Assignment 1: in-class participation, place to upload completion code to verify participation

Assignment 2, Chapter 1, Class 2

Read Craik & Lockhart (1972) available here in the Files section under Readings.

This will orient you somewhat to the background theory behind our hypothesis for Experiment 1.

Some notes to consider for the reading.

* This is a fairly old paper that reflects the theoretical understanding at that time.
* The "levels of processing" theory is presented as an alternative to "multistore models."  Spoiler alert: they both turn out to be true and aren't inconsistent with each other.
* The description and data of the multistore models reflects studies done prior to 1972.  It is a useful overview, but if you are interested in the general topic of studies of memory, be aware that is a historical overview from some time ago.  Characterization of the new ideas related to 'levels of processing' comes after this review in the paper.

Questions to answer about the reading:

1. What is 'depth of processing' and why might it lead to better memory?

2. In our study, what was the operational definition of 'deep encoding'?

3  In our study, what was the operational definition of 'shallow encoding'?

4. From the prior work cited (e.g., p 677), give another example of how researchers have implemented a different procedure to create shallow encoding.

5. Give another example of deep encoding from the briefly reviewed prior work.

Assignment 3, Class 3, Chapter 2

As an exercise in thinking through the process of creating operational definitions, considering the following 3 common sayings.  For each, provide an example of how you might operationally define (a) an independent variable, (b) a dependent variable, and (c) state the direction in which the IV is hypothesized to affect the DV.

1. People feel sadder in blue rooms than in pink rooms

2. It takes longer to recognize a person in a photograph seen upside down

3. Absence makes the heart grow fonder

Assignment 4, Class 4, Chapter 3

Read Chapter 3, answer the following.

Question 1: “Laughter is the best medicine”

Imagine you have just read an article in the newspaper describing a scientific study in which researchers found that people who laugh a lot tend to have lower blood pressure, stronger immune systems, feel less stressed out.

Considering the problem of extraneous variables and potential confounds (Chapter 3), give an alternate hypothesis for how this relationship might be observed without supporting the authors' conclusion.  Note that this requires a statement consistent with the data, not consistent with the conclusion.

Outline an experimental approach to this question that would more directly test the hypothesis.  Provide an example of an operational definition of the IV, the DV and what you would expect to find if laughter positively affects health.

Question 2: Briefly answer the following questions about experimental control from our Experiment 1:

* Why have both groups read the same words?
* Why have 1-5 scales for responding for both conditions?
* Why require the word to be on screen for minimum 3 s?
* Does it matter if the trivia questions use words from the study list?

Assignment 5, Class 5, Chapter 4

Reading 2, Craik & Tulving (1975) and answer the following questions about specific experiments reported there:

* In Experiment 1, how many levels of the IV were used? What was the DV measure of memory?
* Experiment 5 is carefully designed to address what confounding alternative hypothesis? To do so, what aspect of the IV is made as constant as possible?
* In what way was Experiment 9 similar to our in-class experiment? Identify some methodological differences

Read Chapter 4, answer the following questions

* “You are doing a study at a local school. Because of the way things area scheduled, you can have one small testing room in the morning and another much larger testing room in the afternoon. If you have two treatment conditions (A and B), how can you assign subjects to the testing rooms so that the type of room will not lead to confounding your experiment?”
* Dr. L is planning a large scale learning experiment. He would like to have 100 rats in one treatment group and another 100 in the other group. Because he needs so many rats, he says, “Well, I can’t test all these animals by myself.  I’ll ask Dr. P. to help me. He can run the animals in the one group while I test the animals in the other group.”  What is the potential problem with this approach and how would you improve the procedure to correct it?

Assignment 6, Class 6, Chapter 5

In the Files section, folder Experiment 1 are the data files needed to analyze the data from our in-class Experiment 1.  The data we will use is a combined data set from our in-class experiment on 9/21/22 and data from the same experiment run last year in the Fall quarter (2021) to increase the "power" of our design to detect a difference between the conditions.  Note that there are two files with copies of the data in slight different forms.  The file "205\_Fall2022\_exp1\_data.xlsx" is in an Excel workbook form that can be used for (1) and (3) below.  The file "exp1\_data.csv" has the same information but is formatted for input into the R analysis software for step (2).  Make sure you have both versions and use the correct file for the steps below.

1. Calculate the descriptive statistics for Experiment 1, including both the Deep encoding and Shallow encoding conditions.  You can do this within the Excel workbook "205\_Fall2022\_exp1\_data.xlsx."  Chapter 5, Statistics 1, includes a review of the necessary descriptive statistics and specific guidelines on how to calculate these within a spreadsheet program like Excel.  You should have access to Microsoft Excel through NU, but if you do not for some reason, let us know and it should be possible to use a public program like Google Sheets as an alternative.

2. Following the steps described in Chapter 5, run a independent samples t-test in R to provide the inferential statistics that we will need for writing up the results.  With the instructions and the "205\_Exp1\_Fall2022.R" file, this should simply be a matter of following the given recipe for carrying out the analysis.  Let us know if you have technical difficulties with any of the steps or software for carrying out the analysis.

3. Prepare a simple Figure for illustrating the effects within the Experiment 1 data as a bar graph plot (called a 2-D Column Chart in Excel).  Instructions for creating this graph are in Chapter 5, including adding bars reflecting the SE of the conditions means.

Submit a document with all 3 of the above elements as the answer to this homework assignment.  If you have trouble with any of the steps, note that there.  On Monday in class, we will work through all 3 of these steps together to ensure that everybody has the correct answers for the writing assignment due at the end of next week (10/7).

Assignment 7, Class 7, Chapter 6

Read Chapter 6, APA format writing.  Answer the following 5 questions:

 1. Which of the following is the main goal of the methods section of a research report?

a. Meticulously articulate how you analyzed the data.  
b. Provide enough detail to allow an independent researcher to replicate your study.  
c. Outline the demographic information of your participants so that reviewers can access the generalizability of your research.  
d. Discuss the procedure you used so that readers can decide for themselves if your protocol is biased.  
   
2. Which of the following is usually beyond the scope of the results section of a quantitative research report?

a. Discussing what statistical techniques were used  
b. Presenting figures and/or tables to portray the data  
c. Providing detailed interpretation of the implications based on the data  
d. Presenting specific statistics that were generated from the data  
   
3. If you state alternative explanations in your discussion, which of the following should you also consider doing?

a. Tell readers why the alternative explanation falls short of the primary explanation  
b. Conduct statistics tests to test them specifically  
c. Include reviewer opinions of whether they think the alternative explanation is better or worse than the primary explanation  
d. Present a literature review that would allow readers to conduct a follow-up study based on the alternative explanation  
   
4. What is the role played by answering the question “who will you write for” in writing a research report?  How should the answer influence the writing process?

5. Suppose you encountered for the following in a manuscript that was intended to be written to APA format:

In their seminal 1972 paper titled “Levels of Processing: A Framework for Memory Research”, Fergus Craik and Robert Lockhart claim “Over the past decade, models of human memory have been dominated by the concept of stores and the transfer of information among them…”

Name 3 things wrong stylistically about this writing that make it incorrect for an APA style report.

Assignment 8, Class 8, Chapter 7

1. Why is it generally impractical to use a within-participants design in studies that have an element of deception (e.g., the implicit bias studies)?

2. For a study assessing time to recognize famous faces upside-down, why would a within-participants design be a good idea?  Give two reasons.

3. Why are mood manipulation studies difficult to do as a within-participants design?

4.  Why are learning-based studies difficult to do as a within-participants design?

Assignment 9, Class 9, Chapter 8

Ethics

1. What is the main goal and purpose of the Institutional Review Board?
2. Before participating in a research experiment, all participants should generally read and sign an informed consent form. What are 3 main goals of this process intended to maintain ethical standards for the scientific work?
3. In a study of attitudes about extramarital affairs, a researcher finds that an acquaintance has participated in the study and reports having cheated on their spouse. They then find themselves torn about whether to report this information to the spouse. What kind of research ethics problem has occurred here? What research procedures should be used to keep this from occurring?

Reading #3, Gino & Wiltermuth (2014)

1. In Experiment 3, what is the IV changed to and why?  How is the DV changed and why?  What ethical issue in experimental research is now relevant?
2. Experiments 4 and 5 use yet additional novel manipulations of honesty to measure creativity effects. From the General Discussion, how do the authors explain the overall set of their findings with respect to the theoretical relationship between dishonesty and creativity via a mechanism? Give an example of a speculative point made that goes beyond the statement of results.

Class 10 is Exam 1

Assignment 10, Class 11, Chapter 9

Read Chapter 9, answer the following question:

After watching a group of nursery school children, we get the idea that some toys are more popular with children than others are.  We would like to test the difference in time spent playing with toys that are used for building (e.g. blocks) and toys that are not (e.g., stuffed animals).  Since there are many differences between boys and girls, we would also like to look at gender as an independent variable.

Outline a factorial design for this study and describe the operational definitions of the factors (independent variables) and dependent variable.  Speculate about hypotheses for what you might see if you ran this study (effect of toy, gender and any interaction).

Assignment 11, Class 12, Chapter 10

Reading 4, Levav & Argo (2010)

Questions

1. Experiment 1 is a simple two group study. The procedure for implementing the independent variable is described as “In the touch condition, the verbal instruction was accompanied by a light, open-palmed touch on the back of the shoulder blade, right below the deltoid; this touch lasted approximately 1 s. In the no-touch condition, the verbal instruction was unaccompanied by any form of touch. Following this manipulation, the experimenter — who was blind to the hypothesis—retreated to a cubicle on the other side of the room so as not to be visible to the participant.” Why does this operational definition of “touch” need such an elaborate description?

2. Experiment 2 uses a factorial design.  How many factors are there and how many levels of each factor?

3. What is the dependent variable in Experiment 2?

4. List the hypotheses tested by this design.

5. What kind of interaction is shown in Figure 4 (Experiment 3)

Assignment 12

Read Reading #5, Assefi & Garry (2003).  In this report, a study on alcohol placebos and memory distortion is described.

Q1.  What are the two factors and levels of each factor in the design?

Q2.  What is the main dependent variable of the design (see Figure 1)?

Q3.  What are the 3 hypotheses that were tested by this factorial design?

Q4. What kind of interaction is shown in Figure 1?

Chapter 11. Sampling and Generalizability

Q5.  What sampling issues do we have to consider with our methodology for the in-class Experiment 1 and Experiment 2?

Assignment 13

The data for Experiment 2 is available in the Files section in folder Experiment 2.  There are 3 files to download that contain the data and analysis script for R/RStudio.

We did not have as much data as usual this quarter, probably due to limited time to collect, so I am again providing a combined dataset for both this quarter and 2 sections of 205 taught last Fall 2021.  A total of 244 participants were recruited across the 3 sections.  Data with >10 missed trials during the study phase were eliminated as they appear to reflect participants unable to give the study their full attention.  A total of 234 participants are included for analysis.

Exp2\_data\_Fall2022.xlsx is an MS Excel formatted file of the data organized across the four conditions in our 2x2 design.

exp2\_data\_Fall2022.csv is a text file formatted for input into R/RStudio for analysis

205\_Exp2\_ANOVA.R is a script in R for running the anova using a function called 'ezANOVA'

To run the analysis, use the RStudio program to start an analysis session

* Launch RStudio.
* Use File -> Open and navigate to the folder on your computer where you’ve installed the 205 files and associated data from our experiments
  + Open the file “205\_Exp2\_ANOVA.R”
* Set the “working directory” to where your data are stored on your computer. If you have put the “exp2\_data\_Fall2022.csv” in the same folder as the “205\_Exp2\_ANOVA.R” file, navigate to the Session menu, then to Set Working Directory and select the top option “To Source File location.”
* To run a single step of the analysis press the “-> Run” button that is in the upper right part of the top-left panel. This carries out the step in the script on which the cursor is currently.  If you didn’t do the installation of the ‘psych’ and ‘ez’ packages above, put the cursor on line 2 and Run.  Then put the cursor on line 3 and Run.
* The installation process will also download and install a series of other packages needed (called dependencies). The process should only take a few minutes to run.  You may get red warning messages (e.g., if you have already installed these) but it's working if you get a 'successfully unpacked' message as well.
* Now move down to line 6, “library(psych)” and press Run. This loads a set of routines for data analysis for psychology experiment data that are helpful.
* The cursor moves down to the next line after each Run. Press it again to load the library on line 7, 8, and 9 (‘psychTools’, ‘tidyr’, and ‘ez’).  You may again get warning messages about prior R versions, but everything will still run.
* The next step, line 12 will start loading our actual data. If everything is working you should see: “Data from the .csv file exp2\_data\_Fall2022.csv has been loaded.” In red in bottom left panel.
* Run on line 14 to see the output of the describeBy function, which provides descriptive statistics for our data.  Check that these numbers are identical to the descriptive statistics you calculated the Excel version of the data, Exp2\_data\_Fall2022.xlsx.
* Run on line 16 to carry out the ANOVA on these data.  There will be some warning messages even if it runs successfully.
* Run on line 30 to print the ANOVA table

Submit the ANOVA table output here for this assignment.  In addition, write out the ANOVA results for the 3 analyses (2 main effects and interaction) in standard APA format: F(df,df)=X.XX, p<.0Y (filling in the correct numbers for the df's, F-value (X's) and p-value (y).  Details on how to unpack the ANOVA table will be covered in the soon to be available Chapter 12.

Assignment 14

Use Google Scholar to find example publications within the field of experimental psychology research.  Any subdomain with psychology is ok for this but choose papers in peer-reviewed psychology journals that were published in the last few years (2018 or later).

Look for example sections of these papers of the following kinds.  You can copy/paste the relevant sentences from the publications to answer the questions.  Include an APA formatted reference for the source paper you used.  If you cannot find relevant statements in the paper you found, look for another to use.

From the Introduction of the paper:

1. Sentence indicating the purpose of the study from last 2 paragraphs of Introduction.
2. Find sentences that indicate why this is an important research topic.
3. Sentences at the end of the Introduction that signal information about methodology.

From the Discussion section of the paper:

1. Statements of similarity or difference between this work and that of previous researchers or works by the same author
2. Comments that refer to theories referred to in the Introduction

Selected from Writing with Style exercises

Introduction exercises

1. Purpose of the study from last 2 paragraphs of Introduction
2. Find sentences that indicate why this is an important research topic
3. Analyze first sentence of paper
4. Look at final few paragraphs of the introduction, find the specific hypotheses
5. Examples of rationales for hypotheses
6. Examples of research questions
7. Sentences at the end of the Introduction that signal information about methodology
8. Examples of definitions of variables
9. Examples of specific studies under review

Discussion exercises

1. First sentence or two of the discussion section. Examples of whether the main hypothesis was supported.
2. Copy the first sentence or two that refer to major results in terms of research questions
3. Statements of similarity between this work and that of previous researchers or works by the same author
4. Statements of differences between this and prior work
5. Comments that refer to theories referred to in the Introduction
6. Look for acknowledgement of alternative explanations for the findings
7. References to and explanations for negative results
8. Find some words and phrases that signal implications
9. List of examples of how practical applications are mentioned in Discussion
10. Copy phrases that indicate how suggestions for future research are tied to the rest of the Discussion
11. Examples of limitations
12. Specific words and phrases used to present limitations
13. List subject-verb phrases found in the present tense in Discussion sections
14. List subject-verb phrases found in the past tense in Discussion sections

Assignment 15

Read Stephen et al (2009), Reading #6

Writing notes: this article is from a journal that does not completely follow APA format with respect to the references. It may be useful to be aware that neuroscience-oriented journals often use numbered references in square brackets but do not copy this style for your paper.

This paper reports a 2x2 mixed-model design that inspired the Mythbusters episode.

Q1. What are the levels of the between-participants factor?

Q2. What are the levels of the within-participants factor?

Q3. What is the measured operational definition of ‘pain’ used in this study?

Q4. Describe the interaction observed between the factors on the Perceived pain scale score measure (Figure 1b).

Q5. In the Mythbusters episode they did not counterbalance the order of the within-participants factor and additionally excluded participants who scored at the maximum value allowed on the paid measure (neither occurred in the original publication). Explain how each of these reduces the internal validity of their version of the study.

Assignment 16

Q1. Why are experimental studies higher in internal validity?

Q2. Why are nonexperimental studies higher in external validity?

For each of the following 3 examples, indicate what kinds of non-experimental design would be used to study the phenomenon and also outline a 2-group experimental approach that could answer a question that might be inspired by the non-experimental work.

Q3. Pushing ahead in line

Q4. Locating the most popular painting in an art gallery

Q5. Studiousness in college students

Assignment 17

Reading 9, Plant et al (2009).

Methodology for the IAT for Reading 9

**Evaluative IAT**. The IAT is a dual categorization task in which participants categorize words as pleasant or unpleasant and faces as either Black or White by pressing one of two keys on the computer keyboard. Stimuli consisted of pleasant and unpleasant words as used by Greenwald et al. (1998) and pictures of White and Black male faces displaying neutral expressions (Malpass, Lavigueur, & Weldon, 1973) as used by Devine, Plant, Amodio, Harmon-Jones, and Vance (2002; Study 3). Pleasant words included honor, lucky, diamond, loyal, freedom, rainbow, love, honest, peace, and heaven. Unpleasant words included evil, cancer, sickness, disaster, poverty, vomit, bomb, rotten, abuse, and murder

The IAT procedure comprised five blocks of trials (Greenwald et al., 1998). Stimuli were presented individually in the center of the computer monitor in randomized order. In Block 1, participants viewed 10 Black and 10 White faces and categorized Black faces by pressing the left response key (“a” on the alphabetic keyboard) and White faces by pressing the right response key (“5” on numeric keypad). In Block 2, participants viewed 10 pleasant and 10 unpleasant words, categorizing unpleasant words with the left response key and pleasant words with the right response key. In Block 3, stimuli included White faces, Black faces, pleasant words, and unpleasant words, and response mappings were combined such that participants categorized Black faces and unpleasant words by pressing the left response key and White faces and pleasant words by pressing the right response key. This block consisted of 40 trials and was referred to as the compatible block (Greenwald et al., 1998), given that response pairings of White with good and Black with bad are compatible with Whites’ tendency to prefer White faces over Black faces. In Block 4, participants viewed 10 Black and 10 White faces but this time categorized White faces with the left response key and Black faces with the right response key to counterbalance response mappings. In Block 5, categorizations were again combined such that participants categorized White faces and unpleasant words by pressing the left response key and Black faces and pleasant words by pressing the right response key. This block included 40 trials and was referred to as the incompatible block. Half of the participants completed the IAT as described above; half completed a version with reversed response mappings.

Stereotyping IAT. We designed a new IAT in which participants viewed two classes of words associated with the positive characteristics of intelligence and athleticism/rhythmicity, and categorized them as mental or physical, respectively, in addition to the Black versus White face categorizations. Intelligence and athleticism/rhythmicity are central to the African American stereotype, such that African Americans are stereotyped as more athletic/rhythmic and less intelligent than European Americans (Devine & Elliot, 1995). Because the mental and physical categories were relatively neutral, the categorization of words relating to athleticism/rhythmicity and intelligence as mental or physical did not involve evaluative judgments. Target word stimuli used in the stereotyping IAT were selected on the basis of pretesting. Ten target words were selected for each category on the basis of category fit and stereotypicality. Mental words included math, brainy, aptitude, educated, scientist, smart, college, genius, book, and read. Physical words included athletic, boxing, basketball, run, agile, dance, jump, rhythmic, track, and football. The procedure for the stereotyping IAT was identical to that of the evaluative IAT, except that the pleasant and unpleasant target words and category labels were replaced with intelligence- and athletics-related target words and the mental and physical category labels. Hence, the compatible block included Black/physical and White/mental categorizations and the incompatible block included Black/mental and White/physical categorizations.

The main conclusion of this short report is given in the first sentence of the discussion:

“The goal of this project was to explore whether Obama’s historic presidential campaign and the resulting high levels of exposure to a positive, counter-stereotypic Black exemplar led to reduced racial prejudice and stereotyping.”

Q1. Can we be confident about the causal direction here?  Why or why not?

Q2. Give an alternate interpretation of the data.  The interpretation must be with the data as observed (not an alternate outcome) but is a different inference.

Note that this report relies on a measure called the IAT (Implicit Attitudes Test) that is not described in detail in the short report.  A description of the methodology from Amodio & Devine (2006) is below.

Read Chapter 15

Questions

3. What is meant by “selection bias” in the context of survey research?  
a. The survey participants are not randomly chosen from the population.  
b. The survey participants are randomly chosen from the population.  
c. The survey participants are not part of the population of interest.  
d. The survey participants are a part of the population of interest.

1. Which bias occurs when individuals who were contacted chose to complete the survey differ in some ways from others who were contacted but chose not to take the survey?  
   a. Response set  
   b. Non-response  
   c. Attrition  
   d. Motivated respondent
2. Explain how each of the following two questions are examples of “double-barreled” questions:
   1. Please agree or disagree with the following statement: Cars should be faster and safer.
   2. How satisfied are you with your pay and job conditions?

Assignment 18, Statistics

* A colleague helping with a research project comes to tell us in that the latest statistical analysis, they found an *r* = 2.30? Should we be excited?
* A college administrator is choosing between 2 admissions tests, one that correlates with subsequent college performance *r* = -.54, and one for which, *r* = +.45. Which test should be preferred and why?
* Of all the statistical tests we have covered in class so far, explain which is appropriate for each of the following hypothetical designs and why:
  + Older people (age in years) are found to exercise less (in hours per week) than middle aged people
  + At a car dealership, people planning to buy a car are either shown a documentary on climate change or not and then they are scored as to whether they purchased an electric vehicle or gas vehicle
  + Hospitalization rate (percent of people hospitalized) due to COVID infection differ in counties that voted red (Republican) or blue (Democrat) in the 2020 election
  + The relationship of first year salary post-graduation with average GPA in sophomore year during college
  + Number of social media posts made by people who either took research methods in college or did not
  + An analysis of scores on the Oxford Happiness Scale based on participants diet (vegetarian/not) and whether they have a Facebook account.

Assignment 19, Field Research, Cunningham (1989)

Read Cunningham (1989), Reading 7 and answer the following questions:

Q1.  The experimental report does not include information about the time of day when the data were collected for Experiments 1 or 2.  One might imagine that responses to the “lines” might be different at 9pm and 1am.  Give 2 other extraneous variables that might affect the DV for these studies that should be considered in planning data collection.

Q2. How many participants total were run combined across Experiments 1 and 2?  How many days/hours/trips to the bars do you think this would have taken?

Q3. Experiment 3 provides a comparable procedure suitable for a well-controlled laboratory environment.  How does this improve the internal validity of the results?

Q4. In what ways are Experiment 3 less effective than the field research with respect to external validity of the results?

Q5. Experiment 1 includes the note:

“Because of concern that people might resent having their romantic responses subjected to scientific observation, pilot subjects were carefully debriefed, revealing that all had expected that social contacts might follow from being in the public setting of the bar and that non resenting the brief intrusion of the research. Thus this study was deemed to meet Cook and Campbell’s (1979, p. 369) criteria for an innocuous field experiment excluded from the ethical requirement of informed consent.”

This rational does not meet modern expectations for best practices for ethical research. If one were to propose some similar research today, what ethical issues would you expect the IRB to raise and how might a researcher address those?

Assignment 20, Ethics 2

Responsible conduct of research

“I’m sure my hypothesis is correct, so I’ll just give my participants a hint here and there to make sure the data come out properly.”

What kind of RCR violation is this?

What methodological approach should be used by this research to avoid this problem?

In a study of marriage relationships, a researcher discovers that one of the participants in the study is an acquaintance and has indicated ‘yes’ to the question of having had an extra-marital affair. The researcher is debating whether they should inform the participants’ spouse.

What kind of research ethics violation is being considered here? What should they do?

A researcher doing a study on academic performance of students who have been diagnosed with ADHD. Some of the potential participants have refused to answer the question about their diagnosis, so the researcher contacts their medical provides without the participant’s knowledge.

What kind of research ethics violation has occurred here?

Give an example of a research study not included in the chapter for which it would be unethical to include a placebo/control group.

Assignment 21, Intervention research

Assignment 22, Development and Neuropsychology