EAB 4930 - Advanced Seminar in Behavior Analysis: Advanced Translational Research

Course Information

Course Name: Operant Laboratory with the Evolutionary Theory of Behavior Dynamics

Course Code: EAB 4930

Semester: Fall 2024

Instructor: Ryan Higginbotham, MS

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Office Hours: M, W, F | 11:45-12:45 | PSY 095 (or by appointment)

Class Time: M, W, F | 10:40-11:30

Class Location: PSY 0130

Course Description

Why do we make choices? Can we know why you ate what you did for lunch yesterday, why a baseball player threw a fastball instead of a curveball, or why you hit snooze on your alarm despite planning to get up early the night before? In this course, we will dive into a behavioral perspective of choice, where the answers to all these questions are rooted in selection by consequences. We will conduct hands-on experiments using the Evolutionary Theory of Behavior Dynamics (ETBD), a groundbreaking model that uses selection by consequences to animate artificial organisms whose behavior mirrors that of real-world living organisms. We will use experiments, theory, and data to unravel the mysteries of choice and apply these insights to understand real-world behaviors and clinical phenomena.

Prerequisites

Either:

EAB 3002 - Principles of Behavior Analysis

EAB 3764 - Applied Behavior Analysis

Learning Objectives

- Understand the basic principles of selection by consequences and how they relate to behavior
- Be familiar with various experimental procedures used to study choice (e.g., concurrent schedules of reinforcement and single schedules of reinforcement)

- Understand the Evolutionary Theory of Behavior Dynamics (ETBD)
- Know how to run experiments with artificial organisms (AOs) using a version of the ETBD written in Python via Google Colab
- Understand how to interpret the behavior of artificial organisms (AOs) in basic choice experiments and how their behavior can be used to help understand and change real-world behavior
- Understand the fundamental role of selection by consequences in understanding the choice behavior of living organisms

Materials

Readings

No textbook is required for this course. All readings will be provided via Canvas.

Google Colab

We will use Google Colab for running experiments with artificial organisms (AOs) using the Evolutionary Theory of Behavior Dynamics (ETBD). Google Colab is a free, cloud-based service for running Python code. You can access Google Colab here. You will need a Google account to use Google Colab.

Note: No programming experience is expected or required for this course.

Grading

Grading for this course is consistent with the university's policies.

Grading Scale

Grade	Score Range	Grade Points
A	94-100	4.0
A-	90-93	3.67
B+	87-89	3.33
B	84-86	3.0
B-	80-83	2.67
C+	77-79	2.33
C	74-76	2.0
C-	70-73	1.67
D+	67-69	1.33
D	64-66	1.0
D-	60-63	0.67
E	<60	0

Note: There is no rounding of grades.

Grading Breakdown

- 10% Participation
- 20% Reading Guides
- 20% Quizzes
- 20% Homework
- 15% Midterm
- 15% Final

Participation

Participation will be based on two self-evaluations. The first will be due with the midterm and the second will be due with the final. Each self-evaluation will be worth 5% of the final grade.

Reading Guides

Reading guides will be provided for each reading. The primary purpose of the reading guides is to highlight the parts of the reading that are most important for this course. Reading guides will be due at 10:30 AM before class. They will be graded based on completion.

Quizzes

We will have a quiz each Friday at the beginning of class. All quizzes will be open book/note. The quiz questions will be primarily based on the reading guides, so if you complete the reading thoroughly, you should do well on the quizzes.

Note: The two lowest quiz grades will be dropped.

Homework

There will be 6 homework assignments throughout the semester. Each homework assignment will be worth about 3% of the final grade. Homework assignments will be related to running and interpreting experiments with artificial organisms using the Evolutionary Theory of Behavior Dynamics (ETBD). For most homework assignments, I will have a dedicated class day for you to work on them and ask questions. Homework assignments will be due at 10:30 AM before class. You may work on homework assignments with your classmates; however, I expect you to have your own data and a unique write-up.

Midterm

The midterm will be similar to the homework assignments but will be longer and more in-depth. Students will design and conduct an experiment with artificial organisms animated by the ETBD and write up the results. The experiment will use concurrent schedules to study how organisms' bias towards different choices is affected by increasing and decreasing the magnitude of a reinforcer. The midterm will be worth 15% of the final grade. **The midterm will be due on October 21st at 11:59 PM**.

Final

The final will be similar to the midterm. Students will design and conduct an experiment with artificial organisms animated by the ETBD and write up the results. The experiment will test an important prediction of matching theory: the total amount of behavior in a given environmental context is constant even when there are changes in reinforcer properties (e.g., magnitude). The final will be worth 15% of the final grade. **The final will be due on November 18th at 11:59 PM**.

Schedule

Day	Date	Topic	Reading Due	Assignment Due
F	8/23	Introduction to the course	–	–
M	8/26	Review	–	–
W	8/28	Review cont.	CH&H Ch. 1	RG 1
F	8/30	Review cont.	CH&H Ch. 2	Quiz 1, RG 2
M	9/2	Holiday - No class	–	–
W	9/4	Selection by consequences	Skinner, 1981	RG 3
F	9/6	Schedules of reinforcement	P&C Ch. 5	RG 4
M	9/9	Choice	–	Quiz 2
W	9/11	Choice cont.	P&C Ch. 9	RG 5
F	9/13	Introduction to the ETBD	–	Quiz 3
M	9/16	Introduction to the ETBD cont.	McDowell, 2019	RG 6
W	9/18	Introduction to Google Colab	–	–
F	9/20	Questions about HW 1	–	Quiz 4
M	9/23	Cumulative records	Killeen, 1985	HW 1, RG 7
W	9/25	Running a simple experiment	–	–
F	9/27	Questions about HW 2	–	Quiz 5
M	9/30	Matching	–	HW 2
W	10/2	Matching cont.	McDowell, 1988	RG 8
F	10/4	Matching cont.	–	Quiz 6, RG 9
M	10/7	Running an experiment with concurrent schedules	McDowell et al., 2008	RG 10
W	10/9	Interpreting the results of an experiment with concurrent schedules	Baum, 1974	RG 11
F	10/11	Questions about HW 3	–	Quiz 7
M	10/14	Concurrent schedules cont.	Cox, Sosine & Dallery, 2017	HW 3, RG 12
W	10/16	Overview of midterm	–	–
F	10/18	Questions about midterm	–	–
M	10/21	Single schedules	–	Midterm, Self-Eval 1
W	10/23	Single schedules cont.	McDowell, 1982	RG 13
F	10/25	Running an experiment with single schedules	McDowell, 2004	Quiz 8, RG 14
M	10/28	Predictions of matching	–	–
W	10/30	Predictions of matching cont.	Dallery et al., 2000	RG 15
F	11/1	Overview of final	–	HW 4, Quiz 9
M	11/4	Questions about final	–	–
W	11/6	Introduction to delay discounting	Odum, 2011	RG 16
F	11/8	Delay discounting cont.	–	Quiz 10
M	11/11	Holiday - No class	–	–
W	11/13	Preference reversals	Ainslie, 1974	RG 17
F	11/15	Adjusting amount procedures & individual differences in discounting	Bickel et al., 1999	Quiz 11, RG 18
M	11/18	Running an experiment using an adjusting amount procedure	–	Final, Self-Eval 2
W	11/20	Questions about HW 5 & 6	–	–
F	11/22	Short- & long-term contingencies	Stahlman & Catania, 2023	HW 5, Quiz 12, RG 19
M	11/25	Holiday - No Class	–	–
W	11/27	Holiday - No Class	–	–
F	11/29	Holiday - No Class	–	–
M	12/2	Q&A with Dr. McDowell (tentative date)	–	HW 6
W	12/4	Review	–	–

Abbreviations:

P&C: Behavior Analysis and Learning by Pierce and Cheney

CH&H: Applied Behavior Analysis by Cooper, Heron, and Heward

HW: Homework

RG: Reading Guide

Course Policies

Attendance & Make-up Work

The requirements for class attendance and make-up work are consistent with university policies. Attendance is part of the participation grade for this course. If you are unable to attend class, please let me know as soon as possible. Make-up work will be allowed for excused absences. Homework can be turned in up to 5 days late without an excused absence for a 10% penalty each day it is late.

Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. Please let me know as soon as possible if you need any accommodations.

Course Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results.

Expectations

Students are expected to be respectful to the instructor and their peers.

Academic Honesty

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Click here to read the Conduct Code. If you have any questions or concerns, please consult with the instructor.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or guest lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student UF, Academic Affairs, September 9th , 2022 Honor Code and Student Conduct Code.

Campus Resources

Health & Wellness

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.

Syallabus Changes

This syllabus is a guide for the course and changes may be made throughout the semester. Any changes will be announced to students in class and via Canvas.