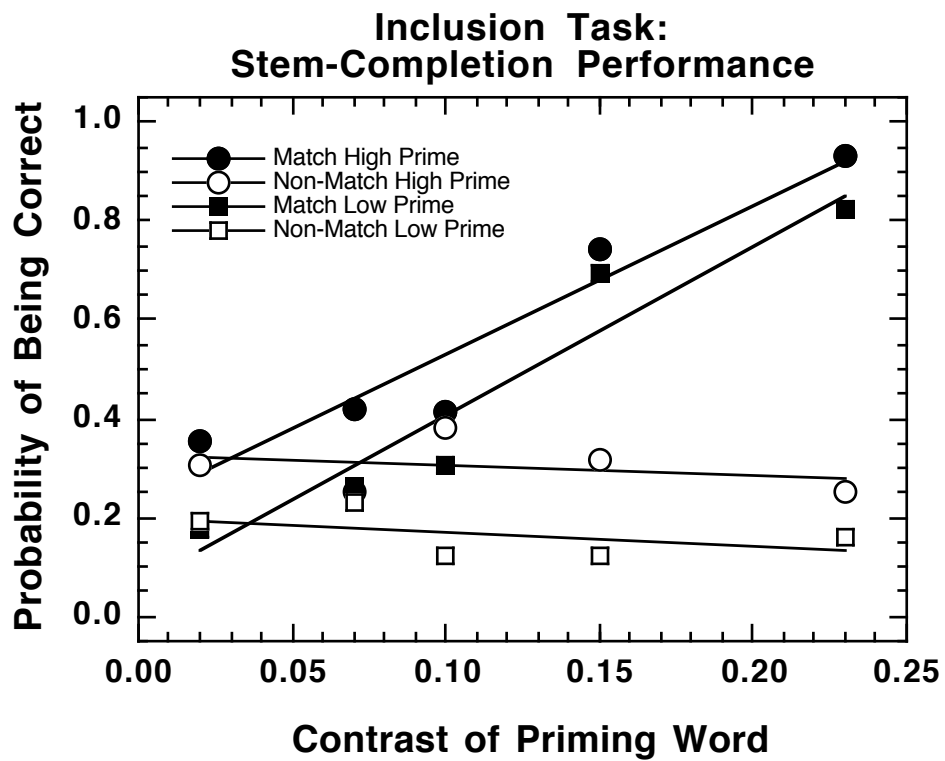


Psychology of Perception  
Psychology 4165, Fall 2005  
Laboratory 4  
Group Project



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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, 2004). 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 in lab on 18 or 20 October 2005**

### Suggested Journals

*Journal of Experimental Psychology: Human Perception and Performance*  
*Perception and Psychophysics*  
*Vision Research*  
*Perception*

### Schedule

1. **18 or 20 October**  
First draft due (Cover Page, Introduction, Methods, References)
2. **1 or 3 November 2005**  
Second draft due (Cover Page, Introduction, Methods, Results, References)
3. **8 or 10 November 2005**  
Start collecting data for your project
4. **22 or 24 November 2005**  
Finish collecting data; start data analysis
5. **29 November or 1 December 2005**  
Finish data analysis; start preparing poster, group presentation, and final report
6. **6 December 2005 (Tuesday)**  
All groups make 20 minute presentations of their projects (12:30–15:20)  
Final reports due at end of presentations

### References

Martin, D. W. (2004). *Doing Psychology Experiments* (6th ed.). Pacific Grove, CA: Brooks/Cole Publishing.

## Tips on Effective Presentations

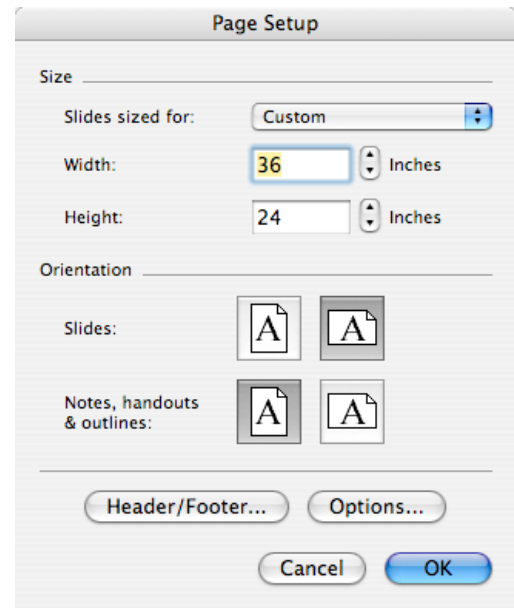
The sequence of material is important, regardless of whether you use PowerPoint or slides or overheads. An effective presentation should last no more than 15 minutes and generally consists of the following material:

- **Title Page:** The name of your project and the full names of your group members
- **Basic Question:** Here you convince your audience that the problem you study is interesting. Articulate the hypothesis or hypotheses that you are going to test.
- **Method:** Describe your experiment with an emphasis on the task you had subjects carry out. You don't need to describe equipment in detail unless it is relevant to your hypothesis. But you want to give the audience a feel for what you actually did. Be sure to make clear what your dependent and independent variables are.
- **Results:** A picture is worth a thousand words. Show a graph with your dependent variable showing the outcome of the experiment. You should mention statistical significance where relevant but usually you do not present detailed statistical analyses (no ANOVA tables).
- **Conclusions:** Given your results, what do you conclude about your hypothesis? What does it all mean in a broader context? Have a maximum of two main points. What other experiments might you want to do? Speculate and have fun.

If you use PowerPoint do NOT simply put your main points on slides and read them. Use the visual material to supplement and reinforce your verbal presentations. Do not use fancy colored/cluttered backgrounds, distracting animations, cute (but tiring) transitions or sound effects. Remember, the audience should not become distracted by the form of your presentation, but should focus on the content of your experiment and your thinking.

## Tips on Effective Posters

Posters are a bit 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. Go to the File menu and select Page Setup.... Choose a 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 title should be around 72 point and should fit on one line
- The authors names and affiliation should be around 60 point
- About 1/3 of the area of the poster should be blank
- Use attention-grabbing graphics (a picture is worth a thousand words)
- Don't make your poster cluttered, put only essentials on it.

### 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. Sine Wave Synthesized (SWS) speech is a simplified version of the speech signal, reduced to only three sine waves. The three components of natural speech (20 syllables for the University of Colorado) were generated using SWS software and presented to two groups. Participants were asked to report the number of syllables in the SWS speech. The control group received no priming, while the experimental group received a priming sentence before the SWS speech. The results showed that the experimental group performed significantly better than the control group in terms of the number of syllables reported.

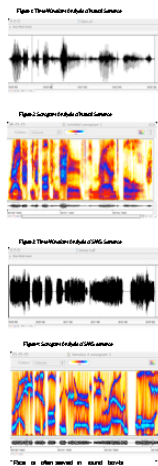
The natural speech signal is a complex sound, which is composed of many different frequencies. It is this complexity that allows us to understand speech. However, when we listen to a recording of speech, we often find it difficult to hear individual words. This is because the natural speech signal is so complex that it is difficult to hear individual words. In this experiment, we used a simplified version of the speech signal, called Sine Wave Synthesized (SWS) speech. SWS speech is a simplified version of the speech signal, reduced to only three sine waves. The three components of natural speech (20 syllables for the University of Colorado) were generated using SWS software and presented to two groups. Participants were asked to report the number of syllables in the SWS speech. The control group received no priming, while the experimental group received a priming sentence before the SWS speech. The results showed that the experimental group performed significantly better than the control group in terms of the number of syllables reported.

#### Method

Twenty-eight students from the University of Colorado, Boulder, enrolled in upper division lab and research methods courses participated in this experiment. The average age of the participants ranged from 19 to 23 years old.

**Apparatus**

Sine wave synthesized sentences were created using COVOC software being run on a Dell Dimension 2400 computer. The control group received no priming, while the experimental group received a priming sentence before the SWS speech. The results showed that the experimental group performed significantly better than the control group in terms of the number of syllables reported.



**Procedure**

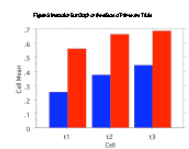
The participants were asked to listen to eight synthesized sine wave sentences. The control group received no priming, while the experimental group received a priming sentence before the SWS speech. The results showed that the experimental group performed significantly better than the control group in terms of the number of syllables reported.

#### Results

Comprehension of the sentences was not correlated across the eight sentences. The mean comprehension probability values for the sentences ranged from 0.20 to 0.70. Figure 2 shows the mean comprehension of all eight sentences. The mean comprehension probability values for the control and experimental groups were 0.20 and 0.70, respectively. This difference was statistically significant ( $F(1, 28) = 11.26, p < 0.0022$ ).

#### Discussion

The results confirm the hypothesis. Priming improves significantly the comprehension of sine wave synthesized speech. The results also show that the control group performed significantly better than the experimental group in terms of the number of syllables reported.



#### References

Carver, T. F. (1973). "The Psychological Organization of Speech." *Psychological Review*, 80(1), 129-156, January, 1974.

Carlson, E., Laudin, J., Toll, K., & Tran, T. (2005). "Speech Perception: The Effect of Priming on the Perception of Sine Wave Synthesized Speech." [www.psych.ucb.edu/psyc4165/psyc4165.html](http://www.psych.ucb.edu/psyc4165/psyc4165.html)