Research Methods 205

Winter 2024

Sections 20 and 21

Your Name:

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If you are taking the exam remotely or on a laptop in the classroom,  
upload the completed exam to Canvas at the end of the exam period.

If you are completing the exam on paper,  
 hand the completed exam to the TA at the end of the exam period.

This exam is new for this class quarter, as always.  
If you think there is a typo or something written unexpectedly unclearly, please ask the TA or professor for clarification.  
 Necessary corrections will be posted in class and on zoom.

There are a total of 20 question elements on this exam. Each is worth an equal 5 pts. Some of the questions are more challenging even though the point values are the same. If you find yourself stuck on a difficult question, make sure to answer all the easy questions. If you are unclear about the answer, explain what you think the relevant issues are so that we can identify your knowledge of the content and give partial credit.

Do not leave questions blank!

Even if you are running short of time, show us your thought process related to what you have learned about research methodology.

If you are taking the exam on paper and are running out of space, use the back sides of exam pages for additional room to explain your answers.

Question 1. In consumer preferences research, the “decoy effect” (Huber et al., 1982) is a phenomenon in which adding a third alternative changes participants’ preferences between two other options. In a recent study, Brendl, Atasoy & Samson (2023) reported that when the third item, the decoy, was similar to but inferior to one of the other options, that option was more likely to be selected to be purchased.

Dr. X ran a new study to further explore this effect. In their design, participants were assigned to one of two conditions. In the Baseline condition, participants were given choice between two bottles of olive oil, choice A was a large bottle at a higher price and choice B was a smaller bottle and lower price. In the Decoy condition, a third bottle was included that was as large as choice A but contained less oil for the same price. Participants were asked to rate how willing they are to purchase choice A on a scale of 1-7, where a higher score corresponds to higher willingness of purchasing.



1a. What is the independent variable for this experiment?

1b. What is the dependent variable for this experiment and what is it an operational definition of?

1c. Is this a within-participants or between-participants design? Explain your answer.

1d. Describe an outcome of data collection that would support the stated hypothesis above, given here in terms of the experimental IV and DV.

1e. Dr. X shows you the basic descriptive and inferential statistics from their data collection below as a means table and output of analysis in R. Write out a results statement for these data including both descriptive and inferential statistics in APA format summarizing the outcome of their data collection.

Two Sample t-test

data: decoy\_study

t = 5.564, df = 78, p-value = 3.41e-07

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

[1.6292158, 0.7707842]

sample estimates:

mean of x mean of y

3.42 4.62

|  |  |  |
| --- | --- | --- |
| Condition | Baseline | Decoy |
| Mean | 3.42 | 4.62 |
| SD | 1.31 | 0.78 |
| SE | 0.29 | 0.17 |

1f. After helping Dr. X with their data analysis, you review their experimental procedure to discover that they collected all the data from the Decoy condition first with participants recruited in a gourmet food store who often by olive oil in large quantities. After completing this and thinking they had an interesting effect, all the data from participants in the Baseline condition were collected in a university lab with undergraduates. Explain the problem this is causing with conclusions about Dr. X’s study in terms of the key methodological ideas you have learned in class. Include a clear statement of the alternative hypothesis.

1g. Briefly explain how the experimental design and procedure could be improved so that future data collection could be carried out and be controlled for this alternative hypothesis.

Question 2. Fill in the blanks with the appropriate terms. The answers should generally be 1-2 words, but if you are unsure of the answer, include more description or explanation as needed.

|  |  |
| --- | --- |
| 2a. What turns an intuitive but imprecise concept into something that can be measured quantitatively, or controlled categorically? |  |
| 2b. Name one technique for controlling extraneous variables. |  |
| 2c. An extraneous variable that is not well controlled by the experimental procedure causes a risk of this kind of error: |  |
| 2d. Which kind of error occurs when an experimenter concludes that their study did not find significant differences even though those differences exist in truth? |  |
| 2e. The process by which participants declare their willingness to participate after researchers explain the risks and benefits of a study is: |  |
| 2f. The section of the manuscript report where the interpretation of the data with respect to the hypothesis is provided is: |  |
| 2g. The name of the standard technique that keeps participant variables from being confounded with the independent variable in a between-participants design is: |  |

Question 3. Martínez et al. (2022) performed an experiment to examine why individuals have issues understanding legal contracts. To examine what features of the text contribute to these misunderstandings, they constructed passages that varied in the amount of commonly seen legal sentence structures. The actual content in each of the experimental passages was kept constant, but the way the information was conveyed in the excerpts varied in the degree to which complex sentence structures were used. Participants read each of the excerpts and completed comprehension questions at the end of each excerpt that were scored to determine their understanding.

Martínez et al. (2022) found that participants scored lower on the comprehension task in the conditions with more complex sentence structures than the conditions with fewer complex sentence structures. They concluded that the difficulties with individuals understanding legal documents like contracts do not have to do with the content of the documents, but the ways in which this content is communicated.

3a. What is the independent variable in this experiment?

3b. What is the dependent variable in this experiment?

3c. List the operational definitions for the IV and DV in this experiment.

3d. What is the purpose in this experimental design of the plan to have every participant complete comprehension questions for all of the excerpts?

3e. Inspired by these findings, another research team sets out to retest this phenomenon with legal experts. However, in a very similar replication study with lawyers as the participants, this follow-up study does not observe any difference in comprehension across conditions. They suggest that the original study might have been a Type 1 error. What other explanation can we give for the differences in results?

3f. Given the potential for inconsistent results, the idea of carrying out this experiment outside the laboratory is suggested. Another researcher suggests to you that legal contracts should be prepared that vary in their sentence structure and used in real scenarios where people are reading and signing these documents. To make sure that these participants are unbiased, they propose not telling them that they are in a study until afterwards. What are the ethical issues that need to be addressed in this kind of research approach?