Unit 0 Reading Guide

An Introduction to Psychological Science Practices: Research Methods and Data Interpretation

Directions: While reading the assigned pages of the unit, complete the reading guide below. Feel free to add additional information to the guide as you see fit. ***This must be handwritten!!*** Reading guides that are typed will not be graded. You will define words within this and for your notecards, it might be easier to do the words at the same time. Yes, it will feel redundant. However, vocabulary is a huge focus of the course.

Please Note: At the end of each module in your textbook, there are reviews and practice multiple choice questions. Occasionally, there are also "AP Science Practice" sections within the chapter in pink/burgundy boxes. These are a great tool for you to quiz yourself for understanding.

Module 0.1: The Scientific Attitude, Critical Thinking, and Developing Arguments (pgs.0-4-0-8)

1. What are the four science practices that all students should develop throughout the AP psychology course?

a.

b.

c.

d.

2. What are the three key elements of the scientific attitude and how do they support scientific inquiry? Be sure to explain all three of these reasons in detail.

a.

b.

c.

3. What is critical thinking?

Module 0.2: The Need for Psychological Science (pgs. 0-9-0-13)

1. Explain how cognitive biases, such as hindsight bias, overconfidence and the tendency to perceive order in random events illustrate why science-based answers are more valid than those based on common sense. Be sure to define hindsight bias, overconfidence, and perceiving order in random events in your answer.

Module 0.3: The Scientific Method (pgs. 0-14-0-21)

Define each of the following parts of the scientific method.

- Scientific method-

- Peer Reviewers-

- Theory-

- Hypothesis-

- Falsifiable-

- Operational definition-

- Use this link to answer additional questions
  - What two words are most important when it comes to psychology research? (HINT: look at the 3rd sentence of the blog post)

  - In her first example, what are the two variables in the hypothesis?

- What are the challenges in defining these variables for the research? (This isn't specifically stated in the example, draw your own conclusions)

- In her second example, what are the two variables in the hypothesis?

- What are the challenges in defining "violent crime" for the purposes of research?

Table 5.1 Dictionary and Operational Definitions of Several Terms Commonly Used by Psychologists

For each concept, other operational definitions are possible.

Term	Dictionary Definition	Operational Definition
Punishment	Harsh or injurious treatment for an offense	Presentation of 3 milliamp shock for .5 second following certain (specified) behavior
Learning	Acquiring knowledge or skill	Change in behavior (specify kind of behavior) as a function of practice
Anxiety	State of being uneasy, apprehensive, or worried	Sweat gland activity (amount), heart rate (amount), physiological changes (specify), self-reported anxiety on a scale of 1 to 7
Intelligence	Ability to learn or understand from experience	Score on the Stanford-Binet Intelligence Test, score on the Wechsler Intelligence Scale for Children
Thirst	Distressful feeling caused by a desire or need for water	Eighteen hours (or other value) without access to water
Sleep	Recurring condition of rest, no conscious thought, eyes closed, etc.	Specific brain wave frequencies (EEG) for different sleep stages
Guilt	A painful feeling of self-reproach	Score on a personality inventory, self-reported guilt on a scale of 1 to 10

Sample Operational Definitions

(from the psychology files at the University of Central Arkansas)

- Replicate (no example needed for this one)-

2. What is the difference between non-experimental methods and experimental methods?

3. Read pgs. 0-16-0-19. While advantages and disadvantages are not clearly given, many of them are implied in the reading on each one—you should have at least 2 per box!

Non-Experimental Methods:	**Definition**	**Advantages**	**Disadvantages**
Case Studies			
Naturalistic Observation			

Surveys			

4. Using the three above, what would be the best research method to use to study each of these? Why?

- People who have one or more hobbies report more job satisfaction than people with no hobbies:

- Siamese twins are stared at by younger children more often than by adults:

- Unmarried cab drivers talk more with their customers than do married cab drivers:

- More men than women report fantasies of making large sums of money:

5. Describe an example of the effect of wording in surveys.

- Define social desirability bias.

- Define self-report bias.

6. What is a sampling bias? What happens if you have a sampling bias in a survey (or even an experiment)?

7. All surveys and experiments start with a representative sample. For example, if the population I want to survey is all students in High Point, I would take 10 students from each high school in High Point —public and private. Those 10 students per school would be my representative sample. Nothing to answer here… just reiterating.

8. Define a random sample and explain why random sampling is so important.

9. Define population. What is a good point to remember here?

Module 0.4: Correlation and Experimentation (pgs. 0-22-0-31)

1. What does it mean when we say two things are correlated, and what are positive and negative correlations?

2. Define the following:

- Correlation-

- Correlation Coefficient-

- Variable-

- Scatterplots-

Draw out the three different types of scatterplots and label them:

3. On page 0-25, in the AP Science Practice section. Complete the "You Try It"! portion here about adolescents. Were you able to identify three possible ways to interpret that finding?

Using scientifically derived evidence presented above, explain why correlation does not equal causation.

4. Correlation Coefficients range from -1 to +1. What does it mean when a score is very close to -1 or +1 (for example, the coefficient is -.98 or +.87)?

5. Think of another example of where correlation does not prove causation and share it here.

6. What is an illusory correlation? Give an example.

7. What is regression toward the mean?

8. Define the following about experiments:

- Experiment-

- Experimental Group-

- Control Group-

- Random Assignment-

- Single-blind Procedure-

- Double-Blind Procedure-

- Placebo Effect-

- Independent Variable-

- Confounding Variable-

- Experimenter Bias-

- Dependent Variable-

9. Each of the following is a hypothesis of an experiment. For each one list the Independent Variable (IV), Dependent Variable (DV), Experimental Group (EG), and Control Group (CG).

- "There will be a statistically significant difference in graduation rates of at-risk high-school seniors who participate in an intensive study program as opposed to at-risk high-school seniors who do not participate in the intensive study program."

o IV:

o DV:

o EG:

o CG:

- "After watching a videotaped re-enactment of a bank robbery, people will recall more about the robbery while being questioned under hypnosis by a police officer as opposed to not being under hypnosis."

o IV:

o DV:

o EG:

o CG:

- "A new drug will increase the maze running performance of older rats."

o IV:

o DV:

o EG:

o CG:

10. What is validity?

<u>Module 0.5: Research Design and Ethics in Psychology (pgs. 0-32 - 0-37)</u>

Comparing Research Methods. Fill in the following table in your own words (be sure to paraphrase). (pg. 0-32)

Research Method	**Basic Purpose**	**How Conducted**	**What is Manipulated**	**Weaknesses**
Non-experimental: Case Studies, Naturalistic Observations, Surveys				

Non-experimental: Correlational Studies				
Experimental				

1. What is the difference between quantitative research and qualitative research?

2. Read the entire section on ethics in research with animals, pgs. 0-34 & 0-35. You do not need to write anything down. Now read the article below.

Professor King is a psychobiologist working on the frontiers of a new and exciting research area of neuroscience: canned 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 sometimes are 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/ Professor King wants to transplant tissue from fetal monkey brains into the entorhinal cortex of adult monkeys; this is the area of the human brain that is involved with Alzheimer's disease.

The experiment will use 20 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 their recovery, the monkey's 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. Control animals will be subjected to the 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.

Professor King argues that this research is in the exploratory stages and can only be done using animals. She further states that by the year 2030 about 72 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.

and answer the following... ***Having read the ethics section explaining the question of animal research, would you approve the following research? Why or why not?***

3. What are the four basic ethical principles developed by the American Psychological Association (APA) that guide researchers with human participants?

4. In your own words, how do psychologists' values influence what they study and how they apply their results? (0.5-4)

Module 0.6: Statistical Reasoning in Everyday Life (pgs. 0-40 - 0-47)

*Statistics is the hardest part of research methods in psychology—please read this carefully! If you need to take extra notes to be clear on terms, you should add those here.

1. Why is it important to understand basic statistics in psych?

2. Define the following:

- Descriptive Stats-

- Histogram-

- Mode-

- Mean-

- Median-

- Range-

- Percentile rank -

- Standard deviation-

3. What is the difference between measures of central tendency and measures of variation?

4. What does it mean when data has a skewed distribution? How does this happen? Why could this be misleading?

5. What is standard deviation? Why is this the most useful way of measuring how much scores deviate from one another?

6. What is the normal curve or normal distribution? Draw it below. Be sure to include everything in Figure 0.6-3, including the percentages under each section of the curve.

7. Let's see how much you understand this normal curve stuff! If you take the Wechsler Adult Intelligence Scale test (a type of intelligence test we'll talk about this semester) and you score a 115. What percentage of people will score at or below your score?

8. Define inferential statistics.

9. What three principles should you keep in mind to make sure your generalizations are reliable, be sure to define/explain each one.

10. Define statistical significance. What is the number that psychologists stick to—for results to be statistically significant their odds of occurring by chance are less than _____ %?

11. What is an important point to remember concerning statistical significance?