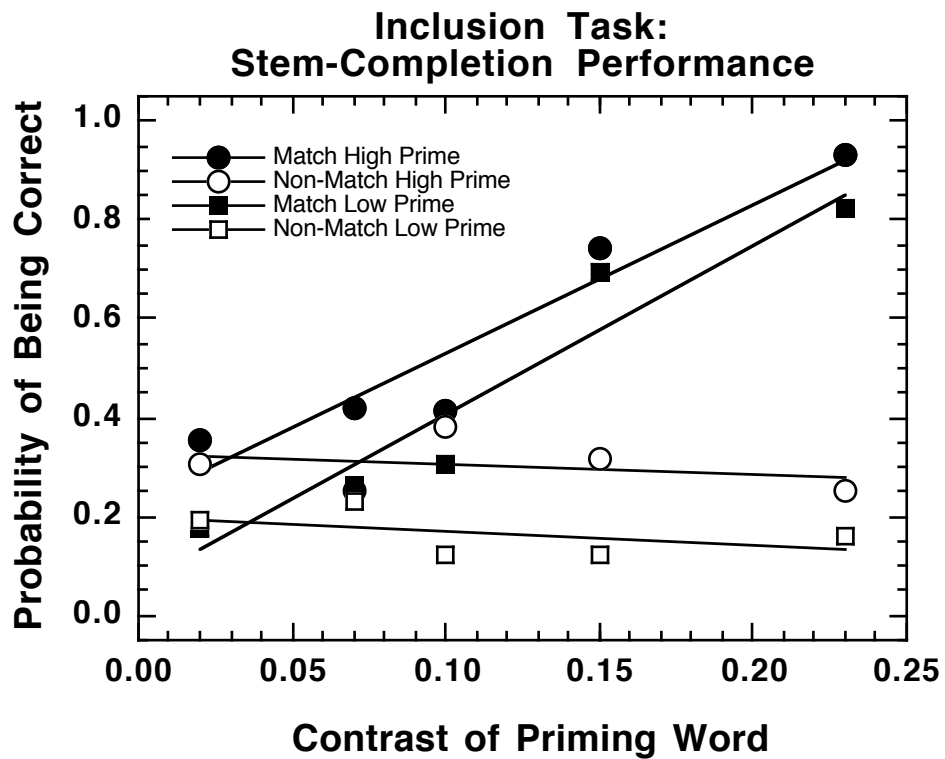


Psychology of Perception
Psychology 4165, Spring 2009
Laboratory 4
Group Project



Psychology of Perception
Psychology 4165-100
Spring 2009

Lewis O. Harvey, Jr.–Instructor
Clare Sims–Assistant
MUEN D156, 09:30–10:45 TR

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Introduction

With this laboratory you will learn how to go through the various stages of scientific experimentation: from getting ideas for research to completing a finished experiment. You will work in groups to brainstorm about what questions to ask, then to search the recent experimental literature, then to design an appropriate experiment and finally to carry out the experiment and write up the results. You will proceed in six steps:

1. The class will be divided into four or five groups. Each group should choose a group leader to keep track of the group discussion by taking notes and then to summarize it to the rest of the class.
2. Each group will then discuss for 10 minutes what questions about perception they would want to answer. The group should make a list of the three most interesting questions.
3. Each group leader will make a three-minute (maximum) presentation of their group's questions. We will keep track of these ideas by writing them down on the blackboard. At the end of the presentations there will be at least 10 questions. There will then be a class discussion about these ideas. Each person should write down the three questions that most interest him/her.
4. The groups will now reconvene and pick one question from the lists of questions compiled by the group members. Each group member should go to the library and locate two papers published within the last ten years related to the question. The papers should be published in one of the journals listed below. Each group member should make copies of these articles for themselves and for of the other group members.
5. The group members should read all the articles gathered by their group and discuss these papers among themselves. The purpose of these discussions is to identify a question that can be answered by a relatively simple experiment.
6. The group should now design an experiment that will answer the question your group has chosen. It will be very helpful during this stage to refer to the relevant chapters of the book *Doing Psychology Experiments* (Martin, 2007). Before the experiment is carried out you need to have it approved by the instructor or the TA.

Laboratory Report

The first draft of your lab report should contain **four** of the standard six parts: **Cover Sheet, Introduction, Methods, Results, Discussion and References**. In the introduction explain what the question is that you propose to answer. You should refer to the relevant literature, including the papers that your group has assembled. The introduction typically starts out broadly and concludes with the specific question you intend to answer. In the methods section describe what you propose to do. Make this section as concrete as possible at this stage. Include a description of the equipment you need and the specific procedure you will follow. Be explicit about what independent variable(s) you will manipulate and what values they will have. Be explicit about the dependent variable(s) you will collect and how you will analyze the data. Include a reference list of all the papers you have cited. Use the standard format of the American Psychological Association for citations and references.

Conciseness and clarity are extremely important characteristics of good scientific writing. Strive for them. We will give you feedback on your first draft before you actually start to carry out your experiment. Remember: keep these reports short, clean, and clear. **First draft is due at the end of lab on 3 or 5 March 2009**

Suggested Journals

Journal of Experimental Psychology: Human Perception and Performance

Perception and Psychophysics

Vision Research

Perception

Schedule

1. **3 and 5 March 2009**

First draft of proposal due (Cover Page, Introduction, References)

2. **10 and 12 March 2009**

Second draft of group proposal due (Cover Page, Introduction, Methods, Anticipated Results and Analyses, References)

3. **17 and 19 March 2009**

Data Collection

4. **March 31 and 2 April 2009**

Data Collection

5. **7 and 9 April 2009**

Data analysis

6. **14 and 16 April 2009**

Work on research presentations

Turn in PowerPoint file of poster.

7. **22 April 2009 (Wednesday) Undergraduate Research Day, 15:00–17:00, UMC**

23 April 2009 (Thursday) Oral presentations of All Group Projects: Both Laboratory Sections (20 points)

8. **28 April 2009 (Tuesday)**

Final version of report due. Each group turns in one paper with a Cover page, Introduction, Methods, Results and Reference section. Each member of the group turns in their own discussion section (80 points total: 40 points for group report, 20 points for individual discussion and 20 points for the group presentation).

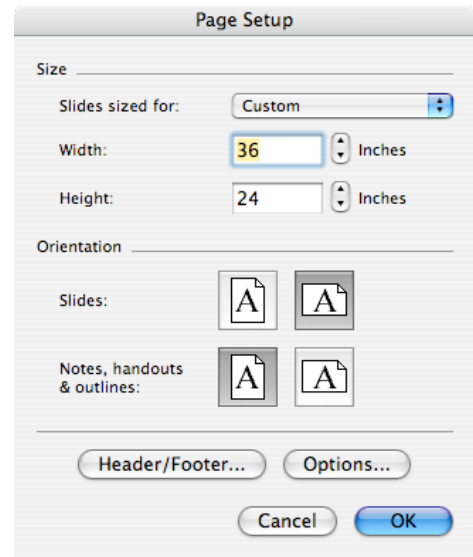
References

Martin, D. W. (2007). *Doing psychology experiments* (7th ed.). Belmont, CA: Thomson Wadsworth.

Hints for Making Posters

Posters are more formal than verbal presentations, but you still don't want to have too much material that will clutter the poster and distract the reader from understanding the main points you want to make. It is easy to prepare your posters using PowerPoint. Start up PowerPoint and make a new slide show with a single slide. You will make your poster on this single slide. Go to the File menu and select Page Setup... Choose Custom paper size and set it to 36 inches wide and 24 inches high. The dialog box should look like this: Below is a sample poster: When making the layout keep the following points in mind:

- The font size of the title should be around 80 points and should fit on one line
- The font for the authors names and affiliation should be around 60 points
- About 1/3 of the area of the poster should be blank
- Use attention-grabbing graphics (a picture is worth a thousand words). The goal is to attract and focus attention on the important parts of your poster.
- Don't make your poster cluttered, put only essentials on it. You want to make it easy for the reader to grasp the main conclusion.



We will print the posters for you here in the department. So you should concentrate on getting the layout right. Here are two examples of posters from previous classes.

Speech Perception: The Effect of Priming on the Perception of Sine Wave Synthesized Speech
 Estelle Carlton, Jim Laudin, Kristen Toll & Thu Yen Tran

Sponsored by: Lewis O. Harvey, Jr. & Benjamin L. Jacobson
 PSYC 4165, Department of Psychology

The purpose of this experiment was to examine the effect of priming on the perception of sine wave synthesized speech. Ten native English speakers (SVC) listened to a synthesized version of the speech signal, which had three sine wave tones. The first tone was of a frequency of 220 Hz, the second tone was of a frequency of 440 Hz, and the third tone was of a frequency of 880 Hz. The participants were then asked to identify the word that they had heard. The results showed that the participants were more likely to identify the word correctly when they had heard the word before.

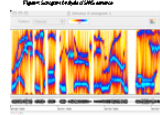
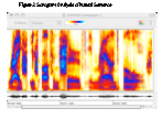
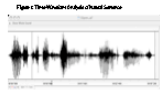
The speech signal is a complex sound, which is composed of many different frequencies. The human ear is able to hear frequencies between 20 Hz and 20,000 Hz. The human brain is able to process these frequencies and identify the words that are being spoken. The purpose of this experiment was to examine the effect of priming on the perception of sine wave synthesized speech.

There were several dependent variables in this experiment. The first was the number of correct identifications. The second was the number of incorrect identifications. The third was the number of words that were not identified. The fourth was the number of words that were identified incorrectly. The fifth was the number of words that were identified correctly. The sixth was the number of words that were identified with confidence. The seventh was the number of words that were identified without confidence. The eighth was the number of words that were identified with a high degree of confidence. The ninth was the number of words that were identified with a low degree of confidence. The tenth was the number of words that were identified with a very high degree of confidence. The eleventh was the number of words that were identified with a very low degree of confidence.

Method

The experiment was conducted at the University of Colorado, Boulder. The participants were 10 native English speakers (SVC) who were between 18 and 25 years old. The participants were randomly assigned to one of two groups: the control group and the priming group. The control group was given a list of words to identify. The priming group was given a list of words to identify, with the words that they were to identify appearing first in the list.

The results of the experiment showed that the priming group was more likely to identify the words correctly than the control group. This was true for all words, but the effect was particularly strong for the words that were primed. The results also showed that the priming group was more likely to identify the words with confidence than the control group. This was also true for all words, but the effect was particularly strong for the words that were primed.



This is what it sounds like in real life.

Procedure

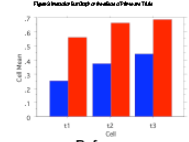
The participants were not told that they were to identify the words that they had heard. They were simply asked to identify the words that they had heard. The results showed that the participants were more likely to identify the words correctly when they had heard the words before.

Results

The results of the experiment showed that the priming group was more likely to identify the words correctly than the control group. This was true for all words, but the effect was particularly strong for the words that were primed. The results also showed that the priming group was more likely to identify the words with confidence than the control group. This was also true for all words, but the effect was particularly strong for the words that were primed.

Discussion

The results of the experiment support the hypothesis that priming affects the perception of sine wave synthesized speech. The results also show that the priming group was more likely to identify the words with confidence than the control group. This suggests that priming not only affects the accuracy of the identification, but also the confidence of the identification.



References

- Carlton, E., Laudin, J., Toll, K., & Tran, T. (2009). The effect of priming on the perception of sine wave synthesized speech. *Psychological Research*, 14(1), 1-10.
- Harvey, L. O., Jr., & Jacobson, B. L. (2009). The effect of priming on the perception of sine wave synthesized speech. *Psychological Research*, 14(1), 1-10.



Olfactory Memory and Cognitive Recall

Caitlin Froehlich, Jessica Graham, Jessica LaBudda, Colleen Micalizzi and Jessica Munday

Psychology of Perception (PSYC 4165)

Sponsors: Lewis O. Harvey, Jr. and Benjamin L. Jacobson

Olfaction is not triggered as quickly as other perceptual events and we are able to evoke other memories than other sensory stimuli. Olfactory stimuli create a unique memory in the brain related to the scent which when paired with another sensory cue is stronger than when it is presented alone. Through this experiment, we predict that smell is recalled more often when paired with a cognitive task, specifically writing a word or drawing a picture associated with a smell. The basis for this hypothesis is olfactory memory occurs because humans have been trained to assign verbal representations to the olfactory stimuli. 30 smells were randomly chosen to be presented for the first training session in the first experimental group: visual imagery, word association, and control. The second training session consisted of 40 smells randomly presented with the participant rating on a scale of confidence that the smell had been previously experienced. The results showed that there was no significant difference between any of the groups, thus demonstrating that cognitive processes do not have an impact on olfactory recall.

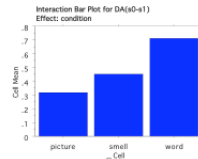
Method

Participants
 The participants in this experiment were 31 college students at the University of Colorado, Boulder enrolled in a psychology class. None of the participants were paid for their time. The participants were both male and female and ranged in age from approximately 18 to 25. All participants were randomly assigned to one of the following groups: control, visual imagery, and word association.

Apparatus
 120 plastic Ziploc bags containing various olfactory stimuli. A list of smells is located in Appendix 1. For the visual imagery and word association groups a pencil and paper was provided.

Procedure
 30 smells were randomly chosen by the experimenter for the first part of the experiment. All three groups were blindfolded and the experimenter opened a plastic bag and instructed the participant to smell for five seconds. The order in which the smells are presented was random for each participant. Immediately following smelling the contents of the container, the control group waited for 15 seconds until the next smell was presented. Within a time span of 15 seconds, the word association group was instructed to write one to two words that best described the smell that was perceived. Also, within a time span of 15 seconds, the visual imagery group was instructed to draw a picture that they associated with that particular. The procedure was repeated for each group for all of the remaining smells. All groups were given a 15 minute break. Following the break, 40 smells were presented, 20 of which were from the original training phase, and 20 new smells. Using the six-point rating scale shown below, each participant rated each smell on his/her confidence that the smell had been previously experienced in this experiment (one of the training smells) (Harvey 3).

Sensitivity of Recall by Group



Results

The results to this experiment show no significant difference between the participants ability to recall olfactory stimuli when paired with a word association or picture association. Though there were no significant values the participants in the word association group recalled more smells than that of the picture association group or control group.

Conclusions

Even though the results did not support our hypothesis the word association group did have a higher sensitivity than both the control group and the visual imagery group. Thus, if this experiment was conducted again with more accuracy it is likely that significance would be found to support the hypothesis that pairing olfactory memory with a cognitive cue aids in more efficient recall.

References

- Blake, R. & Sekler, R. (2002). *Perception*. McGraw-Hill, 541-592.
- Chu, S. & Downes, J. (2002). Pretest nose best: Odors are better cues of autobiographical memory. *Journal of Memory and Cognition*, 30, 44, 511-518.
- White T. and Treisman M. 1997. A comparison of the encoding of content and order in olfactory memory and in memory for visually presented verbal material. *British Journal of Psychology* 88:3 459-469.
- Whitfield, P., and D. M. Stoddard. 1984. Hearing, Taste, and Smell: Pathways of Perception. Torstar Books, Inc., New York, N.Y.
- Zucco, G. (2002). Anomalies in Cognition: Olfactory Memory. *European Psychologist*, Vol. 8, No. 2, pp 77-86.

