Contents

AP Psychology Syllabus

Course Objectives

- To learn about the field of psychology through in-depth study, discussion, and hands-on activities.

- To specifically assess some of the differing approaches adopted by psychologists, including the biological, behavioral, cognitive, humanistic, psychodynamic, and social-cultural perspectives.

Prerequisites

A strong work ethic is the only requirement for this course.

Course Materials

Psychology Interactive Workbook and Diary closely follows the textbook, *Psychology*, 9th ed., by David G. Myers (Holland, MI: Worth Publishers, 2010); the accompanying *Study Guide* by Richard O. Straub (New York: Worth Publishers, 2010); and the resource magazine *Scientific American Mind*.

Grading Policy

The course grade is a weighted average consisting of the following elements:
Study Guide: 20% (graded on completion since answers are provided in footnotes)
Opportunity Quizzes (OQs): 20%
Chapter Tests: 20% (each score is converted to a percentage since different tests have different numbers of questions)
Workbook and Diary Activities: 20% (graded on completion and ability to explain each activity's purpose)
Workbook and Diary Questions/Responses: 20% (graded on completion because of their subjective nature)

Chapter scores will be recorded in the grade book located in Appendix 2.

Grading Scale:
90%+ = A
80-89% = B
70-79% = C
60-69% = D

Daily Opportunity Quiz (OQ)

Since this is a college course, I have simply provided a weekly assignment schedule. This should allow flexibility, but also provide mile markers to make sure you keep on pace. The most important thing is to try to finish a particular chapter (including finishing quizzes, projects and tests) at approximately the proper time.

Having said this, I do value daily reading checkups. This is the purpose of each OQ (Opportunity Quiz). Each section will begin with a five question quiz from the reading homework. Students will be expected to have read the material as well as completed the study guide before class so they are well-prepared for these quizzes. The questions will not be multiple choice, but instead will be short answer questions that test students' recall and deeper understanding.

The course is divided into approximately seventy-eight reading sections, each with a corresponding quiz (OQ). This roughly equates to three reading sections per week, excluding test prep days. Because some sections are quite large, I have divided a few of them a little differently. Simply read the quiz title (for example, **OQ 7.1**) to make sure that you have done the proper reading. The first number represents the chapter; the decimal represents the subsection. The first page of each chapter clearly lists all the subsections.

Please monitor your pace according to the following course plan to make sure that you don't fall behind. It is important that you finish the material in time to allow at least a full week or two devoted solely for review prior to the AP test.

Schedule

WEEK 1					UNIT 1
Date:	Day 1 1	Day 2 2	Day 3 3	Day 4 4	Day 5 5
Psychology	Prologue pp. 1–6 & Note Cards [1]		Prologue pp. 6–13		Chap. 1 pp. 15–20 & Note Cards
Psychology Study Guide	pp. 1–2		pp. 2–3		pp. 15–16
Interactive Workbook and Diary	**Unit 1: Prologue & Thinking Critically with Psychology** OQ Prologue.1		OQ Prologue.2		OQ 1.1

Other Notes

Please use Days 2 and 4 to complete any work that is not finished.

If you plan to take the AP Psychology Test, which is in the first two weeks of May, schedule your time accordingly. Most students begin this course in the second week of August, as there are 36 Weeks in this schedule.

WEEK 2					UNIT 1
Date:	Day 1 6	Day 2 7	Day 3 8	Day 4 9	Day 5 10
Psychology	Chap. 1 pp. 21–33		Chap. 1 pp. 33–38		Chap. 1 pp. 38–45
Psychology Study Guide	pp. 16–18		pp. 18–19		pp. 19–20
Interactive Workbook and Diary	OQ 1.2		OQ 1.3		OQ 1.4

Other Notes

WEEK 3					UNITS 1 & 2
Date:	Day 1 11	Day 2 12	Day 3 13	Day 4 14	Day 5 15
Psychology	Study for Test		Chap. 2 pp. 47–54 & Note Cards		Chap. 2 pp. 55–58
Psychology Study Guide	Prologue Progress Test 1 & 2 pp. 3–7; Chapter 1 Progress Test 1 & 2 pp. 20–24		pp. 37–39		pp. 39
Interactive Workbook and Diary	Test: Prologue and Thinking Critically		**Unit 2: The Biology of Mind & Nature, Nurture and Human Development** OQ 2.1		OQ 2.2

Other Notes

1. Note cards for the vocabulary terms should be done before you begin reading each chapter in *Psychology*. You can find the main terms written with chapter numbers in your *Interactive Workbook and Diary*.

Prologue: The Story of Psychology

psychology P	empiricism P
structuralism P	functionalism P
humanist psychology P	nature-nurture issue P
natural selection P	levels of analysis P
biopsychosocial approach P	basic research P
applied research P	counseling psychology P
psychiatry P	behaviorism P
cognitive neuroscience P	clinical psychiatry P

Introduction: Taking Back Psychology
Many Christians are hesitant to even use the term *psychology* with fellow believers. It is understandable, because unfortunately, the discipline has been dominated by those who have no faith in God. It at least appears that these psychologists have dominated the field, because they are the ones who often get the headlines. But this should not be the case. Psychology, by definition, is the study of the mind. As believers, we have access to the creator of the mind and therefore we should take advantage of this privilege in order to better appreciate the magnificence of His creation.

This chapter introduces you to the big picture of psychology. It explains psychology's history, its position as a science, and some of the major debates within the field. After reading your text, you should have a basic understanding of each of psychology's perspectives so you will be in a better position to critique them. They represent humans' best effort to break down and systematically study the infinite complexity of how God made us. If you are ready for your first OQ, let's begin.

OQ Prologue.1 (After reading pages 1-6, What is Psychology?)
1. What is psychology?

2. Is psychology a science?

3. How did the behaviorists like Skinner feel about introspection?

4. How often do you think you will have hw in this class?

5. What is the culminating activity for this class?

5

The Story of Psychology
I hope you didn't fall asleep reading this section in the textbook. Let me highlight/clarify a few terms and stop to question the material so we can examine it through a biblical worldview.

Psychology's history has, like a pendulum, changed its focus over time. Wundt's introspection was a product of the twentieth century's thirst for objective data; behaviorists like John B. Watson and B. F. Skinner swung the pendulum in that direction. In a way, the pendulum has swung back the other way as the explosion of new brain imaging techniques allows mental processes/brain activity to be tracked via cat scans, MRIs and fMRIs.

Structuralism and *functionalism* have always been difficult concepts for students to grasp. Structuralism is easy to remember because it sought to understand the structure (parts) of the mind through introspection (self-reflection). Functionalists instead focused on how

mental and behavioral processes function—how they help the organism survive. It is easy to see why Darwin would be considered a functionalist.

It is an interesting exercise to use these terms to think about how we try to understand God. Some gravitate toward introspective methods such as seeing His will in our lives through the thoughts and feelings that we have. Yesterday a friend told me the story of how his wife knew God was developing a passion for Russia in her heart. While they were serving as missionaries in Ireland, for some reason her thoughts consistently led her to Russia, though she had no relatives, history, or friends in that part of the world. She examined her thoughts (that is, she used introspection) and concluded that they must be from the Lord since they lined up with the biblical mandate to love each other and reach out to the world.

Others tend to approach their understanding of God via the special purposes (functions) for which He has created us. Isaiah reminds us we were created for God's glory,[12] and Paul states that we all have special gifts and abilities that are to be used for the benefit of the body of believers.[13] I have held many jobs in my life, but I know deep in my heart that I am a teacher. Though I sometimes wish it wasn't my gifting (such as when I compare my bills to my paycheck each month), I know that it is a true calling/function.

Ponder This

How do you personally understand God's will for your life?

Do you rely on introspective means like the early structuralists did? Give an example.

Do you rely on more of a functionalist approach? Give an example.

OQ Prologue.2 (After reading pages 6-13, Contemporary Psychology)

1. Explain the nature-nurture debate.

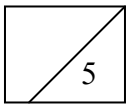
2. What is the *biopsychosocial approach*?

3. What is the difference between basic research and applied research?

4. What is the big legal difference between psychologists and psychiatrists?

12. "Everyone who is called by my name, whom I created for my glory, whom I formed and made" Isaiah 43:7.
13. 1 Corinthians 12.

5. What is the focus of the social-cultural perspective?



Psychology's Big Debate: Nature v. Nurture

We will delve into the details more extensively in later chapters, but as a Christian, all this talk about the nature-nurture debate and evolution probably has caused you to wonder "where is God in all this?" Good question. This is the point where some believers, afraid to wrestle with these issues, run away from the whole scene. Others, like the proverbial frog, don't notice the change occurring around them and have their faith boiled away before they know it. I believe neither of these responses is biblical because God has created us with the responsibility to think and seek the truth. Because our Lord is truth personified, we should never be afraid to seek the truth. He also calls us to walk in faith, and as a believer on a college campus or in the world, we will be surrounded with intelligent and intimidating professors and students who will seek to discredit our beliefs. But if we ask the Father to show us the light of truth, it will shine even brighter in the darkness. If we ask to see things through His eyes, we will enjoy a perspective not mentioned in traditional psychology textbooks.

For instance, in the nature-nurture debate, we can see a glimpse into the beauty of God's plan for us and why this overlap of nature and nurture is so necessary.

For starters, if nurture were completely dominant, we would (even more than we do already) act as though we were God. In other words, if humans were 100 percent responsible for all aspects of who they become, then we would assume full credit and push God out of the picture all together.[14]

For example, you may have already read about how John B. Watson boasted that if he were given an infant, he could mold the child, according to the child's own will, into the occupation of Watson's choosing.[15] Such a statement perfectly illustrates how dangerous such power would be. On the other hand, if God created us completely dominated by nature, then genetics would govern our behavior and there would be no free will whatsoever. Without free will, we could not make the choice to submit and therefore worship God fully; nor, for that matter, would humans ever be capable of true love and sacrificial service.

I would never assume to know the deepest secrets of the mind of God, but I think that through His Word, He has made it clear that our purpose is to serve Him and not ourselves.[16] While psychologists debate the relative contributions of nature and nurture,

14. "Not by works, so that no one can boast" Ephesians 2:9.
15. "Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select - doctor, layer, beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors" John B. Watson (1924).
16. "It does not, therefore, depend on man's desire or effort, but on God's mercy. For the Scripture says to Pharaoh: 'I raised you up for this very purpose, that I might display my power in you and that my name might be proclaimed in all the earth' " Romans 9:16-17.

we can gain insight not only into that question, but also to the larger one: "why were we created in such a fashion?"

Ask Your Parents about Nature vs. Nurture

I hope this course sparks a lot of conversation with your parents. Please be sensitive to the fact that any conversation about parenting is probably strange for them. Sandra Scarr's research about parenting says that "parents should be given less credit for kids who turn out great and blamed less for kids who don't." Before I became a parent, I was offended on behalf of parents everywhere. Emphasizing the limits of parental significance was, I felt, a slap in the face against their God-given responsibility. But now as a parent of four and someone who wants to read more of the Bible than just the parts that give me a feel-good buzz, I have to acknowledge that this parenting thing is way bigger than me. Brew some coffee, and if you can muster up the courage, sit down with your parents or other adults and ask them their thoughts. Ask them specifically how much credit or blame they take for your choices. What did they say?

Also ask them: Does what I do reflect on your parenting? How so? Record their response.

How do their responses compare to the research you read about?

Think of the groups/communities that you belong to such as your neighborhood, school, church, sports team, or musical group. To what degree did your parents participate in the big-picture decisions that led you to these groups, such as providing exposure to different types of activities and encouraging your efforts?

How much responsibility can you take for all the details? (Consider issues like hard work and dedication.)

How is that also true in our relationship with the Lord? He chose what family we grow up with, but we decide how we are going to live within that family. Give two specific examples of what it is like to grow up in your family, and the choices you have made within that structure.

Remember, God created us and therefore He knew "psychology" before it was invented. In fact, an often-quoted Proverb summarizes this discussion nicely: "Train a child *in the way he should go*, and when he is old he will not turn from it" (italics mine).[17] In the original language, it actually refers to raising a child in accordance with his or her God-given temperament. God was telling parents that nature and nurture go hand in hand and that nowhere is that more obvious than in parenting.

The Perspectives in General

In my classroom, I demonstrate the importance of the different psychological perspectives by bringing in a big empty can with a beautiful label depicting the appealing content of fruit. To make a point (and because I'm somewhat of an obnoxious teacher), I purposely push the empty can closer and closer into the face of an unsuspecting student and ask what she sees. She quickly realizes that the closer it gets to her nose, the less of the can she sees, but she also notices the nervous laughter from the other side of the class where those students can see what is written on the back of the can: Do not drink! Poison. Keep away from children! The point is that in psychology (and life in general), there are many perspectives or areas of focus, and we can learn something from each of them, even if it is just to strengthen our argument against them. Students on each side of the class thought they had it right, but only God sees the whole picture. Only an aerial view revealed that the can was empty, except for a valuable jewel inside. In other words, each perspective is a necessary, though not sufficient, means to study psychology.

At this point, I would like to quickly address the concerns of those readers who are afraid to read about the evolution perspective. I say to you, "Fear not!" Every argument made for natural selection makes even more sense under the heading of "divine design." For instance, with microevolution (exemplified by insects adapting to be able to camouflage to their environment), it is clear that a brilliant creator interwove such flexibility into His workmanship. This is very different from, and must not be confused with macroevolution (such as a single cell becoming a plant, a fish, an ape, and then a human).

Make sure you understand each of psychology's current perspectives. Remember, you do not have to agree with all of them, but you do need to understand them.

Apply the Perspectives

For your first assignment, practice interpreting an event through the lens of each perspective. Please complete the following:

17. Proverbs 22:6.

1. Read my fictional news summary below. (No animals were actually hurt in the making of this example!)
2. Complete the chart below to demonstrate your understanding of each of the perspectives. Fill in each perspective's focus and then briefly explain what areas of interest/questions/approach would be used for each perspective.
3. Do the same for another news story or your own event.

Event #1

The police were called to a residence in response to a neighbor's call regarding a domestic dispute. They were told that the mother promised the car to the teenage son and the father promised it to the twenty-one-year-old daughter. Apparently, things got out of hand when each accused the other of playing favorites. The father allegedly lost his cool by hitting the son and throwing the toy poodle Mi Mi across the room. Police and animal welfare officers became involved. The father admitted that "I was accused of being unfair, I saw red, and just went ballistic!"

Follow my example and fill in the remaining spaces.

Perspective	Focus	Questions/approach/area of interest
Neuroscience	How the brain enables emotions and sensory experiences	Is there a brain or chemical deficiency that enabled such a sudden rage response?
Evolutionary		
Behavior genetics		
Psychodynamic	How behavior is linked to unconscious drives and conflicts	What repressed memory/thought has created an unconscious struggle which burst through the surface when triggered by this accusation?
Behavioral		
Cognitive		
Social-cultural		

Event #2
Now do the same thing for a more realistic news story or your own personal situation.
Write out a summary of "Event #2":

Perspective	Focus	Questions/approach/area of interest
Neuroscience		
Evolutionary		
Behavior genetics		
Psychodynamic		
Behavioral		
Cognitive		
Social-cultural		

If this is a bit confusing now, don't worry. It is still a very important assignment because it sets the organizational framework for the rest of the class.

Although approaches are necessarily presented separately in a textbook, in real life an integrated approach is often used in order to focus on the interaction of several perspectives at once.

Ridiculous Example of an Integrated Biopsychosocial Approach

Warning: The following is a fictional dramatization for your educational benefit only. Any resemblance to reality is not only unintended, but sick and wrong.

To give you another of my overdone examples, picture a cute baby, all decked out in a new pink outfit complete with a matching little bow. Everyone who comes across the beautiful little girl gushes over her and does that silly talk-like-a-baby thing. Of course the little girl loves all the attention and responds with smiles and coos, which then elicit even more of an enthusiastic reaction, and the cycle continues.

Contrast this sequence of reactions with those set in motion with baby Bo-Bob. Unfortunately, little Bo-Bob was born with, how does one say this . . . buck teeth, a birdlike beak of a nose, and monstrous elephant ears. (Can you see I'm making this so ridiculous that it can't offend anyone? Did you catch the part about the buck teeth? You know that is developmentally impossible!)

When people took one look at little Bo-Bob, they usually let out a scream and ran the other way. This of course scared little Bo-Bob half to death. This happened so frequently, he began to anticipate it and began to scream every time anyone approached him. If you thought it couldn't get any worse for Bo-Bob, his little nervous system got so upset that he produced and distributed some exceptionally foul smelling expulsions. You can see how things might continue to go south.

I apologize about the graphic description, but it helps explain how our genes (bio), learned fears/emotional responses (psych), and cultural expectations (social) all influence each other and account for our differences.

A Final Word on Perspectives

We may think we have it all figured out, but we could use a dose of humility and eternal perspective. For true perspective, read Isaiah 44:24 to 45:10. Which verse puts it into proper perspective for you?

I am particularly reminded about my position as a psychology teacher when I read the words: "Does the clay say to the potter, 'What are you making?' "[18] God is glorified as we study His creation from all different perspectives, but we must be careful of crossing a line and thinking we know more than our maker.

18. Isaiah 45:9. Also used by Paul in Romans 9:20-21.

Thinking Critically with Psychological Science (Chapter 1)

hindsight bias 1	critical thinking 1
theory 1	hypothesis 1
operational definition 1	replication 1
case study 1	survey 1
normal curve 1	population 1
random sample 1	naturalistic observation 1

correlation 1	scatterplot 1
illusory correlation 1	experiment 1
double-blind procedure 1	placebo effect 1
experimental group 1	control group 1
random assignment 1	independent variable 1
dependent variable 1	mode 1
mean 1	median 1

range 1	standard deviation 1
statistical significance 1	culture 1
correlation coefficient 1	

Introduction
"Be careful what you think, because your thoughts run your life" Proverbs 4:23 (NVC).

This chapter is another great example of how the world may think it owns psychology, but it doesn't. Almost three thousand years ago, Solomon was inspired to write the above proverb, and it perfectly explains the true cognitive perspective. Or, as another biblical writer puts it, we are to "take captive every thought to make it obedient to Christ."[19]

Yet it is not a simple task. Sin, self, and Satan all vie for control of our thought lives, yet as the proverb reveals, we do have control over our thoughts. But we need to be aware that there are several forces doing battle to influence our thinking.

This chapter is all about becoming aware of the limitations of our thinking. Common sense is (unfortunately), not so common or reliable. Bias, cultural forces, and even the *placebo effect* all interact to influence our thinking. As Christians, we should be governed by a biblical sense of humility, because overconfidence and pride distort our thinking. An awareness of our limitations allows us to step back and use our God-given observation, reason, and analysis skills along with statistics to test our assumptions. As you work through this section, ask yourself "how do I know this is true?" As Christians, we not only have access to special insight from the Holy Spirit, but we should possess an extra dose of humility and awe for our creator.

What challenges do you face in taking control of your thought life?

What strategy do you use to try to "take captive every thought"?

In Ephesians 4:17-18, Paul refers to those who live apart from Christ as living "in the futility of their thinking" and being "darkened in their understanding and separated from the life of God because of their ignorance that is in them due to the hardening of their hearts." I find it interesting how Christ clearly integrates one's heart and mind. Things are not as easily separated as a textbook might indicate.

OQ 1.1 (After reading pages 15-20, The Need for Psychological Science)
1. A quick review question. Which perspective means *thinking*?

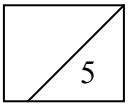
2. Explain *hindsight bias*.

3. Give an example from the text illustrating *overconfidence*.

19. 2 Corinthians 10:5.

4. Give an example of overconfidence from your own life.

5. How did Moses' words foreshadow what today we would call the scientific attitude?



Humility and Preparedness

Scientists these days don't exactly have the reputation for humility, but in the sixteenth and seventeenth centuries, scientists who were Christians fueled the Scientific Revolution because they understood that "in order to love and honor God, it is necessary to fully appreciate the wonders of his handiwork."[20] Again, our faith is not one of timidity,[21] but one of freedom to seek truth about the God who created the universe.

Yet the Bible is clear that we are not to go out into the world unprepared. That is why Paul tells us we are to first arm ourselves with God's gear.[22] This will prepare you for the inevitable and sometimes invaluable late-night, soul-searching coffeehouse conversations that might, momentarily, open the door to an unbeliever's heart. It is true that science cannot answer the deepest questions such as "what is the meaning of life?" Nor can it prove the existence of God. Jesus made it clear that faith is a critical part of our relationship with the Father[23] and can never be replaced. But the humble and inquisitive approach to this material often leads non-believers to ask questions they have never asked before. It is therefore imperative to be ready, not with quick one-line religious platitudes, but with respect for and humility before your fellow students and God. No one can argue with your testimony, your story of your own encounter with God.

But beware: some caffeine encounters only serve as a platform for self-aggrandizement and as a new forum for some people to listen to themselves wax eloquent. Ask God for discernment, and don't get sucked in.[24] Be prepared because it is easy to be intimidated by a confident and seemingly educated argument.[25] Remember what you have learned about overconfidence. Extreme confidence does not correlate with accuracy.

20. Stark A & B R -72).
21. "For God did not give us a spirit of timidity, but a spirit of power, of love and of self-discipline" 2 Timothy 1:7.
22. "With the belt of truth buckled around your waist, with the breastplate of righteousness in place, and with your feet fitted with the readiness that comes from the gospel of peace. In addition to all this, take up the shield of faith, with which you can extinguish all the flaming arrows of the evil one. Take the helmet of salvation and the sword of the Spirit, which is the word of God" Ephesians 6:14-17.
23. Matthew 23:23.
24. "And if any place will not welcome you or listen to you, shake the dust off your feet when you leave, as a testimony against them" Mark 6:11.
25. "I am sending you out like sheep among wolves. Therefore be as shrewd as snakes and as innocent as doves" Matthew 10:16.

Ponder This

What is an example of hindsight bias in your Christian walk?

Has your overconfidence ever led you into trouble? Explain.

I lived and studied in Hungary in 1988 just before the fall of the Iron Curtain. Upon my return a friend asked me if I thought Eastern Europe would ever free itself from communist control. Almost without thinking I told him the same answer that nearly everyone would have given: "No way!" Less than three months later the bottom dropped out. Looking back, there were plenty of signs of chinks in the armor of the communist government, but I wasn't looking for them and therefore didn't notice any.

OQ 1.2 (After reading pages 21-33, How Do Psychologists Ask and Answer Questions?)

1. The example of referring to oneself as pro-choice (rather than pro-abortion) or pro-life (rather than anti-abortion) is an example of what *effect*?

2. What is the difference between a *theory* and a *hypothesis*?

3. Which is better: a *random sample* of 150 or an unrepresentative sample of 800?

4. What is the difference between a *positive* correlation and a *strong* correlation?

5. A *correlation* study is to prediction as an *experiment* is to _____.

/5

Description

Explain the following.

Case study:

Survey:

Naturalistic observation:

Learn by Doing!
Go out and conduct your own naturalistic observation. Spend fifteen minutes observing and recording the behavior of organisms in their natural environment. This can range from watching students or your family perform their eating rituals, to observing the courting practices of crickets.

Record your observations. For example, you might note how people choose a seat, eat, socialize, or leave. Quantify wherever you can; record things such as size and number of helpings, amount of carbohydrates, or number of drinks. You may also describe emotional responses or make comparisons between groups based on *variables* such as gender or social status. Please make sure you specify your *population* and *sample size*.

Population:

Sample size:

Location:

Time:

Observations:

Observational data can often be easier to grasp when it is displayed visually. In the space below, please create a *scatterplot* or any other graphic representation of the data that you collected.

Describing behavior is the first step in trying to predict it, but there is more involved. Next, try to establish a correlation in order to make a prediction. After you have observed two related behaviors (like the amount of food taken and the size or age of the person), think about how each variable might influence the other. Develop a theory (an explanation that organizes your observations) about how two variables are related. An example of a theory is "eating habits affect weight." You try.

Your theory:

Next, form a specific hypothesis (a testable prediction) about the relationship between the same two variables in your theory. For example, "students who eat double cheeseburgers will be heavier than those who eat salads."

Your hypothesis:

Once you have a hypothesis, you are now ready to test it. An experiment is a way to determine cause and effect by manipulating one variable at a time in order to isolate and observe its effect. Right now, you don't have to actually conduct an experiment; it will be enough to identify each type of variable.

Use your textbook to understand the difference between the two types of variables. If I were to do an actual experiment to test my hypothesis, I might feed one group of randomly selected subjects a fatty diet of cheeseburgers and feed the other group salads while controlling for exercise (keeping the two groups on the same exercise routine). In my example, the *independent variable* would be the fat content of the food, and the *dependent variable* would be the weight of the subjects. Now it is your turn. Think of your own experiment, and without actually conducting it, explain the variables.

Your experiment:

Independent variable:

Dependent variable:

The Placebo Effect

As you have read, the placebo effect describes experimental results caused by expectations. In fact, the word *placebo* is Latin for *I shall please*. Since it is a goal of this class to help you anticipate, honestly respond to, and help a world of skeptics, let me rock your boat a little.

What would you say to someone who claimed that the documented, significant effects of the healing power of prayer could be explained entirely through the placebo effect?

Party Placebo

Some of my students gave me an example of the placebo effect at a party. Some of the football players were drinking alcohol and acting like belligerent knuckleheads. At some point, they ran out of rum, so they made a new batch of the punch everyone was drinking, but without any alcohol. A new group of kids then arrived at the party, slammed down the new punch, and joined their friends in an apparent drunken stupor. When they were later told that they had not really consumed any alcohol, they couldn't believe it. Their expectations, paired with the force of the social situation, created almost the same effect as real alcohol.

What does this example suggest about how our brains operate?

Give a one-sentence example of the placebo effect using aspirin, a little kid, and vitamin C.

Experimental Design

In terms of science, the only dependable way to determine cause and effect is the experiment. If everything is held constant and only one variable (the IV, or independent variable) is changed, then we can be confident that the change in the result (the DV, or dependent variable) must be due to the change in the independent variable.

Shredding This Lousy Experiment

In order to apply these principles, please critique the following experiment.[27] I hope that you can find lots of problems.

Dr. Moesteler has long been interested in the effects of alcohol on human behavior. His latest experiment involved giving college students one of three kinds of drinks:

- 3 oz. of 100 proof vodka mixed with a standard sized glass of orange juice,
- 2 oz. of 100 proof vodka mixed with a small glass of orange juice, or
- 3 oz. of a nonalcoholic, vodka-flavored substance mixed with a standard sized glass of orange juice.

Dr. Moesteler recruited some of his subjects from the school's track team, which was easy because he is the assistant coach. He recruited the rest of his subjects from his introductory psychology class. Dr. Moesteler assigned the women on the track team to the 2 oz. vodka group, the men from his class to the 3 oz. vodka group, and the women from his class to the nonalcoholic group.

The women on the track team participated right after they finished practicing, and students from his class participated at various times during the day. After each group drank the beverage, Dr. Moesteler had them sit in an automobile simulator where their task was to step on the brake every time they saw a red light.

Much to his surprise, the 2 oz. group showed slower reaction times to the red light than the 3 oz. group did. The nonalcoholic group was the quickest to react. As soon as the experiment was over, he explained to the subjects the true purpose of the experiment and had them sign an informed consent form. From his analysis of the results, Dr. Moesteler concluded that drinking alcoholic beverages can slow reaction times for braking in college students who drive after drinking.

Use your *critical thinking* skills and list as many problems as you can with this experiment.

27. Eva Conrad and Mark Rafter, "*Instructor's Resource Kit to accompany Wade/Tavris Psychology, 3rd Edition*." (New York: HarperCollins, 1993), pgs. 69-70.

Your Turn
Now that you are an expert at critiquing others' experiments, it is time to go to the next level and design your own. Be sure to avoid all the mistakes that you just pointed out with Dr. Moesteler's method.

Please design an experiment to test popular advertising claims. To help you do a good job, I am hereby giving you a $25,000 budget. With that money, please design an experiment to test the claim that "White Cloud toilet paper is the softest bathroom tissue on earth."[28]

It is your job to determine each component of the experiment, eliminating as many confounding variables as possible. There are many choices to make about how to design an experiment to test this claim, but you are responsible for them all. Label your IV and DV, and above all, make sure you have an appropriate sample!

Sample:

IV:

DV:

Methodology:

Critique: No experiment is perfect. What problems do you see in your own experiment?

28. Martin Bolt, *Instructor's Resources to Accompany David G. Myers Psychology Sixth Edition*. (Holland, MI: Worth Publishers, 2001), chap. 1, p. 17.

OQ 1.3 (After reading pages 33-38, Statistical Reasoning in Everyday Life)

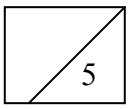
1. The first two questions are a quick review from the lesson before because they are so important. What is the defining characteristic of an *experiment*?

2. Explain the *double-blind procedure* and define the *control condition*.

3. Which measure of central tendency (*mean*, *median*, or *mode*) is used to determine your GPA?

4. What does the *range* measure?

5. Theoretically, in which class would the *standard deviation* for achievement be greater: an AP class like this, or a regular health class comprised of students with a broad range of academic abilities?



Statistics: A Tool Used to Apply Critical Thinking

Descriptive statistics organize and describe group data, whereas inferential statistics test for *statistical significance*.

Just to make sure you can apply these statistical concepts in real life, answer the following:

Which type of measure of central tendency is used to calculate one's GPA?[29]

Which type of measure of central tendency is used to calculate a baseball player's batting average?[30]

What is the mode of how many cookies you've eaten each day this week?[31]

Explain, in your own words, what the standard deviation measures.

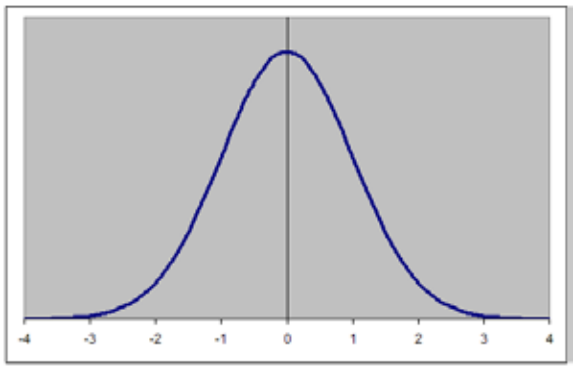
For most students, standard deviation is the most difficult concept in statistics, but it is really rather simple. It just measures consistency. For example, a basketball player might have a hot hand one game and score thirty points, but the next game score only five. From these two games it looks as if this player's scoring is fairly erratic. In order to statistically calculate his or her consistency, we use a measure of variation like standard deviation. For this course, you generally will not need to know how to calculate standard deviation, but if you are curious, it is calculated based on the following formula:

$$\text{Standard deviation} = \text{the square root of: } \frac{\text{sum of (deviations)2}}{\text{number of scores}}$$

29. Mean.
30. Mean.
31. I can't answer that for you, but for me it is five!

Extra Credit: Calculate the standard deviation of this player's scoring over these six games: 10, 34, 17, 8, 20, and 25.[32]

Another important statistical concept is the normal bell curve. It graphically illustrates the idea that most things in life are not equal. Although it might not seem fair,[33] IQ, for instance, is spread out and looks like this:



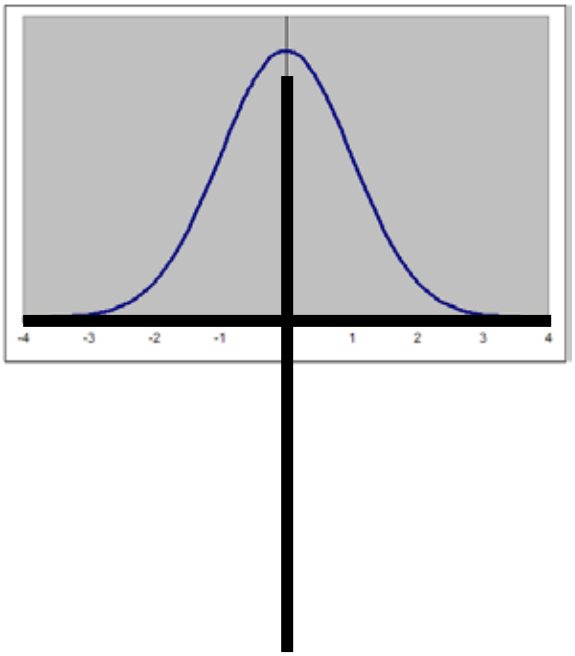
We can see that there are some scores on both the lower and upper ends, but statistically, most are congregated toward the middle. The curve is said to be symmetrical when it looks even on both sides. It is referred to as skewed if the curve is lopsided, revealing that the scores are not evenly distributed, but are higher on one side than the other.

In a perfectly even distribution (normal bell curve), the highest point on the curve illustrates that most scores fall exactly in the middle. In this case, the mean, median, and mode are all the same.

Think of a situation which could be represented by a curve that is skewed to right. As you draw it in the space below, make sure to label each axis and try to determine where the mean, median, and mode are situated along the curve.

32. 8.83. Note, if you got 9.67 you took a shortcut and used a calculator which calculates it differently.
33. "Does not the potter have the right to make out of the same lump of clay some pottery for noble purposes and some for common use?" Romans 9:21.

Like a normal bell curve, God's gifts are spread out along the entire curve. Although God's gifting cannot be numerically quantified and some gifts are more common than others, all points along the curve are needed and serve special purposes. It struck me how the cross is visible even while plotting data.



Another statistical concept you must understand is that of correlation. Complete the following questions:

What does the term *positive correlation* mean?

Draw a graph of what a positive correlation looks like.

What does the term *negative correlation* mean?

Draw a graph of what a negative correlation looks like.

Graphically represent the relationship between your time spent with God and how often you beat up your sibling.[35]

Don't worry, you will eventually get used to my quirky sense of humor. (But graph it anyway!) Let's try one more.

Graphically represent the theoretical relationship between the time spent doing homework and your scores on tests.[36]

Correlation Does Not Mean Causation!

I give my students a couple of examples to illustrate how correlation does not mean causation. Try to figure out the answers to the following questions before checking the answers:

> A Good News Survey (GNS) found that people who often ate Frosted Flakes when they were children had half the cancer rate of those who never ate the cereal. But those who often ate oatmeal as children were four times more likely to develop cancer than those who did not. Why is this?

Many students erroneously think that means that Frosted Flakes prevents cancer while oatmeal causes it. Absolutely not! There is another variable at work here. Try again to figure it out.[37]

> A GNS also found that children who took vitamins were more than twice as likely to go on to use marijuana and cocaine. Why?

> Why is there a negative correlation between the length of a man's marriage and the length of his hair?

35. This would be a negative correlation because theoretically, the two variables should go in opposite directions. The *more* time you spend with God, the *less* often you will beat up your sibling.
36. This would be positive correlation: as one goes up, so does the other.
37. The answer is time. Cancer tends to be a disease of later life, and those who ate Frosted Flakes are younger; the cereal was not even around when the older respondents were children, so they are much more likely to have eaten oatmeal.

These correlations are true for exactly the same reason.[38]

> In the former New Hebrides Islands (now part of the nation of Vanuatu), body lice were at one time thought to produce good health. In other words, there was a strong positive correlation between body lice and good health. Why?[39]

OQ 1.4 (After reading pages 38-45, Frequently Asked Questions About Psychology)

I just wanted to make sure you can still apply these statistical skills. Use the following data, which shows the number of hair flips (you know, where they dramatically flip their hair and head) during an episode of *Friends*, to answer questions 1-3.

215
202
207
202
205
199

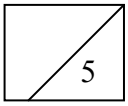
1. Calculate the mean.

2. Calculate the mode.

3. What is the range?

4. Who screens (gives permission for) research projects at university laboratories?

5. Do you think it is ever acceptable to use deception when conducting experiments with people?



A Word about Ethics

38. J. Tierney, "Good News! Better Health Linked to Sin, Sloth," *Hippocrates* (September-October 1987): 39. Ibid. When people became ill, their temperatures rose and caused the body lice to seek more hospitable abodes. Both the lice and good health departed with the onset of the fever.

Secular university ethics committees have the unenviable job of delineating right from wrong without the Bible. Your job, however, in life and in this course is to use God's Word to make better decisions, develop clearer analysis, and be more discerning about what is being taught.

Consider the ethical treatment of animals for starters. The first chapter of Genesis tells us that we are to "rule over" the animals.40 What do you think it means to "rule over" the animals?

Proverbs 12:10 tells us: "a righteous man cares for the needs of his animal, but the kindest acts of the wicked are cruel." There is a reason that police departments keep records and pay close attention to those convicted of cruelty to animals.

Do you think any experiments on animals are morally justified? If so, where exactly would you draw the line between right and wrong? For example, some draw their moral line where it causes harm or pain to the animal; others balance factors such as the benefit to humans or the necessity/value of the research.

Give an example of what you think is acceptable and what you think is not acceptable.

Ethics Committee

Apply your ethics in these examples.[42] Imagine that you are on the ethics committee of your university. It is the committee's responsibility to evaluate and either approve or reject research proposals submitted by faculty members who want to use animals for research or instructional purposes in psychology, biology, or medicine. The proposals describe the experiment, the goals, and potential benefits of the research, and any discomfort or injury that the experiment may cause to the animal subjects. You must either approve the research or deny permission for the experiments. It is not your job to suggest improvements on technical aspects of the projects, such as the experimental design. You should make your decision based on the information given in the proposal.

Case One

40. "And let them rule over the fish of the sea and the birds of the air, over the livestock, over all the earth, and over all the creatures that move along the ground" Genesis 1:26.

42. Martin Bolt, *Instructor's Resources to Accompany David G. Myers Psychology Eighth Edition*. (Holland, MI: Worth Publishers, 2007), chap. 1, p. 56.

Professor King is a psychobiologist working on the frontiers of a new and exciting research area of neuroscience: brain grafting. Research has shown that neural tissue can be removed from the brains of monkey fetuses and implanted into the brains of monkeys that have suffered brain damage. The neurons seem to make the proper connections and are sometimes effective in improving performance in brain-damaged animals. These experiments offer important animal models for human degenerative diseases such as Parkinson's and Alzheimer's. Dr. King wants to transplant tissue from fetal monkey brains into the entorhinal cortex of adult monkeys. In human brains, the entorhinal cortex is the area involved with Alzheimer's disease.

The experiment will use twenty adult rhesus monkeys. First, the monkeys will be subjected to ablation surgery in the entorhinal cortex. This procedure will involve anesthetizing the animals, opening their skulls, and making lesions using a surgical instrument. After they recover, the monkeys will be tested on a learning task to make sure their memory is impaired. Three months later, half of the animals will be given transplant surgery. Tissue taken from the cortex of monkey fetuses will be implanted into the area of the brain damage in the adult monkeys. Control animals will be subjected to sham surgery, and all animals will be allowed to recover for two months. They will then learn a task to test the hypothesis that the animals having brain grafts will show better memory than the control group.

Dr. King argues that this research is in the exploratory stages and can only be done using animals. She further states that soon, well over two million Americans will have Alzheimer's disease and that her research could lead to a treatment for the devastating memory loss that Alzheimer's victims suffer.

Approved or denied:

Explanation:

Case Two

Dr. Fine is a developmental psychobiologist. His research concerns the genetic control of complex behaviors. One of the major debates in his field concerns how behavior develops when an animal has no opportunity to learn a response. He hypothesizes that the complex grooming sequence of mice might be a behavior pattern that is put into the brain at birth, even though it is not expressed until weeks later. To investigate whether the motor patterns involved in grooming are acquired or innate, he wants to raise animals with no opportunity to learn the response. Rearing animals in social isolation is insufficient because the mice could teach themselves the response. Certain random movements could accidentally result in the removal of debris. These would then be repeated and could be coordinated into the complex sequence that would appear to be instinctive but would actually be learned. To show that the behaviors are truly innate, he needs to demonstrate

that animals raised with no opportunity to perform any grooming-like movements make the proper movements when they are old enough to exhibit the behavior.

Dr. Fine proposes to conduct the experiment on ten newborn mice. As soon as the animals are born, they will be anesthetized and their front limbs amputated. This procedure will ensure that they will not be reinforced for making random grooming movements that remove debris from their bodies. The mice will then be returned to their mothers. The animals will be observed on a regular schedule using standard observation techniques. Limb movements will be filmed and analyzed. If grooming is a learned behavior, then the mice should not make grooming movements with their stumps, as the movements will not remove dirt. If, however, grooming movements are innately organized in the brain, then the animals should eventually show grooming-like movements with the stumps.

In his proposal, Dr. Fine notes that experimental results cannot be directly applied to human behavior. He argues, however, that the experiment will shed light on an important theoretical debate in the field of developmental psychobiology. He also stresses that the amputations are painless and the animals will be treated well after the operation.

Approved or denied:

Explanation:

Multiple Choice (M/C) Tests

Love them or hate them, M/C tests are a part of life. Though they are not the only method (or even the best), they are an efficient way to test a student's grasp of information, and therefore remain an integral part of college assessments. To prepare you for the AP test, you will need to take a M/C test every chapter or two.[43]

In order to help students overcome their fear of M/C tests and to emphasize their relevance, I often remind them that M/C tests are a lot like dating. You may not believe

[43] All test questions were generated from John Brink, *Test Bank* to accompany David G. Myers *Psychology Eighth Edition*. Used by permission. (Holland, MI: Worth Publishers, 2007).

me, but in both cases, the main objective is to eliminate bad options! I frequently see kids (in school and in life) get talked into bad decisions because they go straight to the choices set immediately in front of them instead of thinking through the question. It is the same with dating. Instead of asking God and dreaming about what God has for them, many teenagers limit themselves by picking the first thing that looks good.

I suggest that on M/C tests, you try to answer the question before looking at any of the choices so you don't get talked into a bad option. If you do your own thinking first, you will be in a better position avoid being misled.

And by the way, if you ever find yourself in a bad relationship and are having trouble getting out of it, feel free to use me as an excuse. You might laugh, but it has actually happened in real life. Simply tell the person that Mr. Corson said you need to eliminate bad options immediately and that is what you are now doing. It may be quite harsh, but just like with M/C tests, quite necessary.

When you feel you are ready, take the following test that covers the text, workbook, and *Psychology Interactive Workbook and Diary* material from the preface through the chapter on thinking critically. The answer key is in the back of the book.

Prologue & Thinking Critically

1. A theoretical perspective in psychology can be like a two-dimensional view of a three-dimensional object because each perspective is
   A) limited in its scope.
   B) likely to contradict other perspectives.
   C) based on assumptions shared by other perspectives.
   D) of little value for applied research.
   E) impossible to test scientifically.

2. Dr. Robinson conducts basic research on the relationship between brain chemistry and intellectual functioning. Which psychological specialty does Dr. Robinson's research best represent?
   A) social psychology
   B) clinical psychology
   C) biological psychology
   D) industrial/organizational psychology
   E) developmental psychology

3. Mrs. Alfieri believes that her husband's angry outbursts against her result from his unconscious hatred of his own mother. Mrs. Alfieri is looking at her husband's behavior from a(n) _____ perspective.
   A) Evolutionary
   B) Behavioral
   C) Psychodynamic
   D) behavior genetics
   E) social-cultural

4. In its early years, psychology focused on the study of _____, but from the 1920s into the 1960s, American psychologists emphasized the study of _____.
   A) environmental influences; hereditary influences
   B) maladaptive behavior; adaptive behavior
   C) unconscious motives; conscious thoughts and feelings
   D) mental life; observable behavior
   E) biology; culture

5. Contemporary psychology is best defined as the scientific study of
   A) conscious and unconscious mental activity.
   B) observable responses to the environment.
   C) behavior and mental processes.
   D) thoughts, feelings, and perceptions.
   E) maladaptive and adaptive behaviors.

6. Dr. Karima conducts basic research on the relative effectiveness of massed practice and spaced practice on a person's ability to remember information. Dr. Karima is most likely a _____ psychologist.
   A) Social
   B) Developmental
   C) Personality
   D) Biological
   E) cognitive

7. Dr. Kozak has concluded that the unusually low incidence of alcoholism among citizens of a small African country can be attributed to strong fundamentalistic religious influences in that region. This belief best illustrates a(n) _____ perspective.
   A) behavior genetics
   B) evolutionary
   C) psychodynamic
   D) neuroscience
   E) social-cultural

8. Which perspective would suggest that the facial expressions associated with the emotions of lust and rage are inherited?
   A) cognitive
   B) behavioral
   C) evolutionary
   D) social-cultural
   E) psychodynamic

9. Dr. Lipka is involved in an applied research study of customer satisfaction with a newly developed line of facial cosmetics and other beauty aids. Dr. Lipka is most likely a(n) _____ psychologist.
   A) clinical
   B) developmental
   C) social
   D) personality
   E) industrial/organizational

10. Which psychological perspective highlights the manner in which people encode, process, store, and retrieve information?
    A) cognitive
    B) psychodynamic
    C) behavioral
    D) behavior genetics
    E) evolutionary

11. The behavioral perspective is most likely to emphasize the importance of
    A) cognition.
    B) learning.
    C) introspection.
    D) natural selection.
    E) self-esteem.

12. Akira believes that her son has become a good student because she always praises his learning efforts. Her belief best illustrates a _____ perspective.
    A) behavior genetics
    B) neuroscience
    C) psychodynamic
    D) behavioral
    E) structural

13. Humanistic psychologists focused attention on the importance of people's
    A) childhood memories.
    B) genetic predispositions.
    C) unconscious thought processes.
    D) potential for healthy growth.
    E) reactions to environmental stimuli.

14. Dr. Tiao conducts basic research on the effects of head injuries on people's problem-solving and abstract-reasoning skills. Which psychological specialty does her research best represent?
    A) developmental psychology
    B) biological psychology
    C) industrial/organizational psychology
    D) clinical psychology
    E) personality psychology

15. The inheritance of behavioral characteristics was emphasized by
    A) John Locke.
    B) John Watson.
    C) Wilhelm Wundt.
    D) Charles Darwin.
    E) B. F. Skinner.

16. In answering multiple-choice test items, smart test-takers are best advised to
    A) check off as correct the first answer they read that seems to be right.
    B) avoid guessing the answer on any items that do not appear to have a correct answer.
    C) carefully imagine how each of the alternative answers might be correct.
    D) recall the correct answer to each question before reading the alternative answers.
    E) choose either the longest or the shortest possible answer.

17. Lissette wonders whether personality differences between her African-American and Asian-American friends result from biological or cultural influences. In this instance, Lissette is primarily concerned with the relative contributions of
    A) neuroscience and cognition.
    B) nature and nurture.
    C) behavior and mental processes.
    D) conscious and unconscious thoughts.
    E) introspection vs. structuralism.

18. Dr. MacPherson believes that the way students organize and think about the information in their textbooks will strongly influence their ability to later remember and use what they have studied. Dr. MacPherson's ideas most directly exemplify the _____ perspective.
    A) social-cultural
    B) cognitive
    C) psychodynamic
    D) behavior genetics
    E) neuroscience

19. Dr. Wilcox conducts basic research on the behavioral differences between introverted and extraverted people. Dr. Wilcox is most likely a(n) _____ psychologist.
    A) clinical
    B) biological
    C) cognitive
    D) industrial/organizational
    E) personality

20. The self-reflective observation of one's own sensations and feelings is called
    A) clinical psychology.
    B) introspection.
    C) spaced practice.
    D) humanism.
    E) Gestalt psychology.

21. The biopsychosocial approach provides an understanding of social-cultural influences integrated within the larger framework of
    A) SQ3R.
    B) introspection.
    C) humanistic psychology.
    D) multiple levels of analysis.
    E) structuralism.

22. Which perspective is most concerned with the unique ways in which individuals interpret their own life experiences?
    A) behavioral
    B) cognitive
    C) neuroscience
    D) behavior genetics
    E) psychodynamic

23. Dr. Mills conducts research on why individuals conform to the behaviors and opinions of others. Which specialty area does his research best represent?
    A) cognitive psychology
    B) social psychology
    C) developmental psychology
    D) clinical psychology
    E) industrial/organizational psychology

24. Christine, who is opposed to capital punishment, was extremely surprised to learn that the results of a survey indicated that the majority of the population approved of capital punishment. Christine's surprise best illustrates the power of
    A) the false consensus effect.
    B) the placebo effect.
    C) random assignment.
    D) the double-blind procedure.
    E) the hindsight bias.

25. Participants in an experiment are said to be blind if they are uninformed about
    A) the experimental hypothesis being tested.
    B) whether the experimental findings will be statistically significant.
    C) how the dependent variable is measured.
    D) which experimental treatment, if any, they are receiving.
    E) what research method is being used.

26. The range is
    A) a total population from which samples may be drawn.
    B) the difference between the highest and lowest scores in a distribution.
    C) the most commonly used measure of variation.
    D) the average deviation of scores from the mean.
    E) the most frequently occurring score in a distribution of scores.

27. Formulating testable hypotheses before conducting research is most directly useful for restraining a thinking error known as
    A) random sampling.
    B) the hindsight bias.
    C) the false consensus effect.
    D) illusory correlation.
    E) random assignment.

28. The relief of pain following the ingestion of an inert substance that is presumed to have medicinal benefits illustrates
    A) random assignment.
    B) the hindsight bias.
    C) the false consensus effect.
    D) the placebo effect.
    E) illusory correlation.

29. Seven members of a boys' club reported the following individual earnings from their sale of cookies: $2, $9, $8, $10, $4, $9, and $7. In this distribution of individual earnings
    A) the median is greater than the mean and greater than the mode.
    B) the median is less than the mean and less than the mode.
    C) the median is greater than the mean and less than the mode.
    D) the median is less than the mean and greater than the mode.
    E) the median is equal to the mean and equal to the mode.

30. In order to study the development of relationships, Dr. Rajiv carefully observed and recorded patterns of verbal and nonverbal behaviors among men and women in singles bars. Which research method did Dr. Rajiv employ?
    A) naturalistic observation
    B) replication
    C) the survey
    D) the case study
    E) experimentation

31. Seven members of a girls' club reported the following individual earnings from their sale of raffle tickets: $5, $9, $4, $11, $6, $4, and $3. In this distribution of individual earnings, the
    A) median is greater than the mean and greater than the mode.
    B) median is less than the mean and less than the mode.
    C) median is equal to the mean and equal to the mode.
    D) median is greater than the mean and less than the mode.
    E) median is less than the mean and greater than the mode.

32. In order to learn about the TV viewing habits of all the children attending Oakbridge School, Professor DeVries randomly selected and interviewed 50 of the school's students. In this instance, all the children attending the school are considered to be a(n)
    A) population.
    B) representative sample.
    C) independent variable.
    D) control condition.
    E) dependent variable.

33. If college graduates typically earn more money than high school graduates, this would indicate that level of education and income are
    A) causally related.
    B) positively correlated.
    C) independent variables.
    D) dependent variables.
    E) negatively correlated.

34. Which of the following statistical measures is most helpful for indicating the extent to which high school grades predict college grades?
    A) standard deviation
    B) mean
    C) median
    D) correlation coefficient
    E) range

35. Which technique involves repeating the essence of an earlier research study with different participants and in different circumstances?
    A) replication
    B) correlational research
    C) random sampling
    D) naturalistic observation
    E) the double-blind procedure

36. Professor Shalet contends that parents and children have similar levels of intelligence largely because they share common genes. His idea is best described as a(n)
    A) theory.
    B) replication.
    C) naturalistic observation.
    D) illusory correlation.
    E) hindsight bias.

37. Megan was certain that she would never live far away from her family. However, in order to further her career, she decided to move. Megan's experience best illustrates
    A) the hindsight bias.
    B) illusory correlation.
    C) random assignment.
    D) the false consensus effect.
    E) overconfidence.

38. A questioning attitude regarding psychologists' assumptions and hidden values best illustrates
    A) the false consensus effect.
    B) critical thinking.
    C) the hindsight bias.
    D) overconfidence.
    E) illusory correlation.

39. Replication involves
    A) the selection of random samples.
    B) perceiving order in random events.
    C) repeating an earlier research study.
    D) rejecting ideas that cannot be scientifically tested.
    E) overestimating the extent to which others share our views.

40. A research method in which an investigator manipulates factors that potentially produce a particular behavior is called a(n)
    A) survey.
    B) experiment.
    C) case study.
    D) naturalistic observation.
    E) correlational method.

41. Professor Smith told one class that alcohol consumption has been found to increase sexual desire. He informed another class that alcohol consumption has been found to reduce sexual appetite. The fact that neither class was surprised by the information they received best illustrates the power of
    A) the false consensus effect.
    B) replication.
    C) the hindsight bias.
    D) the double-blind procedure.
    E) the placebo effect.

42. Which measure of variation is affected most by a few extreme scores?
    A) mode
    B) standard deviation
    C) mean
    D) median
    E) range

43. The explanatory power of a scientific theory is most closely linked to its capacity to generate testable
    A) assumptions.
    B) correlations.
    C) predictions.
    D) variables.
    E) hypotheses.

44. Faustin, a member of his college's golf team, has an opportunity to play against a nationally acclaimed professional golfer. How many holes of golf should Faustin choose to play with the professional in order to maximize his own slim chances of winning?
    A) 9
    B) 18
    C) 27
    D) 36
    E) 72

45. Six different high school students spent $10, $13, $2, $12, $13, and $4, respectively, on entertainment. The mode of this group's entertainment expenditures is
    A) $9.
    B) $10.
    C) $11.
    D) $12.
    E) $13.

46. In a distribution of test scores, which measure of central tendency would likely be the most affected by a couple of extremely high scores?
    A) median
    B) range
    C) mode
    D) standard deviation
    E) mean

47. The arithmetic average of a distribution of scores is the
    A) mode.
    B) median.
    C) standard deviation.
    D) mean.
    E) range.

48. During the past year, Zara and Ivan each read 2 books, but George read 9, Ali read 12, and Marsha read 25. The median number of books read by these individuals was
    A) 2.
    B) 50.
    C) 10.
    D) 12.
    E) 9.

49. When provided with the unscrambled solution to anagrams, people underestimate the difficulty of solving the anagrams by themselves. This best illustrates
    A) illusory correlation.
    B) the false consensus effect.
    C) the placebo effect.
    D) wording effects.
    E) overconfidence.

50. Professor Woo noticed that the distribution of students' scores on her last biology test had an extremely small standard deviation. This indicates that the
    A) test was given to a very small class of students.
    B) students' scores tended to be very similar to one another.
    C) mean test score was lower than the median score.
    D) students generally performed very well on the test.
    E) test was a poor measure of the students' knowledge.

51. An experiment was designed to study the potential impact of alcohol consumption on emotional stability. A specification of the procedures used to measure emotional stability illustrates
    A) the independent variable.
    B) an operational definition.
    C) the double-blind procedure.
    D) random assignment.
    E) the dependent variable.

52. If the correlation between the physical weight and reading ability of children is +0.85, this would indicate that
    A) there is very little statistical relationship between weight and reading ability among children.
    B) low body weight has a negative effect on the reading abilities of children.
    C) better reading ability is associated with greater physical weight among children.
    D) body weight has no causal influence on the reading abilities of children.
    E) weight is a causal variable *dependent on reading ability.*

53. The complete set of cases from which samples may be drawn is called a(n)
    A) control condition.
    B) population.
    C) case study.
    D) independent variable.
    E) survey.

54. The American Psychological Association and British Psychological Society have developed ethical principles urging investigators to
    A) avoid the use of monetary incentives in recruiting people to participate in research.
    B) forewarn potential research participants of the exact hypotheses that the research will test.
    C) avoid the manipulation of independent variables in research involving human participants.
    D) explain the research to the participants after the study has been completed.
    E) increase the difficulty level of research endeavors while maintaining validity.

55. Evelyn wants to know how consistent her bowling scores have been during the past season. Which of the following measures would be most relevant to this specific concern?
    A) mean
    B) median
    C) scatterplot
    D) standard deviation
    E) correlation coefficient

Chapter Grade Sheet

Study Guide	_____ / 20
OQs (OQ% x 20)	_____ / 20
Example: .90 x 20 = 18/20	
Chapter Tests (test% x 20)	_____ / 20
Example: .80 x 20 = 16/20	
Workbook and Diary Activities	_____ / 20
Workbook and Diary Questions/Responses	_____ / 20
Total Chapter Score	_____/100

(record in grade book located in Appendix 2)

*Grace note: on the first test, I allow students to do a buyback. They are allowed to go back to every question on the test they missed, and get the point back by defining or explaining *every* option on the question. (So they can now explain why the correct answer is correct and why the others are not.)

Here is an example:

The difference between the highest and lowest scores in a distribution is the:

A) mean. The statistical average of a number of scores. Add the scores and divide by the number of scores.
B) range. The difference between the highest and the lowest scores in a distribution. [Clearly the best answer!]
C) median. The middle score in a distribution.
D) standard deviation. How much the scores vary from the mean.
E) correlation coefficient. A number that indicates the direction and strength of numbers in a distribution.

This method takes a lot of work, but ensures that the student will understand the material more thoroughly. I will leave it you and your parents to decide if this is an option for other tests.

The Biology of Mind & Nature, Nurture, and Human Diversity (Chapters 2 & 4)

biological psychology 2	neuron 2
dendrite 2	axon 2
myelin sheath 2	action potential 2
threshold 2	synapse 2
neurotransmitters 2	reuptake 2

endorphins 2	nervous system 2

central nervous system (PNS) 2	peripheral nervous system (PNS) 2
nerves 2	sensory neurons 2
motor neurons 2	interneurons 2
somatic nervous system 2	autonomic nervous system 2
sympathetic nervous system 2	parasympathetic nervous system 2
reflex 2	Check: are you making all your note cards? 2
endocrine system 2	hormones 2

adrenal glands 2	pituitary gland 2
lesion 2	electroencephalogram (EEG) 2
PET (positron emission tomography) scan 2	MRI (magnetic resonance imaging) 2
fMRI (functional MRI) 2	brainstem 2
medulla 2	reticular formation 2
thalamus 2	cerebellum 2
limbic system 2	amygdala 2

hypothalamus 2	cerebral cortex 2
glial cells 2	frontal lobes 2
parietal lobes 2	occipital lobes 2
temporal lobes 2	motor cortex 2
sensory cortex 2	association areas 2
neurogenesis 2	plasticity 2

corpus callosum 2	split brain 2
environment 4	behavior genetics 4
chromosomes 4	DNA 4
genes 4	genome 4
identical twins 4	fraternal twins 4
temperament 4	heritability 4
interaction 4	molecular genetics 4

evolutionary psychology 4	natural selection 4
mutation 4	gender 4
culture 4	norm 4
personal space 4	individualism 4
collectivism 4	aggression 4
X chromosome 4	Y chromosome 4
testosterone 4	role 4

gender role 4	gender identity 4
gender-typing 4	social learning theory 4

Introduction
The Bible says, "Before I formed you in the womb I knew you, before you were born I set you apart."[44] God created us out of flesh and blood with real feelings, emotions, gifts, and abilities, and a unique purpose. My point is that the building blocks of creation go hand in hand with His purposes and therefore shouldn't be ignored. In fact, the human brain and *nervous system* is probably the most amazing created structure. In other words, the spiritual and the physical somehow come together in the brain. As psychologists pick apart and try to deconstruct the form and function of the brain, keep your eye on the big picture of how God actually created everything to work together for His glory.[45]

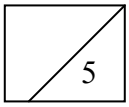
OQ 2.1 (After reading pages 47-58, Neural Communication)
1. Multiple sclerosis is a disease rooted in the lack of _____.

2. A "runner's high" is created when what *neurotransmitter* is released? (Hint: you don't need morphine to get this right.)

3. Which junction has been referred to as the "protoplasmic kiss"?

4. Not that you're thinking of using it . . . yet, but please explain how Botox works.

5. Becoming pregnant illustrates a vocabulary term about a response. (Hint: you can't be just a little bit.)



Does the Outside Reveal the Inside?
As soon as my students walk into the classroom each day, I greet them with the daily quiz about the previous night's reading. I usually start the particular quiz you just took by walking around the classroom and touching different parts of my students' heads while making various comments under my breath such as, "just as I expected," or "I bet he's a rather impulsive one." I probably shouldn't do that in a public school setting, but so far I haven't been sued. Anyway, as my students question my sanity, I begin the quiz by asking them what wrongheaded theory I am demonstrating. What is it?

This launches us into a discussion about the merits and demerits of Franz Gall's idea. What was he wrong about?

What was he partially right about?

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44. Jeremiah 1:5.
45. "And we know that in all things God works for the good of those who love him, who have been called according to his purpose" Romans 8:28.

OQ 2.2 (After reading pages 55-58, The Nervous System)

1. Name the two primary divisions of the nervous system.

2. The *peripheral nervous system* is further subdivided into two levels. Name them.

3. The *autonomic nervous system* is further subdivided into two levels. Name them.

4. Which part of the nervous system (*somatic* or autonomic) tells your brain how to give me a high five?

5. Name the three types of *neurons* and put them in chronological order from the actual prick of your finger to your response.

5

Neuron Flush

The timing wasn't so good on my next demonstration. We had a brand new principal and vice principal, and nobody warned them about my antics. By chance, one of the security guards was patrolling the halls right after I took my whole class on a field trip into the boys' bathroom. I knew there was going to be trouble when I heard her radio make that beeping sound. Two minutes later the principle walked into the boys' bathroom and found me standing over one of the stalls flushing a toilet in order to demonstrate how a neuron works. You can do the same assignment with a friend or parent . . . but without all the drama.

How Is Flushing a Toilet Like a Neuron Firing?

You may not have made the connection on your own, but I hope this exercise will make it easier to recall the information.

Explain how each aspect of flushing a toilet is similar to how a neuron fires. Next to each neurological term write its toilet equivalent.

depolarization:

all-or-none response:

refractory period:

threshold:

resting potential:

action potential:

sodium-potassium pump:

Check your responses against the answers below.[46]

From now on, whenever you make a trip to the bathroom, give yourself a quick review of the function and structure of a neuron (or not)!

Dollar Demo

Although my students love neurology purely as an academic discipline, I find it helpful to use demonstrations which harness another of their interests . . . hard cold cash. I have my students spread their thumbs and middle fingers as I place a five-dollar bill (sorry, I'm cheap) above their hands. I then drop the bill and they try to put their fingers together to catch it before it slips away. I haven't lost too much money over the years. Next, I bait them with a little smack-talk about how I can do it. But when I do it, I simply drop it from my own left hand and catch it with the fingers on my right hand. They cry foul and I ask why. Using what you have learned about *sensory neurons*, *motor neurons*, and *interneurons*, try this mini-experiment with a friend, sibling, or parent and explain why it is easier to catch it with your own hands.[47]

The Neurology of Neglect

You've probably heard the expression "use it or lose it" before. Neurological potential operates on the same principle. With experience, neurons develop. Without it, they don't. My wife and I have been able to learn about and use this information firsthand. We have adopted two kids from orphanages in Russia, and they are undoubtedly the most amazing kids in the world. (I may be just a bit biased here!) But in the process of welcoming them into our family, we were able to witness the devastating effects of neglect.

There are a variety of reasons why kids in these circumstances do not have the opportunity to develop to their neurological potential. In some institutions, it is because they were rarely held and cuddled. Touch is one of the most important gifts a child can receive.

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46. Depolarization: represented by the toilet flushing.
All-or-none principle: the toilet either flushes completely or not at all; it doesn't flush a little or a lot.
Refractory period: after you flush the toilet, it won't flush again for a certain period of time, even if you push the handle repeatedly.
Threshold: you can push the handle a little bit, but it won't flush until you push the handle past a certain critical point. This corresponds to the level of excitatory neurotransmitters that a neuron must absorb before it will fire.
Resting potential: the toilet is "waiting" to fire, and the water in the tank represents the overall negative charge inside the neuron waiting for depolarization.
Action potential: the action potential is represented by opening the flap in the tank and the water suddenly flowing into the toilet bowl.
Sodium-potassium pump: at resting potential, the water is a combination of negatively charged chloride and positively charged potassium. When the toilet is flushed, sodium that has not been able to enter the urinal rapidly comes flowing in and pushes the potassium out. During the refractory period, the potassium reenters and the sodium is pushed back in and balance and repolarization occurs.
47. Hint: think of the shortcut in the second example. What *doesn't* have to happen?

At this point in your reading, you can probably appreciate the neurological benefits from a physical standpoint. One of my goals for this book is to remind you how all of our knowledge should lead us to better appreciate God's purposes, and how we often have to read between the lines in an academic setting. In other words, the books may use phrases such as "neurological development from a rich environment," but I want to train you to translate that into God's vocabulary. It is the role of scientists to eliminate variables and sterilize subjectivity, but please see beyond that. The simple truth is that God created us to receive love.[48] Without that love, we die—spiritually and neurologically.

My wife is an occupational therapist (OT) in the International Adoption Clinic at the Children's Hospital and therefore gets to see many of the adopted kids who come into our city. She has learned how kiddos from different countries have had sensory experiences that vary according to each culture's beliefs and practices. For instance, children from northern China are often so bundled with clothing that they don't get the sensory experience they need directly on their skin. Children from Siberia, Russia have similar experiences; as an example, look at the picture of my daughter Naomi when she was swaddled. Without someone to hold them, love them, cuddle them, change their cloths, and play in the water and the sand box with them, many kids will have problems integrating (processing) all this neurological information later on because their early neglect leads to sensory overload later. As a child, did you hate the feeling of wool or anything else next to your skin? Consider what it would be like to feel that type of aversion all day long.

48 "A new command I give you: Love one another. As I have loved you, so you must love one another" John 13:34.

One way to overcome problems with sensory processing is to introduce a wide variety of experiences in a safe and secure *environment*. I vividly remember trucking across Siberia looking for new experiences for my kids. Though we got a lot of funny looks from the locals, we splashed in public fountains, walked on grass and gravel, and tried on all types of clothing. We knew that the unprecedented experiences would be both beneficial and scary, so we were always there to love them and provide comfort during those times.

Do you see the parallel with God's relationship with you? Regardless of the early experiences you have had, He wants to love you through a special and intimate relationship. Even if you resist new situations, such experiences are necessary to help you become a fully integrated Kingdom worker who can deal with uncomfortable situations in the future. Have you ever experienced a new situation or emotion that severely stressed you out?

How did you react?

Honestly, how did you seek to comfort yourself (friends/family, other good or bad outlets)?

Spinal Cord Injury Designations

When reading about spinal cord injuries, you will often see a designation such as C7, which describes the location of the injury on the vertebrae. C stands for the cervical vertebrae, T stands for the thoracic region, and L stand for the lumbar region. The number describes the particular vertebrae within the region. The numbers are arranged so that the lower the number, the higher the vertebrae in that section. For instance, a C5 represents the vertebrae in the cervical section that is fifth from the top. Such a description is helpful because it correspond with an ability level. Someone with a C5 injury probably has no movement of the legs and some movement of the elbow and shoulder. People with C3 ("high quad") injuries can usually only use facial muscles and some neck muscles, and are dependent on vents to help them breath. T2 would describe a paraplegic who would have complete movement of his or her arms.

As we will learn later in this course, connecting on a gut level with the material actually helps you remember it better. To that end, I will describe just a bit about what daily life is like for a person with an SCI (spinal cord injury). Because a paraplegic is cut off from the sensory neurons to his legs, he does not have awareness of a lack of circulation to his legs. When an able-bodied individual is sitting in the wrong position for a long time, she might experience a leg which has "fallen asleep." She will then notice the lack of circulation and move her leg in order to restore blood flow. Because the paraplegic does not have awareness of this lack of circulation, he cannot correct the problem. The same is true for pressure sores that occur as a result of sitting on one spot all day. While this is a problem you might never have considered, it is a daily problem for others, and even represents a potential threat of infection. To alleviate this threat, individuals with SCIs must do pressure lifts (using their arms to push up and off their seat, or tilting back in their wheelchair in order to allow circulation) every twenty minutes.[49]

Role Model Cousin

My cousin Scottie has taught me a lot, not only about SCIs, but also about how a Christian can choose to respond to such an injury. Rather than bitterness, Scottie has responded by accepting his injury and using it as a platform to reach out to everybody around him. He has never let his injury (C7) slow him down. He skis, plays hoops, fishes, and water skis. While I'm sure he has had to wrestle with the fact that there are limitations now to his body, he has also learned he simply has to be more creative in how he can accomplish his goals.

49. This same kind of lack of sensory information is what people with leprosy (now called Hansen's disease) experience and it is why they become so disfigured.