

Sixth Directed Exercise

Due: Friday, March 25 by 5pm

- Your sixth directed exercise is due by 5pm on **Friday, March 25th**.
- Your assignment should be submitted to our Classes V*2 site under “Assignments” as an attached document.
- As you know from the syllabus, because this is a large lecture class, it is important to have explicit and uniform policies. Among those policies is the following:
 - Directed exercises will be marked down 1 point for each 24 hours that they are late (rounded up to the nearest 24 hours).

Overview:

Your basic task in Directed Exercise 6 is to design an experiment to test a claim related the topic you selected in Directed Exercise 5¹, and then to describe what conclusions might be drawn from the experiment’s various possible outcomes. (You will not actually be conducting the experiment.)

The goal of the exercise is to give you an additional opportunity to think about the process by which empirical claims about human nature are investigated experimentally in the context of contemporary Cognitive Science.

We realize that some of you have taken many courses in these areas, while others of you are encountering these methods for the first time in this class. We want this exercise to be both challenging and manageable for all of you.

So, regardless of your background, we suggest that you spend roughly two hours on this exercise. We hope that this will provide you with an opportunity to think seriously about one aspect of the material in this course, without making excessive demands on your time.

Exercise:

- ➔ Your sixth directed is worth up to 5 points, and should take the form of a QALMRI .That is, it should have six distinct entries: Q, A, L, M, R and I.
- ➔ You may either make use of the QAL from your Directed Exercise 5, or produce a new QAL. Regardless of which of these you do, you will need to produce a new MRI.
- ➔ The pages below contain Instructions and an Example. You may find the Instructions easier to understand if you look at the Example first.
- ➔ Reminder: you should spend roughly two hours on this Exercise.

¹ If your TF indicated that your Exercise 5 topic was problematic, you will need to find a new topic. If your Exercise 5 topic was OK, but you want to do a different topic for this exercise, that’s fine too. In either case, check with your TF first.

Instructions:

Your submission should contain the following six parts:

Question: What is the broad question being addressed?

You may use the question that you used for Directed Exercise 5, or a related question. State your Question clearly and precisely.

Alternatives: What are the plausible alternatives (answers) to this question?

Again, you may use the Alternatives that you used for Directed Exercise 5; you may offer a different set of alternatives to the same question, or you may offer alternatives for your new question. State the Alternatives clearly and precisely.

Logic: What would we expect to be true if each alternative was true? (i.e., “If X, then...”)

Given the Question and Alternatives you have selected, explain clearly and precisely the Logical structure of the situation:

- if Alternative 1, then Outcome 1 is expected;
- if Alternative 2, then Outcome 2 is expected.

Method: What method might be used to test for each alternative?

This is where the creative part begins!

Given the QAL that you have articulated, propose an experiment whose results might distinguish among the Alternatives you have listed.

You should feel free to model your experiment on one that you read about in the articles that you have read (either one that was assigned for class or one that read on your own.) The only requirement is that your proposed method should – if implemented – allow you to learn something that you didn't already know about the Question that motivates your study.

You may find it easiest to think of a method using "the most basic design possible." (An example can be found below). This design is:

- randomly assign participants to two groups
- holding all else constant, do something different with each group
- observe how the groups differ on some outcome measure

Results: Describe three possible outcomes of your experiment.

Inferences: For each of the results, explain what they may show about the alternative answers to the original question.

Example: (Note that the Question addressed in the Example is presented only as an easily-understood simple case: it is not a suitable question for your Directed Exercise. You should choose a Question that is more interesting, and more central to the themes of our course.)

Question: Does studying factual material at a particular time of day (such as morning or evening) produce superior retention of that material?

Alternatives: It could be that evening studying is superior; it could be that morning studying is superior; it could be that they are equally effective.

[NB: there are also more complicated hypotheses that might look at individual differences among subjects, you may wish to consider some of these, or you may wish to set these possibilities aside.]

Logic: If evening studying is superior, we should expect subjects who study in the evening to perform better on retention tests; if morning studying is superior, we should expect subjects who study in the morning to perform better on such tests; if neither is superior, we should expect no difference between the two groups.

Method:

- 100 undergraduate student volunteers are randomly assigned to either Group 1 or Group 2.
- Students in Group 1 are given a vocabulary list of 50 unusual words to study for 30 minutes each evening for one week; students in Group 2 are given an identical vocabulary list to study in the mornings. After one week of studying, students are given a three-day break during which they are asked not to review the words further.
[You may want to describe this task more precisely, explaining why you have structured the details in the way that you have.]
- At 4pm on the third day after studying has ended, all students are given a test to determine how many of the words they have learned.
[Again, feel free to provide details, and/or explain the reasons you chose this measure.]

Some possible results:

- (1) Students in Group 1 performed, on average, 25% better than students in group 2.
- (2) Students in Group 2 performed, on average, 30% better than students in group 1.
- (3) Students in Group 1 and 2 performed, on average, equally well on the test. But subsequent analysis of the data showed that male students in Group 1 performed 20% better than male students in Group 2, whereas female students in Group 2 performed 15% better than female students in Group 1.

Inferences from (1) and (2):

Inferences from (3):

[Explain in more or less detail, depending where you are in your 2 hours]