

This lab exercise appeared in Section I: Critical Thinking, developed by Randi Shedlosky-Shoemaker and Ronald G. Shapiro, in *Promoting psychological science: A Compendium of laboratory exercises for teachers of high school psychology* (Miller, 2018). This exercise is provided here with permission from the editor.

Lab Title: Examining Conjunction Fallacy

Adapted from/References:

Tversky, A. and Kahneman, D. (1982). Judgments of and by representativeness. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases* (pp 84-98). New York: Cambridge University Press.

See also:

Shafir, E. B., Smith, E. E., Osherson, D. N. (1990). Typicality and reasoning fallacies. *Memory & Cognition*, 18, 229-239.

Section 1: Performance Expectations

What will the student be asked to do?

- Analyze data
- Plan and/or carry out a scientific investigation
- Communicate information in a written report

Main Idea/Concept Demonstrated or Taught by Lab:

This lab allows all students to experience a demonstration of the conjunction fallacy and discuss more broadly how contextual information can influence decision-making.

After concluding this lab, students should be able to:

- Describe how the conjunction fallacy can impact decision-making related to probability.
- Create a graphical representation of quantitative data.

Key Terms and Psychologists Associated with Main Idea/Concept:

Conjunction fallacy (Tversky & Kahneman, 1982), Representativeness heuristic, Stereotypes

Materials:

The lab will require two handouts. The first handout (which will go to half of the students in the class) should have the following “context-free” instructions:

Identify which outcome is most likely:

- A) *Linda is a bank teller.*
- B) *Linda is a bank teller who is an active feminist.*

The second handout (which will go to the other half of the students in the class) should have the following “contextualized” instructions:

Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations.

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Identify which outcome is most likely:

- A) Linda is a bank teller.
- B) Linda is a bank teller who is an active feminist.

Instructions:

1. Distribute the handouts to students, making sure that about half get the “context-free” description and half get the “contextualized” description. Do not draw attention to the fact that they are different instructions.
2. Have students make a choice – A or B – and then return their handout.
3. On the board, create the following table to keep count of decisions:

	Option A	Option B
Handout #1		
Handout #2		

4. Once all handouts have been returned, as a class, tally up how many students selected Option A or B for each of the two differing handouts
5. Using the data from the chart, have students create a bar graph of the results. (If possible, this is a good opportunity to have students practice data entry and graph creation in a desired software program. Microsoft Excel is a good option for this purpose.)
6. *Optional:* You could also use this activity as an opportunity to have students conduct a Chi-square analysis (if the course covers statistical analyses).
7. Following discussion (see below), develop (and potentially conduct, if time allows) a follow-up study to examine how the decision might be reframed to create a different pattern of decision-making. *Note: If conducting the follow-up study, as students were the ones to generate ideas, ask that they pose the decision to a peer outside of the class and come back with that peer’s choice for the start of the next class/lab period.

Ideas for follow-up:

- Add additional options (i.e., people have to select from at least three possibilities) – e.g., Linda is a social worker.
- Generate a “real-world” example based on current events with or without providing additional context (e.g., which is more likely – a) school is closed due to weather or b) school is closed due to weather and an exam has to be rescheduled)

Follow-up and Discussion:

Presuming there is a differential pattern of decision-making (usually, those who complete Handout #1 recognize that A is more statistically likely in the absence of any other contextual information and those who complete Handout #2 are more likely to select B over A, even though A would be statistically more likely), pose the following questions for students to discuss:

- Why might those who received additional information about Linda have made a different decision about her?
- What might this suggest about how we make decisions about likelihood of events?
- How might this demonstration relate to our everyday decision-making?
- How might the decision be reframed to make context less impactful? (Suggestions: change the number of choices, include context information that is irrelevant to choices)

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Section 2: Crosscutting Concepts

Select at Least One

- Students will observe patterns of decision-making related to probability under two types of conditions: context-free and contextualized; they will discuss why the pattern of decision-making may differ under the two conditions.
- Students will discuss cause and effect in terms of factors that can influence how individuals make decisions about the likelihood of events.
- Students will examine how the structure of a choice can impact the decision that is made.

Section 3: Lab Report (written, verbal, or recorded)

Suggested Content to be Included in Student Report:

- Describe methodology, including materials
 - Identify type of study (experimental)
 - Identify IV (context) and DV (choice of Option A or B)
- Present results (suggested method: bar graph)
- *Optional:* Discuss Chi-square analysis results
- Discuss implications of findings
- Discuss design of a potential follow-up study (or results from follow-up study if time permits running the additional study)