PSYC 407
Behavioral Neuroscience Laboratory

Lecture:
Room BPS0140
M 9-9:50am

Labs:
Room: BPS0263
W: 9am-12pm
F: 9am-12pm
F: 1pm-4pm

Professor:
Dr. Matthew Roesch mroesch@umd.edu
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Teacing Assistants:
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Course description:
PSYC 407 is a junior/senior level course designed to get at the heart of what it means to be a behavioral neurophysiologist. How does the brain give rise to behavior? What behaviors can we measure to understand how the brain works? What psychological constructs are represented by the firing of single neurons? How does the brain code sensory information and turn it into motor output? These are all questions that a behavioral neurophysiologist asks. In my opinion, the most interesting part of neuroscience is the marriage of behavior and neural firing, and the understanding of the neural basis of cognition and its disruption in psychiatric disease.

In this course, you will collect behavioral data in human subjects using classic behavioral paradigms, design models of neural circuits that can explain those behaviors, and decode firing of task-related single neurons and record activity from the cockroach nervous system. In addition, you will design your own experiment, collect data, write it up and present your ideas to your peers. Through this process you will become a better writer and presenter, learn to work as a team, and obtain knowledge pertaining to the neural mechanism underlying cognitive and behavioral control. Although behavioral data will be collected in humans and roaches, these findings will be related to work in other animal models and patients with psychiatric illness.

Mask Mandate:
President Pines provided clear expectations to the University about the wearing of masks for students, faculty, and staff. Face coverings over the nose and mouth are required while you are indoors at all times. There are no exceptions when it comes to classrooms,

laboratories, and campus offices. Students not wearing a mask will be given a warning and asked to wear one, or will be asked to leave the room immediately. Students who have additional issues with the mask expectation after a first warning will be referred to the Office of Student Conduct for failure to comply with a directive of University officials.

Lectures/Discussions: There will be one lecture/discussion session each week. These are essential to successful completion of labs. A crucial component of the course is discussions. All students are expected to contribute to these discussions. Because of this, your regular and consistent attendance is crucial. Although attendance per se is not part of the final grade computation, participation is (see below), and you can't participate if you are not present. Just as an aside, students who regularly skip class are clearly clueless about what goes on in the lab, can't contribute to discussions, and their lab reports and contribution scores are poor.

Scheduled Lab Times:

During each week students will be working in teams of 2 to collect, record, model and decipher neural data with the goal of writing a cohesive Team Lab Worksheet. Data collection and analysis should be continuous. This will require team communication and coordination outside lab times. Lab times (i.e., 3 hour slots) should be reserved to work with your team to accomplish this goal. During this time course Instructors will be available for questions and to bounce ideas off of.

Office Hours: Your scheduled lab times are to be used to ask questions and get help. Be prepared so that you can best use that time to deal with big issues pertaining to your worksheets. For smaller issues or questions please email us directly and we will respond within 1 *business* day. Do not save your questions for weekends. Do not expect a response to your emails on weekends. All assignments are provided well in advance so please do not wait to the last minute to start them or expect immediate last minute help.

General Weekly Activities:

- **Monday Meeting:** We will discuss previous week's data and/ or I will introduce the topic for the current week.
- **Team Worksheet:** Team Lab Worksheets are typically *(but not always)* due two weeks after lab *(see below for detail)*.
- **Data Collection in Humans:** Data collection in humans (psytoolkit) should start early and be constantly collected. Human Lab Worksheets require data collection from 2 participants online (friends, family, roomates, etc), as well as from you and your lab partner during lab time. You will organize and analyze the data in excel.
- **Neural Data Analysis:** For each worksheet done with human participants you will analyze neural data that is in the same format as the behavioral data that is collected. Your goal will be to decipher what this data is signaling in relation to the task and behaviors collected.
- **Model Data:** You will use Neuronify to build simple models based on the data you collected.
- **Roach Training:** We will spend one lab day trying to test the behavior of a roach!

- **Bi-Weekly Reading:** Bi-weekly, individual students are required to do a PubMed search to find and read two scientific journal articles of your choice on the topics discussed that week. I do not assign specific readings. I want students to have some freedom to choose articles that they find interesting, in the realm of the topics that we are discussing that week. Weekly reading will contribute to the 'discussion' section of Team Lab Worksheet Reports.
- **Bi-Weekly Individual Student Reading Assignment:** Bi-weekly, individual students will post the title and the 'take-home message' from the reading done that week by the corresponding Saturday. A 'take-home message' is the single most important piece of information produced by the research described in an article. The take-home message is the succinct answer to the research question based on the findings and its relevance to the general research topic. *You may be asked to discuss the take home message during Monday meeting.*
- **Roach Recording:** During November we will perform in vivo neural recordings in the cockroach.
- **Final Project:** During the semester you should be thinking about what you want your Final Project to be (see below for detail). It can be anything related to the topics we discuss during the semester. The more you think about this during the semester, the easier it will be to prepare your Final Project Worksheet and Final Project Elevator Talk.

All assignments will be completed on CANVAS in the *quizzes* section by the scheduled due date*

Behavioral Neuroscience is a Team Endeavor: The course is designed to get you experience working as a team. More and more researchers work in teams. This requires coordination and division of labor, but also a coming together to write a cohesive Lab Worksheet. Each week the team should coordinate to designate roles, division of labor, and deadlines. Google doc and spreadsheets could be utilized. Also, working as teams brings new perspectives to research that you would not appreciate when working alone. Take advantage of that and learn from each other!

Team Lab Worksheets: Students will hand in a worksheet write-up for each week's lab. Specific questions to be answered in the worksheet are included with each week's results section. Worksheets are focused reports that provide a concise way to communicate your results and conclusions from the lab. Unless otherwise stated, the group members will hand in a single worksheet, *but each student must submit to CANVAS*. **All members of a group will receive the same score.**

Communicating effectively is one of the very most important skills you must have for success in any field. For this course you will need to learn how neuroscientists communicate their results so you can produce successful worksheets. Early in the semester, we will provide detailed instructions for each write-up and discuss techniques in lecture. As the semester moves on, you will take progressively more responsibility for determining and using the most effective way(s) to communicate your results. The

worksheets vary in difficulty, with less hand holding as the semester goes on. Worksheets handed in late incur a 7 point penalty per late day or fraction thereof.

Why worksheets?

• To focus your attention on the collection of specific data.
• To emphasize the important issues.
• To give you practice in reporting results concisely and effectively.
• To give you practice in the art of writing an effective abstract - much harder than you might think

Worksheet scoring:

Abstract:

90-100% = Within word limit; experimental overview is concise and free of extraneous information; includes questions, goals, interpretation of results, and their overall significance.
80-89% = Slight breach of word limit; experimental overview or results are jumbled or include extra information, or results are not linked to hypotheses or significance.
70-79% = Abstract is confusing or organized poorly.
60-69% = Abstract is difficult to read, poorly organized, or a rote recitation of lab activities and results.

Methods:

90-100% = Methods are concise and free of extraneous information. Aspects of the task and behaviors are adequately described so that the task could be replicated by others.
80-89% = Methods are jumbled or include extra information, but most of the details of task design and behaviors collected are present.
70-79% = Methods are confusing or organized poorly.
60-69% = Methods are difficult to read and poorly organized, or incorrectly describe the experimental design and behavioral measures collected.

Behavioral Results:

90-100% = Proper use of appropriate, intuitive, and easy to read figures with no missing information. All data are addressed and interpreted sensibly and reasonably following the results text structure laid out in the worksheet. Appropriate alternatives are suggested when necessary.
80-89% = Proper use of appropriate figures, but some data are missing or interpretations are not fully thought out or appropriate alternatives not suggested.
70-79% = Somewhat usable figures, but graphic types are inappropriate for data type or missing legends/axes/units or data is cursorily addressed, or interpretations are insubstantial.
60-69% = Figures difficult to read, excessive redundancy or missing information and/ or data interpretation belies a misunderstanding of critical content.

Neural Results:

90-100% = Accurate identification of neural signals. Proper use of appropriate, intuitive, and easy to read figures with no missing information. All data are addressed and

interpreted sensibly and reasonably following the results text structure laid out in the worksheet. Appropriate alternatives are suggested when necessary.
80-89% = Correctly identified neural signals and some proper use of appropriate figures, but some data missing or interpretations are not fully thought out and/ or appropriate alternatives not suggested when necessary.
70-79% = Usable figures, but graphic types inappropriate for data type or missing legends/axes/units or data is cursorily addressed, or interpretations are insubstantial.
60-69% = Figures difficult to read, excessive redundancy or missing information and/ or data interpretation belies a misunderstanding of critical content.

Model:

90-100% = Model can simulate firing that would reasonably trigger behaviors observed in the modeled task. All nodes in the circuit are clearly labeled.
80-89% = Not all behaviors or firing are simulated but most components of the circuit are there. All nodes in the circuit are clearly labeled.
70-79% = Not all behaviors or firing are simulated and most components of the circuit are there. Nodes in the circuit are *not* clearly labeled.
60-69% = Nodes are not labeled, behaviors are not simulated, and critical nodes in the circuit are missing.

Discussion:

90-100% = Writing is clear, concise, and nearly error-free; organization is clear, and information given is appropriate but concise.
80-89% = Writing is relatively clear, with only minor errors which do not affect understanding; organization is good.
70-79% = Reading is difficult due to numerous errors, or organization is poor, or overly verbose to the point of confusion.
60-69% = Extraction of meaning is very difficult due to confusing writing or jumbled organization.

Miscellaneous:

Points may be added for unusually excellent work, or subtracted for reports that do not address worksheet questions or use inappropriate format.

Specific details - a checklist

√ Your worksheets will be submitted as Assignments in CANVAS.

√ The uploaded files should be in WORD (.docx) format.

√ Check the schedule below to make sure you are handing things in on time!

√ Go back and review the grading rubric as you are planning the worksheet.

√ Work hard on your abstract. It is one of the most important parts of any report or paper. The practice it takes to write a really good abstract is well worth the time spent.

√ Be brief and concise. Worksheets are not intended as a creative writing exercise, and obfuscating verbosity will incur evaluative chastisement.

√ Be complete. A common failing in worksheet write-ups is failure to answer all parts of a question or answering them incompletely.

√ Do NOT include raw data—however, you should include selected examples and figures to demonstrate your points.

√ Show any calculations (not for simple statistics, however).

√ Always report the proper units for your answers, e.g. 254 ms

√ Graphs should be computer-generated. Hand-drawn graphs will be accepted only in exceptional cases.

√ Graphs must be fully labeled: title, axis increments, axis labels, line labels.

√ Traces must be labeled with a title and with lines and/or arrows and/or brackets, along with text to indicate what you measured or what is most important.

√ Don't be afraid to speculate or hypothesize, even if the question doesn't specifically ask for it.

√ Proof read!! Don't hand in a sloppy job.

Course Score

Total achievable points = 860

1. Individual take-home message reports = 15 points each (x4).
2. Each Team Lab Worksheet/ Project = 100 points each (x6).
3. Final Project = 200 points

The final course score will simply be the points earned as a percentage of the total possible points. However, the final score will be adjusted to include: 1) a **'Participation Score'** that will range from -4 to +4 course score percentage points. This will reward students whose effort has gone far beyond that of even a very good student. It will also be used to penalize students whose effort in the class has been poor (for instance, not contributing to lecture discussions, being repeatedly unprepared for lab, not actively participating in lab/lecture activities, failing to share data with other students); and 2) a **'Contribution Score'** that will range from 0 to -4 course score percentage points. Letter grades will be assigned using an equal divisions scale, e.g. 80.00 to 83.29 = B-, 83.30 to 86.69 = B, 86.70 to 89.99 = B+

Participation Scores

• PSYC 407 is all about doing things, not just listening to lectures and taking a few notes. The active learning while doing experiments is obvious. However, we also spend a great deal of time during the Monday's classes and scheduled lab times discussing ideas and experiments.

• To succeed in the course every student needs to engage fully in all the activities of the course. This yields personal benefit, but there also is a serious responsibility to the other students to 'carry your load.'

• The vast majority of students realize all this, play an active role in all activities, enjoy themselves, and learn a lot. Occasionally, however, we encounter students who don't fulfill their responsibilities, hence the need for a Participation Score. It also provides an opportunity to reward students who consistently go 'above and beyond.'

• The Participation Score can increase or decrease the final course score by up to four (4) percentage points. The most common Participation Score is zero (0) points.

• The most frequent reasons for losing Participation Score points include, but are not limited to:

- ❖ not actively participating in class activities and discussions. Because you can't participate if you are not there, we do keep track of attendance and significant lateness. The latter is especially disruptive because after group exercises have started, students have to interrupt what they are doing to explain the task to the latecomer.
- ❖ not being prepared for lab, i.e hasn't read or understood the lab worksheet.
- ❖ failing to share data with other students in a timely manner.
- ❖ disruptive behavior in class or lab.

• The most common reasons for increases of the Participation Score are the opposites of the negatives above taken to an exceptional level.

Contribution Scores

• These are a pain, and I would love to do away with them. However, they address a common shortcoming of group assignments: unequal contribution to the preparation of the final product.

• Consistent failure to contribute equally to the work can reduce the final course score by up to four (4) percentage points.

• Here's how it works:

- ❖ every week, each student will report to me, via email, the contribution of their partner(s) in producing that week's worksheet as a percentage of the total work done, e.g. for a group of two, it would normally be 50% for each.

- ❖ If there is a substantial number of low contributions scores at the middle and at the end of the semester, I collate the data and provide it to the whole class. The class then decides on the Contribution Score for each student.

• **Everything about the process is anonymous.** I go to extreme lengths to guarantee it. The TAs are not privy to any of the information.

• A major source of problems is inadequate communication. Be sure you carefully discuss who is going to do what. Be sure you carefully discuss when each person can complete their work. You are all very busy, and being realistic about deadlines is crucial. If you get behind schedule, let your partner(s) know. Within each lab Worksheet there will be a summary of what each team member contributed to the report. This is common practice at journals these days. For example, Cell Press requires an 'Author Contributions Section'. Here is the description from their website: To make author contributions transparent, all research articles should include an Author Contributions section. Please describe the contributions concisely and use initials to indicate author identity. We encourage you to use the CRediT taxonomy, which offers standardized descriptions of author contributions.

Goals of the course:

• Gain knowledge of classic behavioral tasks commonly used today.
• Become familiar with the field of behavioral neuroscience and key researchers in the field.
• Design an experiment to answer a behavioral neuroscience question. This will include hypothesis generation, choice of proper task features, prediction of results, data collection and analysis, interpretation, and understanding alternative interpretations of the results.
• Exercises are designed to emphasize problem solving – both conception and practical.
• Describe and explain the most important principles of behavioral tasks that examine the general principles of neural control of behavior.
• Effectively communicate experimental results with clear, efficient writing and oral presentation. This should include choosing the most effective ways to present experimental results, e.g., choice of appropriate graph type.
• Get a taste of what doing neuroscience research is really like.

Names/Pronouns and Self Identifications:

The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). The pronouns someone indicates are not necessarily indicative of their gender identity. Visit https://lgbt.umd.edu/rainbow-terrapin-network-transterps to learn more.

Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and disability, among all aspects of your identity, is your choice whether to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

Reporting Racism and Other Forms of Hate and Bias:
-If you experience racism or other forms of bias or hate in this class, or any psychology course, we encourage you to do at least one of the following:

- Please report the experience to the instructor or teaching assistant
- Report to the Department of Psychology's Diversity and Inclusion Committee using this link (reports can be made anonymously).
- Report all incidents of hate and bias to the Office of Diversity and Inclusion at https://www.diversity.umd.edu/hbrp/.

Inclusive Learning Environments: Students will be invited to share their thoughts in class and a diversity of opinions is welcome. Respectful communication is expected, even when expressing differing perspectives. Supporting ones' statements with research findings is encouraged. In accordance with free speech statues, speech that contains threats of violence is prohibited.

Statement of Basic Needs: "Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in this course, is encouraged to use the resources listed below for support."

- Fostering Terp Success: https://umd.edu/fostering-terp-success
- UMD Campus Pantry: http://campuspantry.umd.edu/
- UMD Student Crisis Fund: http://www.crisisfund.umd.edu/
- Counseling Center: http://www.counseling.umd.edu/CS/

Standard Course Related Policies: You are personally responsible for making yourself aware of the relevant course and University policies. For policies on academic integrity, code of student conduct, sexual misconduct, non-discrimination, accessibility, attendance, absences, missed assignments, student rights regarding undergraduate courses, official UMD communication, mid-term grades, complaints about course final grades, copyright and intellectual property, final exams and course evaluations, and other related campus resources, please visit http://www.ugst.umd.edu/courserelatedpolicies.html

Schedule:

Each week instructors will be available during designated lab times if there are questions or issues that need to be discussed. Be prepared and use the time wisely!

Human Behavioral Studies and Roach Behavior

Week of Aug 30

- **Monday Meeting:** Introduction, LabChart and Recording.

- **Lab Time: No in-person labs this week. Instead, do the following:**
  1. **Watch Videos:**
     - https://www.youtube.com/watch?v=ARDtX8qgjlM
     - https://www.youtube.com/watch?v=VIf-UuLbi3Y&feature=youtu.be
     - https://www.youtube.com/watch?v=itmFGBYiQ_Q&t=5s
     - https://www.youtube.com/watch?v=6NAeGFKuXLs

     - **Download, do the tutorial and play with Neuronify (**https://ovilab.net/neuronify/)

  2. **Reading:**
     - LabChart tutorial
     - PSYC 407 GSR_ANS lab Worksheet
     - Brief intro to GSR

  3. **Read** psytoolkit website and **create** an account. https://www.psytoolkit.org/

Week of Sep 6

- **Monday Meeting:** Labor Day – No Monday class

- **Lab Time: PSYC 407 GSR_ANS lab Worksheet** *Due Date: Wednesday Groups = 9/14; Friday Groups = 9/16*

Week of Sep 13

- **Monday Meeting:**
  1. Intro to Stroop, Flanker and Simon Task
  2. Introduction to Neuronify
  3. Intro to psytoolkit and analysis

- **Lab Time:**
  1. Start ***Stroop Task Worksheet***: Collect Stroop data on yourself and start analysis.
  2. Start working on Data Analysis
  3. *Stroop Task Worksheet Due Date: Wednesday Groups = 9/28; Friday Groups = 9/30*

- **Online Stroop Task Data Collection:** Collect data from 2 participants performing the Stoop Task online.

- **Individual Reading:**
    1. Use PubMed to find and read one scientific journal article that examines a Stroop-like and/or Flanker-like Task in the context of psychiatric disease or differences between sexes or changes that occur across life span (e.g., adolescent vs adult, middle age vs aged).
    2. Use PubMed to find and read one scientific journal article that examines a Stroop-like and/or Flanker-like Task in the context of neural recording.

- **Individual Student Assignment:** Post titles, upload article PDFs, and state the 'take-home message' from the two articles you read this week (#1 and #2 above) *by the end of Saturday, September 18th.*

Week of Sep 20

- **Monday Meeting:** Discussion of Stroop Worksheet, Analysis, and Model. Introduce roach behavior.

- **Lab time:**
    1. **Stroop Worksheet:** Continue organize and analyze behavioral data if necessary. Construct Model in Neuronify. Decode neural activity.

- ***Stroop Task Worksheet Due Date:*** *Wednesday Group = 9/28; Friday Groups = 9/30*

Week of Sep 27

- **Monday Meeting:** Further discussion of Stroop and Flanker. Introduce Go-NOGO Task.

- **Lab Time:**
    1. **Go-NOGO Worksheet:**
        - Edit task if necessary. Perform and collect data on yourself and lab partner. Use chart to collect EMG data while performing the task.
        - Start working on Go-NOGO Worksheet. *Go-NOGO Worksheet Due Date (Wednesday Group = 10/12; Friday Group = 10/14).*

- **Online GO-NOGO Task Data Collection:** Collect data from 2 participants performing the GO-NOGO Task online.

- **Individual Reading:**
    1. Use PubMed to find and read one scientific journal article that examines a Go-NOGO-like Task in the context of psychiatric disease or differences

between sexes or changes that occur across life span (e.g., adolescent vs adult, middle age vs aged).
2. Use PubMed to find and read one scientific journal article that examines a Go-NOGO-like Task in the context of neural recording.

- **Individual Student Assignment:** Post titles, upload article PDFs, and state the 'take-home message' from the two articles you read this week (#1 and #2 above) *by the end of Saturday, October 2nd.*

Week of Oct 4

- **Monday Meeting:** Discussion of Go-NOGO and Stop-Signal Task.

- **Lab Time**
  1. **Go-NOGO Task Worksheet:** Continue to collect and organize data if necessary. Build Neuronify model and decode neural data. Complete Go-NOGO Worksheet.

- ***Go-NOGO Worksheet Due Date*** *(Wednesday Group = 10/12; Friday Group = 10/14).*

Week of Oct 11

- **Monday Meeting:** Discussion of Wisconsin Card Sorting Task (WCST).

- **Lab Time:**
  1. **WCST Worksheet:** Edit task if necessary. Perform and collect data on yourself and your lab partner, included SCR, pulse and respiration. Start working on WCST Worksheet. *WCST Worksheet Due Date: Wednesday Group = 10/26; Friday Group = 10/28).*

- **Online WCST Task Data Collection:** Collect data from 2 participants performing the WCST Task online.

- **Individual Reading:**
  1. Use PubMed to find and read one scientific journal article that examines the WCST-like Task in the context of psychiatric disease or differences between sexes or changes that occur across life span (e.g., adolescent vs adult, middle age vs aged).
  2. Use PubMed to find and read one scientific journal article that examines the WCST-like Task in the context of neural recording.

- **Individual Student Assignment:** Post titles, upload article PDFs, and state the 'take-home message' from the two articles you read this week (#1 and #2 above) *by the end of Saturday, October 16th.*

Week of Oct 18

- **Monday Meeting:** Discussion of Iowa Gambling Task (IGT) and reward signals.

- **Lab Time:**
    1. **Wisconsin Card Sorting Task (WCST) Worksheet:** Continue to collect and organize data if necessary. Build Neuronify model and decode neural data. Collect WCST data, including SCR, pulse and respiration, on two participants.

- ***WCST Worksheet Due Date:*** *Wednesday Group = 10/26; Friday Group = 10/28.*

Cockroach Labs

Week of Oct 25

- **Monday Meeting:** Discussion of behavior in animals.

- **Lab Time: Roach Training: Try to train a roach to do some sort of behavior!**

- **Individual Reading:**
    1. Use PubMed or any other search engine to find and read one scientific journal article that examines the roach behavior.
    2. Use PubMed or any other search engine to find and read one scientific journal article that examines roach neural recordings.

- **Individual Student Assignment:** Post titles, upload article PDFs, and state the 'take-home message' from the two articles you read this week (#1 and #2 above) *by the end of Saturday, Nov 6th.*

Week of Nov 1

- **Monday Meeting:** Discussion of Roach Leg Sensory Recording Lab

- **Lab Time: Roach Recording Lab 1 Leg Sensory Worksheet** (*Due Date: Wednesday Group = 11/30; Friday Group = 12/2).*

Week of Nov 8

- **Monday Meeting:** Discussion of Roach CNS Lab and FINAL PROJECTS.

- **Lab Time:**

1. Complete collecting data for **Roach Lab 1 Leg Sensory worksheet** if not finish last week (*Due Date: Wednesday Group = 11/30; Friday Group = 12/2).*

2. **Roach lab 2 CNS Worksheet** (*Due Date: Wednesday Group = 11/30; Friday Group = 12/2).*

Week of Nov 15

- **Monday Meeting:** Discussion of Roach CNS Lab and FINAL PROJECTS.

- **Lab Time:** Extra time in case surgeries or recording do not go well for Roach Labs. The **Roach lab 2 CNS Worksheet** *due dates are Wednesday Group = 11/30; Friday Group = 12/2).*

Final Project

Week of Nov 22

- **Monday Meeting:** Discussion of FINAL PROJECTS.

- ***Final Project Proposal** (single space; 0.75" margins; Arial 11 font): One page proposal *due Tuesday, Nov 23th*.***

- **THANKSGIVNG: Think about your final project and cognitive control while you are eating way too much!!!**

Week of Nov 29

- **Monday Meeting:** Grad students present behavioral neurophysiology data and discuss grad school.

- **Final Project Task Data Collection**

- **Final Project Worksheet:**
    1. 1 slide (5 min) oral presentation of take-home summary (i.e., elevator talks) of Final Project Proposal (Randomly select half the class) *to be presented on December 6th or 13th* (random) and submitted to CANVAS by *December 5th*.

    2. *Final Worksheet due on December 17th*

Week of Dec 6

- **Monday Meeting:** 1 slide (5 min) oral presentation of take-home summary (i.e., elevator talks) of Final Project Proposal (Randomly select half the class).

- **Final Project Task Data Collection:** Continue to collect and organize data from if necessary. Complete Final Project Worksheet by the end of *December 17th*

Week of Dec 13:

- **Monday Meeting:** 1 slide (5 min) oral presentation of take-home summary (i.e., elevator talks) of Final Project Proposal (Other half the class).

- ***Final Project Worksheet** *due on December 17th* ***

Appendix:

Two of the most important characteristics of excellent writing are **clarity** and **efficiency**. Clarity means that the reader can easily understand exactly what you want to convey. There are no ambiguities, and the reader does not have to struggle to decipher your writing. Clarity and efficiency go hand-in-hand. Efficient writing expresses ideas using only the absolutely necessary number of words. Extraneous words and phrases obscure meaning and frustrate readers. Both clarity and efficiency require good grammar.

Both clarity and efficiency require logical organization. Will the sequence of your sentences and ideas help the reader understand your argument? Are related ideas presented together to focus the reader's attention on your argument? A blog or essay with unrelated ideas mixed together or with related ideas in a confusing sequence will not be successful.

A few of the most common writing pitfalls:

• overly complex, run-on sentences; these can dramatically reduce clarity. Two examples:

"I never would've expected that there were that many characteristics that needed to be evident in order to consider a person a true sleepwalker, although it makes sense when I contextualize it against a courtroom, where a defense attorney would need to prove beyond a reasonable doubt that their client was fully incapacitated and unaware while committing the offense."

"I also like that unlike the last few papers that used the conclusion section to jump to conclusions that they have definitively answered the questions they asked, this paper said that more research must be done to verify all the results reported, and that it all needs to be done under more controlled conditions to comfortably agree with the results."

•passive voice - inefficient, unclear, weak - very common problem

Replace 'It was discovered by researchers at Cornell …' with

'Researchers at Cornell discovered …'

• unnecessary words and phrases. Just a few examples: - very common problem

‘as to how’ should be just 'how'

‘by the fact that’ should be just 'by'

‘based off of’ sound be 'based on'

‘the reason being that’ should be 'because'

‘due to the fact that’ should be 'because'

‘big of a problem’ should be 'big problem'

‘as to how’ - the word 'how' is over-used and often misused

• avoid ambiguous pronouns

Example:

Error: When Matt dropped the wine bottle onto the glass table, it broke. (What broke? The table or the bottle?)

Correction: The wine bottle broke when Matt dropped it onto the glass table.

• using ‘empty’ sentences. These are sentences that don’t convey any useful or interesting information. They crop up most often in the summary paragraph. They also often use the dread passive voice. Examples:

‘More research is needed on this topic/subject/disease.’

‘Only more studies will allow us to understand this topic/subject/disease.’

‘With more research, scientists will find a cure for this disorder/disease.’

• colloquialisms; phrases that you might use in casual speech are often inappropriate in scholarly writing, even our relatively informal blogs and essays; these phrases also contribute to inefficient writing. Examples:

‘sort of’

‘the same exact thing’

minimize the use of ‘I found it interesting that …,’ ‘I would be interested to learn,’ and equivalents

• incorrect word choice; a few examples:

‘few’ vs. ‘less’

‘that’ vs. ‘which’

‘number’ vs. ‘amount’

‘while’ vs. ‘although’

• grammatical lapses; a few examples:

mismatched subject and verb

no comma separating clauses - for one particular case, look up the 'Oxford comma'

failure to use subjunctive

starting sentences with ‘and’ or ‘but’

• trying to sound artificially scholarly by using big words, complex clauses, and convoluted sentences. This is a very common problem and possibly the most detrimental