new to you and do a moderate-speed read only of those parts that are of particular novelty or interest. “Lay reading” means that this paper was taken from a popular source and should therefore be a faster read. References marked “FURTHER READING” may be useful or interesting to you if you have time. These are readings that I found worthwhile but that did not make the main cut.

Please note: Some of these readings are old and were written at a time before better social standards of respect were implemented. Please be advised that by assigning such readings I do not condone any disrespectful attitude on gender, race, sexual orientation or identity, or any other frame. To the contrary, I believe that awareness of this problem both historically and presently is part of your education, so we will read this material with an eye to pointing out and correcting inappropriate language and understanding the pervasive nature of such problems in order to better combat them in more contemporary frames. To this end, our “art of self-deception” week will explicitly address social biases in science, its history of sponsoring colonial and unethical social norms, and the need for scientists to consciously combat these tendencies methodologically.
Introduction 23


Wallace, D. F. (2009). This is water: Some thoughts, delivered on a significant occasion, about living a compassionate life. Hachette UK. (https://fs.blog/david-foster-wallace-this-is-water/)

“The” scientific method, induction, deduction, abduction, & the pervasiveness of paradigm 113


FURTHER READING 9 Staddon, J. (Draft). Chapter 2, Experiment. In: Scientific Method. (pp. 23-31)

How do we know? (including The Art of Self-Deception) 148


**Testing Guesses: The Variety Show 112**


Note: I am not assigning the original here since the newer article is easier to read, but the Whewell’s original piece is important in the history of scientific thought and is also posted on canvas: Laudan, L. (1971). William Whewell on the consilience of inductions. The Monist, 368-391.


Expansions on Single-case Research Methods 90


Wider Research Methods 159

71 Campbell, D. T. & Stanley, J. C. (1963) Experimental and quasi-experimental designs for research. **NOTE: this is a classic piece, and you will eventually read all of it. For this week, do a typical, focused read on pp. 1-42 excluding sections on validity (we will return to those later) and a quick read on the rest, skipping over any sections that are just on statistics (you’ll have plenty of statistics elsewhere).**


Variety, Strengths, Limitations, & Contexts of Methodological Approaches 74 (plus reference/survey 80)


Lay reading – please note the difference between within-subject and single-subject


See also his book for the context in which Williams came to this particular expertise (obviously not required but I highly recommend you check this out at some point – I’ve put a summary of 3 parts into canvas, and a short film on the topic can be found here https://www.youtube.com/watch?v=SV4epXiKgrM)


SURVEY 47 Selwyn, M.R. (1996). Common designs in biological experimentation and Sequential Clinical Trials. In: Principles of experimental design for the life sciences. Boca Raton, New York, London, Tokyo: CRC Press. Ref/definitions read & Quick Read. Aim to simply understand each design and not to absorb every single sentence. Skip section 5.5. Note that the optional reading is attached to this PDF so know where to stop if you’re not reading that one.


RIDICULOUSLY QUICK SURVEY ~80 Wahed, Abdus S., et al. (2012). (hand-selected entries). In: Encyclopedia of research design. SAGE Publications, Inc. Ref/definitions read & Ridiculously quick read NOTE: I selected these concepts because they are frequently used or may be useful for you to be aware of in the future. You don’t need to understand them in detail; just peruse what’s in there and keep it as a reference. DO NOT READ EVERY PAGE – read each heading and skim anything interesting underneath

Reproducibility, Rigor & Validity 141


16 Dowdy, A., Hantula, D. A., Travers, J. C., & Tincani, M. (2021). Meta-analytic methods to detect publication bias in behavior science research. Perspectives on Behavior Science, 1-16. Quick read – just be familiar with large points that speak to the nature of the literature and how to understand its limitations; don’t worry about capability with specific meta-analytic methods unless they’re useful to you.

71 Campbell, D. T. & Stanley, J. C. (1963) Experimental and quasi-experimental designs for research. NOTE: We are returning to this piece to focus on its sections on validity. Please review those only.


Controls, Blinding, & Bias 137


New stats, Significance vs. relevance, Killeen’s Prep, Bayesian Methods 24


FURTHER READING 64 Berry, D.A., & Stengal, D.K., (1996). Bayesian Methods in Health Related Research. In: Bayesian Biostatistics. New York, Basel, Hong Kong: Marcel Dekker, Inc. Quick read NOTE: in reality this probably won’t be very quick, but the point is: don’t labor if it doesn’t click right away, just introduce yourself


Signal or Noise? 84

72 Sidman, M. (1960). Parts V and VI (pp. 141-212). Tactics of scientific research: Evaluating experimental data in psychology. Boston: Authors Cooperative. NOTE: This should be a REVIEW - Quick read NOT ON CANVAS


FURTHER READING 16 Salsburg, D. (2001). The skew distributions. In The lady tasting tea. (pp. 9-24) NOTE: read with attention to a shift in thinking from determinism to inherent randomness in nature—what Sidman refers to as intrinsic versus imposed variability
Beyond a collection of inductive generalizations 108

Theories:


NAME_________________________________

ABOUT YOU:

Please write your name and a short description of:

1. The global reason you are studying behavior analysis and science

2. Your dissertation research (or probable research) question, topic, or description

3. What you hope this class will provide for your education, dissertation, career, or other

ACCOMMODATIONS DESCRIPTIONS:

Please describe any points of your unique life that will or may weigh on the logistical implementation of this class. For each, please tell me if it’s just something I should be aware of or if there is a particular point of reasonable accommodation or flexibility that can be provided.