Exam 2 / Final Study Guide

Undergraduate Research Methods in Psychology

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1 Exam 2 / Final Format, Logistics, & Structure

- Exam is 50 multiple-choice questions, 2 points for each question.
- Exams are timed, 75 minutes total.
- The exam is **not** open-note, open-book, or collaborative. You are **not** permitted to use any form of assistance to aid you during the test. Do not discuss the test with other students, even after it has concluded.
- Exam 2 Final will be cumulative to **all** content in the semester, therefore, students should plan to review content that was present on exam 1 and in-class quizzes. The exam will contain content from the entire year, from lectures, readings, and other class activities.
- Any indication of academic dishonesty or "cheating" will be investigated thoroughly and will result in an automatic 0 on the exam for offenders. The test will be proctored closely by the instructor.
- The exam will be graded promptly and scores will be posted to Blackboard as soon as possible. After the final exam grades are posted, *most* points in the course should be accounted for - the only likely remain assignment for grading will likely be the final drafts of the research proposal.
- The exam will not be purely vocabulary-based, students should have a solid understanding of applications of concepts, ideas, and theories. The following questions are meant to prompt a deeper understanding besides just rote memorization.

2 Using This Study Guide & Other Resources

This study guide is meant to help get students started with guided questions and tasks that will aid performance on Exam 2 / Final. It is laid out as examples and open-ended questions to provoke thought on the most pressing questions of each chapter. You may consider using the slides, recorded lectures, and textbook to help you address each part. However, there are other valuable resources you may use to help you prepare:

- Review the textbook and professor learning objectives throughout the slides and chapters. Assess your ability to execute on these objectives.
- Use the results and answers from the weekly quizzes to identify areas of need for studying.
- Make flashcards for important vocabulary, which is summarized at the end of each chapter.
- Re-watch recorded lectures to see if you missed any classes and to ensure you haven't missed any critical content.

- Try to "teach" content to a pet, empty classroom, or a willing friend. If you can successfully and confidently explain the content to another, you probably have a pretty good handle on the topic. If not, you probably want to study that portion more.
- You may also try writing your own study guide. While I happily provide this one to students - I think the best study guide is the one that you yourself can make, as you'll learn a lot while you write it.
- If you exhaust your other options for reviewing content, please feel free to ask me additional questions as well.

If you wish to perform your best, you should use a combination of all of these available resources, in addition to this study guide, to help you prepare. Furthermore, I make no guarantee that this study guide will contain *all* the information on the exam - it is the student's responsibility to review all materials related to all content from throughout the semester.

In addition to the questions and activities below, students are expected to:

- Know and describe *all* research designs that were presented in class
- Have a rudimentary idea of how results from different designs are analyzed
  - You will *not* need to actually analyze these yourself
- Know names of *all* validity threats and how they may or may not apply to each design
- Be able to identify designs based upon descriptions of studies

3 Week 1

- What is a research **producer**? What is a job title this person is likely to have? What sorts of activities is this person likely to perform?
- What is a research **consumer**? What is a job title this person is likely to have? What sorts of activities is this person likely to perform?
- Describe the procedures, findings, and structure of Harlow's monkey study to investigate cupboard theory vs. contact comfort theory.
- Describe the concept of **Empiricism** and its relationship to the **Theory-Hypothesis-Data Cycle.** Define and explain each individual part of the cycle.
- How are Empiricism, the process of **reproducing** scientific studies, and the **self-correcting** nature of science related?
- What are **Merton's 4 Scientific Norms**? Be able to give definitions of each and examples of behaviors that support these norms.
- Why don't we use the word "prove" in science, and why do we prefer using the **weight of evidence** to describe support for a claim? Write out an example of what an improper claim statement (i.e., one being too certain) may look like, and then give a "fixed" version of that statement.

- What are the 3 contexts/types of research? Give an example of a study that would be described as each type.
- Compare and contrast the methods and trust-worthiness of **scientific journalism** and **scientific articles published in peer-reviewed journals.** See if you can find an example of both types, or better, find a piece of journalism and then the original article the journalism was based upon.
- What citation style do we use in this course? What are the core, important components of a full citation (Like that found in a "References" section)? Looking at the information of an article, try to type out the correct formatted citation for it. What are some shortcuts in Google Scholar or scientific databases to get the citation information?

4 Week 2

- What are the 4 sources of knowledge or information we can draw from? Which of these is the most sound?
- Why do we consider research to be superior to **authority**? Provide 2 examples of faults in trusting authority.
- Why do we consider research to be superior to **personal experience**? Provide 2 examples of faults in relying on personal experience.
- Why do we consider research to be superior to **intuition**? Provide 2 examples of biases in intuition.
- Describe the dangers of **confounds** and having no **comparison groups.** What issues do these introduce? Describe an example of a confound.
- What does is mean that research is **probabilistic**? How does this affect how we apply research findings to individual people?
- Describe the 6 biases we discussed in intuition. Write an example of each bias.
- What is the difference between an **original empirical article,** a **literature review**, and a **meta-analysis?** Try to find an example of each of these using the techniques we learned to find research.
- What type of search engine should I use in order to find *peer-reviewed* journal articles? Give two examples of appropriate tools. Find a scientific article that is specifically about traumatic brain injury and recovery.
- What are the procedures for fully inspecting a research article before using it?
- Why are books in science generally less valued as a source, compared to scientific journal articles? Connect this back to criticisms of authority.

5 Week 3

- Define a **variable** and a **constant**. Give an example of each in a research setting.
- What are the 3 different **scales of measurement** for variables? Give an example of a variable of each type.
- What is the difference between a **measured** and **manipulated** variables? What are some reasons a measure may have to measured, and could not be manipulated?
- Compare and contrast **construct** and **operational** variables. What are examples of both of these? For the construct of anxiety, propose a simple operational measure.
- What are the 3 types of **claims** we can make? Give one example of each type and a few keywords that signal each type of claim. Which of these claims requires the "hardest" burden to investigate?
- What statistical and graphical methods do we have for presenting information about associative claims? How does one interpret each of these?
- What are the three specified criteria that must be met that allow us to determine causation between two or more things?
- What are the 4 **claim validities** for examining scientific claims? For each validity, give one example of a detriment and one example of a benefit. Which of the validities is only really applicable to causal claims?

6 Week 4

- Be able to explain the general structure and goals of the **Tuskegee Syphilis Study** and the **Milgram Obedience Studies**.
- Describe the questionable/bad ethics of the Tuskegee Syphilis Study and the Milgram Obedience Studies. In what way did these studies cause undue harm or fail the participants? Connect these failing to specific principles or guidelines in the **APA Code of Ethics**.
- Enumerate the 3 principles of the **Belmont Report** and the 5 principles of the APA Code of Ethics. Be able to define each of these *in detail.*
- Describe the relationship between **informed consent**, **deception**, and **debriefing**. In what cases would deception be allowed?
- What are the governing bodies for ensuring ethical research procedures at any institution? In what ways can they influence and regulate ongoing projects?
- The first chapter mentioned **"Pre-registration"** of hypotheses - which of the APA Code of Ethics does this best relate to?

- Describe a situation where ethics and study validity may be at odds or in conflict. What is an example of a study that would be scientifically valid, but not ethical?

7 Week 5

- What type of variable requires a **conceptual definition?**
- What are the 3 types or mediums of psychological measures? Provide an example of each type and describe what these might look like in practice.
- What is the relationship between measurement **reliability** and **validity**? What claim validity do these both fall under?
- Describe the concept of reliability: what is a good synonym for it? Provide a real life example of something "unreliable" in the measurement sense. What are the 3 types of reliability discussed in class?
- What is the most common graphical and statistical method to assess reliability? How does one interpret each of these graphs and statistics? (You do not need to know how to calculate statistics, but you should know what certain values would imply)
- Define measurement validity - what is a good synonym for it? What are the 5 types of measurement validity we discussed in class? Which of these are the "weakest" or the most subjective?
- What are the two methods by which to investigate **criterion validity**? What sorts of analyses do we use in the case of either type?
- Using the visual analogy of targets (as presented in class), what would a reliable, but invalid tool look like?
- By what methods can we find established measures for common psychological constructs? How is this similar to searching for scientific literature?

8 Week 6

- When we use the terms **survey** or **pool** what type/medium are we referring to? What are the roughly 4 types of questions we talked about in class? Write an example of each question type.
- What are the 4 threats we discussed in how questions are written? What are the available solutions to address each one of these threats?
- Describe what a **response set** is and why it is undesirable in participant responses. What are the 3 to 4 response sets we talked about, and how can we attempt to prevent them in our research?

- Describe the concerns in long-term memory and peoples' ability to introspect on *why* they do something, which could affect our survey results?
- Describe the difference between an **observational measure** and a **self-report** one. Why might a psychologist see one as more "objective" than the other?
- What are the 3 major concerns to measurement validity in observational measures? Give an example of each one of these occurring and how we might solve each.
- In what ways may we choose to use deception in observation tools to enhance validity?

9 Week 7

- Describe the core difference between a probabilistic and non-probabilistic sampling method
- Enumerate all the sampling methods we discussed and their relative strengths and weaknesses. Be able to group them into whether they are random or non-random
- Discuss whether sample size or methodology contributes more to external validity, and the logic of pulling the subset from the larger population.
- Describe the difference between random assignment and random sampling, and what validities they add evidence for.
- Explain why a researcher might opt for a non-probabilistic sample and create 5 examples of research topics where this may happen.

10 Week 8

- Breakdown the word "bi-variate correlation" - what does it mean and what statistics and plots are appropriate to help us analyze this.
- For methods in this chapter, what type of claim is most appropriate to be assessed?
- Come up with 3 example of bi-variate claims between variable and explain why this is "correlational" research.
- How do our methods for correlation change when our variables are different scales of measurement (e.g., categorical and continuous, only continuous, etc.)
- Use the 4 validities in application to bi-variate research: What components are you looking for to fully assess each of them?
- Why is internal validity less applicable to these types of claims?

11 Week 9

- Explain the difference between bi-variate and multi-variate designs (hint: it is right in the name!)
- Why does adding additional variables (and the statistics that accompany them) bolster the types of claims we can make with multivariate research?
- Describe the structure of longitudinal and multiple regression research and how they establish temporal precedence and rule out third variables, respectively
- Apply the causal criteria to a stellar multivariate analysis - why can we still not use this for a causal claim.
- What does "parsimonious" mean, in this context? And how can we reach more parsimonious conclusions from numerous, convergent studies?
- Compare and contrast mediators vs moderators vs third variables and their impact on our conclusions

12 Week 10

- How do experiments differ from all of the prior discussed designs? What additional design controls do they provide?
- What is the difference between a between-subjects and within-subjects variable/design? What threats uniquely impact each?
- Define the following vocabulary: independent variable (IV), dependent variable (DV), experimental controls, comparison group
- Walk through each of the causal criteria with a pretest/posttest design and explain how we can establish each in a successful causal design
- Describe how carryover effects and practice effects play out in within-subjects designs
- Craft an example of a repeated-measures in a clinical mental health context. Explain each of the variables and how they interact with one another.

13 Week 11

- List the 12 internal validity threats presented in this chapter, in addition to selection and order effects. Give an example of each one
- Draw a line plot that is representative of null results due to regression to the mean. Draw vertical arrows to demonstrate the lack of intervention effects.

- Create an example of a *non-concerning* attrition effect - i.e., one that does not cause an especially large amount of concern. What sore of results would help us establish this?
- Describe the difference between instrumentation and testing threats. Compare and contrast and observer effect/bias and a demand characteristic.
- When is a placebo effect *not* a concern? Under what circumstances is a placebo effect not going to occur?

14 Week 12

- In the context of a 2 x 3 factorial design, how many variables do we have (both IVs and DVs)? How many conditions are in each IV? How many total effects do we have from this design?
- Will marginal means be similar or different in the case of significant main effects? How will they look in a significant interaction?
- What type of plot would we use to show this design? What trend would be suggestive of a non-significant interaction?
- Create an example of a factorial design where you suspect there would be a significant interaction between the IVs. Write out a brief discussion section with language to describe two significant main effects, but no significant interaction.
- What are the natural limitations of adding more conditions and or more IVs to a factorial design?

15 Week 13

- What is the key factor that separates quasi- and true experiments?
- Outside of the usual internal validity threats, what are some of the unique weaknesses of quasi-experimental designs?
- Create an example hypothesis that would likely use a quasi-experimental design. Would it be for practical and/or ethical reasons? Explain.
- Describe the difference between a correlational study and a quasi-experiment.
- Why are small-n designs used? What are the natural drawbacks to validity with small-n designs?
- Discuss why not all studies *need* to be generalizable.
- Compare and contrast the 3 different designs that we classify as “small-n”

16 Week 14

- List 3 common ways that researchers purposefully or accidentally contribute towards low-reproducability in research. Give a hypothetical example of each of these occurring
- List 3 ways research can be made more transparent and replicable
- Describe how transparent research aids in ensuring ethical guidelines are followed
- In addition to with what we discussed on small-n designs, what are other times in which we might still benefit from research that cannot be replicated?