



Behavioral Neuroscience; Psyc 350; Fall 202X

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You can make an appointment with me at this site: <http://epinnow.youcanbook.me/> If none of the available times work for you, please email me with your available times. When you schedule the meeting you will have the option to specify your location preference (office or Zoom).

*Learning is not attained by chance, it must be sought for with ardor and diligence.
Abigail Adams*

Course Description

Study of the biological systems which underlie human behavior. Covers neural structure and physiology, genetic coding, and hormones. Specific topics of interest to psychology may be included, such as mental illness, the sleep-waking cycle, memory, and stress. Meets the Biological Aspects of Behavior requirement for the Psychology major.

- This is an undergraduate course.
- This is a face-to-face course.
- This course meets the "Biological Basis of Behavior" requirement for the Psychology major and minor.
- This course is a core requirement for the Behavioral Neuroscience minor.

Course Philosophy

Every semester students with a variety of majors and interests take this course; there are typically psychology, biology, chemistry, and social work majors all sitting shoulder-to-shoulder learning about behavioral neuroscience. Consequently, you and your classmates may come to class with very different academic foundations. Some of you will feel very strong in the behavioral aspect of the course, others may be jazzed to learn about the biochemical basis of behavior, others of you may have a passion for the social consequences of behavior. Whatever your interests are, this course is going to be one of the most important classes of your life!

Think of this course as being a "User's Manual" for your brain. In particular, this class will focus on how stress impacts your brain (and your behavior). We'll start by learning information that will lay a foundation for us to understand the biological basis of behavior. Next, we will apply that information to understand how stress impacts the topic of the unit. (For example, how

does chronic stress impact development? How does sleep deprivation change our stress response? Why is exercise such an effective stress reducer?) At the end of this semester you'll know both how your nervous system functions optimally--and how stress changes that functionality. Regardless of your future profession, this is something that is incredibly important to all of us! I have structured this course in a way that will help you recognize the effects of stress in your own life and, hopefully, find ways to minimize it. As you go out into the world, this information will be invaluable to those you come across in your personal and professional life. I'm excited about our semester together and I hope you will feel a deep sense of awe and gratitude for your amazing brain by the end of our time together.

How this course is different (an introduction to C.R.E.A.T.E.)

This class will probably be unlike any other class you've taken at UW-Superior or in high school (unless it was a class with me). So, what is C.R.E.A.T.E and why am I doing this? C.R.E.A.T.E. stands for **C**onsider, **R**ead, **E**lucidate hypotheses, **A**nalyze, **T**hink of the next **E**xperiment. This is an alternate way for you to learn about Psychology and Science in general. I've been teaching Behavioral Neuroscience for nearly 12 years, and I've found that traditional methods just aren't effective in engaging students in critical thinking. Perhaps you can relate: you take a class and are just asked to memorize definitions, or formulas or theories but you don't really understand what those concepts mean or how they relate to the big picture or how they can be applied to the "real world." So, many classes simply test your memory, **not** your actual comprehension of the topic. Also, lectures are boring (for you and for me). I want to make sure that you are engaged and that you feel in control of your learning.

C.R.E.A.T.E. offers a different approach. Instead of being asked to memorize and repeat back answers, you will need to actually understand how ideas relate to each other, how to use the scientific method and how to think like a scientist. You will certainly learn ideas, terms, and theories in this class. Simply memorizing the terms, however, will not be enough to succeed. You will need to use this knowledge creatively. The bulk of the C.R.E.A.T.E. methodology refers to how you will read scholarly articles in this class. First, you will read just the introduction of the paper and connect it to the textbook and lectures; next you will make a concept map that ties together all of those main ideas from the article, textbook, and lecture. Next, you'll read the method section of the article. You'll create a brief cartoon (like a comic strip or graphic novel) that shows all of the steps that the researchers took in conducting this study. Don't worry--your art skills are not part of the grade (seriously, ask me to draw you a mouse; it is not pretty). Finally, I'll give you just the figures and tables of the results. You'll annotate them and mark-them up and analyze what results the method yielded. Then, you'll evaluate the study and think about what would be a good next step! For some of you, this will make you nervous because it is new, different and probably pretty different to how you usually study. I urge you not to be scared and nervous, though. This method will help you understand Psychology more richly. It will also help you be a better reader and better thinker. In combination, these skills will help you in your future college career—regardless of your major!

University Learning Outcomes (ULO)

1. Students will apply modes, styles, and conventions of communication appropriate to the students' work and their audience
2. Students will clearly express themselves to achieve a purpose
3. Students will articulate important questions, theories, and creative processes
4. Students will analyze information to answer specific questions

5. Students will use evidence to reach and present innovative conclusions or produce original work

Program Learning Goals (PLO) & Course Learning Goals

1. Students will demonstrate effective skills in written and oral communication through critiques of psychological research.
2. Students will be able to communicate and critique basic research methods in psychology (specifically behavioral neuroscience), including research design, data analysis, and interpretations.
3. Students will be able to apply behavioral neuroscience to individual, interpersonal, group, and societal issues.
4. Students will be able to use critical thinking, skeptical inquiry, and a scientific approach to address issues related to the biological basis of behavior.

Textbook (required):

Kalat, J. (2015). *Biological Psychology, 13th Edition*. **With Mindtap access code!** (Note: if you purchase the Cengage All Access code for the semester, that is sufficient for what you need in this class.)

Grading

Mastery Trainings: These assignments are basically adaptive quizzes based on the textbook; you'll get more questions about topics that you make mistakes on. Mastery Trainings will take a varied amount of time; the earlier in the semester mastery trainings (Chapters 1-4, 11) will take a full week of work before they are completed (later mastery trainings require, on average, 4 days). It's really important to keep up with these. *You **must** start these early--so please plan ahead!!!* **Chapter 1, 2, 3: 40 points per chapter; Chapter 4 and 11: 30 points per chapter; all other chapters: 20 points per chapter.**

Related Learning Outcomes:

ULO (University Learning Outcomes): 3, 4

PLO (Psychology Learning Outcomes): 2, 3, 4

Fair presentations: You will take part in an information fair about a topic in Behavioral Neuroscience. You will work in teams to create a booth and handout that describes your assigned topic. **Each presentation and handout is worth 25 points.**

Neurotransmitter presentation options: serotonin, dopamine, acetylcholine, glutamate, GABA, norepinephrine, epinephrine, histamine, vasopressin, oxytocin

Sleep presentation options: light sleep, deep sleep, REM sleep, brain structures involved in sleep, neurotransmitters involved in sleep, behavioral and health related to sleep, sleep disorders, biological theories of dreaming

- A week before the fair you'll be assigned to a group.
- Each group will have a topic. The groups will make an information booth and handout for their topic. The booths should all include information that goes beyond what is covered in the textbook or lecture.
- Enough handouts should be brought to class for all students (you can email me your handout and I can print them prior to class).
- You will evaluate your group members at the end of the fair

Related Learning Outcomes:

ULO: 1, 2, 3, 4, 5

PLO: 1, 2, 3, 4

Paper Critique and Synthesis: For each of the scholarly articles that we will read in class, you will be responsible for writing up a critique/review of the article at the end of the unit. These are, essentially, your exams over the unit. So, the depth and quality of information that is provided in the critique is *central* to earning a good grade. The critique is made up of 4 points; successful critiques will also bring in information from the foundational chapters of the textbook (chapters 1-4, 11). **75 points.**

1. Identify the research question and hypothesis of this article (10 points)
2. Summarize how this article is related to previous knowledge (from chapter, readings, videos, lecture, etc) (25 points)
3. Discuss what knowledge this article brings to the field of knowledge (25 points)
4. Discuss meaningful modifications that could be made to the study or a future research question that you think would be helpful to further address this paper's research question. (15 points)

Related Learning Outcomes:

ULO (University Learning Outcomes): 1, 2, 3, 4, 5

PLO (Psychology Learning Outcomes): 1, 2, 3, 4

Article prep work: You will submit a screenshot or other type of picture of the work (concept maps; cartoons, with variables clearly labeled; and annotations of tables and figures). The goal of these assignments is to guide you through reading the articles; these articles can be difficult to understand and process. These are active reading techniques to help you better learn from the information. If you struggle, just do your best--these get easier with practice. Please focus on getting your ideas and understanding down--don't worry about making it pretty! Please view these assignments as ways to help you master the course content. I will grade these for completeness and accuracy. **10 points per prepwork.** (*Note: I will drop your lowest 2 prepwork scores*)

Related Learning Outcomes:

ULO (University Learning Outcomes): 1, 2, 3, 4

PLO (Psychology Learning Outcomes): 1, 2, 3, 4

Final Reflection Paper: The final reflection encourages you to show me that you've mastered the course content that relates to stress and behavioral neuroscience. A successful reflection will discuss the application of the course material to your own life and how your knowledge will shape your future behavior (in both your personal and professional lives). **75 points**

Related Learning Outcomes:

ULO (University Learning Outcomes): 1, 2, 3, 4, 5

PLO (Psychology Learning Outcomes): 1, 2, 3, 4

A note on grading

All mastery trainings are linked in the Cengage module in our Canvas course. You will need to go through Cengage to complete all Mastery Trainings; Cengage will automatically update your grades and completion into Canvas.

For all non-Cengage assignments (prepwork assignments, article critiques/unit exams, and the final reflection), you will submit this work on Canvas. For the prepwork, you can upload a screenshot, phone picture, or a document that contains all of the relevant prepwork. These

assignments are graded for completeness. You can find examples of the three types of prepwork (concept map, cartoon, and annotations) in the "Prepwork Examples Tab" on the "Home" tab. The article critiques/unit exams and the final reflection will be graded using the rubric that is provided in the assignment. Please make sure to review the rubric prior to submitting this work. On all non-Cengage assignments I will leave comments and feedback in Canvas. If you ever have questions about my grading (or you can't find the feedback), please, please, please reach out!

Final Course Grades: Letter grades will be assigned according to the following scale:

A: 93-100%

A-: 90-92.999%

B+: 87-89.999%

B: 84-86.999%

B-: 80-82.999%

C+: 77-79.999%

C: 73-76.999%

C-: 70-72.999%

D: 60-69.999%

F: < 60%

These cutoffs are firm. Do not ask me to give you an extra assignment to raise your grade or to round up your grade – it is not fair to have standards and opportunities that vary across students.

Late policy

Late work will not be accepted. Each unit in this course is based around a sequence of assignments that build one on top of each other. To make sure I have enough time to provide feedback that will provide meaningful guidance, I need it to be turned in on time. Further, I find that late work tends to snowball--students may miss one assignment and then turn it in late. In working to complete the late assignment they often miss subsequent assignments and the chain keeps going! Almost every assignment in this course is relatively low point value--so missing one single, small assignment won't have a big impact on your grade (and I drop your two lowest prep grade scores). It's better to just keep moving forward! All assignments will be turned in on Canvas; due dates are stated on the dropbox. All due dates are in the syllabus and posted on Canvas--please, please, please be mindful of them. If you have any questions--please ask me!

What students can expect from me

- My role for this class is to be a professor, cheerleader, and sounding board.
- I will return graded work within one week.

- I will reply to emails within two business days.
 - Emails that ask questions that can easily be answered in the syllabus (i.e. what is due on class period X? What is your late policy? What did I miss in class?) will receive a reply to see the syllabus.
 - Some responses may advise the student to sign up for a meeting with me, because the question is not easily answered in email.
- I will reply to questions posted on the discussion board within 2 business days.
- I will have at least 5 hours a week available for student appointments.
- I will be excited to meet with you and help you craft work that you will be proud of.

Attendance and Participation (aka: What I Expect from You)

Please make sure that you are checking Canvas at least 5 times a week. This is the primary way that I will communicate with you, and actively being in our course will help you make sure you are on track with the content and deadlines. In general, there is a positive correlation between Canvas presence and final grade: the more you are on Canvas, the better your final grade is likely to be! If you will be absent from the courseroom for more than 3 consecutive days, please send me an email or Canvas message that includes your plan for the coursework that you will miss during your absence.

Questions

If you have questions, please ask them! You can ask them in our Canvas Discussion Board! You can ask them via email! You can make an appointment with me! You can write me a notarized letter (I mean, you *could* but this may be rather slow. . .)! But please, please, please ask! If you feel shy or uncomfortable asking, please think about asking questions as a way of helping out your classmates. Someone else in class has your question--so you would be doing a great kindness by asking it so everyone can benefit from the answer. Remember: I *want to help you learn and grow!* Asking questions is a very important part of your learning and growth. Also, you want to get the most out of your tuition dollars, right? Ask away!

A note on Credit Hours

This class is worth 3 credit hours. What this means is that you'll spend 3 hours in the classroom or lab every week. In addition to the time we spend together, you will be expected to spend *at least* 2 hours out of class per week per credit hour of class. Typically, you can expect to spend 2-3 hours per class hour on work for class. That means that, outside of class meeting times, you should spend **6-9 hours per week** completing assignments, reading and generally working for my class. Please see [Academic Policy 1127: Credit Hour Definition](#).

Classroom Environment

Throughout the course, you will be expected to reflect on, and engage in, discussions on class material sharing your thoughts and even differences of opinion. Disagreeing with ideas, holding alternative views and challenging the status quo are all a part of the higher education tradition, as they provoke us to re-examine our own thinking. That being said, this **will** be a safe and welcoming learning environment for students of all races, ethnicities, sexual orientations, gender identities, ages, religions, economic classes and ability statuses. To achieve this, you will be expected to engage in all classroom activities and assignments in a respectful, inclusive and culturally appropriate manner. If you aren't sure what that may look like, the American

Psychological Association has a very helpful guide to bias-free language that you can find free [here](#).

Academic Honesty

The goal of the University of Wisconsin-Superior is to provide a quality education to all students--part of our [community standards](#) involves a strong statement supporting academic integrity. To learn more about how UWS defines academic integrity (and its evil twin, academic dishonesty) please see [Chapter 14](#). The most important aspect of my job is making sure that my students are given every opportunity to learn and master the course content. I see my goals for your learning as aligned with the community standards and academic integrity. Academic integrity means that all work turned in for a grade must be original and your own; it also must be created *specifically for this class*. *For purposes of this course, work submitted previously for another course is prohibited*. Remember, the goal of this class is for you to master the concepts of Behavioral Neuroscience. Consequently, it's important that you create work specifically for Behavioral Neuroscience.

Diversity and Inclusion at the University of Wisconsin-Superior

Diversity and inclusion is integral to the educational mission of the University of Wisconsin-Superior. As a community we commit to recognize, include and value inherent worth and dignity of each person; foster tolerance, sensitivity, understanding, mutual respect, and justice among its members; and encourages each individual to strive to reach their own potential. The institution recognizes these experiences are crucial for developing the requisite skills to thrive as a member of a pluralistic society and as a responsible global citizen.

In pursuit of its goal of inclusive excellence, the University actively seeks to attract students, faculty, and staff from diverse backgrounds and life experiences, including but are not limited to: race, ethnicity, sex, gender identity, gender expression, sexual orientation, age, socio-economic background, cognitive ability, physical ability, religion and spirituality, value system, national origin, immigration or refugee status, veteran status, and political beliefs.

The University believes that diversity among its members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. The University of Wisconsin-Superior views, evaluates, and treats all person in any University related activity or circumstance in which they may be involved, solely as individuals.

Throughout the course, you will be expected to reflect on, and engage in, discussions on class material sharing your thoughts and even differences of opinion. Disagreeing with ideas, holding alternative views and challenging the status quo are all a part of the higher education tradition, as they provoke us to re-examine our own thinking. That being said, this WILL be a safe and welcoming learning environment for students of all races, ethnicities, sexual orientations, gender identities, ages, religions, economic classes and ability statuses. To achieve this, you will be expected to engage in all classroom activities and assignments in a respectful, inclusive and culturally appropriate manner.

For more information about Equity, Diversity and Inclusion and/or to report bias, discrimination or harassment, please email edi@uwsuper.edu or call 715-394-8015.

Policies and practices to help your learning and growth

The University of Wisconsin-Superior is dedicated to a safe, supportive and nondiscriminatory learning environment. It is the responsibility of all undergraduate and graduate students to familiarize themselves with University policies regarding special accommodations, academic misconduct, religious beliefs accommodation, discrimination and absence for University- sponsored events.

Please review the Student Information Sheet provided by your instructor. This includes policies related to:

- **Student characteristics**, including policies and services related to those who are active military/veterans, those who are pregnant or expecting new family members, and students seeking services for differing abilities and accommodations student services, and others.
- **Academic integrity**, including information on plagiarism and steps that an instructor can take.
- **Campus policies**, including how to sign up for Safe Alerts, information on course evaluations, process for submitting a formal grievance regarding academics and/or discrimination, and others.

Disability and accommodations

All of the materials on Canvas have been designed to be read using a screen reader; your textbook also has an audio option. I have tried to be mindful of anticipating any issues that may come up regarding the accessibility of the course materials. This is an area where I welcome feedback and hope to grow. Please let me know if you experience any issues with the accessibility of the course materials and I will find a solution!

If you need accommodations, please contact Disability Support services <disability@uwsuper.edu>. You can find their office in Swenson 1024A or you can call them at 715-394-8188. You also can request services using the online "Accommodate System." Once I receive a copy of your accommodations, we will make sure you have all the tools that you need to succeed!

Mental Health

On average, one in five Americans will experience mental illness in any given year. Worse, 60% of Americans will not seek treatment for their illness. Mental illness can be debilitating—but it is treatable. If you are struggling with mental health issues, please seek treatment. If you know someone who is struggling with mental health issues, please urge them to get help. Below are some resources that may be helpful for you (or anyone else struggling with mental health).

| | | |
|--------------------------------|--------------|----------|
| UW-Superior Counseling Service | 715-394-8236 | MWC 1729 |
| Minnesota Crisis Line | 800-634-8775 | |
| Wisconsin Crisis Line | 715-395-2259 | |

National Suicide Prevention Lifeline 800-273-8255
 Amberwing Crisis Line 218-723-0099
 LBGTQ Crisis Line 866-488-7386
 Veterans Crisis Line 800-273-8255 (press 1)
 Depression Toolkit <http://www.depressiontoolkit.org>
 Texting hotline Text "ANSWER" to 839863

Tentative Schedule

| Week | Readings | Assignments |
|--------|---|--|
| Week 1 | Chapter 1: Nerve Cells and Nerve Impulses | Chapter 1 Mastery Training |
| Week 2 | Chapter 2: Synapses and Neurotransmitters | Chapter 2 Mastery Training; Neurotransmitter Fair |
| Week 3 | Chapter 3: Anatomy and Research Methods | Chapter 3 Mastery Training |
| Week 4 | Chapter 4: Genetics, Evolution, Development, Plasticity Chapter 11: Emotions, Aggression, and Stress | Chapter 4 Mastery Training Chapter 11 Mastery Training |
| Week 5 | Stress paper: Intro, Method, Figure 1 | CMap Stress Intro, Cartoon Stress Method, Annotate Stress Paper Figure 1 |

| | | |
|---------|--|--|
| Week 6 | Stress paper: Figures 2 and 3 | Annotate Stress Paper Figures 2 and 3; Stress Paper Critique and Synthesis |
| Week 7 | Stress recovery paper: Intro, Method, Figures | Stress Recovery CMap, Stress Recovery Cartoon, and Stress Recovery Annotations |
| Week 8 | Chapter 8: Wakefulness and Sleep | Recovery Paper Critique and Synthesis; Chapter 8 Mastery Training; Sleep Fair |
| Week 9 | Sleep Paper Intro, Method, Figure | Sleep CMap and Sleep Cartoon and Sleep Paper Annotations |
| Week 10 | Chapter 12: Learning and Memory | Sleep Paper Critique and Synthesis; Chapter 12 Mastery Training |
| Week 11 | Chapter 13: Cognitive Functions; Alzheimer's Disease (AZD) Paper Intro; AZD Method | Chapter 13 Mastery Training and AZD CMap and Cartoon |
| Week 12 | AZD Figures | AZD Annotations; AZD Paper Critique and Synthesis |
| Week 13 | Chapter 14: Psychological Disorders; Depression Paper Intro and Method | Chapter 14 Mastery Training; Depression Paper CMap & Cartoon |
| Week 14 | Depression paper Method and Figures | Depression Figures; Depression Paper Critique and Synthesis |

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|------------|---|---|
| Week 15 | Allostatic Load and race paper Intro, Method, and Figure | Allostatic load and race CMap, Cartoon, and Annotation; Final Reflection |
|------------|---|---|

Appendix A

Stress Paper

Eiland, L., Ramroop, J., Hill, M., Manley, J., & McEwen, B. (2012). Chronic juvenile stress produces corticolimbic dendritic architectural remodeling and modulates emotional behavior in male and female rats. *Psychoneuroendocrinology*, *37*, 39-47.

Stress Recovery Paper

Schoenfeld, T., Rada, P., Pieruzzini, P., Hsueh, B., & Gould, E. (2013). Physical exercise prevents stress-induced activation of granule neurons and enhances local inhibitory mechanisms in the dentate gyrus. *The Journal of Neuroscience*, *33*, 7770-7777.

Sleep Paper

Minkel, J., Moreta, M., Muto, J., Htaik, O., Jones, C., Basner, M., & Dinges, D. (2014). Sleep deprivation potentiates HPA axis stress reactivity in healthy adults. *Health Psychology*, *33*, 1430-1434.

Alzheimer's Disease paper

Baglietto-Vargas, D., Chen, Y., Suh, D., Ager, R., Rodriguez-Ortiz, C., Medeiros, R., Myczek, K., Green, K., Baram, T., & LaFerla, F. (2015). Short-term modern life-like stress exacerbates AB-pathology and synapse loss in 3xTg-AD mice. *Journal of Neurochemistry*, *134*, 915-926.

Depression paper

Caspi, A., Sugden, K., Moffitt, T., Taylor, A., Craig, I., Harrington, H., McClay, J., Mill, J., Martin, J., Braithwaite, A., & Poulton, R. (2012). Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science*, *301*, 386-389.

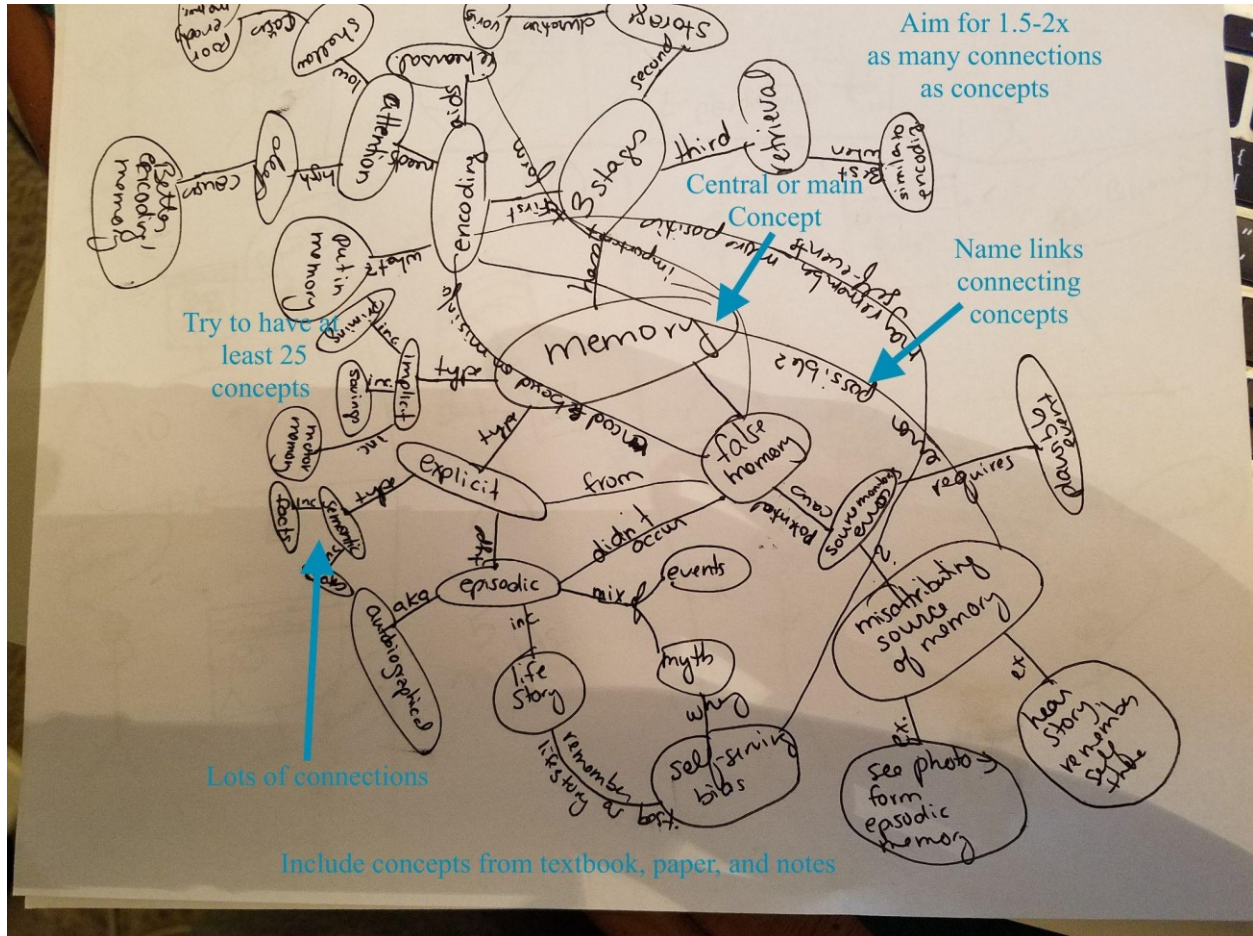
Race and allostatic load paper

Duru, O., Harawa, N., Kermah, D., Norris, K. (2012). Allostatic load burden and racial disparities in mortality. *Journal of the National Medical Association*, *104*, 89-95.

Appendix B

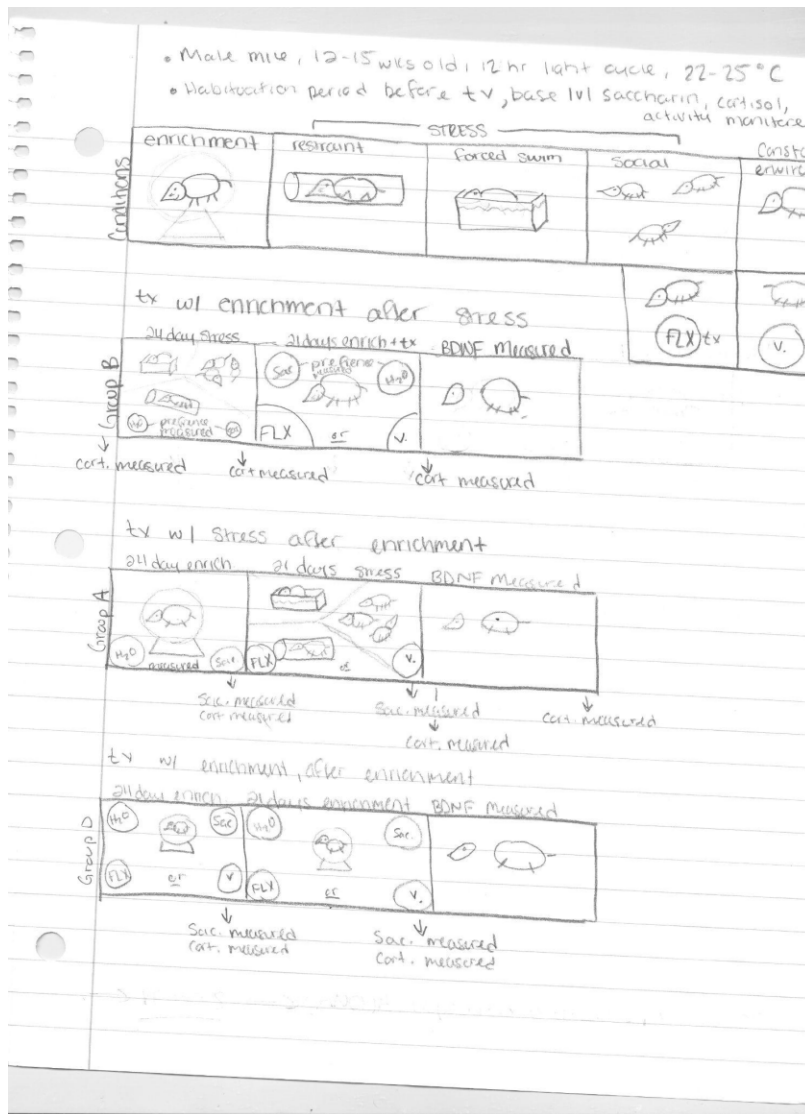
Concept Map

- Pull out all of the keywords/concepts/vocabulary from the article that you think is important
- Include related vocabulary from the textbook
- Create an interconnected web with the concepts being connected by lines that are named and describe the nature of the connection between the concepts.
- This might get messy--*let it get messy!*



Cartoon

- Think of this as a mini-graphic novel or a comic strip.
- You are creating a cartoon that describes all of the steps that the researchers took in this paper.
- From the cartoon, it should be clear what the researchers did, who the participants were, and what the variables were.
- Remember, *this isn't an art class!* Don't worry about making this look pretty or beautiful.



Annotations

- Skip the actual statistics that are written out in the text.
- Instead, go through the tables and figures that are in the document. Mark them up!
- Label the y-axis, x-axis, variables, columns, rows, etc.
- Include the research question that each figure is asking.
- Briefly (1-2 sentences) summarize what these results say about the research question and why they are important.

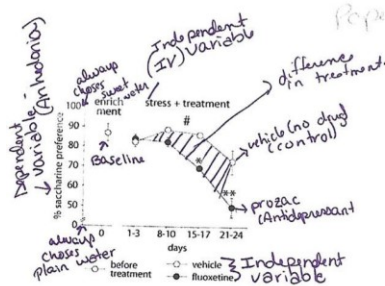


Figure 4. Anhedonic profile during fluoxetine treatment in a stressful condition after exposure to enrichment. When social stress was imposed during treatment, fluoxetine-treated mice showed a faster and more marked reduction of preference for the saccharin solution compared to control mice. # indicates $p=0.0199$, * and ** indicate, respectively, $p<0.05$ and 0.01 vs. vehicle group. Data are means \pm S.E.M.

BDNF - Brain derived neurotrophic factor
 - Promotes cell growth & survival
 - If injected into a brain lower rates of apoptosis (programmed cell death).
 - So, presence of BDNF is good!

Cortisol
 - Part of the stress response.
 - This hormone is released during stress.
 - Higher amounts of cortisol is bad.

Paper 41 Results
 Do rats treated with prozac in a stressful situations have the same level of anhedonia as rats given vehicle?
 - No.
 - By day 21-24 all rats experience anhedonia (do not respond to the same + drink less sugar water than at baseline).
 - Rats given prozac experience more anhedonia than rats given the vehicle

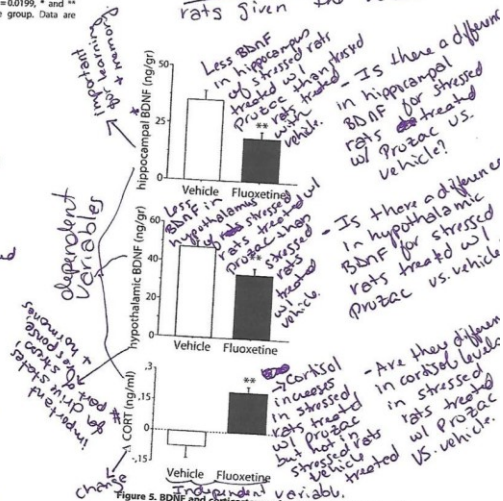


Figure 5. BDNF and corticosterone levels in mice in a stressful conditions after exposure to enrichment. Following social stress mice treated with fluoxetine showed reduced BDNF levels in both hippocampus and hypothalamus compared to control mice. Plasma corticosterone levels resulted increased in fluoxetine mice as shown by the statistically significant difference between levels before and after the treatment period. ** indicates $p<0.01$ vs. vehicle group. Delta (Δ) values were calculated comparing data obtained on the day before treatment and on last day of treatment. Data are means \pm S.E.M.

Less BDNF in hippocampus of stressed rats treated w/ Prozac vs. stressed rats treated w/ vehicle. - Is there a difference in hippocampal BDNF for stressed rats treated w/ Prozac vs. vehicle?
 Less BDNF in hypothalamus of stressed rats treated w/ Prozac vs. stressed rats treated w/ vehicle. - Is there a difference in hypothalamic BDNF for stressed rats treated w/ Prozac vs. vehicle?
 Cortisol increased in stressed rats treated w/ Prozac but not stressed rats treated w/ vehicle. - Are they different in cortisol levels in stressed rats treated w/ Prozac vs. vehicle?

Appendix C

Paper Critique and Synthesis Rubric

| Criteria | Excellent | Satisfactory | Poor |
|---|--|--|---|
| Identify research question and hypothesis | <p>10 to >8.5 pts Excellent Research question(s) and hypothesis(es) are correctly identified. They are phrased clearly and accurately; they are in the student's words.</p> | <p>8.5 to >6.5 pts Satisfactory Research question(s) and hypothesis(es) are mostly correctly identified. There may be minor omissions or a lack of clarity.</p> | <p>6.5 to >0 pts Poor Does not meet the requirements for Excellent or Satisfactory.</p> |
| Connection to previous knowledge | <p>25 to >20.5 pts Excellent There is a clear demonstration of mastery of the course content. The learner clearly connects the paper to material in the class (chapters, lecture, other papers, videos, etc). The connection shows mastery and application of the other course content and the paper. There is an integration of the paper and previous content that is deep and shows that both are understood at a level that is appropriate for an upper-division class.</p> | <p>20.5 to >16.5 pts Satisfactory There is a clear demonstration of understanding of the course content. The learner clearly connects the paper to material in the class (chapters, lecture, other papers, videos, etc). The connection shows an understanding of the other course content and the paper. There is an integration of the paper and previous content that shows that both are understood at a level that is appropriate for an upper-division class.</p> | <p>16.5 to >0 pts Poor Does not meet the requirements for Excellent or Satisfactory.</p> |
| New knowledge | <p>25 to >20.5 pts Excellent There is a clear demonstration of mastery of the course content. The student explains the results within the context of the research question and hypothesis. The discussion of the results places them within the context of previous knowledge and applies them to meaningfully show the contribution of</p> | <p>20.5 to >16.5 pts Satisfactory There is a clear demonstration of understanding of the course content. The student explains the results within the context of the research question and hypothesis. The discussion of the results places them within the context of previous knowledge and applies them to meaningfully</p> | <p>16.5 to >0 pts Poor Does not meet the requirements for Excellent or Satisfactory.</p> |

| | | | |
|----------------------------------|--|---|---|
| | the article to the field. | show the contribution of the article to the field. There may be vague information or a lack of depth in the explanation | |
| Modification and future research | <p>15 to >11.5 pts Excellent</p> <p>The student discusses meaningful a modification that could be made to the study and a future research question that further addresses this paper's research question. These reflect a clear application of concepts learned in the course that show insight into the content.</p> | <p>11.5 to >8.5 pts Satisfactory</p> <p>The student discusses a meaningful modification that could be made to the study or a future research question that further addresses this paper's research question. It reflects a clear application of concepts learned in the course that show insight into the content.</p> | <p>8.5 to >0 pts Poor</p> <p>Does not meet the requirements for Excellent or Satisfactory.</p> |

Appendix D

Final Reflection Rubric

| Criteria | Excellent | Satisfactory | Poor |
|---------------------------|---|--|--|
| Definitions | <p>20 to >16.0 pts Excellent</p> <p>The student includes a thorough and thoughtful definition of stress; the definition includes evidence from the textbook and papers that we read to support their definition. The definition is grounded in a clear understanding of how stress can be studied and understood from a behavioral neuroscience perspective. Supporting evidence is clearly and cogently presented and shows a correct analysis and application of the papers we read this semester.</p> | <p>16 to >12.0 pts Satisfactory</p> <p>The student includes a mostly thorough and thoughtful definition of stress; the definition includes evidence from the textbook and papers that we read to support their definition. There may be minor omissions. The definition is grounded in a clear understanding of how stress can be studied and understood from a behavioral neuroscience perspective. Supporting evidence is mostly clearly and cogently presented and shows a correct analysis and application of the papers we read this semester.</p> | <p>12 to >0 pts Poor</p> <p>Does not meet “Excellent” or “Satisfactory”</p> |
| Change in thought process | <p>40 to >32.5 pts Excellent</p> <p>There is a thorough and thoughtful discussion about how the material that we learned in this class has shaped the way that you think about stress as a biological process. The student references at least four of the papers that we read and other materials (textbook, videos, and readings). There is a mature and thoughtful discussion about how their knowledge about stress has shaped their future approaches to life</p> | <p>32.5 to >25.5 pts Satisfactory</p> <p>There is a thorough and thoughtful discussion about how the material that we learned in this class has shaped the way that you think about stress as a biological process. The student references at least four of the papers that we read and other materials (textbook, videos, and readings). There is a mature and thoughtful discussion about how their knowledge about stress has shaped their future approaches to life</p> | <p>25.5 to >0 pts Poor</p> <p>Does not meet “Excellent” or “Satisfactory”</p> |

| | | | |
|--------------------------|---|--|---|
| | (including at least three of the following: careers, mental health, parenting, and future behavior change). The paper addresses the structural and systemic issues that make stress disproportionately affect some groups. The changes and growth are grounded in the course content for each approach. | (including at least three of the following: careers, mental health, parenting, structural systems, and future behavior change). The changes and growth are grounded in the course content for each approach. oral processes that is grounded in an understanding of the course content. The paper addresses the structural and systemic issues that make stress disproportionately affect some groups. Their may be minor omissions or gaps in how the course content is applied | |
| Spelling, typos, grammar | 10 pts Excellent The paper is entirely free of errors. | 7 pts Satisfactory There are three or fewer errors. | 0 pts Poor There are four or more errors. |
| Flow | 5 points Excellent The paper is free of dysfluencies, is cohesive, cogent, and generally excellently written. | 3 pts Satisfactory The paper reads generally well, but includes awkward or confusing spots. | 0 pts Poor The paper needs substantial work |