CLASS ACTIVITY: FALSE MEMORY EXPERIMENT

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False Memory Unit

Disciplines: Research Methods in Psychology, Statistics for Social Sciences

Purpose: At the beginning of a research methods course, students have difficulty applying the skills learned in the statistics course to an actual experiment. This activity is designed to foster a connection between the skills learned in a prerequisite course to their research methods course.

Brief Summary: Students were asked to replicate a study about false memory by Roediger and McDermott (1995). False memory occurs when a person believes they “remember” an untrue event. Many traditional studies about false memory have assumed that false memory is more apt to occur with memories for events associated with an elaborate story line. Roediger and McDermott (1995) showed that false memory can also occur with rote memory situations where people, e.g., are asked to remember word lists. In this class activity, students replicated Roediger and McDermott’s study and then analyzed the data using descriptive statistics and Excel. We hoped that student would see the importance of using Excel and statistics as a tool to answer research questions.

Relevance to students: This activity explores how memory is sometimes more reconstructive than it is an exact replica of actual events. Moreover, past research has shown that subjects can be just as confident about false memories as they are true memories. Yet, research also shows that jurors are often swayed by confident witnesses. Organizations such as Project Innocence have shown that hundreds of people in the United States have been wrongly convicted based on false memory of eyewitness accounts.

Materials Needed: False Memory article by Roediger and McDermott, 1995, 2 recall lists w/answer keys, recall recording sheets, confidence rating sheets w/answer keys, Excel spreadsheets- false memory results and confidence rating results


Target Audience: Undergraduate students (Jr/Sr)

Time Allotted: Two 75 minute class periods

Prior Knowledge: Introductory Statistics and Excel proficiency

Activity Extension: In Research Methods or related courses, students could conduct different experiments after the false memory study and then create their own Excel spreadsheet to answer various questions about their findings. For example, students could conduct a study in which they pair up and study whether lying about an event leads to changes in nonverbal cues, such as faster eye blink rates and fidgeting. Subjects would be naïve about the hypotheses. One student in the pair would serve as the subject while the other student would serve as the experimenter. The experimenter would ask the subject to answer questions over two sessions with a different set of questions asked during each session. Subjects would be told to answer with a lie to every question during one of the sessions, but truthfully during the other. Lie and truth sessions would be counterbalanced. After completing the experiment, each pair of students would be assigned a group activity where they would construct an Excel spreadsheet used to create average eye blink rates (for example, how many times the subject blinked within a five second interval after responding) and percentage of
trials in which fidgeting occurred within five seconds of the verbal response. There might also be discussion about what these nonverbal cues actually represent as they are probably better measures of nervousness.
False Memory Experiment – Activities

The following details the procedures involved with running the class experiment on inducing false memory using Roediger and McDermott’s (1995) paradigm. As you will see below, false memory is induced by showing students lists of words, each related in meaning to a non-presented word. The non-presented words are what we later refer to as critical lures, the idea being that we lure students into false memory. When students hear the list or related words, it facilitates the memory of the critical lure. For example, students might hear the following words: sour, candy, sugar, bitter, good, taste, tooth, etc. In this case, the words in the list all relate to the critical lure, sweet. We will also note the number of intrusion—words recalled that were not studied nor critical lures. Intrusions will allow us to figure out the guessing rate. We would expect recall of critical lures to be higher than that for intrusions. If these rates are similar, it would indicate recall of critical lures could reflect guessing more than a genuine false memory effect.

Prior to Day 1

- Color code Session 1 and 2 materials.
- Complete the setup of all necessary spreadsheets (see spreadsheets).
- Have a list of the critical lures ready to project via LCD projector.
- Have a handout showing the Appendix of studied words and associated critical lures from the Roediger and McDermott (1995) study (Appendix, Page 814).

Day 1

General Introduction

- Have students pair up and conduct the experiment (see instructions).
- When students return to class, have them fill out the confidence rating sheet (see confidence ratings forms). Collect the rating sheets.
- Conduct a class demonstration where students use clickers to tabulate results. See PowerPoint demonstration.
- Give a brief explanation of the data entered for words studied, critical lures and intrusions (words not studied nor critical lures). Students will come up to the front of the class and enter data into the Excel spreadsheet (see Excel spreadsheet).

Day 2

- Briefly explain the different types of words: Studied words, critical lures, intrusions.
- Present how to use Excel to generate descriptive statistics used to understand the results of the class experiment. Create the formulas for the average percent recall for the different types of words.
- Discuss the results of Spreadsheet #1 and compare the results to that of Roediger and McDermott (1995).
- Poll the class using clickers. Have them estimate the average confidence rating for each type of word (see PowerPoint presentation).
- Create the formulas for the average confidence ratings for each words in Spreadsheet #2. Before projecting the results for the overall average ratings have the students predict the confidence ratings.
for each type of word (see PowerPoint presentation). Ask students how they would setup the formulas and create them.

- Briefly explain the results and implications. How do the results compare to Roediger and McDermott (1995)? What are the issues related to false memory in general? Discuss how showing the list of related words can make non-presented words seem familiar and thus lead to recall false details. Explain how jurors are often swayed by confident witnesses. However, as these results usually show, confidence ratings are not always a good indicator of the accuracy of memory. Indeed, confidence ratings for critical lures are often as high as that for studied words.

**Day 3**

- Explain how to write a research report, including how to write-up the title page, introduction, methods section, results section, discussion, and reference page. Assign student to write up a brief research report for the class experiment.
Directions to be read by Experimenter (Session 1)

Read these general instructions to your subjects:
You are about to hear three lists of words. Each list contains 15 words. Pay close attention to the words since you will be asked to recall and recognize these words later on. Have a blank sheet of paper ready, since you will be asked to write down as many words as you can recall from each list. Please label the top of your blank sheet, “Session 1.”

Next, read the following words at a rate of about one word every two seconds.

1. table
2. sit
3. legs
4. seat
5. couch
6. desk
7. recliner
8. sofa
9. wood
10. cushion
11. swivel
12. stool
13. sitting
14. rocking
15. bench

Tell your subject that s/he has two minutes to write down as many words as s/he can recall from the list just read.

After two minutes, let your subject know that you will read another list of 15 words to be recalled later. Read the next list at a rate of about one word every two seconds.

1. thread
2. pin
3. eye
4. sewing
5. sharp
6. point
7. prick
8. thimble
9. haystack
10. thorn
11. hurt
12. injection
13. syringe
14. cloth
15. knitting
Tell your subject that s/he has two minutes to write down as many words as s/he can recall from the list just read.

After two minutes, let your subject know that you will read one last recall list. Again, read the next list at a rate of about one word every two seconds.

1. smooth
2. bumpy
3. road
4. tough
5. sandpaper
6. jagged
7. ready
8. coarse
9. uneven
10. riders
11. rugged
12. sand
13. boards
14. ground
15. gravel

The subject should recall studied words and write them down for the next two minutes.

When two minutes elapse, let the subject know the recall part of experiment is over. Next, you will be the subject and your subject will be the experimenter for Session 2.
Directions to be read by Experimenter (Session 2)

Read these general instructions to your subject (sound familiar?):
You are about to hear three lists of words. Each list contains 15 words. Pay close attention to the
words since you will be asked to recall and recognize these words later on. Have a blank piece of paper ready, since you will be asked to write down as many words as you can recall from each list of studied words. Label the blank piece of paper, “Session 2.”

Next, read the following words at a rate of about one word every two seconds.

16. hill
17. valley
18. climb
19. summit
20. top
21. molehill
22. peak
23. plain
24. glacier
25. goat
26. bike
27. climber
28. range
29. steep
30. ski

Tell your subject that s/he has two minutes to write down as many words as s/he can recall from the list just read.

After two minutes, let you subject know that you will read the second list of 15 words to be recalled later. Read the next list at a rate of about one word every two seconds.

1. bed
2. rest
3. awake
4. tired
5. dream
6. wake
7. snooze
8. blanket
9. doze
10. slumber
11. snore
12. nap
13. peace
14. yawn
15. drowsy
Tell your subject that s/he has two minutes to write down as many words as s/he can recall from the list just read.

After two minutes, let your subject know that you will read one last recall list. Again, read the next list at a rate of about one word every two seconds.

16. sour
17. candy
18. sugar
19. bitter
20. good
21. taste
22. tooth
23. nice
24. honey
25. soda
26. chocolate
27. heart
28. cake
29. tart
30. pie

Tell your subject to recall studied words from the list just read for the next two minutes.

Let the subject know that the recall part of the experiment is finished. See the instructor to receive the next set of instructions.
Session 1 - RED ___

List 1:

List 2:

List 3:
Session 2 - BLUE ___

List 1: ________________________________

List 2: ________________________________

List 3: ________________________________
Confidence Ratings for First Subject (in Session 1)

Rate each word below according to how confident you are that the word had occurred on one of the studied lists. Circle a number that best reflects your confidence:

- 4 = sure that the word was in one of the study lists
- 3 = probably studied
- 2 = probably not studied
- 1 = sure that the word was not in one of the study lists

<table>
<thead>
<tr>
<th>Word</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td>thimble</td>
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* Critical Lure
* Studied Words
☼ Unrelated Lures
Confidence Ratings for Second Subject (in Session 2)

Rate each word below according to how confident you are that the word had occurred on one of the studied lists. Circle a number that best reflects your confidence:
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2=probably not studied
1=sure that the word was not in one of the study lists

top 1 2 3 4
palace 1 2 3 4
mountain 1 2 3 4
glacier 1 2 3 4
flour 1 2 3 4
sleep 1 2 3 4
radio 1 2 3 4
blanket 1 2 3 4
husband 1 2 3 4
snore 1 2 3 4
ledge 1 2 3 4
tooth 1 2 3 4
sweet 1 2 3 4
sky 1 2 3 4
taste 1 2 3 4
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| mountain* | 1 | 2 | 3 | 4 | ♦ Studied Words
| glacier♦ |   |   |   | 4 |
| flour☼  |   |   |   | 4 | ☼ Unrelated Lures
| sleep*  |   |   |   | 4 |
| radio☼  |   |   |   | 4 |
| blanket♦ |   |   |   | 4 |
| husband☼ | 1 | 2 | 3 | 4 |
| snore♦  |   |   |   | 4 |
| ledge☼  |   |   |   | 4 |
| tooth♦  |   |   |   | 4 |
| sweet*  |   |   |   | 4 |
| sky☼    |   |   |   | 4 |
| taste♦  |   |   |   | 4 |