Psychology: Journey Toward Self-Knowledge

Teacher Manual

Oak Meadow

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Introduction

This Oak Meadow course, *Psychology: Journey Toward Self-Knowledge*, is designed to introduce students to fundamental principles of psychology, relevant research studies, and prominent theorists who expanded our understanding of human functioning. Throughout the course, students are encouraged to engage with the content through self-referencing activities so their understanding of themselves can deepen and grow as they master the concepts. The topics covered in this course were chosen with care and intention; each facilitates self-knowledge, growing awareness, and identity formation—the central concerns for the developing adolescent.

As a social science, the study of psychology bridges the disciplines of philosophy and biology in its quest to comprehend human thought and behavior. The course is designed to engage the students in both aspects of the inquiry, facilitated by a focus on four unifying themes:

- Everything psychological is simultaneously biological
- Nature via nurture
- The impact of evolution on thoughts and behavior
- The unconscious mind

Students will examine these themes throughout the course.

In this teacher manual, answers are seen in **orange**. You will also find the full text for all assignments plus brief lists of the activities. For the full content of the course and instructions for all activities, please refer to the student coursebook.

When assessing student work, if a student misunderstands a factual question, you can share the correct answer with them to clarify any misconceptions. If they answer many of the factual questions incorrectly, encourage them to review the reading assignment or associated videos for better comprehension.

Clearly, it is best not to share this teacher manual with your student, as they are expected to produce original work. Any indication of plagiarism needs to be taken seriously. Make sure your student is familiar with when and how to attribute sources. These conventions are explained fully in the appendix of the student's coursebook. Although high school students should be fully aware of the importance of academic integrity, you are encouraged to review its significance with your student at the start of the course (information on this is also found in the appendix).

We encourage you to join your student in discussing the material in this course. Taking a special interest in your student's work can result in greater engagement and effort. The study of human thought and behavior is not only fascinating, it is also naturally relevant to our healthy functioning in an ever-changing world.

A Note About the Workload

Students vary greatly in terms of reading speed, reading comprehension, and writing ability. Some may find the reading in this course takes longer than expected; others may find the writing assignments take a great deal of time. In general, students can expect to spend about five hours on each lesson (or ten hours for a double lesson). Students who need more time to complete the work might modify some lessons to focus on fewer assignments or opt to complete some of the written assignments orally. Modifications like these can allow students to produce work that is of a higher quality than if they were rushing to get everything done. Each lesson in this course can be customized to suit your student's needs.

Keep an eye on the workload as your student progresses through the course, and make adjustments so they have time for meaningful learning experiences.

Lesson

1

The History of Psychology

Learning Objectives

In this lesson, you will:

- Become familiar with the evolution of the field of psychology and the prominent theorists who influenced its development.
- Learn about levels of analysis and theoretical perspectives employed by contemporary psychologists.
- Encounter various subfields of psychology and their application to our understanding of the world.

Before You Begin

Spend a few minutes flipping through your textbook. Notice the chapter headings in the table of contents, as well as the pictures, cartoons, and graphs spread throughout the book. What intrigues you and captures your attention? What do you already know? What topics would you like to learn more about? What sparks your curiosity?

Set a timer for 15 minutes, and explore these questions in a freewriting exercise. The "no rules" format of freewriting is a great way to explore how topics relate to one another and connect to your previous knowledge and experiences. You do not have to write in complete sentences or be concerned with correct grammar or spelling. Just let your thoughts go, allow your pen to move, and see what emerges from the process.

ASSIGNMENT SUMMARY

- ☐ Write about what interests you about the study of psychology.
- ☐ In your textbook, read the Student Preface and Module 1.
- ☐ Watch the video "Intro to Psychology: Crash Course Psychology #1" and write a reflection.
- ☐ Create a time line of the field of psychology.
- ☐ Match theoretic perspectives to behavior and motivation.
- ☐ Activity: Who Are You?
- ☐ Complete a learning style survey, and write a reflection.

Reading

In your textbook, read the following:

- Student Preface
- Module 1, "The History and Scope of Psychology"

As you read, pay special attention to the key terms in bold print (and defined in the margins), as well as the images, cartoons, graphs, and questions in the chapter. Take notes that you can refer to when you work on the activities and assignments.

Many psychologists encourage students to take notes in outline form because outlines hierarchically organize ideas, with the main principles as major headings and the supporting ideas listed below. This method facilitates deeper cognitive processing and leads to easier recall of the material. However, you may have developed a personal practice of note-taking that supports your learning style efficiently, and you should feel free to use it. Perhaps you like to draw diagrams or color code the concepts that relate to one another. You are encouraged to experiment with new forms of note-taking as you become more aware of your unique style of cognitive processing.

Watch and Reflect

For a lively review of the material presented in your textbook, watch this Crash Course video:

"Intro to Psychology: Crash Course Psychology #1"

https://www.youtube.com/watch?v=vo4pMVb0R6M

If you have never seen a Crash Course video, brace yourself: the narrator is a fast-talking guy! Although we will only assign a few Crash Course videos, you can use any episode in the series at any time to review and clarify the material you read about in your textbook. However, do not rely on them to replace your reading—they do not cover all the material provided in your textbook.

After viewing Crash Course Psychology #1, write a brief reflection on the most memorable concepts you learned. Mention the concepts that might be confusing to you and pose any questions you have regarding them.

Assignments

1. To help you understand the evolution of psychology, your first assignment will be to create a time line from 1879 to current times. Create your time line by hand (rather than in digital form). At each significant date on your time line, enter the names of the famous psychologists you read about in addition to their primary area of focus. You can color code your time line to indicate the prominent years of the differing schools of thought, such as structuralism, functionalism,

behaviorism, etc. If you like, you can find images of the famous researchers and glue them onto your time line near their names.

The time line should include the prominent theorists and schools of thought. The inside front and back covers of the textbook contain a time line that is much more extensive than this assignment requires. You can use it for reference.

2. Have you ever heard the joke, "Why did the chicken cross the road?" In this assignment, you'll look at the chicken's behavior through different psychological lenses.

   There are several different perspectives that psychologists use to investigate and analyze a topic of interest. For example, a behaviorist will look at a problem through the lens of environmental conditioning, noticing how we learn from our associations and are shaped by the rewards or punishments we receive following certain behaviors. In contrast, a psychodynamic theorist will consider the role of unconscious motives and desires when assessing thoughts and actions.

   Before you begin the following activity, review the seven major contemporary theoretical perspectives in your textbook:

   - Behavior genetics
   - Neuroscience
   - Behavioral
   - Evolutionary
   - Psychodynamic
   - Cognitive
   - Social-cultural

   Now it's time to apply these theoretical perspectives:

   The chicken crossed the road (behavior), but why?

   Choose the correct theoretical perspective from the list above to explain the chicken's behavior.

   a. The chicken was performing her traditional mating ritual.

      social-cultural

   b. The most nutritious chicken feed was on the other side of the road.

      evolutionary

   c. The chicken was trying to solve the problem of how to reach the other side.

      cognitive

   d. The chicken had been rewarded for crossing the road in the past.

      behavioral

e. The chicken's mom was a big risk-taker and liked to dodge passing trucks. This chicken liked to do that too.

behavior genetics

f. The chicken's motor cortex was activated by messages from its hypothalamus.

neuroscience

g. The chicken has an unconscious desire to expand its territory and find a mate.

psychodynamic

h. Now it's your turn. Think about a specific behavior and come up with seven reasons to explain it, each one reflective of a different contemporary theoretical perspective. Be sure that your explanations highlight the essential points of each view.

The student should explain their chosen behavior from each of the perspectives by including the key elements of the theoretical perspective in the explanation. Below is a brief description of each perspective.

Neuroscience: the physical body (in particular, the brain) influences and controls emotions and other experiences.

Evolutionary: the natural selection of traits over time has a survival basis.

Behavior genetics: genes and environment interact to influence personal traits.

Psychodynamic: unconscious drives influence behavior.

Behavioral: learned responses can alter behavior.

Cognitive: the way information is processed, stored, and retrieved affects memory, critical thinking, and other mental processes.

Social-cultural: cultural and social influences impact behavior and thinking.

Activities

Complete the activity below.

Activity: Who Are You?

Create a collage, painting, or drawing that represents you and the significant aspects of your life: your interests, values, talents, hopes, dreams, challenges, and sources of joy. You can draw this by hand, or use images from magazines, photos, found objects, or any other materials that suit your ideas for creative expression. As this is the beginning of your journey toward self-knowledge, use this activity to reflect on yourself at this point in your life.

You do not have to be an accomplished artist to engage in this activity; feel free to approach it in whatever creative way you choose. At the end of the semester, you will have the opportunity to create

another self-portrait that will be paired with this one to create a diptych (two related pieces of art joined together to create a cohesive whole).

This activity is offered as a vehicle to begin the focus on self-knowledge in connection with the psychological concepts the student will encounter in the course. They can choose to express the aspects of their personality in any way, as long as they address each component to some degree: interests, values, talents, hopes, dreams, challenges, and sources of joy.

Investigate, Reflect, and Apply

Examine your learning style by taking the inventory below:

> "Diablo Valley College Learning Style Survey"
>
> https://www.dvc.edu/enrollment/counseling/lss/index.html

Reflect on your results in relation to your perception of yourself. Remember that sometimes inventories can catch you in a certain mood, energy level, or time of day that might affect the outcome. Keep that in mind if your scores do not seem to represent what you know to be true about yourself. Write a few sentences about your experience.

FOR ENROLLED STUDENTS

When you have completed this lesson, please share your work with your teacher. If you have any questions about the lesson assignments or how to share your work, let your teacher know. If you would like to modify any of the assignments or activities (now or in the future), please consult with your teacher first.

Lesson

2

Psychological Research Methods

Learning Objectives

In this lesson, you will:

- Examine the strengths and limitations of psychological research methods.
- Become familiar with the significance of operational definitions and ethical considerations.

Reading

In your textbook, read the following:

- Module 2, "Research Strategies: How Psychologists Ask and Answer Questions"

Watch and Reflect

Watch the following video:

"Psychological Research: Crash Course Psychology #2"

https://www.youtube.com/watch?v=hFV71QPvX2I

Afterward, write a reflection that comments on the most memorable concepts you learned. Mention the concepts that might be confusing to you, and pose any questions you have regarding them.

Assignments

1. Psychologists use a variety of research methods to find the answers they seek, including the survey method, naturalistic observations, case studies, and experimentation. Each method has benefits and limitations. Review the practices in your

ASSIGNMENT SUMMARY

- ☐ In your textbook, read Module 2.
- ☐ Watch the video "Psychological Research: Crash Course Psychology #2" and write a reflection.
- ☐ Identify advantages and disadvantages of different research methods.
- ☐ Formulate questions best suited to each research method.
- ☐ Identify dependent and independent variables, and write operational definitions.
- ☐ Choose one activity:
  - Activity A: Create an Experiment
  - Activity B: Psyche and Eros
  - Activity C: Be a Smart Consumer (of Information)
- ☐ Project: Successful Studying

textbook, and complete the chart below by providing an advantage and a disadvantage for each method.

Below are some pros and cons for each method. The student might also think of others that are appropriate.

Method	Advantage	Disadvantage
Survey	**Can gather a large amount of data easily** **Can find out information otherwise difficult to ascertain like political perspectives or sexual attitudes**	**Self-report bias hinders the accuracy of data** **Random samples are imperative and can be hard to generate**
Naturalistic Observation	**Relatively easy to conduct a study** **Technology aids can increase the size of the study** **Descriptions of behavior can lead to further studies**	**Does not explain behavior** **Does not control for variables**
Case Study	**Provides in-depth information for understanding specific conditions** **Relatively simple to conduct**	**Findings are difficult to generalize** **Results are subject to experimenter bias** **Does not explain behavior or establish cause and effect relationships** **Can be expensive to conduct**
Experiment	**Provides cause and effect relationship** **Explains behavior**	**Findings in a lab do not always represent actuality** **Must be ethical** **Must be carefully designed to control variables**

2. Think of a question that can be investigated best by each research method. For example, if you want to know how people intend to vote in the next election, it would be efficient to use a survey because you can gather a large amount of data at a minimal cost and time. But, if you want to find out if conjoined twins are at risk for alcoholism, you would probably use the case study method because you will need to take an in-depth look at a few exceptional cases. Considering

the pros and cons you listed in the chart above, generate a question for each method, and write it in the space below.

The student should generate four appropriate questions, one for each method. The questions should relate to the strength and capability of the method.

3. In all areas of science, researchers need to consider their operational definitions carefully. Operational definitions are carefully worded statements of the exact procedures used in a research study. They are particularly important in psychological research because many of the concepts psychologists wish to understand are abstract rather than concrete. For example, if researchers want to know if regular exercise leads to a greater sense of happiness, how can they define happiness in a specific way so that it can be measured scientifically? And what do they mean by regular exercise?

   Research studies must be designed in a way that ensures they can be replicated in future studies, so the exact procedures and measurements must be clear. In our example of the influence of exercise on happiness, perhaps happiness will be scientifically measured by the number of times a person smiles over a two-hour period while socially engaged or the number of times a person laughs while watching a comedy movie. Regular exercise might be defined operationally as 30 minutes of aerobic activity per day for three weeks. There are many ways a variable can be defined operationally, and researchers must be creative and practical when they design their studies.

   To solidify your understanding of these ideas, carefully read each of the hypotheses below. Provide your own operational definitions for the independent and dependent variables. If you are unclear about the meaning of independent and dependent variables, keep this fact in mind: the experiment is the only research method that provides a cause and effect relationship. It would help if you thought of the cause as the independent variable. It is the condition that the experimenter wants to assess and thus manipulates. The effect is the dependent variable or what happens as a result of the manipulation of the independent variable. (Review the section on independent and dependent variables in your textbook if these terms are still confusing to you.)

   As you design your operational definitions, remember that you are the creator here, so you can be inventive with your procedures as long as you make sure they are practical and ethical.

   Here is an example:

   Hypothesis: If children watch violent movies, they will act more aggressively.

   Independent variable (IV): *exposure to violent movies*

   Operational definition (OD): *Children (age 8) will watch one hour of violent film per day for two weeks.*

   Dependent variable (DV): *level of aggressive behavior*

   Operational definition (OD): *After two weeks of watching violent movies, the children will be put in a frustrating situation; their toys will be taken from them. Their levels of aggression will be observed and measured counting the number of instances of verbal aggression, physical aggression, or both.*

Now it's your turn.

For each of the hypotheses below, there are many different ways an operational definition can be formulated. The key element is that the definition must be specific and measurable. Examples are given for each, but student answers will vary.

Hypothesis A: If people exercise more, it will make them smarter.

Independent variable (IV) **exercise**

Operational definition (OD) **Example: Subjects will perform 30 minutes of aerobic exercise per day for 14 days in a row.**

Dependent variable (DV) **increased intelligence**

Operational definition (OD) **Example: Changes in memory skills will be demonstrated by administering and comparing a pretest and a posttest.**

Hypothesis B: If children eat sweet food, they will feel happier in school.

Independent variable (IV) **eating sweet food**

Operational definition (OD) **Example: Subjects will consume 600 grams of sugar per day for 5 days.**

Dependent variable (DV) **happiness level**

Operational definition (OD) **Example: The number of times the subject smiles in a period of one hour of classroom time will be recorded.**

Hypothesis C: If people spend a lot of time on social media, they will be more likely to feel insecure.

Independent variable (IV) **time on social media**

Operational definition (OD) **Example: Subjects will spend six hours per day on social media.**

Dependent variable (DV) **feelings of insecurity**

Operational definition (OD) **Example: Level of insecurity will be measured by a survey pertaining to self-esteem.**

Hypothesis D: If babies are fed breast milk, they will have higher intelligence.

Independent variable (IV) **consuming breast milk**

Operational definition (OD) **Example: The experimental group will be fed only breast milk, and the control group will be fed only formula.**

Dependent variable (DV) **level of intelligence**

Operational definition (OD) **Example: Tests measuring IQ levels will be administered at 10-year intervals for 30 years. (Note: The student should indicate this would be a longitudinal study.)**

Hypothesis E: If students listen to Spanish music while sleeping, they will do better in Spanish class.

Independent variable (IV) **listening to Spanish music**

Operational definition (OD) **Example: Subjects will play a two-hour recording of Spanish songs when they go to bed for six nights in a row.**

Dependent variable (DV) **improved work in Spanish class**

Operational definition (OD) **Example: Scores on tests administered in Spanish class before the experiment will be compared with those after the experiment.**

Activities

Choose one of the following activities to complete:

- Activity A: Create an Experiment
- Activity B: Psyche and Eros
- Activity C: Be a Smart Consumer (of Information)

Activity A: Create an Experiment

Now that you've had some practice with operational definitions and independent and dependent variables, create your own experiment! If possible, choose a question that you included in your freewriting exercise in lesson 1, or choose another topic that you are motivated to investigate. Imagine you are a psychological researcher determined to uncover the answer in an experimental design.

For your experiment, you should:

- Generate a hypothesis.
- Identify a control group and an experimental group.
- Identify the independent and dependent variables and their associated operational definitions.
- Describe your procedures.
- Attempt to identify all the confounding variables that might influence your results. Review the American Psychological Association Guidelines for Ethical Research on pages 30–31 of your textbook, and make sure that your experiment would meet the approval of an independent review board.
- Safeguard against possible flaws like experimenter bias and the placebo effect.

The student's experiment should address the criteria listed above. Students are often confused about the independent and dependent variables; some may need coaching to find ways to control the variables. They should offer specific operational definitions.

Activity B: Psyche and Eros

The term *psychology* is derived from the Greek words *psyche* and *logos*. *Psyche* is often translated as *soul*, and it is represented as a butterfly, while *ology* denotes scientific study. Are you familiar with the myth of Psyche and Eros? If not, you can read it online or in a book of mythology. Here is one version:

> "The Story of Psyche and Eros"
>
> https://webspace.ship.edu/cgboer/psyche.html

Think deeply about the myth. Although one would probably define the soul as the immaterial part of the individual that remains immortal, the tale of Psyche and Eros provides a more complex interpretation. Do you think the themes of the myth bear relevance to the true meaning of the word *psychology* and the goals of the discipline? If so, in what way? Write a reflection that describes your ideas about this question; there are no right or wrong answers to this question! Write approximately one page.

The student will offer ideas that reflect on the myth, especially the trials and challenges that Psyche needs to resolve to reunite with Eros and become a goddess.

Activity C: Be a Smart Consumer (of Information)

Advertisers frequently present correlational studies with the intent of convincing the public that the relationship between the two variables implies causation. For example, if an advertisement said that studies indicate that people who floss regularly have less risk of heart disease, a person might think that flossing will ensure a healthy heart and therefore buy a lot of dental floss at a high price. In reality, many other factors may contribute to the correlative relationship. For instance, people who floss regularly might also engage in other health-promoting activities like daily exercise and a healthy diet. Another study might indicate that there is a correlation between a high-fat diet and happiness so that an unsuspecting consumer might load up with high-fat ice cream and bacon when, in reality, many other factors might contribute to the relationship, such as income level, temperament, availability of desired food, age, gender, etc. Critical thinkers are always aware that they must consider multiple factors when they assess the relationship between two variables, and that correlation does not prove causation.

For this activity, find four advertisements that present correlational studies. You can look for them in magazines, newspapers, and on the internet. Analyze the message they attempt to offer and then think of the many other variables that warrant consideration in the evaluation of the relationship.

Write up your findings along with your ideas regarding the unreported variables.

There are many correlational studies the student can analyze. Special attention should be given to considering all the other variables that might contribute to the relationship of the correlates. This activity helps students understand that correlation does not prove causation.

Investigate, Reflect, and Apply

Project: Successful Studying

Some of the most relevant applications of psychological research focus on ways to help students improve their study and time-management skills. The authors of your textbook have researched strategies that support academic success, woven those strategies into the presentation of the material in the book, and described them in the Student Preface and at the end of Module 2. These guidelines will support your mastery and retention of the many concepts you will learn throughout the semester. Don't forget to try the SQ3R method presented in your textbook (survey, question, read, retrieve, review) as you proceed through the course.

This project focuses on improving your study skills.

1. Begin by assessing your current study habits. What are your strengths, and what are your challenges? Think about the ways you would like to improve, especially keeping in mind the strategies that support your personal learning style and the obstacles that prevent you from reaching your goals.

   As you consider your current study habits and the ways you organize your time, reflect again on the principles you read about in the textbook to determine which ones might be of particular use to you.

2. Create an action plan to put into practice specific strategies for academic success.
3. Evaluate the efficacy of each strategy at weekly increments during the next month or until you reach your goals.
4. Generate a chart with your target behaviors and incremental goals to help you keep track of your progress. Limit yourself to two or three goals so you don't get overwhelmed.

   For example, perhaps you noticed that it would be beneficial for you to spend less time on social media and more time with your studies. And maybe you want to increase the number of hours you sleep so that your cognitive processes and your ability to stay focused will increase. You would first determine how many minutes per day you will need to reallocate each week, and then you would keep track of your progress as the weeks progress. Below are sample charts for these goals.

   Your chart will identify your own current and target behaviors.

Encourage students to start with simple and attainable goals for this project. They should establish a systematic method for self-assessment. Students may want to incorporate a system of rewards in addition to the intrinsic rewards for enhanced study skills. They will learn more about this in the chapter on learning and conditioning. See the student coursebook for examples of how a chart might be structured.

FOR ENROLLED STUDENTS

When you have completed this lesson, please share your work with your teacher. Include a copy of your chart for your goals related to studying, even though you will continue working on your goals for several weeks.

If you have any questions about the lesson assignments or how to share your work, let your teacher know.

Lesson

3

Encoding and Retrieving Memories

Learning Objectives

In this lesson, you will:

- Become familiar with the underlying processes and stages of memory.
- Identify the various categories of memory along with their associated brain regions.

Before You Begin

Think about your earliest memory. Write about it with as much detail as you can.

- How old were you?
- Who was with you during the event?
- Describe the action, environment, colors, sounds, smells, emotions, or any other aspects of the situation that come to mind.
- Why do you remember that particular event?

Now ask five friends or family members to share their earliest memories with you. Ask them the questions above when they describe their memory. Can you see any themes that emerge in the types of memories you gathered?

Reflect on this process in a freewriting exercise. Set your timer for 10 minutes, and write whatever comes to mind regarding this experience without concerning yourself with grammar, punctuation, and other writing conventions.

ASSIGNMENT SUMMARY

- ☐ Recall your earliest memory.
- ☐ In your textbook, read Module 22 and Module 23.
- ☐ Watch two videos about memory, and write a reflection.
- ☐ Create a diagram of memory processes.
- ☐ Create a diagram of brain regions involved in memory.
- ☐ Choose one activity:
  - Activity A: Flashbulb Memories
  - Activity B: Memories in the Movies
  - Activity C: Memories in Literature, Poetry, Art, and Music

In this exploration of early memories, the student might notice that the first event most people remember has strong emotional content and usually occurred between the ages of three and four years old. There might be some reports of memories at an earlier age, particularly if the events were highly emotional.

Reading

Read the following modules in your textbook:

- Module 22, "Studying and Encoding Memories"
- Module 23, "Storing and Retrieving Memories"

Take notes as you read, and pay attention to charts, graphs, and images.

Watch and Reflect

Watch both of the following videos:

"Feats of Memory Anyone Can Do"

https://www.youtube.com/watch?v=U6PoUg7jXsA

"Remembering What Matters "

https://www.youtube.com/watch?v=6UfDVIiu_BU&t=2s

Choose one of the videos, and write a reflection. Include the following in your reflection:

- Brief summary of the video
- Description of how it relates to your personal life experience as well as the concepts you read about in the chapter
- Description of what impressed you most about the video and the significant idea(s) you will take from it

In "Feats of Memory Anyone Can Do," the student should be able to see the connections between visual imagery and memory, as well as how emotions and personal reference enhance memory and recall. There are several other aspects of the video that could impress them, especially that the narrator went on to win the memory championship. The student should relate the concepts to their life experience.

"Remembering What Matters" highlights the relationship of emotions to memory by identifying the role of adrenaline in memory formation in experiments with rats and with humans. The student should relate the concepts to their life experience.

Assignments

1. Create a box and arrow diagram of memory processes that includes the terms listed below. You can use images from magazines or the internet to enhance your graphic organizer, or you can color code your diagram to indicate the significant processes of encoding, storage, and retrieval, and the sub-processes that fit within each major one.

- Sensory input
- Sensory memory
- Encoding
- Short-term memory/working memory
- Storage
- Long-term memory
- Retrieval
- Rehearsal
- Implicit memory
- Explicit memory
- Episodic memory
- Procedural memory
- Emotional memory
- Semantic memory

The student's diagram should contain all the processes and components of memory listed above. There is a simple box and arrow diagram on page 269 of the textbook. The student's layout can resemble it, but long-term memory storage should be divided into different classifications: implicit memory contains emotional and procedural memory, and explicit memory includes episodic and semantic memory.

2. Create a diagram of the brain that shows the major regions involved in memory functions: the amygdala, hippocampus, cerebellum, and prefrontal cortex.

   Add images or drawings that relate to the memory function in each region. For example, you might put an image of a person riding a bicycle on the cerebellum to represent procedural memory. Some regions might require more than one image because they are involved in multiple memory functions.

   Students may want to use a brain diagram from the textbook or online as a starting point and add images in the appropriate regions. For instance, the frontal lobes and hippocampus are involved in conscious (explicit) memory formation; the cerebellum and basal ganglia are involved in implicit memory formation, which includes behavior that happens without conscious thought (such as riding a bike); and the amygdala is involved in forming memories related to emotions (including trauma and stress).

Activities

Choose one of the following activities to complete:

- Activity A: Flashbulb Memories
- Activity B: Memories in the Movies
- Activity C: Memories in Literature, Poetry, Art, and Music

Activity A: Flashbulb Memories

Psychologists are fascinated with the concept of flashbulb memories. For this assignment, you will interview four friends or family members about their flashbulb memories. To begin each interview, describe the concept of a flashbulb memory and why it occurs. (Think about the biological, emotional, and evolutionary reasons.) Then ask your participants to share their memories with you using as much detail as possible. After you have collected the memories and written them down, see if you can find themes or similarities between the various flashbulb memories.

- Did any of the people you interviewed recall a collective flashbulb memory?
- How certain were they that their memories were accurate?
- What sorts of details did they remember most?
- What was the emotional content of each memory?
- Were the flashbulb memories of your interviewees more positive or negative in their emotional content?

Be on the lookout for other similarities or themes that emerged.

Write a reflection that analyzes your data and comments on the themes that emerged from the responses you received.

This activity is designed to help the student gather more information regarding the impact of adrenaline on memory formation. They might notice that more flashbulb memories concern adverse rather than positive events; this reflects the negativity bias of the brain that is linked to survival needs.

Activity B: Memories in the Movies

Watch the Pixar movie *Inside Out*. Write a movie review from a psychological perspective, one that might appear in a psychology magazine or journal. Consider the following questions as you write your review:

- How accurately did the animators depict memory processing in the film?
- Did the overall theme of the movie reflect what psychologists know about memory and its influence on our lives? If so, in what ways?

- How were memories depicted in ways that were inaccurate or oversimplified?
- Were the colors used by the animators significant? If so, why?
- If you could change the film to make it more accurate, what would you change?

Add any new insights you might have regarding your understanding of memory and its depiction in the film.

The student should identify the many ways that memories are depicted in the movie, and then relate them to the concepts presented in the textbook, such as the link of emotions to memory and the influence of episodic memories on personal identity. There are several fanciful images and themes that students can discuss in addition to imagining how they might change the film, given what they now know about memory formation and retrieval.

Activity C: Memories in Literature, Poetry, Art, and Music

Given the fact that our memories play such a vital part in our lives, they often show up in various art forms, and their significance is depicted in many creative ways. For this assignment, research examples of memory from whatever art form is most appealing to you (literature, poetry, visual art, music, drama, dance, etc.). Write an analysis of one or two examples that you found, relating the imagery, symbolism, plot, characters, or other elements to the concepts covered in the textbook. Here are examples of a painting and a poem. You can use these for your project or find others that intrigue you.

This activity is designed to help students recognize the concepts they are studying in artistic expressions of poetry, literature, and art. Students should identify the critical memory principles at play in the piece and discuss the way the artist depicts them. They should comment on the impact of the choices made by the artist.

FOR ENROLLED STUDENTS

You will share your work from this lesson at the end of lesson 4. For the rest of the course, you will submit your work to your teacher every two lessons (at the end of each even-numbered lesson). In the meantime, if you have any questions, let your teacher know.

Lesson

4

Memory Construction and Improving Memory

Learning Objectives

In this lesson, you will:

- Develop an understanding of false memories.
- Learn the best techniques for improving memory.

Reading

Read the following in your textbook:

- Module 24, "Forgetting, Memory Construction, and Improving Memory"

Take notes as you read and pay attention to charts, graphs, and images.

Watch and Reflect

1. Eyewitness testimony is often less accurate than expected, and it has led to the unfortunate incarceration of many innocent people. To deepen your understanding of this concept, watch the following:

   "Eyewitness Testimony, Part 1"

   https://www.youtube.com/watch?v=u-SBTRLoPuo

   "Eyewitness Testimony, Part 2"

   https://www.youtube.com/watch?v=I4V6aoYuDcg

   After watching the videos, write a reflection in which you:

   - Briefly summarize the videos, and describe how the story of Jennifer and Ronald relates to the concepts you read about in the chapter.

ASSIGNMENT SUMMARY

- ☐ In your textbook, read Module 24.
- ☐ Watch four videos related to memory, and write reflections on each.
- ☐ Watch a video about false memories, and write a reflection.
- ☐ Write an essay on improving memory or false memories.
- ☐ Project: Strengthening Memory Skills
- ☐ Complete the Four Themes Analysis.

- Explain how faulty identification can be avoided.
- Share your response to the videos by describing what made the biggest impression on you.
- Identify the significant idea(s) you will take from them.

These videos highlight the unreliable nature of eyewitness testimony through the sad but inspiring story of Jennifer Thompson and Ronald Cotton. The student should be able to discuss the ways that eyewitness testimony can be framed to yield more accuracy. The power of forgiveness is very impressive in this video, and the student might comment on it.

Further Investigation (optional)

Do some research about the organization called The Innocence Project.

http://www.innocenceproject.org

2. Watch the short video clip below:

   "Creating False Memories"

   https://www.youtube.com/watch?time_continue=4&v=zcjYB1hLzLg

   Afterward, comment on the techniques the researchers employed to create false memories. Why were they effective? What is your response to this research?

   This video highlights the ease with which memories can be vulnerable to suggestion, especially with technologies such as photo and video manipulation software.

3. Watch the TED Talk below in which researcher Elizabeth Loftus explains how memory is unreliable.

   "How Reliable Is Your Memory?"

   https://www.youtube.com/watch?v=PB2OegI6wvI

   Reflect on what you learned. Comment on the information that was new to you and what you will take away from this talk. Have your ideas about your own memory's accuracy been modified by watching this video?

   The memory construction studies conducted by Elizabeth Loftus are presented on page 290 of the textbook. The video reviews this famous car crash study and presents a few more studies to illuminate the concepts.

Assignments

1. Choose one of the following essays to complete:

   Option A: Test Stress

Imagine your close friend is having a lot of trouble in history class and is stressed out because a big test is coming up. Having just studied how memory works and how to master material effectively, you calm down your friend and offer solid advice backed by psychological research for successful study and recall of information. Explain how memory works by identifying the main processes, and then give advice to your friend for skillful studying and memory improvement. Be detailed in the help you offer, and include at least five practical suggestions. Explain the reason why each idea is significant, and include the examples or concepts presented in the relevant videos.

The student should identify the primary memory processes of encoding, storage, and retrieval. They should include the following advice for the friend:

Rehearse the skills.

Make material meaningful.

Get adequate sleep.

Activate retrieval cues.

Use mnemonic devices.

Use visual imagery.

Test your knowledge.

Option B: False Memories

Memories are more vulnerable, fragile, and prone to distortion than we usually think they are. Discuss the concepts involved in false memory construction and the many ways our memories can be distorted and modified. Mention topics highlighted in the videos you watched, and note the theories and the theorists who researched the issues. Is there a foolproof way to determine if a memory is accurate or not? Why or why not?

In this essay, the student will discuss the concepts of source amnesia and the misinformation effect. They can tie these concepts to information presented in the above videos to substantiate their comments. There is not a foolproof method to determine if a memory is accurate or not. Reviewing the section on childhood sexual abuse as it relates to repressed memories (see page 293 of the textbook) will help identify some of the complex issues involved in the question.

Investigate, Reflect, and Apply

Project: Strengthening Memory Skills

Investigate your memory skills by participating in the following online memory assessments:

"Memory Test"

https://www.psychologytoday.com/us/tests/iq/memory-test

"Short Term Memory Test"

https://faculty.washington.edu/chudler/stm0.html

Test My Brain

https://www.testmybrain.org/

Remember that memory skills can be enhanced with motivation and practice, so don't be disheartened if your scores are lower than you would like them to be. Notice if you are better at verbal or visual memory tasks, or if you can better remember the details or the big picture of an event or situation. Reflect on your strengths as well as the areas that need improvement.

Afterward, make a plan for strengthening your skills by adopting some of the memory strategies outlined in the chapter, videos, or online assessments. Be specific with your plan of action, and create a way that you can assess your improvement as the weeks progress. Try to incorporate the memory strategies that will be the most effective for your particular learning style. And don't forget that it's crucial to get an adequate amount of sleep each night, so work that into your plan.

Create a document or chart in which you identify your memory strengths and weaknesses, and devise a plan for application and evaluation. Your chart can resemble the one you created for the Investigate, Reflect, and Apply project for lesson 2, or you can generate a different type.

The student's assessment should be specific with targeted goals. Remind the student to set up a schedule to monitor progress and to work in some rewards.

Four Themes Analysis

The goal of this ongoing assignment is to encourage you to notice the four overarching themes of our course as you progress through the lessons. This process will require some detective work from you as you carefully keep the themes in mind while you read your textbook and watch the assigned films. You will begin to see and appreciate a complex web of interconnected psychological processes that influence one another.

Begin this project by considering the four overarching themes:

1. Everything psychological is simultaneously biological
2. Nature via nurture
3. The impact of evolution on thoughts and behavior
4. The unconscious mind

Let's take a closer look at each theme.

1. Everything psychological is simultaneously biological

Advances in technology in the past few decades have actively changed the way we see and understand ourselves and how we operate within the world. This is especially true in the realm

of psychology. Fifty years ago, a researcher might have deduced that there is a relationship between certain parts of the brain and individual states of being by noticing changes in behavior following a head injury or a degenerative illness. Now, with the many forms of technology and neuroimaging at our disposal, we can peer inside the brain and the body to observe the connections between biological processes, thoughts, and behaviors. Before these advances in technology, the mind and body were considered to be separate entities by many medical and psychological professionals. But as technology has shown us, the interconnections are far too pervasive to find a separation between the two, and most professionals now appreciate the mind-body connection as one interrelated process. Be on the lookout for the various ways this idea will show up in the topics you are studying.

2. Nature via nurture

Similar to the idea of a separation between the mind and body, psychologists were previously divided in their orientation between the seemingly polar influences on human development and behavior: nature or nurture. Some psychologists attributed our identities to the unique constellation of traits we inherit from our parents (nature), while others believed that our environmental conditions (nurture) held all the power in determining the outcome of our behaviors and developmental trends. However, the current psychological perspectives on these two forces bridge the divide and eradicate the separation. Psychologists now see nature and nurture united in a dance, each taking a leadership role in differing circumstances, but generally moving together. Thus, it is now thought of as "nature *via* nurture" instead of "nature *versus* nurture."

You will witness the interplay of nature and nurture in many forms. Notice how the particular combination of influences can lead an individual to take a turn for the better or the worse. Also, pay attention to how therapeutic modalities can enter the situation from either side, nature or nurture, to affect the desired change.

3. The impact of evolution on thoughts and behavior

After Charles Darwin published *On the Origin of Species* in 1859, the concept of natural selection became an organizing principle in the scientific understanding of biological processes. It is no surprise that this perspective is embraced by psychologists as well, as they try to understand some of the root determinants of internal and external psychological phenomena. For example, the cascade of hormones released during times of extreme stress relates to our evolutionary mechanism for survival. We needed those hormones to enable our bodies to quickly escape from the jaws of a predator when we had little else to protect ourselves. Now, when we are about to give a presentation in front of a large group of people or when we are about to take a test, we might experience similar sensations from those same hormones involved in the fight, flight, or freeze response. This process is of great interest to evolutionary psychologists, who identify the many inherent mechanisms for survival that can help or hinder our human functioning in current times. They have come to see that some of these mechanisms occur below

our conscious awareness. As you progress through the course, notice the many of these evolutionary forces at work in psychological functioning.

4. The unconscious mind

The famous psychologist Sigmund Freud contributed many noteworthy ideas to the field of psychology in the early part of the twentieth century. Although psychologists now view some of his insights with skepticism and criticism, his most notable contribution—that of the unconscious mind as a determinant of thought and behavior—has been validated by current studies in memory and consciousness that employ brain imaging technologies. Our conception of the unconscious realm has evolved since the time of Freud, and now we look at its manifestations differently. You will learn how the influence of the unconscious mind can be seen in various functions, such as information processing, memory, conditioning, stress, and social relations, to name a few. Although current perspectives have modified Freud's original ideas, scientific research validates the fact that our mental and emotional processes can function on many levels simultaneously, some beneath the surface of our conscious awareness.

Now that you have a sense of the four underlying themes of this course, find an example of each theme in one or more aspects of memory. Some of your examples might reveal a relationship between two or more of the themes as they connect to the topic.

Create an outline, a graphic organizer or another design of your choice, such as a drawing, comic, infographic, or collage, that demonstrates your understanding of the themes in relation to the processes or fallibility of memory. You should provide an example for each concept to substantiate your ideas. Your examples might come from the relevant research studies or the material you read about in the book or viewed in the films. Find a way to indicate how the themes relate to one another within the topic. For instance, how might you show that unconscious processing relates to evolutionary influences or biological processes relate to nature via nurture?

Here is a sample, in outline form, of what you might discover and explain about the four themes and memory:

Memory

Everything psychological is simultaneously biological:

Concept: We tend to remember emotionally charged events more easily and vividly than other experiences because the release of adrenaline strengthens the neural networks involved in memory formation.

- Example: The research on rats and humans presented in the video, "Remembering What Matters"

Nature via nurture:

Concept: When we experience emotional or traumatic events, our perceptions and memories of future events are altered.

- Example: The inaccurate eyewitness testimony of Jennifer Thompson in the "Eyewitness Testimony" videos or the onset of PTSD

The impact of evolution on thoughts and behavior:

Concept: Our neural networks are predisposed to remember emotional or fearful events because this helps us to avoid danger, which supports our survival.

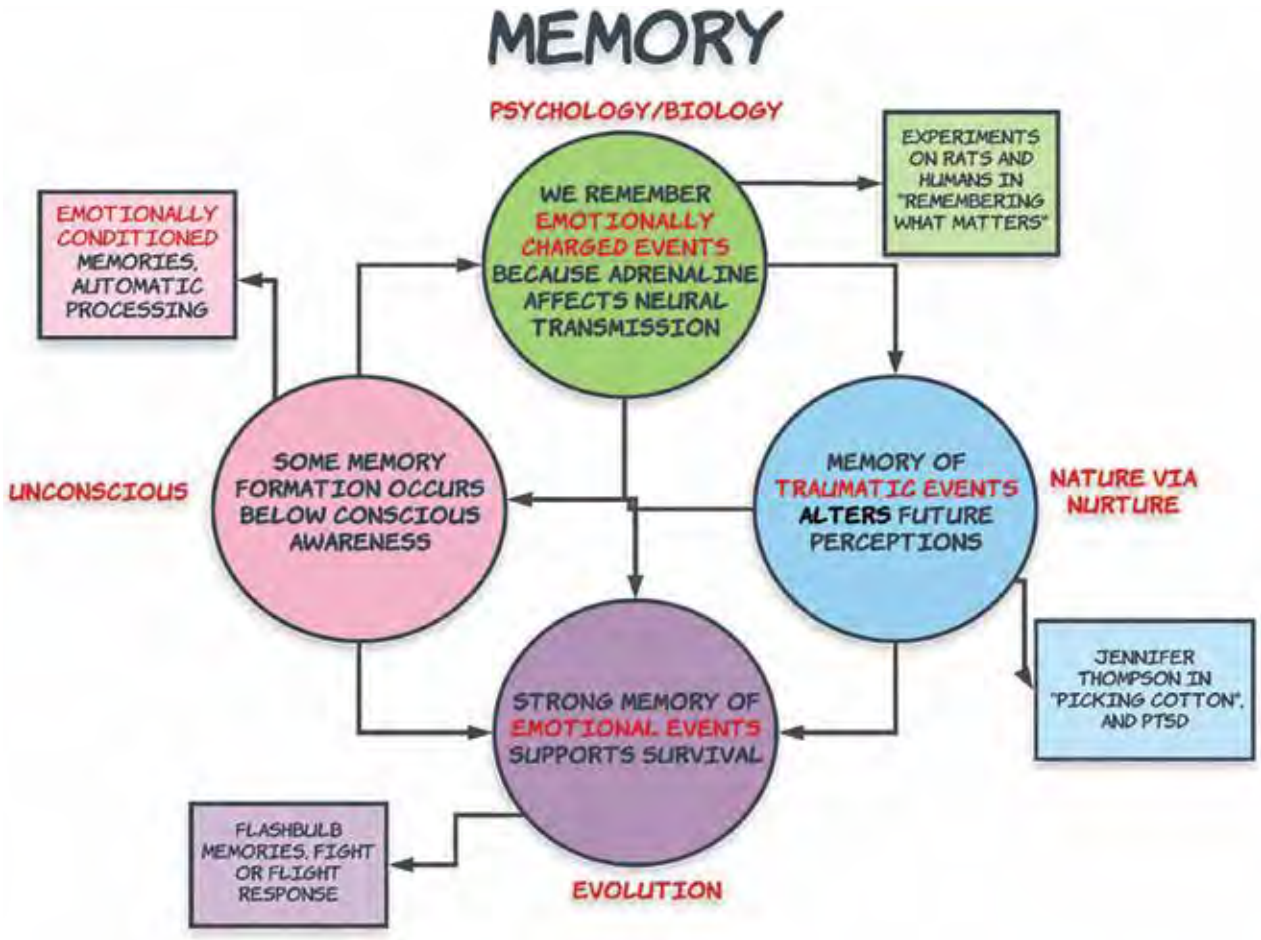
- Example: Flashbulb memories, or the fight, flight, or freeze response

The unconscious mind:

Concept: Some types of memory formation occur below our conscious level of awareness.

- Example: Emotionally conditioned memories or automatic processing

Here is the same information using a graphic organizer. You can explore many types of graphic organizers on the internet or create your own by hand. (This one was created using the *Lucidchart* website: https://www.lucidchart.com.)



You will notice that all the examples in this sample relate to emotional memories, and this creates a connection between the differing themes. You can show the connections by color-coding, or making

the font bold in your outline, or using arrows in your graphic organizer, or whatever makes sense to you.

For this first project, try to come up with concepts that differ from the ones provided in the sample. For instance, you might consider the role of the hippocampus or the cerebellum in memory formation and consolidation, or think about long-term potentiation at the synapse. You might explore the different classifications of memories, the types of processing, vulnerability to distortion, or reasons for forgetfulness.

As you progress further in your study of psychology, you will come to see that some of the examples of the themes you find in the topic of memory will relate to the thematic concepts in future material, slowly revealing that complex interconnected web.

The outline, graphic organizer, or other design should contain an example of each theme. Student answers will vary, but here are some possibilities the students might discover:

Everything psychological is simultaneously biological

- **Activation of the hippocampus and the first memory of an individual**
- **Emotional events, adrenaline, memory strength**
- **Episodic memory housed in the cerebellum**
- **LTP (long-term potentiation)**

Nature via nurture

- **A strong memory of traumatic events**
- **Procedural memory**
- **Episodic memory**

The impact of evolution on thoughts and behavior

- **Survival associated with strong memory for fearful or aversive events**
- **Association with a cognitive map for better recall (the memory palace technique)**

The unconscious mind

- **Parallel processing**
- **Automatic processing**
- **The debated question on repressed memories**

FOR ENROLLED STUDENTS

When you have completed this lesson, please share lessons 3 and 4 with your teacher. Remember to include the chart or document you've created to track your progress in improving your memory skills and your graphic organizer from the Four Themes Analysis.

Lesson

5

The Human Brain

Learning Objectives

In this lesson, you will:

- Identify the brain regions associated with thought, emotions, and behavior and their associated functions.
- Recognize the parts of a neuron and their related functions.
- Become familiar with the divisions of the nervous system and their associated functions.

Before You Begin

Where do you imagine your mind is located? After all, thoughts are immaterial and can go back and forth in time as well as project into the realms of imagination and dreams. Do you think your mind is located within your skull, or is it somewhere else in your body, the space surrounding your body, or elsewhere?

Use the freewrite technique to explore your ideas about this question and attempt to look at it from as many perspectives as you can. Set your timer for 10 minutes and write. At the end of the lesson, notice if your new knowledge has modified your thoughts on this question.

ASSIGNMENT SUMMARY

- ☐ Share your thoughts about the mind.
- ☐ In your textbook, read Module 3, Module 4, and Module 5.
- ☐ Watch two videos about the human brain, and write a reflection on each.
- ☐ Create a diagram or 3D model of two neurons.
- ☐ Create a 2D or 3D model of the brain.
- ☐ Choose one activity:
  - Activity A: Hemispheric Dominance Inventory
  - Activity B: Hemispheric Preference
  - Activity C: Neurological Disorder Mini Research Project
  - Activity D: Science, Religion, and the Brain
  - Activity E: Case Descriptions

Reading

Read the following in your textbook:

- Module 3, "Neural and Hormonal Systems"
- Module 4, "Tools of Discovery, Older Brain Structures, and the Limbic System"
- Module 5, "The Cerebral Cortex"

Take notes as you read, and pay attention to charts, graphs, and images.

Watch and Reflect

Please watch the following video:

"The Story of Phineas Gage"

https://www.youtube.com/watch?v=NFO6ts6vZic&t=19s

Although this video was produced many years ago and depicted a brain injury case that occurred back in 1848, watching it has nearly become a rite of passage for introductory psychology students. Don't be concerned about the old style of the video—the content is far from boring! Up until recent decades, our scientific understanding of neural processing was only advanced by the investigation of postmortem brains following a severe injury or disease. Thanks to the many imaging tools provided by modern technology, we can now comprehend and examine neural processes on a much deeper and more sophisticated level. Nevertheless, the story of Phineas Gage remains vital to our studies because it was one of the first cases to highlight the relationship between neural functions and personality characteristics.

After you view the video, write a reflection that describes the behavior of Phineas before and after the accident. Identify the major regions of the brain involved in his injury, and describe the roles they play in healthy mental, emotional, and social functioning.

Next, watch this video:

"Power of the Human Brain"

https://www.dailymotion.com/video/x6f30x8

This video will show you some of the current technologies used in neuroscience as it highlights many fascinating case studies. After you watch it, write a reflection:

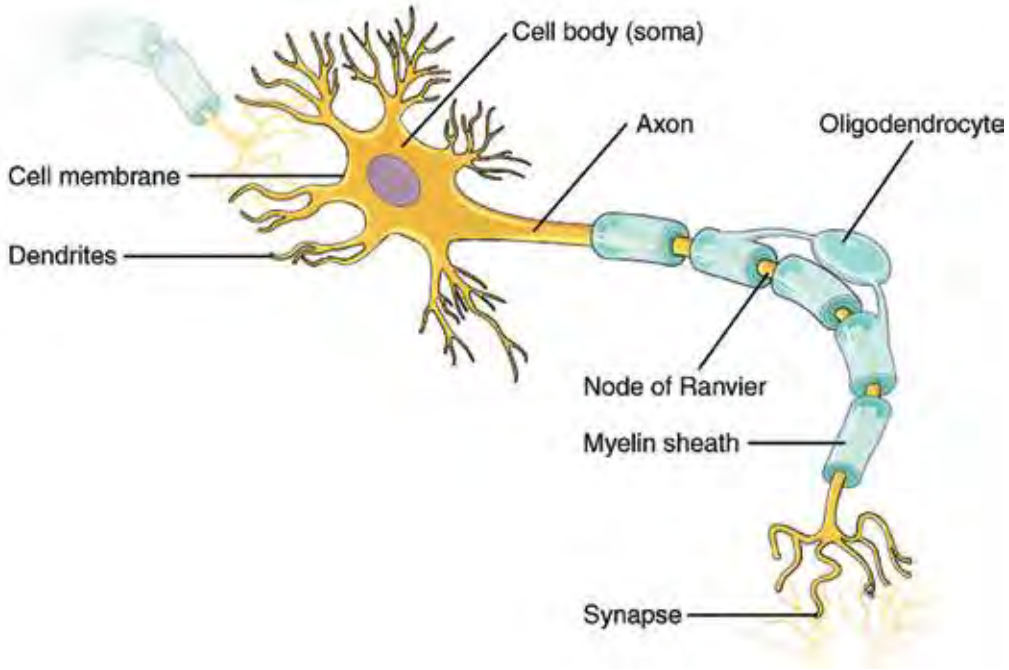
- Describe two of the most memorable segments of the video for you and what you learned from them.
- Comment on the last segment that describes mental chokes, and describe a time or two when these have occurred in your life.

By watching and reflecting on both videos, the student may gain more understanding of the interconnections between the limbic system and the prefrontal cortex in addition to concepts such as brain plasticity, neural pathways, and divisions of the nervous system. Look for specific demonstrations of concept comprehension in your student's reflection.

Assignments

1. Create a diagram or wire sculpture of two neurons. Label the following parts and their functions:
    - dendrites **receive messages and conduct impulses toward the cell body**
    - axons **pass impulses away from the cell body to other neurons, muscles, or glands**
    - soma **the cell body where the signals from the dendrites are joined and passed on**
    - myelin sheaths **fatty, insulating tissue surrounding the axon that enables higher transmission speed of neural impulses**
    - terminal buttons **small knobs at the end of neurons that release neurotransmitters**
    - the synaptic gap **the minute space between an axon terminal and receiving dendrite through which neurotransmitters flow**
    - the release and reuptake of neurotransmitters **the process that occurs when a neurotransmitter is released into the synaptic gap and then taken back into the axon terminal that released it**

This image of the anatomy of a neuron can be used as a reference point.



Anatomy of a neuron (Image credit: OpenStax)

2. Create a larger than life brain model. It can be two dimensional or three dimensional. Make and label the following parts:
    - corpus callosum **a large band of nerve fibers that connects the two hemispheres and carries messages between them**
    - thalamus **relay station for sensory processing**
    - hypothalamus **signals hunger and satisfaction**
    - pituitary gland **master endocrine gland that controls the activity of most of the other hormone-secreting glands**
    - hippocampus **regulates learning and memory consolidation**
    - amygdala **regulates fear, anger, and the fight or flight response**
    - medulla **controls heartbeat, breathing, and other involuntary vital functions**
    - spinal cord **pathway of nerve fibers traveling to and from the brain that controls simple reflexes**
    - cerebellum **controls coordination, balance, and procedural memory**
    - reticular formation **regulates sleep and arousal**
    - pons **regulates sleep and arousal**
    - brainstem **controls basic body functions such as breathing, heartbeat, swallowing, blood pressure, and consciousness; consists of the midbrain, pons, and medulla**
    - cerebral cortex
        - temporal lobe **controls hearing, memory, and emotion**
        - frontal lobe **controls reasoning and higher thought processes (in the prefrontal cortex) as well as motor control and language**
        - parietal lobe **processes perceptual and sensory information, and contains the somatosensory cortex**
        - occipital lobe **controls visual processing**
        - prefrontal lobe or cortex **regulates executive functions, impulse control, decision-making, judgment, and analytical thinking**
        - Broca's area **controls language production and articulation**
        - Wernicke's area **controls language comprehension**
        - somatosensory cortex **regulates sensations of touch**
        - primary motor cortex **controls voluntary movement**

- association areas **connect sensory and motor areas, and integrate sensory information; these areas are involved in higher mental functions, such as learning, memory, and language**

Along with labeling each part, include the function of the region. You can state the function in words or use a visual (for instance, the temporal lobe could consist of a picture of an ear, speaker, etc.), or you can create symbols and a key to identify parts and functions.

You might want to create a 2D model, poster, or collage showing the cerebral cortex areas on one side and the subcortical and lower brain regions on the other. Or you can create a 3D sculpture using modeling clay, papier-mâché, or found objects of any kind. You can also choose to represent the brain in a symbolic way, such as a moving vehicle, computer, zoo, forest, or whatever else. Be creative!

No matter what method or medium you choose, you will need to find appropriate symbols for the parts and their functions listed above. Please avoid the use of computer-generated images.

Your brain model will be assessed on clarity, completeness, and creativity. Good luck, and have fun!

This assignment will help students gain familiarity with the anatomy of the brain regions and their functions. Make sure the diagrams are complete and accurate. The textbook contains many images for reference throughout the chapter.

Activities

Choose one of the following activities to complete:

- Activity A: Hemispheric Dominance Inventory
- Activity B: Hemispheric Preference
- Activity C: Neurological Disorder Mini Research Project
- Activity D: Science, Religion, and the Brain
- Activity E: Case Descriptions

Activity A: Hemispheric Dominance Inventory

Take the Hemispheric Dominance Inventory using this link:

"Right Brain Left Brain Test"

https://www.mentalup.co/blog/right-brain-left-brain-test

After you receive your score, read the analysis of hemispheric tasks. Be sure to click the link at the bottom of the page to access the summary.

Write a reflection on your score. Does it reflect how you perceive yourself? Why or why not? Substantiate your response with examples.

Activity B: Hemispheric Preference

Watch the following video:

"Severed Corpus Callosum"

https://www.youtube.com/watch?v=lfGwsAdS9Dc

Respond to the questions below.

1. What did you learn about the specific tasks of each hemisphere?
2. Explain the experiments that shed light on our understanding of hemispheric specialization.
3. Do you think Micheal Gazanica's preference for the left hemisphere is a reflection of cultural conditioning?
4. Why might industrialized countries favor left-hemispheric tasks over right-hemispheric tasks?

Look for students to demonstrate an understanding of hemispheric specialization substantiated by the word or image recognition tasks featured in the video. The question regarding cultural preference for left-hemispheric tasks will encourage the student to engage in critical thinking about the concepts.

Activity C: Neurological Disorder Mini Research Project

Choose two neurological disorders from the list below and research them. Try to use *.org*, *.edu*, and *.gov* websites for your research.

- Parkinson's disease
- ALS (Lou Gehrig's disease)
- Alzheimer's disease
- Mad cow disease
- Huntington's disease
- Phantom limb syndrome
- Alien hand syndrome
- Stroke
- Epilepsy
- Multiple Sclerosis (MS)
- Tourette's syndrome
- Encephalitis

- Brain aneurysm
- Brain tumors
- Peripheral neuropathy
- Concussion
- Aphasia

Create an online slideshow presentation to share what you've learned. Include images in your slides to make them visually appealing and memorable.

Your slides should include:

- The name and significant symptoms of the two disorders
- The prevalence of the diseases in the population
- The primary biological factors (regions of the CNS) suspected to be important in their etiology and how they are affected or malfunctioning
- Possible treatments for the disorders or other pertinent considerations
- Citation of your sources (MLA format)

Slide presentations should cover the criteria above and include relevant images and diagrams. Check for accurate citations.

Activity D: Science, Religion, and the Brain

Are you interested in the relationship between spiritual experiences and neural functioning or science and religion? Listen to the following podcast, and read the two articles below. Write a reflection on what you discovered, your thoughts about this information, and the research that impressed you.

"Neurotheology: This is Your Brain on Religion" (podcast)

https://www.npr.org/2010/12/15/132078267/neurotheology-where-religion-and-science-collide

"Hard-Wired for Faith: The Religious Experience and the Brain"

https://magiscenter.com/hard-wired-for-faith-the-religious-experience-and-the-brain/

"God in the Brain? How much can 'Neurotheology' explain?"

http://www.blume-religionswissenschaft.de/pdf/GodintheBrainNeurotheology.pdf

This activity encourages students to look deeper into the relationship between science and religion. The reflection should contain information about the specific regions of the brain involved in various religious experiences, as documented by imaging techniques. The themes of evolutionary influences and nature via nurture, as demonstrated by brain plasticity, are highlighted in the articles and podcast.

Option E: Case Descriptions

Watch the following documentary:

"Secrets of the Mind"

https://www.youtube.com/watch?v=w6AfzCNDmbY

Although this documentary was produced almost 20 years ago, it contains several fascinating case studies that shed light on the inner workings of the brain. They will help you to understand the complexity of mental processes and the many things that can go wrong when a person is injured or suffers from a neurological disorder.

Take notes as you watch the video. You will write a case description for at least two of the following people featured in the documentary:

- Derek Steen
- James Peacock
- Graham Young
- Peggy Palmer
- David Silvera
- John Sharon

For each case, describe what was learned about brain functions. In addition, your case descriptions should include:

- The approximate age of the person
- The behavioral symptoms presented
- The diagnosis, if applicable
- The treatment, if appropriate

Derek Steen

Approximate age: 30s

Behavioral symptoms: pain and sensation in an amputated arm

Diagnosis, if applicable: phantom limb syndrome

Treatment, if appropriate: none

What the case revealed about brain functions: Brain plasticity was demonstrated as areas of the somatosensory cortex that were no longer receiving sensation expanded to receive sensory input for nearby areas (arm to cheek).

James Peacock

Approximate age: 30s

Behavioral symptoms: pain and sensation in an amputated hand

Diagnosis, if applicable: phantom limb syndrome

Treatment, if appropriate: mirror box

What the case revealed about brain functions: Pain is partially a construct of the mind and can be mediated by a visual illusion.

Graham Young

Approximate age: 40s

Behavioral symptoms: blind in the left visual field but able to detect movement and orientation

Diagnosis, if applicable: blindsight

Treatment, if appropriate: none

What the case revealed about brain functions: There are multiple areas of the brain involved in visual processing; some are below conscious awareness enabling a blind person to detect certain features rather than see them.

Peggy Palmer

Approximate age: 60s

Behavioral symptoms: only able to process visual stimuli in one visual field (due to a stroke)

Diagnosis, if applicable: visual neglect

Treatment, if appropriate: none

What the case revealed about brain functions: Visual neglect (due to a stroke) can also affect a person's memory and recognition of the neglected visual field.

David Silvera

Approximate age: 30s

Behavioral symptoms: belief that his parents are imposters

Diagnosis, if applicable: Capgras delusion

Treatment, if appropriate: time and use of auditory rather than visual input from parents

What the case revealed about brain functions: There are many pathways involved in visual processing. When the pathway to the limbic system is damaged, the individual

will not register the proper emotion with the stimuli and therefore interpret the event inaccurately.

John Sharon

Approximate age: 20s

Behavioral symptoms: mystical experiences following major seizures

Diagnosis, if applicable: temporal lobe epilepsy

Treatment, if appropriate: medication, if chosen

What the case revealed about brain functions: Certain regions of the brain are involved in religious experiences; other people with temporal lobe epilepsy have reported similar perceptions to John Sharon, inspiring more research on the topic.

FOR ENROLLED STUDENTS

You will be sharing your work from this lesson at the end of lesson 6.